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"CEO Centrality"

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Abstract

We investigate the relationship between CEO centrality – the relative importance of the CEO within the top executive team in terms of ability, contribution, or power – and the value and behavior of public firms. Our proxy for CEO centrality is the fraction of the top-five compensation captured by the CEO. We find that CEO centrality is negatively associated with firm value (as measured by industry-adjusted Tobin's Q). Greater CEO centrality is also correlated with (i) lower (industry-adjusted) accounting profitability, (ii) lower stock returns accompanying acquisitions announced by the firm and higher likelihood of a negative stock return accompanying such announcements, (iii) greater tendency to reward the CEO for luck in the form of positive industry-wide shocks, (iv) lower likelihood of CEO turnover controlling for performance, and (v) lower firm-specific variability of stock returns over time. Overall, our results indicate that differences in CEO centrality are an aspect of firm management and governance that deserves the attention of researchers.

Keywords: Executive compensation, corporate governance, CEOs, executives, options, equity-based compensation, non-equity compensation, Tobin's Q, firm entrenchment, CEO turnover, independent directors, CEO chair, acquisitions, CEO turnover, pay for luck., variability of returns, pay distribution, internal pay equity.
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I. INTRODUCTION

Public firms are likely to vary in terms of how central the CEO is within the top executive team. We use the term 'CEO centrality' to refer to relative importance – in terms of ability, contribution, or power – that the CEO has within the team of top executives. This paper is an empirical study of CEO centrality and how it relates to firm value and behavior. We find that the level of CEO centrality has a rich set of relations with firm outcomes, including correlation with lower firm value as measured by Tobin's Q, lower accounting profitability, lower quality of acquisition decisions, lower CEO turnover, more luck-based pay, and lower firm-specific variability of stock returns.

Our proxy for CEO centrality is the CEO's pay slice (CPS), which we define as the percentage of aggregate top-five total compensation captured by the CEO. Because higher CPS will tend to reflect a greater relative importance of the CEO within the executive team, CPS can serve as a proxy for the CEO's centrality within the top team. Moreover, as CPS is calculated using compensation information from executives that are all at the same firm, this controls for any firm-specific characteristics that affect the average level of compensation in the firm's top executive team.

Firms might differ in their CPS levels for two reasons. First, the firms might differ in their optimal (or "appropriate") CPS level. This optimal CPS level in a given firm reflects the extent to which the CEO is a "star CEO" -- a CEO having superior talents or qualifications that enhance the CEO's relative contribution to the firm as well as the value of outside opportunities. The optimal CPS level also depends on incentive considerations. The higher the CPS level, the stronger the "tournament incentives" for the other executives in the top management team who might be promoted to the CEO post (Lazear and Rosen (1981)). Furthermore, the extent to which it is optimal for the firm to have a management model based on a "dominant player" might well depend on the firm's circumstances.

Second, firms might differ in how their CPS levels depart (if at all) from the optimal level for the firm. To the extent that the CEO has power and influence over the board and company decision-making, the CEO might use this power and influence to raise CPS above its optimal level. In such a case, the "excess CPS" – that is, the excess of the actual CPS over the optimal

CPS – will reflect rents captured by the CEO. Excess CPS can be viewed as a product of agency/governance problems.

This separation of CPS into two components, optimal (or appropriate) CPS and excess CPS, is relevant for interpreting any identified association of CPS with firm characteristics or behavior. A correlation of a given variable with firm differences in observed CPS levels may be due to (i) a correlation of the variable with the optimal level of CPS for a given firm, or (ii) a correlation of the variable with excess CPS (or, of course, a correlation with both).

Our investigation of the relation between CPS levels and firm outcomes and behavior has two parts. The first part examines the relationship between CPS and firm value as measured by Tobin's Q. As will be explained, theory allows for alternative, competing predictions as to whether CPS and Q will be systematically correlated and, if so, in what direction. We find a strong empirical relation between CPS and Q. Controlling for the various factors that prior work has shown to be correlated with Q, there is a significant – and economically meaningful – negative correlation between CPS and Q.

These findings are inconsistent with the hypothesis that firm value and the selection of CPS levels are uncorrelated or with the hypothesis that high-value firms find it optimal to choose high CPS levels. Rather, there are two, not mutually exclusive, explanations. First, an "optimal selection" explanation: the optimal level of CPS might be higher for low-value firms, and the identified pattern might be due to the tendency of such firms to choose high CPS levels. Second, a "governance" explanation: the identified pattern might be due to the correlation between low value and excess CPS; having a high excess CPS might reflect agency and governance problems that in turn bring about a reduction in firm value.

Exploring whether the negative correlation between CPS and value is fully driven by optimal selection, we find that the negative relation is robust to controlling for lagged Q. We also find that increases in CPS are related to decreases in Q, and lower Tobin's Q does not lead to increases in CPS. These results do not enable rejecting the governance/causality explanation in favor of an optimal selection explanation.

Furthermore, we investigate how Q depends on the interaction between CPS and measures of shareholder rights (Gompers et al (2003); Bebchuk et al (2004). Consistent with the governance explanation, we find that the negative association between Q and CPS is concentrated among firms whose boards are entrenched. Because entrenchment itself is negatively correlated with Q, Q is especially low for firms that have a high entrenchment level and a high CPS.

In the second part of our analysis, we examine how CEO centrality is associated with several types of corporate outcomes and decisions, including ones that might reflect governance problems. First, CPS is negatively correlated with accounting profitability. Firms with high CPS tend to have low industry-adjusted return on assets.

Second, high-CPS firms tend to make worse acquisition decisions as judged by the market's reaction to acquisition announcements. If the acquiring firm has a high CPS level, the stock return accompanying the acquisition announcement is lower and more likely to be negative.

Third, high-CPS firms are more likely to reward their CEOs for luck in the sense of Bertrand and Mullainathan (2001) – that is, to increase CEO compensation following positive "industry shocks" that are not attributable to the CEO's own performance. Such luck-based performance is viewed in the literature as a possible sign of governance problems.

Fourth, CPS is associated with CEO turnover. The probability of CEO turnover is lower if CEO centrality is higher controlling for the CEO's length of service and performance.

Fifth, CPS is negatively correlated with the firm-specific variability of stock returns over time, a result that might be due to the tendency and power of dominant CEOs to play it safe and avoid firm-specific volatility (which would impose risk-bearing costs on them but could be less costly to diversified investors).

We should stress that an association between actual CPS levels and excess CPS does not imply that all high-CPS firms have excessive CPS. In some high-CPS firms, the observed high level of CPS might be optimal given the firm's circumstances. Thus, even if the negative correlation between value and CPS is due to the association between high CPS levels and excess CPS, this does not imply that the value of any given high-CPS firm would be increased by reducing its CPS level. [1]Overall, our analysis unearths a rich set of systematic relations between

[1] Also, because our analysis is cross-sectional, it does not imply that increase over time in average CPS levels are necessarily negative. Some recent wprk argues that the importance of general management skills possessed by CEOs has been increasing over time relative to the importance of the skills possessed by other top executives (Frydman (2005), Murphy and Zabojnik (2004)). This view suggests that the average optimal CPS level has increased over tme. However, even if optimal CPS levels had been

CPS levels and firm value and outcomes. The body of evidence we put forward is consistent with the possibility that these associations are at least partly driven by the correlation between the "excessive CPS" component of CPS, which in turn reflects governance problems. At minimum, our results indicate that CPS, and the relationship between it and the value and behavior of firms, are an important issue for study by financial economists. Our analysis calls for further study of the identified associations, including the development of a formal theoretical framework for studying CEO centrality.

Our work is related to several bodies of literature. To begin, our work relates to the literature examining how firm value as measured by Tobin's Q is associated with governance arrangements. For example, studies show that Tobin's Q is negatively correlated with the presence of staggered boards (Bebchuk and Cohen (2005)), the strength of shareholder rights more generally (Gompers, Ishii, and Metrick (2003), Bebchuk, Cohen, and Ferrell (2004), and Cremers and Nair (2005)), and the presence of a large board (Yermack (1996)). We contribute to this literature by identifying yet another aspect of the firm's governance arrangements – the CPS level – that is associated with Tobin's Q.

In addition, this paper relates to the work on stock market reaction to acquisition announcements. Financial economists have paid close attention to buyers' willingness to make acquisitions which, as measured by the stock market returns accompanying the acquisition announcement, the market views as value-decreasing (see, e.g., Lang, Stulz, and Walkling (1991); Morck, Shleifer, and Vishny (1990); Qui (2004); and Moeller, Schlingemann, and Stulz (2005)). Masulis, Wang, and Xie (2007) show that these returns are related to governance characteristics and, in particular, entrenchment provisions. We extend their work by showing that these returns are also negatively correlated with CPS even after controlling for entrenching provisions.

Our work is also related to the work on rewarding CEOs for luck by Bertrand and Mullainathan (2000, 2001). These authors focus on increases in CEO compensation following positive industry-wide shocks that cannot be attributable to the CEO's performance and thus constitute "luck," and they showed that such rewards for luck are more likely to occur in the

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trending upwards, our cross-sectional results suggest that there is a correlation at each point in time between (excess) CPS and the governance problems it reflects.

absence of a large outside blockholder. We complement this work by identifying CPS as another factor that is associated with such rewards for industry-wide positive shocks.

Similarly, our work is further related to the substantial literature on CEO turnover (see, e.g., Jenter and Kanaan (2006), Kaplan and Minton (2006)). We extend this literature by showing that high CPS is associated with a lower CEO turnover controlling for performance.

Two earlier studies have used different measures of CEO dominance within the top executive team. Morck, Shleifer, and Vishny (1989), in a study of alternative mechanisms for transfer of corporate control, define CEOs as powerful when no other person holds the title of President or Chairman and no other person co-signs the letter to shareholders in the annual report. More recently, in investigating how the presence of a powerful CEO is correlated with the variability of stock returns, Adams, Almeida, and Ferreira (2005) assume CEOs to be more powerful when they serve as chair of the board, when they are the only insider on the board, and when they have the status of a founder. We put forward in this paper CPS as a measure of CEO dominance that might capture differences not captured by formal status variables. As we shall see, CPS is positively correlated with such variables, but they explain only a small part of the variability in CPS.

Finally, we should note the growing literature on the type and style of CEOs for firm outcomes (see e.g. Malmendier and Tate (2005) and Bertrand and Schoar (2003)). Our work seeks to highlight the importance of the relative importance of the CEO vis-à-vis other members of the top team for firm outcomes.

Our analysis is organized as follows. Section II describes our data and presents summary statistics. Section III analyzes the relationship between CEO centrality and Tobin's Q as well as accounting profitability. Section IV examines the relation between centrality and abnormal acquirer returns, firm-specific variability of returns, CEO turnover, CEO pay for luck, and abnormal returns around announcements of CPS changes. Finally, Section VI concludes.

II. Data and Summary Statistics

A. The CEO Centrality Index

Because CEO centrality is not directly observable to researchers, the proxy for CEO centrality used in this paper is the CEO's pay slice (CPS). CPS is defined as the percentage of the total compensation to the top five executives that goes to the CEO. The importance of the CEO relative to the other members of the top executive team -- in terms of contribution, ability, or power – is expected to be reflected in CPS.

Because CPS is likely the product of many observable and non-observable dimensions of the firm's top executives and management model, CPS may enable us to capture dimensions of the CEO's role in the top team beyond the ones captured by formal and easily observed variables such as whether the CEO also chairs the board. While CPS is positively correlated with (i) a dummy equal to one if the CEO also chairs the board, and (ii) a dummy equal to one if the CEO is the only executive of the firm who is a member of the board,[2] a regression of CPS on these two variables results in an adjusted r-squared of only 0.009, indicating that CPS is likely to capture other information not contained in those two variables. In addition, because CPS is calculated using the compensation figures for the top executives at the same firm, it directly controls for any firm-specific characteristics that affect the average level of executive compensation at the firm level.

We compute the CEO's pay slice (CPS) using data from Compustat's ExecuComp database from 1993 – 2004.[3] Our main measure is based on the total compensation to each executive, including salary, bonus, other annual pay, the total value of restricted stock granted that year, the Black-Scholes value of stock options granted that year, long-term incentive payouts, and all other total compensation (as reported in ExecuComp item # TDC1).

B. Summary Statistics

Univariate statistics for the average CPS and its dispersion across the 12 Fama-French industries are shown in Table 1, where averages are computed using a panel dataset of 12,011 observations. Using the universe of firms in the ExecuComp database, we find that CPS is, on average, 34.4% in our time period of 1993 – 2004.

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2 The correlation of CPS with the first variable is 0.055 (significant at the 1% level) and the correlation of CPS with the second variable is 0.073 (significant at the 1% level).

3 Whenever ExecuComp reports more than five executives in a given year, we select the top five executives (in terms of total compensation) only to compute CPS for that year.

For each of the 12 industries, we compute the industry mean and median CPS. We find that there is some variation across industries in average CPS. The lowest CPS industry is Telecom with 31.1%, and the highest CPS industry is Chemical with 37.4%.

To assess the significance of the differences in industry average CPS, we run Tobit regressions with CPS as the dependent variable and industry dummies as the independent variables. The results are reported in the last two columns of Table 1. Using the Energy industry as the holdout industry, we find that five of the twelve industries display significantly different levels of CPS. In addition to the observed variation in industry average CPS, within-industry variations in CPS are even more substantial. For example, the Energy industry has a within-industry standard deviation of CPS of 10.4% on an average of 35.1%. This suggests that CPS is in part determined by industry characteristics, but to a large extent, CPS is CEO- and firm-specific.

Table 2 provides descriptive statistics of several pertinent firm characteristics that will be used in our analysis. We use various Compustat, CRSP, IRRC, and ExecuComp variables: Tobin's Q is defined as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. The industry adjustment is made at the four-digit SIC level. Industry-adjusted ROA is the return on assets computed as net income divided by book value of assets adjusted by the median ROA of the firms in Compustat in a given four-digit SIC industry and year. It is expressed in percentage terms. The entrenchment index (Eindex) consists (following Bebchuk, Cohen, and Ferrell (2004)) of 6 shareholder rights provisions in a firm's charter. Eindex ranges between 0 and 6, where higher values indicate weaker shareholder rights or more entrenched management.[4] Book value (in logs) is the book value of assets. Insider ownership is the fraction of shares held by insiders as reported by ExecuComp. Capex/Assets is the ratio of capital expenditures to assets. Leverage is the ratio of long-term debt to assets. R&D is the ratio of research and development to sales. If R&D is missing, it is set to zero and the dummy variable R&D missing is set to one. Company age is computed as the current year minus the year in which the company was first listed on CRSP.

[4] The Eindex is based on data from the Investor Responsibility Research Center (IRRC), which are updated in the years 1990, 1993, 1995, 1998, 2000, 2002, and 2004. For the years where IRRC data is not updated, we use the last value available. For further details, see Bebchuk et al. (2004). As a robustness test, we have also used the Gompers et al. (2003) governance index (Gindex), consisting of 24 charter provisions, and the results are qualitatively similar. The results using Gindex are available upon request.

Table 2 reports averages and standard deviations for all these variables. In addition, we show the average separately for firms with high versus low CPS, proxying for high CPS by industry-adjusting CPS. Firms with a positive industry-adjusted CPS display a lower industry-adjusted Tobin's Q and lower industry-adjusted ROA. These firms also have lower insider ownership, a higher Eindex, a larger book value, higher leverage, and higher age.

By themselves, these univariate results are inconclusive. High entrenchment and high age are both correlated with low industry-adjusted Q. Thus, it is possible that the negative correlation between CPS and Tobin's Q is due to the tendency of high-CPS firms to have high Eindex and high age. Therefore, it is necessary to examine whether the negative correlation between CPS and firm value holds in a multivariate regression, which we shall do in the next section.

III. CEO Centrality and Firm Value

A. How Should CPS and Firm Value Be Expected to Correlate?

Before proceeding, we first discuss whether and how CPS should be expected to correlate with firm value on theoretical grounds. In thinking about this question, it is useful to distinguish between two possible components of a firm's CPS level. One component is the "optimal" level of CPS in this firm given the pool of executives available to the team and the business environment the firm is facing. The other component is the "excess CPS," which is the amount (if any) by which actual CPS exceeds the optimal CPS.

(i) Optimal CPS Levels: The optimal CPS level might vary across firms. Among other things, this optimal level depends on (i) the extent to which it is desirable for the firm to have a dominant player model based on one especially important player rather than a management model based on a team of top executives, (ii) the extent to which it is desirable to provide "tournament incentives" to top executives other than the CEO, (iii) the extent to which it is desirable to concentrate dollars spent on incentive generation on the CEO, and (iv) the pool of candidates available to the firm from which the members of the top executive team were hired. Each of these considerations clearly depends on factors that might vary from firm to firm (or even from time to time for the same firm).

For example, compared with a team player model, a dominant player management model could have both advantages and disadvantages, the magnitude of which could well vary from case to case. On the one hand, a dominant player model could provide clarity, steadiness, and reduction in the cost of decision-making. On the other hand, there is a large body of literature, starting with Shaw (1932),[5] extolling the benefits of group rather than individual decision-making, and there is some experimental data showing that groups often outperform individuals in decision-making (see Bainbridge (2002) for a survey). Furthermore, a dominant player model and the high CPS coming with it can lead to resentment on the part of the other members of the top team (Brill (1993) and Cook (1990)).

Similarly, a tournament environment can provide both positive and negative incentives to top executives other than the CEO (Milgrom and Roberts (1992)). On one hand, a tournament may provide executives other than the CEO with incentives to excel to increase their chances of succeeding the CEO. On the other hand, a tournament may also produce deadweight costs by, for example, causing executives vying for the CEO position to cooperate less with, or even seek to undermine, their rivals.

(ii) Selection of Optimal CPS Levels: Consider the case in which there are no agency problems that might lead firms to set CEO centrality at any level other than the optimal one. In this case, by definition, no firm would be able to increase its value by changing its CPS level; any increase or decrease of CPS from the optimal level could only hurt value.

In the considered case, however, CPS levels could well differ among firms, as they all make the selection optimal for their circumstances, and accordingly an association between CPS levels and firm values could arise. To the extent that such an association would arise, it would reflect a selection mechanism.

As to the direction of this selection effect, theory does not provide us with an unambiguous prediction. First, it could be argued that low-value firms in need of a turnaround might have a greater need for a dominant player and powerful tournament incentives for their other top players. Following this hypothesis, optimal CPS and value are expected to be negatively correlated. Secondly, the need for a dominant player and powerful tournament incentives may in fact be greater with high-value firms that have high growth opportunities that need to be decisively and vigorously pursued. Following this hypothesis, optimal CPS and firm

[5] See also Miner (1984), Blinder and Morgan (2000), and Hill (1982).

value would be positively correlated. Third, the factors calling for more or less CEO centrality are ones that could be distributed independently of firm value. According to this hypothesis optimal CPS would be uncorrelated with firm value. Thus, to the extent that selection effects play a significant role, an empirical investigation would be necessary to choose among these competing hypotheses.

(iii) Deviations from Optimal CPS Levels: Thus far the discussion has assumed that all CPS levels are optimally set. However, because choices are partly made by agents whose behavior is influenced by their private interests and thus involves agency costs, choices might not be made in an optimal fashion. For example, a CEO might use her power and influence to push for a greater use of a dominant player model and higher CPS than optimal for the firm. In such a case, CPS might be higher than optimal, with the excess reflecting rents captured by the CEO.

Let ‘excess CPS’ denote the excess of the actual CPS level over the optimal level. As long as the excess level does not have a perfectly negative correlation with the optimal level, actual CPS level can be expected to be positively correlated with excess CPS. In this case, correlation between excess CPS levels and a given variable can translate into a correlation between this variable and observed CPS levels.

A high level of excess CPS – that is, a substantial departure from the optimal CPS level – can be viewed as a manifestation of significant governance problems. It might reflect a state of affairs in which the CEO is making a considerable use of the CEO’s power, and plays an excessively central role in the top executive team, in pursuit of private rents. Accordingly, high levels of excess pay, and the governance problems they reflect, would be correlated with low firm value. Thus, to the extent that observed CPS levels do indeed contain a potentially significant component of excess CPS, such presence can be expected to produce a negative correlation between CPS and firm value.

B. The Association between CPS and Tobin's Q

In this section, we turn to studying empirically the association between CPS and firm value. Our principal measure of firm value is Tobin’s Q. This follows a substantial literature on the association between firm value and various corporate arrangements, which extensively used

Tobin's Q as a measure of firm value (e.g., Demsetz and Lehn (1985); Morck, Shleifer, and Vishny (1988); Lang and Stulz (1994); Yermack (1996); and Gompers, Ishii, and Metrick (2003)). Our definition of Tobin's Q is that used by Kaplan and Zingales (1997) and subsequently also by Gompers, Ishii, and Metrick (2003).[6] Our dependent variable is the industry-adjusted Tobin's Q, using industry-adjustments at the four-digit SIC code level.[7]

Our regressions include the standard controls used in the above literature. In particular, we control for firm size (in logs of the book value of assets), insider ownership and insider ownership squared (see McConnell and Servaes (1990)), profitability (ROA), the ratio of capital expenditures to assets (Capex/Assets), leverage, the ratio of R&D expenditures to sales (R&D), a dummy for missing R&D data, the age of the firm (in logs) (see Shin and Stulz (2000)), and year fixed effects. We also include the entrenchment index, Eindex, which has been shown to be negatively correlated with firm value controlling for standard controls (Eindex) (Bebchuk, Cohen, and Ferrell (2004)).

The results, which are displayed in Table 3, indicate that higher CPS has a strong association with lower firm value. The first four regressions employ pooled panel regressions with year fixed effects. Column 1 uses a contemporaneous association between industry-adjusted Q and CPS, and column 2 uses lagged CPS and lagged ownership variables.[8] The economic significance is strongest in column 2: a one standard deviation shock in the value of CPS (equal to 11.73%) is associated with a reduction in next year's Tobin's Q of 5.5% (= 11.73% x -0.475). Column 3 and 4 indicate that these results continue to hold using industry-adjusted CPS.

As another robustness check, columns 5 and 6 present the Fama-MacBeth type (average) coefficients of 12 annual cross-sectional regressions. The average coefficients of CPS and lagged CPS are negative and significant, and their average levels are quite similar to those of the corresponding coefficients in regressions 1 and 2, respectively.

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6 According to this specification, Q is equal to the market value of assets divided by the book value of assets (Compustat item 6), where the market value of assets is computed as the book value of assets (item 6) plus the market value of common stock (item 24 * item 25) less the sum of book value of common stock (item 60) and balance sheet deferred taxes (item 74).

7 An alternative specification of our regressions, with log Q as the dependent variable and SIC codes as industry fixed effects, yields similar results throughout. Also, using the Fama-French classification of 48 industry groups, rather than four-digit SIC codes, yields similar results throughout.

8 When using lagged CPS (t-1), we require that the CEO remains in place the following year (t). The results are qualitatively similar without this constraint (not shown separately).

In column 7 of Table 3, we test whether the documented relation in regression 1 between CPS and Tobin's Q is due to the fact that CPS contains information that is already available in the form of proxies such as whether the CEO is also the Chair and whether the CEO is the only member of the board of directors among the top five executives. Such variables have been used by Adams et al. (2006) as proxies for CEO-versus-group decision making and are expected to be related to the concept of CEO centrality. We find that CPS remains strongly negatively associated with Tobin's Q even after controlling for these two additional variables, and that none of these two additional variables is significantly related to Tobin's Q. This result indicates that CPS is capturing more than these two already-available proxies for the relative importance of the CEO in the top executive team.

C. Optimal Selection and Agency Explanations

The above results concerning the negative correlation between CPS and Tobin's Q are inconsistent with some of the hypotheses discussed in section III.A. In particular, the results rule out the hypothesis that firms set their CPS levels optimally and these levels are uncorrelated with firm value. The results similarly rule out the hypothesis that firms set CPS levels optimally and these levels are positively correlated with firm value.

The identified pattern is consistent with and can be explained by the following two (not mutually exclusive) hypotheses:

• Optimal Selection: firms' optimal CPS levels are negatively correlated with firm value.

• Governance/agency: some firms do not set CPS optimally, and excess CPS levels are negatively correlated with firm value.

In the subsequent three tables, we conduct several tests as to whether it is possible to establish that the identified negative correlation between CPS and industry-adjusted Q is all due to a tendency of low-Q firms to choose high CPS. Table 4 displays the results of regressions similar to those shown in Table 3 with the addition of one- and two-year lagged industry-adjusted Tobin's Q. This controls for the level of industry-adjusted Tobin's Q that the firm had prior to the setting of the CPS level serving as a dependent variable. The results indicate that CPS or lagged CPS (industry-adjusted or not) remains negatively associated with industry-adjusted Q (though with weakened statistical significance) even when controlling for lagged Q.

This finding does not support the hypothesis that the association between CPS and low Q is fully driven by a tendency of low-Q firms to adopt high CPS levels.

Next, Table 5 shows regressions of percentage changes in Tobin's Q on changes in CPS. We find that changes in firm value are negatively correlated with changes in CPS. This result is robust to including control variables or changes in control variables. (In the latter case, the statistical significance of the CPS coefficient is weaker, with a p-value of 0.055, but the size of the coefficient is almost identical to the other two specifications.)

Finally, in Table 6, we investigate all 1,326 CEO changes in the universe of firms in our sample, and compare CPS between the new and the old CEO depending on the Tobin's Q of the firms. If low value firms are more optimally run with a high CPS, then we would expect to find that the new CEO has a significantly higher CPS than new CEOs of high value firms. We find no significant differences in CPS, nor industry-adjusted CPS between newly hired CEOs in lower-valued (with an industry-adjusted Tobin's Q that is negative or with a Tobin's Q below 1) versus higher valued firms. Furthermore, there is no significant difference between low and high value firms in terms of the increase in CPS that the new CEO receives relative to the predecessor. The p-value of the difference in the change of CPS from the old CEO to the new CEO across firms with Tobin's Q above versus below 1 has a p-value of 11%, and using negative versus positive industry-adjusted Tobin's Q the p-value is 82%. Thus, this analysis does not provide significant evidence that the identified negative correlation between CPS and Q can be fully explained by a tendency of low-value firms to set high levels of CPS.

D. Interaction with Shareholder Rights

To further explore the possibility that the negative correlation between CPS and firm value is amenable to a governance/agency explanation, we examine whether the association is more or less pronounced in firms with high entrenchment levels. In such firms, the CEO and the board are relatively insulated from market discipline and the threat of removal, and the potential for agency problems in general, and departures from optimal levels of CEO centrality in particular, is higher.

Table 7 displays the results of adding the interaction of CPS with the Eindex as an additional independent variable to the specifications of Table 3. Columns 1 (using contemporaneous CPS) and 2 (using lagged CPS) show that the lower value for firms with higher CPS is driven by firms with high entrenchment as measured by the Eindex. We include both CPS and CPS interacted with the Eindex, and only the interaction has a significant (and negative) coefficient. This suggests a complementary relationship, as it is only firms with both entrenchment and high CPS that have lower firm values.

The results using lagged CPS are especially strong, indicating that there is a strong relation between today's CPS and future firm value. For firms with maximum entrenchment (Eindex value of 6), a one standard deviation positive shock to CPS is associated with a reduction in next year's industry-adjusted Tobin's Q of 22% (= 11.73% x 6 x -0.311, see column 2). Interestingly, using lagged CPS and the interaction of lagged CPS with the Eindex drives out the importance of the Eindex in isolation.

Column 3-6 use alternative specifications along the lines developed earlier in Table 3. Column 3 and 4 use industry-adjusted CPS rather than CPS. Columns 5 and 6 use Fama-MacBeth type regressions with industry-adjusted CPS. Throughout, the interaction term of CPS and Eindex is negative and significant.

Thus, the data suggest that the negative correlation between CPS and firm value is more pronounced in firms with high entrenchment levels. In such firms, the potential for departures from optimal CPS levels might be more significant, and as a result the distribution of actual CPS levels could be more influenced by the distribution of excess CPS levels. As a result, in such firms, CPS levels might be more correlated with excess CPS and the governance problems it reflects.

E. An Event Study

The preceding subsections document that firms with higher CPS are associated with lower firm value as measured by Tobin's Q. In this subsection, we explore whether the release of information about changes in CPS is associated with abnormal stock returns. New information about the elements necessary for calculating CPS is provided in firms' proxy statements, which are the source of public information about executive compensation.

Our event study uses the data on proxy filing dates collected by Dlugosz, Fahlenbrach, Gompers, and Metrick (2006). They collect those dates for 1,916 companies for the years 1996 –

2001. Using the date of the proxy filing as the event date, we calculate the cumulative abnormal return (CAR) around each event date using the market model. The event window is -10 to +10 days around the event. We use a 21-day window since the proxy date and the filing date are not always the same. We assign events to groups according to the change in CPS in the event year relative to the previous year.[9]

Table 8 Panel A presents the comparison of the average CAR for firms with decreasing versus increasing CPS, as well as the average CAR for the 25% of firms with the most negative changes to CPS versus the 25% of firms with the most positive changes to CPS. Comparing across groups, the 25% of firms with the highest decreases in CPS had a significantly higher CAR than the 25% of firms with the highest increases in CPS. The difference in the 21-day event window of 1.2% is statistically and economically significant. Comparing firms with decreasing versus increasing CPS, we again find a positive difference in CAR equal to 0.3%, but it is not statistically significant.

We also find a small but strongly statistically significant correlation of -3.5% between the change in CPS and the CAR (see panel B). As reported in panel C of Table 8, this correlation survives after controlling for differences in firm size and book-to-market characteristics. In particular, the second regression of CAR also includes the interaction of the change in CPS with a dummy indicating whether or not the firm has an Eindex above the sample median. The negative relationship between news about increases in CPS and abnormal returns is driven by firms with high entrenchment. This is consistent with the previous result that the negative correlation of CPS with Q is driven by firms with high entrenchment.

One interpretation of our results is that the market reacts negatively to news about increases in CPS. An alternative interpretation, consistent with the view that CPS levels are correlated with worse governance, is that increases in CPS are also correlated with other information released in firms' proxy statements that investors view unfavorably.

IV. CEO CENTRALITY AND COMPANY DECISIONS AND OUTCOMES

[9] We also weigh the observations by the inverse of the variance of the estimate of the cumulative abnormal return to incorporate estimation risk.

Thus far we have focused on the relation between CPS and one measure of firm outcomes and performance – Tobin's Q. We now turn to examine whether CPS is associated with several other significant aspects of firm behavior and outcomes. This investigation provides a robustness check on the conclusion reached in the preceding section regarding the negative association between CPS and firm value.

Furthermore, this inquiry can also help in assessing whether cross-sectional differences should be viewed as related to governance/agency problems. While a low Tobin's Q might be due to governance problems, an optimally governed firm might also have low Q due to its circumstances. In contrast, some of the aspects to be considered in this section – such as the quality of acquisition decisions – are ones that are closely connected to suboptimal decisions.

We consider in turn five aspects of firm decisions and outcomes: accounting profitability (subsection A); quality of acquisition decisions as judged by the market's reaction to their announcement (subsection B); rewards to the CEO for luck in the form of industry-wide positive shocks (subsection C); CEO turnover (subsection D); and variability of firm-specific stock returns (subsection E).

A. Accounting Profitability and CPS

The first dimension of firm outcomes and performance we consider is that of accounting profitability. Table 9 reports regressions similar to those in Table 3 with industry-adjusted ROA as the dependent variable instead of industry-adjusted Tobin's Q.

Panel A reports results of pooled-panel regressions with year fixed effects, and panel B reports results of Fama-MacBeth type regressions where we only display the coefficients of interest (for brevity). Both panels display six columns with different specifications. In the first column, the only independent variable is contemporaneous CPS. In the second column, we add to contemporaneous CPS the various standard controls we used in the Q regressions (see Table 3). The third column differs from the second column in that lagged CPS replaces contemporaneous CPS as the independent variable. In the fourth and fifth columns, the coefficient of interest is industry-adjusted CPS, with its contemporaneous level used in the regression of column 4 and its lagged level in the regression of column 5. Finally, the sixth column adds as additional controls the two formal variables that capture some dimensions of

CEO centrality: a dummy for the CEO being a chair, and a dummy for the CEO being the only top executive who is also member of the board.

In both panels, in each of the six specifications, the coefficient on CPS – whether CPS is contemporaneous or lagged, whether it is industry-adjusted or not – is negative and significant throughout. The effect of CPS is also economically sizable. For example, using the estimate in column 6, a one standard deviation increase in CPS (0.1172) decreases industry-adjusted ROA by 1.317% (=0.1172 * -11.239), which is close to the mean value of the sample. The conclusion that we draw from this analysis is that CPS is negatively associated with (industry-adjusted) accounting profitability, which reinforces our earlier finding that high CPS is associated with lower firm value as measured by Tobin's Q.

B. CEO Centrality and Acquirer Returns

In order to gain insight into our finding that high-CPS firms display a lower firm value, we follow the study of Masulis et al. (2007). This study investigates the negative correlation between firm value and shareholder rights, measured by the governance index or the entrenchment index, by asking whether shareholder rights are associated with the stock returns accompanying bidders' announcements. The main result is that announcement returns for acquirers with high entrenchment level are significantly lower. Using the same data, we add CPS in the year prior to the acquisition announcement as an additional explanatory variable. Our test asks whether, controlling for the level of entrenchment, high CPS is associated with lower stock returns upon the announcement of an acquisition.

We start with the 3,333 events from Masulis et al. (2007).[10] The sample is based on acquisitions recorded by the Securities Data Corporation (SDC) between January 1, 1990 and December 31, 2003. Since we require that CPS is available at the fiscal year-end prior to the takeover bid our sample is reduced to 1,241 events.[11] For this subsample, we find an average (standard deviation) abnormal announcement return in the eleven days around the announcement date of 0.26% (6.60). These are very similar to the values of 0.22% (6.59) reported by Masulis et

[10] For a detailed description of the sample and the selection process, see Masulis et al. (2007), pages 5-6. We thank Ronald Masulis for sharing this data.

[11] We have CPS date from 1993 onwards and only use CPS when the CEO is not changing during the year.

al. (2007) for the full sample, and it is thus unlikely that the restrictions imposed by the availability of CPS introduce any particular bias.

Table 10 shows the results for two sets of regressions. Regressions 1, 2 and 5 are OLS regressions with the abnormal announcement return of the bidder in the eleven days around the initial announcement as the dependent variable (cumulative abnormal return, CAR[-5,+5]). Regressions 3 and 4 are logit regressions where the dependent variable is equal to one if the CAR was negative and zero otherwise. Both types of regressions use robust standard errors that are clustered at the firm level to account for correlations if firms make multiple acquisitions. The main variable of interest is the CPS of the bidder, computed at the fiscal year end prior to the takeover bid.

In regressions 1, 2, and 5, we find that the coefficient is negative and significant at the 10% level even after controlling for other determinants found to be significant in Masulis et al. (2007). In particular, CPS has additional explanatory power over and above the entrenchment Eindex (regression 1) or the governance Gindex (regression 2) and over and above additional proxies for power such as the CEO also being the Chair and the CEO being the only director among the top five executives.

Economically, the coefficient on the CPS variable of -0.024 indicates that a one standard deviation increase in CPS—in this sample that is 12—results in a reduction of the announcement return of 0.288% (12 x -0.024). Given the average market value of the bidder in our sample of $6,358 million, a one standard deviation increase in CPS results in a loss of about $18 million per acquisition announcement. This is in the same order of magnitude as the effect from adding one more provision in the Eindex (the coefficient on the Eindex in regression 1 is -0.497).

The coefficients on CPS in regressions 3 and 4 are positive and significant at the 5% level, indicating that high-CPS firms are more likely to make acquisitions judged by the market to be value-destroying, i.e., acquisitions where the bidder announcement return is negative. Economically, the coefficient of 0.012 implies that a one standard deviation increase in CPS increases the chances of an acquisition being judged to be value-destroying by the market by 15% (exp(12*0.012)=1.15). This is again of similar importance to increasing the Eindex by one.

From this analysis, we conclude that one potential reason for the lower valuation of firms with high CPS is that high-CPS firms make acquisitions viewed less favorably by the market and, in particular, are more likely to make acquisitions viewed as value-destroying by the market.

C. Pay for Industry-Wide Shocks

This section considers the relation between CPS and changes in CEO compensation accompanying industry-wide value and profitability shocks. Bertrand and Mullainathan (2001) argue that CEO compensation increases following such industry-wide shocks can be viewed as rewards for luck. They further argue and show that the existence and magnitude of such rewards is likely to correlate with agency problems and the lack of effective outside checks.[12] Given this view, we explore in this section whether CPS is related to such rewards for luck.

Table 11 presents the results for industry-fixed effects pooled panel regressions with the log of the CEO's total compensation as the dependent variable. We introduce a dummy variable indicating whether there was a positive industry-wide shock in performance, using either Tobin's Q (regressions 1-4) or ROA (regressions 5-8) as measures for performance. As results are robust to the choice of which performance metric is used, we discuss the results for industry shocks of Tobin's Q. We control for the level of (or change in) CPS and firm-level Tobin's Q in all specifications in Table 11.

Column 1 confirms the main result in Bertrand and Mullainathan (2001) that exogenous, positive performance shocks produce, on average, an increase in CEO compensation. Column 2 and 3 show that this is only the case for firms where CPS is relatively high or went up during the year of the industry shock. Thus, rewarding CEOs for luck during an industry-wide positive shocks is concentrated among firms with high CPS or CPS increases.

An important criticism of the Bertrand-Mullainathan view of pay for lucky performance is given by Himmelberg and Hubbard (2000) and Hubbard (2005). They argue that if the supply

[12] Of course, there may be exceptions to viewing industry-wide performance shocks as exogenous to the firm, especially in cases where the firm is large and has significant market power. In that case, as Bertrand and Mullainathan mention, Gibbons and Murphy (1990) note that relative performance evaluation (i.e., filtering out industry-wide shocks) can distort CEO incentives if they can 'take actions that affect the average output of the reference group.' However, Bertrand and Mullainathan do not find evidence that this is a severe problem when using industry-wide performance shocks, as their results for that measure are very similar to using shocks that are more clearly beyond the CEO's control, such as oil price and exchange rate shocks.

of CEOs is inelastic, then positive industry-wide shocks increase the relative importance of managerial ability and could in equilibrium lead to higher compensation. We investigate this point using their view that the supply of CEOs is most inelastic for the largest firms. Regression 4 shows that our results are not driven by the larger firms for which Himmelberg and Hubbard argue that the supply of CEOs is most likely to be inelastic. We find no difference between large and small firms in terms of how the reaction of CEO compensation to industry-wide shocks is associated with CPS.

D. CEO Centrality and CEO Turnover

We have seen that firms with high CPS have lower Q and lower accounting profitability and make acquisition decisions that are viewed less favorably by the market. It could thus be expected that the CEOs of such firms would be replaced more often unless the high CPS is at least partly due to agency problems in the first place, which could make CEO replacement more difficult and unlikely. We explore this possibility by testing whether, controlling for performance, CEO turnover is related to CPS.

Table 12 displays the results of logit regressions where the dependent variable is equal to one if there is a CEO turnover in year t. We use the ExecuComp dataset to identify CEO turnover, which we define as taking place if the CEO title in this dataset has changed from one person to another. We find 1,326 turnovers in our sample of 11,221 firm-years with available data on the prior-year CPS.

The independent variable of interest in the base regression of column 1 is the industry-adjusted CPS at the end of the preceding year. The control variables include the stock return of the company during the year and dummies for the year of the CEO's service (we do not use tenure as a continuous variable since its effect on turnover might not be monotonic). The coefficient on industry-adjusted CPS is negative and significant, indicating that CEOs with high CPS are less likely to be replaced.

In column 2, we add an interaction between the industry-adjusted CPS and the stock return. The question is whether high-CPS CEOs are less likely to turn over even if their stock performance is bad. The coefficient on the interaction variable is positive, and marginally significant, indicating that turnover is less performance-sensitive for high-CPS CEOs.

To assess the economic significance, we consider the effect of a 10% increase in industry-adjusted CPS on the performance sensitivity of CEO turnover. The coefficient on stock return is -0.404 implying that with a -50% stock return, CEO turnover probability increases by 22% (exp(-0.5*-0.404) - 1). The coefficient on the interaction term between the stock return and industry-adjusted CPS is 1.684, implying a reduction in the performance sensitivity of 8% (exp(-0.5*1.684*0.1) - 1), or about a one-third reduction in the performance sensitivity of turnover.

Following Jenter and Kanaan (2006), regression 3 splits the stock return into firm-specific and market returns, where firm specific returns are defined as the difference between the overall stock return and the market return. Consistent with Jenter and Kanaan (2006) we also find that CEO turnover is sensitive to market returns, albeit not significantly so. The main conclusion is that CEO turnover is less sensitive to firm specific returns for CEOs with a high industry-adjusted CPS. If a lower performance sensitivity is an indication of more agency problems (e.g., Kaplan and Minton (2006)), then our findings here could help explain the overall negative association between CPS and firm value.

E. CEO Centrality and the Variability of Firm-Specific Returns

We conclude our investigation of the relation between CPS and firm outcomes by examining the relation between CPS and the variability of firm-specific stock returns. This variability reflects the frequency with which and the extent to which investors make revisions in their estimate of the firm's prospects.

A priori, theory does not provide us with an unambiguous prediction about the relationship between CEO centrality and the variability of firm-specific stock returns. On the one hand, it might be argued that such centrality should be associated with lower variability for two reasons. To begin, a CEO playing a dominant role in the firm's decision-making might lead to decisions that are more conservative (risk-averse); the CEO may want to play it safe to reduce the chance of a negative stock return which might lead to dismissal. Because the CEO's compensation and tenure are more sensitive to the firm's performance than those of other top executives, the CEO might have an especially strong incentive to avoid risks and, in the words of Bertrand and Mullainathan (2003), "enjoy the quiet life." Second, if one person plays a dominant role in the firm's decision-making, this could lower the market's uncertainty about the firm's strategy and thus decrease the variability of the firm-specific returns.

On the other hand, Sah and Stiglitz (1986, 1991) and Adams, Almeida, and Ferreira (2005) argue that firms with powerful CEOs would tend to make less "balanced" decisions relative to those reached by consensus and coalition-building within a team. On this view, dominant CEOs can be expected to lead to more extreme outcomes and thus be associated with higher variability of firm-specific stock returns.

Table 13 presents the results of Glejser's (1969) heteroskedasticity test. The dependent variable is the absolute value of monthly residual returns, where we use the four-factor Fama-French model to compute residuals. The pooled panel regressions either include industry fixed effects (clustering standard errors by industry) or firm fixed effects (clustering standard errors by firm). As independent variables, we include CPS alongside several other governance variables (founder dummy, CEO as chair dummy, CEO tenure, CEO stock ownership) and other firm characteristics (leverage, firm size, firm age and capital expenditures). Our specification closely follows the heteroskedasticity test in Adams et al. (2005) with CPS as an additional variable.

We find a negative relation between CPS and firm-specific variability. This finding is robust to firm or industry fixed effects and to the inclusion of the other governance variables. To the extent that the lower idiosyncratic volatility of high-CPS firms is due to the tendency of their CEOs to avoid firm-specific volatility which imposes risk-bearing costs on them but not on diversified investors, this evidence is consistent with the view that the association between high CPS and lower firm value is related to governance and agency problems.

In addition to CPS, the dummy of whether the CEO chairs the board also has a negative coefficient, consistent with the view that CEO centrality is associated with lower variability. The CEO's ownership stake and CEO tenure have a non-linear relationship with variability: the first moment has a positive coefficient and the second moment a negative (though significance disappears for CEO tenure when firm fixed effects are included).[13]

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[13] With respect to variables other than the CPS, our results correspond partly to, and differ partly from, those in Adams et al. (2005). For example, in our estimates the dummies for CEO-founder and CEO as the only executive on the board are not significant, while CEO ownership is consistently significant. These differences might be partly due to the difference in samples. Our sample uses a longer time period (1992-2005 rather than 1992-1999 as in Adams et al.) and uses all firms in ExecuComp rather than those in the 1998 Fortune 500 only.

V. CONCLUSION

In this paper, we investigate CEO centrality as proxied by CPS, the fraction of top-five compensation captured by the CEO. We find that cross-sectional differences in CEO centrality are associated with lower Tobin's Q, lower accounting profitability, less favorable market reaction to acquisition announcements made by the firm, more luck-based pay, less CEO turnover controlling for performance and tenure, and lower variability of firm-specific stock returns.

Beyond our particular findings, our general conclusion is that CEO centrality is an aspect of firm governance and management to which financial economists should pay attention in their future work. Research on the effects of governance arrangements and management processes -- as well as research on a wide range of aspects of firm behavior and decision-making -- should consider using CEO centrality as either a necessary control or a subject of investigation.

References

Adams, R. H. Almeida, and D. Ferreira (2005), "Powerful CEOs and Their Impact on Corporate Performance," *Review of Financial Studies* 18, 1403-1432.

Aggarwal, R. K. and A. Samwick (2003), "Performance Incentives within Firms: The Effect of Managerial Responsibility," *Journal of Finance* 58-4, 1613-1649

Bainbridge, S. M. (2002), "Why a Board? Group Decision Making in Corporate Governance," *Vanderbilt Law Review* 55, 1-55.

Bebchuk, L. A. and A. Cohen (2005), "The Cost of Entrenched Boards," *Journal of Financial Economics* 78, 409-433.

Bebchuk, L. A., A. Cohen, and A. Ferrell (2004), "What Matters in Corporate Governance," Harvard University Olin Discussion Paper No. 491.

Bertrand, M. and S. Mullainathan (2000), "Agents With and Without Principals," *American Economics Review* 90, 203-208.

Bertrand, M. and S. Mullainathan (2001), "Are CEOs Rewarded for Luck? The Ones without Principals Are," *Quarterly Journal of Economics* 116, 901-932.

Bertrand, M. and S. Mullainathan (2003), "Enjoying the Quiet Life? Corporate Governance and Managerial Preferences," *Journal of Political Economy* 115, 1043-75.

Bertrand, M. and A. Schoar (2003), "Managing with Style: The Effect of Managers on Firm Policies," *Quarterly Journal of Economics* 118, 1169-208.

Blinder, A. S. and J. Morgan (2000), "Are Two Heads Better than One? Monetary Policy by Committee," *Journal of Money, Credit, and Banking* 37, 798-811.

Brill, Jesse M. (1993), "Stock Ownership Guidelines for Executives," *The Corporate Executive,* March-April, 381-385.

Cook, F. W. (1990), "How Much Stock Should Management Own?" *Compensation and Benefits Review*, September/October, 20-28.

Cremers, K. J. M. and V. B. Nair (2005), "Governance Mechanisms and Equity Prices," *Journal of Finance* 60-6, 2859-2894.

Demsetz, D. and K. Lehn (1985), "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy* 93-6, 1155-1177.

Dlugosz, J., R. Fahlenbrach, P. Gompers, and A. Metrick (2006), "Large Blocks of Stock: Prevalence, Size, and Measurement," *Journal of Corporate Finance* 12, 594-618.

Frydman, C. (2005), "Rising through the Ranks: The Evolution of the Market for Corporate Executives, 1936-2003," MIT Sloan School Working Paper.

Gompers, P. A., J. L. Ishii, and A. Metrick (2003), "Corporate Governance and Equity Prices," *Quarterly Journal of Economics* 118, 107-155.

Gibbons, R. and K. J. Murphy (1990), "Relative Performance Evaluation for Chief Executive Officers," *Industrial and Labor Relations Review*, 43, 30-51.

Glejser, H. (1969), "A New Test for Heteroskedasticity," *Journal of the American Statistical Association* 64, 316-323.

Hill, G. W. (1982), "Group versus Individual Performance: Are N+1 Heads Better than One?" *Psychological Bulletin* 91, 517-539.

Himmelberg, C.P. and R. G. Hubbard (2000), "Incentive Pay and the Market for CEOs: An Analysis of Pay-for-Performance Sensitivity," Working paper.

Hubbard, R. G. (2005), "Pay Without Performance: A Market Equilibrium Critique," *Journal of Corporation Law* 30, 717-720.

Jenter, D. and F. Kanaan (2006), "CEO Turnover and Relative Performance Evaluation," MIT Sloan Working Paper 4594-06, forthcoming in the *Journal of Finance*.

Kaplan, S. N. and B. Minton (2006), "How has CEO Turnover Changed? Increasingly Performance Sensitive Boards and Increasingly Uneasy CEOs," NBER Working Paper 12465.

Kaplan, S. N. and L. Zingales (1997), "Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?" *Quarterly Journal of Economics* 112, 169–216.

Lang, L. H. P. and R. M. Stultz (1994), "Tobin's q, Corporate Diversification, and Firm Performance," *Journal of Political Economy* 102, 1248-1280.

Lang, L., R. Stulz, R. Walkling (1991), "A Test of the Free Cash Flow Hypothesis: The Case of Bidder Returns," *Journal of Financial Economics* 29, 315-336.

Lazear, E. P. and S. Rosen (1981), "Rank-order Tournaments as Optimum Labor Contracts," *Journal of Political Economy* 89, 841-864.

Malmendier, U. and J. A. Tate (2005), "Superstar CEOs," Working paper.

Masulis, R., C. Wang, F. Xie (2007), "Corporate Governance and Acquirer Returns," *Journal of Finance* 62, 1851-1889.

McConnell, J. and H. Servaes (1990), "Additional Evidence on Equity Ownership and Corporate Value," *Journal of Financial Economics* 27, 595-612.

Milgrom, P. and J. Roberts (1992), *Organization and Management*, Prentice Hall, NJ.

Miner, F.C. (1984), "Group versus Individual Decision Making: An Investigation of Performance Measures, Decision Strategies and Process Losses/Gains," *Organizational Behavior and Human Performance* 33, 112–114.

Morck, R., A. Shleifer, and R. Vishny (1988), "Management Ownership and Market Valuation: An Empirical Analysis," *Journal of Financial Economics* 20, 293–315.

Morck, R., A. Shleifer, and R. Vishny (1989), "Alternative Mechanisms for Corporate Control," *American Economic Review* 7, 842-853.

Morck, R., A. Shleifer, R.W. Vishny (1990), "Do Managerial Objectives Drive Bad Acquisitions?" *Journal of Finance* 45, 31-48.

Murphy, K.J. and J. Zabojnik (2004), "Managerial Capital and the Market for CEOs," Working Paper.

Qui, L. (2004). "Which Institutional Investors Monitor?: Evidence from Acquisition Activity," Working Paper, Brown University.

Sah, R.K. and J. Stiglitz (1986), "The Architecture of Economic Systems: Hierarchies and Polyarchies," *American Economic Review* 76, 716-727.

Sah, R.K. and J. Stiglitz (1991), "The Quality of Managers in Centralized versus Decentralized Organizations," *Quarterly Journal of Economics* 106, 289-296.

Shaw, M.E. (1932), "A Comparison of Individual and Small Groups in the Rational Solution of Complex Problems," *American Journal of Psychology* 44, 491-498.

Shin, H. and R.M. Stulz (2000), "Firm Value, Risk, and Growth Opportunities," NBER Working Paper No. 7808.

Yermack, D. (1996), "Higher Market Valuation for Firms with a Small Board of Directors," *Journal of Financial Economics* 40, 185–211.

TABLE 1: CPS BY INDUSTRY

The table displays industry average and median CPS where industry is defined as the 12 Fama-French industries. The averages are computed using the panel data set of 12,011 observations (Obs). Within industry variation is computed as the standard deviation of the CPS within an industry. The regression coefficients are from a tobit regression with CPS as the dependent variable and industry dummies. The hold out industry is Energy. P-values of the coefficients are also reported.

Industry	.Obs	Industry average	Within Industry variation	Industry Median	Regression coefficient	p- value
Non Durable Consumer Goods	1018	0.335	0.109	0.330	-0.016	0.009
Durable Consumer Goods	422	0.363	0.121	0.359	0.011	0.141
Manufacturing	1902	0.354	0.106	0.353	0.003	0.602
Energy	520	0.351	0.104	0.344		
Chemical	477	0.374	0.107	0.370	0.022	0.003
Business Equipment	1782	0.321	0.132	0.304	-0.031	0.000
Telecom	267	0.311	0.118	0.300	-0.040	0.000
Utilities	1080	0.351	0.087	0.347	0.000	0.974
Shops	1491	0.331	0.116	0.321	-0.021	0.000
Health	819	0.354	0.128	0.340	0.002	0.704
Money	922	0.342	0.128	0.330	-0.009	0.138
Other	1311	0.343	0.125	0.330	-0.009	0.138
Average		0.344				
Standard deviation		0.018				

TABLE 2: UNIVARIATE STATISTICS

Tobin's Q is defined as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. The industry adjustment is made at the four-digit SIC level. Industry-adjusted ROA is the return on assets computed as net income divided by book value of assets adjusted by the median ROA of the firms in Compustat in a given four-digit SIC industry and year. It is expressed in percentage terms. Eindex is the entrenchment index of Bebchuk and Cohen (2004). Log book value is the log of the book value of assets. Insider ownership is the fraction of shares held by insiders as reported by Execucomp. Capex/Assets is the ratio of capital expenditures to assets. Leverage is the long-term debt to assets. R&D is the ratio of R&D to sales. If R&D is missing, it is set to zero and the dummy variable R&D missing is set to one. Company age is computed as the current year minus the year in which the company was first listed on CRSP. We present the number of observations, the overall sample mean and standard deviation, as well the mean of the variables for two subsets. The first one is the subset of firms with industry-adjusted CPS bigger than zero, the second is where the industry-adjusted CPS is below or equal to zero. The last column reports the p-value of a mean comparison between the two subsamples.

Variable	Obs	Mean	.Std. Dev	Ind-adj CPS>0	Ind-adj CPS<=0	p-value difference
Ind-adj Tobin's Q	12011	0.359	1.119	0.343	0.374	0.091
Ind-adj ROA	12011	1.462	10.122	1.220	1.699	0.009
Eindex	12011	2.152	1.308	2.225	2.081	0.005
Log book value	12011	7.513	1.606	7.555	7.473	0.000
Insider ownership	12011	0.063	0.073	0.057	0.068	0.000
insider ownership2	12011	0.009	0.033	0.008	0.011	0.000
Capex/Assets	12011	0.185	2.178	0.168	0.202	0.383
Leverage	12011	0.205	0.169	0.209	0.201	0.006
R&D	12011	0.124	3.925	0.114	0.133	0.790
R&D missing	12011	0.481	0.500	0.474	0.489	0.098
Company Age	12011	25.766	19.235	26.381	25.168	0.000

TABLE 3: RELATION BETWEEN TOBIN'S Q AND CPS

This table presents year fixed effects regressions in columns 1-4 and 7, and Fama-MacBeth type regressions in columns 5 and 6. The dependent variable is the four-digit SIC industry-adjusted Tobin's Q. Tobin's Q is defined as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. CPS is the ratio of CEO total compensation to the sum of all top executives' total compensation, and is expressed as decimals here. Total compensation is data item TDC1 from ExecuComp. The industry adjustment in CPS is made at the four-digit SIC level. Eindex is the entrenchment index of Bebchuk and Cohen (2004). Log book value is the log of the book value of assets. Insider ownership is the fraction of shares held by insiders as reported by Execucomp. ROA is the return on assets computed as net income divided by book value of assets. Capex/Assets is the ratio of capital expenditures to assets. Leverage is the long-term debt to assets. R&D is the ratio of R&D to sales. If R&D is missing, it is set to zero and the dummy variable R&D missing is set to one. Company age is computed as the current year minus the year in which the company was first listed on CRSP. Column 7 includes two additional variables. CEOChair is a dummy equal to one if the CEO is also the Chairman and zero otherwise. CEO is only director is a dummy equal to one if none of the other top four executives is on the Board, and zero otherwise. The sample size is smaller for data availability reasons related to the Board memberships of the other top executives. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively.

	Dependent Variable:						Industry-adjusted Tobin's Q
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CPS	-0.256				-0.246		-0.282
	(3.20)**				(2.279)*		(2.97)**
CPS, t-1			-0.475				-0.431
			(4.91)**				(4.070)**
Ind-adj CPS total comp						-0.108	
						(1.92)$	
Ind-adj CPS, t-1							-0.344
							(3.48)**
Eindex	-0.099	-0.097	-0.099	-0.098	-0.093	-0.086	-0.099
	(13.55)**	(11.21)**	(13.66)**	(11.33)**	(9.260)**	(7.667)**	(11.06)**
Log book value	-0.045	-0.038	-0.045	-0.038	-0.040	-0.031	-0.019
	(6.93)**	(4.88)**	(6.93)**	(4.92)**	(4.386)**	(2.778)**	(2.40)*
Insider Ownership	0.592		0.632		1.270		0.807
	(2.04)*		(2.17)*		(3.169)**		(2.20)*
Insider Ownership2	-2.267		-2.319		-3.899		-3.395
	(3.56)**		(3.64)**		(4.561)**		(4.01)**
Insider Ownership, t-1			0.413		0.454		0.839
			(1.24)		(1.36)		(2.751)**
Insider Ownership2, t-1			-2.113		-2.157		-2.528
			(2.96)**		(3.02)**		(3.677)**
ROA, t	3.759	4.089	3.743	4.074	4.565	5.159	4.568
	(37.41)**	(32.70)**	(37.27)**	(32.58)**	(14.810)**	(13.625)**	(35.61)**
Capex/assets	0.003	0.006	0.003	0.006	0.041	0.056	0.004
	(0.76)	(1.05)	(0.79)	(1.05)	(1.536)	(1.184)	(0.99)
Leverage	-0.715	-0.739	-0.722	-0.750	-0.615	-0.610	-0.941
	(12.25)**	(10.59)**	(12.38)**	(10.75)**	(6.381)**	(4.038)**	(12.97)**
R&D	0.027	0.017	0.027	0.017	0.301	0.403	0.297
	(11.28)**	(7.08)**	(11.21)**	(7.04)**	(3.286)**	(4.264)**	(15.49)**
R&D missing dum	-0.190	-0.192	-0.190	-0.193	-0.149	-0.134	-0.212
	(9.91)**	(8.51)**	(9.92)**	(8.51)**	(3.327)**	(2.866)**	(9.09)**
Company age	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(5.79)**	(5.26)**	(5.92)**	(5.43)**	(5.403)**	(3.071)**	(4.85)**
CEOChair dum							-0.007
							(0.26)
CEO only Dir dum							-0.013
							(0.54)
Observations	12011	8661	12011	8661	12	12	8771
R-squared	0.17	0.18	0.17	0.18			0.20

TABLE 4: TOBIN'S Q AND CPS CONTROLLING FOR LAGGED TOBIN'S Q

This table presents year fixed effects regressions in columns 1-4 and 7, and Fama-MacBeth type regressions in columns 5 and 6. The dependent variable is the four-digit SIC industry-adjusted Tobin's Q. Tobin's Q is defined as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. CPS is the ratio of CEO total compensation to the sum of all top executives' total compensation, and is expressed as decimals here. Total compensation is data item TDC1 from ExecuComp. The industry adjustment in CPS is made at the four-digit SIC level. Eindex is the entrenchment index of Bebchuk and Cohen (2004). Log book value is the log of the book value of assets. Insider ownership is the fraction of shares held by insiders as reported by Execucomp. ROA is the return on assets computed as net income divided by book value of assets. Capex/Assets is the ratio of capital expenditures to assets. Leverage is the long-term debt to assets. R&D is the ratio of R&D to sales. If R&D is missing, it is set to zero and the dummy variable R&D missing is set to one. Company age is computed as the current year minus the year in which the company was first listed on CRSP. Column 7 includes two additional variables. CEOChair is a dummy equal to one if the CEO is also the Chairman and zero otherwise. CEO is only director is a dummy equal to one if none of the other top four executives is on the board, and zero otherwise. The sample size is smaller for data availability reasons related to the board memberships of the other top executives. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively.

	Dependent Variable:						Industry-adjusted Tobin's Q
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CPS, t	-0.236				-0.191		-0.243
	(3.99)**				(2.659)**		(3.49)**
CPS, t-1			-0.255				-0.190
			(2.89)**				(2.083)*
Ind-adj CPS, t				-0.194			
				(3.22)**			
Ind-adj CPS, t-1						-0.219	
						(2.44)*	
Ind-adj Tobin's Q, t-1	0.554		0.554		0.668		0.529
	(107.00)**		(107.07)**		(13.220)**		(90.98)**
Ind-adj Tobin's Q, t-2			0.393		0.393		0.521
			(58.92)**		(59.00)**		(10.932)**
Eindex	-0.025	-0.038	-0.025	-0.039	-0.017	-0.021	-0.024
	(4.56)**	(4.89)**	(4.64)**	(4.95)**	(2.571)**	(2.797)**	(3.67)**
Log book value	-0.025	-0.019	-0.025	-0.019	-0.012	-0.004	-0.018
	(5.21)**	(2.72)**	(5.22)**	(2.72)**	(1.566)	(0.357)	(3.19)**
Insider Ownership	0.080		0.091		0.162		0.148
	(0.36)		(0.41)		(0.599)		(0.55)
Insider Ownership2	-0.682		-0.689		-0.682		-1.029
	(1.33)		(1.34)		(1.559)		(1.61)
Insider Ownership, t-1			0.119		0.128		0.279
			(0.39)		(0.42)		(0.993)
Insider Ownership2, t-1			-1.057		-1.060		-0.953)
			(1.57)		(1.58)		(2.000)*

ROA, t	1.598	2.817	1.590	2.808	1.292	2.624	2.126
	(20.82)**	(24.84)**	(20.73)**	(24.79)**	(5.046)**	(11.165)**	(21.82)
Capex/assets	0.000	0.004	0.000	0.004	0.002	0.044	0.001
	(0.13)	(0.93)	(0.14)	(0.93)	(0.115)	(1.112)	(0.35)
Leverage	-0.295	-0.461	-0.300	-0.466	-0.215	-0.347	-0.429
	(6.83)**	(7.30)**	(6.95)**	(7.39)**	(2.479)**	(3.299)**	(8.17)**
R&D	0.012	0.015	0.012	0.015	0.097	0.727	0.106
	(7.20)**	(7.54)**	(7.17)**	(7.51)**	(2.112)*	(1.890)$	(6.13)**
R&D missing dum	-0.040	-0.079	-0.041	-0.079	-0.024	-0.025	-0.045
	(2.86)**	(3.88)**	(2.88)**	(3.89)**	(1.287)	(0.626)	(2.68)**
Company age	0.000	-0.000	0.000	-0.000	0.001	0.000	0.000
	(0.79)	(0.35)	(0.65)	(0.46)	(1.278)	(0.621)	(0.50)
CEOChair dum							0.001
							(0.04)
CEO only Dir dum							-0.021
							(1.22)
Observations	10793	7437	10793	7437	12	11	8319
R-squared	0.60	0.44	0.60	0.44			0.60

TABLE 5: CHANGES IN CPS AND CHANGES IN TOBIN'S Q

The table shows year fixed effects regression results where the dependent variable is the percentage change in Tobin's Q from t-1 to t. The independent variable of interest is the percentage change in CPS from t-1 to t. The second regression controls for lagged variables similar to Table 3. The third regression uses control variables defined as percentage changes in those respective variables. Column 4 includes two additional variables. CEOChair is a dummy equal to one if the CEO is also the Chairman and zero otherwise. CEO is only director is a dummy equal to one if none of the other top four executives is on the board, and zero otherwise. The sample size is smaller for data availability reasons related to the board memberships of the other top executives. $, *, ** indicate significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable: Percentage Change in Tobin's Q from t-1 to t			
	(1)	(2)	(3)	(4)
Percentage Change in CPS	-0.075	-0.082	-0.075	-0.057
	(2.05)*	(2.10)*	(1.92)$	(1.32)
Eindex, t-1			0.003	
			(0.27)	
Log book value			0.019	
			(1.75)$	
Insider Ownership, t-1			0.039	
			(0.08)	
Insider Ownership2, t-1			0.508	
			(0.48)	
ROA, t-1			0.196	
			(1.06)	
Capex/Assets, t-1			-0.009	
			(1.14)	
Leverage, t-1			-0.127	
			(1.24)	
R&D, t-1			-0.013	
			(0.64)	
R&D missing dum, t-1			-0.054	
			(1.68)$	
Company age, t-1		0.000	0.001	0.001
		(0.26)	(0.75)	(0.75)
Change in Eindex			0.047	0.075
			(1.08)	(1.50)
Change in insider ownership			-0.926	-0.800
			(1.91)$	(1.46)
Change in insider ownership2			1.870	0.327
			(1.49)	(0.21)
Change in Capex/Assets			-0.003	-0.003
			(0.60)	(0.60)
Change in Leverage			-0.375	-0.135
			(1.84)$	(0.58)
Change in ROA			0.292	0.209
			(1.44)	(0.87)
Change in R&D			0.011	0.040
			(2.42)*	(1.33)
CEOChair dum				-0.028
				(0.64)
CEO only Dir dum				-0.014
				(0.38)
Observations	9526	8756	8751	6731
R-squared	0.000	0.002	0.003	0.002

TABLE 6: DOES LOW TOBIN'S Q LEAD TO INCREASES IN CPS?

The table shows average values and p-values of differences for a sample of 1,326 firms where the CEO changed during our sample period. The year of the CEO change is denoted by time t. The three variables of interest are the CPS of the new CEO in his/her first full year in charge (t+1), conditional on the CEO being in office for the full year. The second variable subtracts the industry median CPS of surviving CEOs in year t+1 from the new CEO's CPS at t+1. The industry adjustment is at the 2-digit SIC level. The third variable is the change in the CPS from the former CEO to the new CEO. The former CEO's CPS is measured in year t-1, the last full year in office, conditional on the CEO being in charge for the full year. The averages of these variables are displayed for subsamples. The first sample split is at Tobin's Q in year t, the second is at the industry-adjusted Tobin's Q in year t.

	,CPS t+1	,Ind-adj CPS t+1	,Change in CPS t-1 to t+1	.Obs
TQ>=1	33.48	-0.21	4.01	1,124
TQ<1	34.44	0.76	5.94	202
p-value difference	0.26	0.26	0.11	
Ind-adj TQ>=0	33.56	-0.16	4.21	725
Ind-adj TQ<0	33.67	0.05	4.41	601
p-value difference	0.83	0.73	0.82	

TABLE 7: ENTRENCHMENT AND THE RELATION BETWEEN TOBIN'S Q AND CPS

XXX URS: HOW ABOUT MAKING THIS TABLE ONE PAGE BY OMITTING THE VARIABLES OTHER THAN THE COEFFICEITN OF INTEREST AND SAYING IN THE TEXT THAT THEY ARE SIMILAR TO WHAT WE HAVE IN TABLE 3?

This table presents year fixed effects regressions in columns 1-4 and Fama-MacBeth type regressions in columns 5 and 6. The dependent variable is the four-digit SIC industry-adjusted Tobin's Q. Tobin's Q is defined as the market value of equity plus the book value of assets minus the book value of equity, all divided by the book value of assets. CPS is the ratio of CEO total compensation to the sum of all top executives' total compensation, and is expressed as decimals here. Total compensation is data item TDC1 from ExecuComp. The industry adjustment in CPS is made at the four-digit SIC level. Eindex is the entrenchment index of Bebchuk and Cohen (2004). Log book value is the log of the book value of assets. Insider ownership is the fraction of shares held by insiders as reported by Execucomp. ROA is the return on assets computed as net income divided by book value of assets. Capex/Assets is the ratio of capital expenditures to assets. Leverage is the long-term debt to assets. R&D is the ratio of R&D to sales. If R&D is missing, it is set to zero and the dummy variable R&D missing is set to one. Company age is computed as the current year minus the year in which the company was first listed on CRSP. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively.

Dependent Variable:	Industry-adjusted Tobin's Q					
	(1)	(2)	(3)	(4)	(5)	(6)
CPS, t	0.007					
	(0.04)					
CPS, t-1		0.066				
		(0.31)				
Ind-adj CPS, t			0.241		0.239	
			(1.35)		(0.997)	
Ind-adj CPS, t-1				0.281		
				(1.27)		
Eindex * CPS, t	-0.115					
	(1.88)$					
Eindex * CPS, t-1		-0.311				
		(3.41)**				
Eindex * ind-adj CPS, t			-0.143		-0.166	
			(1.92)$		(1.680)$	
Eindex * ind-adj CPS, t-1				-0.347		
				(3.70)**		
Eindex	-0.069	0.003	-0.108	-0.101	-0.134	-0.247
	(2.61)**	(0.09)	(12.20)**	(9.26)**	(1.925)$	(1.814)$
Log book value	-0.049	-0.041	-0.049	-0.041	-0.043	-0.033
	(6.23)**	(4.27)**	(6.21)**	(4.27)**	(3.695)**	(1.996)*
Insider Ownership	0.868		0.921		1.624	
	(2.47)*		(2.62)**		(3.837)**	
Insider Ownership2	-2.810		-2.881		-4.538	

			(3.65)**		(3.74)**	
						(4.918)
Insider Ownership, t-1			0.587		0.643	
			(1.43)		(1.56)	
Insider Ownership2, t-1			-2.504		-2.572	
			(2.83)**		(2.91)**	
ROA, t		4.036		4.434	4.017	4.415
					4.850	5.528
		(33.25)**		(28.65)**	(33.13)**	(28.54)**
					(14.190)**	(12.945)
Capex/assets		0.003		0.005	0.003	0.005
					0.041	0.056
		(0.53)		(0.77)	(0.55)	(0.77)
					(1.494)	(1.101)
Leverage	-0.685		-0.732	-0.693	-0.745	-
			0.602			-0.639
		(9.72)**		(8.47)**	(9.84)**	(8.63)**
					(4.496)**	(3.024)**
R&D		0.040		0.029	0.039	0.029
					0.324	0.445
		(13.75)**		(9.80)**	(13.68)**	(9.79)**
					(3.178)**	(4.147)**
R&D missing dum	-0.224		-0.231	-0.224	-0.233	-
			0.180			-0.158
		(9.65)**		(8.27)**	(9.68)**	(8.30)**
					(3.131)**	(2.630)
Company age	-0.004		-0.004	-0.004	-0.004	-
			0.003			-0.004
		(5.95)**		(5.27)**	(6.04)**	(5.42)**
					(4.574)**	(2.687)**
Observations	12011		8661	12011	8661	12
R-squared		0.14		0.15	0.14	0.15

TABLE 8: ABNORMAL RETURNS AROUND ANNOUNCEMENTS OF CPS CHANGES

We use the date of the proxy filing as the event date, where the proxy dates are from Dlugosz et al. (2006), who collect proxy dates in the years 1996-2001 for 1,916 companies. We find 4,062 firm-years with available data to compute the change in CPS from year t-1 to year t and with sufficient data available on CRSP to compute abnormal returns. We calculate the cumulative abnormal return (CAR) around the event using the market model. The event window is -10 to +10 days around the event, using a 21-day window since the proxy date and the filing date are not always the same. We weigh the observations by the inverse of the variance of the estimate of the cumulative abnormal return. CPS is based on total compensation and is expressed as a percentage. Panel A presents mean comparisons between samples that increase (top quartile) or decrease (lowest quartile) their CPS from one year to the next. Panel B reports the correlation coefficient between CPS and CAR, with the p-value in brackets. Panel C reports a weighted least squares regression where the dependent variable is CAR. The independent variables are the change in CPS from year t-1 to year t, firm size measured as the log of the book value of assets and the book-to-market ratio, both measured at t. Observations are weighed by the inverse of the variance of the estimate of the cumulative abnormal return. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively. The regression in panel C also reports the absolute value of t-statistics in parentheses.

Panel A: Mean comparisons

	Average CAR	Number of observations
For Firms increasing CPS	0.699%**	2062
For Firms decreasing CPS	1.028%**	2000
Difference (decrease-increase):	0.329%	
Top quartile change in CPS	0.531%	1015
Lowest quartile change in CPS	1.691%**	1015
Difference (lowest-top):	1.160%**	

Panel B: Correlation coefficient

Correlation between the change in CPS and CAR (p-value): -0.035 (0.02)

Panel C: Regression Analysis

Dependent Variable		CAR[-10,+10] in %
Independent Variables:		
Change in CPS (t-1, t)	-0.0328	-0.0044
	(2.03)*	(0.21)
Change in CPS		-0.0525
* Dum(Eindex>median)		(1.86)$
Dum(Eindex>median)		-0.3907
		(1.24)
Firm Size	-0.1299	-0.1014
	(1.07)	(0.89)
Book-to-Market	0.1448	0.1514
	(1.61)	(2.02)**
Constant	1.610	1.357
	(1.79)$	(1.56)
R-squared	0.002	0.003
Observations	4062	3763

TABLE 9: CPS AND ACCOUNTING PROFITABILITY

Panel A shows year fixed regression results using the industry adjusted return-on-assets (net income divided by book value of assets) as the dependent variable. The industry adjustment is made at the 4-digit SIC level by subtracting the industry median ROA from the firm's ROA. The industry median ROA is based on the universe of Compustat firms in a given year. The dependent variable is winzorized at the 1% and 99% level and is expressed in percentage terms. Panel B shows the same regression specifications except that we use Fama-MacBeth type regressions instead of year fixed effects regressions. We only report the coefficients and t-statistics of the CPS variables for brevity. $, *, ** indicate significance at the 10%, 5%, 1% level, respectively.

Panel A: Year Fixed Effects Regressions

	Dependent Variable:			Ind-adj ROA (in percentage)		
	(1)	(2)	(3)	(4)	(5)	(6)
CPS, t	-10.469	-9.105				-11.239
	(14.01)**	(11.72)**				(12.88)**
CPS, t-1			-2.388			
			(2.89)**			
Ind-adj CPS, t				-9.141		
				(11.54)**		
Ind-adj CPS, t-1					-2.055	
					(2.43)*	
Eindex		0.042	0.032	0.023	0.026	0.099
		(0.58)	(0.42)	(0.32)	(0.35)	(1.19)
Log book value		0.600	0.616	0.599	0.616	0.272
		(9.43)**	(9.20)**	(9.42)**	(9.19)**	(3.69)**
Insider Ownership		13.988	17.510	13.939	17.607	15.197
		(4.89)**	(5.45)**	(4.87)**	(5.48)**	(4.45)**
Insider Ownership2		-15.596	-22.258	-15.136	-22.308	-23.729
		(2.46)*	(2.97)**	(2.39)*	(2.97)**	(2.99)**
Capex/assets		0.026	0.028	0.027	0.028	0.022
		(0.50)	(0.54)	(0.53)	(0.55)	(0.43)
Leverage		-11.584	-11.713	-11.774	-11.758	-11.003
		(20.82)**	(19.84)**	(21.17)**	(19.92)**	(16.80)**
R&D		-0.245	-0.196	-0.246	-0.197	-2.911
		(10.69)**	(8.53)**	(10.73)**	(8.55)**	(16.91)
R&D missing dum		-0.943	-1.072	-0.968	-1.077	-1.573
		(5.07)**	(5.47)**	(5.21)**	(5.49)**	(7.36)**
Company age		0.010	0.009	0.008	0.009	0.013
		(2.00)*	(1.72)$	(1.58)	(1.62)	(2.15)*
CEOChair dum						0.198
						(0.82)
CEO only Chair dum						-0.894
						(4.14)**
Observations	12011	12011	10936	12011	10936	8775
R-squared	0.01	0.07	0.06	0.07	0.06	0.10

Panel B: Fama-MacBeth Type Regressions (only CPS coefficients reported)

	Dependent Variable:	Ind-adj ROA (in percentage)				
	(1)	(2)	(3)	(4)	(5)	(6)
CPS, t	-11.328	-10.192				-11.588
	(8.936)**	(6.854)**				(12.369)**
CPS, t-1				-4.959		
				(3.291)**		
Ind-adj CPS, t					-9.948	
					(7.155)**	
Ind-adj CPS, t-1						-4.556
						(3.365)**
Additional Controls	yes	yes	yes	yes	yes	yes
Observations	12	12	11	12	11	9

TABLE 10: CPS AND ACQUIRER RETURNS

The sample consists of 1,241 takeover announcement events from the sample of Masulis, Wang, and Xie (2007). The dependent variable is the cumulative abnormal announcement return of the bidder in the eleven days around the announcement (CAR[-5,+5]) in regressions 1, 2 and 5, and a dummy equal to one if the CAR is negative in regressions 3 and 4. Regressions 1 and 2 (3 and 4) are OLS (logit) regressions with robust standard errors and errors clustered at the firm level. Absolute values of t-statistics are in parentheses. CPS is the ratio of CEO to the sum of all top executives' compensation. CPS is based on total compensation as measured by data item TDC1 from ExecuComp containing salary, bonus, other annual compensation, total value of restricted stock granted, Black-Scholes value of stock options granted, long-term incentive payouts, and all other total incentive compensation. G-index is the governance index of Gompers, et al. (2003). E-index is the entrenchment index of Bebchuk et al (2004). 'Fraction Blockowners' is the fraction of the shares outstanding owned by institutional blockholders. Log book value bidder is the book value of the bidder at the end of the fiscal year prior to the takeover. Relative deal size is the ratio of the deal value (from SDC) to the market value of equity of the bidder at the fiscal year end prior to the takeover. Tobin's Q is the market-to-book ratio of the bidder at the fiscal year end prior to the takeover. Leverage is the ratio of book value of long-term debt to assets. Herfindahl is based on sales of firms in the same four-digit SIC industry. Run-up is the cumulative stock return in the year prior to the takeover. 'High tech industry dummy' is equal to 1 if the firm operates in an industry with four-digit SIC code of 3570, 3571, 3572, 3576, 3577, 3661, 3674, 4812, 4813, 5045, 5961, 7370, 7371, 7372, or 7373. Cash used (stock only) dummy is equal to one if the bidder pays at least a part in cash (all in equity). The status of the target is private, public or subsidiary indicated by the respected dummy variables. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively. Year dummies and a constant are included but omitted to save space. Column 5 includes two additional variables. CEOChair is a dummy equal to one if the CEO is also the Chairman and zero otherwise. CEO is only director is a dummy equal to one if none of the other top four executives is on the board, and zero otherwise. The sample size is smaller for data availability reasons related to the board memberships of the other top executives. The r-squared reported for the logit regression is a pseudo r-square.

Dependent Variable:	CAR [-5,+5]		Dummy=1 if CAR Negative		CAR [-5,+5]
	(1)	(2)	(3)	(4)	(5)
CPS (Bidder)	-0.024	-0.024	0.011	0.011	-0.035
	(1.74)$	(1.70)$	(2.21)*	(2.18)*	(1.92)$
Eindex (Bidder)	-0.497		0.098		-0.397
	(4.14)**		(2.19)*		(2.71)**
Gindex (Bidder)			-0.180		0.029
			(2.77)**		(1.30)
Fraction Blockholders (Bidder)	0.025	0.028	-0.013	-0.014	0.017
	(0.97)	(1.08)	(1.20)	(1.28)	(0.44)
Log book value (Bidder)	-0.270	-0.238	0.073	0.067	-0.293
	(2.36)*	(2.10)*	(1.70)$	(1.57)	(1.98)**
Relative Deal Size	-0.770	-0.786	0.244	0.246	-0.471
	(0.62)	(0.62)	(0.80)	(0.80)	(0.28)
Tobin's Q (Bidder)	-0.019	0.017	-0.008	-0.016	-0.040
	(0.12)	(0.11)	(0.18)	(0.37)	(0.22)
Leverage (Bidder)	2.189	2.141	-0.162	-0.143	2.897
	(1.67)$	(1.63)	(0.35)	(0.31)	(1.69)$
Herfindahl (Bidder)	5.311	5.950	-2.163	-2.295	5.675
	(1.96)$	(2.13)*	(1.65)$	(1.74)$	(1.59)
Run-up (Bidder)	-1.375	-1.387	0.200	0.199	-1.430
	(2.29)*	(2.33)*	(1.30)	(1.32)	(2.14)*
High tech dummy (Bidder)	-1.058	-0.989	0.226	0.206	-1.239
	(1.67)$	(1.56)	(1.34)	(1.21)	(1.68)$
Cash Used dummy	0.005	0.006	-0.000	-0.000	0.009
	(1.11)	(1.19)	(0.16)	(0.20)	(1.49)
Stock Only dummy	-0.906	-0.896	0.510	0.504	-0.719
	(1.80)$	(1.76)$	(2.85)**	(2.81)**	(1.07)
Private (Target)	1.723	1.262	-0.389	-0.290	1.839
	(0.46)	(0.31)	(0.25)	(0.18)	(0.47)
Subsidiary (Target)	2.311	1.894	-0.572	-0.481	2.535
	(0.62)	(0.46)	(0.37)	(0.30)	(0.66)
Public (Target)	0.262	-0.212	-0.027	0.076	0.078
	(0.07)	(0.05)	(0.02)	(0.05)	(0.02)
CEOChair dum					0.615
					(1.07)
CEO only Dir dum					0.299
					(0.70)
Constant	3.101	3.750	-0.969	-1.041	-0.493
	(0.78)	(0.85)	(0.61)	(0.61)	(0.12)
Observations	1241	1241	1241	1241	857
R-squared	0.10	0.09	0.05	0.05	0.11

TABLE 11: CPS AND COMPENSATION FOR INDUSTRY-WIDE SHOCKS

This table presents industry fixed effects regressions. All industry groups are defined at the four-digit SIC level. The dependent variable is the log of the CEO total compensation (data item TDC1 from ExecuComp). 'Industry Average TQ UP dum t-1 to t' is a dummy equal to one if the industry average Tobin's Q went up over the last year. 'CPS up from t-1 to t dum' is a dummy equal to one if the firm's CPS increased the previous year. 'Industry Average ROA UP dum t-1 to t' is a dummy equal to one if the industry average ROA went up over the last year. 'Small dum' is a dummy equal to one if the firm's market cap is below the median for that year. See previous table descriptions for the remaining variable descriptions. *, ** indicate significance at 5% and 1% level, respectively.

Dependent Variable:								$\ln(\text{Total Compensation})_t$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industry Average TQ UP dum t-1 to t	0.043	-0.074	-0.024	-0.083				
	(2.12)**	(1.22)	(0.59)	(1.27)				
Industry Average TQ UP dum t-1 to t x CPS, t		0.338		0.402				
		(2.04)**		(2.22)**				
Industry Average TQ UP dum t-1 to t x CPS up from t-1 to t dum			0.080					
			(2.73)***					
Industry Average TQ UP dum t-1 to t x CPS, t x small dum				-0.056				
				(0.51)				
CPS, t	1.932	1.764		1.696	1.931	1.854		1.806
	(22.39)***	(14.78)***		(13.26)***	(22.38)***	(15.65)***		(14.22)***
CPS up from t-1 to t dum			0.107				0.093	
			(3.75)***				(3.32)***	
Industry Average ROA UP dum t-1 to t					0.059	0.005	0.000	0.011
					(2.95)***	(0.09)	(0.00)	(0.17)
Industry Average ROA UP dum t-1 to t x CPS, t						0.156		0.214
						(1.95)*		(2.18)**
Industry Average ROA UP dum t-1 to t x CPS up from t-1 to t dum							0.068	
							(2.33)**	
Industry Average ROA UP dum t-1 to t x CPS, t x small dum								-0.123
								(1.11)
Log book value	0.443	0.443	0.445		0.443	0.443	0.445	
	(52.18)***	(52.17)***	(51.46)***		(52.19)***	(52.19)***	(51.44)***	
Small dum				-0.940				-0.929
				(28.87)***				(28.55)***
Tobin's Q	0.186	0.187	0.191	0.191	0.188	0.187	0.193	0.192
	(23.34)***	(23.36)***	(23.30)***	(22.27)***	(23.57)***	(23.52)***	(23.58)***	(22.43)***
CeoChair dum	0.130	0.130	0.152	0.206	0.132	0.132	0.153	0.208
	(5.64)***	(5.64)***	(6.42)***	(8.37)***	(5.70)***	(5.71)***	(6.48)***	(8.43)***
Constant	3.111	3.169	3.678	6.907	3.100	3.127	3.682	6.854
	(42.94)***	(40.69)***	(52.81)***	(126.35)***	(42.73)***	(40.22)***	(53.00)***	(124.96)***
Observations	8755	8755	8400	8755	8755	8755	8400	8755
R-squared	0.33	0.33	0.31	0.23	0.33	0.33	0.31	0.23

TABLE 12: CEO TURNOVER AND CPS

The sample consists of 11,221 firm year observations with available data on CEO turnover in year t and independent variables the year prior to the turnover. The regressions shown are logit regressions with robust standard errors, clustered at the firm level. We display the coefficients and t-statistics in brackets underneath. The dependent variable is a dummy equal to one if the CEO for firm i in year t-1 is not the same as in year t (there are 1326 turnovers). CPS is based on total compensation as measured by data item TDC1 from ExecuComp containing salary, bonus, other annual compensation, total value of restricted stock granted, Black-Scholes value of stock options granted, long-term incentive payouts, and all other total incentive compensation. The industry-adjustment is done at the four-digit SIC level per year. The tenure dummies are equal to one if a CEO has exactly that number of years of tenure. Zero is the hold out group, i.e., CEOs who in year t-1 just joined the company. Stock return, t-1 is the return over the calendar year prior to the CEO turnover. Market return is the value-weighted CRSP return. Firm specific return is the difference between the firm and the market return. Column 5 includes two additional variables. CEOChair is a dummy equal to one if the CEO is also the Chairman and zero otherwise. CEO is only director is a dummy equal to one if none of the other top four executives is on the board, and zero otherwise. The sample size is smaller for data availability reasons related to the board memberships of the other top executives. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively. Absolute values of t-statistics are in parentheses.

Dependent Variable:			CEO turnover dummy	
	(1)	(2)	(3)	(4)
Ind-adj CPS, t-1	-2.957	-2.802	-2.587	-2.916
	(6.76)**	(6.48)**	(5.41)**	(5.69)**
Stock return t-1	-0.372	-0.404		-0.209
	(3.49)**	(3.77)**		(1.66)$
Stock return, t-1 * Ind-adj CPS, t-1			1.684	
			(1.82)$	
Firm Specific Return, t-1				-0.397
				(3.62)**
Firm Specific Return, t-1 * Ind-adj CPS, t-1				3.833
				(1.69)$
Market Return, t-1				-0.424
				(1.62)
Market Return, t-1 * Ind-adj CPS, t-1				1.385
				(1.43)
Tenure = 1, t-1	7.279	7.281	7.285	7.202
	(10.04)**	(10.05)**	(10.04)**	(9.88)**
Tenure = 2, t-1	5.146	5.142	5.142	4.851
	(7.26)**	(7.25)**	(7.25)**	(6.81)**
Tenure = 3, t-1	0.069	0.069	0.070	-0.305
	(0.08)	(0.08)	(0.08)	(0.33)
Tenure = 4, t-1	-1.187	-1.193	-1.191	-1.265
	(0.97)	(0.97)	(0.97)	(1.03)
Tenure = 5, t-1	0.057	0.057	0.056	0.035
	(0.06)	(0.06)	(0.06)	(0.04)
Tenure = 6, t-1	-0.142	-0.142	-0.146	-0.151
	(0.14)	(0.14)	(0.15)	(0.15)
Tenure > 6, t-1	0.483	0.480	0.482	0.106
	(0.63)	(0.62)	(0.62)	(0.14)
CEOChair dum				-0.363
				(2.91)**
CEO only Dir dum				0.144
				(1.09)
Constant	-5.739	-5.734	-5.734	-5.318
	(8.09)**	(8.08)**	(8.10)**	(7.37)**
Observations	11221	11221	11221	11221

TABLE 13: CPS AND VARIABILITY OF FIRM-SPECIFIC STOCK RETURNS

Pooled panel regressions (1) and (2) use industry fixed effects and standard errors clustered by industry, (3) and (4) use firm fixed-effects and standard errors clustered by firm. The dependent variable is the absolute value of the monthly excess stock return, using the four-factor Fama-French model to compute excess returns. The sample is January 1992 to December 2005. The description of the variables is contained in tables 2 and 3. $, *, ** indicate significance at 10%, 5%, and 1% level, respectively. Absolute values of t-statistics are in parentheses.

Variable	*Industry fixed effects*	*Firm fixed effects*
CPS	-0.027	-0.013
	** (4.76)	** (2.30)
CPS x Eindex		
Eindex	-0.002	-0.002
	** (3.08)	$ (1.73)
Founder	-0.003	-0.005
	(1.03)	(0.85)
.CEO only exec. dir	0.002	-0.001
	(1.16)	(0.40)
Ceochair	-0.005	-0.010
	** (3.07)	** (6.07)
CEO ownership	0.121	0.253
	** (2.05)	** (3.52)
CEO ownership)^2)	-0.402	-0.665
	** (2.22)	** (2.37)
Tenure	0.050	-0.032
	** (2.17)	(0.95)
tenure^2	-0.141	-0.007
	** (2.31)	(0.07)
Leverage	0.031	0.030
	** (4.64)	** (3.52)
Size	-0.008	-0.007
	** (6.94)	** (4.05)
Firm age	-0.056	0.003
	** (4.21)	(0.18)
Capex/Assets	0.014	0.132
	(0.30)	** (2.40)
Constant	0.182	0.146
	** (11.9)	** (9.84)
observations	87536	87536
number of sic2 fe	63	
number of firms fe		1638
R-squared	0.0313	0.0249