“Industry-wide managerial discretion and executive compensation”

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SECTION 3. General issues in management

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Industry-wide managerial discretion and executive compensation

Abstract

This study examines executive compensation in light of traditional agency theoretic assumptions, but also integrates institutional and environmental arguments in an attempt to understand why CEO compensation varies across industries. The authors find that the effect a CEO has on organizational outcomes varies considerably across industries. The researchers also find that some industries have considerable within-industry differences in CEO discretion on organizational outcomes, such as ROA, annual stock returns and Tobin's Q. In industries where there is a large variance in CEO impact, total CEO compensation tends to be significantly higher. However, we do not find that industry-wide CEO discretion affects contingent pay.

Keywords: CEO compensation, industry, managerial discretion.
JEL Classification: M52.

Intoduction

Much of the previous literature on executive compensation has grappled with the question of why firms pay executives what they do (c.f. Jensen and Murphy, 1990; Finkelstein and Hambrick, 1990). Much of the economics-based research in this area has focused on agency theoretic arguments to answer this question (c.f. Murphy, 1999). In recent years, however, scholars have moved beyond the agency theory framework to explore political (Westphal and Zajac, 1995; Gomez-Mejia, Tosi and Hinkin, 1987; Finkelstein and Hambrick, 1989), social (O'Reilly, Main and Crystal, 1988; Wade, Geletkanycz, Boyd and Finkelstein, 2001; O'Reilly and Pollock, 2006), CEO personal traits (Chatterjee and Hambrick, 2011) and institutional (Westphal and Zajac, 1994) forces that may hold great explanatory power for executive compensation.

Although prior studies based on agency theory have provided insight into explaining CEO compensation, the findings on the determinants of CEO pay are still limited. In particular, the role of environmental conditions remains generally unexplained. Most existing studies utilizing an agency theory presume that the CEO's impact on firm performance is homogenous regardless of environmental conditions that may amplify or constrain a CEO's impact on organizational performance. This is a prominent gap in the literature, since the environmental context has consistently been considered an important factor in explaining numerous organizational phenomena (e.g. Milken, 1990).

A number of organizational theorists have considered managerial discretion (e.g. Thompson, 1967; Salancik and Pfeffer, 1977) in order to achieve a better understanding of organizational phenomena such as CEO leadership and executive compensation. Hambrick and Finkelstein (1987) first formally elaborated the concept of managerial discretion, "the latitude of actions that are available to the top decision makers" (p. 371). The concept of managerial discretion serves as moderator between strategic CEO leadership and its external context. That is, CEOs do matter in determining organizational outcomes, but only to the extent that they possess enough discretion to make a variety of strategic choices (Hambrick and Finkelstein, 1987). Furthermore, the managerial discretion framework suggests that top managers' control of corporate outcomes varies by environment (Hambrick and Finkelstein, 1987). Hence, the influence a CEO has on corporate outcomes is moderated by both the internal and external constraints he or she faces.

This study attempts to explore the role of managerial discretion, the interaction between a firm's leader and its environment, in explaining the differences in CEO pay across industries. The possibility that the CEO's discretion, or ability to affect firm performance, varies by industry might have important implications for designing CEO compensation. In industries where CEOs might have a larger influence, the firm is more likely to use compensation as motivation for CEOs to oversee and ensure the success of the firm. Conversely, in industries where CEOs have little impact on firm performance, CEOs' incentives become less important since firm performance will not change much regardless of the actions the CEO might take. Therefore, we will explore whether a variation in industry-wide CEO discretion on firm performance translates into variation in CEO pay.

This study endeavors to establish evidence on the interaction of a CEO's ability and industry-wide effects on firm performance and to examine the implications for CEO pay. We organize the rest of this paper by addressing the following questions.

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First, do CEOs have an impact on firm performance? Second, does the industry matter? Put differently, do CEOs have more influence over firm performance in certain industries than CEOs do in other industries? Finally, what are the implications of these industry differences for executive compensation? We will discuss each of these issues in turn.

1. Research questions and hypotheses

1.1. CEO influence over firm performance. The importance of organizational leadership is not new. The idea that top management's role is pivotal to the success of the firm dates back to Barnard (1938). Other scholars have stressed that leaders' choices and decisions influence organizational outcomes (March and Simon, 1958; Cyert and March, 1963). Researchers in several fields (for example, economics, management and sociology) have revisited recently the question of whether CEOs actually have control over firm performance (Bertrand and Schoar, 2003; Lieberson and O'Connor, 1972; Salancik and Pfeffer, 1977; Weiner and Mahoney, 1981). The consensus seems to be that indeed, leadership does matter. However, the controversy arises when we ask how much it matters.

Lieberson and O'Connor's study (1972) of leadership and organizational performance controversially suggests that leaders have a small impact on organizational outcomes, such as sales, earnings and profit margins. Indeed, they find that similar to Thompson's depiction of a leader (1967), a leader is heavily constrained by his or her environment and therefore, has little impact. Similarly, Salancik and Pfeffer (1977) study the individual effects of mayors on municipal outcomes (income and expenditures) and find that individual mayors explain only a small portion of the variance in these budget items (7 to 15 percent). However, a follow-up study to the previous two studies questions the way in which variance in the organizational outcomes was attributed to industry, company, year and leadership effects (Weiner and Mahoney, 1981). Weiner and Mahoney (1981) suggest that the leadership impact actually explains more variance when we control for leadership first, as opposed to after we have controlled for company or year effects. The implication is that firm fixed effects conceivably absorb some of the CEO fixed effects. More recently, Bertrand and Schoar (2003) propose that managers have their own "style" of management and allows for the leadership to play a role in affecting corporate policies without actually observing CEO leadership measures. They find that including CEO fixed effects significantly increases the R^2 as compared to the model without controlling for the unobserved heterogeneity (Bertrand and Schoar, 2003). However, they paid little attention to the possibility of industry effect on CEO leadership.

A CEO's influence over the success of the firm could be due to the CEO's ability, effort, leadership, managerial style or some other unobservable characteristics. Since we do not have explicit measures of any of these attributes, we can only test the significance of adding CEO fixed effects into a model explaining organizational outcomes. Adding CEO fixed effects to a model explaining firm performances allows us to control for each CEO's discretion or other unobservable characteristic that may affect her job in controlling the direction of the firm. Therefore, we use the CEO fixed effects as proxies for CEO discretion[1]. Following previous literature, we offer our first hypothesis:

Hypothesis 1: CEO fixed effects on firm performance are jointly significant after controlling for firm heterogeneity and year effects.

1.2. Industry-wide managerial discretion. The second question about the importance of the industry seems to flow quite naturally from any discussion of an executive's impact. Using an institutional theory perspective (Meyer and Rowan, 1977; DiMaggio and Powell, 1983), we can ascribe some of an organization's outcomes to the institutional environment in which it operates. Meyer and Rowan (1977) describe how "rationalized institutions (which) create myths of formal structure" significantly influence organizations. Put differently, not only does the organization's internal governance structure matter, but the external governance structures an organization faces matter as well. Drawing upon Scott's three pillars of institutions – regulative, normative and cultural-cognitive (2002), we describe these external governance structures. Regulative institutional forces include rules, laws, sanctions, etc. imposed on an organization by perhaps a government, association or other legal institution. The best example of such a force is regulatory legislation, which plays a varying role in different industries. Previous studies have found support for both differences in CEOs' control and pay in regulated versus unregulated industries (Carroll and Ciscel, 1982; Rajagopalan and Finkelstein, 1992; Joskow, Rose and Shepard, 1993; Hubbard and Palia, 1995).

[1] We realize that this may be less than satisfactory for readers looking for construct validity of "CEO discretion." However, given that we use archival data in this analysis and that we control for firm and industry effects, the CEO fixed effects will pick up any unobserved or unmeasured CEO characteristic that affects firm performance. Such a characteristic could be the CEO's discretion, ability, leadership, managerial style, or perhaps another unobservable characteristic that influence its decision making.

Scholars have reconciled this tension between the importance of industry and the importance of leadership by developing the concept of managerial discretion (Hambrick and Finkelstein, 1987; Finkelstein and Hambrick, 1988; Finkelstein and Hambrick, 1990; Hambrick and Abrahamson, 1995). Managerial discretion integrates the idea that the industry and environment matter with the importance of leadership (vis-à-vis upper-echelons theory, Hambrick and Mason, 1984). Essentially, managerial discretion is a function of the environment (e.g., industry), the organization and the executive (Hambrick and Finkelstein, 1987). Hambrick and Finkelstein (1987) break the environment component down even further into the following key industry characteristics: product differentiability, market growth, structure of the industry, quasi-legal constraints, powerful outside forces and capital intensity. They suggest that these comprise industry-level managerial discretion. Hambrick and Abrahamson (1995) find support that research and development intensity, advertising intensity, capital intensity and market growth all significantly affect industry-level discretion. Comparing 26 firms in the computer industry (a more turbulent environment) with 21 natural gas distribution firms (a less turbulent environment), Halelbian and Finkelstein (1993) find evidence that the efficacy of top management teams is moderated by the environmental turbulence in which teams operate. Others have found differences in managerial discretion based on conformity to industry norms (Finkelstein and Hambrick, 1990). Finkelstein and Hambrick (1990) find that executive tenure affects various conformity measures, particularly in high discretion industries. In a similar vein, Waldman, Ramirez, House and Puranam (2001) find that transactional leadership and charisma do not significantly affect a firm's profit margin; however, the interaction of these variables with environmental uncertainty does matter.

Previous researchers have dealt with the difficult task of operationalizing industry-level managerial discretion (i.e. the effect of the industry on managerial control) by comparing outcomes across a number of distinct industries (Finkelstein and Hambrick, 1990; Haleblian and Finkelstein, 1993), by surveying management scholars to obtain their estimates of managerial discretion in certain industries (Hambrick and Abrahamson, 1995), and by using measures of key industry characteristics (i.e. capital intensity, industry concentration, etc.) (Rajagopalan and Datta, 1996; Henderson and Fredrickson, 1996; Finkelstein and Boyd, 1998). In this study, we utilize industry fixed effects as a proxy for "institutional forces" or "environment." This allows us to estimate the actual effect of CEOs within each industry. In other words, this measure is more direct than using industry wide variables that proxy for industry-wide discretion. Thus, the previous literature suggests that not only should we include CEO, firm and year fixed effects as determinants of firm performance, but also industry fixed effects. This leads to our second hypothesis, which is a simple extension of Hypothesis 1:

Hypothesis 2: CEO fixed effects on firm performance are jointly significant after controlling for industry differences.

1.3. Implications for compensation schemes. In practice, many firms do construct compensation contracts that are a function of some objective measure of firm performance. Murphy (1999) finds many firms that base the CEO's annual incentive plan on firm earnings, sales and other accounting measures of firm performance. This implies that firms must believe that the CEO actually does have substantial control over the direction of the firm, or at least in affecting these firm performance measures. This assumption is congruent with the leadership and managerial discretion literature, which implies that CEOs do have substantial control and influence.

Some empirical research on executive compensation suggests how compensation varies across industries. Rosen (1992) finds that, in general the effect of firm revenues on CEO pay does not vary considerably across firms, industries, countries or time (Rosen, 1992). Conyon and Murphy (2000) also find this to be true for CEOs in the US, and perhaps less so in the UK. However, when they include other controls in their model, the industry indicator variables become statistically significant, suggesting there is wide variation in pay practices across industries. In our sample, the highest paid CEO in the computer industry (2-digit SIC 35) earned about $93 million in 2002, whereas the highest paid CEO in the heavy construction industry (2-digit SIC 16) earned about $1.6 million. This also suggests that at least pay levels vary by industry.

From the institutional standpoint, institutions play a role in executive compensation in two ways. First, various institutions affect pay setting processes directly (Porac, Wade and Pollack, 1999). Second, institutions affect managerial discretion and hence, indirectly affect compensation policies, as these institutions clearly vary across industries. This is the main role we examine in this study. We expect that CEO discretion is amplified or constrained by the firm's industry. Furthermore, such institutional or, in this study, industry differences in managerial discretion should lead to variance in pay across

these industries as well. In other words, since the firm's industry likely affects the CEO's discretion, it should also affect the CEO's compensation.

In a similar vein, Joskow, Rose and Wolfram (1996) examine the electric utilities industry in particular and find that political constraints imposed by a firm's regulatory environment play a significant role in shaping executive compensation. For example, they find that firms regulated by more "consumer-oriented" agencies tend to pay their CEOs less (1996). The idea is that the customers in this industry have more influence over regulation. Likewise, customers with more influence and information are more likely to voice their "outrage" (to use Bebchuk and Fried's (2004) term) at excessive executive compensation. These studies provide evidence of legal and political institutions' direct effect on executive compensation.

We also expect that institutions affect managerial discretion (Hambrick and Finkelstein, 1987; Finkelstein and Hambrick, 1988; Finkelstein and Hambrick, 1990; Hambrick and Abrahamson, 1995; Abrahamson and Hambrick, 1997; Finkelstein and Boyd, 1998), which we expect to moderate the pay-for-performance relationship, i.e. the indirect effect of institutions on executive pay. For instance, Finkelstein and Boyd (1998) argue that CEOs in high-discretion industries face greater uncertainty and complexity, which make correctly predicting the right actions more difficult. Using a sample of 50 investor-owned electric utility companies, Rajagopalan and Finkelstein (1992) find that environmental change, which they proxy for using two distinct time periods, significantly affect the type and mix of executive pay. Abrahamson and Hambrick (1997) suggest that managers in low-discretion industries are more likely to have "homogenous cognitions," because these environments present managers with fewer environmental issues. In other words, a very constrained manager in a low-discretion industry is likely to have less decisions to make and hence, less control than a manager in a higher discretion environment.

We expect that CEO discretion within an industry is a key determinant of the compensation structures. In a high-discretion industry, we expect that the firm will reward this CEO more than in an industry where the CEO has little control. This differential could be viewed as a risk premium. Arguably, in higher-discretion industries, CEOs may bear more risk. This is especially true if these CEOs have more of their pay tied to firm performance (Jensen and Murphy, 1990). In an industry where the CEO has little discretion, we expect that firms will pay CEOs less on average and that pay will be less closely tied to firm performance measures. CEOs in the lower discretion industries will implicitly be bearing less risk.

How do CEOs view these differences in discretion and pay? We suggest CEOs make decisions depending on the marginal returns to their effort and the marginal increase in their compensation for increased effort. Consider CEOs who enjoy relatively higher marginal returns to their effort (i.e. they are higher ability, more motivated, better organized, or somehow more efficient in some unobservable way). These higher ability CEOs would want to sort into firms or industries where they are rewarded the most for maximizing their effort. In industries where CEOs can have a substantial impact on firm performance (high-discretion), it behooves the firm to provide incentives to high ability CEOs to maximize their efforts. Alternatively, lower ability CEOs (i.e. those who incur higher marginal costs for their effort) would prefer to select into firms or industries where wages are fixed and pay for performance sensitivities are weaker.

Our aim for this study is to find out whether these findings hold systematically across industries. Hence, we expect that in industries where CEOs have more discretion and there is substantial variation in how effective CEOs are, executive pay will be larger and more closely tied to firm performance measures. The final contribution of our study is to examine these links between industry differences of CEO discretion, as measured by the variance of CEO fixed effects within an industry, and the implications for CEO compensation. As discussed above, we expect CEO discretion or control within an industry to affect compensation systems. Therefore, we posit the following two hypotheses:

Hypothesis 3: Industry-wide CEO discretion will positively affect the level of CEO compensation.

Hypothesis 4: Industry-wide CEO discretion will positively affect the pay that is more sensitive to firm performance.

2. Methods and data

We examine firms and CEOs from 1970 to 2002. We obtain our data from several sources: executive compensation data comes from ExecuComp for 1992-2002, previously collected datasets by other researchers from 1970 to 1991 (Hallock & Billger, 2004; Huson, Parrino and Starks, 2001) and firm financial data comes from COMPUSTAT. The ExecuComp data typically includes information on the compensation and turnover of the top five executives at each firm as disclosed in the proxy statements. Huson, Parrino and Starks (2001)

collected their data from the *Forbes* Annual Compensation surveys and from the Wall Street Journal. They match announcement dates of CEO turnovers from the Wall Street Journal to the compensation data. Hallock and Billger (2004) use CEO turnover and compensation data from *Forbes* Magazine and the *Forbes* annual compensation surveys.

From this sample, we delete all firms that reported only one CEO over the entire span of years for which we have data for that firm. In these firms, there is no way for us to attribute any of the variation in performance to a particular CEO. Next, we drop the observations where we know that it is the CEO's first year of service. In those years, it is difficult to ascribe accurately the firm performance to either the departing or the in-coming CEO. Therefore, we end up also dropping the observations where we know that it is the CEO's last year of service (Huson, Parrino and Starks, 2001).

Our final sample for testing Hypotheses 1 and 2 consists of 18,364 firm-year observations, 1,521 firms, and 4,366 CEOs in 62 industries (at the 2-digit SIC level). This includes years 1970-2002. We present descriptive statistics in Table 1 (Panel A). We use this sample to estimate CEO effects on firm performance in an industry. However, to test Hypotheses 3, we only have CEO compensation information for years 1992-2002. For this sub-sample, we have 5,555 firm-year observations, 1,248 firms, and 2,179 CEOs in 57 3-digit SIC industries. Panel B refers to this sub-sample.

3. Results

Table 1 presents descriptive statistics for our study.

Table 1. Descriptive statistics

Panel A[a]

Variable	Mean	s.d.	*n*
ROA	4.36	11.05	18,364
Annual stock return (percentage)	18.81	234.19	18,270
Tobin's Q	1.75	1.47	14,768

Panel B[b]

Variable	Mean	s.d.	*n*	1	2	3	4	5	6
1. Total compensation (in millions of 2002 $)	4.53	8.90	5,508						
2. Salary only (in millions of 2002 $)	0.72	0.38	5,572	0.37					
3. Bonus only (in millions of 2002 $)	0.75	1.39	5,572	0.46	0.38				
4. Black-scholes value of stock option grant	2.23	7.25	5,508	0.92	0.20	0.21			
5. Change in firm performance (ROA)	9.53	1.59	4,185	0.27	0.36	0.32	0.14		
6. Change in shareholder wealth	20.11	1.87	4,747	0.01	0.10	0.13	-0.04	0.16	
7. Change in firm performance (Tobin's Q)	8.49	1.61	3,351	0.38	0.36	0.45	0.21	0.60	0.14

Notes: [a] This data is from 1970-2002 (as discussed in the text) used for Hypotheses 1 and 2. [b] All financial variables are in 2002 constant dollars. All correlations above |.05| are significant at the .05 level.
The data used for Hypothesis 3 includes years 1992-2002.

To test our first hypothesis, we estimate the following equation:

$$FP_{ikt}=\alpha + \tau_t + \phi_k + \varepsilon_{ikt}, \quad (1)$$

where FP is a vector of firm performance variables, including ROA, annual stock return and Tobin's Q for firm i and CEO k at time t; τ is a time trend; ϕ represents time invariant CEO fixed effects; and ε is the random error component. From this estimation, we test for individual CEO significance or joint CEO significance. We report joint CEO significance test results in Table 2, but find similar results from the individual significance tests.

In our first hypothesis, we test whether CEO discretion affects firm performance. We model firm performance as a function of individual CEO fixed effects controlling for year fixed effects. In Table 2, our results indicate that regardless of which measure of firm performance that we use, return on assets (ROA), annual stock return or Tobin's Q, CEO fixed effects are significant, suggesting that CEOs do significantly affect performance. We also estimate this model using including firm fixed effects (not reported)[1]. CEO fixed effects are still jointly significant in all models. We report the *F*-statistics for joint significance of the CEO dummy variables. These results are not surprising and in general confirm what previous researchers have found and suggested.

[1] We lose a substantial number of observations when including firm fixed effects (controlling firm heterogeneity) because separately identifying the CEO from the firm becomes an issue.

Table 2. CEO effect on firm performance (no industry controls)[a]

	ROA	Annual stock return	Tobin's Q
F (CEO fixed effects)	9.08***	2.119***	8.73***
Adjusted R^2	0.64	0.19	0.66
N	18,364	18,270	14,768

Note: [a] The dependent variable is ROA, Annual Stock Return or Tobin's Q (measures of firm performance). Independent variables are year and CEO dummies only (no industry controls). We use the 1970-2002 sample for these estimates.
*** $p < .001$.

To test our second hypothesis, we estimate firm performance including year, firm and CEO fixed effects for each industry. Put differently, we estimate equation [a] for each industry *j* to test Hypothesis 2. We present the joint significance tests for CEO fixed effects at the 2-digit SIC industry level in Tables 3 using ROA as our measure of firm performance. CEOs are jointly significant in most industries in explaining ROA. It appears that the joint significance of CEOs vary by industry, supporting our Hypothesis 2.

Table 3. Results of joint *F*-test for CEO effects on return on assets by industry[a]

	n	No firm fixed effects		Firm fixed effects included	
		F	Adjusted R^2	*F*	Adjusted R^2
Agricultural production crops	61	**16.04**	0.83	0.37	0.83
Metal mining	128	**1.91**	0.45	1.34	0.45
Oil and gas extraction	485	**2.27**	0.44	**1.33**	0.44
Mining and quarrying of nonmetallic minerals, except fuel	70	**3.39**	0.40	1.26	0.40
Building construction general contractors and operative builders	101	**2.90**	0.44	**1.66**	0.44
Heavy construction other than building construction contractors	48	1.12	0.26	1.12	0.26
Food and kindred products	721	**11.46**	0.68	**2.18**	0.69
Tobacco products	30	**17.96**	0.76	**17.96**	0.76
Textile mill products	130	1.34	0.09	1.34	0.09
Apparel and other finished products made from fabrics and similar materials	122	**64.56**	0.95	**45.75**	0.95
Lumber and wood products, except furniture	147	**2.10**	0.34	0.95	0.34
Furniture and fixtures	90	**4.99**	0.51	**4.99**	0.51
Paper and allied products	501	**7.77**	0.66	**3.09**	0.77
Printing, publishing and allied industries	416	**2.42**	0.27	0.81	0.27
Chemicals and allied products	1,534	**8.60**	0.65	**1.19**	0.65
Petroleum refining and related industries	358	**4.48**	0.54	**3.21**	0.54
Rubber and miscellaneous plastics products	238	**12.69**	0.78	**4.81**	0.78
Leather and leather products	37	**6.91**	0.70	**6.91**	0.70
Stone, clay, glass and concrete products	80	**6.26**	0.73	**6.26**	0.73
Primary metal industries	440	**3.99**	0.54	**2.53**	0.59
Fabricated metal products, except machinery and transportation equipment	275	0.95	-0.05	0.57	-0.04
Industrial and commercial machinery and computer equipment	1,007	**4.00**	0.48	**2.03**	0.48
Electronic and other electrical equipment and components, except computer equipment	797	**9.55**	0.71	**2.97**	0.71
Transportation equipment	595	**3.88**	0.45	**2.15**	0.45
Measuring, analyzing and controlling instruments	603	**3.46**	0.42	**1.76**	0.42
Miscellaneous manufacturing industries	88	**16.10**	0.81	**16.10**	0.81
Railroad transportation	161	**2.42**	0.33	0.76	0.34
Motor freight transportation and warehousing	51	1.32	0.34	1.32	0.34
Water transportation	65	**4.29**	0.61	**4.29**	0.61
Transportation by air	153	**11.38**	0.81	**5.13**	0.81
Communication	392	**1.74**	0.17	0.16	0.17
Electric, gas & sanitary services	1,324	**2.63**	0.34	**1.19**	0.35
Wholesale trade-durable goods	223	**4.35**	0.61	**1.37**	0.61
Wholesale trade-non-durable goods	312	**5.45**	0.56	**2.24**	0.56
Building materials & gardening supplies	103	**5.65**	0.55	1.16	0.55
General merchandise stores	293	**11.40**	0.75	**3.18**	0.75

Table 3 (cont.). Results of joint *F*-test for CEO effects on return on assets by industry[a]

	n	No firm fixed effects		Firm fixed effects included	
		F	Adjusted R^2	*F*	Adjusted R^2
Food stores	320	**7.33**	0.61	**2.42**	0.64
Automotive dealers & service stations	24	**19.44**	0.91	**19.44**	0.91
Apparel & accessory stores	182	**5.12**	0.53	1.33	0.53
Furniture & home furnishings stores	63	**22.86**	0.88	**22.86**	0.88
Eating & drinking places	149	1.40	0.03	0.66	0.02
Miscellaneous retail	222	**3.50**	0.38	**1.50**	0.38
Depository institutions	2,664	**1.99**	0.24	0.83	0.24
Non-depository institutions	156	**12.07**	0.68	**2.36**	0.68
Security & commodity brokers	185	**26.68**	0.87	0.71	0.87
Insurance carriers	785	**21.90**	0.81	**4.12**	0.81
Insurance agents, brokers & service	113	**282.51**	0.99	1.10	0.99
Holding & other investment offices	40	1.05	-0.51	1.05	-0.51
Hotels & other lodging	53	**5.19**	0.76	2.07	0.76
Personal services	77	**8.48**	0.76	**8.48**	0.76
Business services	685	**10.10**	0.77	**3.95**	0.76
Motion pictures	64	**15.67**	0.71	**15.67**	0.71
Amusement & recreation services	56	**5.67**	0.78	**5.67**	0.78
Health services	74	**2.36**	0.28	**2.36**	0.28
Engineering & management services	72	**1.70**	0.30	**1.70**	0.30
Non classifiable establishments	96	**2.65**	0.18	**1.82**	0.18

Notes: [a]Year fixed effects included in all models. *F*-statistics in bold are significant at the 0.10 level.

For our Hypotheses 3 and 4, we examine the relationship between firm performance and executive compensation controlling for differences in within-industry managerial discretion. This is implicitly a two-stage process. First, we construct a measure of industry-wide CEO discretion by estimating the effect of CEOs on firm performance for each industry controlling for year and firm fixed effects. Then, we calculate the variance of the vector of CEO fixed effects for each industry, or in other words, the variance of the ϕ_ks in equation [a][1]. We denote the variance of the CEO fixed effects in industry j as Z_j. The next step for testing our final hypotheses is to estimate total CEO compensation as a function of shareholder's wealth, the variance of CEO effects (our industry-wide CEO discretion measure), the interaction between the shareholder's wealth and the variance of CEO effects and year fixed effects. Put differently, we use the following model:

$$C_{it} = \tau_t + \psi W_{it} + \kappa Z_j + \lambda W_{it} * Z_j + \mu_{it}, \quad (2)$$

where C is the annual CEO compensation at time t for firm i (also CEO k; note that the CEO level independent variables in this equation are the same as the firm level variables), τ_t represents the year fixed effects, W represents the firm's wealth, Z_j represents the variance of the CEO fixed effects for each industry j, and μ_{it} is the random error component. We have plugged equation (4) into (5) (the model used previously to estimate the pay for performance relationship – Jensen and Murphy, 1990b; Murphy, 1999; Conyon and Murphy, 2000):

$$\beta(\text{hat})_j = \gamma + \lambda Z_j + \eta_j, \quad (3)$$

$$C_{it} = \alpha_i + \tau_t + \kappa Z_j + \beta_j W_{it} + \mu_{it}. \quad (4)$$

In the case of equation (4), the estimated β (hereafter β(hat)) is a pay for performance "elasticity." β(hat) is a pay for performance "elasticity" because we enter the dependent and independent variables in equation (4) logarithmically.

To estimate the effect of industry-wide CEO discretion as measured using our measures of firm performance: ROA, stock return, and Tobin's Q, respectively, we include the change in firm performance from one year to the next as the measure of shareholder wealth. Our measure of CEO compensation includes salary, bonus, the total value of restricted stock grant, the total value of options granted, the long-term incentive payouts, but excludes the value of options exercised during the period.

[1] We also checked correlations to examine the construct validity of our measure of the within industry managerial discretion (correlation matrix results are available upon request). We examine how our measures of industry-wide CEO discretion correlate with other industry-wide measures that may capture the unobserved heterogeneity across industries. The variance of CEO effects on ROA is significantly correlated with all other industry characteristics such as industry average PE ratio and cost of goods sold to sale ratio. We suggest these correlations show some support that measure is construct valid. Put differently, it is a decent proxy for whatever unobservable industry quality may explain why CEO discretion varies by industry.

We find that regardless of which measure of firm performance or shareholder wealth we use, it significantly affects the CEO pay (see first three rows in Table 4)[1]. Some measures of industry-wide CEO discretion positively affect the level of pay (columns 2 and 5 of Table 4). For example, a one percent increase in industry wide CEO discretion over ROA yields a 0.07 to 0.12 percent increase in CEO compensation. This also implies that increasing the industry wide CEO discretion by one percent yields only a $3,164 to $5, 424 increase in pay[2]. We find similar estimates using the other two firm performance measures. However, we find insignificant effects for the interaction of firm value or wealth and the CEO discretion measure. Including this interaction term also results in an insignificant estimated effect of industry wide discretion for annual stock returns and Tobin's Q. Therefore, we find moderate support that industry-wide CEO discretion (mean of CEO fixed effects) positively affects CEO pay (Hypothesis 3) and no support that industry wide CEO discretion affects contingent CEO pay (Hypothesis 4).

Table 4. Results of regression analyses of total compensation on the industry-wide CEO discretion (with firm fixed effects)[a]

	Firm performance measures					
	ROA		Annual stock returns		Tobin's Q	
Change in firm value (ROA)	0.43***	0.43***				
	(.01)	(.01)				
Change in shareholder wealth (annual stock returns)			0.31***	0.31***		
			(.01)	(.01)		
Change in firm value (Tobin's Q)					0.43***	0.43***
					(.01)	(.01)
CEO discretion/control over ROA[b]	0.07***	0.12*				
	(.01)	(.05)				
CEO discretion/control over annual stock returns[b]			0.02	0.08		
			(.03)	(.17)		
CEO discretion/control over Tobin's Q[b]					0.09***	0.02
					(.02)	(.05)
Change in firm value (ROA) x CEO discretion over ROA[b]		-0.005				
		(.006)				
Change in shareholder wealth x CEO discretion over annual stock returns[b]				-0.004		
				(.007)		
Change in firm value (Tobin's Q) x CEO discretion over Tobin's Q[b]						0.01
						(.007)
PE ratio	0.34***	0.34***	-0.08**	-0.08**	-0.008	-0.01
	(.02)	(0.02)	(0.03)	(0.03)	(.02)	(.02)
Constant	9.84***	9.82***	9.33***	9.32***	11.40***	11.40***
	(0.12)	(0.12)	(0.21)	(0.21)	(.09)	(.09)
n	3,344	3,344	2,461	2,461	2,949	2,949
Adjusted R^2	0.34	0.34	0.27	0.27	0.38	0.38

Note: [a] Bootstrapped standard errors in parenthesis. All models include year fixed effects. All variables are logarithmically measured. [b] The variables labeled "CEO discretion.." are simply the variance of the CEO fixed effects. To reiterate, this measure is the variance of the coefficients on the CEO dummy variables from the regression of firm performance (ROA, annual stock returns, or Tobin's Q) on CEO and year dummies. *** $p < .001$, ** $p < .01$, * $p < 0.1$

Discussion and conclusions

Our findings support previous research that leaders do matter, but that their environment moderates how much influence one person can have. Even after controlling for firm heterogeneity, we find that the effect an executive has on firm performance varies by industry. Intuitively, this is appealing because the institutional structures governing an industry vary considerably.

Do these findings imply that "star" or high ability CEOs select into industries similar to the computer industry? We hypothesized that CEOs will receive higher pay in industries where they can exert more control and where there is more variation in control exerted by CEOs in that industry. Even though we do find that pay is higher in high-discretion industries we do not find much support that pay is more

[1] Our pay for performance elasticities are comparable to elasticities estimated by previous researchers (Jensen and Murphy, 1990; Murphy, 1999; Conyon and Murphy, 2000). For example, Conyon and Murphy (2000) report elasticities of 0.27 for US companies using shareholder returns as the performance measure. This is quite close to the values we estimate (see columns 3-4 in Table 5).

[2] This is based on a 0.07-0.12 percent increase in the mean CEO total compensation of $4.53 million from 1992-2002.

sensitive to firm performance in high-discretion industries than in low-discretion industries. While pay for high-discretion CEOs is likely to be of larger magnitude, the firms do not seem to be tying more of their pay to firm performance as we expected. However, it may also be the case that CEOs are sorting, which would mute the estimated interaction of industry-wide managerial discretion and firm performance on CEO pay. If indeed, "star" CEOs select into certain industries, we may observe a lower variance of the CEO fixed effects for that industry, which in essence means that this measure may not be a good measure for industry-wide CEO discretion. Hence, our findings support the notion that there may be sorting of CEOs into certain industries, but we cannot conclude that it is due to higher marginal returns to CEO influence on firm performance measures. We also do not explicitly model this suggested sorting and hence, more research is necessary to answer this question.

This paper endeavors to add another dimension to explanation of CEO pay. Specifically, we include industry as determinant of compensation. We draw from previous literature in management, economics and sociology to build our hypotheses. We find that CEOs do have some control over firm performance measures. However, we find that this CEO effect – labeled CEO discretion, effort, ability, style, leadership, etc. – varies considerably across industries. That is, in some industries CEOs have more influence over organizational outcomes. We rely mostly on institutional theory to explain why CEOs' control varies across industries. Furthermore, we examine how much variance in CEO control there is within an industry. We find that in industries where there is a wide range of CEO effect on firm performance, the average total compensation in that industry is higher. We find little support that in those industries, firms link CEO compensation more closely to firm performance (i.e. pay for performance sensitivity is higher).

Based on these results, we suggest that industry does matter in CEO compensation. However, more interestingly, these results suggest that perhaps CEOs might select into certain industries, although we did not provide direct support for this. In industries where there is large variance in how much impact a CEO can have on firm performance, it may be more rewarding for a CEO to distinguish himself or herself, i.e. as a "star" CEO. The economic interpretation of variable pay schemes is that individuals who are better quality self-select into variable pay jobs as opposed to straight wage jobs because they can earn more. While this may be the case, we cannot exclude other possible explanations and do not suggest that only CEOs in these industries with large variance of CEO effect are high quality. Furthermore, we do not find much support that CEOs in industries with more discretion have compensation that is closely tied to firm performance. Of course, this analysis does not consider the intrinsic motivation, risk aversion, or other important characteristics of CEOs that may be playing a role. We plan to examine some of these other aspects in future research and view this study as the first step in that direction.

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