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A Reexamination of the Association between CEO Compensation and the Components of Accounting Earnings

Abstract

In this paper we reexamine the association between CEO compensation and the cash and accrual components of reported earnings and investigate whether the association has changed over time. we find that whether we look at bonuses, total cash or total direct compensation, the association between compensation and cash flows from operations increases over the period under examination, while that between compensation and the accrual components of earnings decreases. Analyzing the reasons for this change, we find the decreasing emphasis on the use of accruals in the setting of compensation is inversely related to the increase in magnitude of accruals.

Keywords: Executive Compensation, Earnings, Cash Flows from Operations, Accruals.

JEL classification: J33, L2, M41

A Reexamination of the Association between CEO Compensation
and the Components of Accounting Earnings

I. Introduction

In this paper we reexamine the association between CEO compensation and the cash and accrual components of reported earnings and investigate whether the association has changed over time. The past twenty years has seen a plethora of research on executive compensation,[1] earnings management, and the effect of accounting choices on compensation. If the individuals, who set compensation, notably, board compensation committees become aware of and use the information in these studies, it would be consistent with academic research having an impact on decision makers. Motivating much of the academic research on executive compensation has been the political debate. Politicians have railed against excessive non performance-based compensation, leading to increased scrutiny and disclosure including increased proxy statement disclosures in 1993**,** limitations on the deductibility of executive compensation (Section 162m of the Internal Revenue Code), and rules regarding the expensing of equity compensation (SFAS 123 and 123 (revised)). Events like the Michael Ovitz termination and subsequent lawsuits have focused the attention of the board on compensation and its role in setting it. Finally rule changes, e.g., Section 162(m), NYSE listed company manual Section 303A.05, required that the compensation committee be comprised of independent directors. All of these events have increased the pressure on/incentive of directors to focus on executive compensation and its relation to performance of the firm.

[1] Murphy (1999) shows that the increase in academic research on executive compensation has outpaced the increase in executive compensation itself.

We begin by examining the relationship, first between annual bonuses and the cash and accrual components of earnings, and then broadening our examination to the relationship between total cash and total direct compensation, and earnings components. Using annual regressions, we find that whether we look at bonuses, total cash or total direct compensation, the association between compensation and cash flows from operations increases over the period under examination, while that between compensation and the accrual components of earnings decreases. Analyzing the reasons for this change, we find the decreasing emphasis on the use of accruals in the setting of compensation is inversely related to the increase in magnitude of accruals.

This paper continues as follows. Section two briefly discusses the literature on executive compensation, earnings management, and the effect of accounting choices on earnings management, leading to our hypothesis. Section three discusses our data and sample, while section four presents our model and empirical results. The paper concludes with section five which summarizes our results and its implications.

II. Literature and hypothesis development

Generally accepted accounting principles (GAAP) provides management considerable discretion in choosing accounting methods and estimates. The earnings management literature (see Healy and Wahlen 1999 for a review) describes the incentives among managers to exploit the flexibility in GAAP to manage accounting reports in ways that affect earnings quality. Researchers have examined the effect of bonus plans on those choices with mixed results. For example, while Healy (1985) examines accrual choices around the lower and upper bounds of bonus plans showing that managers make accounting/accrual choices as if they affect compensation, later research, i.e., Gaver et al.

(1995), and Holthausen et al. (1995), is unable to confirm his results along the lower bound. While Gaver et al. (1995) suggest their results are "more consistent with the income smoothing hypothesis than with Healy's bonus hypothesis," Holthausen et al. (1995) argue that "Healy's results at the lower bound are likely to be induced by his methodology." Another alternative explanation for the mixed results is that incentives and behavior have changed over time. For example, Holthausen et al. (1995) discuss the evolution of bonus plans from pools plans to budget-based incentive arrangements.

It makes sense that managers would respond to incentives and make accounting choices to manage earnings. Murphy (1999) documents the use of accounting performance measures in annual incentive plans of large corporations. Other studies document a significant statistical association between variants of accounting earnings and incentive pay (e.g., Antle and Smith 1985; Lambert and Larcker 1987; Jensen and Murphy 1990; Sloan 1993). Perhaps most directly, another line of research examines accounting method choices (Abdel-Khalik et al. 1987, Healy et al. 1987), discretionary accruals (Balsam 1998), and nonrecurring transactions (Gaver and Gaver 1998), showing that compensation appears to be affected by these choices, providing indirect evidence that managers manipulate reported income to maximize their bonuses.

Given that managers can take actions to manage reported earnings, earnings-related disclosures, and even the perception of earnings (Schrand and Walther 2000), it is not surprising that Clinch and Magliolo (1993) report that management discretion could limit the effectiveness of earnings as a performance measure in compensation contracts. Thus cash flows from operations are often used by researchers to approximate performance because cash flows are less subject to accounting accruals and deferrals, and

consequently mitigate sources of potential manipulation (Cheng et al. 1997). Prior researchers, i.e., Kumar et al. (1993) and Natarajan (1996), do not find a significant association between cash flows from operations and CEO compensation after controlling for net income. However, Nwaeze et al. (2006) find that cash flows from operations is compensation contract-relevant, especially when the quality of earnings relative to the quality of cash flows from operations as a measure of performance is low.

Our expectation is that boards, like researchers have come to realize that accounting earnings are subject to manipulation and consequently look to other measures of performance. While share returns are less subject to direct manipulation,[2] they can be affected by events out of management's control and consequently are less than optimal as a performance evaluation tool. Further the value of the manager's options and shares owned is already tied to share returns, so tying current pay to share returns exposes managers to additional market risk that he or she needs to be compensated for. Alternatively the board may use cash flow from operations, a measure of performance that is less subject to manipulation than accounting earnings, yet more under management's control than stock price performance. This shift may be ex ante, as the firm's bonus plan may be modified to incorporate cash flows from operations in addition to or in place of accounting earnings, or ex post, where the compensation committee adjusts the bonus and/or other components of compensation downward to reflect manipulation.

Our belief is that over time, as boards have become more sophisticated and more research on earnings management and its relation to executive compensation have

[2] While share prices cannot be directly manipulated, managers can influence their share prices by managing accounting earnings, as earnings directly influence the share price.

become available, a shift will occur and the board will place less emphasis on accounting earnings and more emphasis on cash flow from operations, i.e., they will discount the accrual component of earnings.

III. Data and Sample Selection

For our analysis we require data on compensation, as well as accounting and stock price performance measures. Panel A of Table 1 describes our sample selection procedure. We start with 21,029 firm-year observations for which we have data for the period 1992-2003 from the Standard and Poor's ExecuComp database.[3] We lose 2,858 firm year observations that either have a change in CEO or for which multiple individuals are listed as CEO, and 2,030 firm year observations because of missing financial data on Standard & Poor's Compustat. Finally we eliminate 1,071 outliers (one percent in each tail). This yields a final sample of 15,070 firm-year observations, which includes 2,289 unique firms.

Panel B of Table 1 provides some descriptive statistics on our sample. For ease of presentation, the compensation variables, bonus (BONUS), total current (TCC) and total direct compensation (TDC) are presented in thousands, while the financial variables, earnings (INC), operating cash flow (OCF), non-discretionary accruals (NDA) and discretionary accruals (DA) are reported in millions. As defined by ExecuComp, total current compensation includes salary plus bonus, while total direct compensation includes salary, bonus, other annual, total value of restricted stock granted, total value of

[3] As noted in the sensitivity analysis, we have additional compensation data from Forbes magazine dating back to 1975. However the increased proxy statement disclosures mentioned in the introduction, which went into effect in 1993, included improved disclosure of non cash compensation, which better allows researchers to obtain total compensation on a consistent basis across firms. Consequently not only can we examine the effect of earnings components on cash compensation, we can also examine it on the bonus component of cash compensation and on total compensation itself.

stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total. The mean (median) of bonus is $511 (290) thousand. For current (total) compensation we observe a mean of $1.1 ($3.3) million and median of $818 thousand ($1.7 million).

Earnings and operating cash flows are large and positive on average, with their means (medians) being $159 (43) and $317 (82) million respectively. The large difference between earnings and operating cash flows is primarily driven by non-discretionary accruals which has a mean (median) of $-228 (-36) million. The mean, $50 million, and median, $2 million, of discretionary accruals are much smaller, as while the amounts involved can be substantial, the positives and negatives offset one another, i.e., while the first quartile is negative $38 million the third quartile is positive $57 million.

IV. Model and Empirical Results

Our primary regression follows from model (2) in Balsam (1998). Balsam hypothesizes and finds that the use of income-increasing discretionary accruals increases compensation. Further, in terms of model (1) below, he finds that $\beta_1 > \beta_2 > \beta_3$. In light of our discussion above, we reexamine whether income-increasing discretionary accruals increase compensation, and if it still does, is the level of increase lower in more recent periods and/or has it decreased relative to the multiplier attached to non-discretionary components of earnings.

$$Compensation_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 NDA_{it} + \beta_3 DA_{it} + \varepsilon_{it} \quad (1)$$

Where

Compensation = either bonus, total current or total direct compensation paid in to CEO of firm i in year t,
BONUS = bonus paid to the CEO of firm i in year t,
TCC = total current compensation (salary plus bonus) of the CEO of firm i in year t,

TDC = total direct compensation of the CEO of firm i in year t,
OCF = operating cash flows for firm i in year t,
NDA = nondiscretionary accruals for firm i in year t, and
DA = discretionary accruals for firm i in year t estimated by the cross-sectional version of the modified Jones Model incorporating controls for industry and year.[4]

We examine three different measures of CEO compensation: bonus, total current compensation, and total direct compensation. We examine these three measures for the following reasons. We use bonus, as theoretically it should be most closely related to contemporaneous performance measures. We use total current compensation to tie to the prior literature, and we use total compensation as the non-cash, portion of the CEO compensation package, has become increasingly important over time.

In our pooled regressions (see Table 2) we find results comparable to those in Balsam (1998), i.e., β_1, β_2, β_3, are all significantly greater than zero for the models with BONUS and TCC as dependent variables and β_1, and β_3 are greater than zero for the model with TDC as dependent variable. Looking at the magnitudes of the coefficients, while Balsam finds $\beta_1 > \beta_2 > \beta_3$ in our pooled regressions, we find β_3 significantly greater ($p=0.01$) than β_2 for total current and total direct compensation. Consequently, while we, as did Balsam, find all components of earnings factor positively into compensation, we find some evidence that discretionary accruals are weighted more heavily than non-discretionary accruals.

Turning to the average coefficients from the annual regressions the results are even more closely related to Balsam's, i.e., β_1, β_2, β_3, are all significantly greater than

[4] While both this paper and Balsam (1998) use the Jones (1991) model to calculate discretionary accruals, Balsam uses the time series version of the model and total accruals calculated using the balance sheet approach, whereas we use the cross-version of the model as in Defond and Jiambalvo (1994) and calculate total accruals using the cash flow approach of Collins and Hribar (2002).Our results are comparable if we use performance-matched discretionary accruals following Kothari et al. (2005).

zero and $\beta_1 > \beta_2 > \beta_3$. However our primary interest is in whether the relationship changes over time. Consequently we turn our attention to the annual regressions.

When we run model (1) on an annual basis we generally find strong statistical significance. That is across the three regressions and three independent variables the vast majority of the coefficients are significant at p=0.01. More importantly we notice a distinct trend in the regression coefficients over time (see Table 2 and Figure 1). For the first two years of the time period under examination the coefficients on OCF, NDA and DA seems to be highly correlated and close to one another in magnitude. In some years, for example 1992, the coefficient on DA actually exceeds that on OCF for both the BONUS and TDC regression, albeit this difference is not statistically significant. However beginning in the mid-1990's, there is a large divergence between the coefficient on OCF and those on NDA and DA, and in most cases the difference is statistically significant.[5] When comparing the coefficients on NDA and DA, we see no clear pattern. That is in some cases β_2 is significantly greater than β_3 and in other cases the reverse holds. Overall while there is a strong upward trend in the coefficient on operating cash flows, there appears to be a negative trend on the accrual components.

To test whether these trends are significant we run model (2):

$$\text{Coefficient}_{jt} = \beta_0 + \beta_1 \text{Time}_t + \varepsilon_{it} \qquad (2)$$

where

Coefficient = regression coefficients from model (1) for variable j (OCF, NDA, DA) in year t; and
Time = variable taking the value of 1 to 12, where 1 is the first year in our sample period (1992) and 12 is the last (2003).

[5] The results discussed in this section hold when we replace NDA and DA with total accruals.

This method is similar to that outlined in Theil (1971), and has been used to examine changes in the value-relevance of earnings and book value (Collins, Maydew and Weiss (1997) and Barth, Beaver, and Landsman (1998)) over time.

The results from estimating model (2) are presented in table 3 and are consistent across all three measures of compensation. We find that the coefficient on Time in the OCF model is positive and significant (p-values of 0.01 for BONUS and TDC, and 0.05 for TCC), and those on Time in the NDA and DA models negative and significantly different from zero (all p-values 0.01 except for that on DA in the TDC regression which is 0.05). Thus the trends observed in table 2 are statistically significant.

Balsam (1998) in his model (9) also examines the effect of the discretionary accruals on the relationship between compensation and reported accounting earnings. He acknowledges two alternative scenarios that could hold in the cross-section. The first, which implicitly follows the functional fixation hypothesis (e.g., Chen and Schoderbek 2000), assumes that the higher the correlation between compensation and reported accounting earnings the greater the incentive for management to make income increasing accounting choices. The second assumes that as earnings management increases, the compensation committee is more likely to notice and adjust for it. In terms of model (3) below, the former predicts a positive coefficient β_2, while the latter predicts the coefficient will be negative. While Balsam(1998) consistently found the coefficient to be positive, we feel reexamining the relationship in light of the evidence presented above, would be informative.

$$Compensation_{it} = \beta_0 + \beta_1 INC_{it} + \beta_2 HIGH_{it} * INC_{it} + \varepsilon_{it} \quad (3)$$

where

INC is income before extraordinary items and discontinued operations for firm i in year t,
HIGH is an indicator variable taking the value of one when discretionary accruals/total assets for firm i in year t are positive and zero otherwise, and
Compensation are the three measures of compensation, BONUS, TCC, and TDC as defined above.

The results for estimating model (3) are presented in table 4. For brevity we only present results for the partition where accruals are positive, although the results discussed below apply to other partitions as well, i.e., ratio of discretionary accruals/total assets in the top ten, five, or one percent of all observations. Inconsistent with the results in Balsam (1998), when we pool the observations over time, for all three measures of compensation we consistently find the coefficient β_2 to be negative and significant (p=0.01). This finding also holds for the average of the annual regressions, although the p-value using TDC as the dependent variable falls just short of statistical significance. Looking at the annual regressions, for BONUS we see four of the twelve annual regressions have significantly negative β_2 coefficients at p=0.01. In contrast only one of the annual regressions, 1993, has a positive and significant β_2 coefficient at p=0.01. For both TCC and TDC we find three significantly negative β_2 coefficients (p=0.01), only finding one significantly positive β_2 for TDC at p=0.01. So in contrast to Balsam who concluded that higher levels of discretionary accruals were associated with higher rewards, we find that as discretionary accruals increase the reward to a dollar of earnings decreases.

Potential explanations for the change in reliance on accruals in setting compensation

There are a number of potential explanations for the decrease in the coefficients on accruals in the latter period. One self-serving explanation is that academic research on earnings management had an effect on the compensation setting process. Another is that

the regulatory changes and shareholder/political pressure caused the compensation committee to change its focus in measuring performance. Unfortunately testing either of these theories is beyond the scope of this paper. However one potential explanation that we can examine is that accruals have become more visible because they have increased in magnitude (Bergstresser and Philippon 2005).[6] In panel A of table 5 we show that discretionary accruals as a percentage of assets and discretionary accruals as a percentage of income have increased over the period under examination. Focusing on medians which are influenced less by outliers we see that the absolute value discretionary accruals range from four percent of assets in 1992 to 14 percent in 2001, whereas the absolute value of discretionary accruals ranges from 59 percent of income in 1992 to 253 percent of income in 2001. Correlation analysis presented in panel B shows this increase is inversely related to the discretionary accrual coefficients in the annual compensation regressions, significantly so for the TCC and TDC regressions.

Sensitivity Analysis

Change in sample composition over time

As discussed above we obtained data beginning in 1992 from ExecuComp, which contains detailed compensation data on approximately 1,500 of the largest U.S. corporations per year. In contrast Balsam (1998) used data from the surveys printed in Forbes magazine, which were less comprehensive in nature and covered only about 800 firms per year. To assure that any differences observed are due to changes in behavior

[6] Like Cohen et al. (2005) we find some evidence that discretionary accruals drop post Sarbanes-Oxley, however this is only relative to their 2001 peak. That is discretionary accruals at the end of the sample period are still significantly higher than at the beginning of the sample period.

over time and not our methodology[7] or the sample composition, we conduct a number of additional analyses. First we re-estimate models (1) through (3) using the Forbes data for the period in Balsam (1998). Our results for models (1) and (3) are then identical to the results found by Balsam for his models (2) and (9). Most importantly when we run annual regressions for the 1975-1993 period, we observe that the coefficients OCF, NDA, and DA seem to move in tandem. In terms of our model (2) we observe that while the coefficient on OCF increases significantly from 1975-1993, so do the coefficients on NDA, and DA. Consequently, the decrease weights applied to accruals are unique to our sample period and not a continuation of a trend started earlier.

As noted above, the Forbes survey contained approximately 800 firms per year, defined as firms appearing in one of their Forbes 500 lists, i.e., one of 500 largest firms in the country as defined by sales, profits, assets or market value. In contrast ExecuComp includes approximately 1500 firms comprising the S&P 500, Mid-Cap 400, and Small Cap 600. So while ExecuComp, via its inclusion of the S&P 500 firms includes most if not all of the firms in the Forbes survey, it also includes data on smaller firms, i.e., firms in the Mid-Cap 400 and Small Cap 600. To ensure that the differences are not being driven by smaller firms that entered our sample in 1992, we divide our 1992-2003 sample into two groups. Group one is firms in ExecuComp that were not in Forbes, while group two is firms that were in both the Forbes and ExecuComp data sets. The results reported in tables 2 through 5 hold for both subsamples of firms.

Omitted variables

[7] The major differences in methodology between this study and that of Balsam (1998) are in the calculation of total and discretionary accruals (see note 4) and the treatment of outliers.

In his model (3) Balsam (1998) includes the increase in shareholder wealth as an additional independent variable. We chose not to include it in our primary analysis as our focus was on the change in the relationship between compensation and the components of accounting earnings. However if we include increase in shareholder wealth in model (1) the results are virtually identical to those presented.

Use of Performance-matched Discretionary Accruals

We adjust discretionary accruals for performance and industry effects as suggested in Kothari et al. (2005) because potential measurement errors in discretionary accruals may correlate with industry membership, growth, or performance. To be precise we calculate performance-matched discretionary accruals for firm i as discretionary accruals of firm i minus discretionary accruals of firm j that exhibits the closest ROA in the same industry. Our findings are not affected by performance matching.

V. Conclusion

In this paper we have reexamined the relationship between compensation and the components of accounting earnings, showing that the relationship has changed over time. In particular while we find that while the strength of the relationship between compensation and operating cash flows increases over time, it decreases for the accrual components of earnings. In addition, while in the early years of our study there does not seem to be much difference in the coefficients on operating cash flows, nondiscretionary accruals, and discretionary accruals, which is consistent with the board basing compensation on earnings as a whole, in the latter years of our study we observe a substantial decrease in the coefficients on nondiscretionary and discretionary accruals, consistent with directors becoming more financially sophisticated in setting

compensation. This decrease in the coefficients on nondiscretionary and discretionary accruals coincided with a period in which accruals as a percentage of total assets increased dramatically. So an additional explanation for the decreased weight on the accrual components of earnings is that they became more noticeable and too large to ignore.

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Table 1: Sample selection and descriptive statistics

Panel A: Sample selection

	Firm-year observations	Firms
CEO compensation data available in Execucomp 1992-2003	21,029	2,596
Less: observations with changes in CEOs or dual CEOs	(2,858)	(27)
Less: Missing values for Compustat data	(2,030)	(280)
Less: the top and bottom 1% of observations of each variable	(1,071)	
Final Sample	15,070	2,289

Panel B: Descriptive statistics

Variables	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
BONUS	510.692	695.647	67.384	290.000	650.000
TCC	1,069.977	832.94	510.026	817.612	2,120.898
TDC	3,250.683	4,283.365	878.957	1,726.402	3,681.315
E	158.537	363.380	11.681	42.865	147.035
OCF	317.022	688.923	23.047	81.957	276.007
NDA	-227.941	828.205	-173.752	-36.477	-4.023
DA	50.269	786.527	-37.778	2.398	56.756

Variable definitions:
Bonus= bonus as reported in Standard & Poor's ExecuComp;
TCC= salary plus bonus as reported in Standard & Poor's ExecuComp;
TDC = salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total, as reported in by Standard and Poor's ExecuComp;
E=earnings before extraordinary items (Compustat item 18);
OCF= cash flow from operations (Compustat item 308);
DA= discretionary accruals estimated by the cross-sectional version of the modified Jones Model incorporating controls for industry and year; and
NDA= nondiscretionary accruals, the difference between total accruals (earnings – cash flows from operations) and discretionary accruals.

Table 2: Regressions of CEO compensation on components of earnings

Regression Model: $Compensation_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 NDA_{it} + \beta_3 DA_{it} + \varepsilon_{it}$

Panel A: Compensation is BONUS

YEAR	Intercept	OCF	NDA	DA	N	Adj. R^2
Pooled	357.460	0.492	0.233	0.240	15,070	0.154
	(72.26)*	(38.43)*	(11.79)*	(12.57)*		
1992	259.800	0.418	0.458	0.471	792	0.083
	(15.83)*	(7.73)*	(5.32)*	(5.23)*		
1993	261.355	0.521	0.513	0.621	1,188	0.146
	(19.85)*	(12.10)*	(8.21)*	(8.99)*		
1994	289.854	0.520	0.403	0.271	1,263	0.161
	(21.93)*	(10.42)*	(4.47)*	(3.08)*		
1995	292.482	0.590	0.513	0.300	1,284	0.210
	(22.38)*	(13.60)*	(6.73)*	(4.45)*		
1996	359.799	0.312	0.098	0.123	1,391	0.100
	(23.40)*	(6.32)*	(1.06)	(1.40)		
1997	380.593	0.398	0.275	0.297	1,417	0.116
	(26.45)*	(8.76)*	(3.32)*	(4.01)*		
1998	352.453	0.484	0.190	0.186	1,446	0.147
	(22.72)*	(10.91)*	(2.80)*	(2.99)*		
1999	400.029	0.593	0.250	0.213	1,396	0.199
	(22.63)*	(12.90)*	(3.08)*	(3.09)*		
2000	412.879	0.552	0.133	0.168	1,284	0.204
	(21.84)*	(12.01)*	(1.74)	(2.37)*		
2001	335.931	0.585	0.212	0.235	1,237	0.180
	(17.92)*	(11.90)*	(3.32)*	(3.76)*		
2002	465.650	0.545	0.252	0.188	1,255	0.142
	(22.13)*	(12.50)*	(5.11)*	(3.73)*		
2003	442.550	0.719	0.268	0.306	1,117	0.273
	(19.54)*	(15.10)*	(3.89)*	(4.55)*		
Average	354.448	0.520	0.297	0.282	1,256	0.163
	(17.80)*	(16.86)*	(7.26)*	(6.97)*		

Panel B: Compensation is TCC (salary plus bonus)

YEAR	Intercept	OCF	NDA	DA	N	Adj. R^2
Pooled	852.804	0.719	0.246	0.283	15,070	0.228
	(139.12)*	(45.29)*	(10.05)*	(11.90)*		
1992	701.479	0.651	0.533	0.562	792	0.165
	(33.59)*	(9.46)*	(4.86)*	(4.90)*		
1993	701.527	0.785	0.629	0.716	1,188	0.207
	(40.48)*	(13.84)*	(7.64)*	(7.87)*		
1994	741.982	0.804	0.555	0.419	1,263	0.217
	(41.73)*	(11.99)*	(4.58)*	(3.54)*		
1995	755.650	0.908	0.756	0.474	1,284	0.276
	(44.06)*	(15.96)*	(7.56)*	(5.35)*		
1996	833.059	0.568	0.241	0.253	1,391	0.175
	(43.58)*	(9.26)*	(2.10)*	(2.31)*		
1997	856.709	0.611	0.311	0.355	1,417	0.196
	(47.87)*	(10.82)*	(3.02)*	(3.86)*		
1998	832.766	0.699	0.160	0.194	1,446	0.231
	(44.19)*	(12.98)*	(1.94)†	(2.56)*		
1999	900.403	0.796	0.189	0.193	1,396	0.275
	(42.69)*	(14.52)*	(1.95)†	(2.34)*		
2000	936.992	0.814	0.185	0.255	1,284	0.292
	(41.94)*	(14.99)*	(2.04)†	(3.04)*		
2001	883.531	0.834	0.209	0.281	1,237	0.264
	(38.74)*	(13.95)*	(2.69)*	(3.70)*		
2002	1029.558	0.823	0.295	0.216	1,255	0.227
	(41.25)*	(15.89)*	(5.03)*	(3.62)*		
2003	1029.496	0.937	0.245	0.327	1,117	0.333
	(37.49)*	(16.24)*	(2.94)*	(4.00)*		
Average	850.263	0.769	0.359	0.354	1,256	0.238
	(26.02)*	(23.39)*	(6.13)*	(7.55)*		

Panel C: Compensation is TDC (total direct compensation)

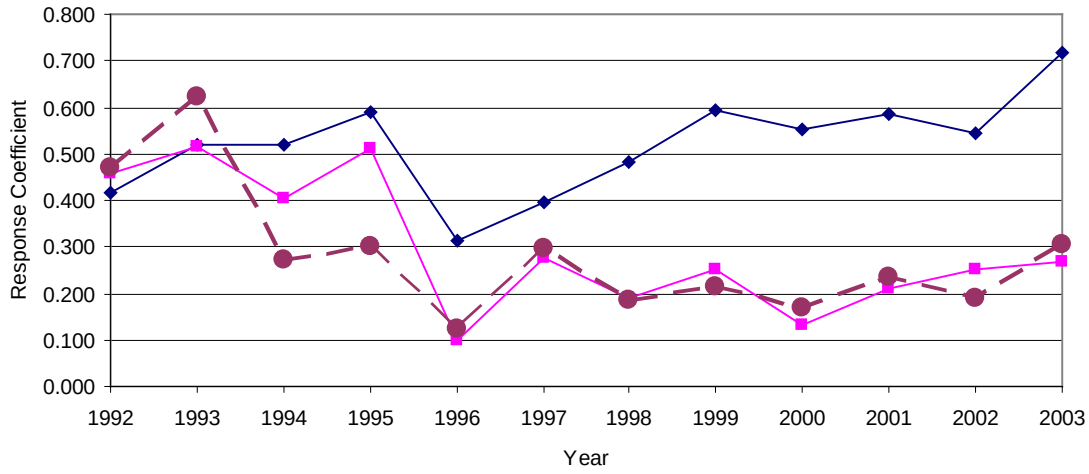
YEAR	Intercept	OCF	NDA	DA	N	Adj. R2
Pooled	2245.041	2.346	0.177	0.367	15,070	0.136
	(70.91)*	(28.61)*	(1.40)	(3.00)*		
1992	1425.631	1.684	1.598	1.764	792	0.083
	(19.53)*	(7.00)*	(4.17)*	(4.40)*		
1993	1428.494	1.655	1.390	1.510	1,188	0.078
	(23.30)*	(8.25)*	(4.77)*	(4.69)*		
1994	1532.809	2.418	1.995	1.385	1,263	0.135
	(23.22)*	(9.71)*	(4.43)*	(3.15)*		
1995	1600.417	2.495	2.287	1.348	1,284	0.133
	(22.72)*	(10.67)*	(5.57)*	(3.71)*		
1996	2047.790	1.002	-0.587	-0.728	1,391	0.084
	(25.14)*	(3.83)*	(-1.20)	(-1.57)		
1997	2259.605	2.531	1.661	1.678	1,417	0.118
	(25.03)*	(8.88)*	(3.19)*	(3.61)*		
1998	2156.192	2.875	0.131	0.609	1,446	0.187
	(21.49)*	(10.02)*	(0.30)	(1.51)		
1999	2663.896	3.659	0.983	0.925	1,396	0.195
	(22.34)*	(11.79)*	(1.79)†	(1.98)†		
2000	2957.516	3.795	0.355	0.641	1,284	0.205
	(21.30)*	(11.23)*	(0.63)	(1.23)		
2001	3048.519	2.223	-1.564	-1.354	1,237	0.157
	(21.17)*	(5.89)*	(-3.19)*	(-2.82)*		
2002	2999.531	2.908	0.079	-0.107	1,255	0.159
	(22.43)*	(10.48)*	(0.25)	(-0.33)		
2003	2457.121	3.638	0.957	1.275	1,117	0.280
	(20.39)*	(14.37)*	(2.61)*	(3.56)*		
Average	2214.794	2.574	0.774	0.746	1,256	0.151
	(12.36)*	(10.28)*	(2.36)*	(2.59)*		

Variable definitions:
Bonus= bonus as reported in Standard & Poor's ExecuComp;
TCC= salary plus bonus as reported in Standard & Poor's ExecuComp;
TDC = salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total, as reported in by Standard and Poor's ExecuComp;
E=earnings before extraordinary items (Compustat item 18);
OCF= cash flow from operations (Compustat item 308);
DA= discretionary accruals estimated by the cross-sectional version of the modified Jones Model incorporating controls for industry and year; and
NDA= nondiscretionary accruals, the difference between total accruals (earnings – cash flows from operations) and discretionary accruals.

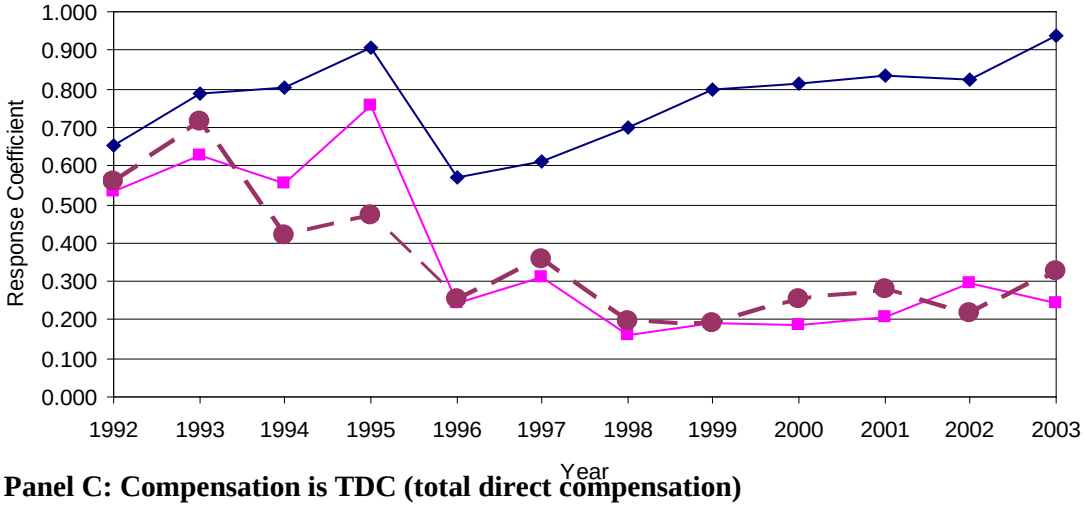
Numbers in parenthesis are t-statistics
* and † indicate a significance level of 0.01 and 0.05 in one-tailed tests, respectively.

Figure 1: Annual coefficients of OCF, NDA and DA in the compensation models
Regression Model: $Compensation_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 NDA_{it} + \beta_3 DA_{it} + \varepsilon_{it}$

Panel A: Compensation is BONUS



Panel B: Compensation is TCC (salary plus bonus)



Panel C: Compensation is TDC (total direct compensation)

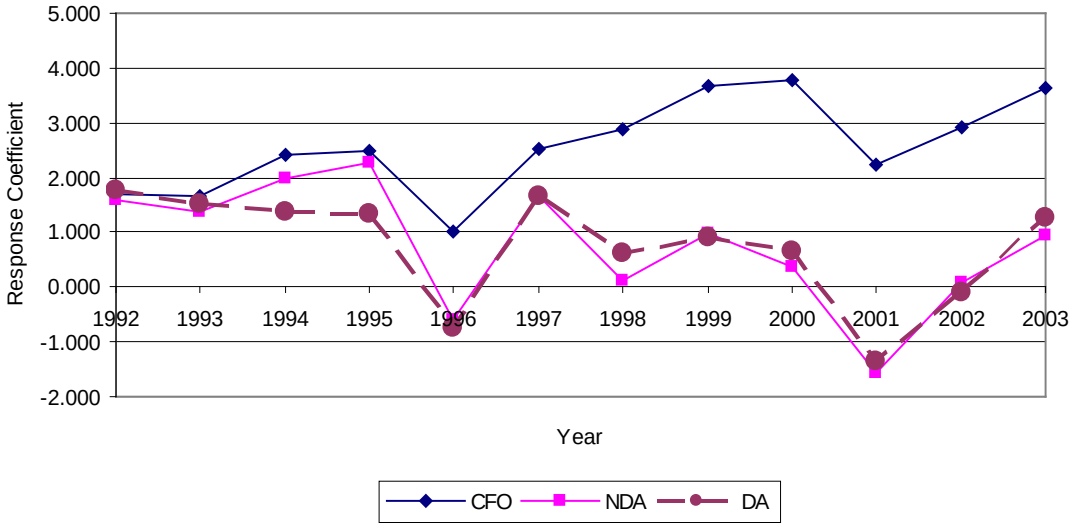


Table 3: Trend analysis of annual coefficients on OCF, NDA and DA in the CEO compensation models

Trend Model: $\text{Coefficient}_t = \theta_1 + \theta_2 \text{Time}_t + e_t$

	BONUS		TCC		TDC	
	θ_1	θ_2	θ_1	θ_2	θ_1	θ_2
β_1 (OCF)	0.412	0.016	0.678	0.014	1.523	0.161
	(7.20)*	(2.12)*	(10.28)*	(1.56)†	(3.67)*	(2.86)*
β_2 (NDA)	0.463	-0.026	0.626	-0.041	1.916	-0.175
	(6.67)*	(-2.70)*	(6.98)*	(-3.37)*	(3.16)*	(-2.13)*
β_3 (DA)	0.428	-0.022	0.569	-0.033	1.626	-0.135
	(5.83)*	(-2.26)*	(8.04)*	(-3.45)*	(2.90)*	(-1.78)†

Variable definitions:
Coefficient_t = the annual slope coefficients on OCF, NDA and DA ($\beta_1, \beta_2, \beta_3$) obtained from the regression model: $\text{Compensation}_{it} = \beta_0 + \beta_1 \text{OCF}_{it} + \beta_2 \text{NDA}_{it} + \beta_3 \text{DA}_{it} + \varepsilon_{it.}$
Time_t = year indicator taking a value from year 1 to year 12 for the sample period of 1992 to 2003.
Bonus= bonus as reported in Standard & Poor's ExecuComp;
TCC= salary plus bonus as reported in Standard & Poor's ExecuComp;
TDC = salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total, as reported in by Standard and Poor's ExecuComp;
OCF= cash flow from operations (Compustat item 308);
DA= discretionary accruals estimated by the cross-sectional version of the modified Jones Model incorporating controls for industry and year; and
NDA= nondiscretionary accruals, the difference between total accruals (earnings – cash flows from operations) and discretionary accruals.

Numbers in parenthesis are t-statistics.
* and † indicate a significance level of 0.01 and 0.05 in one-tailed tests, respectively.

Table 4: Regressions of CEO compensation on reported income, and an interaction variable for firms with positive discretionary accruals

Model: $Compensation_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 HIGH_{it} * E_{it} + \varepsilon_{it}$

Panel A: Compensation is BONUS

YEAR	Intercept	E	High*E	N	Adj. R^2
Pooled	368.891	0.835	-0.164	15,070	0.174
	(75.36)*	(44.37)*	(-6.69)*		
1992	257.414	0.508	-0.122	792	0.083
	(15.25)*	(6.65)*	(-1.28)		
1993	258.630	0.459	0.205	1,188	0.140
	(19.81)*	(8.15)*	(2.68)*		
1994	291.494	0.835	-0.336	1,263	0.188
	(21.93)*	(14.44)*	(-4.67)*		
1995	302.577	0.757	-0.155	1,284	0.191
	(21.22)*	(13.36)*	(-2.17)*		
1996	359.752	0.489	0.058	1,391	0.112
	(23.71)*	(8.84)*	(0.80)		
1997	376.963	0.677	-0.058	1,417	0.153
	(26.01)*	(11.43)*	(-0.77)		
1998	352.621	0.873	-0.153	1,446	0.180
	(23.44)*	(12.44)*	(-1.81)†		
1999	407.317	0.992	-0.190	1,396	0.186
	(23.12)*	(13.94)*	(-2.08)†		
2000	449.098	1.102	-0.476	1,284	0.202
	(23.84)*	(14.61)*	(-5.32)*		
2001	387.799	0.868	-0.086	1,237	0.159
	(20.78)*	(12.17)*	(-0.84)		
2002	483.276	0.905	-0.200	1,255	0.163
	(24.41)*	(14.05)*	(-1.93)†		
2003	487.314	1.069	-0.046	1,117	0.312
	(23.51)*	(18.84)*	(-0.53)		
Average	367.855	0.794	-0.130	1,256	0.172
	(15.89)*	(12.45)*	(-2.59)*		

Panel B: Compensation is TCC (salary plus bonus)

YEAR	Intercept	E	High*E	N	Adj. R^2
Pooled	879.009	1.234	-0.185	15,070	0.246
	(144.84)*	(53.04)*	(-6.05)*		
1992	709.425	0.878	-0.118	792	0.165
	(33.46)*	(9.15)*	(-0.99)		
1993	705.936	0.891	0.126	1,188	0.210
	(41.36)*	(12.12)*	(1.27)		
1994	749.264	1.285	-0.465	1,263	0.246
	(42.51)*	(16.77)*	(-4.87)*		
1995	766.440	1.199	-0.238	1,284	0.275
	(42.80)*	(16.86)*	(-2.66)*		
1996	834.355	0.819	0.089	1,391	0.186
	(44.42)*	(11.96)*	(1.00)		
1997	859.826	1.063	-0.093	1,417	0.229
	(48.32)*	(14.63)*	(-1.01)		
1998	844.438	1.255	-0.114	1,446	0.258
	(46.49)*	(14.82)*	(-1.12)		
1999	917.283	1.385	-0.173	1,396	0.250
	(43.33)*	(16.20)*	(-1.57)		
2000	993.544	1.414	-0.407	1,284	0.261
	(44.01)*	(15.65)*	(-3.80)*		
2001	969.858	1.282	-0.068	1,237	0.221
	(42.26)*	(14.62)*	(-0.54)		
2002	1078.186	1.302	-0.149	1,255	0.229
	(45.11)*	(16.74)*	(-1.19)		
2003	1109.876	1.471	-0.090	1,117	0.360
	(43.54)*	(21.08)*	(-0.83)		
Average	878.203	1.187	-0.142	1,256	0.241
	(22.15)*	(18.52)*	(-2.87)*		

Panel C: Compensation is TDC (total direct compensation)

YEAR	Intercept	E	High*E	N	Adj. R^2
Pooled	879.009	1.234	-0.185	15,070	0.246
	(144.84)*	(53.04)*	(-6.05)*		
1992	1422.420	1.613	0.520	792	0.089
	(19.83)*	(4.97)*	(1.28)		
1993	1433.231	1.907	0.050	1,188	0.079
	(23.85)*	(7.37)*	(0.14)		
1994	1554.646	3.554	-1.475	1,263	0.146
	(23.80)*	(12.51)*	(-4.17)*		
1995	1644.736	2.863	-0.349	1,284	0.126
	(22.72)*	(9.95)*	(-0.96)		
1996	2044.786	2.692	-0.360	1,391	0.093
	(25.28)*	(9.13)*	(-0.93)		
1997	2264.166	4.496	-1.086	1,417	0.142
	(24.66)*	(11.99)*	(-2.28)*		
1998	2238.013	5.081	0.466	1,446	0.207
	(23.42)*	(11.40)*	(0.87)		
1999	2666.516	5.374	1.237	1,396	0.195
	(22.76)*	(11.36)*	(2.03)†		
2000	3275.790	6.376	-2.075	1,284	0.157
	(23.98)*	(11.66)*	(-3.20)*		
2001	3504.417	5.831	-1.089	1,237	0.124
	(25.23)*	(10.99)*	(-1.44)		
2002	3167.950	6.097	-1.385	1,255	0.192
	(26.20)*	(15.50)*	(-2.20)*		
2003	2762.359	5.877	-0.114	1,117	0.314
	(24.15)*	(18.76)*	(-0.23)		
Average	2331.586	4.313	-0.472	1,256	0.155
	(10.87)*	(8.72)*	(-1.68)†		

Variable definitions:
Bonus= bonus as reported in Standard & Poor's ExecuComp;
TCC= salary plus bonus as reported in Standard & Poor's ExecuComp;
TDC = salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total, as reported in by Standard and Poor's ExecuComp;
E=earnings before extraordinary items (Compustat item 18); and
HIGH = an indicator variable taking the value of 1 if discretionary accrual for firm *i* in year *t* are positive and zero otherwise.

Numbers in parenthesis are t-statistics.
* and † indicate a significance level of 0.01 and 0.05 in one-tailed tests, respectively.

Table 5: The association of the magnitude of discretionary accruals with the coefficients from the regression models

Panel A: Relative magnitude of discretionary accruals

Year	N	Absolute value of discretionary accruals/assets		Absolute value discretionary accruals/income	
		Mean	Median	Mean	Median
1992	1144	6%	4%	376%	59%
1993	1372	8%	4%	224%	68%
1994	1474	8%	4%	189%	64%
1995	1522	7%	4%	258%	65%
1996	1650	7%	4%	264%	63%
1997	1679	11%	6%	298%	75%
1998	1730	31%	7%	580%	106%
1999	1655	15%	6%	479%	87%
2000	1550	42%	9%	957%	139%
2001	1506	36%	14%	2259%	253%
2002	1538	72%	7%	1104%	113%
2003	1344	113%	8%	4414%	137%

Panel B: Spearman correlation between relative magnitude of discretionary accruals and annual regression coefficients on discretionary accruals from table 2.

	BONUS		TCC		TDC	
	Mean of absolute value of discretionary accruals/assets	Mean of absolute value discretionary accruals/income	Mean of absolute value of discretionary accruals/assets	Mean of absolute value discretionary accruals/income	Mean of absolute value of discretionary accruals/assets	Mean of absolute value discretionary accruals/income
β_3 (DA)	-0.329 (0.30)	-0.252 (0.43)	-0.552 (0.06)	-0.517 (0.08)	-0.504 (0.09)	-0.524 (0.08)

BONUS= bonus as reported in Standard & Poor's ExecuComp;
TCC= salary plus bonus as reported in Standard & Poor's ExecuComp;
TDC = salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using the Black-Scholes options pricing formula), long-term incentive payouts, and all other total, as reported in by Standard and Poor's ExecuComp; and
DA= discretionary accruals estimated by the cross-sectional version of the modified Jones Model incorporating controls for industry and year.

P-values are in parentheses