

Executive Compensation and Earnings Persistence

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ABSTRACT. Governing boards utilize executive compensation contracts in an attempt to align executive actions with corporate goals. The objective is to ensure that executive performance provides value to the organization in terms of successful outcomes. A key performance criteria typically specified in CEO compensation contracts is earnings targets. However, using earnings as a performance evaluation may be problematic because some firms exhibit robust and sustained earnings over time (high earnings persistence), and other firms, such as high growth oriented firms, exhibit weak or sometimes negative earnings over time (low earnings persistence). Our study reveals that the effect of high earnings persistence results in firms that focus more heavily on cash compensation (salary and bonus) rather than on equity compensation (stock options, etc.) to compensate executive performance. Additionally, for firms characterized by low earnings persistence, our study indicates that cash flows from operations act as a supplementary performance measure to accounting earnings, and become increasingly important as a means to justify executive cash compensation.

KEY WORDS: executive compensation, executive persistence

1. Introduction

Governing boards of corporations utilize management compensation contracts in an attempt to ensure that management actions result in successful performance for the firm. Puffer and Weintrop (1991) point out that the performance criteria typically specified in chief executive officers (CEO) compensation contracts include stock price performance, earnings targets and certain financial ratios that assess the organization's financial well-being.

Prior studies have documented the fact that accounting earnings play a significant role in measuring performance for the purpose of compensation (e.g., Jensen and Murphy, 1990; Sloan, 1993). However investors have become suspicious and skeptical of the earnings and profit figures provided by management as a measure of CEO and corporate performance.

A recent *Fortune* article (Teitelbaum, 2003) reports that investors are discounting promises of future earnings and placing more emphasis on the amount of cash generated by the company's operations. It is also well known that managers can take actions to manage reported earnings, earnings-related disclosures, and even the perception of earnings (Schrand and Walther, 2000). Furthermore, many companies such as high growth oriented technology firms exhibit unreliable earnings or have little to no earnings (as well as negative earnings) to use as a basis for the evaluation of CEO performance. It is apparent that the transitory nature of earnings, i.e., whether or not earnings are likely to persist, impacts on how to measure CEO performance.

This paper investigates the effect of earnings persistence on the type or form of executive compensation as well as on the pay-for-performance relationship. Firms that exhibit robust and sustainable earnings are characterized as having high earnings persistence, while firms with weak, transitory or unsustainable earnings are characterized as having low earnings persistence.

We use the magnitude of total accruals scaled by total assets as a measure of earnings persistence. This accrual measure is found by many studies to be directly related to low persistence in earnings (Sloan, 1996). The accrual measure



is also associated with errors in the assessment of a firm's value, growth in net operating assets, management's aggregate actions, and opportunistic tools to smooth the variability of reported earnings, all of which eventually lead to low earnings persistence (Schipper, 1989; Healy and Wahlen, 1999). Our study reveals that firms with high earnings persistence tend to be larger in size, report higher earnings, lower stock returns, and the form of executive compensations tends to rely more heavily on cash compensation (salary and bonus) rather than equity compensation (stock options, etc.). This study also shows that when earnings persistence decreases, the weight assigned to cash flows increases and the weight on earnings decreases in rewarding executive cash compensation. More specifically, we find that the incremental weight placed on cash flows from operations is significantly greater for firms with low earnings persistence than for firms with high earnings persistence. Results hold when we include other control variables such as age, tenure, and size. We conclude that earnings persistence affects the role of earnings and cash flows from operations in explaining cash compensation.

The remainder of our study is organized as follows: Section 2 provides a literature review and develops hypotheses. Section 3 describes the methodology and Section 4 describes data sources and sample characteristics. Section 5 provides detailed results and sensitivity tests and Section 6 concludes the study.

2. Literature review and hypothesis development

Many firms craft a strategy that focuses, at least in part, on encouraging managerial decisions that attempt to sustain their earnings streams. Prior studies have found a variety of characteristics that related to earnings persistence such as firm size, product types, barriers-to-entry and capital intensity (e.g., Baginski et al., 1999). Other studies have documented that earnings persistence is negatively related to growth and the risk-free rate of return (often the treasury rate) (e.g., Lev, 1983). However, there are few studies

that examine the impact of earnings persistence on executive compensations.¹

Large firms have the financial resources to diversify in order to avoid the volatility of an unexpected earnings surprise, to stabilize profit growth, and to maintain a more persistent earnings stream (Scherer, 1973). The consumption of non-durable (durable) goods and services is also associated with persistent (transitory) income because the less volatile demands from non-durable producers lead to higher sustainable earnings than durable goods producers (Caves, 1987). The higher the level of a firm's competitive powers, barriers-to-entry, market share, advertising spending, and research and development intensity, the higher the level of earnings persistence compared to firms with lower strategic powers. Furthermore, firms in various industries are involved with different levels of fixed costs and capital intensity, which impact the sustainability of earnings. Industries such as mining, construction, textiles, painting, auto parts and hotels require more capital investment and fixed costs thus leading to a high operating leverage and volatile earnings (Lev, 1983). As suggested by prior studies, we note that the persistence of earnings is a firm's operational performance that reflects the manager's overall efforts to increase a firm's wealth. Additionally, earnings persistence provides an aggregate measure for performance evaluation, upon which a CEO compensation contract can be based.

In addition, empirical evidence finds that managers, who are approaching retirement and face relatively short decision horizons, prefer low net present value (NPV) investments to high NPV investments in order to yield faster *current-period* accounting earnings than that of higher paybacks at the *latter* periods. Baber et al. (1998) find that the sensitivity of compensation to earnings varies directly with earnings persistence and becomes greater when executives are approaching retirement. Their result suggests that compensation committees assign greater weight to persistent earnings to attenuate the problem of short employment horizon. Consequently, managerial performance should be evaluated and rewarded based on not only the current period outcome, but also the long-term implications on

firm profitability as measured by earnings persistence.

In this paper, we examine whether earnings persistence is related to the use of alternative compensation vehicles and pay-for-performance relationship. In the era of dot coms and accelerating growth of high technology, sometimes referred as the "new" economy, the executive compensation literature suggests that firms facing high growth and large investment opportunities tend to use more stock-based performance measures to encourage managers' risk-taking actions. Equity value-based compensation vehicles, such as stock options and restrictive stock, are used prevalently to reward managers' actions that yield growth (as well as volatile earnings). In contrast, firms that have persistent earnings streams and stable performance reflecting the long-term consequence of managers' actions, are sometimes labeled as the "old" economy. We expect firms with high earnings persistence to use more of the traditional cash compensations (i.e., salaries and bonuses) than the stock-based compensations to reward managers' long-term efforts. Stock-based compensations are used with the desire primarily for growing stock prices, not the persistence of earnings. Specifically, we expect cash compensation to be more related to firms with high earnings persistence and stock-based compensation to be more related to firms with less earnings persistence. Thus, our first hypothesis is stated in an alternative form as:

H₁: Firms with high persistence of earnings rely more on cash compensation and assign accounting earnings more weight in executive compensation contracts than firms with low earnings persistence.

In the pay-performance relationship, theoretical and empirical evidence has consistently shown that firms search for reliable performance measures to align firm performance with managers' interests in the principal-agent situation. For example, prior studies have found that CEO compensation is associated with stock return (Murphy, 1985; Coughlan and Schmidt, 1985; Jensen and Murphy, 1990), accounting

income (Lambert and Larcker, 1987; Jensen and Murphy, 1990; Sloan, 1993; Dechow et al., 1994) and, more recently, cash flows from operations (Natarajan, 1996; Balsam, 1998; Nwaeze et al., 2002).

Furthermore, when a performance measure becomes noisy and unreliable, prior studies find that an alternative performance measure receives a higher weight as a means to provide supplementary information. For example, Cheng et al. (1996) (also, Cheng and Yang, 2002; Ali, 1994) find that the market rewards high earnings persistence but seeks to use alternatives, such as cash flows, when earnings are not persistent. Other studies find that current cash flows have more predictive ability for future cash flows than current aggregate earnings in a short measurement horizon (Barth et al., 2001; Finger, 1994). For firms with earnings of a substantial transitory nature, the use of earnings results in a performance measure that contains more noise and has less ability to predict future profitability. As a result, it is reasonable that compensation committees will include alternative performance measures, such as cash flows from operations, and assign more weight to cash flows in the compensation contracts. We therefore expected that the weight placed on cash flows from operations increases, as earnings persistence declines. The second hypothesis is stated as follows:

H₂: Cash flows from operations are assigned greater weight in executive compensation contracts for firms with low earnings persistence than firms with high earnings persistence.

3. Methodology

3.1. Measures of earnings persistence

In this paper, we compare different types of executive compensations between high and low earnings persistence, and then we examine whether cash flows from operations receive more incentive weight when earnings persistence is low (H_1 and H_2). In order to evaluate earnings persistence, we use the absolute value of total accruals scaled by total assets as our measure. The

magnitude of total accruals is used in our paper to approximate earnings persistence for a number of reasons.²

First, accruals at extreme levels are shown to contribute to errors in the assessment of a firm's value. Extant studies have shown that extreme accounting accruals are possible vehicles for the introduction of transitory earnings (e.g., Ali, 1994; Sloan, 1996; Xie, 2001). Examples may include poorly predicted receivables, abnormal depreciation, restructuring charges, asset write-downs, or equity income, all of which decrease the ability of earnings to accurately reflect current market value or assess future cash flows (Cheng et al., 1997). Secondly, management uses accounting accruals as an opportunistic tool to smooth the variability of reported earnings (Schipper, 1989), or to manipulate earnings in order to mislead shareholders about the underlying economic performance of a firm (Healy and Wahlen, 1999). Because of the potential distortion and manipulation, extreme accruals are often correlated with the level of transitory items. Some accounting studies (e.g., Sloan, 1996) have indicated that accounting accruals are attributable to the low persistence of earnings.

Following Sloan's estimation approach (1996), we use total accruals scaled by total assets as an estimate of earnings persistence.

$$TACCR_i = \frac{(NI_i - CF_i)}{A_{i-1}}, \quad (1)$$

where for firm i at time t (the latter firm subscript i is omitted for simplicity)

- $TACCR_i$ = total accruals;
 NI_i = net income before extraordinary items and discontinued operations (Compustat item #18);
 CF_i = cash flows from operations (Compustat item #308);
 A_{i-1} = beginning total assets (Compustat item #6).

We use the magnitude of total accruals to compare executive compensation for firms with different earnings persistence. For firms with high earnings persistence, we expect that the

compensation committees rely more heavily on earnings to align a manager's performance with a firm's interests. When extreme accruals (i.e., less persistent earnings) exist in reported earnings, we expect that the informativeness of earnings decreases and cash flows, as an alternative measure performance, receive a larger incentive weight. Defond and Hung (2001) document that cash flows provide value relevant information, in addition to earnings, about estimates of managerial actions and future solvency and liquidity of a firm. Our hypothesis is consistent with prior studies (e.g., Cheng et al., 1996; Cheng and Yang, 2002) that suggest that cash flows are incrementally useful in determining CEO cash compensation for firms with low earnings persistence.

4. Empirical models

4.1. The role of performance measures in explaining cash compensation

We first examine the association of performance measures, such as stock return, earnings, and cash flows with executive compensation. We use the following model to describe change in cash compensation as a function of stock returns, change in earnings, and change in cash flows:

$$\Delta COMP_{i,t} = \beta_0 + \beta_1 RET_{i,t} + \beta_2 \Delta E_{i,t} + \beta_3 \Delta CF_{i,t} + \eta_{i,t} \quad (2)$$

where, for any firm i in year t ,

- $\Delta COMP_{i,t}$ = change in cash compensation (salary + bonus) from year $t - 1$ to year t , deflated by lagged salary;
 $RET_{i,t}$ = actual returns minus expected returns estimated by the market model and accumulated from the fourth month of fiscal year t to the third month of year $t + 1$;
 $\Delta E_{i,t}$ = change in earnings, scaled by book value of equity at the beginning of year t ;

$\Delta CF_{i,t}$ = change in cash flows from operations, scaled by book value of equity at the beginning of year t ; and
 $\eta_{i,t}$ = error term.

We follow prior studies (Baber et al., 1999, 1998) using lagged base salary to scale the change in cash compensation to control for size-related factors and to minimize the effect of period $t - 1$ performance on the compensation metric. Changes in accounting earnings and cash flows are scaled by the beginning book value of equity. Equation (2) provides insights into the different weights assigned to performance measures such as, stock returns, change in earnings, and change in cash flows from operations, which reflect changes in market value of a firm. As in prior research (for example, Murphy, 1985; Coughlan and Schmidt, 1985; Jensen and Murphy, 1990); we predict that β_1 , the weight of stock returns, to be positive and significant. The coefficient on $\Delta E_{i,t}$, β_2 , is expected to be positive and significant (Lambert and Larcker, 1987; Jensen and Murphy, 1990; Sloan, 1993; Dechow et al., 1994). Finally, a significant and positive coefficient on change in cash flows, β_3 , will indicate that cash flows play a role in setting CEO cash compensation. These positive and significant slope coefficients indicate that the compensation committees use performance measures to design the executive incentive contract. We estimate the regression model year by year for the period of 1993–1998 and then divide the mean of each parameter estimate by the standard error to get a test statistics to access its statistical significance. Cross-sectional pooling data are also use as a robustness test.

4.2. Earnings persistence and the role of earnings and cash flows from operations

To test our hypotheses of the effect of earnings persistence on earnings and cash flows, model (2) is run for a group of firms that are characterized by high earnings persistence and a group of firms characterized by low earnings persistence. Each group is derived from the comparison of the

magnitude of total accruals with the cross-sectional median, as a benchmark, to indicate the level of earnings persistence. When a firm's total accruals are larger (smaller) than the cross-sectional median, it is assigned to the high (low) earnings persistence group. The weight of changes in earnings, β_2 is expected to increase with earnings persistence; that is, firms with high persistence of earnings place more weight on accounting earnings than firms with low earnings persistence (H_1). To examine H_2 , we compare the slope coefficient estimate on the cash flow variable, β_3 , between firms with different earnings persistence. The β_3 is expected to be significantly positive and larger for the group with low earnings persistence, since earnings are more volatile and cash flows are expected to provide supplementary information on managerial actions. Also, we have added additional control variables such as size, tenure horizon, age, and industry effect that represent different firm characteristics to Equation (2). Our new regression model is used to evaluate whether the statistical results differ in firms with high or low earnings persistence, after control variables are added.

5. Data sources and sample characteristics

Compensation data are obtained from ExecuComp and financial data are obtained from COMPUSTAT. We follow prior studies (Baber et al., 1998) to investigate the pay-performance relationship in cash compensation (i.e., bonus + salary) because equity-based compensation, such as stock options and restricted stock, is shown to be predominately determined by stock returns. Cash compensation is used as a dependent variable in our study to examine the pay-performance relationship.

Our sample time period extends from 1993 to 1998 because 1992 is the first year that compensation data is available in ExecuComp, and it is used to calculate change in cash compensation. The final sample is equal to 6,924 observations after eliminating observations with missing COMPUSTAT data, compensation data or without sufficient return data to calculate returns.

Observations in the extreme one percent distribution at both tails are deleted for each variable of interest in order to control for outliers and extreme values.

6. Empirical results

6.1. Firm characteristics and executive compensation for firms with different earnings persistence

Table I reports sample descriptive statistics and firm characteristics for firms with different earnings persistence. The results reveal that firms with high earnings persistence tend to be larger in size, report higher earnings, lower stock returns and use more cash compensation to

reward their executives than those with low earnings persistence. As shown in Table I, firms with high earnings persistence are significantly larger (book value of equity = \$1,147,200) than those with low earnings persistence (book value of equity = \$1,015,900). Our results are consistent with Scherer's finding (1973), indicating that large firms have more financial resources to diversify and reduce unexpected volatility of earnings, thereby leading to more persistent earnings.

We find that executives in firms with high earnings persistence use approximately 2.8% of total assets as accounting accruals, compared to 11.3% used in firms with low earnings persistence. Due to the high volatility and the reversal nature of accruals, the more accounting accruals,

TABLE I
Descriptive statistics and comparisons of firm characteristics between high and low earnings persistence

	High earnings persistence	Low earnings persistence	Difference (<i>t</i> -statistics)	
Total Comp. (\$000)	2,638.9	2,727.6	-88.6	(0.73)
Cash Comp. (\$000)	1,063.0	971.9	91.0	(4.25)*
Options (\$000)	1,101.2	1,347.5	-246.3	(-2.52)*
Change in COMP (Δ COMP, %)	15.3	19.4	-4.1	(-3.21)*
CEO Age	58.3	57.1	1.2	(4.52)*
Tenure	4,320.1	4,202.8	117.2	(0.86)
RET	0.144	0.178	-0.035	(-3.74)*
EPS	0.162	0.123	0.038	(8.16)*
CFO	0.213	0.314	-0.101	(-14.45)*
Size (\$000)	1,147.2	1,015.9	131.3	(2.33)*
Earnings Persistence	0.028	0.113	0.085	(-72.63)*

Total numbers of observations = 6,924. Reported numbers are the means of the years of 1993 to 1998. Numbers in parentheses are *t*-statistics. The symbol '*' indicates a significance level of 0.10, two-tailed. The persistence measure is estimated from the comparison of a firm's absolute value of total accruals with the annual cross-sectional median.

The definitions of variables are as follows:

Total Comp. = total compensations, which comprise of cash bonus, pension and medical insurance plans, other performance-based rewards such as restricted stocks, stock options or stock appreciation rights; Cash Comp. = salary + cash bonus; Options = value of stock options; Δ COMP (%) = changes in cash compensation deflated by prior year's base salary; CEO Age = age of executives; Tenure = the number of days executives working for the same company estimated from the difference between the first and last day being an executive; RET = raw returns estimated from fiscal year closing price; EPS = net income excluding extraordinary items (item #18) scaled by the beginning of owner's equity (item #60); CFO = cash flows from operations (item #308) deflated by the beginning book value of equity (item #60); Earnings Persistence = the absolute value of total accrual (the difference between net income before extraordinary items and cash flows from operations, #18-#308) scaled by beginning total assets (item #6); Size = the book value of owner's equity (in thousand).}

such as changes in receivables, equity income, depreciation, deferred assets a firm uses, the less likely the earnings will persist into the future (Sloan, 1996). Table I also indicates that firms with high earnings persistence have higher earnings, lower cash flows from operations and lower stock returns. This is consistent with the implications suggested by prior studies. These studies suggest that firms with high earnings persistence rely more on stable and long-term performance measures (such as persistent earnings), as compared to firms that adopt a short-term and high growth focus and rely more on market returns as a performance indication.

The average age of executives for firms with high earnings persistence is older (58.3 years old), and is significantly different from that of firms with low earnings persistence (57.1 years old). The employment horizon, tenure, estimated from numbers of days in the executive position, is not significantly different between firms with different earnings persistence. On average, executives seem to serve longer (117 days) for firms with high earnings persistence than for firms with low earnings persistence.

In Hypothesis 1, we predict firms with high persistence of earnings rely more on cash compensation to reward executives. Results in Table I support this prediction. Firms with high earnings persistence, on average, use \$1,063,000

(40.2% of total compensation) in the form of salaries and bonuses to compensate executives' actions, which is significantly larger than \$971,000 (35.6% of total compensation) used by firms with low earnings persistence. As predicted, Table I illustrates that firms which focus more on high growth and accelerating earnings use more equity-based compensation vehicles. Compared to stock options used in firms with high earnings persistence (41.7% of total compensation), firms with low earnings persistence utilize more stock-based compensation with a value of \$1,347,500 (49.5% of total compensation). The difference in value of stock options between the two groups (\$246,000) is significant at the level of 0.10. Table I supports our first hypothesis and indicates that while firms with low earnings persistence use more stock-based compensation to motivate (short-term) profit growth, firms with high earnings persistence use more cash compensation to reward successful performance such as sustainable earnings.

Table II presents the frequency distribution between firms with different earnings persistence. Baginski et al. (1999) suggest that different levels of barrier-to-entry, investment intensity, and operating leverage across industries results in varying earnings persistence. We examine the industry effect for firms with different earnings persistence. As reported in Table II, firms in both

TABLE II
The industrial frequency distribution of firms with different earnings persistence

Industry	High earnings persistence (%)	Low earnings persistence (%)
Mining, oil & gas, and construction	3.3	5.5
Food and consumer products	22.4	20.1
Chemical, technology and computers	30.2	28.9
Transportation	14.5	13.4
Durable goods and autos	11.6	13.9
Financial institutions and banks	8.3	3.3
Hotels and recreations	6.5	12.6
Health services	3.1	2.4

The total numbers of observations are equal to 6,924 firm-years. The earnings persistence measure is estimated from the comparison of a firm's absolute value of total accruals with the annual cross-sectional median. The high earnings persistence is assigned when a firm's absolute value of total accruals in the current year t is smaller than the annual cross-sectional median. A firm is classified as low earnings persistence when it has the higher magnitudes of total accruals than the cross-sectional median.

high and low earnings persistence groups concentrate primarily in the chemical, technology and computer industry (30%), followed by food and consumer products. Caves (1987) shows that the consumption of non-durable goods and services are more stable than that of durable goods because the latter is more subject to the influence of spending patterns, economic conditions, and interest rates. In our sample observations, we find that the non-durable goods such as food and consumer products represent 22.4% and 20.1% for firms with high and low earnings persistence, respectively. Also, we find that 11.6% of firms with high earnings persistence, as compared to 13.9% for those with low earnings persistence, in the industry of durable goods and automobiles. Overall, our results are consistent with the findings on the relationship between earnings persistence and economic characteristics: Firm characteristics such as larger in size, higher earnings, and the consumption of non-

durable goods are more likely to result in a sustainable earnings stream.

6.2. *The incentive weighs on performance measures in the compensation models*

Table III presents the pay-performance relationship and examines the ability of returns, change in earnings, and change in cash flows from operations to explain variations in change in cash compensation. All three performance measures are shown to be significant in evaluating managers' performance. We evaluate regression model (2) year by year from 1993 to 1998 and then divide the mean of each parameter estimate by the standard error to get a test statistics to access its statistical significance. The average coefficient on stock returns is 0.355 and is highly significant ($t = 10.13$). The average coefficient for change in earnings is 0.686 and is highly

TABLE III

The relationship between change in cash compensation, stock returns, change in earnings and change in cash flows from operations

$$\text{Model: } \Delta \text{COMP}_{i,t} = \beta_0 + \beta_1 \text{RET}_{i,t} + \beta_2 \Delta E_{i,t} + \beta_3 \Delta \text{CFO}_{i,t} + \eta_{i,t}$$

Year	Intercept	$\text{RET}_{i,t}$	$\Delta E_{i,t}$	$\Delta \text{CFO}_{i,t}$	Adj. R^2
<i>Regression results</i>					
93	0.108	0.241	0.879	0.029	12.8
94	0.173	0.417	0.600	0.087	12.3
95	0.054	0.297	0.765	0.356	16.2
96	0.093	0.327	0.842	0.020	13.7
97	0.109	0.367	0.409	0.127	9.5
98	0.067	0.480	0.619	0.365	18.6
Mean	0.101	0.355	0.686	0.164	13.9
(t -stat)	(5.92)*	(10.13)*	(9.49)*	(2.56)*	
Pooled	0.097	0.341	0.695	0.168	13.4
(t -stat)	(15.14)*	(21.60)*	(15.06)*	(4.65)*	

Number of observations = 6,924 firm-years. Reported coefficient estimates are the means of the year-by-year estimates from 1993 to 1998 and numbers in parentheses are t -statistics. The symbol '*' indicates a significance level of 0.01, two-tailed.

The definitions of variables are as follows:

ΔCOMP (%) = changes in cash compensation deflated by prior year's base salary; RET = raw returns estimated from fiscal year closing price; ΔE = changes in net income excluding extraordinary items (item #18) scaled by the beginning of owner's equity (item #60); ΔCFO = changes in cash flows from operations (item #308) deflated by the beginning book value of equity (item #60).

significant ($t = 9.49$). The mean coefficient for change in cash flows from operations is positive and significant (0.164, $t = 2.56$). Table III indicates that stock returns, earnings, cash flows from operations all play a role in the compensation contract and provide additional information beyond each other to explain variations of cash compensation. The average adjusted R^2 for the model is 13.9%. We also estimate Model (2) using a pooled sample across years. The pooled regression yields similar results, where returns, earnings and cash flows are all positive and significant. The adjusted R^2 of the pooled regression is 13.4%.

6.3. Earnings persistence on the role of earnings and cash flows in compensation contracts

Table IV investigates whether the incentive weight placed on stock returns, change in

earnings and change in cash flows for cash compensation differ between the two groups defined by the degree of earnings persistence. It compares the mean weights of various performance measures between the two groups. As reported in Table IV, regression slope coefficients on stock returns and on changes in earnings are positive and significant in both groups. Results of the t -tests reveal no significant differences in stock return between the two groups. In contrast, Table IV shows that the incentive weight placed on accounting earnings depends on earnings persistence. The slope coefficients on earnings decreases from 0.989 to 0.577 (difference = 0.413, $t = 3.08$), when comparing the high earnings persistence group with the low earnings persistence group. The results are consistent with H_1 .

Change in cash flow is positive and significant in the low persistence group (1.96, $t = 3.10$). However, it is positive but not significant in the high persistence group (0.023, $t = 0.25$). Further,

TABLE IV
The effect of earnings persistence on performance measures in explaining change in executive cash compensation

$$\text{Model: } \Delta \text{COMP}_{i,t} = \beta_0 + \beta_1 \text{RET}_{i,t} + \beta_2 \Delta E_{i,t} + \beta_3 \Delta \text{CFO}_{i,t} + \eta_{i,t}$$

	High earnings persistence (t -statistics)	Low earnings persistence (t -statistics)	Expected sign high-low	High-low (t -statistics)
<i>Regression results</i>				
Intercept	0.074 (3.74)*	0.116 (6.55)*		-0.042 (-2.78)*
$\text{RET}_{i,t}$	0.359 (8.03)*	0.350 (11.38)*	-	0.009 (0.39)
$\Delta E_{i,t}$	0.989 (11.69)*	0.577 (6.41)*	+	0.413 (3.08)*
$\Delta \text{CFO}_{i,t}$	0.023 (0.25)	0.196 (3.10)*	-	-0.173 (-2.52)*
Adjusted R^2 (%)	13.1	14.9		

Total numbers of observations = 6,924. Reported coefficient estimates are the means of the year-by-year estimates from 1993 to 1998 and numbers in parentheses are t -statistics. The symbol '*' indicates a significance level of 0.01, two-tailed and paired sample t -tests for means are performed to compare the two groups.

The definitions of variables are as follows:

ΔCOMP (%) = changes in cash compensation deflated by prior year's base salary; RET = raw returns estimated from fiscal year closing price; ΔE = changes in net income excluding extraordinary items (item #18) scaled by the beginning of owner's equity (item #60); ΔCFO = changes in cash flows from operations (item #308) deflated by the beginning book value of equity (item #60).

The earnings persistence measure is estimated from the comparison of a firm's absolute value of total accruals with the annual cross-sectional median. The high earnings persistence is assigned when a firm's absolute value of total accruals in the current year t is smaller than the annual cross-sectional median. A firm is classified as low earnings persistence when it has higher magnitudes of total accruals than the cross-sectional median.

results of *t*-test show that the coefficients on $\Delta CFO_{i,t}$ are significantly different between the two groups ($t = 2.52$). This indicates that cash flows supplement earnings in executive contracts for the low persistence group and become significantly and incrementally important. On the other hand, cash flows may not be useful in explaining cash compensation in firms with high earnings persistence because it appears that persistent earnings subsume the information provided by cash flows. When the quality and sustainability of earnings is reduced, we find, as expected, earnings carry significantly less weight and cash flows receive more weight in the compensation contract. The results are consistent with H_2 . The implication is that compensation committees search for good performance measures to correlate pay with performance. To reward executives, earnings are assigned more weight in firms with high earnings persistence and more weight is placed on cash flows when accounting earnings are not reliable.

6.4. Firm characteristics, earnings persistence and incentive weights of performance measures

In Tables I and II, we find various earnings persistence result in different firm characteristics. To control for other factors that may affect executive cash compensation and confound the assessment of incentive weight on performance measures, we add control variables to the regression models. Table I and prior studies suggest that cash compensation is related to firm size (Smith and Watts, 1992; Gaver and Gaver, 1995; Gaver et al., 1995), firm risk, and CEO age (e.g., Gibbons and Murphy, 1992). The natural logarithm of beginning book value of equity is used to proxy for size. We use the following model to estimate year-by-year regression and to ensure that our finding on the incentive weight on earnings and cash flow still holds, when different firm characteristic variables are controlled for.

$$\begin{aligned} \Delta COMP_{i,t} = & \beta_0 + \beta_1 RET_{i,t} + \beta_2 \Delta E_{i,t} + \\ & \beta_3 \Delta CFO_{i,t} + \beta_4 AGE_{i,t} + \\ & \beta_5 TENURE_{i,t} + \beta_6 INDUSTRY_{i,t} \\ & + \beta_7 SIZE_{i,t} + \eta_{i,t} \end{aligned} \quad (3)$$

where, for firm *i* in year *t*,

- $\Delta COMP_{i,t}$ = change in cash compensation (salary + bonus) from year $t - 1$ to year t , deflated by lagged salary;
- $RET_{i,t}$ = raw returns estimated from fiscal year closing prices;
- $\Delta E_{i,t}$ = change in earnings, scaled by the book value of equity at the beginning of year t ;
- $\Delta CFO_{i,t}$ = change in cash flows from operations, scaled by the book value of equity at the beginning of year t ;
- $AGE_{i,t}$ = age of the CEO;
- $TENURE$ = the logarithm of numbers of days executives working for the same company;
- $INDUSTRY$ = one-digit SIC code;
- $SIZE_{i,t}$ = the natural logarithm of beginning book value of owners' equity.

Table V presents the results for model (3) that employs additional variables to control for difference in firm characteristics. The coefficients reported here are the mean coefficient estimates for the years 1993 to 1998. As in prior tables, earnings persistence is measured by the magnitude of total accruals scaled by total assets. The results in Table V are similar to Table IV, i.e., stock returns and change in accounting earnings remain statistically significant in explaining variations in change in cash compensation. There is no systematic difference in the weights assigned to stock returns for firms with high earnings persistence and firms with low earnings persistence. However, the difference in incentive weight placed on accounting earnings is significant (0.330, $t = 3.19$) when the two groups are compared, i.e., less weight is placed on accounting earnings for firms with low earnings persistence. Furthermore, the average coefficient on cash flows is positive and significant for the low earnings persistence group (0.210, $t = 3.91$), but not significant for the high earnings persistence group (0.093, $t = 1.79$). Consistent with H_1 and H_2 , the weight assigned to cash flows is

TABLE V

The effect of earnings persistence on performance measures and other variables in explaining change in executive cash compensation

$$\text{Model: } \Delta \text{COMP}_{i,t} = \beta_0 + \beta_1 \text{RET}_{i,t} + \beta_2 \Delta E_{i,t} + \beta_3 \Delta \text{CFO}_{i,t} + \beta_4 \text{AGE} + \beta_5 \text{TENURE} + \beta_6 \text{INDUSTRY} + \beta_7 \text{SIZE} + \eta_{i,t}$$

	High earnings persistence (<i>t</i> -statistics)	Low earnings persistence (<i>t</i> -statistics)	Expected sign High-low	High-low (<i>t</i> -statistics)
<i>Regression results</i>				
Intercept	-0.002 (-0.02)	0.126 (2.74)*		-0.127 (-1.65)
RET _{<i>i,t</i>}	0.340 (6.22)*	0.333 (9.72)*	-	0.008 (0.27)
ΔE _{<i>i,t</i>}	1.046 (11.95)*	0.716 (7.91)*	+	0.330 (3.19)*
ΔCFO _{<i>i,t</i>}	0.093 (1.77)	0.210 (3.91)*	-	-0.117 (-3.20)*
CEO Age	-0.002 (-1.68)	-0.002 (-2.39)*		0.000 (0.33)
Tenure	-0.113 (-0.68)	-0.028 (-0.19)		-0.085 (-0.75)
Industry	0.006 (1.06)	-0.007 (-1.24)		0.013 (1.34)
Size	0.025 (3.31)*	0.020 (4.22)*		0.006 (0.56)
Adjusted R ² (%)	13.3	14.9		

Total numbers of observations = 6,924. Reported coefficient estimates are the means of the year-by-year estimates from 1993 to 1998 and numbers in parentheses are *t*-statistics. The symbol '*' indicates a significance level of 0.01, two-tailed and paired sample *t*-tests for means are performed to compare the two groups.

The definitions of variables are as follows:

ΔCOMP (%) = changes in cash compensation deflated by prior year's base salary; RET = raw returns estimated from fiscal year closing price; ΔE = changes in net income excluding extraordinary items (item #18) scaled by the beginning of owner's equity (item #60); ΔCFO = changes in cash flows from operations (item #308) deflated by the beginning book value of equity (item #60); CEO Age = age of executives; Tenure = the logarithm of numbers of days executives working for the same company; Industry = one-digit SIC code; Size = the logarithm of a firm's book value of owner's equity.

The earnings persistence measure is estimated from the comparison of a firm's absolute value of total accruals with the annual cross-sectional median. The high earnings persistence is assigned when a firm's absolute value of total accruals in the current year *t* is smaller than the annual cross-sectional median. A firm is classified as low earnings persistence when it has higher magnitudes of total accruals than the cross-sectional median.

higher for the low earnings persistence group and the difference is significant (-0.117, *t* = -3.20). These results indicate that cash flows have a greater impact on cash compensation in the presence of low earnings persistence in compensation contracts than in the presence of high earnings persistence and H_2 is supported. Table V also demonstrates that the incentive weight placed on earnings increases for high earnings persistence as stated in H_1 .

7. Conclusion

Our paper contributes to the existing literature that analyzes the use of multiple "imperfect" performance measures in executive compensation contracts. Previous studies indicate that accounting earnings have been an important factor in valuing the performance of the firm, and consequently earnings have been a significant component in determining executive compensation (e.g., Jensen and Murphy, 1990; Sloan, 1993). However, the use of earnings as a meaningful criterion is problematic because some firms exhibit strong earnings over a sustained

period of time (high earnings persistence), and other firms exhibit weak even negative earnings over time (low earnings persistence). Moreover, it has been found that earnings and even the perception of earnings can be "managed" (Schrand and Walther, 2000). The transitory nature of earnings, i.e., whether or not earnings persist over time, as well as the current skepticism concerning whether earnings provide a realistic measure of corporate performance affect the use of this measurement as a means to evaluate CEO performance.

This paper investigates the effect of earnings persistence on the form of executive compensation as well as on the pay-for-performance relationship. We predict that earnings persistence manifests the collective efforts of a managers' actions, and that compensation committees search for the most reliable performance measures to reward managers' operational decisions. By using total accruals as a proxy for earnings persistence, we find that different firm characteristics exist in firms with various earnings persistence. We predict and find that firms with high persistence of earnings rely more on cash compensation to reward successful executive performance, tend to be larger in size, and have larger earnings.

For the pay-for-performance relationship, we find that accounting earnings receive more weight in executive compensation contracts for firms with high earnings persistence than those with low earnings persistence. Furthermore, as earnings persistence declines, we find that compensation committees seek to use cash flows from operations as an alternative performance measure to evaluate executives' performance. The results hold after we include different firm characteristic variables such as firm size, employment horizon, and CEO age.

This paper extends prior studies on the assessment of the stewardship role of management and of pay-performance relationship. It suggests that a firm's persistent earnings stream provides useful information for compensation committees to adjust forms of compensations and performance-based measure in reward contracts.

Notes

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¹ Exceptions may include Baber et al. (1998, 1999), who link the firm valuation (e.g., earnings persistence) to stewardship role of management (e.g., executive compensation). This paper is different from theirs in the sense that they examine the effect of earnings persistence on the incentive weight of earnings, but we compare various compensations and alternative profit measures, such as cash flows, under different earnings persistence.

² The earnings persistence has received significant attention in both academic and professional fields, but how to estimate this measure is still a challenge. For estimation models, some researchers use lower order time-serial models (e.g., Collins and Kothari, 1989; Easton and Zmijewski, 1989) and others use higher orders autoregression models (e.g., Lipe and Kormendi, 1994; Baginski et al., 1999). Some use seasonally-differenced quarterly earnings (e.g., Mendenhall, 2002) and others use annual earnings (e.g., Kormendi and Lipe, 1987). Also, many studies use current accounting and financial items, such as price-to-earnings ratios, losses, special accounts, extraordinary items etc., to imply the transitory nature of earnings (e.g., Gaver and Gaver, 1993, 1995). This study adopts the latter approach; using other measures (e.g., negative earnings), however, does not alter our inferences.

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