

# Managerial Optimism and Earnings Smoothing

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## **Abstract**

Consistent with the recent literature on the importance of personal managerial attributes for corporate decisions, this paper empirically examines the effect of managerial optimism on earnings smoothing. Optimists tend to exhibit an upward bias in their assessment of future earnings and therefore are willing to “borrow” more aggressively from future earnings than rational managers in order to report higher earnings in bad states than their rational counterparts. Since in the long run, reported earnings and true economic earnings must converge, this means that when future earnings do turn out to be high, the optimistic managers have to report lower earnings than they would have, had they not “over-reported” earnings in previous periods. This generates two testable hypotheses. First, optimistic managers smooth earnings more on average than rational managers do. Second, optimistic managers are less likely than rational managers to report earnings that fall short of analysts’ forecasts by much or exceed them by a substantial amount, and are more likely than rational managers to show small (negative or positive) earnings surprises. These hypotheses are tested using existing optimism measures and supporting evidence is found for both predictions. I examine a variety of alternative explanations to check the robustness of the results.

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# 1. Introduction

A well-known stylized fact in the literature is that managers engage in earnings smoothing: they report earnings that are sometimes higher than economic earnings and sometimes lower (see, e.g., Beidleman, 1973; Lev and Kunitzky, 1974; Ronen and Sadan, 1981; Hand, 1989; Barth, Elliott, and Finn, 1999; Goel and Thakor, 2003; Leuz, Nanda, and Wysocki, 2003; Lang, Raedy, and Wilson, 2006; and Myers, Myers, and Skinner, 2007). Recent survey evidence provides further confirmation that managers actively smooth earnings, as evidenced by a quote from an interviewed CFO: “businesses are much more volatile than what their earnings numbers would suggest” (Graham, Harvey, and Rajgopal, 2005).<sup>1</sup> However, the degree of earnings smoothing varies in the cross-section of firms. This has led to research that has uncovered several factors that help explain cross-sectional variations in earnings smoothing.

While research on the determinants of earnings smoothing and how these vary in the cross section has enriched our understanding of the phenomenon, the focus has mainly been on exploring how differences in *firm-specific attributes* (e.g., cash flow volatility, systematic risk, etc.) can explain differences in the degree of earnings smoothing across firms. Only recently has research attention turned to how certain aspects related to attributes of *decision-makers* in firms may also explain differences in smoothing across firms. Healy (1985) and Bergstresser and Phillipon (2006) examine the impact of executive compensation on cross-sectional differences in earnings smoothing, whereas Klein (2002) and Bowen, Rajgopal and Venkatachalam (forthcoming) focus on the characteristics of boards of directors to understand the issue.

What has not been examined thus far is the effect of the personal attributes of managers on their firms’ smoothing decisions. Bertrand and Schoar (2003) have explained how managerial attributes can affect the policies of the firms they lead, so examining the relationship between managerial attributes and corporate earnings smoothing can contribute to our understanding of the broader question of how managerial attributes and firm performance are linked. Although there are various managerial attributes one could focus on, attributes that have recently received considerable attention are those linked to managerial beliefs. To the extent that the degree of earnings smoothing reflects the manager’s beliefs about *future* earnings, it is natural to expect that beliefs-based managerial attributes like optimism could affect how much the manager smooths earnings.

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<sup>1</sup> The popular press tends to view accounting discretion, including earnings smoothing, as a device used by self-interested rent-seeking managers to manipulate earnings. See, for example, the following quote from Fortune (1997): “If Microsoft is the archetype of a hugely successful company trying to tone its earnings down so people don’t get their expectations too high, Boston Chicken bespeaks an altogether different and more common phenomenon. It is a business that isn’t successful yet but has used accounting to help convince investors that it already is, or at least will be soon.” The academic literature is divided on the question whether managers use accounting discretion, including earnings smoothing, to efficiently maximize shareholder value (see, e.g., Ronen and Sadan, 1981; and Chaney and Lewis, 1995) or to opportunistically make themselves better off at the expense of shareholders (see, e.g., Warfield, Wild, and Wild, 1995). Papers that attempt to disentangle whether efficiency or managerial opportunism drives accounting discretion include Christie and Zimmerman (1994) and Bowen, Rajgopal, and Venkatachalam (forthcoming). See also Dechow and Skinner (2000) for a discussion of the practitioners and academic viewpoints on why firms smooth earnings.

Recent evidence indicates that managerial optimism, where optimism is defined as an upward bias in the assessment of future outcomes, does affect a wide range of corporate and individual decisions. For example, Malmendier and Tate (2005, 2008) show empirically that optimistic managers invest more aggressively and are more likely to engage in value-destroying mergers.<sup>2</sup> Manove and Padilla (1999) create a model in which entrepreneurial optimism affects banks' credit policies. Coval and Thakor (2005) develop a new theory of financial intermediation in which intermediaries arise precisely because of the opportunities created by the presence of optimistic entrepreneurs and pessimistic financiers. Puri and Robinson (2007) explain how optimism affects individual choices, and induces them to be more likely to hold undiversified portfolios as well as remarry after divorce. Recently, Graham, Harvey and Puri (2007) provide survey evidence on the importance of managerial optimism in corporate decisions. The empirically-observed relationship between optimism and a variety of real and financial decisions provides a natural backdrop for the question addressed in this paper: does managerial optimism affect earnings smoothing?

I address this question empirically by formulating two distinct but related predictions. First, there is more earnings smoothing by the optimistic manager than by the rational manager ("Smoothing Hypothesis"). Second, relative to the rational manager, the optimistic manager is less likely to report earnings that fall substantially below or substantially exceed analysts' forecasts, and is more likely to report small (positive or negative) earnings surprises ("Earnings Surprise Hypothesis").

The economic intuition generating these hypotheses is explained in detail in Section 3.1. Here I provide a thumbnail sketch. Many papers have noted that there is a "market-response asymmetry" in that the cost (in terms of stock price reaction) of reporting earnings say a penny below expectations far exceeds the benefit of reporting earnings one penny above expectations (see e.g. Graham, Harvey, Rajgopal, 2005, and Burgshahler and Eames, 2006). So, faced with earnings that exceed expectations, the manager prefers to under-report earnings now in order to "save" them for the future and be able to reduce or eliminate an earnings shortfall in the event of a low earnings realization then; since reported and economic earnings converge in the long run, reporting policy can only *shift* reported earnings through time without affecting the total amount of reported earnings. And faced with earnings that are below expectations, the manager prefers to "borrow" earnings from the future and over-report earnings now. Thus arises earnings smoothing. Essentially, the market-response asymmetry makes the manager's benefit of having a gap between reported earnings and earnings expectations *concave* in the gap, inducing earnings smoothing for the same reasons that risk-averse individuals smooth consumption over time. Optimistic managers over-report earnings more than rational managers when faced with a low earnings realization now because they assess a lower probability of a low earnings realization in the future and hence perceive a lower cost associated with "borrowing from the

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<sup>2</sup> Malmendier and Tate (2005, 2008) refer to their proxies as measures of overconfidence, but they are more appropriately viewed as optimism proxies, as I explain later in the Introduction.

future”.<sup>3</sup> When a high earnings realization occurs in the future, the optimists are compelled to report lower earnings than the rational managers because they over-reported by more in the past. Hence, the optimists smooth more than the rational managers.

To test these two hypotheses, one needs a proxy for managerial optimism. For this I rely on measures developed by Malmendier and Tate (2005, 2008). Their proxies are based on the assumption that an (over)optimistic manager systematically overestimates the outcomes of her own firm’s projects, thereby delaying the exercise of her options. While they refer to their measures as overconfidence measures, they also acknowledge that the literature typically associates overconfidence with overestimation of a signal’s *variance*, with overestimation of the *mean* of a signal (as their measures do) referred to as (over)optimism (e.g., Manove and Padilla, 1999; Van den Steen, 2004; Coval and Thakor, 2005; and Puri and Robinson, 2007).<sup>4</sup> Following Baker, Ruback and Wurgler (2007), Jin and Kothari (2008), Lionel (2008), and Hackbarth (2009), I therefore refer to their proxies as measures of managerial optimism. The initial sample used for my tests is the same sample of 477 large U.S. corporations used by Malmendier and Tate (2005, 2008).

The empirical tests provide supporting evidence for both predictions. First, the evidence indicates that firms with optimistic CEOs do smooth earnings more than firms with rational managers. This finding holds even after controlling for other factors that may affect earnings smoothing. These factors include firm size, market-to-book, and leverage, as well as variables that represent controls for operational differences (operating profitability), agency problems (retained earnings), asymmetric information (asset tangibility), corporate governance (board size and CEO duality), CEO stock and option ownership, systematic risk, and year and industry fixed effects. The inclusion of industry fixed effects is to address potential self-selection concerns: if smoothing is prevalent in certain industries and these industries tend to hire optimistic managers, differences across industries rather than managerial optimism *per se* would drive the results. Second, the evidence further indicates that, compared to rational managers, optimistic managers are less likely to report large positive or large negative earnings surprises, and are more likely to report small positive or small negative earnings surprises. Specifically, I find that negative earnings surprises of at least -3 cents relative to analysts’ forecasts (i.e. earnings that fall below analysts’ forecasts by 3 cents or more) and positive earnings surprises of +3 cents or more relative to such forecasts are significantly less likely to be associated with optimists than with rational managers. Optimists are also significantly more likely than rational managers to report small negative surprises of less than 3 cents and small positive surprises of up to 3 cents. Results are qualitatively the same when I use cutoffs of -10 cents and +10 cents per share, or when surprises are measured relative to analysts’ median forecast instead.

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<sup>3</sup> The manager may also face a high earnings realization now. Section 3.1 discusses what happens in that case.

<sup>4</sup> Following the literature on self-serving attribution, Malmendier and Tate (2005, 2008) use the term “overconfidence” to refer to an upward bias in the manager’s assessment of future outcomes that are firm-specific and potentially attributable to the manager’s own skill. They view this as being different from optimism related to a general overestimation of all outcomes, including those outside the CEO’s control, such as the level of the stock market.

To examine the robustness of the results, several additional tests are performed. First, one potential concern is that CEOs who are classified as optimists – on the basis of delayed executive stock option exercise – are not truly optimists, but simply rational CEOs who have favorable inside information about future firm performance that makes them delay their option exercises until this information becomes public. Another possibility is that they may work at firms with lower unsystematic risk which makes them more willing to hold on to their options longer. Yet another possibility is that the stock price volatility of their firms is lower, inducing them to hold on to their options longer. If any of these alternative explanations were to hold, the documented results would be due to factors other than managerial optimism. Robustness checks reveal, however, that these alternative explanations do not drive the results.

Second, I examine whether optimistic managers smooth earnings more, not because they overestimate future earnings, but because their firms happen to have more volatile cash flows, and hence have a greater need to smooth earnings. The empirical evidence does not support this alternative explanation for the findings.

Third, it is possible that the earnings surprise results are driven by my definition of what constitutes a big surprise. As a robustness check, two alternative specifications are used. First, the dollar surprise is calculated as actual earnings per share minus the median analyst forecast rather than the mean forecast. Second, the dollar surprise is expressed as a percentage of the mean analyst forecast. I find that optimists are less likely to report bigger surprises and more likely to show smaller surprises in these alternative specifications as well.

Fourth, a potential concern is that optimistic CEOs show fewer and smaller negative earnings surprises merely because they issued more negative earnings guidance before the actual earnings announcement, thereby lowering the expectations of analysts. Small-sample evidence based on earnings guidance issued by management suggests, however, that this does not hold.

Finally, I examine how the smoothing behavior of rational and optimistic managers differs across good and bad periods. I find that, compared to rational managers, optimists are associated with significantly smaller negative earnings surprises during bad periods and with significantly smaller positive surprises during good periods. This finding is consistent with the premise of the underlying theoretical motivation that optimists report higher earnings than rational managers in bad times, which then compels them to report lower earnings in good times.

The remainder of the paper is organized as follows. Section 2 describes the related literature. Section 3 explains the intuition underlying the hypotheses, and discusses the optimism measures and smoothing variables. Section 4 explains the empirical approach, describes the data and provides descriptive statistics. Empirical results are presented in Section 5. Section 6 addresses robustness issues and performs additional tests. Section 7 summarizes and concludes.

## 2. Related Literature on Earnings Smoothing and Optimism

The smoothing literature has examined many aspects of earnings smoothing. Closely related to this paper are contributions on: why managers prefer to report smooth earnings, the empirical detection of earnings smoothing, and factors that lead to smoothing differences across firms. This section discusses these three strands in turn and indicates the intended contribution of this paper relative to the existing literature.

One strand of the literature consists of papers that explain why managers prefer to report smooth earnings. Trueman and Titman (1988) argue that smoothing may reduce a firm's perceived earnings volatility and risk, hence lowering the required rate of return. In Fudenberg and Tirole (1995), earnings smoothing reduces the manager's probability of being fired. Smooth earnings may also lead to higher stock prices (Thomas and Zhang, 2002; Francis, Lafond, Olsson, and Schipper, 2004), possibly because of the accompanying reduction in the potential losses uninformed stockholders suffer when they trade for liquidity reasons (Goel and Thakor, 2003). Recently, Gong, Louis and Sun (2008) present evidence showing that firms deliberately engage in downward earnings management prior to a stock repurchase and this allows them to achieve higher-than-expected post-repurchase earnings growth because analysts' earnings growth expectations are formed on the basis of deflated pre-repurchase earnings numbers. They conclude that post-repurchase abnormal stock returns are driven at least in part by pre-repurchase downward earnings management.

A second strand of the literature has focused on the empirical detection of earnings smoothing. Many studies focus on managers' use of discretionary accruals. These studies build models of varying complexity to estimate the discretionary component of reported income, but many of them have low power to detect earnings smoothing in a variety of settings (see Dechow, Sloan, and Sweeney, 1995). More recently, studies have examined the extent of earnings smoothing by investigating deferred taxes and/or the provision for taxes (see, e.g., Phillips, Pincus, and Rego, 2003; and Dhaliwal, Gleason, and Mills, 2004), or by assessing the variability of reported earnings relative to the variability of cash flows (Land and Lang, 2002; Leuz, Nanda, and Wysocki, 2003; Lang, Raedy, and Wilson, 2006; and Myers, Myers, and Skinner, 2007). In this paper, I use the latter approach of computing relative earnings volatility to measure earnings smoothing.<sup>5</sup>

A third strand of the literature empirically explores the factors that lead to smoothing differences across firms. Healy (1985) documents that CEOs manage earnings to maximize their bonuses. Warfield, Wild, and Wild (1995) and Bergstresser and Philippon (2006) find evidence that CEO option and stock ownership affects smoothing. Some recent studies in this strand have started to explore the link between board characteristics and earnings smoothing. Klein (2002) documents that firms with boards that have a greater percentage of outside directors and firms that have more independent auditors on the audit committee

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<sup>5</sup> Some papers in this strand argue that a greater amount of earnings smoothing should lead to a larger informational asymmetry between the firm and investors because smoothing is merely an obfuscation device that keeps the manager's private information from reaching investors (see, e.g., Bhattacharya, Daouk, and Welker, 2003).

engage in less smoothing. Bowen, Rajgopal and Venkatachalam (forthcoming) find that earnings smoothness increases with the proportion of top executives on the board. However, none of these papers focus on CEO characteristics.

The main intended contribution of this paper relative to the existing literature is to provide evidence that earnings smoothing is not predicated solely on firm-specific attributes, but is also influenced by managerial attributes associated with the CEOs running these firms. Thus, it adds to the growing literature on the importance of managerial attributes in affecting various corporate decisions, pioneered by Bertrand and Schoar (2003). These decisions include financial decisions, like dividend policy and capital structure (e.g., Ben-David, Graham and Harvey, 2007), investment choices and acquisition decisions (e.g., Malmendier and Tate, 2005, 2008), as well as CEO succession within firms (e.g., Goel and Thakor, 2008). Perhaps more importantly, consistent with the theme in the third strand of the smoothing literature discussed above, it seeks to add to our understanding of smoothing differences across firms and the factors that determine these differences.

### **3. Economic Intuition, Optimism Measures and Smoothing Variables**

This section explains the economic intuition, discusses the optimism measures, and describes how the smoothing variables are constructed.

#### **3.1. The Economic Intuition**

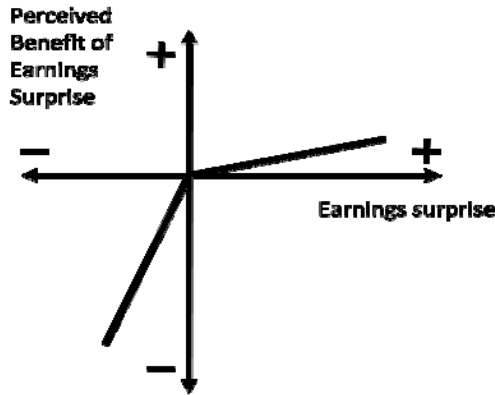
In this subsection, I first discuss the economic intuition for why smoothing occurs in the model. Then I proceed to discuss the intuition underlying the two testable hypotheses, which are as follows. First, there is more earnings smoothing by the optimistic manager than by the rational manager (“Smoothing Hypothesis”). Second, relative to the rational manager, the optimistic manager is *less likely* to report big (positive or negative) earnings surprises and is *more likely* to report small (positive or negative) earnings surprises (“Earnings Surprise Hypothesis”).

#### ***Earnings smoothing in a setup without rational and optimistic managers***

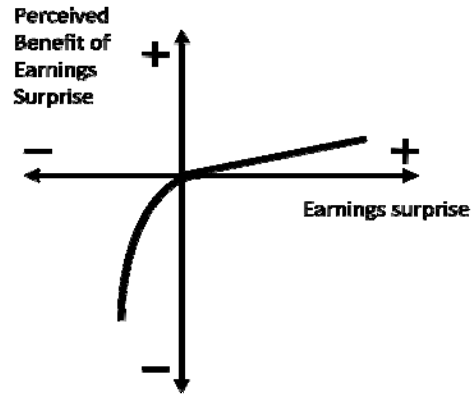
To see the intuition, it is useful to begin by understanding why earnings smoothing occurs in the framework used to generate these hypotheses. For this, it is not necessary to distinguish between rational and optimistic managers. I start with the assumption that if costs and benefits are measured in terms of stock price reactions, then the marginal benefit of an additional penny of a positive earnings surprise is smaller than the marginal cost of an additional penny of a negative earnings surprise. There is extensive empirical evidence supporting this; see e.g. Degeorge, Patel and Zechhauser (1999), Skinner and Sloan (2002), Graham, Harvey, Rajgopal (2005), and Burgshahler and Eames (2006). Specifically, *Figure 1* shows two possible relationships between

the earnings surprise (i.e., the gap between reported earnings and market expectations) on the one hand and the associated perceived benefits on the other, both of which are consistent with this evidence. In *Figure 1a*, the benefit curve is piecewise linear – the marginal benefit of higher earnings when earnings are below market expectations is constant and always higher than the marginal benefit of higher earnings when earnings exceed market expectations. In *Figure 1b*, the marginal benefit of higher earnings when earnings are below market expectations is concave, and it is higher than the marginal benefit of exceeding market expectations even in the neighborhood of a zero earnings surprise.

**Figure 1: Possible Market-Response Asymmetry**



*Figure 1a: Piecewise-Linear Benefit Function*



*Figure 1b: Benefit Function that is Concave for Negative Surprises and Linear for Positive Surprises*

Although managers smooth earnings in both cases (Figures 1a and 1b), the simple intuition behind why they smooth earnings comes out more readily using Figure 1a. I therefore focus on this figure for now.

Now imagine a two-period setting in which, as in the signaling model of Bagnoli and Watts (2005), the manager observes a private signal about earnings for the period before an earnings announcement is made to the market.<sup>6</sup> After observing this private signal, the manager can make an adjustment before publicly announcing earnings. Such earnings management is done in accordance with GAAP and the manager recognizes that economic earnings (or cash flows) will equal reported earnings in the long run, so any adjustment in the current period will have ramifications for future reported earnings.

<sup>6</sup> Bagnoli and Watts (2005) develop a theory of conservative accounting choices. They build a two-earnings states signaling model in which the manager can choose between conservative and not-conservative earnings reporting policies to signal her private information about the firm's liquidation value. The probability that the firm reports low earnings when the manager chooses a conservative reporting policy is greater than when the manager chooses a not-conservative reporting policy. The separating signaling equilibrium that Bagnoli and Watts (2005) derive has the property that managers who know that the firm's prospects are relatively good choose a conservative reporting policy (thereby under-reporting earnings relative to what they would do under a not-conservative policy), and managers who know that the firm's prospects are relatively poor choose not to report conservatively. As a consequence, the ratio of reported earnings to the economic earnings privately observed by the manager is higher in the bad state than in the good state.



The manager's private signal can take one of two values in each period – a high value  $x_h$  or a low value  $x_l$ , where  $x_h > x_T > x_l$ , and  $x_T$  is the target earnings level that corresponds to market expectations. As assessed by the manager, the probability of  $x_h$  is  $p \in (0,1)$ , and the probability of  $x_l$  is  $1-p$ .

First, suppose the manager's private signal in the first period is high ( $x_h$ ). If the manager *under-reports* earnings by a penny in this high earnings state, then the “adding up” constraint – which says that earnings over the lifetime of the firm / asset must add up to the same amount regardless of how they are reported period by period – ensures that earnings in the next period must be *over-reported* by a penny in every state. To see why the manager will wish to under-report earnings now in order to save the under-reported amount to augment future reported earnings, note that the marginal benefit of reporting higher earnings now in the high earnings state is either equal to the marginal benefit of reporting higher earnings in the second period (if the second-period earnings realization is high) or lower than the marginal benefit of reporting higher earnings in the second period (if the second-period earnings realization is low). Thus, the marginal benefit of reporting higher earnings now is *lower* than the *expected* marginal benefit of reporting higher earnings in the second period, and the manager under-reports first-period earnings.

What if the manager's first-period signal is low ( $x_l$ )? Now, given the market-response asymmetry, the manager wishes to over-report earnings because the marginal benefit of increasing reported earnings when earnings are below expectations ( $x_T$ ) now is either higher than the marginal benefit of reporting higher earnings in the second period (if the second-period earnings realization is high) or the same as the marginal benefit of reporting higher earnings in the second period (if the second-period earnings realization is low). Consequently, the marginal benefit of reporting higher earnings in the first period is higher than the *expected* marginal benefit of reporting higher earnings in the second period, and the manager over-reports first-period earnings.

To sum up, as is apparent from Figures 1a and 1b, the market-response asymmetry causes the manager's benefit function to be globally concave in the earnings surprise. This induces the manager to view the reported-earnings gap the same way that a risk-averse individual views intertemporal consumption.<sup>7</sup> Earnings smoothing thus arises from the same intuition that generates intertemporal consumption smoothing.

### ***Introducing rational and optimistic managers – the intuition behind the two hypotheses***

Let us now see how the two hypotheses mentioned earlier arise. For this, suppose that there are two types of managers: rational and optimistic. The rational manager has rational expectations about future earnings in that she believes the probability of high earnings is  $p$ . The optimistic manager overestimates the probability of high earnings, and believes it is  $p_o > p$ .

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<sup>7</sup> In other words, the manager will seek to equate the marginal benefits of higher reported earnings across time the way that a risk averse individual seeks to equate marginal utilities of consumption across time.

While the simple set-up in Figure 1a was sufficient to explain why smoothing arises, it implies that both rational and optimists will smooth identically and will choose to misreport enough in the first period to make reported earnings equal to market expectations in that period.<sup>8</sup> Non-linearity of the benefit function at least over a portion of the domain of the function is needed to induce managers to avoid the extreme of striving for zero earnings surprises and to drive a wedge between the smoothing behaviors of rational and optimistic managers. For simplicity, I assume that the benefit function is concave only for negative surprises, and is linear for positive surprises, i.e, I use Figure 1b.

Start with the case in which the manager's first-period private signal is low ( $x_l$ ). Both the rational and the optimistic managers over-report earnings for the reasons provided earlier in our discussion of smoothing. For both types of managers, the marginal benefit of reporting higher earnings in the first period in which earnings are below expectations exceeds the marginal benefit of reporting higher earnings in the high earnings ( $x_h$ ) state in the second period, due to the market response asymmetry. So, first-period over-reporting is a pure benefit for both types, conditional on a high earnings realization in the second period. However, if there is a low earnings realization ( $x_l$ ) in the second period, then the marginal benefit of increasing reported earnings by say  $e$ , from  $x_l$  to  $x_l+e$ , in the first period is smaller than the marginal benefit of increasing reported earnings from  $x_l-e$  to  $x_l$  in the second period. (Recall that the adding-up constraint requires that over-reporting earnings by  $e$  in the first period will cause reported second-period earnings to decline from  $x_l$  to  $x_l-e$ .) This difference in marginal benefits is due to the concavity of the benefit function when earnings fall below expectations. This means over-reporting earnings by  $e$  in the first period is costly for the manager, conditional on the low earnings state being realized in the second period, and the higher the probability of low earnings in the future, the higher is this expected cost. The manager's optimal choice of  $e$  balances this expected cost against the expected benefit arising due to the possibility of a high-earnings realization in the second period. A manager who assigns a lower probability to a low earnings realization in the second period will over-report earnings by more in the first period. Since  $p_o > p$ , the optimistic manager assigns a lower probability ( $1-p_o$ ) to a low second-period earnings realization than does the rational manager ( $1-p$ ). The result is higher over-reporting by the optimistic manager than by the rational manager in the low earnings state in the first period. Assuming that the over-reporting does not entirely eliminate the shortfall in reported earnings relative to expectations, this means the optimistic manager is associated with earnings surprises that are smaller in absolute value than those the rational manager is associated with.

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<sup>8</sup> The reason why a manager will always seek to report earnings equal to market expectations is that the marginal benefit of reporting higher earnings in the first period is either strictly above or below the expected marginal benefit of reporting higher earnings in the second period. When it is strictly above the expected marginal benefit in the second period (i.e. when the first-period earnings signal is low), it pays to increase the over-reporting until reported earnings equal expectations. Increasing reported earnings beyond that will cause a switch and now the marginal benefit of reporting higher earnings in the first period will be less than the expected marginal benefit of reporting higher earnings in the second period, so the manager will over-report up to the point at which reported earnings equal expectations and no more. Similar logic shows that when the high earnings state occurs in the first period, the manager will under-report until reported earnings equal expectations and no more.

Next we turn to the case in which the first-period private signal observed by the manager is high ( $x_h$ ). Both types of managers under-report earnings for the reasons described earlier. The amount of under-reporting is such that, at the reported level of first-period earnings, the marginal benefit of higher reported earnings in the first period equals that in the second period. Suppose the manager under-reports by  $e$ , so that reported first-period earnings equal  $x_h - e > x_T$ . If the second-period earnings realization privately observed by the manager is  $x_h$ , then she will report  $x_h + e$  due to the first-period under-reporting. But the linearity of the benefit curve for reported earnings exceeding market expectations means that the marginal benefit of higher earnings in the first period is equal to the marginal benefit of higher earnings in the second period in this case for both types of managers, conditional on  $x_h$  being observed by the manager in the second period. But what if the manager observes  $x_l$  in the second period? She will now report  $x_l + e$  in the second period. Given that the marginal benefit of higher reported earnings in the first period equals the marginal benefit of higher reported earnings in the second period for both types of managers, conditional on  $x_h$  in the second period, it follows that the marginal benefit of higher reported earnings in the first period must also equal the marginal benefit of higher second-period reported earnings when the second-period signal is  $x_l$ . Moreover, this holds for both types of managers. That is, if  $e$  is the first-period over-reporting of the rational managers and  $e_o$  is the first-period over-reporting of the optimistic manager, then the marginal benefit the rational manager associates with a second-period report of  $x_l + e$  must be equal to the marginal benefit the optimistic manager associates with  $x_l + e_o$ . Given the concavity of the benefit function for earnings reports below expectations, this can only happen if  $e = e_o$ . In other words, both types of managers engage in the *same* reporting behavior if they both observe a high earnings signal in the first period.

In the real world, sometimes the initial earnings state will be high and sometimes it will be low. When it is low, the optimistic manager reports higher earnings in the low earnings state and lower earnings in the high earnings state than the rational manager. When the initial state is high, both start out reporting identically. But with more than two periods, the low earnings state will be encountered sooner or later, and greater earnings smoothing by the optimistic manager will commence. A statistical sample will contain an average across low and high initial states and thus we should expect in such a sample that, compared to rational managers, optimistic managers smooth earnings more and have smaller negative as well as positive earnings surprises.

### 3.2. Optimism Measures

Following Malmendier and Tate (2005, 2008), three optimism measures are constructed based on the timing of executive option exercise. According to option pricing theory, investors should optimally hold their options until expiration (Black and Scholes, 1973; Merton, 1973). This result is based on the premise that investors can engage continuously in dynamic trading to fully hedge their option positions at every point in time, and options can be priced (using the equivalent Martingale measure) as if investors were risk neutral.

While this is a reasonable assumption for the typical investor, it does not adequately describe the situation of many top executives (Hall and Murphy, 2002). CEOs at large U.S. corporations are typically quite underdiversified for at least a couple of reasons. First, their human capital is disproportionately invested in their own firms. And second, they generally receive sizeable option grants that are non-tradable, can be exercised only after a vesting period has elapsed, and come with short-selling restrictions.

Hall and Murphy (2002) show that since CEOs cannot fully hedge their positions in dynamically complete markets, they should rationally exercise their options early.<sup>9</sup> Unlike rational CEOs, optimistic CEOs overestimate their firm's future earnings. Optimistic CEOs therefore believe that their firm's stock price will increase beyond what should be rationally anticipated, and consequently exercise their options later than rational CEOs would. The three optimism measures exploit this expected difference in the timing of option exercise between rational and optimistic CEOs (see Malmendier and Tate, 2005, 2008).

**Longholder:** The first measure focuses on the year before the options expire, typically year ten in my sample. It classifies a CEO as optimistic ("Longholder") for all of her years in the sample if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Given a typical four-year vesting period and a ten-year duration, a CEO who holds options until the final year of its duration has postponed exercise by at least five years. Note that this measure treats optimism as a managerial fixed effect since a CEO is classified as optimistic for all of her years in the sample.

**Pre-/Post-Longholder:** The second measure splits the Longholder optimism measure into two parts. It classifies a CEO as a "Post-Longholder" from the year after she holds an option until expiration for the first time, even though the option is at least 40% in the money at the beginning of that year. A CEO is classified as a "Pre-Longholder" for all other years during which she was classified as optimistic using the Longholder measure. If optimism is a managerial fixed effect, the coefficients on both Pre- and Post-Longholder will be significant, indicating that both Pre- and Post-Longholders smooth earnings more than rational CEOs. However, if a CEO is only optimistic *after* she has first displayed signs of optimism by exercising options late, only the coefficient on Post-Longholder will be significant.

**Holder 67:** The third and final measure focuses on options that have recently become fully vested. CEOs are rationally expected to exercise options soon after the vesting period is over, provided the options are sufficiently in the money. If there are two occurrences of a CEO failing to exercise an option with five years remaining that is at least 67% in the money, then that CEO is classified as optimistic ("Holder 67"), starting the year after she fails to exercise this option for the first time.<sup>10,11</sup>

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<sup>9</sup> The optimal timing depends on their wealth, degree of risk-aversion, and level of diversification.

<sup>10</sup> This is Malmendier and Tate's (2005) definition. Their (2008) definition classifies a CEO as optimistic if she exercises options late at least *once* (rather than twice), and hence yields more optimistic CEOs.

<sup>11</sup> When Malmendier and Tate (2005, 2008) use this measure, they only include in the sample CEOs who have options that are at least 67% in the money during year five (and depending on whether the CEOs exercise these options on time, they are classified as rational or optimistic). This sample restriction is designed to avoid classifying a CEO as rational

### 3.3. Smoothing Variables

Three smoothing variables are calculated in the spirit of Leuz, Nanda, and Wysocki (2003), Lang, Raedy, and Wilson (2006), and Myers, Myers, and Skinner (2007). Each variable is constructed using regression analysis in a way explained below. Following Myers, Myers, and Skinner (2007), quarterly data are used and seasonal effects are removed by taking fourth differences. In each regression, five years of quarterly data are used, if available, and observations for which data are not available for at least twelve quarters are dropped. After having constructed the smoothing variables, only the fourth-quarter variables are kept to ensure that for each sample firm there is only one observation per year.

The first smoothing variable is the variability of earnings, or more precisely, the variability of the change in net income divided by total assets,  $VARIABILITY (\Delta NI / TA)$ . If optimistic managers smooth earnings more than rational managers, the variability of earnings should be lower, *ceteris paribus*, at firms led by optimistic managers. The  $VARIABILITY (\Delta NI / TA)$  is calculated using the two-step procedure described in Lang, Raedy, and Wilson (2006) and Myers, Myers, and Skinner (2007). First, the change in net income divided by total assets,  $\Delta NI / TA$ , is regressed on a set of six control variables that may affect changes in earnings, including: leverage (total liabilities divided by total assets,  $COMP\ #44$  minus  $COMP\ #60$  divided by  $COMP\ #44$ ); sales growth (percentage annual growth in  $COMP\ #2$ ); debt issuance (percentage change in total liabilities,  $COMP\ #44$  minus  $COMP\ #60$ ); equity issuance (percentage change in shares outstanding adjusted for splits,  $COMP\ #61$  times  $COMP\ #17$ ); annual asset turnover (sales divided by total assets,  $COMP\ #2$  divided by  $COMP\ #44$ ); and size (logarithm of the market value of equity,  $COMP\ #61$  times  $COMP\ #14$ ). Second,  $VARIABILITY (\Delta NI / TA)$  is then calculated as the variance of the residuals of these regressions.

The second smoothing variable recognizes that net income is likely to be more volatile at firms with more volatile cash flows. It therefore takes the first smoothing variable, calculated as explained above, and adjusts it for the variability of the firm's cash flows divided by total assets,  $(\Delta CF / TA)$ , where the latter is calculated in a similar fashion as  $(\Delta NI / TA)$ . That is, the second smoothing variable is defined as  $VARIABILITY (\Delta NI / TA) \text{ over } (\Delta CF / TA)$ , and is calculated by dividing the variance of residuals from regressions of  $(\Delta NI / TA)$  on the six control variables by the variance of residuals from regressions of  $(\Delta CF / TA)$  on those same control variables.

The third smoothing variable focuses directly on the smoothing effect of accruals. It examines the correlation of accruals and cash flows, both normalized by total assets, i.e.  $CORR ((ACC / TA), (CF / TA))$ . This correlation should be more negative at firms that smooth earnings, because their managers respond to poor cash flows by increasing accruals (see, e.g., Land and Lang, 2002; Lang, Nanda, and Wysocki, 2006;

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when she truly is optimistic but never had the opportunity to display such optimism. However, when this restriction is applied, so many firms are lost that there is little cross-sectional variation left and most CEOs are classified as optimistic (92% of 489 observations). I therefore do not impose this restriction. As a consequence, this approach likely classifies some truly optimistic CEOs as rational, which biases the tests against finding the hypothesized results using the Holder 67 optimism measure.

and Myers, Myers, and Skinner, 2007). Thus, if optimistic managers smooth earnings more than rational managers, this correlation should be more negative at firms headed by optimistic CEOs since they use accruals to smooth earnings. Accruals are calculated as in Dechow, Sloan, and Sweeney (1995) using quarterly data as:

$$ACC_{it} = \Delta CA_{it} - \Delta CASH_{it} - \Delta CL_{it} + \Delta STD_{it} - DEP_{it}, \quad (2)$$

where  $\Delta CA_{it}$  is the change in total current assets (COMP #40),  $\Delta CASH_{it}$  is the change in cash and cash equivalents (COMP #36),  $\Delta CL_{it}$  is the change in total current liabilities (COMP #49),  $\Delta STD_{it}$  is the change in short-term debt included in current liabilities (COMP #45), and  $DEP_{it}$  is depreciation and amortization (COMP #5) at firm  $i$  in year  $t$ . The  $CORR((ACC / TA), (CF / TA))$  is then defined as the correlation between the regression residuals of  $(ACC / TA)$  and the regression residuals of  $(CF / TA)$ , where the residuals have been calculated using the regression approach described above.

## 4. Empirical Approach

This section describes the tests used to determine whether optimistic managers smooth earnings more than rational managers (“Smoothing Hypothesis”), and whether they are less likely to report earnings that represent big (positive or negative) surprises relative to analysts’ expectations and more likely to report small earnings surprises (“Earnings Surprise Hypothesis”). It also discusses the control variables and describes the sample.

### 4.1. Testing the Smoothing Hypothesis: Optimistic Managers Smooth Earnings More

The Smoothing Hypothesis states that firms managed by optimistic managers smooth earnings more than those managed by rational managers. To test this hypothesis, univariate tests and multivariate regressions are used.

Univariate test statistics are calculated to obtain preliminary evidence regarding the smoothing behavior of optimistic and rational managers. In particular, for each smoothing measure an examination is conducted of whether optimistic managers on average smooth earnings more than their rational counterparts. In this examination, t-tests are used to establish whether the differences in means are statistically significant. Two types of t-tests are used. If the null hypothesis that the two groups have equal variance (based on a folded F-test) cannot be rejected, I use the pooled t-test, which uses degrees of freedom  $n_1 + n_2 - 2$ , where  $n_1$  and  $n_2$  are the sample sizes for the two populations. If the two groups do not seem to have equal variance, I use the Satterthwaite test instead, which uses the Satterthwaite approximation for degrees of freedom. While this approach affects the level of the reported t-statistics, it does not affect the conclusions: similar results are obtained if the pooled t-test is always used or if the Satterthwaite test is always used.

Multivariate regressions are used to control for other factors that may affect earnings smoothing. The following model is estimated:

$$SMOOTH_{i,t} = \beta_0 + \beta_1 OPTIMIST_{i,t} + X'_{i,t}B \quad (1)$$

$SMOOTH_{i,t}$  measures earnings smoothing at firm  $i$  in year  $t$  using one of the smoothing variables described in Section 3.3.  $OPTIMIST_{i,t}$  is a dummy variable that equals 1 if an optimistic CEO (as defined in Section 3.2) heads the firm and 0 otherwise.  $X_{i,t}$  is a vector of eleven control variables (described in Section 4.3) plus year and industry fixed effects. All regressions are estimated with robust standard errors, clustered by firm to control for heteroskedasticity as well as possible correlation between observations of the same firm in different years. Multicollinearity is tested for by computing variance inflation factors for all regressions. Multicollinearity does not seem to be a problem in the data since all variance inflation factors are close to one.<sup>12</sup>

#### **4.2. Testing the Earnings Surprise Hypothesis: Optimistic Managers are Less Likely to Show Big Surprises and More Likely to Show Small Surprises**

The Earnings Surprise Hypothesis states that optimistic managers are less likely than rational managers to report earnings that represent either large positive or large negative surprises to investors, and are more likely to report small (positive or negative) earnings surprises. To test this hypothesis, actual reported earnings per share data and one-year-ahead earnings per share forecasts are collected from IBES. Earnings surprises are then calculated as the actual reported earnings per share minus the last one-year ahead earnings per share forecast available in IBES before earnings are reported. I define a “big (small) negative earnings surprise” as an earnings report that misses the mean analyst forecast by at least (less than) 3 cents per share. Similarly, I define a “big (small) positive earnings surprise” as earnings that exceed the mean analyst forecast by at least (up to) 3 cents. Results are qualitatively similar based on negative earnings surprises of at least -10 cents and positive earnings surprises of +10 cents or more. Section 6.5 shows comparable results using two alternative definitions of what constitutes an earnings surprise.

#### **4.3. Control variables**

The vector of control variables,  $X$ , includes eleven variables that may affect earnings smoothing (firm size, market-to-book ratio, book leverage, profitability, two controls for agency and asymmetric information, two governance variables, CEO stock and option ownership, and systematic risk), and year and industry fixed effects.

Firm size,  $LNASSETS$ , is measured as the log of total assets (COMP #6). The firm’s market-to-book ratio,  $M/B\ RATIO$ , is defined as the market value of assets divided by the book value of assets. The market value of assets is the fiscal year-end stock price (COMP #199) times the number of shares outstanding

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<sup>12</sup> Variance inflation factors, the diagonal elements of the inverse of the correlation matrix, range from 1 to infinity. Multicollinearity is not considered a problem if the variance inflation factors are close to 1 (see, e.g., Chatterjee, Hadi, and Price, 2000).

(COMP #54), plus the current portion of long-term debt (COMP #34), long-term debt (COMP #9), and preferred stock (COMP #10), minus deferred taxes (COMP #35). Book leverage, *BOOKLEV*, is defined as interest-bearing debt (COMP #9 plus COMP #34) divided by total assets (COMP #6).

Malmendier and Tate (2005, 2008) show that optimistic managers overinvest and are more likely to engage in value-destroying mergers. This suggests operational differences between firms led by optimists and rational managers that may then lead to earnings management differences. To capture the incremental effect of optimism on smoothing above and beyond these operational differences, I add a measure of the firm's operating profitability as a control variable. *PROFITABILITY* is calculated as operating profit (*EBITDA*) divided by total assets. The idea is that if optimistic managers have smoother earnings only because they are making profit-depleting investment decisions, then controlling for profitability should make the smoothing difference between optimistic and rational managers go away.

To control for agency problems, *RETEARN\_CS*, retained earnings as a fraction of common stock, is added. DeAngelo, DeAngelo, and Stulz (forthcoming) observe that unlike contributed equity, retained earnings do not come with the benefit of additional monitoring, and provide evidence that firms in which retained earnings are high relative to common stock face potentially greater agency problems. To control for differences in asymmetric information, I add *COLLATERAL*, measured as tangible assets (net plant, property, and equipment (COMP #8) plus inventory (COMP #3)) divided by total assets (COMP #6) (see, for example, Almeida and Campello, 2007). Asymmetric information problems are presumed to be larger at firms with low tangible assets (see, e.g., Myers and Majluf, 1984, and Kohers and Ang, 2000). To control for differences in corporate governance, I add *BOARD*, the number of board members, and *CHAIRMAN*, a dummy that equals one if the *CEO* is also the chairman of the board (see, e.g., Malmendier and Tate, 2008).

Earnings management may be higher at firms with CEOs whose compensation is more sensitive to their firms' stock prices (see Bergstresser and Philippon, 2006). To account for this, CEO stock and option ownership are controlled for. Stock ownership is calculated as the fraction of company stock held by the CEO and her family at the beginning of the year (*PCTOWN*). CEO option ownership is the number of options exercisable within 60 days from the start of the year divided by the number of shares outstanding (*PCTVESTOPT*). The number of options is multiplied by 10 to ensure that the mean is comparable to mean stock ownership as in Malmendier and Tate (2005).

Firms with higher systematic risk may also smooth earnings more (see Lev and Kunitzky, 1974; and Bange and De Bondt, 1998). I therefore add systematic risk as a control variable. Systematic risk is estimated using a one-factor market model:  $r_{it} = \alpha_i + \beta_i * r_{mt} + \varepsilon_{it}$ , where  $r_{it}$  is the return of firm  $i$  for month  $t$  and  $r_{mt}$  is the return of the CRSP value-weighted index for month  $t$ . The model is estimated using five years of monthly return data, and observations are dropped if fewer than 36 monthly returns are available. Systematic risk, *SYSTRISK*, is measured as  $\beta^2$  times the variance of the value-weighted market index (see Shin and Stulz, 2000).



Industry fixed effects are included in all regressions to address potential self-selection concerns. In particular, if smoothing is more prevalent in certain industries, then self-selection may occur via firms in those industries hiring optimistic managers and firms in other industries hiring rational managers. If so, differences across industries rather than managerial optimism would drive the results presented in this paper. The industry fixed effects in the regressions help deal with this issue.

#### **4.4. Sample Selection and Data Description**

The analysis starts with an initial sample of 477 large, listed U.S. firms that have appeared on a Forbes 500 list at least four times between 1984 and 1994. For those firms, I use the core dataset that has been used in Malmendier and Tate (2005, 2008) and is described in detail in Hall and Liebman (1998) and Yermack (1995). This core dataset spans the years 1980 – 1994 and contains detailed annual information that is needed to construct the CEO optimism measures, including the number of options, the exercise price, and the duration of options each CEO holds.<sup>13</sup>

This dataset is complemented with Compustat, CRSP and IBES data. For each firm in the sample, quarterly Compustat data are collected to construct the earnings smoothing variables, and annual Compustat data to create the control variables used to test the Smoothing Hypothesis. Monthly CRSP stock return data plus value-weighted index returns are obtained to construct risk measures used in a robustness section. One-year ahead earnings per share forecasts and actual earnings per share data are obtained from IBES to test the Earnings Surprise Hypothesis. All variables are winsorized at the 1% and 99% level to reduce the impact of outliers. In most of the tests, a restriction is imposed that the smoothing variables and the control variables have to be available.

The final sample contains 210 firms and 374 CEOs (see Panel A Table 1). Panel B reports summary statistics of the optimism measures. Panel C contains summary statistics of the smoothing variables and the control variables used to test the Smoothing hypothesis. Summary statistics of the fraction of optimistic and rational managers announcing big/small negative and positive earnings surprises will be presented in Table 4.

Place Table 1 here

## **5. Empirical Results**

This section reports the results of the empirical tests of the Smoothing Hypothesis and the Earnings Surprise Hypothesis.

### **5.1. Empirical Results for the Smoothing Hypothesis**

The Smoothing Hypothesis is tested with univariate and multivariate regression specifications.

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<sup>13</sup> I am grateful to Brian Hall for providing the CEO option holdings data.

Table 2 contains preliminary evidence based on univariate statistics. Columns (i) – (iii) contain the results for the three smoothing measures *VARIABILITY* ( $\Delta NI / TA$ ), *VARIABILITY* ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ ), and *CORR* ( $(ACC / TA), (CF / TA)$ ), respectively. For each smoothing variable, the table shows the average amount of smoothing by rational managers and optimistic managers, where optimism is measured using the Longholder, Pre-/Post-Longholder, and Holder 67 measure in turn (see Panels I through III). Differences in the average amounts of earnings smoothing across rational and optimistic managers are also presented.

The univariate results in Table 2 suggest that optimistic managers indeed smooth earnings more than rational managers. The variability of earnings is significantly lower for optimistic managers (see Column (i) in Panels I through III), even after controlling for differences in the variability of cash flows (see Column (ii) in Panels I through III), and the correlation between accruals and cash flows is significantly more negative (see Column (iii) in Panels I through III).<sup>14</sup> These findings provide preliminary support for the hypothesis that optimistic managers smooth earnings more than rational managers.

Place Table 2 here

Table 3 contains the multivariate regression results. Panels I through III show results for Longholders, Pre-/Post-Longholders, and Holders 67, respectively. In each Panel, columns (i) and (ii) present results for two smoothing measures: *VARIABILITY* ( $\Delta NI / TA$ ) and *VARIABILITY* ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ ). The third smoothing variable, *CORR* ( $(ACC / TA), (CF / TA)$ ), is not used as a dependent variable in the regressions since this variable is defined as a correlation.

The coefficients on the optimism measures are negative and significant in both specifications for Longholders and Post-Longholders, significant in one specification for Pre-Longholders and not significant for Holders 67. If systematic risk is excluded from the regressions, however, the results are also significant for Holders 67 (not shown for brevity). These results suggest that the variability of earnings is (significantly) smaller for optimistic managers even after controlling for firm size (*LNASSETS*), growth options (*M/B RATIO*), capital structure (*BOOKLEV*), operational differences (*PROFITABILITY*), differences in agency (*RETEARN\_CS*) and asymmetric information (*COLLATERAL*), differences in corporate governance (*BOARD* and *CHAIRMAN*), stock and option ownership (*PCTOWN* and *PCTVESTOPT*), and systematic risk (*SYSTRISK*). Thus, the regression results generally confirm the univariate results and suggest that optimistic CEOs smooth earnings (significantly) more than their rational counterparts.

Place Table 3 here

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<sup>14</sup> Correlation coefficients around -0.90 that are documented here are in line with the existing literature. Leuz, Nanda, and Wysocki (2003) find average correlations across the countries in their study of -0.85. Myers, Myers, and Skinner (2007) report average correlations of -0.96 for their sample firms and -0.93 for their control firms.

## 5.2. Empirical Results for the Earnings Surprise Hypothesis

Table 4 reports the results related to tests of the Earnings Surprise Hypothesis. The first two columns show that the fraction of optimistic managers reporting big negative earnings surprises or big positive earnings surprises is smaller than the fraction of rational managers reporting similar-sized earnings surprises. The difference is significant in seven out of eight cases. The last two columns indicate that optimists are more likely than rational managers to report small (negative or positive) earnings surprises. That difference is also significant in seven out of eight cases.

Clearly, the results presented support the Earnings Surprise Hypothesis: optimists are less likely to be associated with a big surprise and are more likely to be associated with a small surprise than rational managers.

Place Table 4 here

## 6. Robustness Issues and Additional Tests

The results in the previous section provide empirical support for the Smoothing Hypothesis and the Earnings Surprise Hypothesis. The robustness of each finding is now examined and several additional tests are presented to more deeply understand these findings.

Malmendier and Tate's (2005, 2008) measures are based on the assumption that optimists systematically overestimate the outcomes of their own firms' projects, thereby delaying the exercise of their options. There are reasons, however, why even rational CEOs may delay exercising their options, in which case CEOs who are classified as optimists may not truly be optimists. To address this concern, I explore three alternative reasons for (even rational) managers to delay their option exercise: the manager may possess favorable private information (Section 6.1), or she may work at a firm with lower unsystematic risk (Section 6.2) or lower stock price volatility (Section 6.3). The robustness tests will show, however, that CEOs who are classified as optimists are indeed true optimists.

Second, could factors that are unrelated to managerial optimism be driving the results, with managerial optimism just coincidentally correlated with these factors? Firms led by optimistic CEOs may, for example, smooth earnings more merely because those firms have more volatile cash flows and hence a greater need to smooth earnings. Section 6.4 shows that the evidence does not support this alternative explanation.

Third, it is possible that the earnings surprise results are driven by my choice of the surprise definition. To check this, the analyses are redone using two alternative surprise definitions. As discussed in Section 6.5, these tests show that the results are not materially affected by these alternative definitions of what constitutes a surprise.

Fourth, it is possible that optimistic CEOs show fewer and smaller negative earnings surprises merely by issuing more negative earnings guidance ahead of announcing actual earnings, thereby lowering analysts'

expectations. This possibility is also examined empirically. Tentative evidence presented in Section 6.6 suggests that this is not the case.

Finally, I examine the smoothing behavior of optimistic and rational managers in good and bad earnings periods. I find that both types of managers smooth in good as well as bad times. However, the tests discussed in Section 6.7 suggest that rational managers are associated with bigger negative surprises during bad times and bigger positive surprises during good times than optimistic managers.

### **6.1. Are Optimists merely Rational CEOs with Favorable Private Information about their Firms' Future Performance?**

It is possible that a CEO exercises options late not because she is optimistic but because she has favorable private information, so that such rational managers may be misclassified as optimists. If so, differences in smoothing behavior are not driven by managerial optimism but by the CEO's inside information about the firm's future performance.

A CEO may indeed have positive inside information, but as pointed out by Malmendier and Tate (2005), such information is likely to be transitory. Hence, she may exercise options late, but should not do this persistently or delay exercise for many years. In contrast, the optimism measures are based on a *habitual* tendency to exercise options late. Longholders fail to exercise in the money options for at least five years. Similarly, Holders 67 *at least twice* failed to exercise options that are well in the money.

Nevertheless, I go beyond these observations and specifically confront the misclassification possibility. One way to empirically distinguish between privately-informed rational CEOs and optimistic CEOs is to examine the ex-post performances of their option holdings. Specifically, we could view CEOs who personally profited from exercising in-the-money options late as those with favorable private information, and those who did not profit as the true optimists. Following Malmendier and Tate (2005, 2008), I therefore decompose CEOs who are classified as optimists into those who profited from exercising late and those who did not. To compute the profitability of late exercise, I compare the Longholder's return from exercising options in the year of option maturity (which is the year of actual option exercise) with the hypothetical return from exercising those options one year earlier and investing the proceeds in the S&P 500. Similarly, for Holders 67, I compare the return from exercising options in year 6 with the hypothetical return from exercising options in year 5 (the first year in which exercise was possible but the CEO decided against this) and investing the proceeds in the S&P 500. Since I do not know the price at which the CEO exercised her options, I assume that she was able to perfectly time the market and exercised the options at the maximum price during the fiscal year. This assumption is conservative in that it biases the outcome in favor of documenting profitable late exercise. Longholders, Pre-/Post-Longholders and Holders 67 are classified as "did OK" if they earned positive abnormal returns by holding options to expiration or year 6, respectively;

otherwise they are classified as “should have exercised”. The main regressions are rerun using these two component variables.

Table 5 Panel A shows the results. The coefficients on the “did OK” variables are negative and significant in several cases (limited to Longholders and Pre-/Post-Longholders), suggesting that CEOs who may have had positive private information did smooth more than rational CEOs. Importantly, however, the coefficients on the “should have exercised” variables are negative and also significant (again limited to Longholders and Pre-/Post-Longholders). This suggests that “true” optimists smooth earnings more than rational CEOs, and confirm the main smoothing result of the paper.

Table 5 Panel B shows the percentage of Longholders, Pre-/Post-Longholders and Holders 67 that “did OK” and “should have exercised”. A large percentage of the Longholders (79.1%), Pre-Longholders (65.7%) and Post-Longholders (88.6%) would have benefited from exercising options earlier, suggesting that most of these CEOs did *not* have positive private information but were true optimists. In contrast, among the Holders 67, only 27.5% should have exercised early, suggesting that many Holders 67 may truly be rational CEOs with favorable private information rather than optimists. This may explain why the results are generally weaker based on the Holder 67 measure.

Place Table 5 here

## 6.2. Are Optimists Merely Rational CEOs who Work at Firms with Lower Unsystematic Risk?

Top executives are typically greatly underdiversified (see Section 3.2), which exposes them to their firms’ unsystematic (i.e., firm-specific) risk. As a result, managers who work at firms with higher unsystematic risk may have a greater propensity to exercise options early and thereby shed some unsystematic risk, while those who work at firms with lower unsystematic risk may be more willing to hold on to their options longer. This raises the possibility that managers who are classified as optimists are merely rational CEOs who work at firms with lower unsystematic risk. I now examine this possibility.

Each firm’s unsystematic risk is estimated using the same one-factor market model that was also used to obtain its systematic risk (see Section 4.3):  $r_{it} = \alpha_i + \beta_i * r_{mt} + \varepsilon_{it}$ , where  $r_{it}$  is the return of firm  $i$  for month  $t$  and  $r_{mt}$  is the return of the CRSP value-weighted index for month  $t$ . As before, the model is estimated using five years of monthly return data, and observations are dropped if fewer than 36 monthly returns are available. A firm’s unsystematic risk is computed as the variance of the regression residuals (see Shin and Stulz, 2000). If this alternative explanation were correct, optimists should work at firms with significantly *lower* unsystematic risk.

The (untabulated) results show that based on the Longholder, Post-Longholder, and Holder 67 measures, optimists work at firms with significantly *higher* unsystematic risk than rational managers (p-values of 0.064, 0.008, and 0.001, respectively). Admittedly, however, of critical importance are the results based on the Pre-Longholder measure, since that measure contains the observations before the manager has

first displayed signs of optimism, i.e. they include only the classification phase observations. Based on the Pre-Longholder measure, managers who are classified as optimists do indeed tend to work at firms with lower unsystematic risk, but importantly, the difference is not significant (p-value 0.344). Thus, optimists do *not* seem to be rational CEOs who work at firms with significantly lower unsystematic risk.

### **6.3. Are Optimists merely Rational CEOs who Work at Firms with Lower Stock Price Volatility?**

Malmendier and Tate (2008) argue that higher stock price volatility increases option value and induces later exercise in much the same way that lower risk aversion encourages later exercise. Bettis, Bizjak and Lemmon (2005), however, present evidence suggesting the opposite: executive options are exercised the latest in firms with the lowest stock price volatilities. If the latter is true, this poses a potential problem since the classification of managers as optimists is based on the premise that optimists exercise options later than rational managers. CEOs who are classified as optimists may thus not truly be optimistic – they simply happen to work at firms with lower stock price volatilities. Since earnings volatility and stock price volatility may be correlated, the results I find may be an artifact of this correlation.

To examine this possibility, I calculate the stock price volatility at each firm in the sample. Stock price volatility is the annualized volatility of stock returns, calculated as the standard deviation of five years of monthly stock returns multiplied by the square root of twelve (see, e.g., Bettis, Bizjak and Lemmon, 2005). As an additional check, three (rather than five) years of monthly stock returns are used. If this alternative explanation has merit, I should find that stock price volatility is significantly *lower* at firms led by (supposedly) optimistic CEOs.

Table 6 contains the results. It shows that stock price volatility is significantly *higher* at firms led by optimists using all optimism definitions and regardless of whether stock price volatility is calculated using five years (column i) or three years (column ii) of monthly stock returns. Thus, optimistic CEOs do *not* seem to be rational CEOs who work at firms with lower stock price volatilities.

Place Table 6 here

### **6.4. Is Earnings Smoothing by Optimistic CEOs Driven by More Volatile Cash Flows?**

I now turn to the issue of cash flow volatility. There is no hard-wired relationship between cash flow volatility and stock price volatility. In particular, if a firm has a *predictably* volatile pattern of cash flow through time, then volatility of cash flow *per se* will not communicate enough new information to generate high stock price volatility. Thus, it is important to examine the issue of cash flow volatility independently of stock price volatility. The possibility of concern here is that the optimistic managers in the sample may be working at firms with more volatile cash flows. In this case, one might encounter the findings of the previous section even if managerial optimism *per se* had little to do with earnings smoothing. It should be noted, however, there is no theoretical reason for managerial optimism to be positively correlated with cash flow

volatility. Moreover, differences in cash flow variability have been controlled for in the analysis in the previous section; recall that the second smoothing variable divides the variability of earnings by the variability of cash flows. Nonetheless, a further robustness check is conducted to examine this alternative explanation for the smoothing result. For this robustness check, the regressions are rerun using cash flow variability, *VARIABILITY* ( $\Delta CF / TA$ ), i.e. the denominator of the second smoothing variable, as the dependent variable.

Table 7 shows the results. As before, Panels I through III contain the results for Longholders, Pre-/Post-Longholders, and Holders 67, respectively. If the alternative cash-flow-volatility story has merit, the measures of optimism should be positively correlated with cash flow volatility and the coefficients on the optimism measures should be positive and significant. However, the results do not support this alternative explanation. The coefficients on Longholder and Holder 67 are negative and insignificant, and the coefficient on Pre-Longholder is negative and statistically significant. Only the coefficient on Post-Longholder is positive, but it is not statistically significant (t-statistic of 0.44). Thus, this particular alternative explanation for the evidence can be ruled out.

Place Table 7 here

#### **6.5. Is the Earnings Surprise Result Robust to Alternative Definitions of an Earnings Surprise?**

I have defined an earnings surprise as the reported earnings per share minus the last mean analyst earnings per share forecast before the earnings announcement date. Two robustness checks are now performed. First, reported earnings per share are compared to the *median* analyst earnings forecast rather than the mean. Second, the earnings surprise is expressed as a *percentage* by dividing the dollar surprise by the mean analyst earnings per share forecast.

Table 8 contains the results. Panel A shows that the results are not affected by the use of the median analyst forecast. As can be seen in the first two columns, the fraction of optimistic managers reporting a big positive or negative earnings surprise is smaller than the fraction of rational managers reporting such a surprise (significant in six out of eight cases). The last two columns show that optimists are more likely to report a small surprise than rational managers (also significant in six out of eight cases). Panel B shows that when the surprise is expressed in percentage terms, the conclusion is unchanged for big negative and (to a lesser extent) small positive earnings surprises, while for big positive and small negative earnings surprises, the coefficients have the right sign in two out of four cases, but are never significant.

Place Table 8 here

#### **6.6. Do Optimists Engage in More Downward Earnings Guidance to Avoid Negative Surprises?**

Management often issues its own earnings forecasts. This raises the possibility that optimists engage in more downward earnings guidance than rational managers. Observing lower estimates, analysts may reduce their

earnings forecasts for firms led by optimists, and as a result, those firms on average will be associated with fewer negative surprises at the time actual earnings are announced.

To investigate whether downward earnings guidance drives the results, I use First Call's Company Issued Guidance (CIG) database. This database contains three types of management earnings guidance: (1) point estimates ("about \$0.55"); (2) range estimates ("between \$0.65 and \$0.70"); and qualitative guidance ("at least \$1.45"). When management's earnings forecast is higher (lower) than the analyst consensus forecast, First Call classifies this as a positive (negative) surprise ("cigcoded" equals E and D, respectively). If it is equal to the consensus forecasts, the news is classified as no surprise ("cigcoded" equals M). In some cases, earnings guidance cannot be classified ("cigcoded" equals A). For example, if the consensus analyst forecast is \$1.40 per share and management announces that earnings will be between \$1.30 and \$1.50, it is unclear whether this constitutes positive, negative or neutral news. Note that these are surprises at the time management announces a forecast, *not* at the time it announces actual earnings. If downward earnings guidance is prevalent among optimists, I should find that management earnings *forecasts* issued by optimistic managers contain more negative surprises (at the time of the forecast) than those issued by rational managers.

While coverage started in 1990, the number of observations in the early years is sparse: a mere 330 management earnings forecasts are available for fiscal years 1990 – 1994 (the last sample year). Of these, 25 were issued by managers in my sample: 5 by optimists (based on the Longholder measure) and 20 by rational managers. Similarly, based on the Holder 67 optimism measure, 10 of these were issued by optimists and 15 by rational managers. Since these sample sizes are too small to do formal hypothesis testing, I present summary statistics.

Table 9 contains the results based on the Longholder optimism measure (Panel A) and the Holder 67 measure (Panel B). Panel A shows that earnings guidance issued by rational managers tended to contain a negative surprise (five cases) or no surprise (thirteen cases); it never contained a positive surprise and was not classified in the remaining two cases. In contrast, earnings guidance by optimistic managers tended to contain a positive surprise (one case) or no surprise (three cases); it never contained a negative surprise and was not classified in one case. The evidence shown in Panel B is qualitatively similar. These results are consistent with the observation that optimists do *not* engage in more downward management guidance than rational managers.

Place Table 9 here

### **6.7. Do Smoothing Behavior and Earnings Surprises Vary across Good and Bad Periods?**

The predictions formulated in this paper are based on a presumed asymmetry in smoothing and earnings surprises across good-news and bad-news periods. Specifically, the assumption was made that, relative to rational managers, optimistic managers are more likely to inflate earnings during bad times. This results in greater smoothing for optimistic managers because they are essentially "borrowing" more earnings from



(future) good times. This suggests that not only do optimistic and rational managers differ from each other in how they manage earnings, but also that their earnings management behavior varies across good and bad times.

So I now examine the smoothing behavior and earnings surprises of firms led by optimists and rational managers in good and bad times. My definition of “good periods” and “bad periods” focuses on the industry in which a firm operates. It classifies a quarter as a good period if industry earnings (measured as net income) belong to the top 25% of industry earnings over the past five years. Note that this definition does not use firm-specific data because doing so would introduce an endogeneity problem. The smoothing regressions and earnings surprise analyses are now redone separately for good and bad periods.

Table 10 contains the results. Panel A shows that optimistic CEOs smooth more than rational CEOs during good times and bad times, but the difference is not always significant. More importantly, Panel B indicates that during good times, optimistic CEOs are associated with fewer big positive surprises and with more small positive surprises than are rational CEOs. During bad times, optimists show fewer big negative surprises and more small (negative and positive) surprises. This is consistent with the core intuition of the hypothesis that optimists tend to inflate earnings more than rational managers during bad times and that this reduces their relative ability to deliver (big) positive surprises during good times.

Place Table 10 here

## **7. Conclusion**

The main goal of this paper has been to examine the effect of a specific managerial behavioral bias, optimism, on the degree of earnings smoothing displayed by the firm. The intended contribution is to add to the small but growing literature on how *manager-specific* attributes – such as details of executive compensation, board characteristics, and managerial behavioral biases – can explain differences in earnings smoothing practices across firms.

Based on economic intuition derived from the empirically-documented market-response asymmetry related to earnings reports and the behavior of optimistic managers relative to rational managers, I formulate two testable predictions. First, optimistic managers smooth earnings more than rational managers. Second, optimistic managers are less likely than rational managers to be associated with large positive or negative earnings surprises, and are more likely to be associated with small positive or negative earnings surprises. In line with the existing literature on behavioral biases, managerial optimism is defined as an upward bias in the assessment of firm-specific future outcomes. To test these hypotheses, optimism measures based on the timing of exercise of executive stock options are used.

I find supporting evidence for both hypotheses, even after controlling for other factors that may affect earnings smoothing, such as firm size, market-to-book, leverage, profitability, asymmetric information,

agency problems, corporate governance, CEO stock and option ownership, systematic risk, and year and industry fixed effects. A variety of additional tests are performed to examine whether optimists are truly optimistic and to establish the robustness of the Smoothing and Earnings Surprise results. The conclusion is that the innate optimism of some managers does exert a significant independent effect on their firms' inclination to smooth earnings, determines whether the firm falls short of analysts' earnings forecasts or beats them, and also the magnitude of the earnings surprise.

The theoretical motivation for the results depends on the specific representation of the market-response asymmetry depicted in Figure 1b. Clearly, alternative specifications may also be consistent with the existing evidence on how the market responds to earnings surprises, and not all of them might yield the predictions that arise from the specification chosen here. In that sense, what I have provided is a possible theoretical justification for my empirical hypotheses that is a sufficiency condition for the results to hold, but not a theory of why the market-response asymmetry should be as it is in Figure 1b. That is an interesting challenge for future theoretical research.

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**Table 1: Summary Statistics of Optimism Measures, Smoothing Variables, and Control Variables**

This table contains summary statistics. Panel A shows the number of firms and CEOs in the sample. Panel B reports summary statistics of the optimism measures and smoothing variables. Panel C contains summary statistics of the control variables used to test the hypothesis that optimistic CEOs smooth earnings more than their rational counterparts.

**Optimism Measures:** A CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. A CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. If a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

**Smoothing Variables:** *VARIABILITY* ( $\Delta NI / TA$ ) is the variability of earnings, the change in net income divided by total assets. It is calculated as the variance of residuals from regressions of ( $\Delta NI / TA$ ) on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity). *VARIABILITY* ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ ) is the variability of earnings (as defined above) divided by the variability of cash flows, the change in cash flows divided by total assets (calculated using the same approach as the variability of earnings). *CORR* ( $(ACC / TA)$ ,  $(CF / TA)$ ) is the correlation between the regression residuals of ( $ACC / TA$ ) and the regression residuals of ( $CF / TA$ ), where the residuals have been calculated using the regression approach discussed above. Accruals ( $ACC$ ) equal the change in current assets minus the change in cash and cash equivalents minus the change in current liabilities plus the change in short-term debt included in current liabilities minus depreciation and amortization.

**Control Variables:** *LNASSETS* is the log of total assets. *M/B RATIO* is the firm's market-to-book ratio, defined as the market value of assets divided by the book value of assets. *BOOKLEV* is interest-bearing debt divided by total assets. *PROFITABILITY* is EBITDA divided by total assets. *RETEARN\_CS* is retained earnings as a fraction of common stock. *COLLATERAL* is tangible assets divided by total assets. *BOARD* is the number of board members. *CHAIRMAN* is a dummy that equals 1 if the CEO serves as the chairman of the board, and 0 otherwise. *PCTOWN* is the fraction of company stock owned by the CEO. *PCTVESTOPT* is the number of options exercisable within 60 days from the start of the year (multiplied by 10) divided by the number of shares outstanding. *SYSTRISK* is systematic risk, measured as  $\beta^2$  times the variance of the value-weighted market index, where  $\beta$  is estimated with monthly return data using a one-factor market model.

**Panel A: Number of Firms and Number of CEOs**

Number of firms	210
Number of CEOs	374

**Panel B: Summary Statistics of Optimism Measures and Smoothing Variables**

	Obs	Mean	Median	Minimum	Maximum
<b><u>OPTIMISM MEASURES:</u></b>					
LONGHOLDER	1704	0.194	0.000	0.000	1.000
PRE-LONGHOLDER	1704	0.080	0.000	0.000	1.000
POST-LONGHOLDER	1704	0.113	0.000	0.000	1.000
HOLDER 67	1704	0.400	0.000	0.000	1.000
<b><u>SMOOTHING VARIABLES:</u></b>					
VARIABILITY ( $\Delta NI / TA$ )	1704	0.000	0.000	0.000	0.058
VARIABILITY ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ )	1704	0.157	0.042	0.000	3.068
CORR ( $(ACC / TA)$ , $(CF / TA)$ )	1704	-0.888	-0.950	-1.000	0.359

**Panel C: Summary Statistics of Control Variables Used to Test the Smoothing Hypothesis**

	Obs	Mean	Median	Minimum	Maximum
<b><u>CONTROL VARIABLES:</u></b>					
LNASSETS	1704	7.759	7.740	4.760	11.517
M/B RATIO	1704	1.067	0.796	0.138	4.271
BOOKLEV	1704	0.268	0.276	0.000	0.742
PROFITABILITY	1704	0.169	0.156	0.002	0.463
RETEARN_CS	1704	0.634	0.653	-0.208	1.544
COLLATERAL	1704	0.651	0.678	0.004	0.939
BOARD	1704	12.152	12.000	5.000	24.000
CHAIRMAN	1704	0.179	0.000	0.000	1.000
PCTOWN	1704	0.016	0.001	0.000	0.518
PCTVESTOPT	1704	0.019	0.004	0.000	1.056
SYSTRISK	1704	0.002	0.002	0.000	0.012

**Table 2: Smoothing Hypothesis – Optimistic CEOs smooth Earnings More than Rational CEOs (Univariate Evidence)**

This table contains results of univariate tests that compare earnings smoothing by optimistic and rational managers. The evidence presented provides initial support for the hypothesis that optimistic CEOs smooth earnings more than rational CEOs.

**Smoothing Variables:** Column (i) contains results using *VARIABILITY* ( $\Delta NI / TA$ ) which is the variability of earnings, the change in net income divided by total assets. It is calculated as the variance of residuals from regressions of ( $\Delta NI / TA$ ) on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity). Column (ii) contains results using *VARIABILITY* ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ ), which is the variability of earnings (as defined above) divided by the variability of cash flows, the change in cash flows divided by total assets (calculated using the same approach as the variability of earnings). *CORR* ( $(ACC / TA)$ ,  $(CF / TA)$ ) is the correlation between the regression residuals of ( $ACC / TA$ ) and the regression residuals of ( $CF / TA$ ), where the residuals have been calculated using the regression approach discussed above. Accruals ( $ACC$ ) equal the change in current assets minus the change in cash and cash equivalents minus the change in current liabilities plus the change in short-term debt included in current liabilities minus depreciation and amortization.

**Optimism Measures:** Panel I shows results for rational CEOs and Longholders. A CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. CEOs not classified as Longholders are classified as rational. Panel II shows results for rational CEOs and Pre-/Post-Longholders. A CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. CEOs not classified as Pre-/Post-Longholders are classified as rational. Panel III contains results for rational CEOs and Holders 67. If a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time. CEOs not classified as Holders 67 are classified as rational.

t-statistics are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

		(i) VARIABILITY ( $\Delta NI / TA$ )			(ii) VARIABILITY ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ )			(iii) CORR ( $(ACC / TA)$ , $(CF / TA)$ )		
		N	Mean	t-statistic	N	Mean	t-statistic	N	Mean	t-statistic
Panel I:	LONGHOLDER	330	0.0002		330	0.1006		330	-0.9170	
	RATIONAL	1374	0.0005		1374	0.1700		1374	-0.8810	
	Difference		-0.0003	(-3.55)***		-0.0694	(-5.47)***		-0.0360	(-4.35)***
Panel II:	PRE-LONGHOLDER	137	0.0001		137	0.0920		137	-0.9160	
	RATIONAL	1567	0.0005		1567	0.1622		1567	-0.8850	
	Difference		-0.0004	(-5.24)***		-0.0702	(-4.25)***		-0.0310	(-2.55)**
	RATIONAL	193	0.0003		193	0.1067		193	-0.9180	
	POST-LONGHOLDER	1511	0.0005		1511	0.1629		1511	-0.8840	
	Difference		-0.0002	(-2.07)**		-0.0562	(-3.75)***		-0.0340	(-6.40)***
Panel III:	HOLDER 67	681	0.0003		681	0.1278		681	-0.9140	
	RATIONAL	1023	0.0005		1023	0.1757		1023	-0.8700	
	Difference		-0.0002	(-2.21)**		-0.0479	(-3.63)***		-0.0440	(-6.07)***

**Table 3: Smoothing Hypothesis – Optimistic CEOs Smooth Earnings More than Rational CEOs**

This table contains results of OLS regressions of earnings smoothing on CEO optimism and control variables. The evidence presented provides further support for the hypothesis that optimistic CEOs smooth earnings more than rational CEOs.

Smoothing Variables: In each Panel, Column (i) contains results using *VARIABILITY* ( $\Delta NI / TA$ ) which is the variability of earnings, the change in net income divided by total assets. It is calculated as the variance of residuals from regressions of ( $\Delta NI / TA$ ) on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity). In each Panel, Column (ii) contains results using *VARIABILITY* ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ ), which is the variability of earnings (as defined above) divided by the variability of cash flows, the change in cash flows divided by total assets (calculated using the same approach as the variability of earnings).

Optimism Measures: Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

Control Variables: *LNASSETS* is the log of total assets. *M/B RATIO* is the firm's market-to-book ratio, defined as the market value of assets divided by the book value of assets. *BOOKLEV* is interest-bearing debt divided by total assets. *PROFITABILITY* is EBITDA divided by total assets. *RETEARN\_CS* is retained earnings as a fraction of common stock. *COLLATERAL* is tangible assets divided by total assets. *BOARD* is the number of board members. *CHAIRMAN* is a dummy that equals 1 if the CEO serves as the chairman of the board, and 0 otherwise. *PCTOWN* is the fraction of company stock owned by the CEO. *PCTVESTOPT* is the number of options exercisable within 60 days from the start of the year (multiplied by 10) divided by the number of shares outstanding. *SYSTRISK* is systematic risk, measured as  $\beta^2$  times the variance of the value-weighted market index, where  $\beta$  is estimated with monthly return data using a one-factor market model.

All regressions include a constant, year and industry fixed effects. t-statistics based on robust standard errors clustered by firm are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

	<b>Panel I: Longholders</b>		<b>Panel II: Pre-/Post-Longholders</b>		<b>Panel III: Holders 67</b>	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
LONGHOLDER	-0.001 (-1.84)*	-0.047 (-1.96)**				
PRE-LONGHOLDER			-0.000 (-1.84)*	-0.027 (-1.01)		
POST-LONGHOLDER			-0.001 (-1.70)*	-0.063 (-2.28)**		
HOLDER 67					-0.000 (-1.44)	-0.003 (-0.15)
LNASSETS	0.000 (2.29)**	0.010 (0.79)	0.000 (2.29)**	0.009 (0.77)	0.000 (2.26)**	0.010 (0.81)
M/B RATIO	0.001 (1.38)	0.011 (0.55)	0.001 (1.38)	0.011 (0.56)	0.001 (1.42)	0.015 (0.75)
BOOKLEV	0.002 (1.66)*	0.103 (0.93)	0.002 (1.66)*	0.100 (0.91)	0.002 (1.65)	0.099 (0.88)
PROFITABILITY	-0.007 (-1.77)*	-0.372 (-2.18)**	-0.007 (-1.77)*	-0.378 (-2.22)**	-0.007 (-1.80)*	-0.402 (-2.36)**
RETEARN_CS	-0.001 (-1.28)	-0.134 (-2.63)***	-0.001 (-1.28)	-0.135 (-2.64)***	-0.001 (-1.28)	-0.134 (-2.61)***
COLLATERAL	0.000 (0.77)	-0.004 (-0.06)	0.000 (0.80)	-0.005 (-0.08)	-0.001 (-1.25)	-0.014 (-0.20)
BOARD	0.000 (0.34)	0.000 (0.10)	0.000 (0.33)	0.000 (0.10)	0.000 (0.60)	0.000 (0.05)
CHAIRMAN	0.000 (0.87)	0.042 (1.07)	0.000 (0.84)	0.039 (0.99)	0.000 (0.90)	0.045 (1.15)
PCTOWN	0.000 (0.26)	-0.259 (-1.89)*	0.000 (0.22)	-0.268 (-1.93)*	0.000 (0.26)	-0.244 (-1.72)*
PCTVESTOPT	-0.003 (-1.46)	-0.241 (-2.46)**	-0.002 (-1.46)	-0.232 (-2.40)**	-0.003 (-1.60)	-0.299 (-3.06)***
SYSTRISK	0.100 (1.59)	-2.774 (-0.49)	0.100 (1.59)	-2.752 (-0.49)	0.101 (1.56)	-3.260 (-0.58)
Year & Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1705	1705	1705	1705	1705	1705
Adjusted R2	0.09	0.15	0.09	0.15	0.09	0.15



**Table 4: Earnings Surprise Hypothesis – Optimistic CEOs are Less Likely to Show Big Surprises and More Likely to Show Small Surprises**

This table contains results of univariate tests. It compares the fractions of optimistic and rational managers that show big negative surprises (-3 cents per share or more), big positive surprises (+3 cents per share or more), small negative surprises (between -3 cents and 0 cents per share), and small positive surprises (between 0 and 3 cents per share). Earnings surprises are calculated as actual earnings per share minus the mean analyst forecast based on the last one-year ahead forecast before the earnings announcement date. The null hypothesis that optimistic CEOs are less likely to report big (negative or positive) earnings surprises than rational CEOs and more likely to report small earnings surprises cannot be rejected.

Optimism Measures: Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

p-values are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

		<i>Fraction of managers announcing:</i>			
		<i>Big negative surprise</i>	<i>Big positive surprise</i>	<i>Small negative surprise</i>	<i>Small positive surprise</i>
Panel I:	LONGHOLDER	25.3%	17.9%	21.0%	28.8%
	RATIONAL	32.4%	24.9%	17.3%	20.0%
	Difference <i>p-value</i>	-7.1% (0.015)**	-7.0% (0.010)***	3.7% (0.090)*	8.8% (0.001)***
Panel II:	PRE-LONGHOLDER	23.6%	17.3%	22.8%	28.3%
	RATIONAL	31.7%	24.1%	17.6%	21.2%
	Difference <i>p-value</i>	-8.1% (0.032)**	-6.8% (0.046)**	5.2% (0.075)*	7.1% (0.035)**
	POST-LONGHOLDER	26.9%	18.5%	19.2%	29.2%
	RATIONAL	31.3%	23.9%	18.0%	21.1%
	Difference <i>p-value</i>	-4.4% (0.157)	-5.4% (0.084)*	1.2% (0.372)	8.1% (0.018)**
Panel III:	HOLDER 67	27.2%	20.6%	21.2%	23.7%
	RATIONAL	34.0%	25.7%	15.5%	20.0%
	Difference <i>p-value</i>	-6.8% (0.008)**	-5.1% (0.023)**	5.7% (0.008)***	3.7% (0.111)

**Table 5: Evidence that Optimists Are Not Rational CEOs with Favorable Private Information**

Panel A contains results of OLS regressions of earnings smoothing on CEO optimism and control variables. Optimists are split into those who “should have exercised early” and those who “did OK” based on whether exercising their in-the-money options one year earlier and investing the funds in the S&P500 yields higher or lower returns than holding onto their options one more year. CEOs who should have exercised early are likely “true” optimists; those who did OK may be rational CEOs with favorable private information. The results support the main result: (“true”) optimists smooth earnings more than rational CEOs. Panel B shows summary statistics.

**Smoothing Variables:** In each Panel, Column (i) contains results using  $VARIABILITY (\Delta NI / TA)$  which is the variability of earnings, the change in net income divided by total assets. It is calculated as the variance of residuals from regressions of  $(\Delta NI / TA)$  on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity). In each Panel, Column (ii) contains results using  $VARIABILITY (\Delta NI / TA) \text{ over } (\Delta CF / TA)$ , which is the variability of earnings (as defined above) divided by the variability of cash flows, the change in cash flows divided by total assets (calculated using the same approach as the variability of earnings).

**Optimism Measures:** Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

All regressions include a constant, all the control variables (see Table 3), and year and industry fixed effects. t-statistics based on robust standard errors clustered by firm are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Regress Smoothing on Optimists Who Should Have Exercised (“True Optimists”), Optimists Who Did OK and Controls**

	<b>Panel I: Longholders</b>		<b>Panel II: Pre-/Post-Longholders</b>		<b>Panel III: Holders 67</b>	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
LONGHOLDER: should have exercised	-0.001 (-1.77)*	-0.058 (-1.94)*				
LONGHOLDER: did OK	-0.000 (-1.65)*	-0.038 (-1.67)*				
PRE-LONGHOLDER: should have exercised			-0.001 (-1.89)*	-0.034 (-0.86)		
PRE-LONGHOLDER: did OK			-0.000 (-1.54)	-0.041 (-1.82)*		
POST-LONGHOLDER: should have exercised			-0.001 (-1.63)	-0.072 (-2.37)**		
POST-LONGHOLDER: did OK			-0.001 (-1.39)	-0.031 (-0.58)		
HOLDER 67: should have exercised					-0.001 (-1.43)	-0.015 (-0.53)
HOLDER 67: did OK					-0.000 (-1.31)	-0.003 (-0.10)
All Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1705	1705	1705	1705	1705	1705
Adjusted R2	0.09	0.15	0.09	0.15	0.09	0.15

**Panel B: CEOs Classified as Optimists Split into Those Who Should Have Exercised and Those Who Did OK**

<b>CEOs Classified as Optimists</b>		<b>Percentage of All CEOs</b>	<b>Percentage of All Optimists</b>
Panel I: LONGHOLDER		19.4%	
	Should have exercised	15.3%	79.1%
Panel II: PRE-LONGHOLDER	Did OK	4.0%	20.9%
		8.0%	
Panel II: POST-LONGHOLDER	Should have exercised	5.3%	65.7%
	Did OK	2.8%	34.3%
Panel III: HOLDER 67		11.3%	
	Should have exercised	10.0%	88.6%
	Did OK	1.3%	11.4%
Panel III: HOLDER 67		40.0%	
	Should have exercised	11.0%	27.5%
	Did OK	29.0%	72.5%

**Table 6: Evidence that Optimists Are Not Rational CEOs Working at Firms with Lower Stock Price Volatility**

This table contains results of univariate tests that compare the stock price volatility at firms led by CEOs classified as optimists with the stock price volatility at firms led by rational managers. Stock price volatility is the annualized volatility of stock returns calculated as the standard deviation of five years or three years of monthly stock returns multiplied by the square root of twelve. The results show that CEOs classified as optimists work at firms with higher stock price volatility than the firms at which rational CEOs work, mitigating concerns that CEOs classified as optimists are truly rational CEOs who happen to work at firms with lower stock price volatility and hence are more willing to hold on to their options longer and also smooth earnings less.

Optimism Measures: Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

p-values are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

		Mean stock price volatility		
		N	(i) Calculated using 5 years of monthly returns	(ii) Calculated using 3 years of monthly returns
Panel I:	LONGHOLDER	370	0.3236	0.3185
	RATIONAL	1507	0.2793	0.2750
	Difference		0.0443	0.0436
	<i>p-value</i>		(0.00)***	(0.00)***
Panel II:	PRE-LONGHOLDER	168	0.3158	0.3156
	RATIONAL	1709	0.2853	0.2804
	Difference		0.0305	0.0352
	<i>p-value</i>		(0.00)***	(0.00)***
	RATIONAL	202	0.3301	0.3210
	POST-LONGHOLDER	1675	0.2830	0.2790
	Difference		-0.3301	0.0420
	<i>p-value</i>		(0.00)***	(0.00)***
Panel III:	HOLDER 67	753	0.3174	0.3137
	RATIONAL	1124	0.2684	0.2634
	Difference		0.0490	0.0503
	<i>p-value</i>		(0.00)***	(0.00)***

**Table 7: Evidence that Greater Earnings Smoothing by Optimistic CEOs Is Not Driven by More Volatile Cash Flows**

This table contains results of OLS regressions of cash flow variability on optimism and control variables. An alternative explanation for the Smoothing result is tested, namely that firms led by optimistic CEOs may smooth earnings more merely because those firms have more volatile cash flows and hence a greater need to smooth earnings. The evidence presented does not support this alternative explanation.

Cash Flow Volatility Measure: *VARIABILITY* ( $\Delta NI / TA$ ) is calculated as the variance of residuals from regressions of ( $\Delta NI / TA$ ), the change in net income divided by total assets, on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity).

Optimism Measures: Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

Control Variables: *LNASSETS* is the log of total assets. *M/B RATIO* is the firm's market-to-book ratio, defined as the market value of assets divided by the book value of assets. *BOOKLEV* is interest-bearing debt divided by total assets. *PROFITABILITY* is EBITDA divided by total assets. *RETEARN\_CS* is retained earnings as a fraction of common stock. *COLLATERAL* is tangible assets divided by total assets. *BOARD* is the number of board members. *CHAIRMAN* is a dummy that equals 1 if the CEO serves as the chairman of the board, and 0 otherwise. *PCTOWN* is the fraction of company stock owned by the CEO. *PCTVESTOPT* is the number of options exercisable within 60 days from the start of the year (multiplied by 10) divided by the number of shares outstanding. *SYSTRISK* is systematic risk, measured as  $\beta^2$  times the variance of the value-weighted market index, where  $\beta$  is estimated with monthly return data using a one-factor market model.

All regressions include a constant, year and industry fixed effects. t-statistics based on robust standard errors clustered by firm are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

	<b>Panel I: Longholders</b>	<b>Panel II: Pre-/Post-Longholders</b>	<b>Panel III: Holders 67</b>
LONGHOLDER	-0.000 (-0.26)		
PRE-LONGHOLDER		-0.002 (-2.41)**	
POST-LONGHOLDER		0.001 (0.44)	
HOLDER 67			-0.001 (-1.19)
LNASSETS	-0.001 (-3.23)***	-0.001 (-3.22)***	-0.001 (-3.21)***
M/B RATIO	0.001 (0.98)	0.001 (0.96)	0.001 (1.00)
BOOKLEV	0.004 (0.88)	0.004 (0.92)	0.004 (0.91)
PROFITABILITY	-0.020 (-2.59)**	-0.019 (-2.57)**	-0.020 (-2.65)***
RETEARN_CS	0.001 (0.46)	0.001 (0.50)	0.001 (0.48)
COLLATERAL	0.000 (0.05)	0.000 (0.01)	0.000 (0.13)
BOARD	0.000 (0.92)	0.000 (0.89)	0.000 (0.83)
CHAIRMAN	0.000 (0.18)	0.000 (0.06)	0.000 (0.25)
PCTOWN	-0.005 (-1.35)	-0.004 (-1.18)	-0.005 (-1.49)
PCTVESTOPT	0.002 (0.22)	0.001 (0.13)	0.002 (0.32)
SYSTRISK	0.710 (2.79)***	0.709 (2.80)***	0.725 (2.84)***
Year & Industry Dummies	Yes	Yes	Yes
Observations	1704	1704	1704
Adjusted R-squared	0.20	0.20	0.20

**Table 8: Evidence that the Earnings Surprise Result is Not Driven by the Choice of Surprise Definition**

This table compares the fraction of optimistic and rational managers that report earnings surprises. It examines whether the Earnings Surprise result is robust to using two alternative definitions of what constitutes an earnings surprise. As before, the null hypothesis that optimistic CEOs are less likely to report big (negative or positive) earnings surprises than rational CEOs and are more likely to report small earnings surprises cannot be rejected.

In Panel A, big negative earnings surprises (-3 cents per share or more), big positive earnings surprises (+3 cents per share or more), small negative surprises (from -3 cents up to 0 cent per share), and small positive surprises (from 0 to +3 cents per share) are calculated as actual earnings per share minus the median (rather than the mean) analyst forecast based on the last one-year ahead forecast before the earnings announcement date. In Panel B, earnings surprises are expressed in percentage terms as actual earnings per share minus the mean analyst forecast divided by the mean analyst earnings forecast based on the last one-year ahead forecast before the earnings announcement date.

Optimism Measures: Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

p-values are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

		Panel A: Earnings Surprise Based on the Median Analyst Forecast				Panel B: Earnings Surprise Divided by the Mean Analyst Earnings Forecast			
		<i>Fraction of managers announcing:</i>				<i>Fraction of managers announcing:</i>			
		<i>Big negative surprise</i>	<i>Big positive surprise</i>	<i>Small negative surprise</i>	<i>Small positive surprise</i>	<i>Big negative surprise</i>	<i>Big positive surprise</i>	<i>Small negative surprise</i>	<i>Small positive surprise</i>
Panel I:	LONGHOLDER	22.6%	17.9%	23.7%	28.4%	21.8%	27.6%	19.5%	24.1%
	RATIONAL	30.8%	25.4%	16.0%	22.5%	26.5%	28.2%	19.6%	20.4%
	Difference <i>p-value</i>	-8.2% (0.006)***	-7.5% (0.007)***	7.7% (0.002)***	5.9% (0.027)**	-4.7% (0.066)*	-0.6% (0.431)	-0.1% (0.515)	3.7% (0.103)
Panel II:	PRE-LONGHOLDER	18.1%	16.5%	28.3%	28.3%	20.5%	26.8%	22.8%	22.0%
	RATIONAL	30.2%	24.6%	16.4%	23.3%	26.0%	28.2%	19.1%	21.2%
	Difference <i>p-value</i>	-12.1% (0.002)***	-8.1% (0.023)**	11.9% (0.001)***	5.0% (0.107)	-5.5% (0.089)*	-1.4% (0.366)	3.7% (0.159)	0.8% (0.413)
	POST-LONGHOLDER	26.9%	19.2%	19.2%	28.5%	23.1%	28.5%	16.2%	26.2%
	RATIONAL	29.1%	24.2%	17.6%	23.3%	25.7%	28.0%	20.0%	20.6%
	Difference <i>p-value</i>	-2.2% (0.307)	-5.0% (0.104)	1.6% (0.327)	5.2% (0.098)*	-2.6% (0.261)	0.5% (0.544)	-3.8% (0.850)	5.6% (0.075)*
Panel III:	HOLDER 67	25.6%	21.4%	20.0%	25.8%	23.2%	28.4%	20.2%	20.8%
	RATIONAL	31.7%	25.7%	15.8%	22.2%	27.4%	27.7%	18.9%	21.7%
	Difference <i>p-value</i>	-6.1% (0.014)**	-4.3% (0.047)**	4.2% (0.037)**	3.6% (0.080)*	-4.2% (0.055)*	0.7% (0.404)	1.3% (0.291)	-0.9% (0.643)

**Table 9: Evidence that Optimists do not Engage in more Downward Earnings Guidance**

This table examines earnings guidance provided by optimistic and rational managers over the sample period using data from First Call's Company Issued Guidance (CIG) database. When management's earnings forecast is higher than / lower than / equal to the analyst consensus forecast, First Call classifies this as a positive surprise / negative surprise / no surprise. The results suggest that earnings forecasts by rational managers constitute a negative surprise more often than earnings forecasts by optimists, mitigating concerns that a key result of the paper (optimists are less likely to announce big earnings surprises) is driven by optimists engaging in more downward earnings guidance.

In Panel A, optimism is measured using the Longholder measure: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. In Panel B, optimism is measured using the Holder 67 measure: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

**Panel A: Earning Guidance by Rational CEOs and Longholders**

Management Earnings Guidance Classified as a ("cigcode1"):	First Call's Code ("cigcode")	Frequency of Earnings Guidance by:	
		RATIONAL CEOs	LONGHOLDERS
Negative surprise	D	5	0
Positive surprise	E	0	1
No surprise	M	13	3
Not classified	A	2	1
<i>Total</i>		<i>20</i>	<i>5</i>

**Panel B: Earning Guidance by Rational CEOs and Holders 67**

Management Earnings Guidance Classified as a ("cigcode1"):	First Call's Code ("cigcode")	Frequency of Earnings Guidance by:	
		RATIONAL CEOs	HOLDERS 67
Negative surprise	D	5	0
Positive surprise	E	0	1
No surprise	M	10	6
Not classified	A	0	3
<i>Total</i>		<i>15</i>	<i>10</i>

**Table 10: Smoothing Behavior and Earnings Surprises across Good and Bad Periods**

Panel A contains results of OLS regressions of CEO optimism on earnings smoothing and control variables across good and bad periods. Panel B contains the results of univariate tests that compare the fraction of optimistic and rational managers that report big negative earnings surprises (-3 cents per share or more), big positive earnings surprises (+3 cents per share or more), small negative surprises (from -3 cents up to 0 cent per share), and small positive surprises (from 0 to +3 cents per share) during good times and bad times; earnings surprises are calculated as actual earnings per share minus the mean analyst forecast based on the last one-year ahead forecast before the earnings announcement date. A quarter is classified as a good (bad) period if industry earnings in that quarter are in the top (bottom) 25% of industry earnings over the preceding five years. The evidence in Panel A suggests that optimistic CEOs smooth earnings more than rational CEOs in good and bad times. The results in Panel B show that during good times, optimistic CEOs are less (more) likely to report big (small) positive earnings surprises than rational CEOs and are less (more) likely to report big (small) negative earnings surprises than rational CEOs during bad times.

**Smoothing Variables:** In each Panel, Column (i) contains results using *VARIABILITY ( $\Delta NI / TA$ )* which is the variability of earnings, the change in net income divided by total assets. It is calculated as the variance of residuals from regressions of ( $\Delta NI / TA$ ) on six control variables. The six control variables include: leverage (total liabilities divided by total assets); sales growth (percentage annual growth); debt issuance (percentage change in total liabilities); equity issuance (percentage change in shares outstanding adjusted for splits); annual asset turnover (sales divided by total assets); and size (logarithm of the market value of equity). In each Panel, Column (ii) contains results using *VARIABILITY ( $\Delta NI / TA$ ) over ( $\Delta CF / TA$ )*, which is the variability of earnings (as defined above) divided by the variability of cash flows, the change in cash flows divided by total assets (calculated using the same approach as the variability of earnings).

**Optimism Measures:** Panel I shows results for Longholders: a CEO is classified as a Longholder (for all of her years in the sample) if she ever held an option until the year of expiration, although the option is at least 40% in the money at the beginning of that year. Panel II shows results for Pre-/Post-Longholders: a CEO is classified as a Post-Longholder (Pre-Longholder) for the years after (up until) she has held options that are at least 40% in the money until the year of expiration for the first time. Panel III contains results for Holders 67: if a CEO twice fails to exercise an option with five years remaining duration that is at least 67% in the money, she is classified as a Holder 67 from the year after she exercises such options late for the first time.

In Panel A, t-statistics based on robust standard errors clustered by firm are in parentheses. All regressions include a constant, all the control variables (see Table 3), and year and industry fixed effects. In Panel B, p-values are in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Earnings Smoothing during Good and Bad Times**

	Earnings smoothing during good times						Earnings smoothing during bad times					
	Panel I: Longholders		Panel II: Pre-/Post- Longholders		Panel III: Holders 67		Panel I: Longholders		Panel II: Pre-/Post- Longholders		Panel III: Holders 67	
	(i)	(ii)	(i)	(ii)	(i)	(ii)	(i)	(ii)	(i)	(ii)	(i)	(ii)
LONGHOLDER	-0.000 (-1.57)	-0.043 (-1.37)					-0.000 (-1.53)	-0.069 (-2.10)**				
PRE-LONGHOLDER			-0.000 (-1.93)*	-0.062 (-2.10)**					-0.000 (-0.60)	-0.056 (-1.26)		
POST-LONGHOLDER			-0.000 (-0.76)	-0.022 (-0.48)					-0.000 (-1.62)	-0.078 (-1.93)*		
HOLDER 67					-0.000 -0.150	-0.004 -0.140					-0.000 -0.990	-0.017 -0.500
All control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	547	547	547	547	547	547	432	432	432	432	432	432
Adjusted R2	0.29	0.21	0.28	0.21	0.28	0.20	0.18	0.17	0.18	0.17	0.18	0.16

**Panel B: Earnings Surprises across Good and Bad Periods**

		During <i>good</i> times, the fraction of managers announcing:				During <i>bad</i> times, the fraction of managers announcing:			
		<i>Big negative surprise</i>	<i>Big positive surprise</i>	<i>Small negative surprise</i>	<i>Small positive surprise</i>	<i>Big negative surprise</i>	<i>Big positive surprise</i>	<i>Small negative surprise</i>	<i>Small positive surprise</i>
Panel I:	LONGHOLDER	25.2%	19.5%	18.2%	30.2%	25.5%	15.3%	25.5%	26.5%
	RATIONAL	26.7%	28.3%	16.1%	23.3%	39.6%	20.8%	18.9%	15.9%
	Difference <i>p-value</i>	-1.6% (0.35)	-8.8% (0.02)**	2.1% (0.27)	6.9% (0.02)**	-14.1% (0.01)***	-5.5% (0.11)	6.7% (0.07)*	10.7% (0.01)***
Panel II:	PRE-LONGHOLDER	20.7%	19.5%	18.4%	34.5%	30.0%	12.5%	32.5%	15.0%
	RATIONAL	27.3%	27.1%	16.4%	23.5%	37.3%	20.3%	19.1%	18.4%
	Difference <i>p-value</i>	-6.6% (0.10)*	-7.5% (0.07)*	2.0% (0.32)	11.0% (0.01)***	-7.3% (0.18)	-7.8% (0.12)	13.4% (0.02)**	-3.4% (0.70)
	POST-LONGHOLDER	30.6%	19.4%	18.1%	25.0%	22.4%	17.2%	20.7%	34.5%
	RATIONAL	25.8%	26.9%	16.5%	25.1%	38.7%	20.0%	20.2%	15.8%
	Difference <i>p-value</i>	4.8% (0.81)	-7.4% (0.09)*	1.6% (0.37)	-0.1% (0.50)	-16.3% (0.01)***	-2.7% (0.31)	0.5% (0.47)	18.7% (0.00)***
Panel III:	HOLDER 67	24.1%	21.8%	19.5%	26.1%	31.7%	18.8%	23.6%	20.2%
	RATIONAL	28.5%	30.1%	13.8%	24.0%	40.6%	20.3%	17.6%	16.4%
	Difference <i>p-value</i>	-4.4% (0.11)	-8.3% (0.01)***	5.8% (0.03)**	2.0% (0.28)	-8.9% (0.02)**	-1.6% (0.34)	6.0% (0.06)**	3.8% (0.15)