

# 行政院國家科學委員會專題研究計畫 成果報告

## 高階主管獎酬與財務績效衡量指標之研究 研究成果報告(精簡版)

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# **The Choice of Financial Performance Measures in CEO Bonus Plans**

## **I. Introduction**

One of the primary uses of accounting information is to serve as a performance measure for executive incentive contracting. This is supported by evidence that earnings-based measures serve as the predominant means of determining bonuses in executive bonus plans (Murphy 2000). However, while the vast majority of bonus plans include earnings-based measures, a substantial number of plans supplement those measures with other financial measures, such as measures based on cash flow, or sales, or with nonfinancial measures. The presence of the non-earnings based measures suggests that firms adjust their bonus plans for perceived noise in earnings as a measure of performance by using alternative measures that would reduce the noise in the measure. However, the source of the noise in earnings, and the manner in which firms adjust their performance measures for the noise in earnings are open questions. To provide insight into these issues in this paper we consider two sources of noise, growth opportunities and earnings quality, and examine how they relate to the choice of performance measures in CEO bonus contracts.

At the CEO level, designing incentive contracts is a complicated process of negotiation that involves the definition of performance measures and the formula that maps ex post performance to CEO pay. In this context, reported earnings provide a reasonable choice as a performance measure for determining the bonus. Net Income is a well-established, convenient measure that is defined by Generally Accepted Accounting Principles (GAAP) and verified by an independent auditor. Thus, it is not surprising that the vast majority of CEO bonus plans include some measure of earnings as a performance measure.

On the other hand, GAAP earnings also suffer from a number of weaknesses as a performance measure. In particular, the conservatism built into the accounting system makes earnings a particularly noisy measure for growth firms (Baber et al. 1996). In addition, the subjective nature of the accrual process is likely to introduce both noise and bias in earnings (Dechow and Dichev 2002, Bushman, Engel, and Smith 2006). As a result, firms often supplement earnings in bonus plans with other financial and nonfinancial measures. The purpose of this study is to examine the factors that influence the choice of these performance measures in CEO bonus contracts.

The next section of this report discusses the background and develops the hypotheses. Section 3 explains the sample and the research design. Section 4 summarizes the results and provides concluding remarks.

## **II. Background and Hypothesis Development**

The specific measures in bonus plans, and their definitions, are highly variable and idiosyncratic. However, they can be grouped according to common characteristics. For example, several individual measures, such as return on assets, return on equity, and earnings per share, are all based on accrual based earnings, whereas other measures, such as total revenue, sales growth, and market share are based solely on revenue and exclude the recognition of expenses. In this study, we obtain the individual performance measures for the CEO bonus plan from proxy

statement disclosures and aggregate them into five financial classifications (earnings, sales, cash flow, residual income, and stock price/return) and two general classifications (other financial and non-financial).

In this study, we investigate whether firms use nonearnings performance measures to offset the noise in earnings. For example, the conservatism inherent in the financial reporting system requires that firms deduct the cost of investments in advertising, and research and development in advance of the realization of revenues. Similarly, firms entering into new product markets will often absorb losses as they begin to establish their products and their market share. In such cases, a reliance solely on earnings would provide a disincentive to managers to make such investments. To offset that incentive, firms could supplement or replace earnings-based performance measures with measures that are based on stock price, sales, or nonfinancial standards. Stock return measures should enhance the contract because a firm's stock price should incorporate the anticipated future profits of these investments. Similarly, sales-based measures focus solely on growth and do not charge the manager for the cost of generating that growth and nonfinancial measures, such as customer satisfaction, are completely removed from the financial reporting system. As a result, we expect growth firms to be more likely to use stock return, sales-based, or nonfinancial measures in their CEO bonus plans.

Similarly, firms can adjust for the noise in earnings generated by the accrual process by selecting measures that are generally unaffected by management's subjective accrual choices. Although accruals are an important component of earnings, they are also under the control of management. Therefore, accruals can also add noise into the measure of earnings as a measure of performance. In that case, firms can improve the efficiency of the bonus contract by incorporating stock price, cash flow, or nonfinancial performance measures. Alternatively, firms can adjust for a high degree of noise in earnings by using multiple measures, either earnings, or non-earnings based, to reduce the noise. Our second prediction is therefore that firms with a lower degree of earnings quality will be more likely to rely on stock price, cash flow, and nonfinancial measures, and that firms with low earnings quality will use a greater number of performance measures in their CEO bonus contracts to offset the noise in earnings.

### **III. Empirical Design**

To test these hypotheses we use a sample of 803 ExecuComp firms for which we are able to identify the performance measures in the CEO bonus plans in both the 2000 and 2005 fiscal years and for which we are able to obtain sufficient data to estimate our independent variables. The five-year lag allows us to examine how firms adjust their performance measures for changes in firm characteristics. In addition, this particular time period to investigate whether the determinants of performance measures changed after the passage of the Sarbanes-Oxley Act, or the changes in the economic and regulatory environment related to the Act. Our main tests consist of a series of pooled regressions with the dependent variable in each regression set equal to one if the given performance measure classification is included in the CEO bonus plan and zero otherwise. In addition, we estimate a regression with the dependent variable equal to the total number of performance measures in the CEO bonus plan.

We use a principle components factor analysis to form our measures of growth and earnings quality. For our growth measure we use past sales growth, dividend

yield, and the market to book ratio as the fundamental factors and for our earnings quality measure we use the accruals quality measure from Dechow and Dichev (2002), the industry ROA volatility, and the earnings/return correlation as the fundamental factors for earnings quality.

#### **IV. Results and Concluding Remarks**

While the pooled regressions provide evidence regarding the manner in which the firm's growth and earnings quality affects the decision to use a specific class of performance measure, given the dramatic economic events occurring between 2000 and 2005, we examine whether the relations between growth and earnings quality and performance measure choices changed over the two years. Finally, we use a changes specification to provide evidence as to how changes in firm characteristics relate to the addition or deletion of each category of performance measure. This test provides insights into the dynamic adjustment of bonus plans in response to changes in the firm's growth characteristics and earnings quality.

We find that extent of expected firm growth is negatively associated with the presence of stock price based performance measures, and the total number of performance measures and positively associated with the presence of sales-based measures in bonus plans. We also find that earnings quality is negatively associated with the presence of cash flow-based, sales-based, and non-financial measures, as well as with the total number of performance measures in the CEO bonus contract, and positively associated with the presence of residual income measures. These results hold for the full sample and for a restricted sample that excludes regulated firms from the financial services and utility industries (Ittner et al. 1997). The results are also generally robust to sensitivity tests that control for possible cross-correlation between 2000 and 2005.<sup>1</sup>

Our results support the contention that firms adjust the measures in the CEO bonus plan based on their expected growth and earnings quality. Specifically, our results suggest that growth firms tend to avoid using stock based performance measures and are more likely to use sales-based measures, perhaps because they tend to rely more heavily on equity compensation. In addition, our results are consistent with firms responding to perceived noise in the accrual generation process by adding cash flow, sales-based, and non-financial measures and expanding the number of performance measures in the bonus plan.

With respect to a comparison across the two years, we find significant decreases in the use of stock price and residual income measures, and significant increases in the use of other financial measures and the total number of measures. We also find the impact of growth on the presence other financial performance measures to be greater in 2005, and the impact of earnings quality on the presence of a sales-based measure to be lower in 2005. Finally, we find a significantly negative relation between changes in earnings quality and changes in the use of sales as a performance measure and with the total number of performance measures, indicating that firms adjust the performance measures in their bonus contracts for changes in the perceived noise in earnings.

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<sup>1</sup> The one notable exception is the negative relation between earnings quality and the use of a cash flow measure.

Our study contributes to the literature by providing evidence regarding the factors that influence the usefulness of earnings as a measure of performance and how firms adjust the performance measures in their bonus plans for the perceived noise in earnings. Specifically, we investigate how growth and earnings quality influence the manner in which firms use other financial and nonfinancial measures to supplement earnings in CEO bonus contracts. Our results complement the empirical findings that examine factors that influence the relative weight on earnings versus stock returns, by providing evidence regarding the source of the noise in earnings and the manner in which firms adjust the structure of their bonus plans for the noise in earnings. Our paper also extends Ittner et al. (1997), who compare the use financial measures to non-financial measures, by including other financial measures, such as stock price, sales and cash flow.

Finally, provide evidence regarding the manner in which firms adjust the performance measures in their contracts for changes in firm characteristics, earnings quality, and changes in the environment. While the performance measures in CEO bonus contracts tend to remain fairly stable over time, we also find evidence that firms adjust the structure of their bonus plan for changes in earnings quality.

Our study is subject to three notable limitations. First, although firms identify the performance measures that determine they rarely disclose the specific formula used to determine the amount of the bonus. Thus, our study does not address the sensitivity of CEO wealth to performance outcomes. Second, our study is restricted to the explicit measures disclosed in the proxy statements. As such, our study does not address implicit measures that the compensation committee may consider in determining the annual bonus. Finally, our study is limited to CEO bonuses and does not address equity compensation. Although equity compensation represents a large proportion of the CEO's total compensation, the equity grant for a given year is generally not based on a pre arranged formula. Instead, as noted by Core and Guay (1999), firms commonly use equity grants to reset the incentives in the CEO's portfolio. Despite these limitations our study provides insight into one of the primary uses of the accounting system, i.e., to generate a useful measure of performance.

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會議時間	8/2-8/5, 2009	會議地點	New York, NY, USA
會議名稱	(中文)美國會計學會 2009 年年會 (英文)American Accounting Association 2009 Annual Meeting		
發表論文標題	(中文) 股權集中下的股票獎酬制度之實證探討 (英文) Stock-based Compensation in a Concentrated Ownership Setting: An Empirical Investigation		
<p>報告內容含下列各項：</p> <p>一、參加會議經過</p> <p>8/2 Registration Early Bird Reception</p> <p>8/3 8:30-9:45 AM Opening Plenary Session 10:15-11:45 AM Concurrent Sessions 12:00-1:45 PM Section Luncheons 2:00-3:30 PM Concurrent Sessions 4:00-5:30 PM Concurrent Sessions 6:30-8:30 PM Welcome Reception</p> <p>8/4 8:30-9:45 AM Plenary Session 10:15-11:45 AM Concurrent Sessions 12:00-1:45 PM Luncheon 2:00-3:30 PM Concurrent Sessions (presenting paper) 4:00-5:30 PM Concurrent Sessions 6:30-8:30 PM Reception</p> <p>8/5 8:30-9:45 AM Plenary Session 10:15-11:45 AM Concurrent Sessions 12:00-1:45 PM Luncheons 2:00-3:30 PM Concurrent Sessions 4:00-5:30 PM Concurrent Sessions 6:30-8:30 PM Reception</p> <p>二、與會心得</p>			



此次在美國會計學會 2009 年年會中發表論文，獲得 Discussant 及其他學者許多具建設性的專業建議。 Discussant 及會議中的學者 對發表之論文提出之評論及建議將有助於提高本文的品質，獲益良多。

除了論文的發表之外，在參與其他的 concurrent sessions 中也獲得很多寶貴的資訊，藉由其他學者的論文發表可知道目前的研究趨勢及研究者所關心的研究議題，有助於未來的研究工作。

在會議之外，也有機會與國際學者的互動交流，對後續的研究極有幫助。

### 三、考察參觀活動(無是項活動者省略)

無。

### 四、建議

希望可以多提供國內學者參與類似國際學術會議的機會，以幫助國內的研究者獲得最新的研究資訊並增加與國外的學者互相交流的機會。

### 五、攜回資料名稱及內容

1. 大會議程
2. Concurrent sessions 及 Forum sessions 中各論文的摘要

### 六、其他

無。