

MEASURING MANAGERIAL OPTIMISM AND OPPORTUNISM  
USING NON-GAAP EARNINGS DISCLOSURE

by

HAKYIN LEE

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2012

© 2012  
HAKYIN LEE  
All Rights Reserved

This manuscript has been read and accepted for  
the Graduate Faculty in Business in satisfaction of  
the dissertation requirement for the degree of Doctor of Philosophy.

CAROL A. MARQUARDT

\_\_\_\_\_  
Date

\_\_\_\_\_  
Chair of Examining Committee

JOSEPH WEINTROP

\_\_\_\_\_  
Date

\_\_\_\_\_  
Executive Officer

MASAKO N. DARROUGH

ARMEN HOVAKIMIAN

JOSEPH WEINTROP

Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK

## **ABSTRACT**

### **MEASURING MANAGERIAL OPTIMISM AND OPPORTUNISM USING NON-GAAP EARNINGS DISCLOSURE**

by

Hakyin Lee

Advisor: Professor Carol A. Marquardt

In this dissertation, I propose and validate new measures of managerial optimism and opportunism using firms' non-GAAP earnings disclosures. I estimate the magnitude of managerial optimism versus opportunism using firm-level time-series regressions of non-GAAP exclusions on GAAP earnings and evaluate both the construct and criterion-related validity of these measures. I find that the non-GAAP earnings based measure of optimism is positively correlated with optimistic and point management earnings forecasts, and CEOs' delays in option exercising, while the measure of opportunism is positively correlated with the propensity to meet/beat analyst forecasts. These results provide evidence of construct validity. The measures also perform as expected in predicting firms' financial reporting, capital structure, and investment decisions, which provides criterion-related validity. Overall, these new disclosure-based representations perform well in capturing notions of managerial optimism and opportunism and offer researchers an easily-estimated, widely-available methodology for measuring these constructs.

## ACKNOWLEDGEMENTS

I would never have been able to finish my dissertation without the guidance of my committee members and support from my family and wife.

I would like to thank the members of my dissertation committee: Carol A. Marquardt (Chair), Masako N. Darrough, Armen Hovakimian, and Joseph Weintrop. They provide much inspiration, guidance and many insightful comments. I am fortunate to have had such dedicated people to guide me along from generating research ideas of the study through writing this final manuscript. I also thank Donal Byard, Alope Ghosh, Ting Chen, Dae-Hee Yoon and other faculty members in Baruch College for their helpful comments.

I would like to express my utmost appreciation to my family for their unyielding support. I thank my father and mother, father-in-law and mother-in-law for always being there.

Finally, words cannot express my gratitude to my wife, Jung Heum. She was always there cheering me up and stood by me through the good times and bad. I thank her for allowing me to pursue this dream.

## TABLE OF CONTENTS

1.	INTRODUCTION	1
2.	BACKGROUND AND LITERATURE REVIEW	7
3.	DEVELOPING NON-GAAP EARNINGS-BASED MEASURES OF MANAGERIAL OPTIMISM AND OPPORTUNISM	13
4.	VALIDITY TEST DESIGN	17
5.	SAMPLE SELECTION AND DESCRIPTIVE STATISTICS	27
6.	EMPIRICAL RESULTS	29
7.	CONCLUSION	39
	APPENDIX 1: LONG TERM EFFECTS IN THE AUTO REGRESSIVE DISTRIBUTED LAG (ADL) MODEL	63
	APPENDIX 2: SAMPLE NON-GAAP EARNINGS DISCLOSURE FROM ORACLE CORPORATIONS IN THE FOURTH QUARTER OF 2008	65
	REFERENCES	69

## LIST OF TABLES

Table 1	Variable Definitions	41
Table 2	Descriptive Statistics	43
Table 3	Regression Analysis of Non-GAAP Exclusions	45
Table 4	Non-GAAP Earnings-Based Measures of Optimism and Opportunism	47
Table 5	Probit Analysis of Meeting or Beating Market Expectations	49
Table 6	Probit Analysis of Management Forecasts	51
Table 7	Regression Analysis of CEO's Stock Option Holding	54
Table 8	Regression Analysis of Discretionary Accruals	55
Table 9	Regression Analysis of Capital Structure	56
Table 10	Probit Analysis of Debt Choice	57
Table 11	Regression Analysis of Investment	58
Table 12	Regression Analysis of Mergers and Acquisitions	59
Table 13	Regression Analysis of Future Operating Earnings	61

## SECTION 1. INTRODUCTION

This study presents a new approach to measuring managerial optimism and opportunism. Managerial optimism has been shown theoretically and empirically to affect important corporate decisions, including investment, financing, and financial reporting choices (e.g. Malmendier and Tate 2005).<sup>1</sup> Managerial opportunism also influences corporate decisions, regardless of whether it is driven by a managerial self-interest or by a motivation to maximize existing shareholder value (e.g. Baker and Wurgler 2002). Despite a growing interest in the managerial characteristics that affect corporate policies, it remains difficult to empirically measure optimism and opportunism because they cannot be observed directly (Baker et al. 2007).

I develop new measures of optimism and opportunism using firms' non-GAAP (sometimes interchangeably referred to as "pro-forma" or "street") earnings disclosures. Unlike GAAP earnings, non-GAAP earnings are defined by individual firms. Managers disclose the non-GAAP earnings figure that they expect to persist in future periods by excluding one-time or unusual items from GAAP earnings. Therefore, a manager's expectations for future performance are incorporated into non-GAAP earnings when she/he screens out gains or losses from GAAP earnings (Bradshaw and Soliman 2007). Alternatively, several studies contend that some managers opportunistically adjust non-GAAP earnings to influence investors' perceptions of future firm performance (e.g. Doyle and Soliman 2002; Bhattacharya et al. 2003).<sup>2</sup>

---

<sup>1</sup> Theoretical models distinguish between optimistic managers who overestimate the mean of their firms' cash flows and overconfident managers who either underestimate the volatility of their firms' future cash flows or overweight their private signals relative to public information. However, it is hard to distinguish overconfident management from optimistic management because they act similarly (Gervais 2010).

<sup>2</sup> This study does not exclude an alternative motivation of the release of non-GAAP earnings, that of informing investors (e.g. Lougee and Marquardt 2004). Under the hypothesis of more informative earnings, managerial exclusions are justified because the resulting non-GAAP earnings are better predictors of future performance. Moreover, this study considers other exclusions and not special items. According to GAAP, special items are not expected to be recurring but other exclusions (included operating income) are expected to be recurring.

Based on the assumption that both the expectations for future performance and the opportunistic motivation operate in non-GAAP earnings at the same time, I define managers as optimistic when they consistently disclose higher non-GAAP earnings than GAAP earnings regardless of the firm's contemporaneous performance and earnings target. In contrast, I define managers as opportunistic when they adjust non-GAAP earnings in response to reported GAAP earnings results. I estimate both firm-specific measures of managerial optimism and opportunism from time-series regressions of non-GAAP exclusions on GAAP earnings.

This approach to empirically measuring managerial optimism and opportunism offers several advantages over prior methods. Managerial optimism (or "overconfidence") is typically measured using management earnings forecasts, which are infrequently released, or hand-collected CEO option exercise data, which also limits sample sizes.<sup>3</sup> Because non-GAAP earnings data can be easily obtained from forecast service providers such as I/B/E/S, researchers will be able to examine questions related to managerial optimism or overconfidence using much larger samples than they were previously able, thereby enhancing the generalizability of their results.

A second benefit to measures based on non-GAAP exclusions is that there should be fewer endogeneity and omitted variable problems than with the typical measures of managerial overconfidence. For example, the potential concern with Malmendier and Tate (2005)'s option-based measure is endogeneity in the model that links the CEO's equity holdings to their corporate decisions (Hribar and Yang 2010). A manager's stock option exercise may also be driven by other factors such as a tax liability (Jin and Kothari 2008). I expect that a non-GAAP earnings-based measure will have less severe endogeneity problems than measures based on

---

<sup>3</sup> Malmendier and Tate's (2008) measure of overconfidence based on outsiders' perceptions of the CEO from the popular media is similarly disadvantaged. Because it is very costly to obtain this data, their study covers only Fortune 500 firms.

CEO's stock option exercising, because it is less likely that the release of non-GAAP earnings affects a firm's financial policies directly.

A third advantage is that non-GAAP exclusions have an objective benchmark of zero while management forecasts are compared with actual earnings to determine whether managers are optimistic. Actual earnings is an imperfect benchmark to measure optimism because underlying economic conditions could be different from those used in forecasting, and there is uncertainty as to whether managers would meet their forecasts even if the forecasts were unbiased. Exclusions from non-GAAP income, however, are normally included in operating income and are thus considered to be recurring; they should consequently never be excluded from reported income figures and therefore are arguably a better indicator of managerial optimism than management forecast errors.

A further advantage is that this study identifies opportunism and optimism from one corporate event -- non-GAAP earnings disclosure -- because non-GAAP exclusions enable us to easily capture both constructs. As Baker et al. (2007) point out, managerial optimism and opportunism can coexist but the existing literature has typically considered the two concepts separately.<sup>4</sup> This study identifies optimism and opportunism simultaneously, and provides evidence that optimism (opportunism) plays a significant role in decisions of financial structure, investment, and reporting decisions after controlling for opportunism (optimism).

The results from the construct validity tests suggest that non-GAAP earnings based measures are (not) similar to previously developed operations to which it should (not) be similar. I find that optimistic managers tend to disclose optimistic forecasts with point estimates, but that opportunistic managers are more likely to disclose pessimistic earnings guidance intend to

---

<sup>4</sup> For example, McNichols and Stubben (2008) suggest that overinvestment in firms managing earnings could be driven by a managerial optimism. In contrast, Polk and Sapienza (2008) claim that mispricing from discretionary accruals enables rational managers to decide overinvestment.

meet/beat their earnings forecast more likely. Consistent with Malmendier and Tate (2005), the non-GAAP earnings-based measure of optimism is positively related to CEO's delayed option exercising: more optimistic managers have more unexercised exercisable in-the money options, and this relation is more significant as the options' expiration date approaches. Last, I find that managers who opportunistically adjust non-GAAP earnings have a higher likelihood of meeting/beating analyst forecasts, while optimism is not related to the probability of meeting/beating analyst forecasts.

I also perform a series of criterion-related validity tests. First, I find that optimism is positively related to discretionary accruals, consistent with Hribar and Yang (2010). This result suggests that optimistic managers are more likely to conduct income increasing earnings management because optimistic managers could believe that future earnings are high enough to reverse present income-increasing earnings management. In contrast, opportunism is negatively related to discretionary accruals because the managers adjust non-GAAP earnings in response to GAAP earnings.

Heaton (2002) proposes that an optimistic manager who believes that the firms' stock is undervalued relies more on debt than equity. I find that a manager's optimism is significantly positively associated with firm's leverage and that optimistic managers tend to prefer issuing debt when they need external financing, consistent with Malmendier et al. (2011). Meanwhile, opportunistic managers are more likely to issue equity when the firms' stock prices are high, consistent with the opportunistic market timing hypothesis (Baker and Wurgler 2002).

Investment by optimistic managers could be restricted to internal cash or debt because they are reluctant to issue equity. Malmendier and Tate (2005) find that firms managed by overconfident CEOs have a higher sensitivity of cash flow on investment. I also find that

optimism has a positive relationship with the cash flow sensitivity of investment and this positive relationship is more pronounced among equity dependent firms. Both managerial optimism and opportunism are positively related to probability of mergers and acquisitions, but optimism plays a more important role when the firm utilizes more cash in the M&A transactions. The results are consistent with findings of Malmendier and Tate (2008).

I also examine how a manager's optimism and opportunism are associated with future performance and the quality of non-GAAP exclusions. Using future operating EPS as a proxy for future performance, an optimistic manager's performance is better on average. The result is consistent with Davis et al. (2008)'s finding of a significant positive association between levels of optimistic tone in earnings press releases and future ROA.<sup>5</sup>

This paper makes three main contributions to the existing literature. First, I contribute directly to the literature on managerial confidence and opportunism by proposing and validating new measures of these constructs. My empirical findings suggest that these new disclosure-based representations perform well in capturing notions of managerial optimism and opportunism and offer researchers an easily-estimated, widely-available methodology for measuring these important managerial characteristics.

Second, I also contribute to more generally to the literature on non-GAAP earnings disclosures. Prior work on non-GAAP disclosure has typically focused on investor responses to non-GAAP figures or the determinants of non-GAAP reporting choices. In contrast, I demonstrate that non-GAAP disclosures have the ability to reflect cognitive traits of managers

---

<sup>5</sup> However, the relationship is negative for high-technology firms. The result is consistent with Gombola and Marciukaityte's (2007) findings that firms managed by overoptimistic managers are expected to underperform in growth industries because of overinvestment.

that potentially influence *all* of their decisions related to the firm, thereby establishing a new role for non-GAAP disclosure that had previously gone unrecognized in the literature.

Third, this study provides new evidence that managerial optimism (overconfidence) and opportunism can play important roles in firms' capital structure, investment, and financial reporting voluntary disclosure decisions by employing a much larger and more representative sample than was possible in the previous literature. Prior studies employed only limited samples (e.g., Malmendier and Tate 2005) because costly hand-collected data was required, thus precluding generalizability to small and medium sized companies. My results therefore lend credence to prior work that has documented the effects of managerial optimism and opportunism on firm decision-making. The remainder of this paper is organized as follows. In Section 2, I review the relevant literature. I develop the empirical measures of managerial optimism and opportunism in Section 3. In Section 4, I present the design of the construct and criterion-related validity tests. I present sample selection criteria and descriptive statistics in Section 5 and empirical results in Section 6. I offer concluding remarks in Section 7.

## SECTION 2. BACKGROUND AND LITERATURE REVIEW

### **Behavioral Corporate Finance**

Behavioral corporate finance research replaces the traditional rationality assumption with potentially more realistic assumptions. The literature is divided into two general approaches: studies focusing on a manager's behavior, and those focusing on an investor's behavior (Baker et al. 2007). The first approach considers managerial behavior that is less than fully rational, which is related to measures of managerial optimism or overconfidence, and the second emphasizes the effect of investor behavior that is less than fully rational, which is related to measures of managerial opportunism.

#### *Managerial Overconfidence or Optimism*

The psychology and economics literature points out that individuals do not always form beliefs logically, nor do these beliefs convert to decisions in a consistent and rational manner. Most research in corporate finance has focused on the positive illusions of optimism and overconfidence (Baker et al. 2007). In particular, optimistic managers have a higher probability of being promoted to CEOs (Goel and Thakor 2008), and successful managers become overconfident even though they start out without such a bias (Gervais and Odean 2001).

A manager's overconfidence and optimistic bias affects the firm's economic decisions, including its investment policy and capital structure. Roll (1986) pioneered the optimism and overconfidence construct in corporate finance to explain the winner's curse (overbidding) in takeovers. Overconfident CEOs tend to overestimate deal synergies. Malmendier and Tate (2008) confirm that overconfident CEOs complete more mergers, especially diversifying mergers by cash abundant firms, and that investors react more negatively to merger bids of overconfident CEOs. CEO overconfidence is also related to real investment decisions.

Hirshleifer et al. (2010) find that overconfident CEOs are more likely to undertake riskier projects, to invest more heavily in R&D, and to achieve a greater total quantity of innovation as measured by patent and citation counts.

Heaton (2002) proposes that optimistic management has a pecking order capital structure preference. Because optimistic managers systematically attach higher probabilities to good outcomes than the capital market, optimistic managers believe that the capital market undervalues the firm's risky securities. Malmendier and Tate (2005) find that investment of overconfident CEOs is significantly more responsive to cash flow, particularly in equity-dependent firms, because overconfident managers overestimate the returns to their investment projects and view external funds as unduly costly. Overconfident managers overinvest when they have abundant internal funds, but curtail investment when they require external financing.

Malmendier et al. (2007) find that overconfident managers are significantly less likely to issue equity and raise more debt than their peers to meet current cash commitments. They also find some evidence that the history of managerial beliefs is related to long-term changes in capital structure: the longer a firm has had an overconfident CEO, the higher the firm's leverage ratio is. Landier and Thesmar (2009) document that optimistic entrepreneurs prefer short term debt to long term debt because optimistic entrepreneurs are willing to exchange cash-flow rights in the low state (that he believes to be unlikely) against claims on the good state. Sunder et al. (2009) find that debtholders recognize the implications of the CEO overconfidence on investment policies and respond to them by designing covenants restrictively.

Until recently, however, little empirical research regarding managerial confidence has been completed among accounting researchers. Hribar and Yang (2010) provide evidence that overconfident managers have a greater likelihood of disclosing narrowly ranged earnings

forecasts and of missing his/her earnings forecasts. They also find a positive relationship between overconfidence and discretionary accruals. Schrand and Zechman (2010) find that fraud-firm executives are more overconfident than those at the non-fraud firms and that better governance mechanisms were not in place to mitigate their tendency to commit fraud.

#### *Measures of Optimism (Overconfidence)*<sup>6</sup>

The main challenge for empirical tests in behavioral corporate finance is empirically measuring opportunism and overconfidence because they can not be observed directly (Baker et al. 2007). As a measure of managerial overconfidence or optimism, Malmendier and Tate (2005, 2008) pioneered the idea of using insider trading and stock option exercise to proxy for executive overconfidence. The authors classify CEOs as overconfident when they hold onto their vested stock options past their optimal exercise time, and when they increase their exposure to their firm's specific risk by regularly acquiring additional company stock, because overconfident CEOs do not diversify their wealth.

Malmendier and Tate (2008) also develop a second measure of overconfidence from popular press stories. The authors define an overconfident CEO when the articles portray a CEO as being "confident" or "optimistic" rather than "cautious," "conservative," "not confident" or "not optimistic." Meanwhile, Davis et al. (2008) analyze optimistic or pessimistic tones from press releases of earnings announcements using a linguistic program.

Ben-David et al. (2007) develop a measure of the biases of executives from a survey. They poll CFOs with a series of questions about the distribution of their forecasts of returns on the S&P500 index. The authors interpret tight distributions as a sign of overconfidence and high expected returns as a sign of optimism.

---

<sup>6</sup> Because research questions involving opportunism assume a rational manager, researchers do not focus on developing measures of opportunism but instead apply incentives of opportunistic behavior and mispricing.

The measures developed in previous research rely on costly hand-collection of data or surveys of executives, which is difficult to apply to large samples. Furthermore, the option-based measure has a potential endogeneity problem because CEOs' equity/stock option holdings may affect corporate decisions (Hribar and Yang 2010). Jin and Kothari (2008) also argue that delayed exercising of stock options could be driven by low idiosyncratic risk or a CEO's individual tax rate rather than overconfidence. The use of non-GAAP exclusions to empirically estimate managerial optimism or overconfidence alleviates many of these problems.

### *Managerial Opportunism*

In the less rational investor approach, we assume that the market is not fully efficient. When the capital market is not fully efficient at least in a short horizon, stock price does not reflect the fundamental value of the firm, and managers can maximize short-term stock prices (consequently causing mispricing) by catering to short-term investors' demands. Maximizing short term value may be driven by a managerial self-interest or by a manager's intention to maximize existing shareholder value. For example, Bergstresser and Philippon (2006) find that self-interested CEOs manipulate earnings when they exercise unusually large numbers of options and sell large quantities of shares. On the other hand, Dechow et al. (1996) report that external financing at low cost (benefiting existing shareholders) is a more important motivation for earnings manipulation than compensation incentives. Rajgopal et al. (2007) suggest that 1) different horizons between the manager and long-term shareholders, 2) manager's compensation, and 3) increases in investment opportunities due to a lower cost of capital could drive the manager's preference for the short-run over the long-term. Consequently, this mispricing affects capital investments (e.g. Polk and Sapienza 2008), dividend policy (e.g. Baker and Wurgler 2004) and corporate name changes (e.g. Cooper et al. 2001).

## **Non-GAAP Earnings Disclosure**

Unlike net income, which is defined under generally accepted accounting principles (GAAP), non-GAAP earnings are defined by individual firms. As shown in Appendix 2, Oracle Corporation discloses \$1.06 of GAAP earnings per share and \$1.30 of non-GAAP earnings per share for fiscal year 2008. The company excludes certain business combination accounting entries and expenses related to acquisitions and other significant expenses such as restructuring costs. In the exclusion process, management's expectations for future performance are included. For example, Oracle increases software update revenues from acquired business by \$179 millions on the assumption that the company is able to retain customers in future.

Prior research suggests two motivations for non-GAAP earnings disclosure: informing and misleading investors. Managers often contend that non-GAAP earnings provide a clear picture of the core earnings that they expect to persist in future periods by excluding one-time or unusual items (Bhattacharya et al. 2004). In earnings disclosure (Appendix 2), Oracle also describes that "we believe that non-GAAP measures are helpful in understanding our past financial performance and our future results." The company notes that "our management regularly uses our non-GAAP financial measures internally to understand, manage and evaluate our business make operating decisions." Non-GAAP measures are also among the primary factors for future planning and management compensation in Oracle.

However, there are also several studies reporting that non-GAAP earnings announcements are often motivated by managers' desires to meet or beat market expectations or to avoid earnings decreases. Doyle and Soliman (2002) show that firms reporting non-GAAP earnings that are slightly greater than GAAP earnings have a greater probability of meeting or just beating analyst forecasts. Bhattacharya et al. (2003) also find that firms tend to avoid earnings declines

and missing market expectations through non-GAAP earnings when their GAAP earnings are below the earnings targets.

Under the informing hypothesis, a manager's expectations for future performance will be reflected in the exclusions from non-GAAP earnings. For example, when managers have an overoptimistic view of future performance, managers may be more likely to exclude recurring losses. Alternatively, the studies of the misleading hypothesis implicitly assume that managers act rationally when they disclose non-GAAP earnings, but investors may be less rational in the short term. Investors do not fully adjust for managers' opportunistic use of non-GAAP earnings and mispricing occurs, because investors (especially unsophisticated investors) are not able to recognize that non-GAAP exclusions are used to meet or beat market expectations (Doyle et al. 2003; Bhattacharya et al. 2007).

Because non-GAAP earnings disclosures have the ability to reflect both managerial optimism and opportunism, they are particularly well-suited in empirical measuring these constructs. As Baker et al. (2007) point out, managerial optimism and opportunism can coexist but the existing literature has typically considered the two approaches separately. To my knowledge, this is the first paper to use a single corporate practice to simultaneously measure both optimism and opportunism.

### **SECTION 3. DEVELOPING NON-GAAP EARNINGS-BASED MEASURES OF MANAGERIAL OPTIMISM AND OPPORTUNISM**

#### **Definition of Exclusions**

I follow previous studies (e.g. Doyle et al. 2003) to define non-GAAP exclusions. GAAP earnings are defined as earnings per share (EPS) before extraordinary items and discontinued operations (Compustat item code, epspxq) and non-GAAP earnings are defined as I/B/E/S actual EPS (I/B/E/S item code, actual). The difference between non-GAAP earnings and GAAP earnings (non-GAAP earnings less GAAP earnings) is defined as total non GAAP exclusions: total non-GAAP exclusions are decomposed into special items and other exclusions. Special items are defined as operating EPS (Compustat item, opepsq) less GAAP earnings, and other exclusions are defined as total non GAAP exclusions less special items. Thus, positive total non-GAAP exclusions (other exclusions) indicates that a firm's non-GAAP earnings (non-GAAP earnings before special items) are higher than GAAP earnings (operating EPS).

Previous studies (e.g. Kolev et al. 2008; Doyle et al. 2003) separate other exclusions and special items from non-GAAP exclusions and find that other exclusions have poorer quality than special items. Unlike special items, other exclusions are included in GAAP operating income, so an auditor's position is inconsistent with manager's implicit assertion that items excluded from non-GAAP earnings are non-recurring. For this reason, other exclusions are more likely to be determined through managerial discretion than are special items, and consequently I use other exclusions rather than total exclusions or special items as my main variable in developing measures of managerial optimism and opportunism.

## Cross-Sectional Test of External Validity

Before developing firm-specific measures of managerial optimism and opportunism, I conduct a cross-sectional test of external validity of managerial optimism and opportunism.<sup>7</sup> Based on the assumption that both optimism and opportunism may operate in non-GAAP earnings at the same time, I conjecture that opportunistic managers use non-GAAP earnings to meet/beat the benchmarks when firm's GAAP earnings are below the benchmark (Bhattacharya et al. 2003). In other words, firms do not have to inflate non-GAAP earnings when their GAAP earnings are high enough to meet/beat the earnings target. In contrast, optimistic managers are expected to disclose consistently higher non-GAAP earning than GAAP earnings.

To test the association between non-GAAP earnings and GAAP earnings in my sample, I build the following simple autoregressive distributed lag (ADL) model:

$$\begin{aligned} \text{Other Exclusions}_q = & \alpha_0 + \beta_1 \text{Other Exclusions}_{q-4} + \beta_2 \text{Operating EPS}_q + \beta_3 \text{Operating EPS}_{q-4} \\ & + \beta_4 \text{Log(Total Asset)} + \beta_5 \text{Log(Sales)} + \beta_6 \text{Market to Book} + \beta_7 \text{Institutional holdings} \\ & + \beta_8 \Delta \text{Log(Total Asset)} + \beta_9 \Delta \text{Log(Sales)} + \beta_{10} \Delta \text{Market to Book} + \beta_{11} \Delta \text{Institutional holdings} \\ & + \beta_{12} \text{Earnings Volatility} + \varepsilon \end{aligned} \quad (1)$$

The dependent variable is current other exclusions, and the test variables are current operating EPS, one-year lagged (four-quarter lagged) operating EPS, and lagged other exclusions. The variables expressed in per share amounts are scaled by beginning stock price, as in Doyle et al. (2003). As in Brown et al. (2009), I control for firm size, leverage, earnings volatility, market-to-book ratio, and institutional holdings. I include changes in the control variables in addition to levels because the ADL model includes lagged variables. Variable definitions are provided in Table 1.

Non-GAAP exclusions are expected to be negatively correlated to current operating EPS when other exclusions are used for meeting/beating market expectations. In addition, other

---

<sup>7</sup> External validity concerns the extent to which the (internally valid) results of a study can be held to be true for other cases, for example to different people, places, or times (Patten 2002).

exclusions may have positive relationships with previous period earnings because lagged earnings increase earnings targets in the current period. I expect non-GAAP exclusions are positively related to previous non-GAAP exclusions because optimistic managers could disclose higher non-GAAP earnings continuously. Therefore, I expect positive signs of  $\beta_1$  and  $\beta_3$ , but a negative  $\beta_2$ .

### **Firm-Specific Measures of Optimism and Opportunism**

To obtain firm-specific measures of manager's optimistic and opportunistic disclosure of non-GAAP earning, I estimate the following firm-level, time-series model:

$$Other\ Exclusions_q = \beta_0 + \beta_1 Other\ Exclusions_{q-4} + \beta_2 Operating\ EPS_q + \beta_3 Operating\ EPS_{q-4} + \varepsilon \quad (2)$$

As in the cross-sectional model, I expect a negative  $\beta_2$  and positive  $\beta_3$ . To obtain the firm-specific measures of managerial opportunism and optimism for future performance, I rewrite equation (2) as it would appear in the long-run when we assume that  $\varepsilon$  is white noise,  $|\beta_1|$  is less than 1, and operating EPS has zero growth (the derivation is provided in the Appendix)<sup>8</sup>:

$$OtherExclusions = \frac{\alpha_0}{1 - \beta_1} + \frac{\beta_2 + \beta_3}{1 - \beta_1} OperatingEPS \quad (3)$$

From equation (3), I define the measure of the manager's *Optimism* as  $\alpha_0/(1-\beta_1)$  (change to beta instead of alpha?) because the constant term represents the manager's constant tendency to disclose higher non-GAAP earnings than GAAP earnings. If managers do not have biased future expectations,  $\alpha_0/(1-\beta_1)$  should be zero. When there is no opportunistic behavior, firms' other exclusion decisions should be independent from operating EPS and thus  $(\beta_2+\beta_3)/(1-\beta_1)$  should be zero. On the contrary,  $(\beta_2+\beta_3)/(1-\beta_1)$  becomes negative when managers inflate non-GAAP

---

<sup>8</sup> The measure of *Optimism* needs the assumption of zero growth, but the measure of *Opportunism* does not require this assumption. When a firm grows at a steady growth rate  $g$ , equation (3) becomes

$$OtherExclusions = \frac{\alpha_0}{1 - \beta_1} + \left( \frac{\beta_2}{1 - \beta_1} - \frac{\beta_2 + \beta_3}{(1 - \beta_2)^2} \right) g + \frac{\beta_2 + \beta_3}{1 - \beta_1} OperatingEPS.$$

earnings to meet/beat analyst forecasts. Therefore, I define the manager's *Opportunism* as  $-(\beta_2 + \beta_3)/(1 - \beta_1)$  so that a higher *Opportunism* indicates a higher degree of opportunistic non-GAAP exclusions.

I acknowledge that *Opportunism* is not a perfect measure because the manager's optimism could also increase as the firm's performance improves.<sup>9</sup> In such a case, the opportunism could be underestimated because the increases in optimism may cause a positive  $\beta_2$  but opportunism causes a negative  $\beta_2$ .

---

<sup>9</sup> This type of bias is known as the self-serving attribution bias, inducing people to take too much credit for successes in their undertakings and to assume too little responsibility for occasional failures (Gervais and Odean 2001).

## SECTION 4. VALIDITY TEST DESIGN

### Construct Validity Tests

Construct validity refers to how well operationalizations in research reflect the theoretical constructs they are supposed to reflect. Campbell and Fiske (1959) suggest that evaluation of construct validity requires both convergent and discriminant validity. Convergent validity is the degree to which an operation is similar to (converges on) other operations to which it should theoretically be similar. Discriminant validity describes the degree to which the operationalization is not similar to (diverges from) other operationalizations to which it theoretically should not be similar (Trochim and Donnelly 2007). Therefore, I test how the non-GAAP earnings based measures are correlated with previously developed measures.

#### *Meeting/Beating Analyst Forecasts*

Several studies find that managerial opportunism is related to meeting/beating analyst forecasts (e.g. McVay et al. 2006). Opportunistic managers tend to disclose higher non-GAAP earnings when they are not able to meet market expectations with GAAP earnings, so they are more likely to meet or beat analyst forecasts. In contrast, managers who continuously disclose higher non-GAAP earnings relative to GAAP earnings may include biased expectations for future performance because they are confident that non-recurring items will not recur in the future. They disclose higher non-GAAP earnings with optimistic expectations regardless of whether or not non-GAAP earnings meet/beat analyst forecasts. Thus, I expect that the probability of meeting/beating analyst forecasts is positively related to managerial opportunism, but is not related to managerial optimism.

To test these conjectures, I estimate the following probit model of the probability of meeting/beating analyst forecasts:

$$\begin{aligned} \text{Meet or Beat (Just Meet)} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Operating EPS} \\ & + \beta_4 \text{Leverage} + \beta_5 \text{Market to Book} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Institutional Holdings} + \varepsilon \quad (4) \end{aligned}$$

where *Meet or Beat* is one if firm's non-GAAP earnings are greater than, or equal to the mean of analyst forecasts, otherwise zero. *Just Meet* is an indicator variable that is one if a firm's earnings surprise (non-GAAP earnings less mean forecasts) is between one cent and zero, and zero otherwise. *Optimism* and *Opportunism*, the variables of interest, are as defined above. Following Matsumoto (2002) and Brown et al. (2009), I control for *Operating EPS*, *Leverage*, *Market to Book*, size (*Log (Total Asset)*), and *Institutional Holdings*. A positive estimated coefficient on *Opportunism* would provide evidence of convergent validity, while a negative (or insignificant) coefficient on *Optimism* would provide evidence of discriminant validity.

#### *Management Guidance*

Optimistic management forecasts are often used as a proxy for managerial optimism (e.g. Brown et al. 2009). If overconfident managers overestimate their ability to influence firms' earnings and underestimate the probability of unexpected events, their forecasts could be optimistic. On the other hand, opportunistic managers' earnings forecasts could be pessimistic, *ex post*, because opportunistic managers are more likely to meet/beat their forecasts (Richardson et al. 2004).

To test these conjectures, I develop following probit model:

$$\begin{aligned} \text{Optimistic Guidance} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Horizon} + \beta_4 \text{Beat or Meet} \\ & + \beta_5 \text{Market to Book} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Leverage} + \beta_8 \text{Institutional holdings} + \varepsilon \quad (5) \end{aligned}$$

where, *Optimistic Guidance* equals one if a firm's non-GAAP earnings is smaller than management forecasts, otherwise zero. Like analyst forecasts, management forecasts also have a tendency to walk down (Kato et al. 2009), so I add the control variable *Horizon*, defined as the number of days between management forecasts and end of the forecasted fiscal quarter.

As Hribar and Yang (2010) note that managerial optimism and opportunism could affect both the decision to forecast, as well as the forecast error conditional on issuing a forecast, I use a two-stage Heckman procedure to try to remove the bias. The selection probit model is as follows:

$$Guidance = \alpha_0 + \beta_1 Optimism + \beta_2 Opportunism + \beta_3 Log(Analyst) + \beta_4 Market\ to\ Book + \beta_5 Log(Total\ Asset) + \beta_6 Leverage + \beta_7 Institutional\ holdings + \varepsilon \quad (6)$$

where *Guidance* is one if a firm discloses voluntary management forecasts, and zero otherwise, and *Log(Analyst)* is the natural logarithm of analyst coverage. The inverse Mills ratio (*Mills*) estimated from equation (7) is added to equation (6) to control for self-selection. Because an optimistic manager is expected to forecast optimistic earnings guidance, a positive coefficient of *Optimism* ( $\beta_1$ ) in equation (6) provides evidence of convergent validity. In contrast, a negative coefficient of *Opportunism* ( $\beta_2$ ) provides evidence of discriminant validity because an opportunistic manager is less likely to disclose optimistic guidance.

Ben-David et al. (2007) define overconfident managers as having too narrow confidence intervals when they forecast future stock market performance. Hribar and Yang (2010) also report that overconfident managers (measured using media press) are more likely to issue “point” estimates than “range” estimates because overconfident managers tend to underestimate the volatility of their firms’ future cash flows. I conjecture that the measure of optimism using non-GAAP earnings disclosure is positively related to propensity of disclosing point estimates because optimistic managers also tend to be overconfident (Taylor and Brown 1988).

As Ajinkya et al. (2005) include control variables of institutional holdings, analyst followings, market value of equity and forecasts horizon, I build a following model of management guidance type:

$$\begin{aligned}
\textit{Point} = & \alpha_0 + \beta_1\textit{Optimism} + \beta_2\textit{Opportunism} + \beta_3\textit{Horizon} + \beta_4\textit{Beat or Meet} \\
& + \beta_5\textit{Market to Book} + \beta_6\textit{Log}(\textit{Market value of equity}) + \beta_7\textit{Leverage} \\
& + \beta_8\textit{Institutional holdings} + \beta_9\textit{Mills} + \varepsilon
\end{aligned} \tag{7}$$

where *Point* is one if management discloses point estimates, and zero if management disclose range or open ended estimates of future earnings. The positive coefficient of *Optimism* ( $\beta_1$ ) in equation (8) provides evidence that measure of optimism using non-GAAP earnings could represent managerial overconfidence in management guidance.

#### *Late Stock Option Exercising*

In spite of high exposure of idiosyncratic risk of their company, overconfident CEOs tend not to diversify their investment of their company (Malmendier and Tate 2005).<sup>10</sup> Because overconfident CEOs overestimate future performance, they believe that the stock prices of their companies will continue to rise under their leadership more than they objectively should expect. As a result, overconfidence induces them to postpone option exercise. Based on Malmendier and Tate (2005), I hypothesize that the non-GAAP earnings based measure of optimism is positively related the amount of unexercised exercisable options and build following regression model:

$$\begin{aligned}
\textit{Unexercised Options} = & \alpha_0 + \beta_1\textit{Optimism} + \beta_2\textit{Opportunism} + \beta_3\textit{Log}(\textit{Total Asset}) \\
& + \beta_4\textit{Market to Book} + \beta_5\textit{Leverage} + \beta_6\textit{Institutional holdings} + \beta_7\textit{Stock return} \\
& + \beta_8\textit{CEO Age} + \beta_9\textit{CEO Tenure} + \varepsilon
\end{aligned} \tag{8}$$

where *Unexercised Options* is number of exercisable unexercised in-the-money stock options granted divided by number of shares outstanding. *Institutional holdings*, *CEO Age* and *CEO Tenure* are added as control variables as in Jin and Kothari (2008). A positive estimated coefficient on *Optimism* would provide evidence of convergent validity.

---

<sup>10</sup> Malmendier and Tate (2005) argue that CEOs are exposed to high idiosyncratic risk of their company not only because they hold large amounts of stock and options but also because they invest their human capital and reputations into the company.

## Criterion – Related Validity Tests

Criterion validity is a measure of how well the variable explains an outcome based on information from other variables. Criteria or concrete validity is the extent to which the measures are demonstrably related to concrete criteria in the "real" world. This type of validity is often divided into concurrent-validity and predictive-validity (Trochim and Donnelly 2007). The concurrent validity is reserved for demonstrations relating a measure to other concrete criteria assessed simultaneously. The predictive validity refers to the degree to which any measure can predict future events. Based on prior literature, I evaluate a concurrent validity of non-GAAP earnings based measures by testing relationships between the measures and GAAP earnings management, capital structure, cash flow sensitivity of investment and firm's merger and acquisition decisions. I also evaluate a predictive validity by testing how the measures are related to future performance.

### *Earnings Management*

Because optimistic managers could think future earnings are sufficient to cover reversals of income-increasing accruals, they may be more likely to "borrow" from the future. Schrand and Zechman (2010) find that optimistic managers are more likely to commit fraud, and Hribar and Yang (2010) also find a positive relationship between discretionary accruals and the degree of managerial overconfidence. Therefore, I hypothesize that managerial optimism measured by non-GAAP earning based measures are positively related to firm's discretionary accruals. I estimate the following model:

$$\begin{aligned} \text{Discretionary Accruals} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Beat or Meet} + \beta_4 \text{ROA} \\ & + \beta_5 \text{Loss} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Market to Book} + \beta_8 \text{Leverage} + \beta_9 \text{Log(Analyst)} \\ & + \beta_{10} \text{Quarter4} + \varepsilon \end{aligned} \quad (9)$$

As in Hribar and Yang (2010), I add *Beat or Meet*, *ROA*, *Loss*, *Log (Total Asset)*, and *Log(Analyst)* as control variables in the model. The dependent variable, *Discretionary Accruals*, is estimated from a performance-matched discretionary accrual model (Kothari et al. 2004).

$$\frac{TotalAccruals_q}{TotalAsset_{q-1}} = \alpha_0 + \beta_1 \frac{1}{TotalAsset_{q-1}} + \beta_2 \frac{(\Delta Sales_q - \Delta Receivables_q)}{TotalAsset_{q-1}} + \frac{PPE_q}{TotalAsset_{q-1}} + \varepsilon \quad (10)$$

Discretionary accruals are defined as the residuals from regressions of equation (10) by industry (two digit SIC) and quarter, and subtracted from the discretionary accruals of firms with the closest return on assets to match performance.

### *Capital Structure*

The optimistic managers feel that equity prices of their firms are undervalued, so they are reluctant to issue equity. Therefore, firms managed by optimistic CEOs could have higher leverage (Heaton 2002) and prefer to debt rather than equity when they need external capital (Malmendier et al. 2011). Based on the prior studies, I expect that managerial optimism is positively related to firm leverage and the propensity of issuing debt and build two models of a firm's capital structure. Following the method used in Hovakimian et al. (2001), I test the relationships between optimism and (1) firms' leverage levels, and (2) firms' choices of whether to issue debt or equity when the firm needs external financing. To test the relationship between optimism and level of leverage, I estimate the following model, using control variables drawn from Hovakimian et al. (2001):

$$\begin{aligned} Leverage = & \alpha + \beta_1 Optimism + \beta_2 Opportunism + \beta_3 3\text{ Year Mean ROA} \\ & + \beta_4 Operating\ Loss\ Carryforward + \beta_5 24\text{Month Stock Return} + \beta_6 Market\ to\ Book \\ & + \beta_7 R\&D\ Expense + \beta_8 PPE + \beta_9 Log(Total\ Asset) + \beta_{10} Industry\ Mean\ Leverage + \varepsilon \quad (11) \end{aligned}$$

I also employ a probit model of debt choice to test how a manager's optimism and opportunism affect firms' external financing choices:

$$\begin{aligned}
\text{Debt Choice} = & \alpha + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Optimism} * 24\text{Month Stock Return} \\
& + \beta_4 \text{Opportunism} * 24\text{Month Stock Return} + \beta_5 24\text{Month Stock Return} \\
& + \beta_6 3 \text{ Year mean ROA} + \beta_7 \text{Log(Total Asset)} + \beta_8 \text{Market to Book} \\
& + \beta_9 \text{Operating Loss Carryforward} + \beta_8 (\text{Industry Mean Leverage} - \text{Leverage})_{t-1} + \varepsilon \quad (12)
\end{aligned}$$

*Debt Choice* is an indicator variable for whether a firm issues debt (coded 1) or equity (coded 0). I define a debt issuance firm when a firm's change in debt exceeds 5 percent of its beginning total assets, following Hovakimian et al. (2001). Similarly, I define an equity issuance firm when a firm's equity issuance exceeds 5 percent of its beginning total asset. In addition to *Optimism*, *Opportunism*, and the control variables, I add interaction variables, *Optimism\*24 Month Stock Return* and *Opportunism\*24month Stock Return*. These interaction variables represent how opportunistic/optimistic managers change external financing decisions conditional on changes in stock price.

#### *Investment Decisions*

An optimistic CEO believes that the market is understating the present value of investment returns and that issuing shares will dilute the claims of current shareholders. Thus, he is unwilling to issue shares to finance his desired investment level and generates investment–cash flow sensitivity when internal resources are scarce. The investment sensitivity of cash flows might be more prominent among the equity dependent firms because overconfidence could reduce the level of investment when the firms do not have sufficient amounts of cash or untapped debt capacity to finance. Malmendier and Tate (2005) find that managerial overconfidence is significantly positively related to cash flow sensitivity of investment, especially in the samples of financially constrained firms. Following Malmendier and Tate (2005), I estimate the following model to test the sensitivity of investment on cash flow:

$$\begin{aligned}
\text{Investment} = & \alpha + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Optimism} * \text{Cash Flow} \\
& + \beta_4 \text{Opportunism} * \text{Cash flow} + \beta_5 \text{Cash flow} + \beta_6 Q + \varepsilon \quad (13)
\end{aligned}$$

I also follow variable definitions in Malmendier and Tate (2005). *Investment* is defined as firm capital expenditures (Compustat variable *capx*) normalized by capital (net PPE) at the beginning of the fiscal year. *Cash Flow* is earnings before extraordinary items before depreciation and is normalized by capital at the beginning of the year. *Q* is the market value of assets over the book value of assets at the beginning of the year. Because a firm's investment is non-negative but cash flow has both directions, the relationship between cash flow and investment is not clear for the case of firms with negative cash flow. Therefore, I exclude observations of negative cash flow firms as in Hovakimian and Hovakimian (2009).

### *Mergers and Acquisitions*

Roll (1986) suggests that successful acquirers may be optimistic and overconfident in their own valuation of deal synergies, and fail to properly account for the winner's curse. More recently, Malmendier and Tate (2008) report that overconfident managers are more likely to conduct acquisitions than non-overconfident managers. The positive relationship between managerial overconfidence and frequency of mergers is more significant when the firms do not need external financing for the mergers. This is because overconfident managers are reluctant to raise external finance and may forgo mergers if external capital is required (Malmendier and Tate 2008).

Alternatively, managerial opportunism could affect firm's decision of mergers. Jensen (1988) argues that managers have incentives to expand firms beyond their optimal size in order to increase resources under their control and their compensations. The market timing hypothesis also provides incentives for acquisitions. Shleifer and Vishny (2003) propose a market timing model in which overvalued acquirers could preserve some of their temporary overvaluation for long-run shareholders by acquiring less-overvalued targets with overpriced stock.

Based on a model by Malmendier and Tate (2008), I construct a probit model to test whether measures of optimism and opportunisms are related to mergers and acquisitions.

$$\begin{aligned}
 M\&A = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Log(Total Asset)} + \beta_4 \text{Leverage} \\
 + \beta_5 Q + \beta_6 \text{Cash flow} + \beta_7 \text{ROA} + \beta_8 \text{1 year lagged Stock return} \\
 + \beta_9 \text{Industry average M\&A} + \varepsilon
 \end{aligned}
 \tag{14}$$

M&A is an indicator variable, which is one when a firm made at least one merger bid that was eventually successful. Like Malmendier and Tate (2008), I control for a firm's size ( $\text{Log(Total Asset)}$ ), leverage, Tobin's Q, and cash flows. To control timely variance of merger activity, I include *industry average M&A* which is average number of mergers and acquisitions by year and industry (two- digit SIC). I also construct an OLS model by replacing a dependent variable with the total transaction amounts of mergers and acquisitions scaled by the market value of the acquirer firm. This OLS model enables us to test not only frequency (or binary choice) but also deal size of mergers and acquisitions. I expect positive  $\beta_1$  and  $\beta_2$ , based on the previous literature which suggests that both optimistic and opportunistic managers are more likely to conduct mergers.

#### *Future Performance and Exclusion Quality*

Goel and Thakor (2008) propose a model that an overconfident CEO could improve a firm's value under an optimal compensation structure because it is less likely that an overconfident CEO underinvests than does a rational CEO. Davis et al. (2008) provide evidence that managerial optimism is positively related to future ROA. However, firms' future performances could be negatively related to future performance when optimistic managers overinvest even in negative NPV projects. Gombola and Marciukaityte (2007) find that high growth firms managed by optimistic managers underperform in long term because of overinvestment.

Based on the previous studies, I expect managerial optimism to be positively related to future economic performance, on average, but the relation changes to negative in high growth firms. As in Kolev et al. (2008), I use future operating EPS scaled by beginning market value summed over four quarters starting with quarter  $q+1$  and estimate the following model:

$$\begin{aligned}
 \text{Future Operating EPS}_{q+1, q+4} = & \alpha + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} \\
 & + \beta_3 \text{Optimism} * \text{Other Exclusions} + \beta_4 \text{Opportunism} * \text{Other Exclusions} \\
 & + \beta_5 \text{Other Exclusions} + \beta_6 \text{Special items} + \beta_7 \text{Non-GAAP Earnings} + \beta_8 \text{Loss} \\
 & + \beta_9 \text{Sales Growth} + \beta_{10} \text{Market-to-Book} + \beta_{11} \text{Earnings Volatility} + \beta_{12} \text{Log(Total Asset)} \\
 & + \beta_{13} \text{Log(Age)} + \beta_{14} \text{RegG} + \varepsilon
 \end{aligned} \tag{15}$$

The model also enables me to test the quality of non-GAAP exclusions. Prior literature (e.g. Doyle et al. 2003) reports poor quality of non GAAP exclusions because management opportunistically excludes (actually) recurring items from GAAP earnings. Thus I expect negative  $\beta_4$  in equation (15).

## SECTION 5. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

As in prior research (e.g. Bradshaw and Sloan 2002; Doyle et al. 2003), I use I/B/E/S actual earnings to proxy for the non-GAAP earnings figure disclosed by managers in press releases. Although I/B/E/S actual earnings is not a perfect proxy for the firm's disclosed non-GAAP earnings (Bhattacharya et al. 2003), the sample could not overestimate the empirical results because most exclusions in I/B/E/S actual earnings are consistent with management's non-GAAP earnings (Gu and Chen 2004). Moreover, Bhattacharya et al. (2003) report that manager's non-GAAP earnings and I/B/E/S actual earnings metrics coincide in about 60% of cases, and Brown et al. (2009) report that the amounts excluded from GAAP earnings in I/B/E/S is smaller by about 3 cents.

I obtain data from the Preliminary History Quarterly Compustat File and I/B/E/S Split-Unadjusted File for the period between 1998 and 2007 because the use of a firm's non-GAAP earnings becomes popular after 1997 (Brown et al. 2009). The full sample has 111,765 firm-quarters and is used in the cross-sectional model. To obtain firm-specific measures of opportunism and optimism, I only include firms with at least 12 consecutive quarters of data, resulting in 53,277 firm-quarters. Management forecasts are collected from First Call Companies Guideline data file. When the firms disclose management forecasts more than once, I include only the management forecast made on the day closest to the earnings announcement date. After merging with other data, 15,609 observations are available for this analysis.

The data on institutional holdings, one of the control variables, are collected from Thomson-Reuters Institutional (13f) Holdings database. Because the Compustat Quarterly file does not provide debt and equity issuance data, I use Compustat annual data in the tests of capital structure. A total of 14,761 firm-years are used in the test of capital structure.

For testing manager's option exercising, I use Compustat Executive Compensation - Outstanding Equity Awards data file, because the data file provides detailed information, such as exercising price and expiring date of each stock option granted.<sup>11</sup> After merging with Compustat Annual and I/B/E/S, 10,234 unexercised exercisable stock options are available. Among the stock options, 7,760 stock options are in-the-money. In test of mergers and acquisitions, I collect 5,465 mergers and acquisitions (3,698 unique firms) from SDC premium database.

Table 2 presents descriptive statistics on the sample data. The mean (median) non-GAAP EPS is 0.211 (0.160) and GAAP EPS is 0.176 (0.210). These averages fall between those reported in Doyle et al. (2003) and Kolev et al. (2008). Mean operating EPS (0.210) is similar to mean non-GAAP earnings, consistent with these measures representing "core" earnings. Because 45 percent of firms report zero *Other Exclusions*, mean and median *Other Exclusions* are zero. The mean of *Other Exclusions* is 0.125 (-0.056) in samples with positive (negative) *Other Exclusions*. The mean of *Special items (Other Exclusions)* is higher (lower) relative to that reported in Kolev et al. (2008) because my sample period of 1998-2007 includes more post-Regulation G quarters, when firms reduced other exclusions and increased special items, consistent with Kolev et al.'s (2008) findings.

---

<sup>11</sup> Some early studies (e.g. Jin and Kothari 2008) use Compustat Executive compensation file and apply Core and Guay (2002)'s approximation method. However, the approximation becomes less accurate as out-of money options increase (Core and Guay 2002). The Outstanding Equity Award data file provides the expiration date and exercise price for each granted stock option.

## SECTION 6. EMPIRICAL RESULTS

### Cross-Sectional Test of Other Exclusion Decisions

Table 3 shows the cross-sectional results of a firm's other exclusions on current operating EPS and lagged operating income and other exclusions. The first column in Panel A presents a pooled regression for the full sample, and the second to sixth columns present bi-yearly regressions. Consistent with expectations, the coefficient of current operating EPS is significantly negative, but that of lagged operating EPS is highly significantly positive in all the models. These results indicate that managers opportunistically adjust non-GAAP earnings as GAAP earnings changes -- when current operating EPS is low, a manager is more likely to increase other exclusions. Since previous period earnings represents one important earnings benchmarks, the manager is more likely to increase other exclusions when the previous period earnings was high. Meanwhile, the coefficient of lagged other exclusions is significantly positive and the positive relation suggests that firms also tend to consistently exclude items from non-GAAP earnings.

The magnitudes of the relationship are greater in the samples before Regulation G. The coefficient on current operating income (*Operating EPS<sub>q</sub>*) in year 2004 and 2005 is -0.0731, which is only 42 percent of that from 2002-2003. The coefficient on *Operating EPS<sub>q-4</sub>* also decreases in post-Regulation G periods. In contrast, the coefficient on lagged other exclusions (*Other Exclusions<sub>q-4</sub>*) is decreasing during 2004 and 2005 but increasing in 2006 and 2007. The results suggest that Regulation G affects both a manager's opportunistic non-GAAP earnings disclosures and bias for future performance, but that the effect is greater for managerial opportunism.

Panel B in Table 3 reports regression results for each size (total asset) quintile. The coefficients of test variables are consistent with the hypothesis and significant in all quintiles. The magnitudes are largest in the middle quintile firms. In sum, the managerial decisions on non-GAAP earnings are consistent regardless of year or firm size, although there is some variation related to changes in regulation.

### **Firm-Specific Measures of Optimism and Opportunism**

To obtain firm-specific measures of managerial bias and opportunism, I regress equation (2) by firm using 12 quarters of data. Following the assumption that absolute value of  $\beta_1$  is smaller than one, I drop observations when the absolute value of  $\beta_1$  is greater than one. When I employ 16 quarters of data, estimation of Optimism and Opportunism does not change significantly. Table 4 provides summary statistics of the two measures and correlation coefficients with other exclusions, operating EPS, market-to-book ratio, leverage, and firm size. Panel A and Panel B in Table 4 present summary statistics of *Optimism* and *Oppportunism*, respectively. Means of both *Optimism* and *Oppportunism* are decreasing after 2003, but medians are increasing. Panel C in Table 4 shows that both *Optimism* and *Oppportunism* are positively correlated with *Other Exclusions* and firm size ( $\text{Log}(\text{Total Asset})$ ), while *Optimism* (*Oppportunism*) is positively (negatively) correlated with *Operating EPS* and *Market to Book*.

### **Construct Validity Tests**

#### *Meeting/Beating Analyst Forecasts*

Panel A in Table 5 presents a significantly positive relation between opportunism and the probability of meeting or beating and just meeting. Consistent with the prediction, *Oppportunism*

is positively related to the probability of beating/meeting analyst forecasts after controlling for the firm's operating EPS. *Opportunism* is also significantly positively related to *Just Meet* in the second model. The results provide construct validity (convergent validity) because *Opportunism* is positively related to *Meet or Beat* and *Just Meet*, which are previously developed measures of opportunism. In contrast, *Optimism* is significantly related to neither the probability of meeting/beating market forecasts, nor of just meeting. This result provides discriminant validity, because optimistic managers are expected not to use non-GAAP earnings to meet or beat analyst forecasts.

Additionally, I replace the dependent variable of current *Meet or Beat* with future *Meet or Beat* to confirm the stability of the measures of optimism and opportunism. Panel B in Table 5 provides evidence that *Opportunism* measured at quarter  $q$  is related to future probability of beating/meeting analyst forecasts. However, management's optimism does not have a significant relation with the probability of meeting/beating in current period as well as in the future.

#### *Management Forecasts*

Optimistic managers could transfer optimistic expectations to investors via voluntary disclosures, so *Optimism* is expected to be positively related to optimistic management forecasts. Before estimating the relation, I test whether managerial optimism or opportunism could affect manager's management forecasts decision to control for self-selection. Panel A in Table 6 shows the results of the first stage probit model. *Opportunism* is related to the probability of issuing management forecasts with marginal significance, but *Optimism* is not related to the probability.

The insignificant relationship between *Optimism* and the probability of disclosing management forecasts is inconsistent with Hribar and Yang's (2010) result.<sup>12</sup>

Next, I add an inverse Mill's ratio estimated from the first stage model into equation (5) to control for the selection bias. Panel B of Table 6 shows the relationship between opportunism and optimism and the probability of issuing optimistic management forecasts. *Optimism* is positively related to *Optimistic Guidance*, which provides construct validity (convergent validity). The magnitude and significance of the coefficients do not change significantly after adding the inverse Mill's ratio. In contrast, *Opportunism* is negatively related to *Optimistic Guidance*. The result suggests that opportunistic managers are more likely to disclose pessimistic forecast to avoid risks of missing earnings targets.

The second test is whether the measure of optimism could explain managerial overconfident behaviors in management guidance. Managers who overestimate the precision of their private information or underestimate future variance of random process are more likely to issue forecasts as a point relative to non-overconfident managers. While *Opportunism* is not significantly associated with forms of management guidance, I find that *Optimism* is positively related to propensity that managers issue point estimates regardless of controlling self-selection bias of management guidance in Panel C in Table 6. This result provides validity of *Optimism*.

#### *CEO's Stock Option Exercising*

Malmendier and Tate (2005) classifies managers as overconfident if they overexpose themselves to the idiosyncratic risk of their firms. They classify CEOs as overconfident if they exercise options later than the optimal date or hold their options until expiration. Therefore, I

---

<sup>12</sup> A manager's preemptive disclosure of bad news could explain negative relationship between optimism and voluntary disclosure. The managers could disclose voluntarily less frequently because they underestimate probability of bad future outcomes.

posit that a non-GAAP based measure of optimism is positively related to CEO's delays in exercising stock options.

Table 7 provides construct validity (convergent validity) of a non-GAAP based optimism measure. *Optimism* is not positively related to number of unexercised exercisable in-the-money options (*Unexercised Options*) when the model includes all unexercised exercisable in-the-money options. However, *Optimism* is positively related to *Unexercised Options* in subsamples representing delayed exercising, i.e., when I include only unexercised options expiring within the next six months (in other words, the CEO does not exercise the option in 9.5 years). *Optimism* is significantly positively related at the 1% level (coefficient is 0.0034 with 3.22 of t-statistic). When I include only options expiring between the next six months and one year, the magnitude and significance decrease substantially (the coefficient is 0.0016 with 1.82 of t-statistic). In the sample with longer than one year to expiration (third to sixth column in Table 7), *Optimism* and CEO's exercising options are not significantly related.

In contrast, *Opportunism* is negatively related to *Unexercised Options* in the model applying the full sample. The negative association is the most significant in the subsamples with unexercised options expiring within the next six months.

## **Criterion – Related Validity Tests**

### *Earnings Management*

I posit that managers who consistently report higher non-GAAP earnings than GAAP earnings could also manage earnings upward because they are confident that they will reverse the earnings management in the near future. Table 8 presents evidence that optimistic management tends to report higher discretionary accruals, and the positive relationship between *Optimism* and

*Discretionary Accruals* is significant only when firms report positive discretionary accruals. The results suggest that optimistic managers are more likely to conduct income-increasing earnings management. These results are consistent with Hribar and Yang (2010)'s results from a measure of press publications and therefore provide criterion-related validity (concurrent validity).

In contrast, *Opportunism* is significantly negatively related to the level of discretionary accruals in full sample and firms with positive discretionary accruals, but positively related in firms with negative discretionary accruals. In other words, opportunism has a negative relationship with the absolute value of discretionary accruals. These relations suggest that managers who opportunistically adjust non-GAAP earnings are less likely to conduct both income-increasing and income-decreasing GAAP earnings management.

#### *Capital Structure*

My second test of criterion-related validity is how managerial optimism and opportunism are related to firms' capital structure. Table 9 provides evidence that managerial optimism is positively related to firms' leverage. The results in both an OLS model and a Tobit model are significant but the magnitude and significant are larger in a Tobit model, which is designed to estimate linear relationships between variables when Leverage is censored between zero and one. The positive relation between *Optimism* and *Leverage* provide criterion validity because the results are consistent with Heaton (2002)'s prediction. *Opportunism* is not significantly related to firms' capital structure in either model, and the coefficients of the control variables are consistent with prior literature (e.g. Hovakimian et al. 2001). For example, firm's size (*Log(Total Asset)*), tangibility of assets (*PPE*), tax effects (*Operating Loss Carryforward*), and industry mean leverage are positively related to leverage, but growth (*Market-to-Book* and *R&D expense*) are negatively related to firm's leverage.

As a second model to test the association between capital structure and managerial optimism or opportunism, I test firms' preference for debt when they need external financing. The first column in Table 10 shows the result that optimistic managers tend to prefer debt financing to equity financing, but opportunistic managers tend to prefer equity financing when they need external financing. Furthermore, *Optimism\*24 Month Stock Return* is not significant, but *Opportunism\*24month Stock Return* is significantly negative. The result suggests that optimistic managers do not change corporate structure decisions according to market timing, but opportunistic managers choose issuance of equity to debt as stock prices increase. Optimistic managers' preference of debt over equity is consistent with Malmendier et al. (2011) and therefore provides criterion-related validity.

I also partition the samples into high technology and non-high technology industry firms because Schrand and Zechman (2010) report that managerial optimism is more prevalent in growth firms such high technology industry firms. I follow Francis and Schipper's (1999) definition of high technology industry firms, which includes firms in the computer, electronics, pharmaceuticals, and telecommunications industries. The coefficient of *Optimism* is significantly positive only in high-technology firms, and the magnitude and significance are greater than those in full sample. The result confirms the criterion validity.

#### *Investment Decision*

I test how a management's optimism and opportunism affects firm's investment decisions, following Malmendier and Tate (2005). Table 11 presents a negative coefficient of the interaction variable of optimism and cash flow (*Optimism\*Cash flow*) in the regression using all observations. This result is consistent with the hypothesis and Malmendier and Tate's (2005) results that optimistic or overconfident managers tend to increase investment when the firms

have enough to cash flow to invest but reduce investment when the firms do not have enough cash flow.

I also partition the observations by beginning Kaplan and Zingales' (1997) index (KZ-index) for the financial constraint because financially constrained firms are no longer able to issue debt. Kaplan and Zingales (1997) generate direct measures of financing constraints from five accounting ratios meant to quantify these financial constraints: cash flow to total capital, Tobin's Q, debt to total capital, dividends to total capital, and cash holdings to capital.

(Specifically,  $KZ = -1.001909 * Cash\ flow + 0.2826389 * Q + 3.139193 * Leverage - 39.3678 * Dividend - 1.314759 * Cash\ holdings$  and *Cash flow*, *Dividend* and *Cash holdings* are scaled by beginning net property, plant and equipment.)

The positive relationship between *Investment* and *Optimism \* Cash flow* is not significant for less financially constrained firms (first and second quintile firms). There are two subsamples where the coefficient is significantly positive: third quintile and the most constrained quintile. However, the magnitude and significance in the most constrained quintile (the coefficient is 0.214 and t-stat is 4.53) is greater than those in the third quintile (the coefficient is 0.140 and t-stat is 2.85). Therefore, the investment–cash flow sensitivity of optimistic CEOs is more pronounced in equity-dependent firms because financially constrained firms could not use internal cash flow or issue debt.

### *Mergers and Acquisitions*

I test whether non-GAAP earnings based measures of optimism and opportunism are related to firms' merger and acquisition decisions. Panel A of Table 12 shows the results (in models 2 and 3) that managerial opportunism is positively related to the probability of announcing mergers whenever the model includes optimism. *Optimism* is also significantly

positively related to *M&A* when the model does not include *Opportunism* in Model 1; however, the relationship becomes insignificant when the model includes *Opportunism* in Model 3.

Panel B reports results of the OLS model. Both *Optimism* and *Opportunism* are significantly positively related to *Deal amounts*, unlike the result in a probit model. Malmendier and Tate (2008) argue that managerial overconfidence unambiguously predicts more mergers when the CEO does not need to access external capital markets to finance deal. They suggest that an overconfident CEO is more likely to finance mergers using cash. To test this argument, I restrict only firms that announce at least one merger and pay more than 50 percent in cash. The third column in panel B reports that only managerial optimism is positively related to a firm's mergers when the firm completes the mergers using more cash than acquirer's stock or debt financing. These results are also consistent with Shleifer and Vishny (2003) model that suggests opportunistic managers conduct mergers and acquisitions to capitalize short-term overpricing by acquiring relatively underpriced target firms. Their model suggests that opportunistic incentives drive mergers and acquisitions only when acquirers finance using their stock. *Opportunism* is not significantly related to mergers and acquisitions when I include only firms that finance more than 50 percent using cash.

#### *Future Performance and Exclusion Quality*

Lastly, I examine whether optimism and opportunism are associated with future firm performance. The models also enable us to test the quality of non GAAP exclusions. Panel A in Table 13 shows the result that optimism and future operating EPS has a positive relationship, suggesting that a manager's optimism could not be overoptimistic but be realistic to be achieved in average. This result is consistent with Davis et al. (2008)'s result that future ROA is significantly positively (negatively) associated with levels of optimistic (pessimistic) tone in

earnings press releases and future ROA. However, the relationship becomes negative in the high-technology industry (the second column) and the results support Gombola and Marciukaityte's (2007) findings that firms managed by overoptimistic managers are expected to underperform in growth industries because of overinvestment. Opportunism is not related to future operating EPS significantly. Non-GAAP exclusions initiated by optimism do not tend to be poor in quality because the interaction variable optimism and other exclusions are positive and significant. The results provide criterion related validity (predictive validity).

Panel B in Table 11 presents the result of regression using samples with non-zero exclusions. The results are not different from those in panel A except for the coefficient of *Opportunism\* Other Exclusions*. The result provides evidence that non GAAP exclusions driven by opportunistic have lower quality because the exclusions are more likely to recur negatively in future.

## SECTION 7. CONCLUSION

I develop new measures of optimism and opportunism estimated from firm's non-GAAP earnings disclosures, exploiting the fact that both a managerial bias regarding future performance and opportunistic motivations are simultaneously reflected in non-GAAP earnings. I estimate firm-specific measures of managerial opportunism and bias for future performance using time-series regressions and evaluate construct and criterion-related validity of the measures.

In construct validity tests, I find that non-GAAP earnings based measure of optimism is positively correlated to management optimistic earnings forecasts and CEOs' delays in option exercising. The measure of opportunism is positively correlated to the propensity of meeting/beating analyst forecasts. Since non-GAAP based measures are correlated to previously developed measures, the measures hold construct validity. The non-GAAP based measures also explain firm's earnings management, capital structure, investment decisions and future performance as exhibited by optimistic or opportunistic managers. The consistent results with prior studies applying other measures provide criterion-related validity.

There are at least two possible limitations to the study. Because I rely on I/B/E/S as the data source for non-GAAP earnings, I may not capture managers' optimistic bias or opportunistic behavior because analysts do make adjustments to the numbers reported by managers in press releases.<sup>13</sup> Second, the measure of optimism may not capture a manager's self-serving attribution bias and thus the measure of opportunism could be underestimated when manager's optimism increases as firm's performance improves.

---

<sup>13</sup>However, Bhattacharya et al. (2003) find that over 65% of their hand-collected non-GAAP earnings perfectly match the IBES actual earnings. The remaining difference between the median hand-collected non-GAAP EPS and the median IBES EPS is only one cent. Doyle et al. (2003) also report that 48 cases of IBES actual earnings are identical with earnings in the press release among 50 randomly selected samples.

In spite of the limitations, there are several attractive features to the disclosure-based measures of optimism and opportunism. First, because non-GAAP earnings data can be easily obtained from forecast service providers, researchers will be able to examine questions related to managerial optimism or overconfidence using much larger samples than they were previously able, thereby enhancing the generalizability of their results. Second, a non-GAAP earnings based measure will have less severe endogeneity problems than the measures based on stock option exercising, because it is less likely that the release of non-GAAP earnings affects a firm's financial policies directly. Third, non-GAAP exclusions have more objective benchmark to determine whether managers are optimistic than management forecasts. Lastly, non-GAAP earnings-based measure of optimism (opportunism) enables researchers to control for opportunism (optimism), which may coexist and affect firms' decisions of financial structure, investment and reporting decisions.

**TABLE 1**  
**Variable definitions**

Variable name	Definitions
<i>GAAP earnings</i>	Earnings per share (basic) before extraordinary items and discontinued operations scaled by beginning stock price
<i>Non-GAAP earnings</i>	I/B/E/S reported actual earnings per share scaled by beginning stock price
<i>Non-GAAP Exclusions</i>	<i>Non-GAAP earnings</i> less <i>GAAP earnings</i> ;
<i>Other Exclusions</i>	<i>Non GAAP Exclusions</i> less <i>Special Item</i> scaled by beginning stock price
<i>Special Item</i>	<i>Operating EPS</i> less <i>GAAP Earnings</i>
<i>Operating EPS</i>	Operating earnings per share
<i>Market to Book</i>	Market value of equity to book value of equity
<i>Institutional holdings</i>	Shares owned by institutional investors to total shares outstanding
<i>Earnings Volatility</i>	Standard deviation of return on assets over at least six of the preceding eight quarters
<i>Optimism</i>	$\alpha_0/(1-\beta_1)$ from equation (2)
<i>Opportunism</i>	$-(\beta_2+\beta_3)/(1-\beta_1)$ from equation (2)
<i>Meet or Beat</i>	An indicator variable, one when firm's non-GAAP earnings are not smaller than mean of analyst forecasts otherwise zero
<i>Just meet</i>	An indicator variable, one when a firm's earnings surprise is between 0 and one cent, otherwise zero
<i>Guidance</i>	An indicator variable, one if a firm issues management forecasts, otherwise zero
<i>Optimistic Guidance</i>	An indicator variable, one when firm's non-GAAP earnings are smaller than management forecasts, otherwise zero
<i>Point</i>	An indicator variable, one when firm issues management forecasts with point estimates, otherwise zero
<i>Horizon</i>	A number of days between date of guidance and period end date of forecasts
<i>Leverage</i>	Total debt divided by total debt and equity
<i>ROA</i>	Operating income divided by beginning total asset
<i>Loss</i>	An indicator variable, one when firm's net income is below zero otherwise zero
<i>Analyst</i>	Number of analyst covering the firm
<i>Quarter4</i>	An indicator variable, one if fiscal quarter is 4 <sup>th</sup> quarter zero otherwise
<i>Unexercised Options</i>	CEO's shares of unexercised exercisable in-the-money stock options scaled by number of shares outstanding
<i>In-the-money option</i>	The stock option that exercising price is higher than stock price as of fiscal year end
<i>CEO Age</i>	CEO Age
<i>CEO Tenure</i>	CEO tenure as of fiscal year ends
<i>Discretionary Accruals</i>	Performance matched discretionary accruals, computed by method of Kothari et al. (2005)

Table 1, continued

Variable name	Definitions
<i>Debt Choice</i>	An indicator variable, one when a firm's debt increases by more than 5% of beginning total equity; zero when a firm issues equity more than 5% of beginning total asset
<i>Industry mean Leverage</i>	Mean of <i>leverage</i> , computed using two-digit SIC industry means for a given year.
<i>Stock return</i>	Annual buy-and-hold return
<i>PPE</i>	Property, plant, and equipment, net. PPE, gross is used for computing discretionary accruals
<i>R&amp;D Expense</i>	Research and Development expenses scaled by net sales
<i>KZ</i>	Kaplan and Zingales (1997)'s index.
<i>Cash flow</i>	Operating income plus depreciation and amortization
<i>Q</i>	Tobin's Q, (total asset + market value of equity-book value of equity)/total asset
<i>Investment</i>	Capital expenditure scaled by <i>PPE</i>
<i>RegG</i>	An indicator variable, one if firms fiscal quarter ends after March 2003
<i>High Tech</i>	An indicator variable, one if firm is included in high tech industry, classified by Francis and Shipper (1999)
<i>Sales Growth</i>	Quarter-over-quarter increase in sales
<i>M&amp;A</i>	An indicator variable, one if a firm announce at least one completed merger bid
<i>Deal amount</i>	M&A deal amounts scaled by market value.

**TABLE 2**  
**Descriptive statistics**

variable	N	Mean	p25	Median	p75	Standard deviation
<u>Quarterly data</u>						
<i>Non-GAAP earnings (unscaled)</i>	111765	0.211	0.000	0.160	0.390	0.416
<i>GAAP earnings (unscaled)</i>	111765	0.176	-0.040	0.150	0.390	0.515
<i>Operating EPS (unscaled)</i>	111765	0.210	-0.020	0.160	0.400	0.447
<i>Special items (unscaled)</i>	111765	0.033	0.000	0.000	0.000	0.169
<i>Other Exclusions (unscaled)</i>	111765	0.000	-0.010	0.000	0.000	0.111
<i>Loss</i>	111765	0.279	0.000	0.000	1.000	0.449
<i>Market to Book</i>	111765	3.046	1.295	2.089	3.558	4.048
<i>Institutional holdings</i>	111765	0.527	0.279	0.545	0.774	0.292
<i>Earnings Volatility</i>	111765	0.025	0.006	0.012	0.027	0.040
<i>Beat or meet</i>	91366	0.684	0.000	1.000	1.000	0.465
<i>Just meet</i>	91366	0.187	0.000	0.000	0.000	0.390
<i>Leverage</i>	111765	0.317	0.025	0.274	0.509	0.294
<i>ROA</i>	111765	-0.001	-0.003	0.010	0.022	0.051
<i>Loss</i>	111765	0.279	0.000	0.000	1.000	0.449
<i>Analyst</i>	91366	6.644	2.000	5.000	9.000	5.938
<i>Qauter4</i>	111765	0.248	0.000	0.000	0.000	0.432
<i>Stock Return</i>	111721	1.181	0.820	1.099	1.410	0.631
<i>Sales growth</i>	109516	0.497	-0.035	0.220	0.744	1.581
<i>Guidance</i>	47525	0.330	0.000	0.000	1.000	0.470
<i>Optimistic Guidance Point</i>	15609	0.426	0.000	0.000	1.000	0.495
<i>Horizon</i>	15609	132.006	57.000	72.000	229.000	118.617
<i>Discretionary Accruals</i>	95973	-0.003	-0.033	-0.001	0.030	0.080
<i>Total Asset (in \$M)</i>	111765	2910.831	104.825	360.235	1385.025	15471.840
<i>Sales (in \$M)</i>	111765	645.698	22.949	87.753	332.266	2847.466

Table 2, continued

variable	N	Mean	p25	Median	p75	Standard deviation
<u>Annual Data</u>						
<i>3year mean ROA</i>	14732	0.106	0.075	0.122	0.174	0.140
<i>24month Stock Return</i>	14776	0.374	-0.135	0.222	0.646	0.886
<i>Operating loss carry forward</i>	14781	0.142	0.000	0.000	0.038	0.559
<i>R&amp;D Expense</i>	14739	0.169	0.000	0.001	0.070	0.852
<i>Debt choice</i>	2954	0.611	0.000	1.000	1.000	0.488
<i>Investment</i>	14593	0.299	0.120	0.205	0.354	0.360
<i>Cash flow</i>	14641	0.617	0.216	0.528	1.138	4.097
<i>Q</i>	14770	1.983	1.172	1.553	2.267	1.394
<i>KZ</i>	14296	-5.705	-5.454	-1.341	0.507	19.567
<i>Unexercised Options (%)</i>	7760	0.135	0.018	0.054	0.149	0.224
<i>CEO Age</i>	7760	55.996	52.000	56.000	60.000	6.370
<i>CEO Tenure</i>	7760	6.740	1.706	5.069	9.383	6.781
<i>M&amp;A</i>	14,781	0.250	0	0	1	0.433
<i>Deal Amounts</i>	14,781	0.028	0	0	0.001	0.090

All continuous variables are winsorized at the first and 99<sup>th</sup> percentiles.

Observations in annual data represent number of observation when *Optimism* and *Opportunism* are available.

*Unexercised Options* includes only in-the money exercisable options.

**TABLE 3**  
**Regression Analysis of Non-GAAP Exclusions**

$$\begin{aligned} \text{Other Exclusions}_q = & \alpha_0 + \beta_1 \text{Other Exclusions}_{q-4} + \beta_2 \text{Operating EPS}_q + \beta_3 \text{Operating EPS}_{q-4} \\ & + \beta_4 \text{Log(Total Asset)} + \beta_5 \text{Log(Sales)} + \beta_6 \text{Market to Book} + \beta_7 \text{Institutional holdings} \\ & + \beta_8 \Delta \text{Log(Total Asset)} + \beta_9 \Delta \text{Log(Sales)} + \beta_{10} \Delta \text{Market to Book} \\ & + \beta_{11} \Delta \text{Institutional holdings} + \beta_{12} \text{Earnings Volatility} + \varepsilon \end{aligned}$$

*Panel A: Pulling regression and biyearly regression*

	Full sample	Y98&99	Y00&01	Y02&03	Y04&05	Y06&07
<i>Constant</i>	-0.0037*** (-5.09)	0.0025 (1.45)	-0.0102*** (-4.71)	-0.0047** (-2.55)	-0.0029** (-2.57)	-0.0019 (-1.59)
<i>Other Exclusions<sub>q-4</sub></i>	0.1284*** (22.57)	0.1023*** (7.07)	0.1419*** (8.26)	0.1634*** (13.73)*	0.0834*** (9.26)	0.1354*** (12.35)
<i>Operating EPS<sub>q</sub></i>	-0.1592*** (-91.56)	-0.1913*** (-51.30)	-0.2045*** (-49.44)	-0.1731*** (-41.46)	-0.0742*** (-21.02)	-0.0585*** (-15.86)
<i>Operating EPS<sub>q-4</sub></i>	0.0038*** (22.20)	0.0056*** (13.11)	0.0046*** (8.76)	0.0061*** (13.80)	0.0010*** (3.63)	0.0011*** (4.15)
<i>Log(Total Asset)</i>	-0.0006*** (-8.08)	-0.0014*** (-7.64)	-0.0006*** (-2.74)	-0.0005** (-2.59)	-0.0001 (-1.11)	0.0000 (0.09)
<i>Log(Sales)</i>	0.0008*** (11.91)	0.0014*** (7.85)	0.0012*** (5.83)	0.0007*** (3.96)	0.0003** (2.38)	0.0001 (0.48)
<i>Market to Book</i>	-0.0001*** (-4.80)	-0.0001*** (-3.59)	-0.0001*** (-2.66)	0.0000 (-1.01)	0.0000 (-0.72)	0.0000 (-0.56)
<i>Institutional holdings</i>	0.0002 (1.01)	0.0001 (0.23)	-0.0001 (-0.17)	0.0014** (2.34)	0.0011*** (3.06)	0.0007* (1.84)
<i>ΔLog(Total Asset)</i>	0.0022*** (9.53)	0.0025*** (5.00)	0.0006 (1.05)	0.0011 (1.63)	0.0029*** (7.34)	0.0029*** (6.98)
<i>ΔLog(Sales)</i>	0.0004** (2.38)	0.0002 (0.47)	0.0014*** (3.21)	0.0013*** (3.25)	-0.0001 (-0.37)	-0.0004* (-1.68)
<i>ΔInstitutional holdings</i>	0.0003 (0.66)	0.0008 (0.79)	-0.0011 (-0.82)	0.0014 (1.02)	0.0012 (1.54)	-0.0002 (-0.23)
<i>Earnings Volatility</i>	0.0044*** (2.75)	-0.0078** (-2.22)	0.0223*** (5.21)	0.0095** (2.42)	-0.0159*** (-5.44)	0.0067** (2.24)
Observations	110,538	22,199	21,473	20,420	22,718	23,728
Adjusted R <sup>2</sup>	8.17%	11.38%	12.71%	9.24%	2.51%	2.1%

*Panel B: Regressions by firm size quintile*

<i>Size Quintile</i>	1 <sup>st</sup> quintile	2 <sup>nd</sup> quintile	3 <sup>rd</sup> quintile	4 <sup>th</sup> quintile	5 <sup>th</sup> quintile
<i>Mean total asset</i>	\$ 37M	\$ 125M	\$344M	\$1,015M	\$12,202M
<i>Constant</i>	-0.0295*** (-4.83)	0.0006*** (0.08)	0.0137*** (2.37)	0.0097*** (2.22)	0.0052*** (3.29)
<i>Other Exclusions<sub>q-4</sub></i>	0.1208*** (7.49)	0.1561*** (11.36)	0.1668*** (14.54)	0.1153*** (10.33)	0.1039*** (11.44)
<i>Operating EPS<sub>q</sub></i>	-0.1320*** (-26.87)	-0.1567*** (-36.37)	-0.2074*** (-60.97)	-0.1824*** (-52.87)	-0.1616*** (-54.69)
<i>Operating EPS<sub>q-4</sub></i>	0.0082*** (7.68)	0.0054*** (8.77)	0.0080*** (20.74)	0.0049*** (17.39)	0.0027*** (16.35)
<i>Log(Total Asset)</i>	0.0010*** (2.47)	-0.0009*** (-1.90)	-0.0011*** (-3.43)	-0.0008*** (-3.15)	-0.0006*** (-5.48)
<i>Log(Sales)</i>	0.0007*** (3.68)	0.0009*** (5.01)	0.0004*** (2.94)	0.0003*** (2.36)	0.0005*** (4.79)
<i>Market to Book</i>	0.0000*** (1.03)	0.0000*** (-0.51)	-0.0001*** (-3.43)	-0.0001*** (-2.14)	-0.0001*** (-4.06)
<i>Institutional holdings</i>	-0.0012*** (-0.94)	0.0006*** (0.79)	-0.0001*** (-0.17)	-0.0001*** (-0.25)	-0.0009*** (-2.87)
<i>ΔLog(Total Asset)</i>	0.0042*** (5.88)	0.0013*** (2.15)	-0.0008*** (-1.65)	-0.0001*** (-0.31)	0.0006*** (1.68)
<i>ΔLog(Sales)</i>	0.0004*** (1.04)	0.0005*** (1.45)	0.0022*** (6.13)	0.0011*** (3.01)	-0.0001*** (-0.26)
<i>ΔInstitutional holdings</i>	-0.0017*** (-0.81)	0.0006*** (0.45)	0.0017*** (1.97)	-0.0002*** (-0.21)	0.0005*** (0.67)
<i>Earnings Volatility</i>	-0.0033*** (-0.85)	0.0163*** (4.37)	0.0253*** (7.42)	0.0284*** (7.48)	0.0174*** (4.80)
Observations	18,861	21,503	22,879	23,648	23,647
Adjusted R <sup>2</sup>	4.15%	7.29%	16.19%	12.36%	12.73%

This table reports results for association between non-GAAP exclusions and operating EPS. In Panel A, I report results of pooling regression (first column) and bi-yearly regression (from second to sixth column). In panel B, Firms are partitioned by firm size (total asset). Definitions of variables are provided in table 1.

Coefficient t-statistics are in brackets. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 4**  
**Non-GAAP earnings-based measures of Optimism and Opportunism**

*Panel A: Summary Statistics of Optimism*

Year	N	Mean	p25	Median	p75	Standard Deviation
2000	1,749	0.0074	-0.0004	0.0001	0.0021	0.1855
2001	6,917	0.0078	-0.0004	0.0002	0.0024	0.1984
2002	6,929	0.0083	-0.0005	0.0002	0.0021	0.1951
2003	7,048	0.0100	-0.0005	0.0001	0.0021	0.1958
2004	7,255	0.0081	-0.0004	0.0002	0.0023	0.1671
2005	7,509	0.0081	-0.0004	0.0003	0.0027	0.1529
2006	7,882	0.0063	-0.0004	0.0004	0.0030	0.1768
2007	7,988	0.0047	-0.0004	0.0004	0.0033	0.1676
Total	53,277	0.0075	-0.0004	0.0002	0.0026	0.1794

*Panel B: Summary Statistics of Opportunism*

Year	N	Mean	p25	Median	p75	Standard Deviation
2000	1,749	0.1073	-0.0022	0.0369	0.1900	0.3400
2001	6,917	0.1174	-0.0018	0.0408	0.2156	0.3485
2002	6,929	0.1275	0.0000	0.0457	0.2233	0.3533
2003	7,048	0.1287	0.0000	0.0450	0.2286	0.3546
2004	7,255	0.1500	0.0006	0.0543	0.2559	0.3339
2005	7,509	0.1426	0.0016	0.0582	0.2565	0.3381
2006	7,882	0.1402	0.0000	0.0576	0.2427	0.3531
2007	7,988	0.1298	-0.0066	0.0580	0.2438	0.3642
Total	53,277	0.1331	0.0000	0.0512	0.2372	0.3495

Panel C: Correlation coefficients

	<i>Optimism</i>	<i>Opportunism</i>	<i>Other Exclusions</i>	<i>Operating EPS</i>	<i>Leverage</i>	<i>Market to Book</i>	<i>Log (TotalAsset)</i>
<i>Optimism</i>		0.435 (0.00)	0.129 (0.00)	0.074 (0.00)	0.008 (0.08)	0.029 (0.00)	0.110 (0.00)
<i>Opportunism</i>	0.055 (0.00)		0.067 (0.00)	0.004 (0.31)	0.024 (0.00)	-0.009 (0.03)	0.093 (0.00)
<i>Other Exclusions</i>	0.053 (0.00)	0.129 (0.00)		-0.437 (0.00)	-0.080 (0.00)	-0.101 (0.00)	-0.110 (0.00)
<i>Operating EPS</i>	0.016 (0.00)	-0.016 (0.00)	-0.347 (0.00)		0.114 (0.00)	0.230 (0.00)	0.487 (0.00)
<i>Leverage</i>	0.003 (0.53)	0.017 (0.00)	-0.028 (0.00)	0.048 (0.00)		-0.115 (0.00)	0.409 (0.00)
<i>Market to Book</i>	0.006 (0.14)	-0.017 (0.00)	-0.012 (0.00)	0.011 (0.00)	-0.055 (0.00)		0.125 (0.00)
<i>Log (Total Asset)</i>	0.010 (0.02)	0.092 (0.00)	-0.025 (0.00)	0.418 (0.00)	0.343 (0.00)	-0.042 (0.00)	

This table reports summary statistics of non-GAAP earnings based measures of *Optimism* and *Opportunism*, which are measured from firm-level time-series regressions of non-GAAP exclusions on GAAP earnings using twelve quarters data. Panel A and B show yearly descriptive statistics of *Optimism* and *Opportunism*, respectively. Panel C reports correlation coefficients among *Optimism*, *Opportunism* and other control variables. Bottom left represents Pearson correlations and up right represents Spearman correlations. P-values are in parentheses.

**TABLE 5**  
**Probit Analysis of Meeting or Beating Market Expectations**

$$\text{Meet or Beat (Just Meet)} = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Operating EPS} \\ + \beta_4 \text{Leverage} + \beta_5 \text{Market to Book} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Institutional holdings} + \varepsilon$$

*Panel A: The dependent variable is current Meet or Beat or Just Meet*

Dependent Variable	<i>Meet or Beat</i>		<i>Just Meet</i>	
	Coefficient	z-stat	Coefficient	z-stat
<i>Constant</i>	-0.250 ***	-2.93	-1.342 ***	-14.36
<i>Optimism</i>	-0.017	-0.47	0.012	0.30
<i>Opportunism</i>	0.118 ***	6.36	0.089 ***	4.41
<i>Operating EPS</i>	0.603 ***	38.31	-0.276 ***	-15.57
<i>Leverage</i>	-0.362 ***	-15.41	-0.455 ***	-17.00
<i>Market to Book</i>	0.022 ***	12.84	0.018 ***	9.93
<i>Log(Total Asset)</i>	0.020 ***	4.42	0.025 ***	5.07
<i>Institutional holdings</i>	0.364 ***	13.34	0.077 **	2.52
Observations	47,525		47,525	
Pseudo R <sup>2</sup>	5.3%		1.5%	

*Panel B: Dependent variable is future Meet or Beat*

Dependent Variable	1 quarter ahead		2 quarter ahead		3 quarter ahead		4 quarter ahead	
	<i>Meet or Beat</i>		<i>Meet or Beat</i>		<i>Meet or Beat</i>		<i>Meet or Beat</i>	
	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat
<i>Constant</i>	-0.966 ***	-11.02	-1.074 ***	-11.87	-1.194 ***	-12.80	-1.186 ***	-12.34
<i>Optimism</i>	-0.020	-0.53	-0.022	-0.59	0.053	1.35	-0.006	-0.14
<i>Opportunism</i>	0.085 ***	4.46	0.086 ***	4.37	0.069 ***	3.41	0.064 ***	3.02
<i>Operating EPS</i>	0.201 ***	13.07	0.140 ***	8.83	0.081 ***	4.95	0.075 ***	4.48
<i>Leverage</i>	-0.385 ***	-16.04	-0.379 ***	-15.29	-0.396 ***	-15.49	-0.388 ***	-14.71
<i>Market to Book</i>	0.021 ***	11.92	0.020 ***	11.16	0.020 ***	10.93	0.018 ***	9.42
<i>Log(Total Asset)</i>	0.062 ***	13.26	0.070 ***	14.54	0.077 ***	15.62	0.079 ***	15.45
<i>Institutional holdings</i>	0.343 ***	12.28	0.298 ***	10.32	0.283 ***	9.49	0.250 ***	8.11
Observations	44,803		42,341		39,964		37,704	
Pseudo R <sup>2</sup>	2.4%		2.1%		1.9%		1.7%	

This table reports results of probit models of a probability of meeting and beating market expectations. Panel A reports model probit in which dependent variable is *Meet or Beat* and *Just meet*. *Meet or Beat* is an indicator variable, one if firm's non-GAAP earnings (IBES actual) is greater than (or equals to) mean of forecasts, otherwise zero. *Just Meet* is one if earnings surprise is between zero and one cent, inclusive. In panel B, I replace a dependent variable with future *Meet or Beat*. *Optimism* is  $\alpha_0/(1-\beta_1)$ , and *Opportunism* is  $-(\beta_2 + \beta_3)/(1-\beta_1)$ .  $\alpha_0$ ,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are estimated from the equation (2). Definitions of other variables are provided in Table 1.

\*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 6**  
**Probit Analysis of Management Forecasts**

*Panel A: Dependent variable is Guidance (Issuing management forecasts)*

$$\text{Guidance} = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Log}(\text{Analyst}) + \beta_4 \text{Market to Book} + \beta_5 \text{Log}(\text{Total Asset}) + \beta_6 \text{Leverage} + \beta_7 \text{Institutional holdings} + \varepsilon$$

	Coefficient	z-stat
<i>Constant</i>	-3.2207 ***	-34.15
<i>Optimism</i>	0.0099	0.27
<i>Opportunism</i>	0.0351 *	1.90
<i>Log(Analyst)</i>	0.0950 ***	10.20
<i>Market to Book</i>	-0.0018	-1.05
<i>Leverage</i>	-0.0401 *	-1.67
<i>Log(Total Asset)</i>	0.1080 ***	21.49
<i>Institutional Holdings</i>	0.5698 ***	19.28
Observations	47,525	
Pseudo R2	4.42%	

Panel B: Dependent variable is Optimistic management forecast

$$\begin{aligned} \text{Optimistic Guidance} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Horizon} + \beta_4 \text{Beat or Meet} \\ & + \beta_5 \text{Market to Book} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Leverage} + \beta_8 \text{Institutional holdings} \\ & (+ \beta_9 \text{Mills}) + \varepsilon \end{aligned}$$

	Without controlling selection bias		With controlling selection bias	
	Coefficient	z-stat	Coefficient	z-stat
<i>Constant</i>	1.5702 ***	10.72	3.9591 ***	4.54
<i>Optimism</i>	0.1301 *	1.86	0.1232 *	1.76
<i>Opportunism</i>	-0.1919 ***	-5.65	-0.2124 ***	-6.11
<i>Horizon</i>	0.0026 ***	27.89	0.0026 ***	28.01
<i>Beat or Meet</i>	-1.0140 ***	-38.47	-1.0209 ***	-38.54
<i>Market to Book</i>	-0.0109 ***	-3.47	-0.0119 ***	-3.74
<i>LogAsset</i>	-0.0666 ***	-9.26	-0.1341 ***	-5.3
<i>Leverage</i>	0.2077 ***	4.81	0.2587 ***	5.51
<i>Institutional Holdings</i>	0.1105 **	2.08	-0.2274 *	-1.71
<i>Mills</i>			-0.6970 ***	-2.78
Observations	15,609		15,609	
Pseudo R <sup>2</sup>	11.56%		11.6%	

Panel C: Dependent variable is Management Guidance with a Point Estimate

$$\text{Point} = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Horizon} + \beta_4 \text{Beat or Meet} \\ + \beta_5 \text{Market to Book} + \beta_6 \text{Log}(\text{Market value of equity}) + \beta_7 \text{Leverage} + \beta_8 \text{Institutional} \\ \text{holdings} (+ \beta_9 \text{Mills}) + \varepsilon$$

	Without controlling selection bias		With controlling selection bias	
	Coefficient	z-stat	Coefficient	z-stat
<i>Constant</i>	-2.0589 ***	-13.94	-3.3542 ***	-4.92
<i>Optimism</i>	0.1240 *	1.78	0.1268 *	1.81
<i>Opportunism</i>	-0.0382	-1.10	-0.0276	-0.78
<i>Horizon</i>	-0.0009 ***	-9.26	-0.0009 ***	-9.37
<i>Beat or Meet</i>	0.1348 ***	4.81	0.1339 ***	4.78
<i>Market to Book</i>	0.0155 ***	4.86	0.0121 ***	3.32
<i>Log(Market Value of equity)</i>	0.0536 ***	7.57	0.0896 ***	4.52
<i>Loss</i>	0.0695 **	2.03	0.0788 **	2.28
<i>Leverage</i>	0.1098 ***	2.70	0.1328 ***	3.15
<i>Institutional holdings</i>	-0.1679 ***	-3.07	0.0101	0.10
<i>Mills</i>			0.3859 *	1.95
Observations	19,234		19,234	
Pseudo R <sup>2</sup>	1.34%		1.70%	

This table reports probit models of issuing optimistic management guidance (*Optimistic Guidance*) and point estimate (*Point*). In panel A, I run a probit model of guidance and estimate inverse Mill's ratio (*Mills*). Panel B reports results of the probit model of optimistic guidance including *Mills* to control self selection biases of providing guidance. Panel C reports results of the probit model of guidance of point estimates including *Mills*. Definitions of other variables are provided in Table 1.

\*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively

**TABLE 7**  
**Regression Analysis of CEO's Stock Option Holding**

$$\begin{aligned} \text{Unexercised Options} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Log(Total Asset)} \\ & + \beta_4 \text{Market to Book} + \beta_5 \text{Leverage} + \beta_6 \text{Institutional holdings} + \beta_7 \text{Stock return} \\ & + \beta_8 \text{CEO Age} + \beta_9 \text{CEO Tenure} + \varepsilon \end{aligned}$$

Stock Option Expiration date	Full Sample	Within 6 month	6month to 1yr	1yr to 2yrs	2yrs to 3yrs	longer than 3 yrs
<i>Constant</i>	0.0092*** (20.38)	0.0052 (1.61)	0.0078** (2.27)	0.0101*** (5.55)	0.0093*** (5.84)	0.0093*** (18.93)
<i>Optimism</i>	0.0002 (1.07)	0.0034*** (3.22)	0.0016* (1.82)	0.0004 (0.51)	0.0001 (0.25)	-0.0001 (-0.45)
<i>Opportunism</i>	-0.0002*** (-2.76)	-0.0013** (-2.28)	-0.0005 (-1.06)	-0.0006** (-2.06)	-0.0003 (-1.25)	-0.0001 (-0.85)
<i>Log(Total Asset)</i>	-0.0005*** (-25.67)	-0.0005*** (-3.58)	-0.0004*** (-3.41)	-0.0005*** (-6.27)	-0.0005*** (-7.38)	-0.0005*** (-23.64)
<i>Market-to-Book</i>	0.0000*** (-2.87)	0.0000 (-0.31)	0.0000 (-0.24)	0.0000 (-0.12)	0.0000 (-1.06)	0.0000*** (-2.87)
<i>Leverage</i>	0.0008*** (6.70)	0.0009 (0.99)	-0.0009 (-0.98)	0.0001 (0.21)	0.0007 (1.64)	0.0009*** (7.30)
<i>Institutional holdings</i>	0.0006*** (3.52)	0.0010 (0.84)	0.0003 (0.23)	0.0014** (2.20)	0.0007 (1.36)	0.0004** (2.43)
<i>Stock Return</i>	-0.0003*** (-3.62)	-0.0004 (-0.63)	0.0000 (0.00)	-0.0005 (-1.49)	-0.0002 (-0.81)	-0.0003*** (-3.04)
<i>CEO Age</i>	0.0000*** (4.57)	0.0001*** (3.09)	0.0000 (1.51)	0.0000 (-0.31)	0.0000 (1.37)	0.0000*** (3.96)
<i>CEO Tenure</i>	0.0001*** (14.43)	0.0001*** (3.13)	0.0000* (1.91)	0.0001*** (4.55)	0.0001*** (5.66)	0.0001*** (11.54)
Observations	7,760	178	175	627	797	5,983
Adjusted R <sup>2</sup>	14.74%	25.05%	14.55%	14.42%	15.02%	14.37%

This table report results of an OLS model of CEO's stock option exercising. The first column includes all unexercised exercisable in-the-money options, and second to sixth columns are partitioned by holding periods of stock options. Definitions of variables are provided in Table 1.

Coefficient t-statistics are in brackets. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 8**  
**Regression Analysis of Discretionary Accruals**

$$\text{Discretionary Accruals} = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Beat or Meet} + \beta_4 \text{ROA} + \beta_5 \text{Loss} + \beta_6 \text{Log(Total Asset)} + \beta_7 \text{Market to Book} + \beta_8 \text{Leverage} + \beta_9 \text{Log(Analyst)} + \beta_{10} \text{Institutional holdings} + \beta_{11} \text{Quarter4} + \varepsilon$$

	Full samples		Positive Discretionary Accrual Firms		Negative or Zero Discretionary Accrual firms	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
<i>Constant</i>	0.008	1.57	0.089 ***	18.59	-0.082 ***	15.47
<i>Optimism</i>	0.004 **	2.00	0.004 **	2.25	-0.001	-0.77
<i>Opportunism</i>	-0.002 *	-1.77	-0.002 **	-2.34	0.002 **	2.21
<i>Beat or Meet</i>	0.002 **	2.22	0.002 **	2.46	0.000	-0.34
<i>ROA</i>	0.003	0.31	-0.045 ***	-4.88	0.053 ***	5.15
<i>Loss</i>	-0.002 *	-1.86	0.005 ***	5.00	-0.006 ***	-6.12
<i>Log(Total Asset)</i>	-0.001 **	-2.00	-0.002 ***	-9.37	0.002 ***	6.69
<i>Market to Book</i>	0.000 **	-2.27	0.001 ***	6.95	-0.001 ***	-9.03
<i>Leverage</i>	0.007 ***	5.37	-0.001	-0.65	0.004 ***	2.97
<i>Log(Analyst)</i>	-0.001	-1.45	-0.001 ***	-2.91	0.001 *	1.88
<i>Institutional Holdings</i>	-0.001	-0.90	-0.001	-0.76	0.000	0.22
<i>Quarter4</i>	0.000	-0.43	0.005 ***	6.97	-0.004 ***	-6.09
Observations	41844		20241		21603	
Adj.R <sup>2</sup>	0.12%		3.12%		2.43%	

This table presents analysis of earnings management by optimistic and opportunistic managements. *Discretionary Accruals* are estimated from Kothari et al. (2004)'s performance matched discretionary accrual model. The first column includes all observations and second to third columns are partitioned by a sign of *Discretionary Accruals*. Definitions of variables are provided in table 1. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 9**  
**Regression Analysis of Capital structure**

$$\begin{aligned} \text{Leverage} = & a_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{3 Year Mean ROA} \\ & + \beta_4 \text{Operating Loss Carry forward} + \beta_5 \text{24 month Stock Return} + \beta_6 \text{Market to Book} \\ & + \beta_7 \text{R\&D Expense} + \beta_8 \text{PPE} + \beta_9 \text{Log(Total Asset)} + \beta_{10} \text{Industry mean Leverage} + \varepsilon \end{aligned}$$

	OLS		Tobit	
	Coefficient	t-stat	Coefficient	t-stat
<i>Constant</i>	-0.704***	-35.53	-0.909***	-38.79
<i>Optimism</i>	0.018*	1.86	0.024**	2.12
<i>Opportunism</i>	-0.003	-0.65	-0.006	-1.03
<i>3 Year mean ROA</i>	-0.198***	-11.99	-0.216***	-10.84
<i>Operating Loss Carry forward</i>	0.011***	3.05	0.015***	3.45
<i>24 Month Stock Return</i>	0.000	0.876	0.004*	1.70
<i>Market to Book</i>	-0.027***	-19.84	-0.038***	-22.61
<i>R&amp;D expense</i>	-0.004*	-1.67	-0.004	-1.31
<i>PPE</i>	0.122***	13.92	0.150***	14.78
<i>Log (Total Asset)</i>	0.042***	41.39	0.050***	42.50
<i>Industry mean Leverage</i>	0.658***	39.12	0.720***	36.66
Observations	14,671		14,761	
Adjusted/Pseudo R <sup>2</sup>	34.69%		69.9%	

This table reports results of firm's level of leverage to examine influences of managerial optimism and opportunism. The first column reports the result of OLS regressions and the second column presents the result of a tobit model with censoring at zero at the lower end and one at the upper end. Definitions of variables are provided in Table 1. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 10**  
**Probit Analysis of Debt choice**

$$\begin{aligned} \text{Debt choice} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Optimism} * 24\text{Month Stock Return} \\ & + \beta_4 \text{Opportunism} * 24\text{Month Stock Return} + \beta_5 24\text{Month Stock Return} \\ & + \beta_6 3 \text{ Year mean ROA} + \beta_7 \text{Log}(\text{Total Asset}) + \beta_8 \text{Market to Book} \\ & + \beta_9 \text{Operating Loss Carry forward} + \beta_8 (\text{Industry mean Leverage} - \text{Leverage})_{t-1} + \varepsilon \end{aligned}$$

	Full Sample		High-Tech industry		Non High-Tech industry	
	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat
<i>Constaant</i>	-3.779 ***	-9.79	-3.305 ***	-4.79	-4.416 ***	-9.05
<i>Optimism</i>	0.276 *	1.75	0.702 *	1.93	0.216	1.15
<i>Opportunism</i>	-0.147 *	-1.79	-0.002	-0.01	-0.129	-1.24
<i>Optimism*24Month Stock Return</i>	0.085	0.30	1.708 **	1.98	-0.336	-0.94
<i>Opportunism*24Month Stock Return</i>	-0.361 **	-2.55	-0.532 **	-2.15	-0.258	-1.44
<i>24 Month Stock Return</i>	-0.273 ***	-9.17	-0.303 ***	-5.33	-0.287 ***	-7.91
<i>3 Year Mean ROA</i>	1.593 ***	7.61	0.921 ***	3.05	1.490 ***	4.73
<i>Log (Total Asset)</i>	0.210 ***	10.92	0.164 ***	4.75	0.250 ***	10.35
<i>Market to Book</i>	-0.018 ***	-3.06	0.000	0.02	-0.016 **	-2.34
<i>Operating Loss Carry forward</i>	-0.360 ***	-4.91	-0.283 ***	-3.43	-0.390 ***	-2.63
<i>(Industry mean Leverage – Leverage)<sub>t-1</sub></i>	0.132	0.96	0.803 ***	3.26	-0.400 **	-2.35
Observations	2,626		782		1,844	
Pseudo R2	19.35%		18.39%		16.70%	

This table presents results of firm's choice of debt when raises additional funds from outside. The first column includes observations and second to third columns are partitioned by firm's industry. High-technology firms are classified by Francis and Shipper (1999). Definitions of variables are provided in Table 1. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 11**  
**Regression Analysis of Investment**

$$Investment = \alpha_0 + \beta_1 Optimism + \beta_2 Opportunism + \beta_3 Optimism * Cash\ flow + \beta_4 Opportunism * Cash\ flow + \beta_5 Cash\ flow + \beta_6 Q + \varepsilon$$

	Full sample	Least constrained	Q2	Q3	Q4	Most constrained
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
<i>Constant</i>	0.120*** (28.9)	0.204*** (13.4)	0.123*** (13.6)	0.124*** (14.1)	0.099*** (14.5)	0.069*** (7.6)
<i>Optimism</i>	-0.023 (-1.4)	-0.068 (-1.1)	-0.005 (-0.1)	-0.089** (-2.1)	-0.007 (-0.3)	-0.070* (-1.9)
<i>Opportunism</i>	0.034*** (4.2)	0.062** (2.1)	0.023 (1.1)	0.059*** (3.0)	0.012 (0.8)	0.042*** (2.6)
<i>Optimism* Cash flow</i>	0.019*** (2.9)	0.012 (1.0)	0.004 (0.2)	0.140*** (2.9)	-0.027 (-0.6)	0.214*** (4.5)
<i>Opportunism* Cash flow</i>	-0.004 (-1.3)	0.008 (1.1)	-0.003 (-0.2)	-0.069*** (-3.8)	0.008 (0.3)	-0.041*** (-7.5)
<i>Cash flow</i>	0.052*** (47.4)	0.045*** (19.9)	0.063*** (13.5)	0.098*** (15.1)	0.084*** (10.6)	0.046*** (22.5)
<i>Q</i>	0.047*** (28.9)	0.038*** (9.8)	0.041*** (13.3)	0.028*** (7.8)	0.041*** (12.0)	0.064*** (13.2)
Observations	12,866	2,581	2,603	2,600	2,607	2,475
Pseudo R <sup>2</sup>	0.2468	0.1894	0.1705	0.124	0.1187	0.2741

This table reports results of OLS regression of firm's investment-to-cash flow sensitivity. The first column includes full sample and the second to sixth columns are partitioned by a quintile of financial constraint. Financial constraints are measured by Kaplan and Zingales (1997)'s index. Definitions of variables are provided in Table 1. Coefficient t-statistics are in brackets. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 12**  
**Regression Analysis of Mergers and Acquisitions**

*Panel A: Probit model of M&A*

$$M\&A = \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Log(Total Asset)} + \beta_4 \text{Leverage} + \beta_5 Q + \beta_6 \text{Cash flow} + \beta_7 \text{ROA} + \beta_8 \text{1 year lagged Stock return} + \beta_9 \text{Industry average M\&A} + \varepsilon$$

	Model 1		Model 2		Model 3	
	Coefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat
<i>Constant</i>	-5.279 ***	-34.45	-5.266 ***	-34.35	-5.267 ***	-34.35
<i>Optimism</i>	0.183 ***	2.78			0.105	1.53
<i>Opportunism</i>			0.159 ***	4.73	0.144 ***	4.12
<i>Log (Total Asset)</i>	0.201 ***	26.51	0.200 ***	26.29	0.200 ***	26.3
<i>Leverage</i>	-0.233	-4.25	-0.225 ***	-4.1	-0.227 ***	-4.13
<i>Q</i>	0.012 ***	1.28	0.012	1.31	0.012	1.32
<i>Cash flow</i>	0.031	7.11	0.031 ***	7.04	0.031 ***	7.02
<i>ROA</i>	-0.192 ***	-1.61	-0.172	-1.44	-0.176	-1.47
<i>1 year lagged Stock Return</i>	0.092 ***	4.45	0.090 ***	4.34	0.090 ***	4.35
<i>Industry Average M&amp;A</i>	0.809 ***	17.11	0.795 ***	16.76	0.795 ***	16.77
Observations	14,634		14,634		14,634	
Pseudo R <sup>2</sup>	7.77%		7.85%		7.87%	

Panel B: OLS model of M&A deal amounts

$$\begin{aligned} \text{Deal amounts} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} + \beta_3 \text{Log(Total Asset)} \\ & + \beta_4 \text{Leverage} + \beta_5 Q + \beta_6 \text{Cash flow} + \beta_7 \text{ROA} + \beta_8 \text{1 year lagged Stock return} \\ & + \beta_9 \text{Industry average M\&A} + \varepsilon \end{aligned}$$

	Full Sample		M&A Sample		Cash paid more than 50%	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
<i>Constant</i>	-0.015 *	-1.68	0.532 ***	17.92	0.558 ***	15.28
<i>Optimism</i>	0.008 **	2.03	0.014	1.06	0.034 **	2.01
<i>Opportunism</i>	0.009 ***	4.21	0.013 *	1.87	0.011	1.30
<i>Log (Total Asset)</i>	0.001 **	2.54	-0.020 ***	-13.93	-0.022 ***	-12.02
<i>Leverage</i>	0.029 ***	8.64	0.148 ***	13.35	0.193 ***	13.9
<i>Q</i>	-0.004 ***	-7.39	-0.020 ***	-9.51	-0.023 ***	-7.95
<i>Cash flow</i>	0.001 ***	4.72	0.002 **	2.47	0.003 **	2.16
<i>ROA</i>	-0.030 ***	-4.51	-0.176 ***	-6.37	-0.175 ***	-4.48
<i>1 year lagged Stock Return</i>	0.006 ***	5.00	0.008 *	1.92	0.007	1.14
<i>Industry Average M&amp;A</i>	0.032 ***	10.88	0.023 **	2.46	0.031 **	2.56
Observations	14,634		3,672		2,182	
Adjusted R <sup>2</sup>	2.76%		14.80%		19.95%	

This table presents results of influences of managerial optimism and opportunism on firm's merger and acquisition decisions. In panel A, I run a probit model in which the dependent variable is a dummy that equals one if a firm announce at least one merger bid that was eventually completed. In panel B, I regress OLS model in which the dependent variable is deal amounts scaled by market value. First column reports OLS result of all firms (M&A firms and non-M&A firms) and second column reports OLS results including only firms that announce at least one merger. The third column includes only firms announce at least one merger and pay more than 50% in cash. Definitions of variables are provided in Table 1. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

**TABLE 13**  
**Regression Analysis of Future Operating Earnings**

$$\begin{aligned}
 \text{Future Operating EPS}_{q+1, q+4} = & \alpha_0 + \beta_1 \text{Optimism} + \beta_2 \text{Opportunism} \\
 & + \beta_3 \text{Optimism*Other Exclusions} + \beta_4 \text{Opportunism*Other Exclusions} \\
 & + \beta_5 \text{Other Exclusions} + \beta_6 \text{Special items} + \beta_7 \text{Non-GAAP Earnings} + \beta_8 \text{Loss} \\
 & + \beta_9 \text{Sales Growth} + \beta_{10} \text{Market-to-Book} + \beta_{11} \text{Earnings Volatility} + \beta_{12} \text{Log(Total Asset)} \\
 & + \beta_{13} \text{Log(Age)} + \beta_{14} \text{RegG} + \varepsilon
 \end{aligned}$$

*Panel A: full samples*

	Full Sample		High Tech firms		Non high-tech firms	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
<i>Constant</i>	-0.055***	-11.93	-0.080***	-9.78	-0.031***	-5.65
<i>Optimism</i>	0.005**	2.47	-0.010***	-2.62	0.012***	4.51
<i>Opportunism</i>	0.000	0.25	0.001	0.53	-0.001	-0.52
<i>Optimism*Other Exclusions</i>	0.245***	3.87	0.098	0.93	0.373***	4.83
<i>Opportunism*Other Exclusions</i>	0.039	0.88	0.154**	2.06	-0.007	-0.13
<i>Other Exclusions</i>	-0.683***	-26.69	-1.003***	-23.96	-0.568***	-17.87
<i>Special items</i>	0.367***	13.67	0.574***	12.31	0.261***	8.04
<i>Non-GAAP earnings</i>	1.989***	123.99	2.444***	84.30	1.832***	96.13
<i>Loss</i>	-0.030***	-24.84	-0.032***	-16.97	-0.023***	-15.01
<i>Sales Growth</i>	0.002***	9.20	0.000	0.33	0.002***	9.64
<i>Market to Book</i>	0.001***	8.50	0.001***	4.80	0.001***	8.91
<i>Earnings Volatility</i>	-0.253***	-18.21	-0.041**	-2.41	-0.400***	-18.47
<i>Log(Total Asset)</i>	0.002***	8.73	0.003***	5.87	0.002***	5.18
<i>Log(Age)</i>	0.009***	12.29	0.009***	6.51	0.007***	8.05
<i>RegG</i>	0.007***	7.95	0.014***	8.97	0.005***	5.59
Observations	49,049		12,595		36,454	
Adj. R <sup>2</sup>	0.446		0.584		0.373	

*Panel B: Firms with non zero exclusion*

	Non zero Exclusions		High Tech firms		Non high-tech firms	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
<i>Constant</i>	-0.029***	-5.16	-0.064***	-6.48	-0.005	-0.75
<i>Optimism</i>	0.004	1.53	-0.010**	-2.47	0.010***	3.53
<i>Opportunism</i>	-0.002	-1.25	-0.001	-0.38	-0.002	-1.55
<i>Optimism*Other Exclusions</i>	0.267***	4.65	0.096	0.97	0.399***	5.71
<i>Opportunism*Other Exclusions</i>	-0.074*	-1.78	0.049	0.69	-0.110**	-2.16
<i>Other Exclusions</i>	-0.591***	-24.81	-0.887***	-21.76	-0.489***	-16.62
<i>Special items</i>	0.402***	12.93	0.620***	11.24	0.317***	8.45
<i>Non-GAAP earnings</i>	1.759***	89.57	2.161***	54.43	1.647***	72.49
<i>Loss</i>	-0.034***	-22.39	-0.032***	-13.43	-0.031***	-15.63
<i>Sales Growth</i>	0.002***	8.19	0.001	1.03	0.002***	7.86
<i>Market to Book</i>	0.001***	4.66	0.001**	2.45	0.001***	4.76
<i>Earnings Volatility</i>	-0.311***	-18.82	-0.130***	-5.98	-0.445***	-18.08
<i>Log(Total Asset)</i>	0.001***	4.81	0.002***	4.64	0.001*	1.94
<i>Log(Age)</i>	0.006***	7.67	0.006***	3.54	0.005***	5.46
<i>RegG</i>	0.008***	7.77	0.012***	6.54	0.007***	5.90
Observations	29,874		7,507		22,367	
Adj. R <sup>2</sup>	0.413		0.494		0.372	

This table examines relationships of managerial opportunism and opportunism with future performance. Future performance is measured by future operating EPS scaled by beginning market value summed over four quarters starting with quarter q+1. Panel A reports OLS results of future operating EPS using full samples. Samples are partitioned into high-technology firms and non-high technology firms. High-technology firms are classified by Francis and Shipper (1999). Panel B provides OLS results including only firms with non-zero other exclusions. Definitions of variables are provided in Table 1. \*, \*\*, and \*\*\* indicates significance at the 10%, 5%, and 1% level respectively.

## APPENDIX 1

### LONG TERM EFFECTS IN THE AUTO REGRESSIVE DISTRIBUTED LAG (ADL) MODEL<sup>14</sup>

The regressors may include lagged values of the dependent variable and current and lagged values of one or more explanatory variables. This model allows us to determine what the effects are of a change in a policy variable. The simplest model, ADL(1,1) model is used to estimate optimism and opportunism in this study.

$$y_t = \alpha_0 + \beta_1 y_{t-1} + \beta_2 x_t + \beta_3 x_{t-1} + \varepsilon_t \quad (\text{A1})$$

where  $y_t$  and  $x_t$  are stationary variables, and  $\varepsilon_t$  is a white noise. As long as it can be assumed that the error term  $\varepsilon_t$  is a white noise process, or more generally, is stationary and independent of  $x_t, x_{t-1}, \dots$  and  $y_t, y_{t-1}, \dots$ , the ADL models can be estimated consistently by ordinary least squares.

We can invert equation (A1) as the lag polynomial in  $y$  as

$$y_t = (1 + \beta_1 + \beta_1^2 + \dots)\alpha_0 + (1 + \beta_1 L + \beta_1^2 L^2 + \dots)(\beta_2 x_t + \beta_3 x_{t-1} + \varepsilon_t). \quad (\text{A2})$$

The current value of  $y$  depends on the current and all previous values of  $x$  and  $\varepsilon$ . We can derive the impact multiplier by taking partial derivatives over periods.

For the first period,  $\frac{\partial y_t}{\partial x_t} = \beta_2,$

The effect after one period,  $\frac{\partial y_{t+1}}{\partial x_t} = \beta_3 + \beta_1 \beta_2,$

The effect after two periods,  $\frac{\partial y_{t+2}}{\partial x_t} = \beta_1 \beta_3 + \beta_1^2 \beta_2$

Therefore, the long-term multiplier is  $\sum_{i=1}^{\infty} \frac{\partial y_{t+i}}{\partial x_t} = \frac{\beta_2 + \beta_3}{1 - \beta_1}$  if  $|\beta_1| < 1$ .

When we assume that  $x$  is constant, equation (A2) becomes

$$y = \frac{\alpha_0}{1 - \beta_1} + \frac{\beta_2 + \beta_3}{1 - \beta_1} x \quad (\text{A3})$$

Equation (A1) can be reparameterized by substituting  $y_t$  and  $x_t$  with  $y_{t-1} + \Delta y_t$  and  $x_{t-1} + \Delta x_t$ ,

---

<sup>14</sup> This Appendix is summarized from Johnston and DiNardo (1997), pages 244 to 248.

$$\Delta y_t = \alpha_0 + \beta_2 \Delta x_t - (1 - \beta_1) y_{t-1} + (\beta_2 + \beta_3) x_{t-1} + \varepsilon_t \quad (\text{A4})$$

By using equation (A3), equation (A4) becomes

$$\Delta y_t = \beta_2 \Delta x_t - (1 - \beta_1) \left[ y_{t-1} - \frac{\alpha_0}{1 - \beta_1} - \frac{\beta_2 + \beta_3}{1 - \beta_1} x_{t-1} \right] + \varepsilon_t \quad (\text{A5})$$

If we suppose that  $x$  grows at constant rate  $g$  ( $\Delta x_t = g$ ) instead of zero growth, equation (A5) becomes

$$y = \frac{\alpha_0 - \left( \left( \frac{\beta_2 + \beta_3}{1 - \beta_1} \right) - \beta_2 \right) g}{1 - \beta_1} + \frac{\beta_2 + \beta_3}{1 - \beta_1} x = \frac{\alpha_0}{1 - \beta_1} + \left( \frac{\beta_2}{1 - \beta_1} - \frac{\beta_2 + \beta_3}{(1 - \beta_1)^2} \right) g + \frac{\beta_2 + \beta_3}{1 - \beta_1} x \quad (\text{A6})$$

and equation (A6) is called as the dynamic equilibrium. When there is no growth, equation (A6) is identical with equation (A3).

## APPENDIX 2

### SAMPLE NON-GAAP EARNINGS DISCLOSURE FROM ORACLE CORPORATIONS IN THE FOURTH QUARTER OF 2008



#### For Immediate Release

Contacts: Roy Lobo  
Oracle Investor Relations  
+1.650.506.4073  
[investor\\_us@oracle.com](mailto:investor_us@oracle.com)

Deborah Hellinger  
Oracle Corporate Communications  
+1.650.506.5158  
[deborah.hellinger@oracle.com](mailto:deborah.hellinger@oracle.com)

#### **ORACLE REPORTS Q4 GAAP EPS UP 27% TO 39 CENTS, NON-GAAP EPS UP 27% TO 47 CENTS**

*Q4 Applications New License Revenues Up 36%, Q4 Technology New License Revenues Up 23%*

REDWOOD SHORES, Calif., June 25, 2008—Oracle Corporation (NASDAQ: ORCL) today announced that fiscal 2008 Q4 GAAP earnings per share were up 27% to \$0.39, compared to the same quarter last year. Fourth quarter GAAP revenues were up 24% to \$7.2 billion, while quarterly GAAP net income was up 27% to \$2.0 billion. Total GAAP software revenues were up 26% to \$6.0 billion. GAAP new software license revenues were up 27% with database and middleware new license revenues up 23% and applications new license revenues up 36%. GAAP software license updates and product support revenues were up 25% to \$2.8 billion. GAAP service revenues were up 18% to \$1.3 billion.

Fourth quarter non-GAAP earnings per share were up 27% to \$0.47, and non-GAAP net income was up 27% to \$2.4 billion.

For fiscal year 2008, GAAP earnings per share were up 30% to \$1.06. Fiscal year 2008 GAAP revenues were up 25% to \$22.4 billion, while annual GAAP net income was up 29% to \$5.5 billion. Total GAAP new software license revenues for the year were up 28% to \$7.5 billion with database and middleware new license revenues up 24% and applications new license revenues up 38%. For the year, GAAP software license updates and product support revenues were up 24% to \$10.3 billion. Annual GAAP service revenues were up 21% to \$4.6 billion. GAAP operating margins were up nearly 200 basis points to 35% in FY08.

Fiscal year 2008 non-GAAP earnings per share were up 29% year over year to \$1.30. Annual non-GAAP net income was up 28% to \$6.8 billion compared to fiscal year 2007.

“Non-GAAP operating margins were up 200 basis points in FY08 to a record 43.0%,” said President and CFO Safra Catz. “Non-GAAP earnings per share were up 29% for the year and non-GAAP EPS has tripled over the last five years. Oracle has delivered solid results year-after-year.”

“Oracle’s application new software license revenues grew 38% in FY08, while SAP’s new software license revenues grew only 13% in their most recent fiscal year,” said President Charles Phillips. “This is the third consecutive year we’ve taken applications market share from SAP.”

“Four years ago we publicly announced a five year plan to deliver non-GAAP earnings per share at a compound annual growth rate of 20%,” said Oracle CEO Larry Ellison. “During the past four years we exceeded our plan and delivered a non-GAAP EPS CAGR of over 26%.”

#### **Q4 Earnings Announcement**

Oracle will hold a conference call and web broadcast today, June 25<sup>th</sup>, to discuss these results at 2:00 p.m. (PDT) / 5:00 p.m. (EDT). To access the live web broadcast of this event, please visit the Oracle Investor Relations website at <http://www.oracle.com/investor>. Please hold down your control key while pressing refresh to ensure that the weblink is visible.

#### **About Oracle**

Oracle is the world’s largest enterprise software company. For more information about Oracle, including supplemental financial information, please visit <http://www.oracle.com/investor> or call Investor Relations at (650) 506-4073.

# # #

**ORACLE CORPORATION**  
**Q4 FISCAL 2008 FINANCIAL RESULTS**  
**RECONCILIATION OF SELECTED GAAP MEASURES TO NON-GAAP MEASURES (1)**  
(in millions, except per share data)

	Three Months Ended May 31,						% Increase in US \$	
	2008 GAAP	Adj.	2008 Non-GAAP	2007 GAAP	Adj.	2007 Non-GAAP	GAAP	Non-GAAP
<b>TOTAL REVENUES (2)</b>	\$ 7,239	\$ 42	\$ 7,281	\$ 5,828	\$ 55	\$ 5,883	24%	24%
<b>TOTAL SOFTWARE REVENUES (2)</b>	\$ 5,974	\$ 42	\$ 6,016	\$ 4,753	\$ 55	\$ 4,808	26%	25%
New software licenses	3,144	-	3,144	2,481	-	2,481	27%	27%
Software license updates and product support (2)	2,830	42	2,872	2,272	55	2,327	25%	23%
<b>TOTAL OPERATING EXPENSES</b>	\$ 4,268	\$ (531)	\$ 3,737	\$ 3,547	\$ (378)	\$ 3,169	20%	18%
Stock-based compensation (3)	64	(64)	-	53	(53)	-	20%	-
Amortization of intangible assets (4)	344	(344)	-	255	(255)	-	35%	-
Acquisition related and other	95	(95)	-	74	(74)	-	30%	-
Restructuring	27	(27)	-	(4)	4	-	715%	-
<b>OPERATING INCOME</b>	\$ 2,971	\$ 573	\$ 3,544	\$ 2,281	\$ 433	\$ 2,714	30%	31%
<b>OPERATING MARGIN %</b>	41%		49%	39%		46%	5%	6%
<b>INCOME TAX EFFECTS ON ABOVE ADJUSTMENTS (5)</b>	\$ 905	\$ 176	\$ 1,081	\$ 660	\$ 127	\$ 787	37%	38%
<b>NET INCOME</b>	\$ 2,037	\$ 397	\$ 2,434	\$ 1,604	\$ 306	\$ 1,910	27%	27%
<b>DILUTED EARNINGS PER SHARE (6)</b>	\$ 0.39		\$ 0.47	\$ 0.31		\$ 0.37	27%	27%
<b>DILUTED WEIGHTED AVERAGE COMMON SHARES OUTSTANDING (6)</b>	5,233	(3)	5,230	5,224	6	5,230	0%	0%

(1) This presentation includes non-GAAP measures. Our non-GAAP measures are not meant to be considered in isolation or as a substitute for comparable GAAP measures, and should be read only in conjunction with our consolidated financial statements prepared in accordance with GAAP. For a detailed explanation of the adjustments made to comparable GAAP measures, the reasons why management uses these measures, the usefulness of these measures and the material limitations on the usefulness of these measures, please see Appendix A.

(2) As of May 31, 2008, approximately \$205 million in estimated revenues related to assumed support contracts will not be recognized in fiscal 2009 due to business combination accounting rules.

(3) Stock-based compensation is included in the following GAAP operating expense categories:

	Three Months Ended May 31, 2008			Three Months Ended May 31, 2007		
	GAAP	Adj.	Non-GAAP	GAAP	Adj.	Non-GAAP
Sales and marketing	\$ 13	\$ (13)	\$ -	\$ 11	\$ (11)	\$ -
Software license updates and product support	2	(2)	-	3	(3)	-
Cost of services	4	(4)	-	4	(4)	-
Research and development	30	(30)	-	21	(21)	-
General and administrative	15	(15)	-	14	(14)	-
Subtotal	64	(64)	-	53	(53)	-
Acquisition related and other	72	(72)	-	8	(8)	-
Total stock-based compensation	\$ 136	\$ (136)	\$ -	\$ 61	\$ (61)	\$ -

(4) Estimated future annual amortization expense related to intangible assets as of May 31, 2008 is as follows:

Fiscal 2009	\$ 1,660
Fiscal 2010	1,550
Fiscal 2011	1,266
Fiscal 2012	1,125
Fiscal 2013	962
Thereafter	1,831
Total	\$ 8,395

(5) The income tax provision was calculated reflecting an effective tax rate of 30.8% and 29.2% in the fourth quarter of fiscal 2008 and 2007, respectively.

(6) Non-GAAP diluted earnings per share and non-GAAP diluted weighted average shares outstanding were calculated excluding the effects of expensing stock options under Statement 123(R).

\* Not meaningful

**ORACLE CORPORATION**  
**FISCAL 2008 FINANCIAL RESULTS**  
**EXPLANATION OF NON-GAAP MEASURES**

To supplement our financial results presented on a GAAP basis, we use the non-GAAP measures indicated in the tables, which exclude certain business combination accounting entries and expenses related to acquisitions, as well as other significant expenses including stock-based compensation, that we believe are helpful in understanding our past financial performance and our future results. Our non-GAAP financial measures are not meant to be considered in isolation or as a substitute for comparable GAAP measures and should be read only in conjunction with our consolidated financial statements prepared in accordance with GAAP. Our management regularly uses our supplemental non-GAAP financial measures internally to understand, manage and evaluate our business and make operating decisions. These non-GAAP measures are among the primary factors management uses in planning for and forecasting future periods. Compensation of our executives is based in part on the performance of our business based on these non-GAAP measures. Our non-GAAP financial measures reflect adjustments based on the following items, as well as the related income tax effects:

- Support deferred revenue: Business combination accounting rules require us to account for the fair value of support contracts assumed in connection with our acquisitions. Because these are typically one-year contracts, our GAAP revenues for the one year period subsequent to our acquisition of a business do not reflect the full amount of software license updates and product support revenues on assumed support contracts that would have otherwise been recorded by the acquired entity. The non-GAAP adjustment is intended to reflect the full amount of such revenues. We believe this adjustment is useful to investors as a measure of the ongoing performance of our business because we have historically experienced high renewal rates on support contracts, although we cannot be certain that customers will renew these contracts.

- Stock-based compensation expenses: We have excluded the effect of stock-based compensation expenses from our non-GAAP operating expenses and net income measures. Although stock-based compensation is a key incentive offered to our employees, and we believe such compensation contributed to the revenues earned during the periods presented and also believe it will contribute to the generation of future period revenues, we continue to evaluate our business performance excluding stock-based compensation expenses. Stock-based compensation expenses will recur in future periods.

- Amortization of intangible assets expenses: We have excluded the effect of amortization of intangibles expenses from our non-GAAP operating expenses and net income measures. Amortization of intangible assets expenses is inconsistent in amount and frequency and is significantly affected by the timing and size of our acquisitions. Investors should note that the use of intangible assets contributed to revenues earned during the periods presented and will contribute to future period revenues as well. Amortization expenses will recur in future periods.

- Acquisition related and other expenses, and restructuring expenses: We incurred significant expenses in connection with our acquisitions and also incurred certain other operating expenses or income, which we generally would not have otherwise incurred in the periods presented as a part of our continuing operations. Acquisition related and other expenses primarily consist of in-process research and development expenses, personnel related costs for transitional employees, stock-based compensation expenses (in addition to the stock-based compensation expenses described above), integration related professional services, certain business combination contingency adjustments after the purchase price allocation period has ended, and certain other operating expenses or income, net. Substantially all of the stock-based compensation expenses included in acquisition related and other expenses primarily resulted from unvested options assumed in acquisitions whose vesting was fully accelerated upon termination of the employees pursuant to the original terms of those options. Restructuring expenses consist of Oracle employee severance and other exit costs. We believe it is useful for investors to understand the effect of these items on our total operating expenses. Although acquisition related expenses and restructuring expenses are not recurring with respect to past acquisitions, we will incur these expenses in connection with any future acquisitions.

For the year ended May 31, 2008, acquisition related and other expenses include a gain on property sale of \$57 million. For the year ended May 31, 2007, acquisition related and other expenses included a \$52 million benefit related to the settlement of a lawsuit filed against PeopleSoft, Inc. on behalf of the U.S. government. This lawsuit was filed in October 2003, prior to our acquisition of PeopleSoft and represented a pre-acquisition contingency that we identified and assumed in connection with our acquisition of PeopleSoft. In October 2006, we agreed to pay the U.S. government \$98 million to settle this lawsuit. Since the purchase price allocation period for PeopleSoft ended in the third quarter of fiscal 2006, the favorable difference of \$52 million between the estimated exposure recorded for this lawsuit during the purchase price allocation period and the actual settlement amount has been included in our consolidated statement of operations for the year ended May 31, 2007 as a component of acquisition related and other expenses.

## REFERENCES

- Ajinkya, B., S. Bhojraj, and P. Sengupta. 2005. The Association between Outside Directors, Institutional Investors and the Properties of Management Earnings Forecasts. *Journal of Accounting Research* 43(3): 343-376
- Baker, M., R. Ruback, and J. Wurgler. 2007. Behavioral corporate finance." In *The Handbook of Corporate Finance: Empirical Corporate Finance*, edited by B. Espen Eckbo. Elsevier/North-Holland,
- , and J. Wurgler. 2002. Market Timing and Capital Structure. *Journal of Finance* 57(1): 1-32
- , and ----- . 2004. A Catering Theory of Dividends. *Journal of Finance* 59(3): 1125-1165
- Ben-David, I., J.R. Graham, and C.R. Harvey. 2007. Managerial Overconfidence and Corporate Policies. *Working Paper*, University of Chicago, Duke University and Harvard University
- Bergstresser, D., and T. Philippon. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80(3): 511-529
- Bhattacharya, N., E. Black, T. Christensen, and C. Larson. 2003. Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics* 36: 285-319.
- , -----, -----, and R. Mergenthaler. 2004. Empirical evidence on recent trends in pro forma reporting. *Accounting Horizons* 18: 27-43.
- , -----, -----, and ----- . 2007. Who trades on pro forma earnings information? *The Accounting Review* 82 (3): 581-620
- Bradshaw, M., and R. Sloan. 2002. GAAP versus the street: An empirical assessment of two alternative definitions of earnings. *Journal of Accounting Research* 40: 41-66.
- , and M. Soliman. 2007. Discussion of "Letting the 'Tail Wag the Dog': The Debate over GAAP versus Street Earnings Revisited" *Contemporary Accounting Research* 24(3): 725-39
- Brown, N.C., T.E. Christensen, W.B. Elliott, and R.D. Mergenthaler. 2009. Do Managers Use Pro Forma Earnings Disclosures to Cater to Investor Sentiment? *Working Paper*, University of Southern California
- Campbell, D.T., and D.W. Fiske. 1959. Convergent and discriminant validation by the multitrait multimethod matrix. *Psychological Bulletin* 56(2): 81-105
- Cooper, M.J., O. Dimitrov, and P.R. Rau. 2001. A rose.com by any other name. *Journal of Finance* 56: 2371-2388.
- Core, J., and W. Guay. 2002. Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. *Journal of Accounting Research* 43(3): 613-630
- Davis, A.K., J.M. Piger, and L.M. Sedor. 2008. Beyond the Numbers: Managers' Use of Optimistic and Pessimistic Tone in Earnings Press Releases. *Working Paper*, University of Oregon



- Kato, K., D.J. Skinner, and M. Management. 2009. Forecasts in Japan: An Empirical Study of Forecasts that are Effectively Mandated. *The Accounting Review* 84(5):1575-1606
- Kolev, K., C.A. Marquardt, and S.E. McVay. 2008. SEC Scrutiny and the Evolution of Non-GAAP Reporting. *The Accounting Review* 83(1): 157-184
- Kothari, S., Leone, A., Wasley, C., 2004, Performance Matched Discretionary Accrual Measures, *Journal of Accounting & Economics* 39: 163-197.
- Landier, A. and D. Thesmar. 2009. Financial Contracting with Optimistic Entrepreneurs. *Review of Financial Studies* 22: 117-150
- Lougee, B.A. and C.A. Marquardt. 2004. Earnings Informativeness and Strategic Disclosure: An Empirical Examination of “Pro Forma” Earnings. *The Accounting Review* 79(3): 769-795
- Malmendier, U. and G. Tate. 2005. CEO Overconfidence and Corporate Investment. *Journal of finance* 60(6): 2661-2700
- and -----, 2008. Who makes acquisitions? CEO overconfidence and the market’s reaction. *Journal of Financial Economics* 89(1): 20-43.
- , -----, and J. Yan. 2011. Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies. *Journal of finance* 66(5): 1687-1733
- Matsumoto, D.A. 2002. Management’s Incentives to Avoid Negative Earnings Surprises. *The Accounting Review* 77(3): 483-514
- McVay S., V. Nagar, and V. W. Tang. 2006. Trading incentives to meet the analyst forecast. *Review of Accounting Studies* 11:575-598
- McNichols, M.F. and S.R. Stubben. 2008. Does Earnings Management Affect Firms’ Investment Decisions? *The Accounting Review* 83(6): 1571-1603
- Polk, C. and P. Sapienza. 2008. The Stock Market and Corporate Investment: A Test of Catering Theory. *Review of Financial Studies* 23: 305-344
- Rajgopal, S.; L. Shivakumar, and A. Simpson. 2007. A catering theory of earnings management. Working paper. Emory University
- Richardson, S., S.H. Teoh, and P.D. Wysocki. 2004. The Walk-down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives. *Contemporary Accounting Research* 21(4): 885-924
- Roll, R. 1986. The Hubris Hypothesis of Corporate Takeovers. *Journal of Business* 59(2): 197-216
- Schrand, C.M. and S.L.C. Zechman 2010. Executive Overconfidence and the Slippery Slope to Fraud. *Working Paper*, University of Pennsylvania
- Shleifer, A., and R. Vishny. 2003. Stock market driven acquisitions. *Journal of Financial Economics* 70: 295-311
- Sunder, J., S.V. Sunder, and L.Tan. 2009. The Role of Managerial Overconfidence in the Design of Debt Covenants. *Working Paper*. Northwestern University
- Trochim, W., and J.P. Donnelly. 2007. *The Research Methods Knowledge Base*. 3<sup>rd</sup> Edition. Atomic Dog.