Does CEO pay keep up with the Joneses? A test of the KUJ theory

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Abstract

What determines CEO pay? We investigate the theory that CEO's pay is set to "keep up with the Joneses" (KUJ) versus relative performance evaluation (RPE). Under RPE an increase in aggregate peer output leads to a reduction in CEO pay. Conversely, under KUJ, contracts may be set such that CEO pay increases with aggregate peer output. This positive effect under KUJ becomes stronger as CEO pay becomes more transparent. We investigate this empirically using data over four time periods: 1971-1981, 1982-1993, 1994-2005, and 2006-2015. These periods are selected to coincide with changes in CEO pay transparency such as pay surveys in the 1980s, online posting of pay through the EDGAR system starting in 1994, and the 2006 SEC mandate that boards report the method for determining compensation. We find evidence of KUJ pay from 1994-2005 when there is a strong positive correlation between CEO pay and average peer stock returns. However, this effect becomes smaller and insignificant from 2006-2015, an indication that the 2006 SEC mandate made it harder for boards to justify pay based on aggregate peer output.

JEL classification: G30; G38; J33; J41

Keywords: CEO pay; keeping up with the Joneses (KUJ); relative performance evaluation (RPE)

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1. Introduction

What determines CEO pay? After more than half a century of study, there is still considerable debate on this question (see Edmans, Gabaix, and Landier (2009)). We investigate the explanatory power of the theory that a CEO's pay is set to "keep up with the Joneses" (hereafter KUJ). DeMarzo and Kaniel (2017), in a theoretical model of optimal contracting, argue that under KUJ preferences optimal contracts exhibit more "pay for luck" (i.e., pay based on industry or peer performance) and thus a smaller component of pay is based on relative performance. This distortion becomes larger when contracts are publicly disclosed and easily known.

DeMarzo and Kaniel (2017) KUJ theory is a relatively recent development in the CEO compensation literature. In contrast, a long literature theorizes that Relative Performance Evaluation (hereafter RPE) explains the impact of peers on CEO pay. Under RPE, boards set CEO pay to filter out the effect of external shocks to performance over which the CEO has no control.

The two theories, KUJ and RPE, have contrasting predictions for the effect of peers on an agent's compensation. Under RPE, an agent's compensation is based on performance relative to the average of their peers, $X_i - \bar{X}$. Thus, holding peer average performance, $\bar{X}$, constant, compensation increases with own performance, X_i, and there is no "pay for luck". Likewise, holding own performance constant, an increase in average peer performance results in a decrease in an agent's compensation.

In contrast, under KUJ theory, an agent's utility depends on how their pay compares to peer's pay. DeMarzo and Kaniel (2017) show that if KUJ preferences exist then optimal contracting results in more compensation based on aggregate or peer performance. Thus, own pay becomes less sensitive to own performance and may become positively related to aggregate peer

performance. We note that the theories are not mutually exclusive. Boards are known to set part, but not all of pay by RPE (Albuquerqu (2009); Gong, Li, and Shin (2011)). Further, Edmans, Gabaix, and Jenter (2017) point out that regulation has affected the structure of and board's pay determination method for CEO pay.

Both theories require that CEOs and boards know the pay and performance of their peers *ex post*. However, under KUJ *ex ante* knowledge of peer contracts allows boards and CEOs to negotiate contract terms similar to those of peers. This can lead to a convergence of executive compensation across industry peers, as noted by DeMarzo and Kaniel (2017). Knowledge of peers' pay has increase remarkably over time. Prior to 1934, disclosure occurred by chance. Since 1934, CEO pay has been disclosed through the SEC in the proxy statement (DEF14A); however, availability limited widespread knowledge of proxy statements. Starting in the 1970s, the Forbes 800 pay survey increased public awareness of CEO pay.[1]

Staring in the early 1980s, pay consultants introduced well received pay surveys that, for the first time, enabled pay comparisons of items such as salary, bonus, and stock grants (Crystal (1991)). Starting in 1994, the SEC required that all pay be disclosed online through its EDGAR system. This change made CEO pay information readily available to anyone with access to the internet including journalists, CEOs, and board members. Disclosure has also been impacted by changes in accounting rules. The adoption of accounting rule FAS123R required U.S. firms to expense unvested options starting in 2005 or 2006, depending on the firm's fiscal year end. Edmans, Gabaix, and Landier (2009) show that the use of options rapidly declined starting in 2006. Also in 2006, the SEC instituted the Compensation Discussion and Analysis (CD&A); thus, firms

[1] In 1979 the SEC started requiring disclosure of CEO perks to reduce tax avoidance. We do not investigate this element of compensation. In 1993 the SEC required disclosure of pay for CEOs who serve less than a year; our sample does not include these CEOs.

started reporting the method and determinants of pay such as relative performance (RPE) and peer or aggregate performance (KUJ). These changes in disclosure enable tests of the KUJ and RPE theories from a time when even board members had relatively little knowledge of peers' pay (the 1970s) to a time when CEO pay became well known to the general public. Further, since the 1960's, regulations affecting pay have changed dramatically.

We test the relative strength of RPE and KUJ preferences in a regression framework where log of pay is the dependent variable and both own and peer performance are explanatory variables. Under RPE, pay should be positively related to own performance and negatively related to peer performance. Under KUJ, we expect that pay is still positively related to own performance, although the effect should be smaller compared to RPE. The key difference under KUJ is that pay does not necessarily respond negatively, and likely responds positively to peer performance.

The sample is S&P 500 CEOs. Our model is similar to that suggested by Demarzo and Kaniel (2017, eq. (6)), whereby compensation is a function of a constant, own output, and aggregate output of the agent's peers. Following Albuquerque (2009), we select peers in the same industry and in firms that have similar sales volume. Further, as noted in proxies, the S&P 500 is used as a measure of peer performance.

Our sample covers the period from 1971 to 2015. We split our sample into four time periods, representing different levels of pay transparency.

- 1971 to 1981 is characterized as a period of low awareness of peers' pay and performance.
- 1982 to 1993 is a period of increasing awareness due to pay consultant surveys.
- 1994 to 2005 is characterized by widespread awareness due to online posting of proxy statements containing CEO pay information through the EDGAR system.

- 2006 to 2015 is characterized by regulations that affect the structure and public knowledge of how CEO pay is determined as well as additional reporting requirements in the proxy statements.

Our results for the 1971-1981 period are consistent with RPE; we find no evidence supporting KUJ preferences for either total pay or cash pay (salary plus bonus) during this period. During this period, own performance variables (log of sales, ROA, and 3-year stock return) are positive and significant. Increases in average peer sales are negatively related to pay although the effect is not significant, and the effect of peer stock returns is essentially zero.

We find similar results for the 1982-1993 period. During this period we again observe positive returns to own performance. The peer performance measures generally have positive coefficients during this period, an indication of possible KUJ preferences, but are insignificant. For CEOs of utility companies, regressions of cash pay generally find no evidence supporting KUJ or RPE, consistent with many studies that find the additional regulatory oversight in this industry affects the method that boards use to set CEO pay. In this era, Hermalin (2005) suggests that governance of firms is increasing.

From 1994-2005, there is strong evidence supporting KUJ preferences for both total and cash pay related to stock returns. Whereas the coefficient for log(sales) is still positive and significant with regard to own sales and insignificant with regard to average peer sales (consistent with RPE), the pattern is quite different with regard to 3-year stock returns. During this period, the coefficient for own stock returns is small and insignificant while the coefficient for average peer returns is large and significant. This is consistent with contracts related to KUJ preferences where CEO pay increases with average peer returns ("pay for luck"). We note that a prediction of KUJ theory, greater pay for performance, is also documented in this period by Perry and Zenner (2001).

As expected, we again find no evidence that utility firm CEO pay is set in accord with KUJ or RPE theory.

From 2006-2015, we find no evidence supporting KUJ or RPE for total pay and some evidence supporting KUJ preferences for cash pay. During this period, both own and peer performance measures are positively related to pay, although they are generally not significant.

Overall, we find support for KUJ preferences as knowledge of CEO pay becomes more available and when regulations do not require that boards report they are setting pay to keep up with the Joneses. We surmise that the 1994 disclosure requirements through EDGAR, led to contracts that increased pay based on aggregate peer performance, consistent with the theory of DeMarko and Kaniel (2017). However, two regulations together may have brought an end to boards' use of KUJ preferences in setting CEO pay. First, in 1993 Congress limited the deductibility of pay over one million dollars unrelated to performance, i.e., Internal Revenue Code Section 162(m). Second, in 2006 the SEC mandated that boards report on their method of pay determination. Boards cannot avoid the tax if pay is based on peer performance to KUJ.

We believe we are the first to establish the role that KUJ preferences play in setting CEO pay. We build on research identifying the role of peers in CEO pay determination that builds on Bizjak, Lemmon, and Naveen (2008) as well as the long line of literature on RPE. We further contribute to an understanding of the role that regulation, disclosure, and online disclosure have on boards' determination of CEO pay when KUJ preferences exist.

The rest of the paper is organized as follows. We discuss prior research in Section 2 and our hypotheses in Section 3. Section 4 details our data and methodology. We present empirical results in Section 5, and Section 6 concludes.

2. Prior research

This section brings together the disclosure requirements, legislation, tax laws, and accounting rules that are relevant to KUJ theory. KUJ theory models the effect of information that is known broadly; to be known broadly requires disclosure. In addition, speedy dissemination of the information is involved: to journalists, the public, board members, and managers. One cannot keep up with the Joneses if one does not know of them and their status.

Mandated disclosure of CEO pay started in 1934; though available, this information was stored in a written form at designated locations – thus it was not widely disseminated. In 1971, Forbes Magazine started publishing ex post CEO pay for large firms; this increased knowledge of the highest cash amount paid to CEOs each year.[2]

The next major increase in dissemination of CEO pay information occurred in the early 1980s with the introduction of detailed pay surveys (Crystal (1991)); these surveys made industry peers' salary, bonus, option, stock, and other elements of compensation readily apparent to those willing to pay for the surveys. Starting in 1994 (1995) the SEC's accepted voluntary (mandatory) filing of CEO pay information (DEF14A) on EDGAR, which made CEO pay information available to all who are on the internet. Our focus in on S&P 500 firms; 86% voluntarily filed starting in January of 1994. As a result of making CEO pay data electronically available and batch downloadable, CEO pay information became rapidly disseminated. Further, due to its digital format, this pay information became readily analyzed.

Finally, in 2006, the SEC instituted Compensation Discussion and Analysis (CD&A) in which firms report their methods for setting pay and their determinants of pay. Gipper (2017) suggest the CD&A by itself had a minor impact on disclosure; however, Edmans, Gabaix, and

[2] In 1978 there was a relatively minor (in terms of magnitude of pay) disclosure of perks (so they could be taxed).

Jenter (2017) raise the possibility that disclosing the determinants of pay could have had a strong effect on the method of pay determination due to Congress' tax on pay not related to performance.

In 1993, Congress mandated that top executive pay greater than $1 million would be taxed unless it was dependent on the executive's performance (Perry and Zenner (2001)). Repeatedly, research has found that boards change the structure of pay to comply with legislation, accounting rules, and SEC regulations; in addition to Perry and Zenner (2001) see Edmans, Gabaix, and Jenter (2017) for a discussion of FAS 123R which required the expensing of options and led to their rapid reduction in CEO pay packages. Thus the SEC's 2006 mandate to disclose the determinants of pay coupled with the 1993 requirement that pay is for *own* CEO performance made setting a CEO's pay to keep up with the Joneses problematic for boards – this pay would not be deductible and KUJ pay could quickly end.

3. Hypothesis development

Our hypotheses are developed from the KUJ theory of DeMarzo and Kaniel (2017). In their theory, as KUJ preferences become stronger, CEO pay is determined less by own performance measures and more by aggregate peer performance. In addition, this effect becomes more pronounced as disclosure increases. As DeMarzo and Kaniel (2017) state, "comparing the setting with publicly disclosed contracts compared to the one with undisclosed contracts shows that publicly disclosed contracts generally imply higher relative sensitivity compared to when contracts are undisclosed." Thus, we expect that CEO pay increases with peers (the Joneses) if peers' pay is widely known.

Our basic model, which is described in more detail in section 4, follows DeMarzo and Kaniel (2017, equation (6)) and relates CEO pay to both own and peer performance measures

$$w_i = \beta_1 + \beta_2 Perf_i + \beta_3 Perf_{-i} + e_i . \quad (1)$$

This leads to the following hypotheses:

Hypothesis 1: Under RPE, pay is positively related to own performance and negatively related to peer performance; $\beta_2 > 0$ **,** $\beta_3 < 0$ **.**

Hypothesis 2: Under KUJ, pay is positively related to own performance and positively related to peer performance; $\beta_2 > 0$ **,** $\beta_3 > 0$ **.**

Since peer pay was relatively unknown in the 1970s, we expect little evidence of KUJ preferences in this time period. Starting in the early 1980s compensation consultants improved executives' and boards' knowledge of peers' pay; if this disclosure is sufficiently strong, we would expect evidence of KUJ preferences in the 1982 to 1993 period.

Next, the adoption of EDGAR in 1994 by the SEC put CEO pay on the World Wide Web. Web access increased the breadth and speed with which journalists, the public, executives, and boards members could learn about peers' pay. This is the situation in which KUJ theory suggests KUJ preferences are most likely to be addressed by boards, so pay in the 1994 to 2005 period would show a strong positive relationship to the performance of peers. This leads to

Hypothesis 3: Under KUJ preferences, pay becomes more sensitive to aggregate peer performance as disclosure increases, thus we would expect β_3 **to become larger from 1994 to 2005 compared to previous periods.**

Finally, Edmans, Gabaix, and Jenter (2017) suggest that Congress' 1993 tax on pay not related to performance curbs methods of awarding pay unrelated to performance. The 2006

Compensation Discussion and Analysis (CD&A) would reveal pay methods that involve KUJ, which is pay for peers' (not own) superior performance. Therefore, after 2005 we expect a decline in pay that is positively related to peers' performance.

Hypothesis 4: Due to the above rules, which made it harder to set contracts based on KUJ preferences, we expect $\beta_3 = 0$ during 2006 to 2015.

In each of the above periods we expect highly regulated firms to set CEO pay independent of CEOs' KUJ preferences. Specifically, we expect utility industry CEO pay to show no evidence of KUJ preferences in any time period from 1971 to 2015.

Hypothesis 5: For highly regulated utilities, we do not expect evidence of either RPE of KUJ in pay; thus, $\beta_2 = \beta_3 = 0$ for these firms.

In the next section, we explain how our data was collected and elaborate on the regression model, including the specific own- and peer-specific output measures as well as additional controls.

4. Data and methodology

Stock market data is obtained from the University of Chicago's Center for Research in Security Prices (CRSP). Accounting data is obtained from Compustat. Our sample of S&P 500 CEOs extends from 1971 to 2015. This sample is based on the Forbes 800 ex-post pay series, our own hand collected sample of ex-ante pay for 150 of the largest US firms in fiscal year 1980 (130 were S&P 500 firms), and the ExecuComp dataset.

We use multiple means to determine peer pay. First, similar to Albuquerqu (2009), we

select contemporaneous peers within the same 2 digit SIC industry and having similar sales (ln(sale) within +/- 30%). The average return on assets (income before extraordinary items / total asset) and the average stock return of these firms are our first measures of peer performance. Second, some firms use the return of S&P 500 firms for their benchmark rather than a specific group of named firms (see Bizjak et. al., 2017). Therefore, we also use the return of S&P 500 firms as a determinant of own CEO pay when testing for evidence of KUJ or RPE preferences.

Summary statistics for CEO pay as well as the three performance measures (Sales, ROA, and trailing 3-year stock return) are provided in Table 1. Panel A gives statistics for 1971-1981, panel B for 1982-1993, panel C for 1994-2005, and panel D for 2006-2015. Pay and sales statistics are inflation adjusted and are reported in 2015 dollars. Average cash pay (salary plus bonus) went from $1.26 million in 1971-1981 to $3 million in 1994-2005 (a 138% increase) while total pay went from $1.73 million to $11.96 million (a 591% increase) during this same time period. In contrast, average sales increased from $12.15 billion to $15.58 billion (a 28% increase) over the same time frame. The summary statistics give some indication that traditional measures such as sales revenue, ROA and stock returns have become less important in explaining pay over time, as we discuss later.

Insert Table 1 here.

For our baseline regression, we include firm-specific effects only. The model is

$$\ln(pay_{it}) = \beta_1 + \beta_2 \ln(rSale_{it}) + \beta_3 ROA_{it} + \beta_4 return_{i,t-3} + controls + e_{it} \quad (2)$$

where *pay* is either cash pay (salary + bonus) or total pay (TDC1) and *return* is the cumulative return over the previous 3-year period. Controls include market-to-book ratio, standard deviation of monthly returns over the previous 3-year period, and industry fixed effects by 2-digit SIC code.

We then add average peer value for the performance variables sales, ROA, and 3-year returns to obtain our main regression

$$\ln(pay_{it}) = \beta_1 + \beta_2 \ln(rSale_{it}) + \beta_3 ROA_{it} + \beta_4 return_{i,t-3} + \beta_5 \ln(rSale_{-it}) + \beta_6 ROA_{-it} + \beta_7 return_{-i,t-3} + controls + e_{it} \quad (3)$$

where the coefficients with '-i' represent average peer values (with peers identified as described at the beginning of this section. This format allows us to test directly whether CEO pay is consistent with RPE ($\beta_5, \beta_6, \beta_7 < 0$) or KUJ ($\beta_5, \beta_6, \beta_7 > 0$) preferences or whether it is unrelated to average peer performance.

We run an additional set of regressions with both own and peer performance adding S&P 500 trailing year return and year fixed effects as additional controls. We run this final model for the full set of firms and, additionally, for the subset of firms in the utility industry for which pay is more heavily regulated. We present results for all regressions in the next section.

5. Results

Results for the baseline regression with firm-specific performance variable only are given in Table 2. The four columns in the left panel give results for each period with the log of total *ex ante* pay as the dependent variable. The columns to the right give results using log of cash pay as the dependent variable. Note that cash pay was much more widely reported than total pay for the 1971-1981 and 1982-1993 periods.

Insert Table 2 here.

The results indicate that a 1% increase in sales is associated with roughly a 0.2%-0.3% increase in pay, which is relatively consistent whether using total or cash pay. There appears to be a decrease in the relationship between sales and pay for the final period 2006-2015. The trailing 3-year stock

return has a positive relationship in all regressions, but is not significant in 2006-2015. The relationship of ROA to total compensation varies wildly, but has a consistently positive relationship to cash pay, which diminishing over time. Finally, we note that the $\bar{R}^2$ drops noticeably across each time period from about 0.5 in 1971-1981 down to 0.05 in 2006-2015. This indicates that determinants of pay are changing over time with traditional explanatory variables becoming less important in recent years.

We next add the average peer performance variables and present these results in Table 3. We note that the own performance coefficients change very little, in magnitude and significance, as we add the peer performance variables. As noted earlier, negative coefficients for the peer variables are consistent with RPE pay whereas positive coefficients are consistent with KUJ pay. First, the effect of peer sales is insignificant across all regressions. The effect of peer ROA is generally positive with regard to total pay but not significant. In contrast, peer ROA is positively associated with cash pay across all periods with the largest effect in 1971-1981 and 1994-2005. This provides some evidence of KUJ preferences but only with regard to cash pay.

The most interesting effect seen in Table 3 is that of peer 3-year stock returns. For the first two periods, peer stock returns have basically no impact on CEO pay. Then in 1994-2005, following the SEC's EDGAR reporting requirements, peer stock returns have a positive and significant impact on CEO pay (both cash and total). In fact, the effect of peer returns is larger than that of own returns during this period. This is the strongest evidence in favor of KUJ preferences and their use in setting pay. In the 2006-2015 period, this effect is still positive, but becomes smaller in magnitude and is insignificant. This is consistent with reduced use of KUJ pay in CEO contracts due to taxes on pay not related to performance combined with the CD&A reporting requirements.

Insert Table 3 here.

We next add controls for S&P 500 trailing year return and year fixed effects. These results are reported in Table 4. Again, the results change very little when we add the additional controls. In fact, the effect of peer 3-year returns is slightly more pronounced when we add the year fixed effects. For example, with regard to total pay, the coefficient in 1994-2005 increases from 0.0007 to 0.0011 while the coefficients for all other periods become smaller once we include yearly dummies.

Insert Table 4 here.

Finally, we present results for utility firms in Table 5. We test for KUJ and RPE in this regulated industry to determine the association between regulation and the determinants of pay. If regulation is significant, as we suggest, evidence of KUJ and RPE would not follow their respective theories. In general, we do not find significance with regard to own or peer performance, although the lack of significance is at least partially due to the smaller sample size. For only the 1982-1993 period, both peer sales and 3-year stock returns have a positive effect indicating possible KUJ preferences. However, these effects are negative when examining cash pay. Further, the relationship of S&P 500 stock returns to own total pay is significant (p-value < 0.01) but changes sign or is insignificant from period to period. In general, we believe the evidence is consistent with the fact that this is a highly regulated industry and thus CEO contracts are structured much differently compared to other industries.

Insert Table 5 here.

6. Conclusions

Overall, we provide evidence that KUJ preferences exist and were rewarded in contracts following the SEC's EDGAR filing requirements in 1994/1995. The EDGAR filing requirement allowed CEO pay became known more quickly and broadly than previously was possible. During this period, there is strong evidence that CEOs were rewarded more based on positive peer stock performance - to keep up with the Joneses (KUJ). However, this effect diminished in the 2006-2015 period following the new requirement that firms report how pay was set; setting pay to keep up with the Joneses would conflict with prior tax law that CEO be paid for their own performance. Further, in earlier periods when CEO pay information was not as readily available to journalists, executives, and directors we find, as expected, no evidence that CEO were rewarded to keep up with the Joneses.

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Table 1: Sample statistics

All data are reported in 2015 dollars. The sample is S&P 500 CEOs from 1971 to 2015. From 1971 to 1981 our sample is the S&P 500 CEOs in the Kevin Murphy's Forbes 800 data, which includes most S&P 500 CEOs (Nagel (2010)). From 1992 onward we use the ExecuComp database, which identifies all S&P 500 CEOs. For fiscal year 1980, we collect ex ante pay information on the 100 largest U.S. firms (80 are in the S&P 500) and the S&P 500 firms not in the Forbes 800. From 1992 onward the value of ex ante total pay is ExecuComp variable TDC1. It is cash pay, restricted stock, payouts from long term programs, and the value of stock options granted, using ExecuComp's modified Black-Scholes approach. In fiscal year 1980, ex ante total pay is found using proxy data and ExecuComp's method of computing TDC1. Sales is Compustat's "Sale" variable. ROA is earnings before extraordinary items / total assets (IBCOM/AT). Trailing 3 year stock return is the stock return over the previous three years for the CEO.

[a] For the 1980 fiscal year. [b] For S&P 500 CEOs in the ExecuComp database for calendar years 1992 and 1993

Panel A: 1971-1981 time period					
	Ex ante total pay ($000s)[a]	Salary + Bonus ($000s)	Sales ($ millions)	ROA	Trailing 3 year stock return
Average	1,730	1,260	12,146	0.061	40.2
Standard Deviation	1,349	543	22,939	0.043	80.5
25th percentile	800	879	3,383	0.035	-8.6
median	1,179	1170	6,043	0.056	25.0
75th percentile	2,319	1,537	11,374	0.084	67.6
Sample Size	153	3,667	3,796	3,820	3,757

Panel B: 1982-1993 time period					
	Ex ante total pay ($000s)[b]	Salary + Bonus ($000s)	Sales ($ millions)	ROA	Trailing 3 year stock return
Average	4,215	1,820	12,955	0.049	67.8
Standard Deviation	4,343	1,331	21,648	0.060	87.0
25th percentile	1,840	1,135	3,740	0.018	17.2
median	3,030	1,596	6,997	0.047	54.7
75th percentile	5,045	2,190	13,541	0.079	99.4
Sample Size	855	4,739	4,731	4,738	4,644

Panel A: 1994-2005 time period					
	Ex ante total pay ($000s)	Salary + Bonus ($000s)	Sales ($ millions)	ROA	Trailing 3 year stock return
Average	11,958	2,997	15,582	0.046	63.3
Standard Deviation	24,933	3,406	26,879	0.109	249.3
25th percentile	3,607	1,463	3,532	0.015	-1.6
median	6,805	2,326	7,576	0.044	35.5
75th percentile	12,818	3,499	16,650	0.081	84.1
Sample Size	6,168	6,193	6,190	6,192	6,024

Panel A: 2006-2015 time period					
	Ex ante total pay ($000s)	Salary + Bonus ($000s)	Sales ($ millions)	ROA	Trailing 3 year stock return
Average	11,525	3,890	21,012	0.059	41.6
Standard Deviation	11,776	3,984	39,399	0.076	77.3
25th percentile	5,971	1,961	4,149	0.023	-5.5
median	9,155	3,011	8,792	0.054	29.8
75th percentile	13,824	4,435	18,967	0.094	73.0
Sample Size	4,790	4,798	4,798	4,798	4,684

Table 2: Baseline regressions

All data are reported in 2015 dollars. The sample is S&P 500 CEOs as described in Table 1. Sales, ROA, and Trailing 3 year stock return are defined in Table 1. Market-to-book (MB) = Market value of common equity to book value of common equity = PRCC_F*CSHO /CEQ. The "Std. dev. of 3 year stock return" is the standard deviation of monthly stock returns over the prior three years. Following Murphy (2002) our industry fixed effect are for utilities (SIC codes 49xx), financial firms (SIC codes 6xxx), and new economy firms. New economy firms are "companies with primary SIC designations of 3570 (Computer and Office Equipment), 3571 (Electronic Computers), 3572 (Computer Storage Devices), 3576 (Computer Communication Equipment), 3577 (Computer Peripheral Equipment), 3661 (Telephone & Telegraph Apparatus), 3674 (Semiconductor and Related Devices), 5045 (Computers and Software Wholesalers), 5961 (Electronic Mail-Order Houses), 7370 (Computer Programming, Data Processing), 7371 (Computer Programming Service), 7372 (Prepackaged Software), and 7373 (Computer Integrated Systems Design)". Year fixed effects are for calendar years. Standard errors are corrected for firm level clustering (Petersen (2009)) when computing significance; *p*-values are given in parentheses below each reported coefficient; *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Ln(TDC1)					Dependent variable = Ln(Salary + Bonus)			
	1971-1981	1982-1993	1994-2005	2006-2015		1971-1981	1982-1993	1994-2005	2006-2015
Intercept	5.4618***	5.3321***	4.7524***	7.5567***		5.1527***	5.1736***	5.1371***	6.9619***
	15.62	17.18	20.05	15.59		38.67	34.60	21.31	13.67
Ln(Sales)	0.2110***	0.2733***	0.4030***	0.1843***		0.2254***	0.2282***	0.2914***	0.1303***
	6.78	9.02	15.25	4.25		17.31	16.52	11.68	2.87
ROA	0.2422	1.1006**	0.3718	-0.4977		1.0915***	1.5249***	0.6469**	0.3524
	0.29	2.31	1.25	-1.23		3.80	5.94	2.25	0.82
Trailing 3 year stock return	0.0021***	0.0013***	0.0004**	0.0005		0.0006***	0.0005***	0.0002	0.0006
	3.70	3.47	2.25	0.51		5.71	3.31	1.18	0.63
Market-to-book	0.0813**	0.0589***	0.0033**	0.0005**		-0.0034	0.0142**	0.0006	0.0006*
	2.47	2.93	2.36	2.42		-0.41	2.23	0.75	1.67
Std. dev. of 3 year stock return	-3.3439**	-0.1899	3.4715***	-2.1351**		-1.2932***	0.3749	-1.4356**	-2.5800**
	-2.47	-0.20	6.21	-2.21		-3.39	0.66	-1.98	-2.11
Industry fixed effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No		No	No	No	No
Adjusted R^2	0.536	0.316	0.203	0.049		0.470	0.293	0.131	0.053
Sample size	149	827	5,913	4,579		3,579	4,574	5,936	4,584

Table 3: Regression with peers' performance

All data are reported in 2015 dollars. The sample is S&P 500 CEOs as described in Table 1. Sales, ROA, 3 year stock return, Market-to-book, Std. dev. of 3 year stock return, industry fixed effects, and year fixed effects are defined in either Table 1 or Table 2. "Avg." is an abbreviation for "average". Peers are any CEOs of S&P 500 firms in the same 2-digit Standard Industry Classification (SIC) industry that are also within +/- 3-5 of the Ln(Sales) for the CEO's firm. Year fixed effects are for calendar years. Standard errors are corrected for firm level clustering (Petersen (2009)) when computing significance; *p*-values are given in parentheses below each reported coefficient; *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Ln(TDC1)					Dependent variable = Ln(Salary + Bonus)			
	1971-1981	1982-1993	1994-2005	2006-2015		1971-1981	1982-1993	1994-2005	2006-2015
Intercept	5.4503***	5.2050***	4.6908***	7.4797***		5.0689***	5.1504***	5.1598***	6.8377***
	14.18	14.41	20.19	18.54		35.27	31.07	20.28	15.27
Ln(Sales)	0.2682***	0.2462***	0.4108***	0.1820**		0.2297***	0.2108***	0.3451***	0.1109
	3.25	3.68	4.40	2.03		9.11	6.81	3.98	1.19
ROA	0.2768	1.0133**	0.3532	-0.5013		0.8316***	1.4504***	0.5370**	0.3543
	0.32	2.13	1.20	-1.28		2.69	5.60	2.15	0.85
3 year stock return	0.0020***	0.0014***	0.0003**	0.0003		0.0006***	0.0006***	0.0001	0.0004
	3.27	3.20	2.23	0.21		4.58	3.44	0.97	0.34
Avg. peer Ln(Sale)	-0.0920	0.0415	-0.0085	0.0065		-0.0056	0.0241	-0.0854	0.0331
	-0.84	0.47	-0.07	0.07		-0.18	0.59	-0.79	0.33
Avg. peer ROA	2.6829	1.8898	-0.0734	0.2088		1.6268**	0.4906	1.6294**	0.1838*
	1.17	1.44	-0.09	1.52		2.36	1.09	2.25	1.67
Avg. peer 3 year stock return	0.0004	-0.0001	0.0007**	0.0007		0.0000	-0.0004**	0.0008***	0.0005
	0.30	-0.22	2.29	0.70		0.10	-2.01	2.84	0.56
Market-to-book	0.0737**	0.0548***	0.0034**	0.0005**		-0.0012	0.0138**	0.0006	0.0006*
	2.13	2.64	2.35	2.42		-0.14	2.21	0.86	1.65
Std. dev. of 3 year stock return	-3.0738**	0.0304	3.6324***	-1.9860**		-1.2159***	0.4049	-0.7786	-2.4661**
	-2.36	0.03	6.56	-2.42		-3.16	0.71	-1.05	-2.18
Industry fixed effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No		No	No	No	No
Adjusted R^2	0.533	0.318	0.204	0.050		0.473	0.295	0.137	0.053
Sample size	149	827	5,913	4,578		3,575	4,571	5,936	4,583

Table 4: Regression with peers' performance, S&P 500 return, and year fixed effects

All data are reported in 2015 dollars. The sample is S&P 500 CEOs as described in Table 1. Sales, ROA, 3 year stock return, Market-to-book, Std. dev. of 3 year stock return, industry fixed effects, and year fixed effects are defined in either Table 1 or Table 2. "Avg." is an abbreviation for "average". Peers are any CEOs of S&P 500 firms in the same 2-digit Standard Industry Classification (SIC) industry that are also within +/- 3-5 of the Ln(Sales) for the CEO's firm. "S&P 500 trailing year return "is the one year return over the 12 months since the fiscal year end when the CEO's pay is awarded. Year fixed effects are for calendar years. Standard errors are corrected for firm level clustering (Petersen (2009)) when computing significance; *p*-values are given in parentheses below each reported coefficient; *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Ln(TDC1)					Dependent variable = Ln(Salary + Bonus)			
	1971-1981	1982-1993	1994-2005	2006-2015		1971-1981	1982-1993	1994-2005	2006-2015
Intercept	5.4261***	5.3065***	5.1017***	7.4882***		5.0898***	4.8290***	5.3349***	6.8955***
	13.51	13.53	21.87	18.88		34.26	28.43	20.71	15.56
Ln(Sales)	0.2547***	0.2469***	0.4387***	0.1826**		0.2299***	0.2135***	0.3590***	0.1131
	3.13	3.69	4.76	2.02		9.10	7.12	4.21	1.21
ROA	0.3150	0.9868**	0.1161	-0.5788		0.6859**	1.4587***	0.4523**	0.1146
	0.44	2.06	0.56	-1.47		2.10	5.73	1.99	0.27
3 year stock return	0.0019***	0.0014***	0.0004**	0.0003		0.0006***	0.0007***	0.0001	0.0006
	3.04	3.13	2.29	0.19		4.62	4.10	1.06	0.45
Avg. peer Ln(Sale)	-0.0902	0.0377	-0.1177	0.0028		-0.0092	0.0234	-0.1274	0.0257
	-0.82	0.43	-1.06	0.03		-0.29	0.59	-1.22	0.26
Avg. peer ROA	2.3551	1.8645	0.6319	0.1639		1.5509**	0.7320	1.6561**	0.0874
	1.06	1.40	0.73	1.18		2.17	1.36	2.14	0.83
Avg. peer 3 year stock return	0.0002	-0.0002	0.0011***	0.0006		-0.0001	0.0000	0.0010***	0.0007
	0.17	-0.26	3.50	0.76		-0.27	0.13	3.82	0.86
S&P 500 trailing year return	0.0078	-0.0178	-0.0019	0.0015		-0.0008	-0.0001	-0.0010	0.0052***
	1.03	-0.90	-1.25	1.25		-1.36	-0.12	-0.71	2.92
Market-to-book	0.0709**	0.0548***	0.0027**	0.0005**		0.0040	0.0053	0.0004	0.0006*
	1.95	2.63	2.35	2.45		0.43	1.48	0.61	1.69
Std. dev. of 3 year stock return	-2.7870**	0.1162	0.8321	-2.1858***		-1.2319***	0.5854	-1.7725**	-3.3307***
	-2.42	0.12	1.28	-2.68		-2.63	1.02	-2.07	-2.75
Industry fixed effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Adjusted R^2	0.549	0.317	0.234	0.050		0.474	0.353	0.141	0.058
Sample size	149	827	5,913	4,578		3,575	4,571	5,936	4,583

Table 5: Regression on utility firms

All data are reported in 2015 dollars. The sample is S&P 500 utility firm CEOs; the sample of S&P 500 CEOs is described in Table 1. The regression set-up is identical to that in Table 4. Standard errors are corrected for firm level clustering (Petersen (2009)) when computing significance; *p*-values are given in parentheses below each reported coefficient; *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Ln(TDC1)					Dependent variable = Ln(Salary + Bonus)			
	1971-1981	1982-1993	1994-2005	2006-2015		1971-1981	1982-1993	1994-2005	2006-2015
Intercept	NA	-1.482	1.214	13.104		NA	5.786*	1.063	17.229
		-0.55	0.13	0.61			1.93	0.12	0.88
Ln(Sales)	NA	-0.169	1.258*	0.555		NA	0.224	0.932	0.614
		-0.82	1.79	0.85			1.30	1.41	1.06
ROA	NA	4.662	-1.770	7.787		NA	-0.997	0.692	7.788*
		1.44	-0.33	1.48			-1.10	0.14	1.69
3 year stock return	NA	0.005*	-0.001	0.001		NA	0.001*	-0.001	0.001
		1.80	-0.87	0.66			1.83	-0.85	0.59
Avg. peer Ln(Sale)	NA	1.478**	-0.743	-0.844		NA	0.076	-0.217	-1.020
		2.48	-0.45	-0.36			0.15	-0.15	-0.50
Avg. peer ROA	NA	-98.194	72.963	-115.903		NA	-30.970	28.327	-113.591
		-1.48	1.49	-0.76			-1.34	0.61	-0.78
Avg. peer 3 year stock return	NA	0.053*	-0.091	-0.018		NA	-0.014	-0.086	-0.062
		1.78	-1.52	-0.24			-1.34	-1.49	-0.87
S&P 500 trailing year return	NA	-0.164***	-0.005	0.152***		NA	-0.002	-0.003	0.149***
		-3.03	-1.16	3.11			-0.45	-0.88	3.44
Market-to-book	NA	0.444***	0.020	-0.095		NA	0.184***	0.020	-0.108
		4.85	1.28	-1.42			3.79	0.92	-1.56
Std. dev. of 3 year stock return	NA	10.361**	-1.125	7.015**		NA	4.658***	-1.365	6.478**
		2.12	-0.50	2.31			2.83	-0.68	1.99
Industry fixed effects	No	No	No	No		No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Adjusted R^2	NA	0.441	0.181	0.010		NA	0.438	0.144	0.012
Sample size	10	79	468	353		349	389	472	353