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Aiming to Beat Expectations: Do Growth Firms Set Revenue Targets above Analyst Forecasts?

성장기업의 매출목표는 재무분석가 예측치보다 더 높게 설정되는가?

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ABSTRACT

Despite the increasing popularity of revenue measures, the accounting literature has remained focused on earnings targets. Using a hand-collected dataset on target information of S&P 1500 firms, this study provides the first large sample examination of revenue targets and documents its difference to earnings targets. I find that revenue targets are in general set above revenue forecasts, whereas earnings targets are in general set below earnings forecasts. This phenomenon is robust to controlling for forecast errors. In addition, I find that growth opportunities increase the extent to which revenue targets are set relative to revenue forecasts, but do not find such effect on earnings targets. I attribute this effect to the incentive to beat revenue forecasts and document heightened effect when the benefits from beating revenue forecasts are larger. My research casts attention on the veiled yet popular revenue targets and documents its distinct characteristics from earnings targets.

Keywords: Revenue targets, target setting, market expectations, revenue forecasts, growth

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I. INTRODUCTION

Performance target is one of the most important elements of managerial incentive system. Since a manager is evaluated and rewarded based on performance relative to target, she is highly incentivized to beat the target (Merchant and Van der Stede 2012). Therefore, the way performance target is set critically affects manager's actions, and thus is an integral ex-ante incentive design decision of the firm (Indjejikian and Nanda 2002).

Yet, despite this importance, large sample research on performance target setting has been scarce due to the lack of publicly available data on target information. Prior research has been limited to analyses of survey data (Indjejikian and Nanda 2002; Indjejikian, Matejka, Merchant, and Van der Stede 2014b) or single firm data (Bowen and Kroos 2011; Aranda, Arellano, and Davila 2014). Some exceptions are Kim and Yang (2010), Kim and Shin (2016), and Choi, Kim, Kwon, and Shin (2016), who examine target setting behavior in a large sample for earnings per share measure, the most frequently used performance measure in annual bonus contracts.

However, as far as I know, no research has examined target setting behavior for revenue measure, the second most frequently used performance measure in annual bonus contracts (Huang, Marquardt, and Zhang 2015). Given the increasing use and weight of revenue measure (Huang et al. 2015), this is an important void to be addressed. Through a hand-collected dataset on target information of S&P 1500 firms, I attempt to fill this void and thereby gain a more balanced perspective on target setting.

In examining revenue targets, I start with the simple question: how are revenue targets set relative to expected revenue? This is an important consideration when setting targets, since too high or too low targets can disrupt manager's incentives (Milgrom and Roberts 1992). Generally, targets are expected to be achieved (Merchant and Manzoni 1989), and this widespread notion has been supported by empirical research on EPS targets (Kim and Yang 2012; Kim and Shin 2016). However, I document surprising results for revenue targets. Using revenue

forecasts as expected revenue, I find that revenue targets are in general set above revenue forecasts. EPS targets are in general set below EPS forecasts, consistent with prior research (Kim and Yang 2012). To ascertain that this discrepancy is not induced by difference between firms that use revenue measure and firms that use EPS measure, I restrict my sample to firms that use both revenue and EPS measure and find robust results. To ascertain that this disparity is not induced by difference between revenue forecast errors and EPS forecast errors, I also control for forecast errors and find robust results.

Given the above results for revenue targets, a natural question follows: what drives revenue targets to be set above revenue forecasts? I explain that this target setting behavior is induced by growth opportunities. For firms with higher growth opportunities, market reaction to revenue surprise is more pronounced (Ertimur, Livnat, and Martikainen 2003; Rees and Sivaramakrishnan 2007), and these firms face stronger incentives to beat revenue forecasts. Hence, these firms are more likely to adopt revenue measures (Huang et al. 2013) and set revenue targets to motivate beating revenue forecasts (Edmond, Leece, Maher 2013). As past studies have indirectly evidenced this behavior through bonus data (Edmond et al. 2013), I seek to directly examine this behavior through target data. In specific, building on the survey evidence that targets are often set above analysts' forecasts to beat these forecasts (Graham, Harvey, and Rajgopal 2005), I expect that growth opportunities increase the extent to which revenue targets are set relative to revenue forecasts.

However, I do not expect that growth opportunities increase the extent to which EPS targets are set relative to EPS forecasts. Although firms might incorporate EPS forecast information in setting EPS targets (Indjejikian, Matejka, Schloetzer 2014a; Choi et al. 2016), they would be hesitant to set EPS targets above EPS forecasts. To begin with, pressuring managers to beat EPS forecasts can trigger serious adverse reactions. Managers are evidenced to curtail R&D, hiring, or other investments when they are required to beat earnings forecasts, thereby jeopardizing the firm's long-term prospects (Graham et al. 2005; Burgstahler and Eames 2006).

In addition, since targets are usually set during the first quarter (Edmonds et al 2013) in which EPS forecasts are highly optimistic (Richardson, Teoh, and Wysocki 2004), setting targets above EPS forecasts would be overly demanding. In contrast, these cutbacks would not apply when setting revenue targets. Managing revenue is difficult and detectable (Ertimur et al. 2003), and managers are actually refrained from opportunistic R&D cuttings when evaluated on revenue performance (Huang et al. 2013). Furthermore, revenue forecasts are highly accurate throughout the year (Bradshaw, Lee, and Peterson 2016), and therefore can serve as reasonable benchmarks of performance.

Consistent with my expectations, I find that growth opportunities increase the extent to which revenue targets are set relative to revenue forecasts. This result is robust to different ranges of revenue forecasts and definitions of growth opportunities. Also, although growth opportunities are positively correlated to revenue forecasts and bias against my results, I test a research design more stringent on growth opportunities and find robust results. On the other hand, I find no evidence that that growth opportunities increase the extent to which EPS targets are set relative to EPS forecasts. To confirm that this differential target behavior is not induced by difference between firms that use revenue measure and firms that use EPS measure, I again restrict my sample to firms that use both revenue and EPS measure and find robust results for both revenue and EPS targets. Furthermore, in this sample, I document that the proportion of firms that set revenue targets over revenue forecasts increases with growth opportunities whereas the proportion of firms that set EPS targets over EPS forecasts shows no trend to growth opportunities.

In further analyses, I rule out some alternative explanations for this target setting behavior. To show that growth firms set revenue targets above revenue forecasts to incentivize revenue surprises, I test if the effect of growth opportunities on revenue targets is heightened when the benefits of beating revenue forecasts are larger. Similar to Bowen and Rajgopal (2002), I find that the effect of growth opportunities is more pronounced when the firm faces

external financing incentives or future acquisitions. Since firms in these situations can benefit more from increased stock prices, they would feel a greater need for revenue surprises and thus be more likely to set revenue targets above revenue forecasts. Furthermore, to confirm that revenue target setting behavior is not driven by recently appointed CEOs of growth firms who are pressured to show their abilities, I limit the analysis to longer-tenured CEOs and find robust results.

In several respects, this paper contributes to the existing literature. First of all, it is the first paper to investigate the distribution and determinant of revenue targets. Considering the popularity of revenue measure, revenue target setting has been a critical void in the literature. Second of all, this paper extends the revenue surprise literature by examining how firms attempt to beat revenue forecasts. Although a large body of research has been dedicated to how firms strive to meet earnings forecasts, scant research has examined how they try to meet revenue forecasts. This study suggests that annual bonus target serves as a motivating mechanism to beat revenue forecasts, and thereby contributes to the convergence of managerial accounting and financial accounting literature. Third of all, I examine performance targets in relation to analysts' forecasts, a void that has been called upon in Indjejikian et al. (2014a). I propose that growth firms not only consider revenue forecasts, but also set revenue targets over these forecasts. Lastly, I show that revenue target setting behavior is starkly different from EPS target setting behavior. This shows that by focusing on earnings targets, target setting literature has investigated only one side of the coin—the other side is yet to be unveiled.

The remainder of this paper is as follows: in section 2 and 3, I introduce the prior literature and develop my hypothesis. In section 4 and 5, I explain my research design and show the results of my research. In section 6 and 7, I present further analyses and robustness checks to corroborate my results. Section 8 concludes.

II. PRIOR LITERATURE

Beating revenue forecasts

Whether or not a firm beats its analyst forecasts is a prime interest of the market. Investors reward firms for performing above analysts' forecasts, aside from rewarding absolute performances. Beating analysts' forecasts is a signal of future performance to investors, which is closely linked to stock prices, managements' reputation, and litigation costs (Bartov, Givoly, and Hayn 2002). In this literature, researchers have mainly focused on the effect of earnings surprise; however, revenue surprise is documented to have an additional effect—which in some cases dominates the effect of earnings surprise (Ertimur et al. 2003).

One of the first papers to document the incremental effect of revenue surprise is Swaminathan and Weintrop (1991), which is followed by a number of studies. Ertimur et al. (2003) find that the effect of earnings surprise is stronger when it is supported by revenue surprise since revenue changes are more persistent, more homogenous, and less manipulable than expense changes. Ghosh et al. (2005) suggests that earnings growth accompanied by revenue growth is more stable and has larger earnings response coefficient. Rees and Sivaramakrishnan (2007) affirm that the market response to revenue surprise is separate and distinct from that to earnings surprise, and find no evidence of market premium or penalty to earnings surprise not supported by revenue surprise. Furthermore, Chandra and Ro (2008) find that the incremental informational content of revenue surprise beyond earnings surprise is not restricted to situations where earnings are less informative, but is documented pervasively among firms.

Nevertheless, although the incremental effect of revenue surprise is prevalent, this effect is indeed more accentuated in certain types of firms. Namely, researchers evidence that the effect of revenue surprise is stronger for growth firms, to the extent that it dominates the effect of earnings surprise (Ertimur et al. 2003; Rees and Sivaramakrishnan 2007). For these firms,

investors are more interested in growth in consumers' demand than in cost controls, and thus react more strongly to revenue surprise than to expense surprise. Ertimur et al. (2003) show that positive earnings surprise coupled with negative revenue surprise leads to a negative market reaction for firms in the highest market-to-book tercile. The strategy literature also emphasizes revenue for growth firms, indicating that revenue growth is crucial for growth firms in order to capture initial market share (Chandler 2001; Spar 2001; Chandra and Ro 2008). However, though this pronounced importance of revenue surprise for growth firms is well-documented, only a few studies have attempted to investigate how these firms strive to achieve revenue surprise. Throughout this paper, I suggest that annual bonus contract acts as an incentive scheme to encourage revenue surprise.

Revenue target in annual bonus contract

Annual bonus contract is a widely used incentive mechanism[1] that is known to significantly affect managerial behavior (Healy 1985; Holthausen et al. 1995; Anderson et al. 2010; Kim and Shin 2016). Constructed by three principal elements—performance measure, pay-for-performance sensitivity, and performance target (Murphy 2000), the relatively simple design of annual bonus contracts provides a clear link between effort and reward (Murphy and Jensen 2011). Of these three elements, I cast my attention on performance targets. Performance targets are explicit benchmarks of managerial performance that significantly impact managers' motivation (Merchant and Van der Stede 2012). Thus, they are an important ex-ante incentive design decision of the board (Indjejikian and Nanda 2002), for which the board relies on all available information from diverse sources (Choi et al. 2016).

[1] A 2010 survey by Meridian Compensation Partners LLC indicates that more than 86% of responding companies use annual bonus as a compensation scheme to reward their executives.

Yet, despite this importance of performance targets, the previous lack of publicly available data has constrained the research on performance targets. Prior research has been confined to survey data (Holthausen et al. 1995; Leon and Rock 2002; Indjejikian and Nanda 2002; Indjejikian et al. 2014b) or single firm data (Anderson et al. 2010; Bowen and Kroos 2011; Aranda et al. 2014). Some exceptions are Kim and Yang (2010), Kim and Shin (2016), and Choi et al. (2016), who examined target setting in a large sample by retrieving performance target data which were mandatorily disclosed after the SEC amendments of 2006.

However, one caveat of these large sample studies is that they only examined one measure. After showing that earnings per share is the most frequently used performance measure, they have relied on earnings per share measure to investigate representative target setting behavior (Choi et al. 2016; Kim and Shin 2016). However, although EPS measure is indeed the most widely used performance measure, revenue measure—the second most widely used performance measure, is rapidly gaining popularity. Huang et al. (2015) document that the use and weight of revenue measure in annual bonus contracts is escalating, and survey evidence buttresses their claim (Towers Watson 2010). Furthermore, revenue measures are evidenced to exhibit distinct characteristics. Bouwens and van Lent (2007) suggest that disaggregated measures such as revenue measures prevent "gaming" of managers. Huang et al. (2013) add that revenue measures effectively discourage managers from cutting R&D expenses opportunistically. Huang et al. (2013) also document that firms with higher value relevance of sales, in higher competition, and with higher growth potential are more likely to adopt revenue measures. Given the increasing popularity and distinct properties of revenue measure, the lack of research on target setting for revenue measure is a critical void to be addressed. Throughout this paper, I examine revenue target setting in a large sample and document its unique characteristics.

III. HYPOTHESIS DEVELOPMENT

As beating analysts' forecasts is a signal of future prospects, growth firms have pronounced incentives to beat analysts' forecasts (Matsumoto 2001). If a growth firm does not meet its forecasts, investors feel that there is "something wrong" with the company and discount its future prospects. In the following conferences, the management team of the firm has to focus on explaining why the firm could not meet its forecasts, missing the opportunity to deliver favorable future prospects (Graham et al. 2005).

Particularly, growth firms have strong incentives to beat revenue forecasts. As revenue performance communicates the existing and expanding demand of customers, investors pay more attention to revenue growth than expense reductions. Missing revenue forecasts triggers stock price declines even when coupled with beating earnings forecasts (Ertimur et al. 2003). This reaction for growth firms contrasts to that for value firms, as missing revenue forecasts combined with beating earnings forecasts induce stock price increases for value firms (Ertimur et al. 2003).

I expect that this strong incentive of growth firms to beat revenue forecasts is reflected in the design of their CEO annual bonus plans[2]. Growth firms are more likely to adopt revenue measure (Huang et al. 2013) and set revenue targets to incentivize beating revenue forecasts. Relevant to my study, Edmonds et al. (2013) evidence that annual bonus is diminished after missing revenue forecasts, a phenomenon accentuated with higher growth. However, due to the lack of data, they cannot ascertain if this effect is due to ex-ante incorporation of forecasts into targets or ex-post penalty for missing the forecasts, though they suggest the former. By using a novel set of data with target level information, I empirically pinpoint that growth firms set revenue targets to incentivize beating revenue forecasts. Specifically, building onto the survey

[2] Firms would avoid relying solely on equity incentives to motivate beating expectations since equity incentives have a serious side effect of incentivizing the opposite—motivating CEOs to miss analysts' forecasts. To receive a lower strike price on following option grants, CEOs are evidenced to purposefully miss analysts' forecasts (McAnally et al. 2008).

evidence that firms set annual targets above consensus forecasts to encourage beating these forecasts (Graham et al. 2005), I predict that growth opportunities increase the extent to which revenue targets are set relative to revenue forecasts.

However, I do not expect that growth opportunities increase the extent to which EPS targets are set relative to EPS forecasts. Although firms might also refer to EPS forecast information in setting EPS targets (Indjejikian et al. 2014a; Choi et al. 2016), they would be reluctant to set EPS targets above EPS forecasts. To begin with, pressuring CEOs to beat EPS forecasts can trigger adverse reactions detrimental to the firms' prospects. When pressured to meet earnings forecasts, CEOs face incentives to manage earnings upward (Matsunaga and Park 2001) and are evidenced to curtail R&D, hiring, or other investments (Graham et al. 2005; Burgstahler and Eames 2006). Because these expenses are critical sources of future prospects, curtailing these expenses would jeopardize the firms' long-term value, especially for growth firms. In addition, since targets tend to be set during the first quarter (Edmonds et al 2013) in which EPS forecasts are highly optimistic (Richardson, Teoh, and Wysocki 2004), setting targets above EPS forecasts would be overly demanding.

In contrast, these cutbacks would not apply when setting revenue targets. Revenue cannot be increased by cutting expenses or investments, and managing revenue is more difficult and more detectable. Revenue management techniques such as inventory stuffing, bill and hold, and early buy-back generally necessitate assistance from other parties and are under close inspection by auditors and regulators (Ertimur et al. 2003). Also, emphasizing revenue can mitigate managerial myopia in contrast to highlighting EPS. Evaluating CEOs on revenue performance can actually prevent opportunistic R&D cutting, as R&D is a critical source of revenue growth (Huang et al. 2013). Furthermore, revenue forecasts are highly accurate throughout the year (Bradshaw, Lee, and Peterson 2016), and therefore can serve as reasonable benchmarks of performance in contrast to earnings forecasts. In summary, I predict that growth

opportunities increase the extent to which revenue targets are set relative to revenue forecasts.

H1 Firms with more growth opportunities set revenue targets higher than analyst forecasts.

IV. DATA AND RESEARCH DESIGN

To examine if targets are indeed set to beat market expectations, I hand-collect a novel set of target data of S&P 1500 firms from year 2008 to year 2014. Firms are required to disclose the details of annual bonus plans in their proxy statements, due to SEC disclosure enforcement that is effective from 2006. An example is provided in Appendix B. Relevant to this research, I collect performance measures, target levels, and grant date of annual bonus plan for each firm-year. Out of a total of 8,542 firm-year observations, 2,098 firm-years use revenue as a performance measure, which is approximately 25% of the total observations.[3]

Consistent with the series of papers that examine the effect of revenue surprise, I use analysts' consensus forecast calculated from I/B/E/S database as a measure for market expectations (Swaminathan and Weintrop 1991; Ertimur et al. 2003). Consistent with Choi et al. (2016), I obtain the consensus of analysts' forecasts as the median of analysts' forecasts that satisfy the following criteria.

(1) The release of forecast is after the announcement of year t-1 earnings.
(2) The release of forecast is before the grant date of annual bonus plan for year t.

If the analyst has issued multiple forecasts that satisfy these criteria, I use the last issued forecast. If the grant date of annual bonus plan is missing, I use the last day of the first quarter. Since firms

[3] This proportion is similar to that in Kim and Yang (2012) and Huang et al. (2015). Consistent with the two papers, the most frequently used measure in my data is also EPS, which is used by 2,723 observations (32%). Revenue is the second most frequently used measure next to EPS.

must set targets within the first quarter of the fiscal year in order to enjoy the unlimited tax deductibility applied to performance-based compensation, most firms set targets during that quarter (Kim and Yang 2012; Edmonds et al. 2013). The above explanation regarding the range of analysts' forecasts is illustrated in Figure 1.

<Insert Figure 1 about here>

According to a recent study by Bradshaw et al. (2016), my approach of using revenue forecasts has great advantages that mitigate the concern of biased forecasts. To begin with, revenue forecasts are highly accurate. Since revenue is easier to predict than earnings, analysts predict revenue with higher precision. During the twelve months prior to announcement, the average percentage forecast error of consensus revenue forecast remains below 5 percent. In addition, revenue forecasts show no evidence of bias related to growth.[4] The accuracy and unbiasedness of revenue forecasts add to the credibility of my research design.

Because I compare the level of target and the level of consensus analyst forecast, that these two values are exactly comparable is a critical concern. Firms might use adjusted revenue to evaluate performance, and analysts might also report adjusted revenue to predict performance. Therefore, to ensure that the target value and forecast value exactly correspond to each other, I only use the observations whose actuals (the realized revenue number) from target data and actuals (the realized revenue number) from I/B/E/S are in 1% difference (Kim and Yang 2010). To give an example, in the proxy statement of Abott Laboratories for year 2010, the revenue target value is $36.62 billion and the actual value is $35.17 billion. Since the actual value for the same firm-year in the I/B/E/S database is $35.167 billion—which is in 1% difference of $35.17 billion, I pair the median analysts' forecast of $36.093 billion to the target value of $36.62 billion. This example is further illustrated in Appendix B. To ensure consistency of revenue targets,

[4] In Bradshaw et al. (2016), revenue forecasts show positive and insignificant association to growth opportunities. A positive relation would render my tests more conservative.

revenue forecasts, and revenue actuals, all revenue-related values are used from these paired values throughout the paper.

To examine whether firms with more growth opportunities set revenue targets higher than revenue forecasts, I test the following regression.

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} =$$

$$\alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 REVForecastOpt_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t} \quad (1)$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 48 Fama-French classifications. The financial statement variables are measured for year t-1, that is, at fiscal-year-end before the grant date of annual bonus plan for year t. Annual bonus plan information and analyst forecast information is for year t. CEO information is measured for t to ensure that the annual bonus plan information corresponds to the CEO information. If there is more than one CEO for a given year, I delete the observations for the given year. To measure the extent that the target is set over the consensus forecast, I deduct consensus forecast from target and scale the term by lagged assets ($REV\ Target_{i,t}\text{-}REV\ AF_{i,t}$)[5]. For my main measure of growth opportunities, I use market-to-book ratio ($Market\text{-}to\text{-}Book_{i,t-1}$) consistent with papers that examine the relation between growth and revenue surprise (Skinner and Sloan 2002; Ertimur et al. 2003). Market-to-book ratio is measured by market value of equity divided by book value of equity. In my hypothesis, I predict the coefficient of $Market\text{-}to\text{-}Book_{i,t-1}$ to be positive. To see if the results differ with the firm's portfolio of performance measures, I include a dummy variable ($EarnMeasure_{i,t}$) that indicates observations who also use at least one

[5] According to Kasnik and Mcnichols (2002), analysts' earnings forecasts are higher for firms that beat current and prior earnings expectations, but not after controlling for current forecast errors. If forecasts are also set higher for revenue, the dependent variable $REV\ Target_{i,t}\text{-}REV\ AF_{i,t}$ would decrease for firms that beat expectations, leading to more conservative tests.

earnings measure along with revenue measure. An example of an earnings measure would be EPS, EBIT, EBITDA and so forth. I expect that a firm that does not complement its revenue measure with earnings measure puts more emphasis on revenue growth than a firm that does, and predict the coefficient on $EarnMeasure_{i,t}$ to be negative. I control for the leverage level ($Lev_{i,t-1}$), measured by total liability divided by total assets. I also include industry competition ($HHI_{i,t-1}$), using the Herfindahl-Hirschman Index. Herfindahl-Hirschman Index is the sum of squares of market share for all firms in a given industry in a given year, which ranges from 0—indicating high competition to 1—indicating low competition. I include earnings volatility ($Volatility_{i,t-1}$) as standard deviation of quarterly earnings over 12 quarters scaled by lagged total assets. I control for firm size ($Size_{i,t-1}$) by natural logarithm of market value of equity. I also control for optimism in revenue consensus forecasts ($REVForecastOpt_{i,t}$). Consistent with Bradshaw et al. (2016), I measure this variable by consensus forecast minus the actual value, scaled by the actual value. Finally, I control for CEO characteristics: a dummy variable indicating new CEO ($NewCEO_{i,t}$) and logarithm of CEO Tenure ($CEOtenure_{i,t}$). All variables are again explained in Appendix A. I gather executive information and financial statement information from Execucomp and Compustat. Requiring the observations to have all the variables in the regression leaves us with the final sample of 766 firm-year observations. The sample selection procedure is discussed in detail in Table 1. All variables included in the regression are winsorized at 1 percent from the top and the bottom.

<Insert Table 1 about here>

Furthermore, to test if the same effect applies to EPS targets, I test model (2).

$$EPS\ Target_{i,t}\text{-}EPS\ AF_{i,t} =$$

$$\alpha_0 + \alpha_1 RevMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 \mathrm{EPSForecastOpt}_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t} \quad (2)$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 48 Fama-French classifications. The only difference between model (1) and model (2) is naturally, the use of *EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$ instead of *REV Target*$_{i,t}$*-REV AF*$_{i,t}$, the use of *RevMeasure* $_{i,t}$ instead of *EarnMeasure* $_{i,t}$, and the use of *EPSForecastOpt*$_{i,t}$ instead of *REVForecastOpt*$_{i,t}$. The definitions of these variables are consistent to the explanations above. To be specific, I deduct consensus EPS forecast from EPS target and scale the term by lagged assets (*EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$). I include a dummy variable indicating whether the observation supplements its EPS measure with revenue measure (*RevMeasure* $_{i,t}$). An example of a revenue measure would be revenue, average daily sales, global sales, and so forth. I control for optimism in EPS consensus forecast as consensus forecast minus the actual value, scaled by the actual value (*EPSForecastOpt*$_{i,t}$). Using the same procedure as for revenue targets, I retrieve a sample of firm-year observations that use EPS measure, and require that EPS actuals from target data are in 1% difference of EPS actuals from I/B/E/S data. Requiring the observations to have all the variables in the regression leaves us with the final sample of 1,111 firm-year observations. All variables included in the regression are winsorized at 1 percent from the top and the bottom.

To corroborate my research design, I retrieve a sample of firm-year observations that use both revenue and EPS measure, and require that both revenue and EPS actuals from target data are in 1% difference of revenue and EPS actuals from I/B/E/S data. Requiring the observations to have all the variables in the regression leaves us with the final sample of 176 firm-year observations. For this sample, I are able to test the effect of *Market-to-Book* $_{i,t-1}$ on both *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ and *EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$. From model (1) and (2), indicator variables for the use of earnings measure (*EarnMeasure* $_{i,t}$) and the use of revenue measure (*RevMeasure* $_{i,t}$) are naturally omitted, since observations in this sample are those that use both revenue and EPS performance measure. Also, to compare the effect of *Market-to-Book* $_{i,t-1}$ on *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ to that on *EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$, I use the same series of independent variables for the two

models.

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} =$$

$$\alpha_0 + \alpha_1\ Market\text{-}to\text{-}Book_{i,t-1} + \alpha_2\ Lev_{i,t-1} + \alpha_3\ HHI_{i,t-1} + \alpha_4\ Volatility_{i,t-1} + \alpha_5\ Size_{i,t-1} + \alpha_6 REVForecastOpt_{i,t} + \alpha_7 EPSForecastOpt_{i,} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$EPS\ Target_{i,t}\text{-}EPS\ AF_{i,t} =$$

$$\alpha_0 + \alpha_1\ Market\text{-}to\text{-}Book_{i,t-1} + \alpha_2\ Lev_{i,t-1} + \alpha_3\ HHI_{i,t-1} + \alpha_4\ Volatility_{i,t-1} + \alpha_5\ Size_{i,t-1} + \alpha_6 REVForecastOpt_{i,t} + \alpha_7 EPSForecastOpt_{i,} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t} \quad (4)$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Since the stringent requirement of matching both revenue and EPS actuals reduce my observations to 176 observations, I classify industries based on 1-digit SIC codes. All variables included in the regression are winsorized at 1 percent from the top and the bottom.

V. RESULTS

Descriptive statistics

Overall, this study considers three samples: my main sample of 766 observations that use revenue as a performance measure, a sample of 1,111 observations that use EPS as a performance measure, and a sample of 176 observations that use both revenue and EPS as a performance measure. Using a sample spanning from 1993 to 2007, Huang et al. (2015) show that firms that use revenue as a performance measure significantly differ from those that do not. I extend this analysis to a more recent sample and to a more detailed segmentation.

Descriptive statistics are shown in Table 2. Panel A shows the size and mean of the three samples: REV stands for the main sample that uses revenue as a performance measure, EPS stands for the sample that uses EPS as a performance measure, BOTH stands for the sample that

uses both revenue and EPS as a performance measure. In the descriptive statistics, my main variable of interest $Target_{i,t}$- $AF_{i,t}$ shows an interesting divergence of signs: while both raw and scaled *REV* $Target_{i,t}$-*REV* $AF_{i,t}$ show a positive sign, both raw and scaled *EPS* $Target_{i,t}$-*EPS* $AF_{i,t}$ show a negative sign. That is, on average, revenue targets are set higher than revenue forecasts whereas EPS targets are set lower than EPS forecasts. I investigate deeper into this intriguing phenomenon in the next section. In addition, consistent with Huang et al. (2013), most of the observations in my REV sample use at least one type of earnings measures and less than half of my EPS sample uses at least one type of revenue measures. Consistent with Bradshaw et al. (2016), revenue consensus forecast is substantially less optimistic than EPS consensus forecast. Revenue forecasts are much more accurate than EPS forecasts.

I compare mean statistics of my main sample, REV, with those of other two samples, EPS and BOTH. Panel B shows the mean difference between REV and EPS sample. Similar to Huang et al. (2013) in which firms who use revenue performance measure tend to be growth firms with smaller sizes compared to firms that do not, REV sample has significantly higher market-to-book ratio and smaller size than EPS sample in Panel B. REV sample also has lower leverage and higher volatility. Panel C exhibits the mean difference between REV and BOTH sample. REV sample has insignificantly lower market-to-book ratio and has significantly smaller size than BOTH sample. REV sample also has lower leverage and lower Herfindahl-Hirschman Index. The extent that revenue targets are set above revenue forecasts is higher in REV sample than in BOTH sample.

<Insert Table 2 about here>

Target vs Analysts' Forecasts

As noted above, $Target_{i,t}$-$AF_{i,t}$ show interesting characteristics. Both raw and scaled *EPS* $Target_{i,t}$-*EPS* $AF_{i,t}$ are negative, implying that targets are set lower than analysts' forecasts. This result is expected, as EPS targets were found to be set significantly lower than analysts'

consensus forecast in Kim and Yang (2012). Nevertheless, the result for revenue targets is startling. Both raw and scaled *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ is positive, implying that targets are set higher than analysts' forecasts. To delve deeper into this phenomenon, I t-test the difference between raw *TARGET*$_{i,t}$ and *AF*$_{i,t}$ and examine the distribution of this difference.

The results for *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ *(Raw)* and *EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$ *(Raw)* are starkly different, as presented in Table 3. To begin with, in Panel A, the distribution of *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ *(Raw)* is skewed to the right: that is, firms tend to set their revenue targets above revenue forecasts. While observations are centered on 0, the majority stands on the positive side. In specific, the number of observations in -25 to 0 million dollars bin is 42, while the number of observations in 0 to 25 million dollars bin is 196—which is approximately 5 times larger. Also in out t-tests, revenue targets are significantly higher than revenue forecasts, showing a t-value of 3.19. Considering that annual bonus targets are generally expected to be achieved (Merchant and Manzoni 1989), this is unprecedented.

On the other hand, in Panel B, the distribution of *EPS Target*$_{i,t}$*-EPS AF*$_{i,t}$ *(Raw)* is skewed to the left: that is, firms tend to set their EPS targets below EPS forecasts. While observations are centered on 0, the majority stands on the negative side. In specific, the number of observations in -0.025 dollar to 0 dollar bin is 122, while the number of observations in 0 dollar to 0.025 dollar bin is 99. Also in my t-tests, EPS targets are found to be significantly lower than EPS forecasts, showing a t-value of minus 7.46. That EPS targets are not set at a challengeable level is consistent with the general belief and with prior empirical results that examine EPS targets (Merchant and Manzoni 1989; Kim and Yang 2012; Kim and Shin 2016).

To ascertain that this different target setting behavior for revenue and EPS measures is not driven by different firm characteristics between REV and EPS sample, I examine revenue and EPS targets in BOTH sample (Panel C) and find robust results. Revenue targets are set significantly above analysts' forecast, whereas EPS targets are set significantly below analysts'

forecast. To make sure that the difference is not induced by difference in revenue and EPS forecast errors, I examine the difference for all three samples after eliminating forecast errors. The results are robust.

<Insert Table 3 about here>

Correlations

Before testing my main regression, I observe the correlations between all variables that are included in my main regression. Correlations in bold signify a five percent significance level. Consistent with my main expectation that high growth opportunities lead to target setting above analysts' forecasts, my dependent variable *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ is positively correlated with *Market-to-Book* $_{i,t-1}$. *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ is negatively related to *EarnMeasure* $_{i,t}$, suggesting that firms that do not supplement their revenue measure with any earnings measure set their revenue targets higher than revenue forecasts. *Market-to-Book* $_{i,t-1}$ is also positively correlated to *REVForecastOpt*$_{i,t}$, similar to the results in Bradshaw et al. (2016) where revenue forecast walk-down increases with higher growth. This relation decreases the increasing effect of *Market-to-Book* $_{i,t-1}$ on *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ and makes my regressions more conservative.

<Insert Table 4 about here>

Regressions

Table 5 shows OLS estimation results for my regression model, controlled for year and industry effects and clustered by firm. Consistent with my hypothesis H1, estimated coefficient of *Market-to-Book* $_{i,t-1}$ is significantly positive. Firms with more growth opportunities set revenue targets higher than analyst forecasts. In addition, congruent to my expectations, estimated coefficient of *EarnMeasure* $_{i,t}$ is significantly negative. Firms that do not supplement their revenue measure with any earnings measure set revenue targets higher than revenue forecasts than firms that do. Also, coefficient of *Size* $_{i,t-1}$ is significantly negative. An interesting observation

is the positive coefficient of $REVForecastOpt_{i,t}$, since high $REVForecastOpt_{i,t}$ would have an increasing effect on the $REV\ AF_{i,t}$ term and therefore a decreasing effect on the dependent variable.

<Insert Table 5 about here>

On the other hand, consistent with my expectations, I find no evidence of the effect of $Market\text{-}to\text{-}Book_{i,t-1}$ on $EPS\ Target_{i,t}\text{-}EPS\ AF_{i,t}$ for the sample of observations that use EPS as a performance measure. In my untabulated results, the estimated coefficient of $Market\text{-}to\text{-}Book_{i,t-1}$ is insignificant. To ascertain that the difference in revenue target setting and EPS target setting is not driven by distinct characteristics between firms who use revenue measure and firms who use EPS measure, I execute the same analysis for the sample of observations who use both revenue and EPS measure. Since observations in this sample by definition use both revenue and EPS measure, $EarnMeasure_{i,t}$ and $RevMeasure_{i,t}$ are omitted. Results in Table 6 incrementally confirm my expectation. In Panel A, the effect of $Market\text{-}to\text{-}Book_{i,t-1}$ on $REV\ Target_{i,t}\text{-}REV\ AF_{i,t}$ is significantly positive, while the effect of $Market\text{-}to\text{-}Book_{i,t-1}$ on $EPS\ Target_{i,t}\text{-}EPS\ AF_{i,t}$ is insignificant. I find that firms with higher growth opportunities that use both revenue and EPS measures set their revenue targets higher than analysts' forecast, but do not find such evidence that they do so for EPS targets. I present a graphical illustration in Panel B. I divide my sample of observations that use both revenue and EPS measure into four quartiles, by $Market\text{-}to\text{-}Book_{i,t-1}$. Quartile 4 refers to the sample of observations with highest $Market\text{-}to\text{-}Book_{i,t-1}$ and Quartile 1 refers to those with lowest $Market\text{-}to\text{-}Book_{i,t-1}$. In each group, I bar-graph the proportion of revenue targets and EPS targets set above analysts' forecast. For revenue targets, the proportion of firms that set revenue targets above analysts' forecast increases monotonically as the quartile $Market\text{-}to\text{-}Book_{i,t-1}$ increases. for EPS targets, there is no such trend. Another interesting point is that the proportion of revenue targets and EPS targets set above analysts' forecast is indistinguishable at the quartile 1, with lowest $Market\text{-}to\text{-}Book_{i,t-1}$. This implies that firms have

no incentives to set their revenue and EPS forecasts in a different manner when they have low growth opportunities, but face more incentives to do so as growth opportunities increase. All in all, I conclude that firms with high growth opportunities set revenue targets higher than revenue forecasts but are reluctant to do so for EPS targets.[6] I attribute this divergence in target setting behavior to the side effects of setting high EPS targets, such as cutting R&D and investments.

<Insert Table 6 about here>

VI. FURTHER ANALYSES

In my main analysis, I stated that growth firms set revenue targets above revenue forecasts to incentivize beating revenue forecasts. To rule out some alternative explanations, I test whether this behavior of growth firms are indeed related to stock price incentives. In specific, I test if the effect of growth opportunities on revenue target setting is stronger when firms have high incentives to increase their stock price. Similar to Bowen et al. (2002) who find that internet firms inflate revenue numbers to influence the stock market when they face the need to raise additional equity capital and when they pursue acquisitions, I test if external financing incentives and upcoming acquisitions affect revenue target setting as well.

I expect that firms with external financing incentives would have higher incentives to set their revenue targets over revenue forecasts because these firms would substantially benefit from higher stock prices when they raise equity capital. Consistent with Bowen et al. (2002), I measure external financing incentives as cash burn rate—or the time remaining before needing to raise additional capital. This is defined as cash from operations plus cash from investing activities divided by cash and cash equivalents. I label this variable as $Burn_{i,t-1}$. I expect that a lower *Burn*

[6] This result does not imply that revenue target setting and EPS target setting are unrelated. $REV\ Target_{i,t}$-$REV\ AF_{i,t}$ and $EPS\ Target_{i,t}$-$EPS\ AF_{i,t}$ show positive correlation.

$_{i,t-1}$ will magnify the effect of *Market-to-Book* $_{i,t-1}$ on *REV Target*$_{i,t}$*-REV AF*$_{i,t}$. In addition, I expect that firms with upcoming acquisitions during the year would have higher incentives to set their revenue targets over analysts' forecasts. Since most acquisitions are paid in full or in part with stock, firms with upcoming acquisitions during the year would have higher incentives to motivate their managers to perform well during the year. Acquisitions are measured by the total value of acquisitions that occurred in year t scaled by lagged market value of equity, and this measure is labeled $Acq_{i,t}$. Of all the financial statement variables, only *Acq* $_{i,t}$ is measured for year t to measure planned acquisition for year t when the annual bonus plan is granted. I expect that a higher $Acq_{i,t}$ will intensify the effect of *Market-to-Book* $_{i,t-1}$ on *REV Target*$_{i,t}$*-REV AF*$_{i,t}$. Requiring *Burn* $_{i,t-1}$ does not drop any observations, but requiring *Acq* $_{i,t}$ drops the sample number to 691 observations. To show that the effect of growth opportunities on revenue target setting is emphasized when the firm faces external financing incentives or upcoming acquisitions, I interact each *Burn* $_{i,t-1}$and *Acq* $_{i,t}$ with *Market-to-Book* $_{i,t-1}$ and also include separate terms.

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Burn_{i,t-1} + \alpha_4 Market\text{-}to\text{-}Book_{i,t-1} * Burn_{i,t-1} + \alpha_5 Lev_{i,t-1} + \alpha_6 HHI_{i,t-1} + \alpha_7 Volatility_{i,t-1} + \alpha_8 Size_{i,t-1} + \alpha_9 REVForecastOpt_{i,t} + \alpha_{10} NewCEO_{i,t} + \alpha_{11} CEOtenure_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Acq_{i,t} + \alpha_4 Market\text{-}to\text{-}Book_{i,t-1} * Acq_{i,t} + \alpha_5 Lev_{i,t-1} + \alpha_6 HHI_{i,t-1} + \alpha_7 Volatility_{i,t-1} + \alpha_8 Size_{i,t-1} + \alpha_9 REVForecastOpt_{i,t} + \alpha_{10} NewCEO_{i,t} + \alpha_{11} CEOtenure_{i,t} + \varepsilon_{i,t} \quad (6)$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Consistent with my expectations, stock price incentives intensify the effect of growth opportunities on revenue target setting. For model (5), the interaction term *Market-to-Book* $_{i,t-1}$**Burn* $_{i,t-1}$ is significantly negative: the less time remaining before raising additional equity capital, the higher revenue targets are set over analysts' forecasts. The estimated coefficient on *EarnMeasure* $_{i,t}$ is significantly negative and that on *Market-to-Book* $_{i,t-1}$ is significantly positive, consistent with prior results. Coefficients on control variables are also

similar to prior results. For model (6), the interaction term *Market-to-Book* $_{i,t-1}$* *Acq* $_{i,t}$ is significantly positive: if the firm plans to engage in acquisitions during the year, the firm sets revenue targets incrementally higher than analysts' forecasts. The estimated coefficient on *EarnMeasure* $_{i,t}$ is significantly negative, but the inclusion of *Acq* $_{i,t}$ renders *Market-to-Book* $_{i,t-1}$ positive but marginally insignificant. Coefficients on control variables are consistent with prior results.

<Insert Table 7 about here>

VII. ROBUSTNESS CHECKS

Growth opportunities as R&D

To estimate growth opportunities, I use market-to-book ratio following the studies that examine growth opportunities and revenue surprise (Skinner and Sloan 2002; Ertimur et al. 2003). To show that my results are robust to a different definition of growth opportunities, I borrow from Albuquerque et al. (2014) and use the ratio of R&D expenses to the value of total assets, denoted by $R\&D_{i,t-1}$. I assume missing R&D expenses to be zero. The results are robust, as shown in Table 8 Panel A.

Market expectations as prior year revenue

According to random walk hypothesis, revenue is unpredictable. Therefore, the best prediction that the market can make is that the next year revenue would be similar to current year revenue. In line with this hypothesis, some research examining revenue surprise supplement their tests using analysts' forecasts with tests using prior year revenue (Ertimur et al. 2003). I also replace analysts' forecasts with prior revenue and obtain untabulated robust results.

Market expectations as prior year revenue multiplied by growth

My dependent variable *REV Target*$_{i,t}$*-REV AF*$_{i,t}$ consists of two terms, *REV Target*$_{i,t}$ and *REV AF*$_{i,t}$, which both increases with *Market-to-Book*$_{i,t-1}$. Furthermore, the positive correlation between *Market-to-Book*$_{i,t-1}$ and *REVForecastOpt*$_{i,t}$ incrementally increases *REV AF*$_{i,t}$ and therefore decreases the effect of *Market-to-Book*$_{i,t-1}$ on *REV Target*$_{i,t}$*-REV AF*$_{i,t}$, biasing against my results. However, to further mitigate the concern that the increasing effect of *Market-to-Book*$_{i,t-1}$ on *REV Target*$_{i,t}$ might drive my results, I use two proxies of market expectations that is more stringent on growth. The first proxy is actual revenue of t-1 multiplied by revenue growth from t-2 to t-1, denoted by *REV Actual* $_{i,t-1}$**PriorGr* $_{i,t-1}$. The second proxy is actual revenue of t-1 multiplied by expected revenue growth of t-1. Following Choi et al. (2016) who also examine expected growth in a target setting study, expected revenue growth is estimated by the following model.

$$ExpGr_{i,t-1} = \alpha_0 + \alpha_1\ Past\ Revenue\ growth_{i,t-1} + \alpha_2\ Size_{i,t-1} + \alpha_3\ EP_{i,t-1} + \alpha_4\ Leverage_{i,t-1}$$
$$+ \alpha_5\ MKT_{i,t-1} + \alpha_6\ RD_{i,t-1} + \alpha_7\ CAP_{i,t-1} + \alpha_8\ BTM_{i,t-1} + \alpha_9\ Div\ yield_{i,t-1} + \alpha_{10}\ Past\ RET_{i,t-1} + \varepsilon_{i,t}$$

The variables included are growth in revenue over the prior three years (*Past Revenue growth*), natural logarithm of the market value of equity (*Size*), earnings to price ratio (*EP*), leverage (*Leverage*), advertising expenses scaled by sales (*MKT*), average of R&D expenses scaled by sales for the prior three years (*RD*), average of capital expenditures scaled by total assets (*CAP*), book-to-market ratio (*BTM*), dividend yield ratio (*Div yield*), and stock returns over the past 12 months (*Past RET*). Using the expected growth from this model, I calculate the second proxy, denoted *REV Actual* $_{i,t-1}$**ExpGr* $_{i,t-1}$. Requiring the observations to have all the variables necessary to estimate *ExpGr* $_{i,t-1}$leaves us with 688 observations. The results for using both proxies of market expectations are robust, as tabulated in Table 8 Panel B.

Market expectations as consensus forecast, using forecasts in a different range

To estimate consensus analysts' forecast, I use a range of analysts' forecasts from

announcement of year t-1 earnings to grant date of annual bonus plan of year t. Other studies that examine annual bonus compensation and analysts' forecasts use a looser classification, the consensus analysts' forecasts for the first quarter. To show that my results are robust to a different range of analysts' forecasts, I also test using the consensus forecast of first quarter and find robust results that are untabulated.

Results not driven by CEO's career concerns

According to Graham et al. (2005), CEOs with more career concerns are more pressured to beat market expectations. To show that my results are not driven by recently appointed CEOs of growth firms who are pressured to show their abilities, I divide my sample into two groups by CEO tenure. The results in the shorter tenure sample and in the longer tenure sample are both robust and untabulated.

<Insert Table 8 about here>

VIII. CONCLUSION

This study explores the distribution and determinant of revenue targets. I find that revenue targets are in general set higher than revenue forecasts, and that growth opportunities push revenue targets above revenue forecasts. I attribute this target setting behavior to the incentive of growth firms to achieve revenue surprises and find heightened behavior when these firms can benefit more from high stock prices. In addition, I find that EPS targets are in general set lower than EPS forecasts, in contrast to revenue targets. I find no evidence on the effect of growth opportunities on EPS targets. The results are robust to various research designs.

Casting attention on the unexamined revenue targets, this paper opens new venues of future research. To begin with, what other factors influence revenue target setting above revenue forecasts? I only explore the effect of growth opportunities, but there would also be other

situations when achieving revenue surprise is important. For instance, revenue surprise might be more critical to firms in internet industries or to firms in loss situations. In addition, the differential target setting behavior for revenue and EPS measure could also be linked to other factors. For example, firms who pursue revenue-increasing strategy and those who pursue cost-reduction strategy might also set targets differently for revenue and EPS measure. It is my limitation that I have not addressed or negated all other explanations related to the documented phenomenon. Given the increasing importance of revenue, further examination of revenue target setting would add value to the literature.

All in all, this paper extends the accounting literature in various ways. First of all, as far as I know, it is the first paper to focus on revenue targets. Revenue is one of the most frequently used measures, but how targets are set for this revenue measure has been largely unexamined. I directly address this void and explore the distribution and determinant of revenue targets. Second of all, this paper examines how firms attempt to beat revenue forecasts. Although the importance of revenue surprise has been well-documented in the literature, how firms try to beat revenue forecasts has not been well-addressed. I suggest that annual bonus plays a motivational role in achieving revenue surprise. Third of all, I examine the use of analysts' forecasts in setting annual bonus targets. Though anecdotal evidence has suggested this issue (Indjejikian et al. 2014a), it has been rarely examined by researchers. Fourth of all, I discover that revenue and EPS targets are set differently. This implies that by focusing on earnings targets, researchers have only investigated a limited realm of target setting. To attain a more balanced and complete perspective, further research on revenue targets is imperative.

APPENDIX A

Variable Definitions

$REV\ Target_{i,t}$-$REV\ AF_{i,t}$ *(Raw)*	Revenue target minus revenue consensus forecast
$REV\ Target_{i,t}$-$REV\ AF_{i,t}$	Revenue target minus revenue consensus forecast, scaled by lagged assets
$EPS\ Target_{i,t}$-$EPS\ AF_{i,t}$ *(Raw)*	EPS target minus EPS consensus forecast
$EPS\ Target_{i,t}$-$EPS\ AF_{i,t}$	EPS target minus EPS consensus forecast, scaled by lagged assets
$EarnMeasure_{i,t}$	1 if the observation uses at least one earnings measure, 0 otherwise (e.g. EPS, EBIT, EBITDA)
$RevMeasure_{i,t}$	1 if the observation uses at least one revenue measure, 0 otherwise (e.g. revenue, daily sales, global sales)
$Market\text{-}to\text{-}Book_{i,t-1}$	Market value of equity divided by book value of equity
$Lev_{i,t-1}$	Total liability divided by total assets
$HHI_{i,t-1}$	Herfindahl-Hirschman Index, defined as the sum of squares of market share of all firms in an industry in a year based on 48 Fama-French classifications
$Volatility_{i,t-1}$	Standard deviation over 12 quarters of quarterly earnings scaled by lagged total assets
$Size_{i,t-1}$	Natural logarithm of market value of equity
$REVForecastOpt_{i,t}$	Revenue consensus forecast minus realized actual revenue, scaled by realized actual revenue
$EPSForecastOpt_{i,t}$	EPS consensus forecast minus realized actual EPS, scaled by realized actual EPS
$NewCEO_{i,t}$	1 if the CEO is newly appointed during the year, 0 otherwise
$CEOtenure_{i,t}$	Natural logarithm of the years the CEO has served as a CEO
$Burn_{i,t-1}$	Cash from operations plus cash from investing activities, divided by cash and cash equivalents
$Acq_{i,t}$	Value of acquisition scaled by lagged market value of equity
$REV\ Target_{i,t}$-$REV\ Actual_{i,t-1}$*$PriorGr_{i,t-1}$	Revenue target minus prior year revenue multiplied by revenue growth from year t-2 to t-1
$REV\ Target_{i,t}$-$REV\ Actual_{i,t-1}$*$ExpGr_{i,t-1}$	Revenue target minus prior year revenue multiplied by expected revenue growth from year t-1 to t, measured by model $ExpGr_{i,t-1} = \alpha_0 + \alpha_1\ Past\ Revenue\ growth_{i,t-1} + \alpha_2\ Size_{i,t-1} + \alpha_3\ EP_{i,t-1} + \alpha_4\ Leverage_{i,t-1} + \alpha_5\ MKT_{i,t-1} + \alpha_6\ RD_{i,t-1} + \alpha_7\ CAP_{i,t-1} + \alpha_8\ BTM_{i,t-1} + \alpha_9\ Div\ yield_{i,t-1} + \alpha_{10}\ Past\ RET_{i,t-1} + \varepsilon_{i,t}$
$R\&D_{i,t-1}$	R&D expenses scaled by total assets

Financial statement variables are measured for year t-1, that is, at fiscal-year-end before the grant date of annual bonus plans. Annual bonus plan variables and analyst forecast variables are measured for year t. CEO variables are measured for year t to ensure that the annual bonus plan variables correspond to the CEO variables.
All variables are winsorized at top and bottom 1 percent.

APPENDIX B

An example of annual bonus plan details disclosed in proxy statement

Excerpt from 2010 Proxy Statement of Abbott Laboratories

Goal and Expected Result	Results Achieved
A. Adjusted Diluted EPS of $4.11	A. Adjusted Diluted EPS of $4.17
B. Sales of $36.62BN	B. Sales of $35.17BN
C. Adjusted Earnings Before Taxes of $7.67BN	C. Adjusted Earnings Before Taxes of $7.77BN
D. Adjusted Return on Assets of 14.5%	D. Adjusted Return on Assets of 15.0%
E. Adjusted Return on Equity of 25.9%	E. Adjusted Return on Equity of 26.5%
F. Operating Cash Flow of $7.4BN	F. Operating Cash Flow of $8.7BN

Above is a real example of an annual bonus plan used in my study. Abbott Laboratories uses six performance measures for its CEO, Miles D. White: adjusted diluted EPS, sales, adjusted earnings before taxes, adjusted return on assets, adjusted return on equity, and operating cash flow. I collect the target values and the actual values from this disclosed proxy statement. The revenue target value is $36.62 billion and the actual value is $35.17 billion in this proxy statement. Since the actual value in the I/B/E/S database is $35.167 billion—which is in 1% difference of the actual value in the proxy statement $35.17 billion, I pair the median analysts' forecast of $36.093 billion to the target value of $36.62 billion. On the other hand, the EPS target value is $4.11 and the actual value is $4.17 in the proxy statement. Since the actual value from the I/B/E/S database is $4.17—which is in 1% difference of the actual value in the proxy statement $4.17, I pair the median analysts' forecast of $4.24 to the target value of $4.11.

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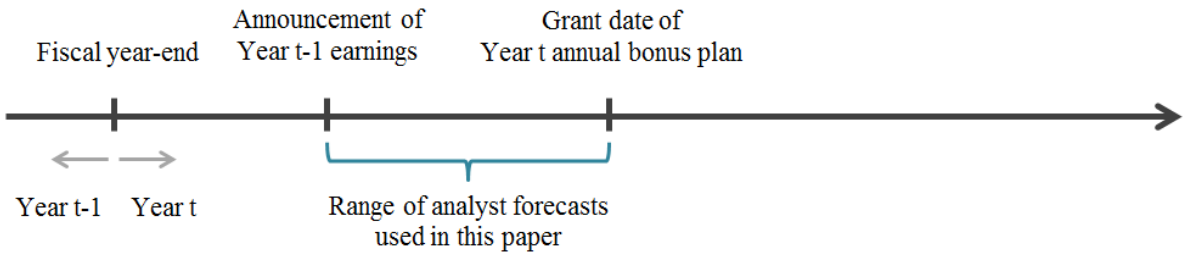
FIGURE 1

Range of analysts' forecasts used in the study



Following Choi et al. (2016), I obtain the consensus of analyst forecasts as the median of analysts' forecasts that satisfy these criteria:

(1) The release of forecast is after the announcement of year t-1 earnings.

(2) The release of forecast is before the grant date of year t annual bonus plan.

If the grant date of an annual bonus plan is missing, I use the last day of the first quarter. Since firms must set targets within the first quarter in order to enjoy the unlimited tax deductibility applied to performance-based compensation (Edmonds et al. 2013), most firms set targets within the first quarter.

TABLE 1

Sample Selection

S&P 1500 firm-years that use revenue as a performance measure in CEO annual bonus plan	2098
Less firm-years that did not state revenue target value or revenue actual value in the proxy statement	(552)
Less firm-years that lack I/B/E/S data	(273)
Less firm-years whose revenue actual value in the proxy statement and I/B/E/S database are not in 1% difference	(429)
Sample firm-years that have matching actuals in the proxy statement and I/B/E/S database	844
Less firm-years that lack Compustat or Execucomp data	(17)
Sample firm-years that have matching actuals and have analyst forecast, financial statement, and executive compensation information	827
Less firm-years that lack data needed for control variables	(61)
Final sample	766

In my sample spanning from 2008 to 2014, 2,098 firm-years use revenue as a performance measure out of a total of 8,542 firm-year observations (25%). This proportion is similar to that in Kim and Yang (2012) and Huang et al. (2015). Consistent with the two papers, the most frequently used measure in my data is also EPS, which is used by 2,723 observations (32%). Revenue is the second most frequently used measure next to EPS.

TABLE 2

Descriptive Statistics

PANEL A. Descriptive Statistics

	REV		EPS		BOTH	
Variables	N	Mean	N	Mean	N	Mean
REV Target$_{i,t}$-REV AF$_{i,t}$ (Raw)	766	49.326	N/A	N/A	176	70.295
REV Target$_{i,t}$-REV AF$_{i,t}$	766	0.011	N/A	N/A	176	0.006
EPS Target$_{i,t}$-EPS AF$_{i,t}$ (Raw)	N/A	N/A	1,111	-0.082	176	-0.066
EPS Target$_{i,t}$-EPS AF$_{i,t}$	N/A	N/A	1,111	-0.000	176	-0.000
EarnMeasure $_{i,t}$	766	0.950	1,111	1.000	176	1.000
RevMeasure $_{i,t}$	766	1.000	1,111	0.340	176	1.000
Market-to-Book $_{i,t-1}$	766	3.597	1,111	3.181	176	4.982
Lev $_{i,t-1}$	766	0.501	1,111	0.579	176	0.530
HHI $_{i,t-1}$	766	0.063	1,111	0.061	176	0.069
Volatility $_{i,t-1}$	766	0.011	1,111	0.008	176	0.011
Size $_{i,t-1}$	766	8.224	1,111	8.355	176	8.745
REVForecastOpt$_{i,t}$	766	0.048	N/A	N/A	176	0.043
EPSForecastOpt$_{i,t}$	N/A	N/A	1,111	0.142	176	0.157
NewCEO $_{i,t}$	766	0.054	1,111	0.065	176	0.068
CEOtenure $_{i,t}$	766	1.785	1,111	1.796	176	1.862

REV refers to my main sample, 766 firm-year observations that use revenue measure. Since not all firms in REV sample use EPS measure, variables that require EPS target information are N/A for REV sample. EPS refers to the sample of 1,111 observations that use EPS measure. Since not all firms in EPS sample use revenue measure, variables that require revenue target information are N/A for EPS sample. BOTH refers to the sample of 176 observations that use both revenue and EPS measure. Variable definitions are in Appendix A.

PANEL B. Mean Difference between observations that use revenue measure and observations that use EPS measure

Variables	REV (N=766)	EPS (N=1,111)	Diff	p-value
Market-to-Book $_{i,t-1}$	3.597	3.181	0.416	0.053
Lev$_{i,t-1}$	0.501	0.579	-0.078	<0.001
HHI$_{i,t-1}$	0.063	0.061	0.002	0.395
Volatility $_{i,t-1}$	0.011	0.008	0.003	<0.001
Size$_{i,t-1}$	8.224	8.355	-0.131	0.074
NewCEO $_{i,t}$	0.054	0.065	-0.011	0.305
CEOtenure $_{i,t}$	1.785	1.796	-0.011	0.769

PANEL C.

Mean Difference between observations that use revenue measure and observations that use both revenue and EPS measure

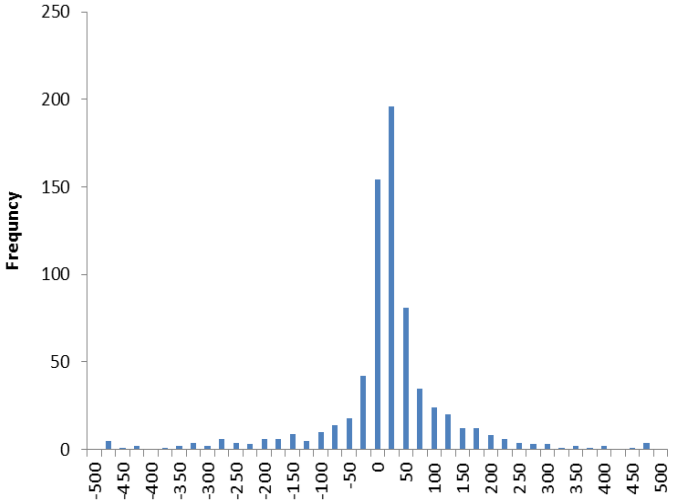
Variables	REV (N=766)	BOTH (N=176)	Diff	p-value
REV Target$_{i,t}$*-REV AF*$_{i,t}$ *(Raw)*	49.326	70.295	-20.970	0.272
REV Target$_{i,t}$*-REV AF*$_{i,t}$	0.011	0.006	0.005	0.067
Market-to-Book $_{i,t-1}$	3.597	4.982	-1.385	0.130
Lev$_{i,t-1}$	0.501	0.530	-0.029	0.085
HHI$_{i,t-1}$	0.063	0.069	-0.006	0.091
Volatility $_{i,t-1}$	0.011	0.011	0.000	0.983
Size$_{i,t-1}$	8.224	8.745	-0.521	<0.001
REVForecastOpt$_{i,t}$	0.048	0.043	0.005	0.200
NewCEO $_{i,t}$	0.054	0.068	-0.014	0.480
CEOtenure $_{i,t}$	1.785	1.862	-0.077	0.253

TABLE 3

Target vs Analyst Forecast

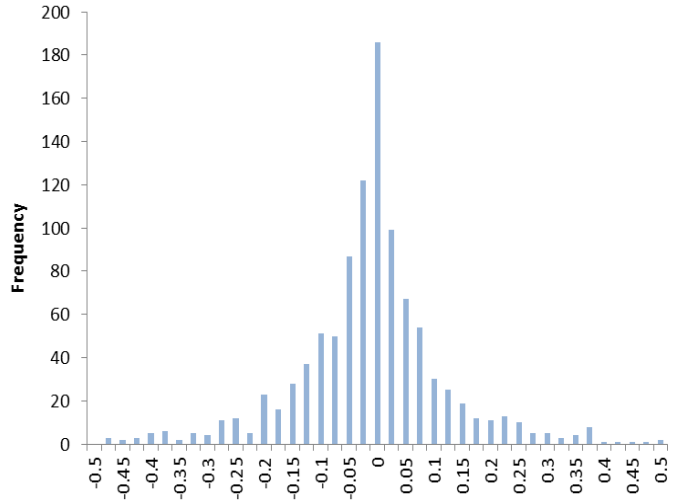
PANEL A.

Revenue target vs consensus revenue forecast of observations that use revenue measure

T-TEST		HISTOGRAM
REV Target$_{i,t}$-REV AF$_{i,t}$ (Raw)		
N	766	
Mean	49.326	
t	3.19	
Pr > |t|	0.002	

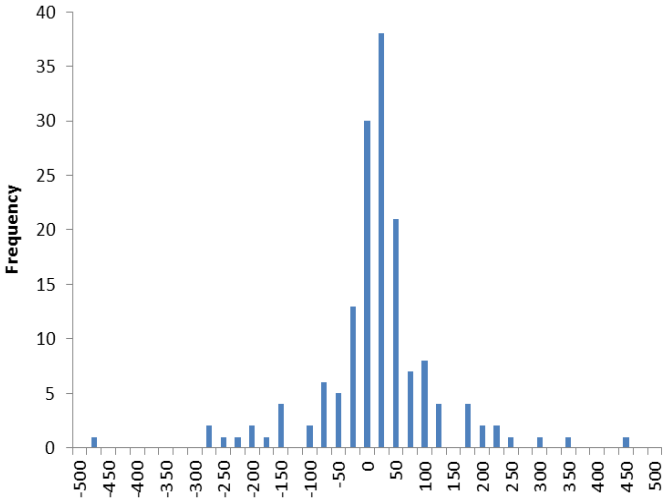
PANEL B.

EPS target vs consensus EPS forecast of observations that use EPS measure

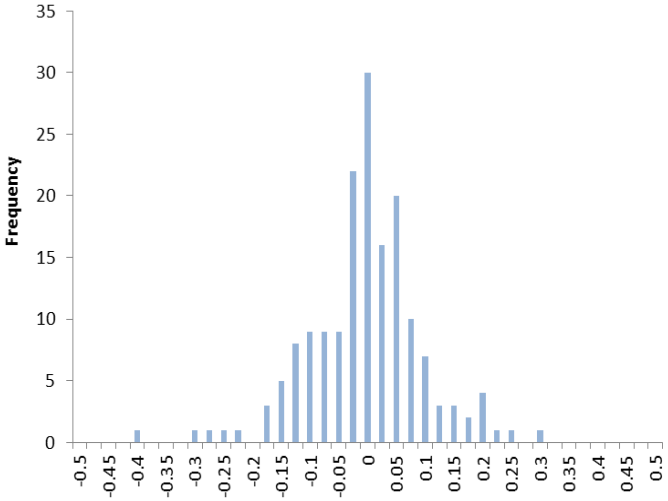
T-TEST		HISTOGRAM
EPS Target$_{i,t}$-EPS AF$_{i,t}$ (Raw)		
N	1,111	
Mean	-0.082	
t	-7.46	
Pr > |t|	<.0001	

PANEL C.

Revenue target vs consensus revenue forecast of observations that use both revenue and EPS measure

T-TEST		HISTOGRAM
REV Target$_{i,t}$-REV AF$_{i,t}$ (Raw)		
N	176	
Mean	70.295	
t	1.95	
Pr > |t|	0.053	

EPS target vs consensus EPS forecast of observations that use both revenue and EPS measure

T-TEST		HISTOGRAM
EPS Target$_{i,t}$-EPS AF$_{i,t}$ (Raw)		
N	176	
Mean	-0.066	
t	-2.08	
Pr > |t|	0.040	

On the left are results of t-tests between raw target value *Target$_{i,t}$* and raw consensus forecast value *AF$_{i,t}$*. On the right are histograms showing the distribution of the difference between raw target value and raw consensus forecast value, *Target$_{i,t}$-AF$_{i,t}$ (Raw)*. The unit for *REV Target$_{i,t}$-REV AF$_{i,t}$ (Raw)* is million dollars. The bin width for *REV Target$_{i,t}$-REV AF$_{i,t}$ (Raw)* is 25 million dollars; for brevity, observations with values greater than 500 (-500) million dollars are not shown in histograms. The unit for *EPS Target$_{i,t}$-EPS AF$_{i,t}$ (Raw)* is one dollar. The bin width for *EPS Target$_{i,t}$-EPS AF$_{i,t}$ (Raw)* is 0.025 dollar; for brevity, observations with values greater than 0.5 (-0.5) dollar are not shown in histograms.

TABLE 4

Pearson Correlation Matrix

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*
(1) REV Target$_{i,t}$-REV AF$_{i,t}$	1.000									
(2) EarnMeasure $_{i,t}$	**-0.083**	1.000								
(3) Market-to-Book $_{i,t-1}$	**0.088**	0.007	1.000							
(4) Lev$_{i,t-1}$	-0.013	-0.043	**0.164**	1.000						
(5) HHI$_{i,t-1}$	-0.035	-0.022	0.050	0.065	1.000					
(6) Volatility $_{i,t-1}$	**0.083**	0.038	-0.016	**-0.177**	0.051	1.000				
(7) Size$_{i,t-1}$	**-0.200**	-0.039	0.063	**0.228**	0.026	**-0.181**	1.000			
(8) REVForecastOpt$_{i,t}$	**0.185**	0.020	**0.098**	**-0.186**	-0.012	**0.156**	**-0.276**	1.000		
(9) NewCEO $_{i,t}$	0.030	0.028	0.044	0.015	**0.079**	0.050	-0.059	0.001	1.000	
(10)CEOtenure $_{i,t}$	-0.051	**-0.086**	**-0.098**	**-0.128**	-0.012	**-0.097**	-0.035	0.000	**-0.533**	1.000

Above are the correlations between all variables included in the main regression, for the sample of 766 firm-year observations used in the main regression. Bold coefficients correspond to a 5 percent significance level. Variable definitions are in Appendix A.

TABLE 5

The Effect of Growth Opportunities on Revenue Target Setting above Analysts' Forecasts

Variables	Prediction	$REV\ Target_{i,t}$-$REV\ AF_{i,t}$	
$EarnMeasure_{i,t}$	-	-0.0255	*
		(0.071)	
$Market\text{-}to\text{-}Book_{i,t-1}$	+	0.0006	**
		(0.024)	
$Lev_{i,t-1}$		0.0068	
		(0.602)	
$HHI_{i,t-1}$		0.4360	*
		(0.092)	
$Volatility_{i,t-1}$		0.1770	
		(0.309)	
$Size_{i,t-1}$		-0.0055	***
		(0.000)	
$REVForecastOpt_{i,t}$		0.1360	**
		(0.020)	
$NewCEO_{i,t}$		-0.0061	
		(0.490)	
$CEOtenure_{i,t}$		-0.0046	
		(0.125)	
Constant		0.0403	
		(0.213)	
Observations		766	
R-squared		0.173	
Year FE		YES	
Industry FE		YES	

Above are the OLS regression results for model (1):

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 REVForecastOpt_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t} \quad (1)$$

for the sample of 766 firm-year observations that use revenue measure.
Industry fixed effects and year fixed effects are included and standard errors are clustered by firm.
Industries are based on 48 Fama-French classifications. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. P-values are in parentheses. Variable definitions are in Appendix A.

TABLE 6

The Effect of Growth Opportunities on Revenue and EPS Target Setting above Analysts' Forecasts

PANEL A. OLS regression results

Variables	Prediction	*REV Target$_{i,t}$-REV AF*$_{i,t}$		Prediction	*EPS Target$_{i,t}$-EPS AF*$_{i,t}$	
Market-to-Book $_{i,t-1}$	+	0.0002	*	No sign	0.0000	
		(0.086)			(0.308)	
Lev$_{i,t-1}$		-0.0054			0.0000	
		(0.685)			(0.503)	
HHI$_{i,t-1}$		-0.0504			0.0000	
		(0.434)			(0.940)	
Volatility $_{i,t-1}$		-0.3700	***		-0.0003	
		(0.007)			(0.674)	
Size$_{i,t-1}$		-0.0027			-0.0000	
		(0.223)			(0.469)	
REVForecastOpt$_{i,t}$		0.0252			-0.0005	
		(0.660)			(0.248)	
EPSForecastOpt$_{i,t}$		0.0102	**		0.0000	
		(0.041)			(0.418)	
NewCEO $_{i,t}$		-0.0082			-0.0007	
		(0.458)			(0.127)	
CEOtenure $_{i,t}$		-0.0040			-0.0000	**
		(0.124)			(0.0454)	
Constant		0.0630	*		0.0001	
		(0.097)			(0.286)	
Observations		176			176	
R-squared		0.149			0.178	
Year FE		YES			YES	
Industry FE		YES			YES	

In Panel A, on the left are the OLS regression results for model (3) and on the right are the results for model (4)

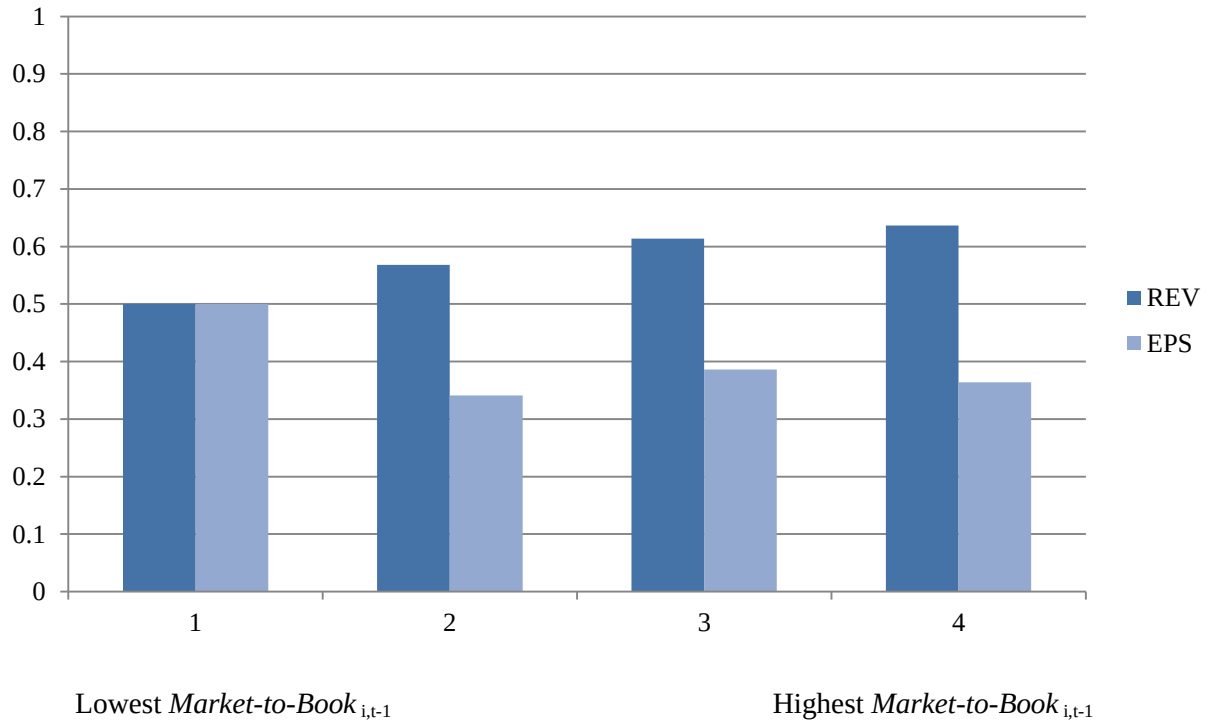
$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1\ Market\text{-}to\text{-}Book_{i,t-1} + \alpha_2\ Lev_{i,t-1} + \alpha_3\ HHI_{i,t-1} + \alpha_4\ Volatility_{i,t-1} + \alpha_5\ Size_{i,t-1} + \alpha_6\ REVForecastOpt_{i,t} + \alpha_7\ EPSForecastOpt_{i,t} + \alpha_8\ NewCEO_{i,t} + \alpha_9\ CEOtenure_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$EPS\ Target_{i,t}\text{-}EPS\ AF_{i,t} = \alpha_0 + \alpha_1\ Market\text{-}to\text{-}Book_{i,t-1} + \alpha_2\ Lev_{i,t-1} + \alpha_3\ HHI_{i,t-1} + \alpha_4\ Volatility_{i,t-1} + \alpha_5\ Size_{i,t-1} + \alpha_6\ REVForecastOpt_{i,t} + \alpha_7\ EPSForecastOpt_{i,t} + \alpha_8\ NewCEO_{i,t} + \alpha_9\ CEOtenure_{i,t} + \varepsilon_{i,t} \quad (4)$$

for the sample of 176 firm-year observations that use both revenue and EPS measure. Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 1-digit SIC codes. *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. P-values are in parentheses. Variable definitions are in Appendix A.

PANEL B.

The proportion of firm-year observations that set revenue target above analysts' forecast vs. the proportion of firm-year observations that set EPS target above analysts' forecast



The above histogram contrasts the proportion of firm-year observations that set revenue target above analysts' forecasts and the proportion of firm-year observations that set EPS target above analysts' forecasts, per *Market-to-Book* $_{i,t-1}$ quartile. I divide the sample of 176 firm-year observations that use both revenue and EPS measure, into 4 groups of 44 observations based on *Market-to-Book* $_{i,t-1}$. 1 indicates the group with lowest growth opportunities and 4 indicates the group with highest growth opportunities.

TABLE 7

The Impact of Stock Price Incentives on
the Effect of Growth Opportunities on Revenue Target Setting above Analysts' Forecasts

Variables	Prediction	$REV\ Target_{i,t}$-$REV\ AF_{i,t}$		$REV\ Target_{i,t}$-$REV\ AF_{i,t}$	
$EarnMeasure_{i,t}$	-	-0.0253	*	-0.0325	*
		(0.0740)		(0.0562)	
$Market\text{-}to\text{-}Book_{i,t-1}$	+	0.0007	***	0.0002	
		(0.002)		(0.161)	
$Burn_{i,t-1}$		0.0009			
		(0.849)			
$Market\text{-}to\text{-}Book_{i,t-1}$*$Burn_{i,t-1}$	-	-0.0001	*		
		(0.0767)			
$Acq_{i,t}$				0.0224	
				(0.498)	
$Market\text{-}to\text{-}Book_{i,t-1}$* $Acq_{i,t}$	+			0.0129	***
				(0.000)	
$Lev_{i,t-1}$		0.0070		0.0028	
		(0.594)		(0.843)	
$HHI_{i,t-1}$		0.4130		0.5010	*
		(0.109)		(0.0991)	
$Volatility_{i,t-1}$		0.1730		0.1980	
		(0.319)		(0.294)	
$Size_{i,t-1}$		-0.0055	***	-0.0047	***
		(0.0001)		(0.0041)	
$REVForecastOpt_{i,t}$		0.1350	**	0.1020	*
		(0.0216)		(0.0682)	
$NewCEO_{i,t}$		-0.0064		-0.0146	
		(0.468)		(0.155)	
$CEOtenure_{i,t}$		-0.0047		-0.0058	*
		(0.116)		(0.0857)	
Constant		0.0243		0.0110	
		(0.605)		(0.838)	
Observations		766		691	
R-squared		0.176		0.204	
Year FE		YES		YES	
Industry FE		YES		YES	

On the left are the OLS regression results for model (5) for the 766 observations that use revenue as a performance measure:

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Burn_{i,t-1} + \alpha_4 Market\text{-}to\text{-}Book_{i,t-1} * Burn_{i,t-1} + \alpha_5 Lev_{i,t-1} + \alpha_6 HHI_{i,t-1} + \alpha_7 Volatility_{i,t-1} + \alpha_8 Size_{i,t-1} + \alpha_9 REVForecastOpt_{i,t} + \alpha_{10} NewCEO_{i,t} + \alpha_{11} CEOtenure_{i,t} + \varepsilon_{i,t} \quad (5)$$

On the right are the OLS regression results for model (6). Requiring $Acq_{i,t}$ drops the sample number to 691 observations.

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Acq_{i,t} + \alpha_4 Market\text{-}to\text{-}Book_{i,t-1} * Acq_{i,t} + \alpha_5 Lev_{i,t-1} + \alpha_6 HHI_{i,t-1} + \alpha_7 Volatility_{i,t-1} + \alpha_8 Size_{i,t-1} + \alpha_9 REVForecastOpt_{i,t} + \alpha_{10} NewCEO_{i,t} + \alpha_{11} CEOtenure_{i,t} + \varepsilon_{i,t} \quad (6)$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 48 Fama-French classifications *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. P-values are in parentheses.

TABLE 8

Robustness Checks

PANEL A. Growth opportunities as R&D

Variables	Prediction	$REV\ Target_{i,t}$-$REV\ AF_{i,t}$	
$EarnMeasure_{i,t}$	-	-0.0264	*
		(0.0674)	
$R\&D_{i,t-1}$	+	0.0902	*
		(0.0884)	
$Lev_{i,t-1}$		0.0114	
		(0.388)	
$HHI_{i,t-1}$		0.4290	*
		(0.0918)	
$Volatility_{i,t-1}$		0.0331	
		(0.845)	
$Size_{i,t-1}$		-0.0054	***
		(0.0002)	
$REVForecastOpt_{i,t}$		0.1440	**
		(0.0188)	
$NewCEO_{i,t}$		-0.0046	
		(0.598)	
$CEOtenure_{i,t}$		-0.0046	
		(0.125)	
Constant		0.0477	
		(0.107)	
Observations		766	
R-squared		0.177	
Year FE		YES	
Industry FE		YES	

Above are the OLS regression results for the model below:

$$REV\ Target_{i,t}\text{-}REV\ AF_{i,t} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 R\&D_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 REVForecastOpt_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t}$$

for the sample of 766 firm-year observations that use revenue as a performance measure. If $R\&D_{i,t-1}$ is missing, then it is assumed to be zero. Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 48 Fama-French classifications. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. P-values are in parentheses. Variable definitions are in Appendix A.

PANEL B. Market expectations as prior revenue multiplied by growth

Variables	Prediction	$REV\ Target_{i,t}$ $-REV\ Actual_{i,t-1}$ $*PriorGr_{i,t-1}$		$REV\ Target_{i,t}$ $-REV\ Actual_{i,t-1}$ $*ExpGr_{i,t-1}$	
$EarnMeasure_{i,t}$	-	-0.2900	*	-0.3100	**
		(0.0530)		(0.0464)	
$Market\text{-}to\text{-}Book_{i,t-1}$	+	0.0104	**	0.0072	**
		(0.0106)		(0.0182)	
$Lev_{i,t-1}$		0.0523		0.0406	
		(0.691)		(0.777)	
$HHI_{i,t-1}$		-0.8910		0.5000	
		(0.613)		(0.731)	
$Volatility_{i,t-1}$		1.1980		0.5690	
		(0.395)		(0.650)	
$Size_{i,t-1}$		-0.0629	***	-0.0672	***
		(0.0005)		(0.0003)	
$REVForecastOpt_{i,t}$		-0.4310		-0.2960	
		(0.252)		(0.339)	
$NewCEO_{i,t}$		-0.0509		-0.1180	
		(0.562)		(0.205)	
$CEOtenure_{i,t}$		0.0006		-0.0032	
		(0.987)		(0.926)	
Constant		1.7010	***	1.6610	***
		(0.000)		(0.000)	
Observations		766		688	
R-squared		0.530		0.551	
Year FE		YES		YES	
Industry FE		YES		YES	

On the left is the OLS regression result of the model below for the 766 observations that use revenue measure.

$$REV\ Target_{i,t} - REV\ Actual_{i,t-1} * PriorGr_{i,t-1} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 REVForecastOpt_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t}$$

On the right is the OLS regression results of the model below. Requiring the observations to have all the variables necessary to estimate $ExpGr_{i,t-1}$ leaves us with 688 observations.

$$REV\ Target_{i,t} - REV\ Actual_{i,t-1} * ExpGr_{i,t-1} = \alpha_0 + \alpha_1 EarnMeasure_{i,t} + \alpha_2 Market\text{-}to\text{-}Book_{i,t-1} + \alpha_3 Lev_{i,t-1} + \alpha_4 HHI_{i,t-1} + \alpha_5 Volatility_{i,t-1} + \alpha_6 Size_{i,t-1} + \alpha_7 REVForecastOpt_{i,t} + \alpha_8 NewCEO_{i,t} + \alpha_9 CEOtenure_{i,t} + \varepsilon_{i,t}$$

Industry fixed effects and year fixed effects are included and standard errors are clustered by firm. Industries are based on 48 Fama-French classifications. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively. P-values are in parentheses. Variable definitions are in Appendix A.

성장기업의 매출목표는 재무분석가 예측치보다 더 높게 설정되는가?

국문초록

매출 성과지표의 사용은 늘어나고 있지만, 아직 회계학 연구는 이익 성과목표에 치중되어 있다. 본 연구는 직접 모은 S&P 1500 회사의 성과목표 데이터를 이용하여 매출 성과목표에 대한 최초의 대량표본 연구를 수행한다. 본 연구는 매출 성과목표가 일반적으로 재무분석가의 매출 예측치를 상회하나, 이익 성과목표는 일반적으로 재무분석가의 이익 예측치를 하회한다는 것을 밝힌다. 이 현상은 재무분석가 예측치 오류의 통제에 강건하다. 또한, 본 연구는 성장 기회가 매출 예측치 대비 매출 성과목표를 상승시킨다는 것을 밝히며, 이익 예측치 대비 이익 성과목표에 대해서는 이 같은 관계를 발견하지 못한다. 저자는 기업이 매출 예측치를 뛰어넘는 성과를 이끌어내기 위해 매출 성과목표를 매출 예측치 위에 설정한다고 가정하고, 매출 예측치를 뛰어넘는 성과에 따른 이익이 더 클 때 매출 성과목표가 매출 예측치 위에 설정되는 경향이 더 심화됨을 보인다. 본 연구는 매출 목표를 새롭게 주목하여 매출 목표가 이익 목표와는 다르게 설정됨을 보인다.

키워드: 매출 목표, 성과목표 설정, 시장 예측치, 재무분석가 매출 예측치, 성장 기회
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