Earnings Smoothing, Analyst Following, and Firm Value

George Allayannis
Darden School of Business
University of Virginia
PO Box 6550
Charlottesville, VA 22906
(434) 924-3434
allayannisy@darden.virginia.edu

Paul J. Simko
Darden School of Business
University of Virginia
PO Box 6550
Charlottesville, VA 22906
(434) 924-1391
simkop@darden.virginia.edu

August 2009

We thank Richard Evans, Mary Margaret Frank, Marc Lipson, Michael Mosebach, Frank Warnock, James Weston, and workshop participants at the University of Virginia for helpful discussions. The Darden School Foundation provided generous financial support for this research.

Earnings Smoothing, Analyst Following, and Firm Value

ABSTRACT

This paper examines whether earnings smoothing based on accounting discretion is positively associated with value when less information is otherwise available. We estimate a smoothing index which measures the decrease in earnings per share volatility related to the use of discretionary accruals, and proxy for a firm's information environment using the number of analysts following the firm. In unconditional tests, we find a modest though statistically significant premium for firms that smooth earnings. However, consistent with our hypothesis, we find that this premium is concentrated among firms with low or no analyst following. On average, we find no relation between firm value and earnings smoothing for firms with a high analyst following. These findings are consistent with findings that earnings smoothing increases the informativeness of earnings.

I. Introduction

Earnings smoothing is the reduction of volatility in reported earnings that would otherwise exist in the absence of some action. Direct actions that smooth earnings commonly take the form of real strategic business decisions such as exiting a line of business, influencing product demand through price changes, or cost cutting.[1] A more subtle means to smooth earnings, however, is the application of available accounting discretion through the use of estimates, assumptions, and method choice. In practice this behavior has been shown to be quite common, as might be expected given a number of perceived benefits associated with less volatile earnings (Rountree et al. 2008; Graham et al. 2005; Trueman and Titman 1988).

Despite the accepted pervasiveness of discretionary earnings smoothing, little direct evidence exists establishing that this activity translates into higher firm value, and the conditions under which this link might be affected. Recent work finds that managers' use of discretionary accruals to smooth earnings makes earnings more informative (Tucker and Zarowin 2006). This increase in informativeness should be valued more by investors in an environment where there is otherwise limited information about the firm. In this paper we test directly whether earnings smoothing via discretionary accruals is more valuable in a low information environment. While it is less obvious what the valuation impact of smoothing should be in an environment where information about the firm is plentiful, we expect that the effect should be smaller in such an environment.

Our design uses the number of analysts as a proxy for the richness of the information environment, and we test whether there is a difference in the valuation effect of discretionary smoothing between high and low analyst following. Well accepted is that analysts play a critical role in processing, analyzing, and synthesizing information about the firm (Schipper 1991).

[1] For example, see Roychowdhury (2006) and Cohen et al. (2007).

Thus, more analyst coverage implies a stronger information set about the firm, all else equal. Our estimate of earnings smoothing uses the relative volatilities of reported earnings per share and pre-managed earnings (reported earnings adjusted for discretionary accruals) per share. We construct a "discretionary smoothing index" (DSI) for each firm as the ratio of reported earnings volatility scaled by pre-managed earnings volatility. Lower values of DSI imply a higher degree of earnings smoothing using accounting discretion.[2]

Over the sampling period of 1993 through 2006 we find that firms use accounting discretion to reduce the volatility of earnings. Specifically, the median DSI is consistently less than one (i.e., pre-managed earnings volatility is greater than the reported earnings volatility) in all years examined. This finding is not entirely surprising given the nature and objectives of accrual accounting, but importantly this characteristic does establish that our proxy for unexpected reported and pre-managed earnings yields a statistical measure that reflects smoothing activity. On average, we find that over 90 percent of the observations in our sample have a DSI that indicates at least some discretionary smoothing. This frequency is consistent with Graham et al. (2005), whose survey evidence documents that executives prefer smooth earnings and engage in activities that accomplish this goal, and reveals the pervasiveness of the phenomenon.[3]

First, as a way to establish a baseline result and compare with prior work, we examine the valuation effect of smoothing in an unconditional context. We find evidence that earnings smoothing through accounting discretion is positively related to proxies for firm value, on

[2] Prior work has examined earnings smoothing from different perspectives. For example, Francis et al. (2004) examine firms that consistently meet or beat analyst earnings forecasts whereas more recently, Myers et al. (2007) examine firms that report long strings of consecutive increases in earnings per share.

[3] The smoothing that the executives refer to is clearly not a result of GAAP violation or fraud, but simply a matter of "running the business."

average, after controlling for pre-managed earnings volatility.[4] A firm that moves from the median in DSI to the lowest quartile (i.e., higher smoothing) increases its value by approximately 1.3 percent. We interpret this result as consistent with Tucker and Zarowin (2006) who find that earnings smoothing increases the informativeness of earnings, hence it can be beneficial to investors in its predictive value. The value-premium for smooth earnings documented in our fixed-effects regressions is also generally present in separate by-year tests. However, the relation is more pronounced and statistically significant in the post-1999 years, and weaker or absent in earlier years. These by-year results are consistent with evidence in Rountree et al. (2008) who examine total accruals and find no significant valuation effect for earnings smoothing in a sample of firms from 1987 through 1997. A potential explanation for these by-year results, for which we find confirming evidence, is that there is a higher percent of firms followed by analysts in the earlier part of the sample. In the later part, new firms with lower or no analyst coverage enter the sample, yielding a higher average valuation effect for smoothing over time. Hence, we find that the relative strength of the information environment in the sample affects the impact of smoothing on value. We test this more directly in a cross-sectional setting in subsequent tests.[5]

Our main tests re-estimate our value regression model allowing the coefficient on DSI to vary based on subsamples of low and high analyst following. Consistent with our hypothesis, we find strong evidence of a differing association of value with discretionary earnings smoothing dependent on the level of analyst following. Earnings smoothing for firms with high analyst following exhibit no significant association with value. In contrast, for firms followed by a low

[4] Controlling for pre-managed earnings volatility is critical in our tests as a low DSI (high smoothing) could be the outcome of low earnings volatility or high pre-managed earnings volatility. Our hypothesis focuses on the value of the extent of smoothing, which is the value impact of DSI conditional on pre-managed earnings volatility, not on the value of earnings or pre-managed volatility on their own.

[5] Of course, other factors besides the relative strength of the information environment may be associated with the time-series pattern on the value of smoothing that we observe. Though interesting, such examination is beyond the scope of this paper.

number of analysts, there exists a strong positive association with value indicative of a premium to smoothing. We partition into subsamples of various levels of analyst following, and results are generally robust to whether we categorize at the median level of analyst following or at the extreme case of zero following. As a whole, these results document a conditional valuation effect for firms that use accounting discretion to smooth earnings.

This paper complements and extends the ongoing literature examining the motivations, characteristics and benefits of earnings smoothing. We provide a large sample, multi-year examination of the value relevance of firms' use of accounting discretion to lower reported earnings volatility and the role of the information environment in its determination. We find that such behavior is positively (but modestly) priced by the market, on average, hence our results are consistent with the view taken by financial executives that smoother earnings are value enhancing (Graham et al. 2005). However, this relation holds only when the firm information environment is weak. In this sense, our results cast doubt on the usefulness of smoothing for many firms for which extensive information is available. Finally, our paper adds to recent evidence by Yu (2008), who documents that managers' use of accounting discretion inversely relates to analyst following. We document the valuation effects of smoothing and establish the context in which this activity is valuable.

In this study we document an association between earnings smoothing and firm value that can be interpreted as a valuation premium, and as such have inferred that it is earnings smoothing that leads to an increase in value. However, it could be instead that firms with higher value simply engage in higher amounts of smoothing (i.e., causality is reversed). Although we do not directly eliminate this potential endogeneity, the fact that our tests rely on the interaction of analyst following and smoothing mitigates this concern. Specifically, it is not clear why firms

with higher value would engage in more smoothing when there is a low information environment only.[6]

The remainder of this paper is organized as follows. In section II we discuss related research and our hypothesis. The sample, research design and diagnostics are described in section III. Results are reported in section IV. Section V concludes.

II. Prior Literature and Hypotheses Development

Reducing the inherent volatility in earnings, or earnings smoothing, has been the subject of extensive research and debate over the last few decades. From a practical standpoint, earnings smoothing is at the forefront of executives' thinking. In the Graham et al. (2005) survey of CFOs, several argue that "…you have to start with the premise that *every* company manages earnings" and the authors note that an "overwhelming 96.9 percent of the survey respondents indicate that they prefer a smooth earnings path." Those same CFOs argued that smoother earnings are perceived as less risky by investors (88.7 percent), result in a smaller cost of debt or equity (57.1 percent), or are a way to achieve a higher credit rating (42.2 percent). They also argue that smooth earnings should make it easier for analysts and investors to predict future earnings (79.7 percent).

The academic literature on earnings smoothing examines motivations from several perspectives.[7] Managerial incentives commonly motivate a proactive decision to show performance stability. For instance, Healy (1985) shows that managers smooth to meet performance targets. Fudenberg and Tirole (1995) document the more pragmatic motivation of job protection, and Burns and Kedia (2006) and Bergstresser and Philippon (2006) find that

[6] In robustness tests, we have also used a smoothing measure in which we have removed any potential impact of analyst following on it and find that our results hold.
[7] Early examinations of income smoothing were documented by Beidleman (1973) and Ronen and Sadan (1981).

earnings management is driven by managers' incentive-based compensation. Another set of research takes a firm or an investor perspective. For instance, Trueman and Titman (1988) show that smoothing reduces a firm's perceived bankruptcy risk, while Badrinath et al. (1989) find that institutional investors avoid companies that experience large variations in earnings.

Earnings smoothing can reveal managers' private information about future earnings (e.g., Sankar and Subramanyam 2001; Demski 1998). Volatile earnings make the performance signal noisy and as a result less can be inferred by investors regarding the permanent component of future earnings. This effect, however, should be attenuated by the availability of other sources of information about the firm. Consistent with arguments in Lang et al. (2003), the firm's information environment and analyst following are naturally linked. Increased disclosure by firms is demanded by analysts, and likewise analysts are attracted to firms with high quality, more transparent disclosures.[8] In sum the availability to investors of a more complete set of information about a firm's future prospects would provide a richer context in the valuation of smooth earnings.

Recently, Tucker and Zarowin (2006) directly address whether income smoothing improves the informativeness of current and past earnings for future earnings. They base their measure of income smoothing on the reduction of pre-managed earnings volatility resulting from the use of discretionary accruals, and find evidence that firms with higher smoothing have returns that are more reflective of future earnings. Their results identify a benefit to earnings smoothing, a higher future earnings response coefficient, for firms that use accounting discretion

[8] Consistent with this notion, analysts have been shown to avoid firms with volatile earnings, as this type of coverage increases their likelihood of forecast errors and involves more effort (Brennan and Hughes 1991; Schipper 1991). In contrast, Barth et al. (2001) argue that analyst following could be greater for more volatile firms, as these are exactly the firms where superior analysts can distinguish themselves and add more value with their efforts. Hence the relation between the level of analyst following and firm earnings volatility is mixed. Generally firms have incentives to attract analyst coverage. Higher information asymmetries when there is low analyst coverage are associated with lower valuation. See Merton (1987) for theoretical arguments, and Lang et al. (2003) for empirical evidence.

to accomplish this objective. An implication is that earnings smoothing should result in a valuation premium, all else equal. We provide evidence pertaining to this conjecture.

Several papers have addressed the valuation question indirectly, specifically by examining the value-relevance of cash flow and/or earnings volatilities. For instance, Thomas and Zhang (2002) find evidence that the volatility of analyst forecasted earnings per share is negatively linked to forward price-earnings ratios. Similarly, Rountree et al. (2008) find that earnings and cash flow volatility are negatively linked to valuation metrics during 1987 through 1997, and that low earnings volatility is priced at a premium only to the extent that it is linked to low cash flow volatility. [9] Unlike Rountree et al. (2008), who use a more general proxy of smoothing (the correlation between cash flows and accruals), our paper examines specifically the impact of discretionary accruals on earnings smoothing, extends the sample to a more recent period, and more importantly focuses on the conditional impact of earnings smoothing on value.

Our paper contributes to the earnings smoothing literature by directly examining the conditional valuation implications of smoothing via discretionary accruals. We expect that any valuation effect should be critically dependent on the firm's information environment. Analysts are key information intermediaries, and both survey and voluminous academic evidence suggests they are one of the most important influences on stock value (Graham et al. 2005; Schipper 1991).[10] We employ the level of analysts as our proxy for firms' information environment and investigate the association between value and earnings smoothing conditional on this proxy. While the valuation implications of earnings smoothing for firms that are associated with a high

[9] On the other hand, several studies find that smoothing can garble the contemporaneous information content of reported earnings. For example, Jayaraman (2008) documents a greater presence of informed trading when earnings volatility deviates from cash flow volatility. Leuz et al. (2003) show that discretionary earnings smoothing is more pervasive in countries with weak investor protection. Lafond et al. (2007) document lower liquidity and governance characteristics of firms that smooth.

[10] Yu (2008) documents this influence in an earnings management context. He finds an inverse association between the use of discretionary accruals and analyst following, consistent with analyst serving as effective monitors of firms' earnings management activities.

information environment are less obvious, we expect that there should be a differing effect between those followed by a high versus a low number of analysts, with smoothing being valued higher for firms with low or no analyst coverage. Our study is the first to directly examine the richness of information environment and how it impacts the valuation benefits of earnings smoothing.

III. Sample and Research Design

Our objective in this study is to examine the value relevance of earnings smoothing via accounting discretion. We thus require proxies for discretionary accruals, pre-managed earnings, and earnings volatility. To estimate these measures we use all 1988 through 2006 quarterly COMPUSTAT firms with non-missing observations for both assets and sales. We eliminate firms with less than 10 million in sales or assets to avoid undue influence of very small firms on our industry based models. To ensure that our inferences are not influenced by a few firms, we also eliminate industries with fewer than 10 firms at the 2-digit SIC. To increase the sharpness of our tests, we focus on firms with positive earnings, given the differential use of discretionary accruals by loss firms and the uncertainty regarding their smoothing strategies (Hayn 1995; DeFond and Park 1997). For our primary sample we also have dropped utilities and financial institutions given their unique regulatory and financial reporting characteristics.

Pre-managed earnings are those earnings that would be reported in the absence of managers' use of accounting discretion. Our proxy for pre-managed earnings is simply actual earnings less discretionary accruals, scaled by common shares used in the calculation of earnings per share (hereafter, PME). We use reported earnings per share (before extraordinary items) and employ the modified Jones (1991) model, as suggested by Kothari et al. (2005), to estimate

discretionary accruals and, therefore, pre-managed earnings.[11] Discretionary accruals (DAC) are estimated for firm *i* in quarter *t* using the residual from the following regression, estimated by quarter and by two-digit SIC (Jones 1991; Han and Wang 1998):

$$TAC_{it}/TA_{it-1} = \delta_0(1/TA_{it-1}) + \delta_1 ROA_{it} + \delta_2[(\Delta REV_{it} - \Delta REC_{it})/TA_{it-1}] + \delta_3(PPE_{it}/TA_{it-1}) + \sum_{q=4}^{6} \delta_q I_q + \varepsilon_{it} \quad (1)$$

TAC is total accruals, TA is total assets, ROA is return on assets, ΔREV and ΔREC are the quarterly changes in revenues and accounts receivable, respectively, and PPE is gross property, plant and equipment. I_q are fiscal-quarter indicators included to control for seasonality. ROA is included in the model as a control for performance.[12] Kothari et al. (2005) document that adjusting discretionary accruals with a control for contemporaneous performance improves the reliability of the equation (1) estimates. This type of adjustment is particularly important for our context as accruals tend to be correlated with firm performance (Barth et al. 2001), and therefore we estimate earnings smoothing as a function of their past and contemporaneous earnings as we describe below.

Investors are more likely to price the *unexpected* component of volatility (i.e., abnormal smoothing), we thus operationalize earnings smoothing using the residual variance of firm-level regressions of quarterly earnings on its lagged and seasonally adjusted values, estimated over rolling five-year intervals. We replicate this approach for pre-managed earnings and likewise

[11] Although models used to estimate discretionary accruals have been criticized as having low power and often yield biased results for firms with extreme earnings performance (see, e.g., Guay et al. 1996; Kothari et al. 2005), they have been nonetheless widely used in the literature (see e.g., Yu 2008; Daniel et al. 2007; Tucker and Zarowin 2006). Despite our diligence in estimating measures of earnings smoothing, given that managerial behavior surrounding discretionary accruals is unobservable, we cannot completely eliminate the possibility that measurement error on discretionary accruals affects our results. Several recent papers (Yu 2008; Jayaraman 2008; Daniel et al. 2007; Tucker and Zarowin 2006) have used a similar methodology in estimating discretionary accruals.

[12] Following Kothari et al. (2005) we also estimate DAC for each observation as the difference in firm i's discretionary accrual from equation (1) with that for a firm in the same two-digit SIC and with the closest return on assets. This alternative estimation had no material effect on our primary inferences.

estimate its *unexpected* volatility. Together these unique estimates of volatility are used to construct a "discretionary smoothing index" for each firm as the ratio of unexpected earnings volatility scaled by unexpected pre-managed earnings volatility.

We employ time-series models to measure the expected and unexpected components of earnings per share volatility and pre-managed earnings per share volatility. The following model is estimated for reported earnings per share (EPS):

$$\mathrm{EPS}_{q} = \delta_0 + \delta_1 \mathrm{EPS}_{q-1} + \sum_{q=2}^{4} \delta_q \mathrm{I}_q + \delta_5 \mathrm{EPS}_{q-4} + \varepsilon_q \qquad (2)$$

where EPS is earnings per share before extraordinary items and discontinued operations, and I is a quarterly indicator dummy. The independent variables in equation (2) are included to control for any persistence in earnings as well as seasonality. We estimate the equation over five-year rolling time-periods for each firm in the sample with the ultimate objective of estimating firm-specific proxies for earnings smoothing. More specifically, we estimate volatility and firms' discretionary smoothing during 1988-93 for the 1993 cross-section, 1989-94 for the 1994 cross-section and so forth until 2006. As data requirements, each estimation must have at least 16 (out of the potential 20) quarterly EPS observations during a five-year period, and EPS during the estimation period is adjusted for stock splits.[13] The residuals from equation (2) reflect the unexpected component of reported earnings (ε_q), and it is the standard deviation of ε_q that serves as our proxy for unexpected earnings per share volatility (UEPS):

$$\mathrm{UEPS}_{t} = \mathrm{Std\ Dev}(\hat{\varepsilon}_q) \qquad (3)$$

Unexpected pre-managed earnings volatility is estimated in a similar fashion:

[13] Splits induce changes in EPS that may cause values to appear more volatile than they actually are. We perform a similar split-adjustment when we estimate the pre-managed earnings volatility.

$$PME_q = \lambda_0 + \lambda_1 PME_{q-1} + \sum_{q=2}^{4} \lambda_q I_q + \lambda_5 PME_{q-4} + \nu_q \quad (4)$$

and

$$UPME_t = \text{Std Dev}(\hat{\nu}_q) \quad (5)$$

From UEPS and UPME we construct for each firm and each year an index of discretionary smoothing (DSI) defined as the ratio of unexpected reported earnings per share volatility (UEPS) to unexpected pre-managed earnings per share volatility (UPME):

$$DSI_t = UEPS_t / UPME_t \quad (6)$$

Sample Characteristics

Table 1 reports statistics on the sample fundamentals. In these and all analyses that follow we winsorized our smoothing variable (i.e., DSI) and its components (i.e., UEPS and UPME) and our control variables at the top and bottom one percent to reduce the influence of outliers. The summary statistics we present also exclude observations that do not enter our cross-sectional regressions due to a missing control variable. In summary, our sample firms have a mean (median) value of assets (ASSETS) of 3,107.7 (618.7) million dollars and a mean common equity value (MVCE) of 4,364.0 million. Firms are, on average, profitable and growing with a return on assets (ROA) of 6.8 percent and growth in revenue (GR_REV) of 12.0 percent. We use the market value of equity scaled by assets (MVCE_AT) as a measure of value here, but we also employ Tobin's Q in alternative robustness tests and find that our main results hold.[14] The

[14] Using market to book as a proxy for firm value has been quite common in corporate finance (see e.g., Lang and Stulz, 1994, on corporate diversification, Servaes 1991, on corporate takeovers, Doidge, Karolyi, and Stulz 2004, on cross-listing, La Porta, Lopez de Silanes, Shleifer, and Vishny 2002, on equity ownership, and Allayannis and Weston, 2001, on risk management).

median market value of equity scaled by assets (MVCE_AT) is just under one (0.97) with a mean of 1.30.

Similar to Frankel and Li (2004) we assume that a firm without a match between IBES and Compustat indicates a firm not followed by analysts. With this approach we find that a firm in our sample is followed by an average of 7.6 analysts (5 at the median) (NUMEST), with considerable variation across firms (standard deviation of 8.3). As a robustness check we later re-estimate our main models excluding observations with no match between IBES and Compustat, and find no material effect on our results.

Panel B of Table 1 presents summary statistics on the components that yield our proxy for discretionary smoothing, DSI. On average, total accruals and discretionary accrual estimates are within reasonable ranges for models of this general form. TAC is estimated at 4.6 percent of assets on average, while mean discretionary (non-discretionary) accruals were 2.0 (2.6) percent of assets.[15] The bottom three variables of Panel B are summary statistics for the estimates of the inputs to our discretionary smoothing index as well as the summary index itself. As expected we find that firms smooth earnings on average. The mean and median pre-managed earnings volatility (UPME) is significantly higher than that of the reported earnings volatility (UEPS). Specifically, the mean (median) pre-managed volatility is 0.72 (0.46) versus 0.32 (0.15) for reported EPS volatility. As a comparison, we also estimate and report cash flow per share volatility (UCFO) (which reflects both discretionary and non-discretionary accruals) and find a similarly higher mean and median volatility than UEPS (e.g. a median of 0.38 for UCFO versus 0.15 for UEPS). Recall that given the definition of our DSI index, a DSI value of less than one indicates smoothing as pre-managed earnings volatility would be higher than reported earnings

[15] We estimate Non-discretionary accruals (NDAC) for each firm as total accruals (TAC) (earnings before extraordinary items and discontinued operations less operating cash flows) less discretionary accruals (DAC).

volatility; the lower the magnitude of the index, the higher the level of smoothing. On average, we find that firms in our sample smooth via discretionary accruals as the mean DSI is 0.45. Further, the vast majority of firms have a DSI value of less than one (smoothers) – above 88 percent in all years examined between 1993 and 2006.

Univariate Results

Table 2 presents Pearson correlations among our smoothing index, its components, and other key variables including MVCE_AT, ROA, and ASSETS. Market value of equity to assets is negatively associated with earnings and cash flow volatility (correlations of -0.05 and -0.13 respectively), consistent with Rountree et al. (2008). In addition, we also find that pre-managed earnings volatility is negatively correlated with MVCE_AT, consistent with investors discounting volatility. Our measure of pre-managed earnings volatility is positively correlated with cash flow volatility (0.78) reflective of common information in total and discretionary accruals. Also noteworthy is the negative association between DAC and MVCE_AT, reflecting an average discount to discretionary accruals (Francis et al. 2005) in the univariates.

Our main variable of interest is DSI, and in the Table 2 correlations it appears to be modestly associated with equity value (.02). Given that low values of DSI indicate higher smoothing, a positive correlation with MVCE_AT suggests that higher smoothing via discretionary accruals is associated with a lower valuation. Of course, these univariate inferences can be influenced by many confounds (e.g., size, pre-managed volatility) and in our subsequent multivariate tests we control for such factors.

The DSI correlations reported in Table 2 also point to smoothers being smaller firms with higher profitability and with higher pre-managed earnings volatility. As indicated above, the

majority of the firms tend to smooth, but this feature appears to be relatively more pronounced for smaller firms. Also, it is not surprising that firms with higher pre-managed earnings volatility have higher earnings smoothing, and we control for this effect in our multivariate tests. We find no significant correlation between DAC and DSI suggesting that smoothing is, on average, unrelated to the level of discretionary accruals. While on the surface this may seem surprising, note that firms can smooth by using either positive or negative discretionary accruals (DeFond and Park 1997). Finally, two correlations that we also explore later in our multivariate tests are related to potential linkages of analyst presence with smoothing and valuation effects. Consistent with Yu (2008), we find that higher analyst presence (NUMEST) is associated with less discretionary accruals (-.12) and lower smoothing (.08). Consistent with earlier findings high analyst presence is positively related to firm value (.35).[16] In our multivariate models we directly test the valuation implications of smoothing conditional on the presence of analyst following and independently control for the number of analysts as well.

In Figures 1 and 2 we illustrate the trends in reported and pre-managed earnings volatility and the DSI index over the sample years of 1993 through 2006. Figure 1 plots the median unexpected reported earnings volatility, UEPS, and the median unexpected pre-managed earnings volatility, UPME. Each volatility measure shows a steady increase beginning in 1993. Most interesting, however, is the decrease in both reported and pre-managed earnings volatility beginning in 2000. This downward trend continues almost without interruption until 2006, the end of the sampling period. For example, reported earnings volatility is down by 20 percent from 0.15 in 2003 to 0.128 in 2006 whereas pre-managed earnings volatility is down by 11.6 percent

[16] See, for example, Lang, Lins, and Miller (2003) who find that ADRs receive a premium as a result of higher analyst following in the U.S.

from 0.43 to 0.38 during the same time. These trends can likely be attributed to both the end of the bull market run in late 2000 and the commensurate slowing of technology firm growth.

Figure 2 plots the median DSI along with its 90^{th} and the 10^{th} percentile. Recall that this measure reflects the relative volatilities of UEPS and UPME. Evident again is that a very high percent of firms have a DSI value of less than one (the percent fluctuates between 88.9 and 92.9 percent during the study period) suggesting that the vast majority of firms smooth, consistent with Graham et al. (2005) survey evidence. While we can observe a noticeable decrease in earnings smoothing over time (the median DSI index increases from 0.30 in 1993 to 0.37 in 2006), there is a less noticeable trend post 2003 (from 0.36 in 2003, it increases to 0.37 in 2006).

In Table 3, Panel A, we divide our sample into quintiles based on our measure of discretionary earnings smoothing. Given the definition of our index the lowest quintile of the index (top row) represents the firms engaged in the highest smoothing. We find that there is no difference (economic or statistical) in value (MVCE_AT) among high and low smoothers at both the mean and median (1.345 vs. 1.333, respectively, for the mean). In Panel B we present univariate results for the value of smoothing splitting our sample based on the median number of analysts. On the left (right) hand-side of the panel we show mean and median values of MVCE_AT for each quintile of smoothing for firms with a low (high) number of analysts (number of analysts less (more) than 5). At the bottom we report t-statistics of the univariate test of difference in value between high and low smoothing quintile. We find no significant difference in this univariate test for the value effect of smoothing for firms with a low analyst following (t-value of -0.60). We find a marginal effect for firms with a high analyst following but in the opposite direction, indicating that more smoothing is less valuable for these firms (t-value of -1.78). Although these results appear less consistent with our expectations that there is

value to smoothing for firms with a low analyst following, they are not unsupportive either, as we find a higher, more positive (though not significant) valuation impact for smoothing for these firms relative to firms with high analyst following. Clearly, the relation between smoothing and firm value and the impact of the information environment as proxied by analysts can be masked by confounding factors, which we control for in further multivariate regressions outlined in Section IV.

IV. Multivariate Results

Because many factors may affect MVCE_AT in a similar way to our smoothing index, in this section we report multivariate tests of the relationship between smoothing and firm value where we explicitly control for these factors. The general form of our primary regression is as follows (firm, industry and year subscripts and fixed effects suppressed):

$$\text{MVCE\_AT} = \alpha_0 + \alpha_1 \text{DSI} + \sum_{k=2}^{9} \alpha_k \Phi_0 + \varepsilon \qquad (7).$$

The matrix of control variables, Φ, reflect a number of firm characteristics which theory and previous empirical work suggest will influence firm value (Doidge et al. 2004; Allayannis and Weston 2001; Lang and Stulz 1994). We first control for the level of pre-managed earnings volatility (UPME) given that high levels of this metric are linked to high smoothing. Controlling for UPME ensures that our results reflect the relative degree of smoothing on value and not the impact of how much potential pre-managed earnings volatility could be smoothed. We also control for firm size using the log of ASSETS and profitability using ROA. We expect the latter to be positively associated with firm value, and make no prediction for ASSETS as it proxies for

firm size but is also a scalar for our dependent variable.[17] Growth in revenue (GR_REV) and capital expenditures scaled by sales (CAPX_S) capture growth opportunities for the firm and we expect coefficients on these variables to be positive. The ratio of total long-term debt to assets proxies for leverage (LEVERAGE) and we expect a negative relation with value. We expect a positive coefficient on controls for intangible asset intensity. R&D to sales (XRD_S) and advertising to sales (ADV_S) serve as our proxies. We also include the number of analysts following the firm (NUMEST) and expect a positive association with firm value (Lang et al. (2003)). Finally, we control for firm, industry and year effects.

Table 4 presents the results of the pooled fixed-effects regressions of the unconditional test of whether smoothing is valued on average. We present this result to establish a baseline and compare with prior work. The first column presents results of a restricted regression that excludes the smoothing index, which we add in the next regression (full model, column (2)). The results reported in column (1) are generally consistent with our theoretical priors and extant empirical evidence (Lang and Stulz 1994, Allayannis and Weston 2001). Specifically, we find that profitability and growth are positively and significantly related to firm value. We find our proxy for size is positively and significantly related to firm value, possibly reflecting the market power of large firms. As expected, R&D and advertising expenditures (both as a percent of sales) are positively and significantly related to firm value. Our measure of pre-managed earnings volatility is negatively and significantly related to MVCE_AT suggesting that the market discounts volatility, consistent with empirical evidence in Rountree et al. (2008). We find a similarly negative relationship between leverage and value consistent with our priors. Finally,

[17] Agency considerations would suggest a negative association between size and firm value, whereas size as a proxy for market power would yield a positive association.

analyst following is positively and significantly associated with value, consistent with Lang et al. (2003).

In the regression presented in column (2) we add our DSI index (full model). We find a significant negative relationship between DSI and MVCE_AT (α_1 = -0.082, significant at the 1 percent level). That is, we find that in the general case more smoothing (a lower DSI) is associated with higher equity value. The magnitude of the coefficient on the DSI index, -0.082, implies a modest premium for smoothing on average. A firm which moves from being a median smoother to the first quartile, arguably a very large move, would increase its market value by 1.3 percent. In sum, our evidence suggests that the market rewards smoothing via discretionary accruals on average.

Table 5 reports summary statistics for DSI coefficients estimated by year. Examining yearly regressions is important as our sample reflects periods where new firms enter and there is a differing level of information over time as reflected by the percent of firms followed by analysts. This should have implications on the overall value effect of smoothing over time. There is also a statistical reason to examine by-year results, as these by-year regressions are less sensitive to potential cross-correlations among variables.[18]

With the exception of 1996, we find negative coefficients on the DSI index in all years again suggesting that the market awards a premium to smoothing after controlling for size, leverage, profitability, growth, pre-managed earnings volatility, R&D and advertising expenditures, number of analysts, and industry. The coefficient on DSI is also statistically significant in 10 out of the 14 years. However, the effect is weak or absent in most of our earlier

[18] Clearly, there is significant autocorrelation in DSI since for a given cross-section, four out of five years used in its estimation are in common with those used to estimate DSI in a subsequent cross-section. To alleviate such a potential problem we have also estimated fixed effects models using non-overlapping data, which we discuss later in the robustness tests.

sample period (before 1999). This finding is generally consistent with Rountree et al. (2008), who find no significant effect of total accruals before 1997. We examine whether this result reflects the overall information environment about the firms in our sample and find confirming evidence that over time the percent of firms in our sample with low analyst following has increased, reflecting the entrance of newly listed firms in our sample. Specifically, we find that 70 percent of our sample firms have no analyst following in 1993, whereas the percent increases almost monotonically each year to 77 percent in 1999 and 86 percent in 2006. As an additional test, we focus on firms that have been in our sample consistently for the first 10 years of our sample, for which we should expect more information to be available and find no significant valuation effect of earnings smoothing for these firms. These pieces of evidence are consistent with smoothing being valued dependent on the strength of the information environment. Although a thorough investigation of all the factors affecting this time-variation of the value of smoothing is beyond the scope of this paper, we examine the importance of the information environment on the value of smoothing more directly in further cross-sectional tests below.

Analyst Following and the Value of Smoothing

Our results thus far indicate that smoothing is rewarded by the market with a premium on average. We expect the association between firm value and smoothing to be influenced by the information environment characterizing the firm. The degree of analyst following is our proxy for that environment, and in Table 6 we present the results of a modified form of equation (7) in which we test for this effect. In particular, for these regressions the estimated association of DSI with value is partitioned by interacting DSI with dummy variables defined based on whether the firm has high or low analyst following. DSI_HIGH_A is the discretionary smoothing index for

all firms with “high” analyst following, zero otherwise. DSI_LOW_A is the discretionary smoothing index for all firms with “low” analyst following, zero otherwise. Recognizing the ad hoc nature of any decision rule we employ to define high and low following, in each column of Table 6 we define a specific number of analysts as cut-off points. For example, the first column presents the results assuming that a firm is followed by a high number of analysts if the firm is followed by any analyst at all. Conversely, a firm is followed by a low number of analysts if it is followed by no analyst. The second column presents results assuming that a firm is followed by a high number of analysts if it is followed by 3 or more analysts. The third column divides the sample based on the median number of analysts in the sample (5), and the fourth column by 7 analysts.

Overall, across all alternative definitions of high analyst following, we find no significant relationship between earnings smoothing and firm value when a firm is followed by a high number of analysts. The coefficients range from -0.053 to 0.004 and all are statistically insignificant. In contrast, we find significantly negative coefficients for firms followed by a low number of analysts, regardless of the cutoff we use, indicating a valuation premium for earnings smoothing when analyst following is low. F-tests reported at the bottom of Table 6 which test for the difference across the two coefficients for the value effect of smoothing for high and low analyst following are significant across all alternative definitions of high analyst following at the 1 percent level. Consistent with analyst following serving as a proxy for the richness of the information environment, the result is more pronounced when we define low analyst following at zero (-0.221) than when low analyst following is defined as less than 7 analysts (-0.101). In fact, we find a monotonic decrease in the DSI_LOW_A coefficients as the number of analysts increases which further supports the view that analysts proxy for the richness of the information

environment and that the richness of the information environment impacts the value of smoothing. Our results are consistent with the finding that in an environment of low information, the market values the increase in informativeness of earnings via smoothing, especially when contrasted with a high information environment. We find no premium for firms with high analyst following suggesting that analysts might already provide information to the market that renders the increase in informativeness from smoothing of no consequence. At the same time, however, we find no discount for these firms' smoothing activities either.

Finally, we re-estimate the pooled fixed-effects regressions in Table 6 on a yearly basis and report these year-by-year results in Table 7. We summarize the coefficients on DSI_HIGH_A and DSI_LOW_A for the specifications in which high and low analyst following is based on zero analysts covering a firm (left-most columns of Table 7) and at the median number of five analysts (right-most columns). Results confirm the pooled-fixed effects result presented above. We find a significant valuation effect for smoothing when firms are followed by a low number of analysts and generally find an insignificant or less significant association for high analyst following. Based on F-tests which test for the statistical significance of coefficient differences, we find that in the majority of the years examined (10 out of 14) the results are consistent with our hypothesis that there is a differing valuation effect between these groups of firms.[19] Examining the significance of the results for firms with low analyst following we find that the results are generally stronger for the post-1999 years, but there are significant results for several of the early years (1993 through 1994). This suggests that the general weaker results in the unconditional tests in the earlier part of the sample possibly reflect the lack of association for firms with high analyst following. Indeed, we find generally no significant evidence that earnings smoothing is valuable for firms with a high analyst following in the years before 1999.

[19] In the remainder 4 years we find no statistically significant difference.

Robustness Tests

We have performed several robustness tests to examine the sensitivity of our results to various assumptions and measurement issues:[20]

1. We examine the sensitivity of our results to the unbalanced panel nature of our sample. This sample attrition is in part linked to more technology firms entering the sample in the late nineties. To control for this effect we re-estimate our reported regressions using a survivor-biased sample of firms that were present in rolling five year periods over the study period. Using such alternative samples had no qualitative impact on our results.
2. Analyst following is significantly positively correlated with firm size (.31 correlation with assets, see Table 2). Thus our main inferences may be reflecting a differential association between earnings smoothing and firm value that relates to firm size rather than the firm's information environment. We replicate our models in Table 6 by using a sample partition based on the median annual level of firm assets, as opposed to partitions based on analyst following. We find for this test that the coefficients on DSI for both large and small firms are significantly negative at the 5 percent confidence level (-0.074 and -0.090 coefficients for large and small firms, respectively). Similarly, replications of the Table 7 annual regressions yield no discernible pattern of coefficient differences across large and small firms.
3. We examine the sensitivity of our results to potential cross-correlations in our explanatory variables by examining three non-overlapping cross-sections (1996, 2001, and 2006). Our main results remain unchanged using this non-overlapping sample.

[20] For brevity, we do not report these results.

4. In alternative specifications, we also control for the correlation between discretionary accruals and cash flows, an alternative measure of earnings management used in prior literature (e.g., Leuz et al. (2003)) and again find no meaningful changes in our main results.

V. Conclusion

In this paper we examine whether the market values earnings smoothing via accounting discretion, and more so when the information environment is poor. Using a large sample of firms between 1993 and 2006, we first examine the question in an unconditional context as a comparison with prior work, then conditional on the information environment as proxied by analyst following. There are theoretical arguments as well as empirical evidence for why firms smooth earnings (e.g., Trueman and Titman 1988) and anecdotal evidence from CFO surveys (e.g., Graham et al. 2005) suggesting that overwhelmingly companies smooth.

We examine a common approach that firms employ to smooth earnings, via discretionary accruals, and devise a metric (DSI) to measure the relative smoothing effect. Our DSI index is the ratio of the unexpected reported EPS volatility to unexpected pre-managed earnings volatility (i.e., before the use of accounting discretion). Consistent with both anecdotal and survey evidence, we find that the vast majority of firms in our sample smooth earnings through the use of discretionary accruals. We find a significant value effect for smoothing on average suggesting that the market rewards smoothing with a premium. Consistent with our hypothesis we find that this premium is concentrated among firms with a low analyst following, reflecting potentially an improvement in earnings informativeness in this low information environment (Tucker and Zarowin 2006); no such association is generally found for firms with a high analyst following. In

addition, although we find that smoothing adds value on average, we find that the value effect of smoothing is most pronounced post-2000 but still present for most years in the sample of firms with low analyst following.

Finally, given that we find high analyst following mitigates the valuation premium to earnings smoothing, one could ask why discretionary earnings smoothing exists at all for these firms. In these cases it is likely that managers engage in this activity for personal reasons, such as to meet bonus targets or other profit metrics (Healy 1985; Bergstresser and Philippon 2006, Burns and Kedia 2006), or simply for employment protection (Fudenberg and Tirole 1995) or for firm-specific reasons such as to meet dividend thresholds (Daniel et al. 2007). Although a thorough investigation of the reasons for engaging in earnings smoothing is beyond the scope of the paper, our results introduce one of the tradeoffs that managers face and how ultimately investors assess this activity.

References

Allayannis, G. and J. Weston. 2001. The Use of Foreign Currency Derivatives and Firm Market Value *The Review of Financial Studies* 14, 243-276.

Badrinath, S., G. Gay and J. Kale. 1989. Patterns of Institutional Investment, Prudence, and the Managerial "Safety-Net" Hypothesis. *Journal of Risk and Insurance* pp. 605-629.

Barth, M., D. Cram and K. Nelson. 2001. Accruals and the Prediction of Future Cash Flows. *The Accounting Review* 76, 27-58.

Barth, M., R. Kaznik, and M. McNichols. 2001. Analyst Coverage and Intangible Assets. *Journal of Accounting Research.* 39 (1), 1-34.

Beidleman, C. 1973. Income Smoothing: The Role of Management. *The Accounting Review* 79 (4): 889-920.

Bergstresser, D. and T. Philippon. 2006. CEO incentives and earnings management. *Journal of Financial Economics* 80, 511-529.

Brennan, M. and P. Hughes. 1991. Stock Prices and the Supply of Information. *Journal of Finance* 46, 1665-1691.

Burns, N. and S. Kedia. 2006. The Impact of Performance-based Compensation on Misreporting, *Journal of Financial Economics*, 79, 35-67.

Cohen, D. A., A. Dey and T. Z. Lys. 2007. Real and Accrual-based Earnings Management in the Pre- and Post-Sarbanes Oxley Periods. Working Paper. New York University. August.

Daniel, N., D. Denis and L. Naveen. 2008. Do Firms Manage Earnings to Meet Dividend Thresholds? *Journal of Accounting and Economics* 45, 2-26.

DeFond, M. L. and C. W. Park. 1997. Smoothing income in anticipation of future earnings. *Journal of Accounting and Economics* 23: 115-139.

Demski, J. 1998. Performance Measure Manipulation. *Contemporary Accounting Research* 15 (3): 261-285.

Doidge, C., G.A. Karolyi and R. Stulz. 2004. Why are Foreign Firms Listed in the U.S. Worth More? *Journal of Financial Economics* 71, 205-238.

Frankel, R. and X. Li. 2004. Characteristics of Firm's Information Environment and the Information Asymmetry Between Insiders and Outsiders. *Journal of Accounting and Economics* 37: 229-259.

Francis, J., R. Lafond, P. Olsson and K. Schipper. 2004. Costs of Capital and Earnings Attributes. *The Accounting Review* 79 (October) p. 967 (44).

Francis, J., R. Lafond, P. Olsson and K. Schipper. 2005. The Market Pricing of Accruals Quality. *Journal of Accounting and Economics* 39, 295-327.

Fudenberg, D. and J. Tirole. 1995. A Theory of Income and Dividend Smoothing Based on Incumbency Rents. *Journal of Political Economy* 103 (1): 75-93.

Goel, A. M. and A. V. Thakor. 2003. Why do Firms Smooth Earnings? *Journal of Business* 76, 1 (January): 151-192.

Graham, J., C. Harvey and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40, 3-73.

Guay, W., S.P. Kothari and R. Watts. 1996. A Market-based Evaluation of Discretionary Accrual Models. *Journal of Accounting Research* 34, 83-105.

Han, J, C.Y. and S.W. Wang. 1998. Political Costs and Earnings Management of Oil Companies During the 1990 Persian Gulf Crisis. *The Accounting Review* 73 (January): 103-117.

Hayn, C. 1995. The information content of losses. *Journal of Accounting and Economics* 20: 125–153.

Healy, P. 1985. The Effect of Bonus Schemes on Accounting Decisions. *Journal of Accounting and Economics* 7 (1-3): 85-107.

Jayaraman, S. 2008. Earnings Volatility, Cash Flow Volatility, and Informed Trading *Journal of Accounting Research* 46, 4, 809-851.

Jones, J. 1991. Earnings Management during Import Relief Investigations. *Journal of Accounting Research* 29 (2): 193-228.

Kothari, S.P., A. Leone and C. Wasley. 2005. Performance Matched Discretionary Accrual Measures. *Journal of Accounting and Economics* 39 163-197.

Lafond, R., M. Lang and H. Ashbaugh-Skaife. 2007. Earnings Smoothing, Governance and Liquidity: International Evidence. Working Paper. University of North Carolina at Chapel Hill.

Lang, L., and R. Stulz. 1994. Tobin's Q, Corporate Diversification and Firm Performance. *Journal of Political Economy* 102, 1248-1280.

Lang, M., K. Lins and D. Miller. 2003. ADRs, Analysts, and Accuracy: Does Cross Listing in the US Improve a Firm's Information Environment and Increase Market Value? *Journal of Accounting Research* 317-345.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny. 2002. Investor Protection and Corporate Valuation. *Journal of Finance* 58, 1147-1170.

Leuz, C., D. Nanda and P. Wysocki. 2003. Investor Protection and Earnings Management. *Journal of Financial Economics*, 69 (3): 505-527.

Merton, R.C., 1987, A simple model of capital market equilibrium with incomplete information, *Journal of Finance*

Myers, J., L. Myers, and D. Skinner. 2007. Earnings Momentum and Earnings Management. *Journal of Accounting, Auditing, and Finance*, 22 (2), 249-284.

Ronen, J., and S. Sadan. 1981. *Smoothing Income Numbers: Objectives, Means, and Implications.* Boston, MA: Addison-Wesley Publishing Company.

Rountree, B., J. Weston, and G. Allayannis. 2008. Do Investors Value Smooth Performance? *Journal of Financial Economics*. 90: 237-251.

Roychowdhury, R. 2006. Earnings Management Through Real Activities Manipulation. *Journal of Accounting and Economic*. 42: 335-370.

Sankar, M., and K.R. Subramanyam. 2001. Reporting Discretion and Private Information Communication Through Earnings. *Journal of Accounting Research* 39 (2): 365-386.

Schipper, K. 1991. Commentary on Analysts' Forecasts. *Accounting Horizons* 5, pp. 105-121.

Thomas, J., and H. Zhang. 2002. Value Relevant Properties of Smoothed Earnings. Working Paper. Columbia Business School.

Trueman, B. and S. Titman. 1988. An Explanation of Accounting Income Smoothing. *Journal of Accounting Research* 26 (Supplement): S127-S139.

Tucker, J., and P. Zarowin. 2006. Does Income Smoothing Improve Earnings Informativeness? *The Accounting Review* 81, 1, pp. 251-270.

Yu, F. 2008. Analyst Coverage and Earnings Management. *Journal of Financial Economics* 88, pp. 245-271

TABLE 1

Sample Fundamentals, Accrual Components, and Earnings Volatility Metrics

Panel A: Sample Fundamentals

	Mean	Std Dev.	Q1	Median	Q3
ASSETS	3,107.7	12,170.1	214.4	618.7	2,003.2
MVCE	4,364.0	21,623.5	180.3	645.9	2,300.8
ROA	0.068	0.047	0.034	0.058	0.092
GR_REV	0.120	0.194	0.016	0.089	0.186
MVCE_AT	1.302	1.131	0.571	0.971	1.639
NUMEST	7.564	8.329	1.000	5.000	11.000

Panel B: Accrual Components and Earnings Volatility Metrics

	Mean	Std Dev.	Q1	Median	Q3
TAC	-0.046	0.090	-0.086	-0.048	-0.012
DAC	-0.020	0.083	-0.060	-0.019	0.020
NDAC	-0.026	0.074	-0.062	-0.025	0.009
UCFO	0.595	0.976	0.221	0.379	0.668
UEPS	0.317	1.086	0.074	0.153	0.319
UPME	0.720	0.953	0.279	0.465	0.820
DSI	0.449	0.363	0.183	0.341	0.613

Table presents distribution statistics for fundamentals, accrual components, estimates of earnings volatility and earnings smoothing. The sample size is 19,075. The unexpected performance measure volatilities, UCFO, UEPS, and UPME relate to cash from operations, earnings per share, and pre-managed earnings per share (defined as actual earnings less discretionary accruals), respectively. These variables are the residual variances from regressions of the current performance measure on the prior quarter and the seasonally adjusted prior quarter performance measure. Five years of rolling quarterly data are used in each regression, with a minimum of 16 observations required. As an illustration, for earnings per share the following regression is estimated at the firm level:

$$\mathrm{EPS}_{q} = \delta_0 + \delta_1 \mathrm{EPS}_{q-1} + \sum_{q=2}^{4} \delta_q \mathrm{I}_q + \delta_5 \mathrm{EPS}_{q-4} + \varepsilon_q$$

The standard deviation of ε_q is our proxy for unexpected earnings per share volatility (UEPS).

TABLE 1 (continued)

Other Variable Definitions:

ASSETS =	Total assets at year-end.
MVCE =	Market value of common equity at year-end.
ROA =	Net income before special items, discontinued operations, and extraordinary items scaled by assets.
GR_REV =	Annual growth in total revenue.
MVCE_AT =	MVCE scaled by ASSETS.
NUMEST =	Number of analyst following firm; Compustat firms matched with the I/B/E/S database.
TAC =	Total accruals scaled by ASSETS, measured as net income before extraordinary items less cash from operations.
DAC =	Total discretionary accruals scaled by ASSETS, measured consistent with Kothari et al. (2005), for firms in industries with at least 12 industry members,
NDAC =	Total non-discretionary accruals scaled by ASSETS, measured as TAC less DAC.
DSI =	The annual discretionary smoothing index, measured as UEPS scaled by UPME.

The observations span 1993 through 2006 and all variables are gathered from COMPUSTAT with the exception of NUMEST.

TABLE 2

Pearson Correlations

	UEPS	UPME	DSI	DAC	MVCE_AT	ASSETS	ROA	NUMEST
UCFO	.33***	.78***	-.12***	.01	-.13***	.09***	-.08***	-.03***
UEPS		.52***	.24***	.01*	-.05***	.05***	-.01	.00
UPME			-.07***	.04***	-.15***	.14***	-.08***	-.00
DSI				-.03	.02***	.03***	-.04**	.08***
DAC					-.27***	-.02**	-.25***	-.12***
MVCE_AT						-.01	.66***	.35***
ASSETS							-.01	.31***
ROA								.20***

Table presents Pearson correlations for the main variables used in the primary analyses of the study. The sample size is 19,075 spanning the years 1993 through 2006. All variables are as defined in Table 1. *, **, and *** represent significance at the 10, 5 and 1 percent confidence levels, respectively.

TABLE 3

Market Value of Equity Scaled by Assets (MVCE_AT) for Quintiles of the Discretionary Smoothing Index (DSI) and by Above and Below Median Analyst Following

Panel A: MVCE_AT by Quintiles of DSI

	N	Mean MVCE_AT	Median MVCE_AT
1 (more smoothing)	3,809	1.345	0.968
2	3,819	1.277	0.954
3	3,816	1.259	0.952
4	3,819	1.297	0.970
5 (less smoothing)	3,812	1.333	1.008
	t: Quintile 1 v. 5	0.45	

Panel B: MVCE_AT by Quintiles of DSI and Above and Below Median Analyst Following

	MVCE_AT: NUMEST <= 5			MVCE_AT: NUMEST > 5		
	N	Mean	Median	N	Mean	Median
1 (more smoothing)	2,006	1.016	0.754	1,803	1.171	1.337
2	2,165	1.003	0.784	1,654	1.634	1.271
3	2,049	1.036	0.817	1,767	1.518	1.140
4	1,967	1.029	0.795	1,852	1.580	1.188
5 (less smoothing)	1,914	1.034	0.796	1,898	1.633	1.250
t: Quintile 1 v. 5		-0.60			-1.78	

Panel A of the table presents the mean and median market value of equity scaled by assets (MVCE_AT) for quintiles of DSI. Panel B presents the mean and median MVCE_AT for quintiles of DSI partitioned at the median level of analyst following (i.e., NUMEST=5). All variables are defined in Table 1.

TABLE 4

Pooled Fixed-Effects Regressions of Market Value of Equity Scaled by Assets on the Discretionary Smoothing Index, Unexpected Pre-managed Earnings Volatility, and Other Controls

Variable	Predicted	(1)		(2)	
Intercept		-0.664	***	-0.640	***
DSI	+/-			-0.082	***
UPME	-	-0.134	***	-0.136	***
lnASSETS	+/-	0.022	**	0.023	***
ROA	+	8.709	***	8.688	***
CAPX_S	+	0.474	***	0.501	***
LEVERAGE	-	-1.199	***	-1.180	***
GR_REV	+	0.311	***	0.305	***
ADV_S	+	1.182	***	1.205	***
XRD_S	+	2.854	**	3.024	**
NUMEST	+	0.015	***	0.014	***
Adj. R-sq		0.610		0.612	
N		19,075		19,075	

Table presents pooled fixed-effects regressions of market value of equity scaled by assets (MVCE_AT) on the discretionary smoothing index, unexpected pre-managed earnings volatility, and other controls. lnASSETS is the log of ASSETS. CAPX_S is capital expenditures scaled by total revenue, and leverage is total long-term debt scaled by total assets. XRD_S and ADV_S are research and development expenditures and advertising expenditures, respectively, both scaled by total revenue. All other variables are defined in Table 1. The model is estimated over the years 1993 through 2006. Fixed effects are estimated at the firm, industry and year levels. *, **, and *** represent significance at the 10, 5 and 1 percent confidence levels, respectively.

TABLE 5

Summary Statistics for Annual Regressions of Market Value of Equity Scaled by Assets on the Discretionary Smoothing Index (DSI), Unexpected Pre-managed Earnings Volatility, and Other Controls

Year	N	Adj-R^2	DSI	
1993	1,106	0.685	-0.062	*
1994	1,204	0.697	-0.075	*
1995	1,220	0.651	-0.022	
1996	1,284	0.688	0.036	
1997	1,287	0.682	-0.044	
1998	1,317	0.673	-0.046	
1999	1,348	0.685	-0.092	*
2000	1,344	0.635	-0.273	***
2001	1,262	0.620	-0.117	**
2002	1,423	0.596	-0.342	***
2003	1,500	0.656	-0.108	***
2004	1,672	0.630	-0.120	***
2005	1,638	0.616	-0.117	***
2006	1,470	0.625	-0.150	***

Table presents select summary statistics of the model (2) regressions presented in Table 4 estimated by year; regressions of market value of equity scaled by assets (MVCE_AT) on the discretionary smoothing index, unexpected pre-managed earnings volatility, and other controls. All variables are defined in Tables 1 and 4. Presented are the number of observations, adjusted R-square and the DSI coefficient for each estimation. *, **, and *** represent significance at the 10, 5 and 1 percent confidence levels, respectively.

TABLE 6

Pooled Fixed-Effects Regressions of Market Value of Equity Scaled by Assets on the Discretionary Smoothing Index (DSI) Partitioned by High and Low Analyst Following, and Other Controls

NUMEST High	**>0**		**>3**		**>5**		**>7**	
Intercept	-0.661	***	-0.619	***	-0.617	***	-0.631	***
DSI_HIGH_A	-0.029		0.004		-0.017		-0.053	
DSI_LOW_A	-0.221	***	-0.198	***	-0.144	***	-0.101	***
UPME	-0.134	***	-0.134	***	-0.135	***	-0.136	***
lnASSETS	0.027	***	0.024	***	0.023	***	0.023	***
ROA	8.734	***	8.731	***	8.716	***	8.702	***
CAPX_S	0.512	***	0.503	***	0.500	***	0.500	***
LEVERAGE	-1.183	***	-1.188	***	-1.184	***	-1.180	***
GR_REV	0.302	***	0.295	***	0.299	***	0.303	***
ADV_S	1.202	***	1.175	**	1.195	***	1.200	***
XRD_S	2.994	***	2.962	***	2.986	***	3.011	***
NUMEST	0.012	***	0.011	***	0.012	***	0.013	***
R-sq	.615		.615		.613		.612	
F: High v. Low	126.90	***	152.54	***	56.80	***	7.32	***
N: High Following	14,693		11,102		8,975		7,265	
N: Low Following	4,382		8,063		10,101		11,810	

Table presents pooled fixed-effects regressions of market value of equity scaled by assets (MVCE_AT) on the discretionary smoothing index (DSI) partitioned by analyst following, unexpected pre-managed earnings volatility, and other controls. DSI_HIGH_A is the discretionary smoothing index for all firms with "high" analyst following, zero otherwise. DSI_LOW_A is the discretionary smoothing index for all firms with "low" analyst following, zero otherwise. "High" and "low" analyst following are defined at the levels of 0, 3, 5 and 7 as indicated in each of the columns. All other variables are as described in Tables 1 and 4. The model is estimated over the years 1993 through 2006. Fixed effects are estimated at the firm, industry and year levels. *, **, and *** represent significance at the 10, 5 and 1 percent confidence levels, respectively.

TABLE 7

Summary Statistics for Annual Regressions for High and Low Analyst Following: Market Value of Equity Scaled by Assets on the Discretionary Smoothing Index Partitioned by High and Low Analyst Following, and Other Controls

		No Analyst Following (High NUMEST > 0)						Median Analyst Following (High NUMEST > 5)					
Year	N	Adj-R^2	DSI_HIGH_A		DSI_LOW_A		F: High v Low	Adj-R^2	DSI_HIGH_A		DSI_LOW_A		F: High v Low	
1993	1,106	0.686	-0.015		-0.148	***	5.30	**	0.690	0.053		-0.196	***	17.39	***
1994	1,204	0.698	-0.037		-0.137	***	3.17	*	0.697	-0.035		-0.109	**	1.50	
1995	1,220	0.651	-0.026		-0.013		0.04		0.651	-0.015		-0.028		0.04	
1996	1,284	0.689	0.069	*	-0.037		3.65	*	0.688	0.026		0.046		0.13	
1997	1,287	0.682	-0.039		-0.059		0.14		0.683	0.012		-0.100	**	4.52	**
1998	1,317	0.673	-0.025		-0.107	*	1.67		0.673	-0.037		-0.054		0.09	
1999	1,348	0.685	-0.070		-0.169	**	1.76		0.685	-0.054		-0.139	**	1.46	
2000	1,344	0.638	-0.195	***	-0.461	***	11.13	***	0.637	-0.166	**	-0.380	***	7.58	***
2001	1,262	0.622	-0.043		-0.274	***	9.01	***	0.621	-0.015		-0.196	***	5.26	***
2002	1,423	0.613	-0.176	***	-0.741	***	61.66	***	0.603	-0.133	**	-0.527	***	27.22	***
2003	1,500	0.661	-0.033		-0.301	***	22.61	***	0.658	-0.009		-0.209	***	12.36	***
2004	1,672	0.641	-0.040		-0.356	***	50.08	***	0.632	-0.050		-0.179	***	8.61	***
2005	1,638	0.628	-0.057	*	-0.430	***	51.14	***	0.617	-0.065	*	-0.179	***	6.32	**
2006	1,470	0.630	-0.110	***	-0.370	***	21.49	***	0.630	-0.095	**	-0.210	***	6.71	***

Table presents select summary statistics of the regressions presented in Table 6 estimated by year, for the case where high analyst following is defined as greater than 0 (i.e., any analyst coverage) and more than 5 analysts (median analyst coverage in our sample); regressions of market value of equity scaled by assets (MVCE_AT) on the discretionary smoothing index, unexpected earnings volatility, and other controls. In these models the discretionary smoothing indices, DSI_HIGH_A is DSI for firms with above the analyst following threshold, zero otherwise, DSI_LOW_A is DSI for firms with below the analyst following threshold, zero otherwise, All other variables are defined in Tables 1 and 4. Presented are the adjusted R-square, DSI coefficients for each estimation, and F-tests of coefficient equivalence. *, **, and *** represent significance at the 10, 5 and 1 percent confidence levels, respectively.

FIGURE 1

Median Unexpected Earnings per share Volatility (UEPS) and Media Unexpected Pre-Managed Earnings per share Volatility (UPME) by Year

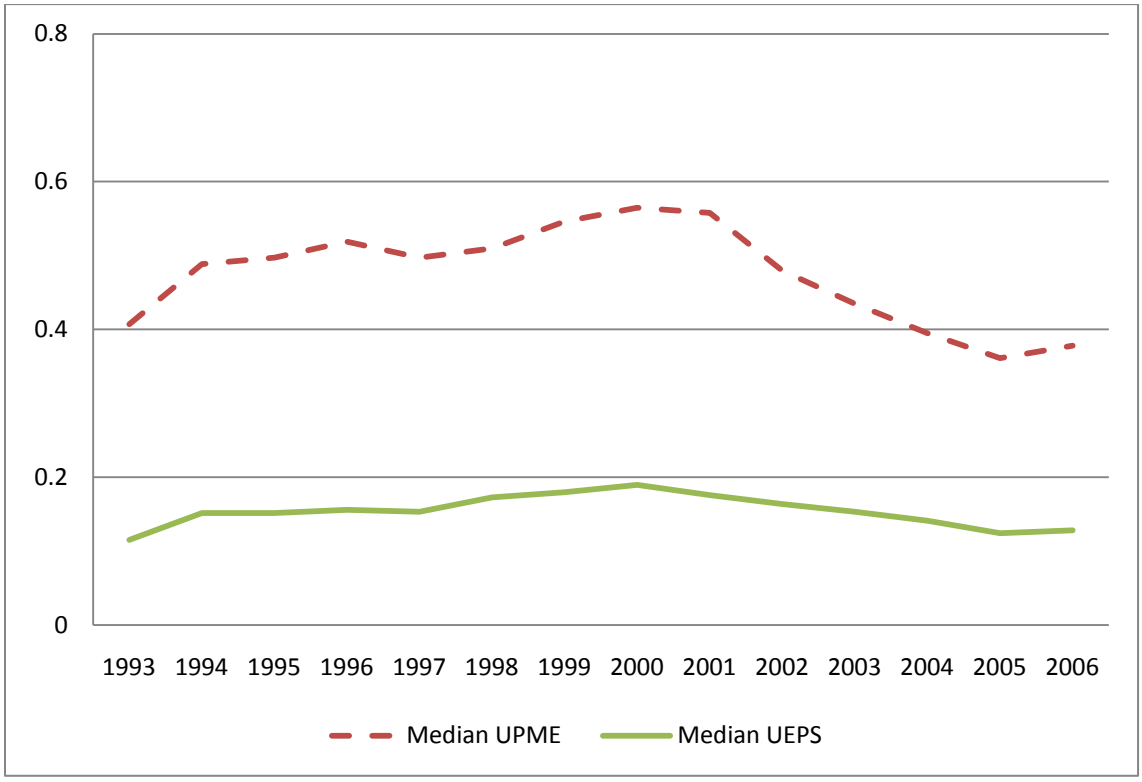

FIGURE 2

Median, 90th Percentile and 10th Percentile of the Discretionary Smoothing Index (DSI) by Year