Dissecting Earnings Recognition Timeliness

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Abstract

The focus of our paper is on the portion of value change that is recognized in earnings of the period, which we refer to as earnings recognition timeliness (ERT). Our emphasis is on two fundamental elements of financial accounting: (1) the matching principle, which is manifested in the recognition of expenses in the same period as the related benefits (i.e., sales revenue) accrue; and, (2) recognition in expenses in the current period due to changes in expectations regarding earnings in future periods. Although the vast literature on ERT describes these two elements, we are unaware of any study that identifies them empirically. The distinction is important because the accounting for these elements (and the associated ERT) differs considerably and it follows that the mapping from returns to these elements, which is the empirical manifestation of ERT, may also differ. We show that empirical identification of these elements may provide additional insights in studies that examine differences in ERT across various scenarios (the best known example being the difference between positive return and negative return samples).
1. Introduction

We are interested in the portion of value change that is captured in earnings; we call this portion earnings recognition timeliness (ERT). Ball and Brown [1968] started research on ERT by showing that some of the unexpected change in market prices is recognized in earnings. Within this line of research, Beaver, Lambert and Ryan [1987] and Basu [1997] emphasized the regression coefficient relating earnings of the fiscal period to returns of the same period; this coefficient is the estimate of ERT.

We focus on the timing of the recognition in earnings of value change within the fiscal period (i.e., we examine differential recognition of value change occurring at the beginning of the year vis-à-vis value change occurring at the end of the year). Our primary analyses are based on regressions of annual earnings on daily returns. We predict and show that the earnings/daily return coefficient declines significantly over the fiscal year consistent with the notion that value change at the beginning of the year has the entire year to be incorporated in sales and related expenses while value change at the end of the year is likely to have a much lesser effect on earnings of the year.

ERT reflects the effect of two quite different fundamental elements of financial accounting; we dissect ERT in order to gain a further understanding of these two elements. The first element, which we call the current sales element, is a manifestation of the matching principle of accounting in which expenses are recognized in the same period as the related benefits (i.e., sales revenue). The second element, which we call the expectations element, reflects expectations about earnings of future periods. These expectations lead to recognition of expenses in earnings in the current period. These expenses may reflect management’s attempts

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1 Although the matching principle is fundamental to financial accounting, we have been unable to find a unique definition. We define matching as recognition of expenses that are associated with the sales of the period.
to affect future earnings (e.g., research and development and advertising), the accounting for the
associated expenditures, and generally accepted accounting principles that require recognition of
expenses as a result of changes in the value of the recognized assets of the firm (e.g.,
restructuring charges and write-downs).

The key to our empirical identification of the current sales element and the expectations element is the observation that value change at the beginning of the year reflects expectations for both the current year and future years while value change at the end of the year reflects expectations about future years only. It follows that the current sales element may be estimated via the change in the earnings/daily return coefficient over the year. The expectations element is manifested in the estimate of the earnings/daily return coefficient at the end of the year. Our primary research design is based on cross-sectional regressions in which fiscal-year earnings is the dependent variable and daily returns for each day within the fiscal year are the explanatory variables. In order to focus on the two elements of ERT, we constrain the earnings/daily return coefficients to be a linear function of time within the fiscal year.

\[ \text{As an illustration of the relation between value change and these two elements of expenses, consider the effect of the terrorist attacks on the World Trade Center on 9/11/2001 on United Airlines. United’s stock price fell from$30.82 on 9/10/2001 to$17.10 when the market re-opened on 9/17/2001. Expenses matched to sales for the remainder of the third quarter and for the fourth quarter (i.e., the current sales element of ERT) decreased because sales decreased while expenses related to sales of the future (i.e., the expectations element) increased dramatically (e.g., there was a $1.3 billion charge to earnings associated with the write-off of airplanes and other restructuring charges). Our point is that, if the attack on the World Trade Center had occurred at the beginning of the fiscal year rather than just 113 calendar days before the end of the year, the effect on the current sales element of expenses for 2001 would have been much greater. On the other hand, since the effect of the attack on United Airlines in particular, and the travel industry in general, was expected to have such long-lasting effects, the expectations element most likely would have been very similar whether the attack had occurred on 1/1/2001 or 9/11/2001.} \]

\[ \text{Net income after extraordinary items is the earnings variable we use in our analyses. The terms “earnings” and “net income” are synonymous in this paper. The dependent variable in each of our regressions is deflated by beginning of year market capitalization.} \]

\[ \text{The earnings/daily returns regression may be used to estimate a coefficient relating each of 252 daily returns to earnings. But the number of estimated parameters relative to the number of observations may be such that these daily coefficients will have a great deal of estimation error. Constraining the estimated coefficients to be a linear function of time reduces the number of estimated earnings/returns coefficients from 252 to 2.} \]
Consistent with our prediction, we find that the earnings/daily return coefficients decline from 0.139 at the beginning of the fiscal year to 0.082 at the end of the fiscal year. This result is illustrated in Figure 1. The decline in the earnings/daily return coefficients over the fiscal year is statistically significant and captures the current sales element of ERT. The coefficient estimate of 0.082 at the end of the fiscal year is also statistically significant and reflects the expectations element of ERT.

We show that empirical identification of the effects of the accounting for the current sales element and the expectations element of ERT may provide additional insights in studies that examine differences in ERT across various scenarios (the best known example being the difference between positive and negative annual return sub-samples). We argue that the distinction between these two elements may serve to bring a clearer empirical focus on the expenses that are at the heart of arguments that asymmetric loss recognition leads to more efficient contracting (i.e., bringing forward expenses associated with bad news regarding the future (e.g., write downs) but capitalizing expenditure related to expansion to cope with increased expected future sales (e.g., purchase of property, plant and equipment)).

The notion of asymmetric timely loss recognition rests on features of accounting that lead to more immediate recognition of downward changes in value relative to recognition of upward changes in value. Downward revisions in expectations about future earnings (associated with negative returns) may, for example, result in immediate recognition of expenses related to the impairment of recognized assets. In contrast, upward revisions in expectations about future earnings (associated with positive returns) typically do not result in an increase in the book value.

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5 See, for example, Basu [1997], Ball [2001], Basu [2005], and Ball and Shivakumar [2006].
of recognized assets (under U.S. GAAP). This implies that asymmetric timely loss recognition will be manifested in the expectations element of ERT because it reflects the portion of value change, related to changes in expectations about future earnings, recognized in contemporaneous earnings. The concept of asymmetric timely loss recognition does not, however, predict that the current sales element of ERT will differ across positive and negative annual return sub-samples. Our method permits identification of the expectations element and hence a focus on the element at the heart of arguments regarding asymmetric loss recognition.

Figure 2 summarizes the results for the sub-samples of observations partitioned on the sign of annual returns. We find that the estimate of the earnings/daily return coefficient for the sub-sample of observations with positive annual returns decreases from 0.069 at the beginning of the fiscal year to 0.020 at the end of the fiscal year. This decline of 0.049 in the coefficient over the fiscal year is statistically significant and reflects the contribution of the current sales element to ERT. In contrast, we find that for the sub-sample of observations with negative annual returns, the earnings/daily return coefficient increases slightly from 0.253 at the beginning of the fiscal year to 0.262 at the end of the fiscal year. This increase of 0.009 is not statistically significantly different from zero. The difference between the estimates of the end-of-year coefficients for the positive annual returns sample (0.262) and the negative annual returns sample (0.020) reflects differences in the expectations element of ERT. In short, these results show that, for our sample of observations, the asymmetry observed in ERT is driven primarily by the

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6 As an illustration of this point, United Airlines wrote-off $1.3 million as a result of dramatic downward revisions in expectations of future earnings. On the other hand, expenses of InVision Technologies, which was the company that manufactured the explosive detection devices seen in most airports at the time, increased as sales increased for the remainder of the year; but, costs of expansion to cope with expected future sales were capitalized and did not affect expenses for 2011 and the implicit increase in the value of the assets of InVision did not affect reported earnings for 2011 (i.e., the expectations element of ERT was virtually non-existent).
expectations element but it is also due, to a much lesser extent, to asymmetry in the current sales element.

In order to validate that the change in the earnings/daily return coefficient does reflect the current sales element of ERT, we decompose the annual earnings dependent variable into two readily observable components of earnings: (1) gross margin (i.e., sales revenue minus cost of sales); and, (2) period expenses (i.e., gross margin minus earnings). Specifically, we repeat our analyses, replacing annual earnings with gross margin and period expense as the dependent variable and we analyze the intra-year dynamics of the daily return coefficients for both specifications.

The gross margin component reflects sales revenue less the cost of sales; cost of sales primarily includes expenses that are matched to sales revenue. Therefore, the association between gross margin and returns is expected to primarily reflect expenses that are matched to sales of the current fiscal period (i.e., the current sales element) rather than expenses related to changes in expectations of future earnings (i.e., the expectations element). If changes in the association between gross margin and return over the fiscal period reflect the current sales element, we expect the gross margin/daily return coefficient to be positive and statistically significant at the beginning of the fiscal year and decline to zero at the end of the year. Consistent with our prediction, we find that the gross margin/daily return coefficient is positive.

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7 We adopt the convention that period expenses are signed in an opposite direction to earnings and gross margin. In other words, an increase in period expenses is associated with a decrease in earnings. The term “period expense” is used in varied ways in accounting. We define it as gross margin minus net income and use this term for wont of one that is better.

8 Because net income is equal to gross margin minus period expenses, the coefficient estimates from the regression of net income on daily returns will be equal to the coefficient estimates from the regression of gross margin on daily returns minus the coefficient estimates from the regression of period expenses on daily returns.

9 We choose to focus on gross margin as a manifestation of the matching principle rather than identifying line items on the income statement that are specifically matched to sales because identifying these components as line items on the income statement is difficult, perhaps impossible, because both elements of ERT are likely: (1) to be spread across different line items; and/or, (2) to be present within some line items.
(0.386) and statistically significant at the beginning of the year, but not significantly different from zero (0.021) at the end of the year.

In addition, we find that the dynamics of the gross margin/daily return coefficients do not differ significantly across a sample partition based on the sign of the annual return. This result is illustrated in Figure 3. This finding suggests that the period expense component of earnings, rather than the gross margin component, primarily drives the observed differences in ERT across the positive/negative annual return partition.

In contrast to the gross margin component of earnings, the period expense component, as we have defined it, tends to reflect the *expectations* element of ERT. The observed asymmetry in ERT, if driven by the *expectations* element, will be reflected in period expense/daily return coefficients, averaged over the fiscal year, that differ significantly across a partition of the observations based on the sign of the annual return. Consistent with this argument, we find a statistically significant difference between the average period expense/daily return coefficients for the positive returns sub-sample relative to negative returns sub-sample of 0.183.

This asymmetry in the average period expense/daily return coefficient is the combined effect of a positive and statistically significant coefficient (0.149) for the positive annual returns sub-sample and a relatively small and not statistically significant coefficient (-0.034) for the negative annual returns sub-sample. In other words, the observed asymmetry in ERT reflects that fact that period expenses are correlated with returns only for the positive annual returns sub-sample. At first glance, this result appears inconsistent with the Basu [1997] notion of asymmetric timely loss recognition because period expenses include items (e.g., write-downs, restructuring charges, and special items) that tend to only be observed when returns are negative. In contrast, positive returns will tend to be associated with costs (e.g., investment in property,
plant and equipment) that are capitalized and thus affect the recognition of expenses in future periods rather than recognition of expenses of the current period. An examination of the intra-year dynamics of the period expense/daily return coefficient, which permits identification of the current sales and expectations elements, facilitates an explanation for this result.

We find that the period expense/daily return coefficient declines from positive and significant (0.285) at the beginning of the fiscal year to not significantly different from zero (0.012) at the end of the year for the sub-sample of observations with positive annual returns. This result is illustrated in Figure 4. This evidence suggests that, when news is good, the period expense component of earnings primarily reflects recognized expenses matched to current period sales (i.e., the current sales element of ERT). The role of the expectations element is minimal when returns are positive because upward revisions in the expectations of future sales associated with recognized assets in place is not recognized in current period earnings and most investment expenditure is capitalized rather than expensed in the current period.

In contrast, the expectations element of period expenses (e.g., write-downs, restructuring charges, special items) will be negatively correlated with returns when returns are negative (i.e., worse news is associated with larger expenses recognized in the current period), while the current sales element of period expenses will still be positively correlated with returns. Therefore, the negative correlation between period expenses and returns driven by the expectations element will tend to offset the positive correlation driven by the current sales element, which leads to the observation that the period expense/return coefficient is, on average, not significantly different from zero when returns are negative.

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10 For example, if sales of the current period increase following good news, income tax expense, which is reflected in period expenses, will also increase, ceteris paribus. On the other hand, if sales of the current period decrease following bad news, income tax expense (i.e., period expenses) will also decrease, ceteris paribus.
Consistent with our prediction, we find that, for the sub-sample of observations with negative annual returns, the period expense/daily return coefficient declines from positive and statistically significant (0.129) at the beginning of the fiscal year to negative and statistically significant (-0.198) at the end of the fiscal year. The decline in the period expense/daily return coefficient over the fiscal year (0.327), which is statistically significant, reflects a positive contribution from the current sales element to the overall average correlation between period expenses and daily returns. In contrast, the period expenses/daily return coefficient at the end of the year (-0.198) reflects an opposing negative contribution from the expectations element. The net effect from both elements results in an estimate of the period expense/daily return coefficient that is, on average, not significantly different than zero (-0.034).

These analyses illustrate the point of our paper. Empirical identification of the effects of the accounting for the current sales element and the expectations element of expenses on the mapping from returns to earnings (i.e., ERT) may provide additional insights in studies that examine differences in ERT across various scenarios. We show that in the analysis of the difference in ERT between positive annual return and negative annual return samples, absence of the separate identification of the elements of ERT in period expenses may lead to the erroneous conclusions that: (1) evidence of asymmetric loss recognition is not seen in the mapping from returns to these expenses; and, (2) period expenses are only related to returns when returns are positive.

The remainder of the paper proceeds as follows. In section 2, we elaborate on the motivation for our paper and we outline the research design. Section 3 briefly describes the sample selection criteria and the sources of data. We present and discuss the results of our main
analyses in section 4. In section 5, we provide several alternate specifications, which ensure the robustness of our results. We conclude in section 6.

2. Motivation and Research Design

A large body of literature, beginning with Ball and Brown [1968], has examined the properties and economic implications of ERT. Early studies focused on the association between the news component of earnings and abnormal returns (e.g., Beaver et al. [1979]; Hagerman et al. [1984]), while later studies changed the focus to the association between earnings and raw returns (e.g., Beaver et al. [1980], Easton and Harris [1991], Easton et al. [1992]; Warfield and Wild [1992]; Collins et al. [1994]). With the exception of Beaver et al. [1980], these studies were motivated by an interest in whether or not the earnings metric and the return metric summarized the same underlying information. The mapping between these two variables was of little interest.11

Beaver et al. [1987] and Basu [1997] shifted the focus of this literature to an examination of the extent to which earnings of the period capture information that has affected firm value in the same fiscal period (i.e., ERT). In these studies, ERT is estimated as the slope coefficient in the following regression of annual earnings on contemporaneous annual stock returns:

\[ NI_{jt} = \alpha_t + \beta_{t}^{ANN} \cdot RET_{jt} + \epsilon_{jt} \]  

11 A related literature, which examined the market response to news in earnings, was very focused on the mapping from the information in earnings to the market reaction to this information. In this literature the natural dependent variable is the returns metric. This literature referred to this mapping as the earnings response coefficient (see, Easton and Zmijewski [1989]; Collins and Kothari [1989]; Kothari and Sloan [1992]; and Kothari and Zimmerman [1995]). This literature, however, sheds light on a very different question; what is the market response to earnings news? The ERT literature inverts this question and asks; how much of the news that has affected prices is also captured in contemporaneous earnings? The natural dependent variable in this literature is the earnings metric.
where the dependent variable, $NI_{jt}$, is annual net income for firm $j$ for fiscal year ending at $t$ deflated by the beginning of fiscal-year market capitalization. The explanatory variable, $RET_{jt}$, is the stock return of firm $j$ for fiscal year $t$. $\alpha_t$ is the regression intercept and $\varepsilon_{jt}$ is the regression disturbance term.\footnote{Basu [1997] partitions the regression into observations with negative returns and those with positive returns. The reverse form of this regression, which also restricts the earnings/return coefficient to be the same for all intervals within the fiscal period, was the basis of Beaver, et al. [1980], Easton and Harris [1991], and Easton, et al. [1992].} The coefficient $\beta_t^{ANN}$ reflects the portion of the value change in year $t$ that is recognized in period $t$ earnings (i.e., ERT).\footnote{The fundamental question addressed in this research design is, what portion of the change in market value is captured in earnings (i.e., change in book value) in the same fiscal period? It follows that earnings appropriately is the dependent variable in this context (see Ball et al. [2010] for an elaboration of this argument).}

Our analyses go beyond just assessing ERT. We argue that there are two distinct accounting concepts, which have fundamentally different effects on ERT and we estimate these elements of ERT. The first element, which we call the current sales element, is a manifestation of the matching principle of accounting in which expenses are recognized in the same period as the related benefits (i.e., sales revenue). For this element, value change reflects changes in sales of the current period and changes in the expenses related to these sales; the matching principle leads to recognition of matched expenses within the period. The second element, which we call the expectations element, reflects expectations about future earnings; these changes in expectations will lead to price changes and recognition of expenses in earnings in the current period.

We empirically distinguish these two elements of ERT by focusing on daily stock returns within the fiscal year. Expectations reflected in daily returns observed at beginning of the fiscal year will have an entire year to be recognized in sales and matched expenses within the current period (i.e., the current sales element). In contrast, expectations reflected in daily returns observed at the end of the fiscal year will have no time remaining to be recognized as sales and
matched expenses within the current period. Therefore, the *current sales* element of ERT will manifest in an association between daily returns and annual earnings of the current year that is positive at the beginning of the fiscal year and declines to zero at the end of the year. Any association between daily returns on the last day of the fiscal year and earnings of the year will only reflect the *expectations* element of ERT.

We develop a research design that utilizes observations of daily stock returns within the fiscal year, facilitating the separate empirical identification of the *current sales* and *expectations* elements of ERT. Specifically, we examine the intra-year dynamics of the earnings/daily return coefficient via the following regression model:

\[ NI_{jt} = \alpha_t + \sum_{\tau=0}^{251} \beta_{\tau \tau} \cdot ret_{j\tau} + \epsilon_{jt} \]  

(2)

Similar to regression (1), the dependent variable, \( NI_{jt} \), is annual net income for firm \( j \) for fiscal year \( t \) deflated by the beginning of fiscal-year market capitalization. Unlike regression (1), however, the explanatory variables, \( ret_{j\tau} \), are the daily stock returns of firm \( j \) for each trading day \( \tau \) within the fiscal year \( t \), where \( \tau \) is the number of trading days relative to the first day of fiscal year \( t \). The regression parameters \( \beta_{\tau \tau} \), which may be different on each of the trading days within the fiscal year, reflect the portion of value change on day \( \tau \) that is recognized in contemporaneous net income. Allowing the net income/daily return coefficient to vary throughout the fiscal year allows us to quantify and test for changes in the earnings/daily return coefficient (i.e., the *current sales* element) as well as the magnitude of the earnings/daily return coefficient at the end of the fiscal year (i.e., the *expectations* element).

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14 We use the following daily timing convention: \( \tau = 251 \) is the last trading day of the fiscal year; and \( \tau = 0 \) is within two days of the first trading day of the fiscal year. This ensures that all years have 252 days. Daily returns are calculated as the daily price change plus the daily dividend payments divided by the beginning-of-year price, so that the sum of these daily returns is a meaningful construct (i.e., an annual return, which is equal to the annual return metric used in equation (1) above). We obtain similar results when we use the log of daily returns as the independent variables.
Regression (2) requires estimation of 252 parameters, which severely reduces the degrees of freedom, and introduces a large amount of noise in the estimation of each net income/daily return coefficient, limiting our ability to quantify and test the intra-year dynamics of the net income/daily return coefficients. We circumvent these problems, while also emphasizing a central tenet of our paper—the change in the coefficient estimate from the beginning of the year to the end—by placing a more restrictive assumption on the net income/daily return coefficients, $\beta_{tt}$ in (2). Specifically, we restrict the net income/daily return coefficients in (2) as follows:

$$ NI_{jt} = \alpha_t + \sum_{\tau=0}^{251} \beta_{tt} \cdot ret_{jtt} + \epsilon_{jt} $$

subject to: $\beta_{tt} = \beta_{t}^{beg} + \frac{1}{251} \cdot \left( \beta_{t}^{end} - \beta_{t}^{beg} \right) \cdot \tau$

(3)

We refer to this model as the linear coefficient model because the net income/daily return coefficient, $\beta_{tt}$, is constrained to be a linear function of time, $\tau$, within the fiscal year. This restriction reduces the number of estimated coefficients from 252 to only two parameters, $\beta_{t}^{beg}$ and $\beta_{t}^{end}$ (in addition to the regression intercept, $\alpha_t$), while still allowing us to quantify and test for changes in the net income/daily return coefficient throughout the fiscal year.\footnote{Restricting the coefficients in this manner is similar in spirit to traditional distributed lag models (see Judge et al. [1985]) and mixed data sampling regressions predominantly used in return volatility forecasting models (e.g., Ghysels et al. [2005]).} Specifically, the two estimated parameters, $\beta_{t}^{beg}$ and $\beta_{t}^{end}$, represent the net income/daily return coefficient at the beginning and end of the fiscal year and reflect the portion of the value change at the beginning and end of the year, respectively, that is recognized in current period earnings.

The difference between these parameter estimates (i.e., $\beta_{t}^{end} - \beta_{t}^{beg}$) reflects the change in the net income/daily return coefficient over the entire fiscal year. We expect this change to be negative as a result of the current sales element of ERT; value change at the beginning of the
year has 252 remaining days to be incorporated in sales and related expenses of the current year, while value change toward the end of the fiscal year has relatively less time (i.e., only a few remaining days) to be recognized as current period sales and matched expenses. We expect \( \beta_t^{end} \) to be non-zero, representing the proportion of value change recognized in current period earnings related to changes in expectations about earnings of future years (i.e., the *expectations* element of ERT).

The average of the net income/daily return coefficients throughout the fiscal year is our estimate of the portion of value change for the fiscal year that is reflected in earnings of the year (i.e., ERT). Expressing the average net income/daily return coefficient as \( \beta_t^{end} + \frac{1}{2} \times (\beta_t^{beg} - \beta_t^{end}) \) highlights the separate roles of the *current sales* element, \( \frac{1}{2} \times (\beta_t^{beg} - \beta_t^{end}) \), and the *expectations* element, \( \beta_t^{end} \), of ERT.

The linear coefficient constraint we impose in (3) may appear overly restrictive. However, consider the following model, which places a more stringent constraint on the earnings/daily return coefficients as follows:

\[
NI_{jt} = \alpha_t + \sum_{t=0}^{251} \beta_{tt} \cdot ret_{jtt} + \epsilon_{jt}
\]

subject to: \( \beta_{tt} = \beta_t^{beg} = \beta_t^{end} = \beta_t \) \hspace{1cm} (4)

This model restricts the net income/daily return coefficients to be the same (\( \beta_t \)) on each day (\( \tau \)) within the fiscal year. Since daily returns summed over the fiscal year equals the total annual return (i.e., \( \sum_{t=0}^{251} ret_{jtt} = RET_{jt} \)), it follows the constant earnings daily return coefficient \( \beta_t \) in (4) will be identical to the earnings/annual return coefficient in (1). In other words, prior studies that measure ERT from the earnings/annual return coefficient (\( \beta_t \)) in (1), implicitly assume the annual net income/daily return coefficient is constant throughout the fiscal period. While the
single parameter model permits estimation of the ERT, it does not distinguish between the current sales element and the expectations element of ERT, which is the focus of this paper.

A key aspect of our analyses is the separate empirical identification of the current sales element and the expectations element. Net income, $NI_{jt}$, has a readily observable component, gross margin, $GM_{jt}$ (i.e., sales revenue minus cost of sales) in which expenses (i.e., cost of sales) are, by and large, matched to sales. In order to first focus attention on and analyze the current sales element, we separate this component of net income from the remainder, which we call period expenses, $PE_{jt}$, (i.e., gross margin minus net income).16

The gross margin component of earnings will, primarily, reflect the current sales element of earnings because the cost of sales expense included in this variable is more or less matched directly to sales of the current fiscal period; it generally does not include expenses arising from changes in expectations of earnings in future periods (i.e., the expectations element). Therefore, we replace net income with gross margin, $GM_{jt}$, as the dependent variable in the linear coefficient model and predict that the gross margin/daily return coefficient will decline from a positive value at the beginning of the fiscal year (i.e., $\beta_{t}^{beg} > 0$) to a value that is not significantly different from zero at the end of the year (i.e., $\beta_{t}^{end} \approx 0$).17

Analogous to the estimates of the net income/daily return coefficients, the average estimate of the gross margin/daily return coefficient measures the portion of annual value change that is reflected in gross margin of the year (i.e., the component of ERT that is due to the gross

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16 This decomposition of net income implies: $NI_{jt} = GM_{jt} - PE_{jt}$. In other words, increases in period expenses result in a decrease to net income.

17 It is possible that gross margin may include some expenses related to changes in expectations of future earnings (i.e., the expectations element). If so, we would observe a non-zero gross margin/daily return coefficient at the end of the year. We do not observe a non-zero end-of-year coefficient in our samples.
margin component of earnings). Similarly, $\frac{1}{2} \times (\beta_{beg}^t - \beta_{end}^t)$ captures the current sales element and $\beta_{end}^t$ captures the expectations element of this component of ERT.

The period expense component of earnings will reflect expenses that are matched to sales of the current period (i.e., the current sales element) as well as expenses related to changes in the expectation of earnings of future periods (i.e., the expectations element), such as the an impairment of a recognized asset from a decline in value. The portion of period expenses related to the current sales element will result in a period expense/daily return coefficient that declines from a positive value at the beginning of the fiscal year to a value of zero at the end of the year. Thus, the current sales element will result in a positive association, on average, between period expenses and daily returns. We expect to observe this positive association for both the positive annual return and negative annual return sub-samples.

The portion of period expenses related to the expectations element is expected to differ according to whether the annual returns are positive or negative (Basu [1997]). When returns are negative, indicating a possible decline in asset values, financial reporting rules tend to accelerate the recognition of expenses (e.g., asset impairments) associated with changes in the expectation of sales of future periods, which leads to a negative association between period expenses and returns (i.e., the more negative the return, the greater the expense associated with changed expectations about future earnings). Conversely, financial reporting rules typically do not permit the accelerated recognition of good news related to earnings of future periods. This implies that the expectations element of period expenses lead to an association between period expenses and returns that is not significantly different from zero when annual returns are positive.

We replace net income with period expenses, $PE_{jt}$, as the dependent variable in the linear coefficient model and predict that, for both the positive and negative annual return sub-samples,
the period expense/daily return coefficient will decline significantly over the fiscal year reflecting the current sales element of period expenses (analogous to the estimates of the net income/daily return coefficients, the estimate of the current sales element of the period expense component of ERT is $\frac{1}{2} \times (\beta_t^{\text{beg}} - \beta_t^{\text{end}})$. In addition, we predict that the estimate of the period expense/daily return coefficient at the end of the period, $\beta_t^{\text{end}}$, which reflects the expectations element of the period expense component of ERT, will differ across the positive and negative annual return sub-samples. Specifically, we expect the period expense/daily return coefficient at the end of the fiscal year to be negative when annual returns are negative (i.e., worse news leads to higher period expenses) and not significantly different from zero when annual returns are positive.

3. Data and Sample Selection

To construct our sample, we begin with all firm-year observations from 1973 to 2009 in the Compustat Fundamentals Annual File with sufficient data to determine net income before extraordinary items (Compustat $IB$) and gross margin (Compustat $SALE$ less $COGS$). We remove observations with insufficient data on the daily CRSP files to compute daily stock returns on each of the 252 trading days within the current fiscal year and a market value of equity at the beginning of the fiscal year.¹⁸ We also exclude utility ($4900 \leq \text{sic code} \leq 4999$) and financial ($6000 \leq \text{sic code} \leq 6999$) firms and we exclude observations with a market value of equity less than $10M or a share price less than $1$ at the beginning of the fiscal year. The remaining sample contains 108,894 firm-year observations.

¹⁸ When there are no trades on a day, CRSP computes daily returns based on the average of bid and ask prices. We use these returns when they are available and there are no prices based on trading data.
In order to reduce the influence of outliers on the regression results, each year we remove observations falling in the top or bottom percentile of net income \( (NI_{jt}) \), gross margin \( (GM_{jt}) \), period expenses \( (PE_{jt}) \), and annual return \( (RET_{jt}) \). It is important to note that truncating the sample based on the annual return reduces the influence of extreme values of annual returns (i.e., the summary of all information for the year) but there may still be influential outliers of daily returns (i.e., outliers with respect to the timing of the returns within the fiscal year).\(^{19}\) Because truncating observations based on each of the 252 daily returns is infeasible, we address this concern by winsorizing daily return observations in the top or bottom percentiles.

Our final sample includes 102,563 firm-year observations over the 37 years from 1973 to 2009. Within the final sample, 54,472 firm-year observations have a non-negative fiscal year return \( (RET_{jt} \geq 0) \) and 48,091 firm-year observations have a negative fiscal year return \( (RET_{jt} < 0) \).

4. Results of Main Analyses

4.1. Main Results

Table 1, Panel A presents the net income/daily return coefficients estimated from the linear coefficient regression (3).\(^{20}\) For the entire sample (reported in the first column), the

\(^{19}\) For example, consider two firms that both have a total annual return of ten percent. Firm 1 realizes the entire ten percent return on the first day and zero return over the remainder of the fiscal year. Conversely, Firm 2 realizes the entire ten percent return on the very last day and zero return over the other 251 trading days of the fiscal year. Truncating observations based on the magnitude (ten percent in both cases) of the annual return does not distinguish between these timing differences.

\(^{20}\) In all regression specifications in this paper, we include industry fixed effects based on industry classifications defined Barth, Beaver and Landsman [1998]. These industry fixed effects mitigate the effects of systematic differences in the dependent variable (e.g., in the net income/daily return regressions, the dependent variable is the ratio of net income to beginning of year market capitalization, which is essentially an EP ratio). The dependent variable is likely much more homogenous at the industry level; our industry fixed-effects variables are included to mitigate the cross-sectional heterogeneity. Reported coefficient estimates are based on the mean of annual estimates and the standard errors of these means (following Fama and Macbeth [1973]).
estimate of the coefficient at the beginning of the fiscal year, $\beta_{t}^{beg}$, is 0.139 (t-statistic of 12.51) and the estimate of the coefficient at the end of the fiscal year, $\beta_{t}^{end}$, is 0.082 (t-statistic of 8.63); this is the estimate of the *expectations* element of ERT (see Table 1, Panel B). The estimate (0.029) of the *current sales* element of ERT, $\frac{1}{2} \times (\beta_{t}^{beg} - \beta_{t}^{end})$, is statistically significant (t-statistic of 4.59). The estimate (0.111) of ERT (i.e., $\frac{1}{2} \times (\beta_{t}^{beg} + \beta_{t}^{end})$), which is the sum of the *current sales* element and the *expectations* element, is also statistically significantly positive (coefficient estimate of 0.111 with a t-statistic of 13.37). The estimate of the ERT of 0.111 indicates that 11.1 percent of value change for the fiscal year is, on average, recognized in contemporaneous net income. More precisely, on average, 11.1 percent of the change in market value is captured in change in book value in the fiscal period in which the change in market value occurs.

Figure 1 plots the net income/daily return coefficient estimates as a function of the number of trading days relative to the beginning of the fiscal year. The change in the net income/daily return association throughout the fiscal year is evident in this figure.

Table 1, Panel C presents the net income/annual return coefficient estimated via regression (1), which implicitly restricts the net income/daily return coefficient to be a constant function of time within the fiscal year. The estimate of the net income/annual return coefficient, $\beta$, is 0.112 (t-statistic of 12.15). As expected, this estimate is nearly identical to the average net income/daily return coefficient estimate from the linear coefficient model (Panel A), because both represent the proportion of news implicit in return of the fiscal year that is, on average, reflected in current period earnings (i.e., ERT).

The second column of Table 1, Panel A presents the net income/daily return coefficients estimated from the linear coefficient model (3) for the sub-sample of observations with positive
annual returns. For this sub-sample, the coefficient at the beginning of the fiscal year is 0.069 (t-statistic of 5.13) and the coefficient at the end of the fiscal year is 0.020 (t-statistic of 2.61). The current sales element of ERT for this sample is 0.025 (t-statistic of 3.01) and the expectations element is 0.020 (t-statistic of 2.61) – see Table 2, Panel B. The sum of these elements, that is, ERT, (0.045) is also statistically significantly positive at conventional levels (t-statistic of 6.08); in other words, when returns are positive, 4.5 percent of the value change is recognized in contemporaneous net income.

The third column presents similar coefficient estimates for a sub-sample of observations with negative annual returns. For this sub-sample, the coefficient at the beginning of the fiscal year is 0.253 (t-statistic of 21.69) and the coefficient at the end of the fiscal year, which is the estimate of the expectations element of ERT, is 0.262 (t-statistic of 22.34). The estimate of the current sales element of ERT for this sample (-0.005) is not significantly different from zero (t-statistic of -0.84). That is, the expectations element dominates ERT (0.258 with a t-statistic of 24.77) when annual returns are negative; i.e., 25.8 percent of the value change is captured in earnings.

Finally, the fourth column of Table 1 presents the differences between estimates for the negative annual return sub-sample relative to those for the positive annual return sub-sample. Consistent with prior studies (e.g., Basu [1997]), we find that the difference in ERT for the negative annual return sub-sample relative to the positive annual return sub-sample is 0.213 (t-statistic of 14.70) reflecting the overall asymmetry of ERT. As we predicted, this difference is primarily driven by the expectations element (difference of 0.242, with a t-statistic of 15.88). However, we also find a significant difference in the current sales element (-0.029, with a t-statistic of -4.18). That is, the well-documented asymmetry in ERT across positive and negative
annual return sub-samples is primarily, but not completely, driven by the *expectations* element. Figure 2 illustrates the differences in the intra-year dynamics of these estimates for both sub-samples. This evidence provides an initial illustration of the importance of separately identifying the asymmetry in ERT emanating from an asymmetry in the *expectations* element, which is implicitly the element motivating many of studies examining asymmetric timely loss recognition in the spirit of Basu [1997].

### 4.2. Evidence of the Current Sales element reflected in the intra-year change in the Gross Margin/Daily Return coefficient

Table 2, Panel A presents the gross margin/daily return coefficients estimated from the linear coefficient model.\(^{21}\) For the sub-sample with positive annual returns (reported in the second column), the estimate of the gross margin/daily return coefficient is 0.354 (t-statistic of 7.02) at the beginning of the fiscal year and declines by 0.322 (t-statistic of -4.81) to 0.032 (t-statistic of 1.12) at the end of the fiscal year. Similarly, the estimate of the gross margin/daily return coefficient is 0.382 (t-statistic of 10.67) at the beginning of the fiscal year and declines by 0.318 (t-statistic of -4.49) to 0.062 (t-statistic of 0.91) at the end of the fiscal year for the sub-sample of observations with negative annual returns (reported in the third column). Figure 3 illustrates the intra-year dynamics of the gross margin/daily return coefficient for both sub-samples.

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\(^{21}\) Again, we include industry fixed effects based on industry classifications defined Barth, Beaver and Landsman [1998]. These industry fixed effects are particularly important in the regressions based on components of earnings. For example, gross margin likely varies systematically across the sample (retail firms having lower gross margins than manufacturing firms). The industry fixed effects likely mitigate the effects of these differences. Recall that we chose to focus on gross margin as a manifestation of the matching principle rather than identifying line items on the income statement that are specifically matched to sales because identifying these components as line items on the income statement is difficult, perhaps impossible, because both elements of ERT are likely: (1) to be spread across different line items; and/or, (2) to be present within some line items. Concerns about likely vast effects of heterogeneity if the dependent variable was, say, special items divided by beginning of period market capitalization, is another important reason for choosing to use gross margin and period expenses as the components of net income.
These results have two key implications. First, the gross margin/daily return coefficient is significantly positive at the beginning of the year, but declines to zero for both sub-samples. This result is consistent with our prediction that the gross margin component is driven primarily by the current sales element of ERT because it primarily reflect expenses (i.e., cost of sales) that are matched to sales revenue. In other words, value changes on the last day of the fiscal year will not have time to be reflected in contemporaneous sales and matched cost of sales expenses, but will instead be recognized in sales and associated expenses in future periods. Second, the observation that the estimates of the end-of-year gross margin/daily return coefficients are not significantly different from zero implies that the gross margin component of earnings does not have an expectations element.

Second, the intra-year dynamics of the gross margin/daily return coefficient for the negative annual returns sub-sample and the positive annual returns sub-sample (as reported in the fourth column) are not significantly different. For example, the average gross margin/daily return coefficient is 0.193 (t-statistic of 8.15) when news is good and 0.222 (t-statistic of 5.97) when news is bad. The difference of 0.029 (t-statistic of 0.30) is not statistically significantly different from zero. This evidence indicates that the asymmetry observed in ERT is primarily due to an asymmetry in the recognition of expenses reflected in the period expense component of net income (e.g., asset impairments) rather than an asymmetry in the recognition of expenses in the gross margin component. We turn next to consideration of period expenses.
4.3. Evidence of the Current Sales and Expectations elements reflected in the intra-year change in the Period Expense/Daily Return coefficient

Table 3, Panel A presents the period expense/daily return coefficients estimated from the linear coefficient model. For the sub-sample of observations with positive annual returns (reported in the second column), the period expense/daily return coefficient is 0.285 (t-statistic of 6.79) at the beginning of the fiscal year and declines by 0.275 (t-statistic of -4.93) to a value of 0.012 (t-statistic of 1.27) at the end of the fiscal year. Figure 4 illustrates this result.

For this sub-sample, this pattern in the period expense/daily return coefficient is similar to the pattern observed in the gross margin/daily return coefficients. Specifically, the insignificant period expense/daily return coefficient at the end of the year suggests that none of the value change related to changes in expectations about future sales is recognized in contemporaneous period expenses. The positive and statistically significant coefficient at the beginning of the year reflects the recognition of an increase in expenses (other than cost of sales) that are directly matched to an increase in current period sales related to the arrival of good news. In other words, the current sales element contributes to a positive association between period expenses and returns, while the expectations element has a negligible influence on the association.

When annual returns are negative, a different pattern in the period expense/daily return coefficient emerges. For this sub-sample (reported in the third column of Table 3, Panel A), the period expense/daily return coefficient is 0.129 (t-statistic of 4.61) at the beginning of the fiscal year.

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22 By definition, net income is equal to gross margin minus period expenses. Therefore, the estimates of the coefficients in the various net income/daily return regressions may be obtained either from the regression where net income is the dependent variable or by taking the difference between the estimates of the coefficients when gross margin is the dependent variable and the corresponding estimates of the regression coefficients when period expense is the dependent variable. Taking this perspective enables us to highlight the key features of the similarities and differences in the net income/daily return relations when returns are positive vis-à-vis when returns are negative.
year and declines by 0.327 (t-statistic of −6.32) to -0.198 (t-statistic of -2.86) at the end of the fiscal year. Figure 4 illustrates this result.

The statistically significant decline in the period expense/daily return coefficient for this sub-sample reflects a positive association between period expenses and returns driven by the current sales element, which is 0.164 (t-statistic of 6.32). However, the estimate of the expectations element is statistically significantly negative (-0.198, with a t-statistic of -2.86). In other words, more negative news will, ceteris paribus, imply lower future sales and/or higher future expenses, leading to increased recognition in current earnings of period expenses associated with asset impairments and/or restructuring charges. This result is consistent with the concept of asymmetric timely loss recognition, and underscores the main point of Basu [1997]; financial accounting generally requires immediate recognition of asset impairments and restructuring charges when expectations about the future change in such a way that asset values decline, but increases in asset value are generally not, under U.S. GAAP recognized in the current period.

When the two elements are combined into the average period expense/daily return coefficient, the positive association of the current sales element and returns is netted against a negative association of the expectations element and returns; when returns are negative, the average period expense/daily return coefficient is -0.034 and is not statistically significant (t-statistic of -0.75) – see Table 3, Panel B. Observed in isolation, this result would suggest that period expenses are not recorded in a timely manner, which is inconsistent with the Basu [1997] concept of asymmetric timely loss recognition stemming from the expectations element. However, an examination of the dynamics of the period expense/daily return coefficient reveals the countervailing influence of the current sales element, which potentially masks the
expectations element of interest. In addition, this result reinforces the importance of considering how the net income/daily return coefficient changes throughout the fiscal year when formulating and testing hypotheses specifically related to the current sales element and/or the expectations element.

5. Alternative Specifications

5.1. Changes in Earnings/Daily Return Coefficients at Quarterly Earnings Announcements

On earnings announcement days, value change primarily reflects the announcement of quarterly earnings and components of earnings (e.g., sales revenue). Since this value change is likely more closely related to annual earnings of the current period, rather than earnings of future periods, we may expect a different earnings/daily return coefficient on the days surrounding the earnings announcement date. For example, it is possible that the observed decline in the earnings/daily return coefficient over the fiscal year may be driven by a much higher coefficient mapping from daily returns to earnings on earnings announcement dates that occur early in the year relative to those later in the fiscal year. Alternatively, our results may be muted by higher earnings/daily return coefficients on earnings announcement days later in the fiscal year. Without further analyses, we note that such a difference may be somehow due to the fact that the first earnings announcement of the current fiscal year is the announcement of annual earnings for the previous fiscal year, whereas subsequent earnings announcements made later in the fiscal year pertain to interim quarters within the current period.23

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23 Our goal in this section is to ensure that our primary results (i.e., a significant decline in the earnings/daily returns coefficient over the year and non-zero end-of-year coefficients) are robust to potential changes in the net income/daily return coefficients on earnings announcement dates. An extensive analysis of changes in the association around earnings announcement dates, in the spirit of Ball and Shivakumar [2008], is an interesting extension left for future research.
With this in mind, we modify our linear coefficient model to allow the earnings/daily return coefficient to change within 3-day windows centered on each of the four quarterly earnings announcement dates within the current fiscal year. Specifically, we modify the linear coefficient constraint in (3) as follows:

\[
NI_{jt} = \alpha_t + \sum_{\tau=0}^{251} \beta_{t\tau} \cdot ret_{t\tau} + \epsilon_{jt}
\]

subject to: \[\beta_{t\tau} = \beta_t^{beg} + \frac{1}{251} \cdot (\beta_t^{end} - \beta_t^{beg}) \cdot \tau + \beta_t^{q4} \cdot ea_{jtt}^{q4} + \beta_t^{q1} \cdot ea_{jtt}^{q1} + \beta_t^{q2} \cdot ea_{jtt}^{q2} + \beta_t^{q3} \cdot ea_{jtt}^{q3}
\]  

(5)

where \(ea_{jtt}^{q4}\) is an indicator variable equal to 1 if day \(\tau\) is within a 3-day window centered on the prior fiscal year's fourth quarter earnings announcement date of firm \(j\); \(ea_{jtt}^{q1}\), \(ea_{jtt}^{q2}\) and \(ea_{jtt}^{q3}\) are indicator variables equal to 1 if day \(\tau\) is within a 3-day window centered on the current fiscal year's first, second, and third quarter earnings announcement dates, respectively, of firm \(j\). The estimated parameters, \(\beta_t^{q4}\), \(\beta_t^{q1}\), \(\beta_t^{q2}\) and \(\beta_t^{q3}\) reflect the incremental change in the net income/daily return coefficient during each of the four quarterly earnings announcements within the fiscal year. We refer to regression (5), as the “linear with EA coefficient” model.

Table 4 presents the net income/daily return coefficients estimated for this model. These results are also shown in Figure 5. Overall the inferences from our previous analyses are robust to the influence of quarterly earnings announcements. For the entire sample of observations, the estimate of the current sales element of ERT, after removing the earnings announcement effects, is 0.014 (t-statistic of 2.40) and the expectations element is 0.088 (t-statistic of 8.82). Although controlling for earnings announcement effects reduces the estimate of the current sales element (from 0.029 – see Table 1), this estimate remains significant and inferences are unchanged. The estimate of the expectations element is very similar with (0.088 – see Table 4) and without
(0.082 – see Table 1) the control for earnings announcement effects. A comparison of the estimates of the elements of ERT for the sub-samples of observations with positive annual returns and with negative annual returns, reported in columns 3 and 4 of Table 4 with the corresponding estimates in Table 1, again leads to the conclusion that inferences are unchanged when we include controls for earnings announcement effects.

The estimates of the parameters $\beta_t^{q_4}, \beta_t^{q_1}, \beta_t^{q_2}$ and $\beta_t^{q_3}$, which capture the incremental change in the earnings/daily return coefficient on earnings announcement days relative to non-earnings announcement days, are positive and statistically significant at conventional levels. For example, the estimate of $\beta_t^{q_4}$, which captures the incremental shift in the earnings/daily return coefficient on the of the first earnings announcement date within the current fiscal year is 0.097 (t-statistic of 8.89) when annual returns are positive. These higher earnings/daily return coefficients on the earnings announcement days imply that the value changes on quarterly earnings announcement dates (potentially a direct result of the revelation of part of annual earnings for the current period, per se) have a less persistent effect on earnings compared to the portion of value change on non-earnings announcement days.\(^{24}\)

5.2. Intra-year changes in the Variance of Daily Returns

In general, the net income/daily return coefficients in our main analyses represent the covariance between annual net income and daily returns divided by the variance of daily returns. The focus of our paper is on how different fundamental elements of financial accounting affect the mapping from news implicit in daily returns to earnings, which is captured by the covariance between annual net income and daily returns, rather than by the variance of daily returns.

\(^{24}\) If the price change is due to an entirely transitory shock to the earnings of the firm, the earnings/daily return coefficient will be equal to one; as the earnings/daily return coefficient tends closer to zero, the shock is more persistent. The observed higher earnings/daily return coefficients on the earnings announcement days, suggests that this information reflects more transitory (less persistent) impacts on earnings; in other words, the news tends to be more about the current period and less about future periods.
Therefore, it is important to control for any potential influence on the net income/daily return coefficient related to variation (within the fiscal year) in the cross-sectional variance of daily returns (e.g., Ball and Shivakumar [2008]).

Figure 6 plots the cross-sectional standard deviations of daily returns for each day \( \tau \) within the fiscal year. The standard deviation of daily returns increases over the fiscal period (on average) when annual returns are positive, which is consistent with the evidence in Patatoukas and Thomas [2010] of a positive correlation between price levels and the variance of returns. Because the variance is the denominator of the earnings/daily return coefficient, this increasing variance may bias toward finding a decline in the earnings/daily return coefficient over the year. Conversely, the cross-sectional variance of daily returns decreases throughout the fiscal year when annual returns are negative, which potentially biases against finding a decline in the earnings/daily return coefficient.

To control for the potential influence of changes in the variance of daily returns throughout the fiscal year, we estimate the following variance-normalized linear coefficient model:

\[
NI_{jt}^{adj} = \sum_{\tau=0}^{251} \rho_{\tau \tau} \cdot ret_{jt\tau}^{adj} + \varepsilon_{jt}
\]

subject to: \( \rho_{\tau \tau} = \rho_{t}^{beg} + \frac{1}{251} \cdot (\rho_{t}^{end} - \rho_{t}^{beg}) \cdot \tau. \) (6)

The dependent variable, \( NI_{jt}^{adj} \), is the variance-normalized annual net income of firm \( j \) in year \( t \) equal to \( (NI_{jt} - \overline{NI}_{kt})/\sigma_{t}(NI_{jt} - \overline{NI}_{kt}) \), where \( NI_{jt} \) is the annual net income of firm \( j \) in fiscal year \( t \) scaled by stock price at the beginning of fiscal year \( t \), \( \overline{NI}_{kt} \) is the average \( NI_{jt} \) across all firms within industry \( k \) to which firm \( j \) belongs in year \( t \), and \( \sigma_{t}(NI_{jt} - \overline{NI}_{kt}) \) is the cross-
sectional standard deviation of the industry-adjusted annual net income for all firms in year \( t \).

\( ret_{jtt}^{adj} \), is the variance-normalized daily stock return of firm \( j \) on day \( \tau \) equal to

\[
\frac{(ret_{jtt} - \bar{ret}_{kt})}{\sigma_{tt}(ret_{jtt} - \bar{ret}_{kt})},
\]

where \( ret_{jtt} \) is the change in stock price plus dividends on day \( \tau \) scaled by stock price at the beginning of fiscal year \( t \) of firm \( j \), \( \tau \) is the number of trading days relative to the first day of fiscal year \( t \), \( \bar{ret}_{kt} \) is the average \( ret_{jtt} \) on day \( \tau \) across all firms within industry \( k \) and year \( t \), and \( \sigma_{tt}(ret_{jtt} - \bar{ret}_{kt}) \) is the cross-sectional standard deviation of the industry-adjusted daily stock return of firm \( j \) on day \( \tau \) within year \( t \). Therefore, all dependent and independent variables in (6) have a cross-sectional standard deviation equal to one. \( \rho_t^{beg} (\rho_t^{end}) \) is the estimate of the variance-normalized net income/daily return coefficient on the first (last) day of the fiscal year ending at \( t \).

Table 5, Panel A presents the variance-adjusted net income/daily return coefficients estimated for the linear coefficient model. Overall, we find that our previous inferences are robust to changes in the variance of daily returns throughout the fiscal year. For the entire sample of observations, the variance-adjusted estimate of the current sales element of ERT, is 0.006 (t-statistic of 2.67) and the expectations element is 0.024 (t-statistic of 12.86); that is, inferences remain unchanged.\(^{25} \) Inferences based on the estimates of the elements of ERT for the sub-samples of observations with positive and negative annual returns, reported in columns 3 and 4 of Table 5, are also the same as inferences based on the corresponding estimates in Table 1.

Similarly, inferences from our main analyses are unchanged when the dependent variable is the variance-adjusted gross margin (Panel B) or variance-adjusted period expense (Panel C). Overall, this provides evidence that our results reflect changes in the covariance between net

\(^{25} \) The magnitudes of the coefficients (which are, in fact correlation coefficients) from the variance-adjusted regressions are not comparable to the estimates of the coefficients from the regressions without the variance adjustment.
income (and components of net income) and daily stock returns, rather than an increase (decrease) in the cross-sectional variance of daily returns throughout the fiscal year when annual returns are positive (negative).

5.3. *Inclusion of Next-Year Earnings and Components of Earnings in the Dependent Variable*

In order to further examine the idea that value change at the beginning of the year will have the remainder of the year to be incorporated in earnings of the year while value change at the end of the year will not be incorporated in earnings of the year, we repeat our analyses, changing the dependent variables to net income (and components of net income) for the current fiscal year $t$ plus the net income (and components of net income) for the next year $t+1$ (the independent variables continue to be daily returns of the fiscal year $t$).

As expected the estimates of the two-year gross margin/daily return coefficients are significantly higher than the estimates of the one-year gross margin/daily return coefficients at both the beginning of the current fiscal year (the difference is 0.506 with a $t$-statistic of 7.71) and at the end of the current fiscal year (the difference is 0.231 with a $t$-statistic of 5.15) because gross margin in the next year is related to returns of all days of the current fiscal year; this result is observed for both the positive and negative annual returns sub-samples.  

The estimates of the two-year period expense/daily return coefficients are also significantly higher than the estimates of the one-year period expense/daily return coefficients at both the beginning of the current fiscal year (the difference is 0.369 with a $t$-statistic of 5.15) and at the end of the current fiscal year (the difference is 0.078 with a $t$-statistic of 1.94) for the positive annual returns sub-sample. For the negative annual returns sub-sample, the estimate of the two-year period expense/daily return coefficient is significantly higher than the estimate of the one-year period expense/daily return coefficient at the beginning of the year (the difference is

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26 These statistics for the analyses discussed in this section are not reported in tabular form.
0.243 with a t-statistic of 3.39). However, consistent with the observation that the expectations element of period expenses is negatively correlated with returns when returns are negative, the estimate of the end-of-year two-period expense/daily return coefficient is less negative (difference of 0.115) than the estimate of the end-of-year one-period expense/daily return coefficient, though this difference is not significantly different from zero at conventional levels (t-statistic of -0.81).

6. Summary

Our analyses are based on regressions of annual earnings and components of annual earnings on daily returns. We predict and show that the earnings/daily return coefficient declines significantly over the fiscal year consistent with the notion that value change at the beginning of the year has the entire year to be incorporated in earnings while value change at the end of the year is likely to have a much lesser effect on earnings of the year.

We call the portion of the change in stock price that is recognized in earnings of the period, earnings recognition timeliness (ERT); this is estimated as the average earnings/daily returns coefficient. We dissect ERT into two elements – the current sales element and the expectations element -- which reflect the effects of two quite different fundamental elements of financial accounting. The current sales element, is a manifestation of the matching principle of accounting in which expenses are recognized in the same period as the related benefits (i.e., sales) are recognized. The expectations element reflects changes in expectations about future earnings and recognition of expenses in earnings in the current period. The significant decline in the earnings/daily return coefficient over the fiscal year is a manifestation of the current sales
element of ERT. The estimate of this coefficient at the end of the fiscal year, which is also statistically significant, is the expectations element of ERT.

The main contribution of our paper is the empirical identification of the effects of the accounting for the current sales element and the expectations element of expenses on the mapping from returns to earnings (i.e., ERT). We show, via an example, that empirical identification of these elements provides additional insights in studies that examine the difference in ERT across various scenarios.

The example we examine is the comparison of positive annual return and negative annual return sub-samples, which is, following Basu [1997], the most widely studied analysis of ERT. We argue that asymmetric timely loss recognition will be manifested in the expectations element of ERT because it reflects the portion of value change recognized in contemporaneous earnings related to changes in expectations about future earnings. The concept of asymmetric timely loss recognition does not, however, predict that the current sales element of ERT will differ across sub-samples of positive annual returns and negative annual returns. Our method permits separation of the expectations element and hence a focus on the element at the heart of arguments regarding asymmetric loss recognition.

We find that the current sales element is statistically significant for the sub-sample of observations with positive annual returns but not significantly different from zero for the sub-sample of observations with negative annual returns. Although the expectations element is statistically significant for the negative annual return sub-sample and for the positive return sub-sample, it is much larger for the negative return sub-sample. In short, most of the asymmetry in the ERT is due to the expectations element but it is also due, to a much lesser extent, to asymmetry in the current sales element.
In order to validate that the change in the earnings/daily return coefficient does reflect the current sales element of ERT, we decompose the annual earnings dependent variable, into two components: (1) gross margin (i.e., sales revenue minus cost of sales); and, (2) period expenses (i.e., gross margin minus earnings). We repeat our analyses, replacing annual earnings with gross margin and period expense as the dependent variable and we analyze the intra-year dynamics of the daily return coefficients for both specifications. This decomposition also permits us to better understand the source of asymmetric loss recognition.

The association between gross margin and returns is expected to primarily reflect expenses that are matched to sales of the current fiscal period (i.e., the current sales element). Consistent with this expectation, the gross margin/daily return coefficient is positive and statistically significant at the beginning of the fiscal year and declines to zero at the end of the year. In addition, we find that the dynamics of the gross margin/daily return coefficients do not differ significantly across a sample partition based on the sign of the annual return. This finding suggests that the period expense component of earnings, rather than the gross margin component, primarily drives the observed differences in ERT across positive/negative annual return partition.

Consistent with the notion that the period expense component of earnings tends to reflect the expectations element of ERT, we find a statistically significant difference between the average period expense/daily return coefficients for the positive annual returns sub-sample relative to the negative annual returns sub-sample. This asymmetry is the combined effect of a positive and statistically significant coefficient for the positive annual returns sub-sample and a relatively small and not statistically significant coefficient for the negative annual returns sub-sample. In other words, the observed asymmetry in ERT reflects the fact that period expenses are correlated with returns only when news is good. At first glance, this result appears
inconsistent with the Basu [1997] notion of asymmetric timely loss recognition. The apparent inconsistency is due to the fact that the *expectations* element of the period expense component of ERT is statistically significantly negative while the *current sales* element of the period expense component of ERT is statistically significantly positive. The net effect from both elements results in an estimate of the period expense/daily return coefficient that is, on average, not significantly different than zero for the negative annual returns sub-sample.

In summary, we present a method, which permits identification of the effects of two fundamental aspects of accounting on earnings recognition timeliness and we provide an example of analyses where the separation of these effects provide new insights.

There is much room for further analyses. Some examples include: (1) consideration of lagged daily returns (returns of the prior period) and leading daily returns (returns of the subsequent period) as additional independent variables; (2) comparison of, say, the fourth quarter with the other quarters of the year; and, (3) a more detailed analysis of earnings announcement effects. We consider our paper to be the necessary first step to other analyses of components of earnings. This is due to our focus on the fundamental aspects of accounting and our empirical identification of two elements of ERT, which reflect the effects of these fundamental aspects. In view of their prominence in the accounting literature, the next most obvious components to be analyzed are cash flows and accruals and the extent to which asymmetric timeliness is driven by each of these earnings components. We are currently undertaking these analyses.
References


Table 1

<table>
<thead>
<tr>
<th>Panel A: Parameter estimates from the linear coefficient regression model</th>
<th>Sign of Annual Return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full Sample</td>
</tr>
<tr>
<td>$\beta^{beg}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.139</td>
</tr>
<tr>
<td></td>
<td>(12.51)</td>
</tr>
<tr>
<td>$\beta^{end}$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.082</td>
</tr>
<tr>
<td></td>
<td>(8.63)</td>
</tr>
<tr>
<td>Avg. Adj. R²</td>
<td>0.171</td>
</tr>
</tbody>
</table>

Panel B: Estimates of Current Sales and Expectations elements

<table>
<thead>
<tr>
<th>Current Sales element $= \frac{1}{2} \cdot (\beta^{beg} - \beta^{end})$</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.029</td>
<td>-0.005</td>
<td>-0.029</td>
</tr>
<tr>
<td></td>
<td>(4.59)</td>
<td>(-0.84)</td>
<td>(-4.18)</td>
</tr>
<tr>
<td>Expectations element $= \beta^{end}$</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>0.082</td>
<td>0.262</td>
<td>0.242</td>
</tr>
<tr>
<td></td>
<td>(8.63)</td>
<td>(22.34)</td>
<td>(15.88)</td>
</tr>
<tr>
<td>Total ERT $= \frac{1}{2} \cdot (\beta^{beg} + \beta^{end})$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.111</td>
<td>0.257</td>
<td>0.213</td>
</tr>
<tr>
<td></td>
<td>(13.37)</td>
<td>(24.77)</td>
<td>(14.70)</td>
</tr>
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</table>

Panel C: Parameter estimates from the annual returns regression model

<table>
<thead>
<tr>
<th>$\beta^{ANN}$</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.112</td>
<td>0.259</td>
<td>0.220</td>
</tr>
<tr>
<td></td>
<td>(12.15)</td>
<td>(26.31)</td>
<td>(15.05)</td>
</tr>
</tbody>
</table>

Avg. Adj. R²

|               | 0.167    | 0.072    | 0.148      |

Panel A presents the mean (t-statistic) parameter estimates from the following linear coefficient regression model estimated annually from 1973 to 2009:

$$N_{It} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{t=0}^{255} \beta_t \cdot ret_{it} + \epsilon_{it}$$

subject to: $\beta_t = \beta_t^{beg} + \frac{1}{255} \cdot (\beta_t^{end} - \beta_t^{beg}) \cdot \tau$.

The dependent variable, $N_{It}$, is firm $j$'s annual net income in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $ret_{it}$ is the daily stock return of firm $j$ on day $t$, computed as the change in stock price plus dividends on day $t$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\beta_t^{beg}$ ($\beta_t^{end}$) is the estimated net income/daily return coefficient on the first (last) day of the fiscal year ending at $t$.

Panel B presents the mean (t-statistic) estimates of the current sales and expectations elements of earnings recognition timeliness (ERT) computed as linear combinations of $\beta_t^{beg}$ and $\beta_t^{end}$ from the linear coefficient regression model (Panel A). Panel C presents the mean (t-statistic) parameter estimates from the following annual returns regression model estimated annually from 1973 to 2009:

$$N_{It} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \beta_t^{ANN} \cdot RET_{it} + \epsilon_{it},$$

where $RET_{it}$ is the annual stock return ($\sum_{t=0}^{255} ret_{it}$) of firm $j$ for fiscal year $t$ and $\beta_t^{ANN}$ is the estimated net income/annual return coefficient in year $t$. The first column summarizes parameter estimates for the full sample of 102,563 observations. The second column presents model parameters estimated for the sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($RET_{it} > 0$). The third column presents model parameters estimated for the sub-sample 48,091 observations with a negative annual stock return in fiscal year $t$ ($RET_{it} < 0$). The fourth column presents the difference between parameter estimates in the second and third columns.
Table 2

<table>
<thead>
<tr>
<th>Sign of Annual Return</th>
<th>Full Sample</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td><strong>Panel A: Parameter estimates from the linear coefficient regression model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta^{beg}$</td>
<td>0.386</td>
<td>0.354</td>
<td>0.382</td>
<td>0.028</td>
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<td></td>
<td>(8.61)</td>
<td>(7.02)</td>
<td>(10.67)</td>
<td>(1.11)</td>
</tr>
<tr>
<td>$\beta^{end}$</td>
<td>0.021</td>
<td>0.032</td>
<td>0.064</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>(1.07)</td>
<td>(1.12)</td>
<td>(0.91)</td>
<td>(0.90)</td>
</tr>
<tr>
<td>Avg. Adj. R$^2$</td>
<td>0.167</td>
<td>0.143</td>
<td>0.160</td>
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<tr>
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</tr>
<tr>
<td><strong>Panel B: Estimates of Current Sales and Expectations elements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Sales element = $\frac{1}{2} \cdot (\beta^{beg} - \beta^{end})$</td>
<td>0.182</td>
<td>0.161</td>
<td>0.159</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(6.38)</td>
<td>(4.81)</td>
<td>(4.49)</td>
<td>(-0.13)</td>
</tr>
<tr>
<td>Expectations element = $\beta^{end}$</td>
<td>0.021</td>
<td>0.032</td>
<td>0.064</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>(1.07)</td>
<td>(1.12)</td>
<td>(0.91)</td>
<td>(0.90)</td>
</tr>
<tr>
<td>Total ERT = $\frac{1}{2} \cdot (\beta^{beg} + \beta^{end})$</td>
<td>0.203</td>
<td>0.193</td>
<td>0.223</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td>(10.44)</td>
<td>(8.16)</td>
<td>(5.17)</td>
<td>(1.13)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Panel C: Parameter estimates from the annual returns regression model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta^{ANN}$</td>
<td>0.233</td>
<td>0.201</td>
<td>0.241</td>
<td>0.037</td>
</tr>
<tr>
<td></td>
<td>(7.88)</td>
<td>(6.37)</td>
<td>(7.27)</td>
<td>(1.67)</td>
</tr>
<tr>
<td>Avg. Adj. R$^2$</td>
<td>0.158</td>
<td>0.130</td>
<td>0.152</td>
<td></td>
</tr>
</tbody>
</table>

Panel A presents the mean (t-statistic) parameter estimates from the following linear coefficient regression model estimated annually from 1973 to 2009:

$$GM_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{i=0}^{251} \beta_i \cdot ret_{jt} + \varepsilon_{jt}$$

subject to: $\beta_i = \beta^{beg}_i + \frac{1}{251} \cdot (\beta^{end}_i - \beta^{beg}_i) \cdot \tau$.

The dependent variable, $GM_{jt}$, is firms’ annual gross margin (i.e., sales less cost of goods sold) in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$, $ret_{jt}$ is the daily stock return of firm $j$ on day $t$, computed as the change in stock price plus dividends on day $t$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\beta^{beg}_i$ ($\beta^{end}_i$) is the estimated gross margin/daily return coefficient on the first (last) day of the fiscal year ending at $t$. $\alpha_t$ is the regression intercept (not reported) and $\alpha_{kt}$ are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. Panel B presents the mean (t-statistic) estimates of the current sales and expectations elements computed as linear combinations of $\beta^{beg}_i$ and $\beta^{end}_i$ from the linear coefficient regression model (Panel A). Panel C presents the mean (t-statistic) parameter estimates from the following annual returns regression model estimated annually from 1973 to 2009:

$$GM_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \beta^{ANN}_t \cdot RET_{jt} + \varepsilon_{jt},$$

where $RET_{jt}$ is the annual stock return ($\sum_{i=0}^{251} ret_{jt}$) of firm $j$ for fiscal year $t$ and $\beta^{ANN}_t$ is the estimated gross margin/annual return coefficient in year $t$. The first column summarizes parameter estimates for the full sample of 102,563 observations. The second column presents model parameters estimated for the sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($RET_{jt} \geq 0$). The third column presents model parameters estimated for the sub-sample 48,091 observations with a negative annual stock return in fiscal year $t$ ($RET_{jt} < 0$). The fourth column presents the difference between parameter estimates in the second and third columns.
Table 3
Estimates of the Intra-year Period Expense/Daily Return Coefficients, the Current Sales and Expectations Elements, and the Period Expense/Annual Return Coefficient

<table>
<thead>
<tr>
<th>Sign of Annual Return</th>
<th>Full Sample</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: Parameter estimates from the linear coefficient regression model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta^{beg}$</td>
<td>0.247</td>
<td>0.285</td>
<td>0.129</td>
<td>-0.156</td>
</tr>
<tr>
<td></td>
<td>(6.68)</td>
<td>(6.79)</td>
<td>(4.61)</td>
<td>(-2.96)</td>
</tr>
<tr>
<td>$\beta^{end}$</td>
<td>-0.061</td>
<td>0.012</td>
<td>-0.198</td>
<td>-0.210</td>
</tr>
<tr>
<td></td>
<td>(-0.53)</td>
<td>(1.27)</td>
<td>(-2.86)</td>
<td>(-3.08)</td>
</tr>
<tr>
<td>Avg. Adj. R²</td>
<td>0.126</td>
<td>0.127</td>
<td>0.121</td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Estimates of Current Sales and Expectations elements

Current Sales element $= \frac{1}{2} \cdot (\beta^{beg} - \beta^{end})$

| | Full Sample | Positive | Negative | Difference |
| | | 0.154 | 0.137 | 0.164 | 0.027 |
| | (6.54) | (4.93) | (6.32) | (1.03) |

Expectations element $= \beta^{end}$

| | Full Sample | Positive | Negative | Difference |
| | | -0.061 | 0.012 | -0.198 | -0.210 |
| | (6.54) | (4.93) | (6.32) | (1.03) |

Total ERT $= \frac{1}{2} \cdot (\beta^{beg} + \beta^{end})$

| | Full Sample | Positive | Negative | Difference |
| | | 0.093 | 0.149 | -0.034 | -0.183 |
| | (1.13) | (11.78) | (-0.75) | (-3.33) |

Panel C: Parameter estimates from the annual returns regression model

$\beta^{ANN}$

| | Full Sample | Positive | Negative | Difference |
| | | 0.121 | 0.162 | -0.018 | -0.183 |
| | (4.51) | (7.13) | (-0.88) | (-3.11) |

Avg. Adj. R²

| | Full Sample | Positive | Negative | Difference |
| | | 0.119 | 0.111 | 0.115 |

Panel A presents the mean (t-statistic) parameter estimates from the following linear coefficient regression model estimated annually from 1973 to 2009:

$$PE_t = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} \cdot \text{REP}_{kt} + \sum_{i=0}^{24} \beta_{i} \cdot \text{ret}_{it} + \epsilon_{it}$$

subject to: $\beta_{i} = \beta^{beg}_{i} + \frac{1}{251} \cdot (\beta^{end}_{i} - \beta^{beg}_{i}) \cdot \tau$.

The dependent variable, $PE_t$, is firms $j$'s annual period expense (equal to gross margin less net income) in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $\text{REP}_{kt}$ is the daily stock return of firm $j$ on day $\tau$, computed as the change in stock price plus dividends on day $\tau$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\beta^{beg}_{i}$ ($\beta^{end}_{i}$) is the estimated period expense/daily return coefficient on the first (last) day of the fiscal year ending at $t$. $\alpha_{kt}$ is the regression intercept (not reported) and $\alpha_{kt}$ is a fixed-effect parameter (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. Panel B presents the mean (t-statistic) estimates of the current sales and expectations elements computed as linear combinations of $\beta^{beg}_{i}$ and $\beta^{end}_{i}$ from the linear coefficient regression model (Panel A). Panel C presents the mean (t-statistic) parameter estimates from the following annual returns regression model estimated annually from 1973 to 2009:

$$PE_t = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \beta^{ANN}_{t} \cdot \text{RET}_{it} + \epsilon_{it},$$

where $\text{RET}_{it}$ is the annual stock return (\sum_{t=1}^{251} \text{ret}_{it}) of firm $j$ for fiscal year $t$ and $\beta^{ANN}_{t}$ is the estimated period expense/annual return coefficient in year $t$. The first column summarizes parameter estimates for the full sample of 102,563 observations. The second column presents model parameters estimated for the sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($\text{RET}_{it} \geq 0$). The third column presents model parameters estimated for the sub-sample 48,091 observations with a negative annual stock return in fiscal year $t$ ($\text{RET}_{it} < 0$). The fourth column presents the difference between parameter estimates in the second and third columns.
Table 4  
Estimates of Intra-year Net Income/Daily Return Coefficients for the Linear with Earnings Announcements (EA) Coefficient Regression Model and the Current Sales and Expectations Elements

| Panel A: Parameter estimates from the linear with earnings announcement (EA) coefficient regression model | Sign of Annual Return |
| --- | --- | --- | --- | --- |
| Full Sample | Positive | Negative | Difference |
| $\beta_{beg}$ | 0.117 | 0.055 | 0.242 | 0.187 |
| (9.88) | (3.38) | (17.05) | (10.33) |
| $\beta_{end}$ | 0.088 | 0.023 | 0.254 | 0.231 |
| (8.82) | (2.83) | (18.09) | (15.79) |
| $\beta_{ea,q4}$ | 0.092 | 0.097 | 0.077 | -0.020 |
| (7.66) | (8.89) | (4.93) | (-1.12) |
| $\beta_{ea,q1}$ | 0.095 | 0.113 | 0.064 | -0.058 |
| (9.27) | (10.99) | (3.83) | (-2.62) |
| $\beta_{ea,q2}$ | 0.091 | 0.099 | 0.092 | -0.007 |
| (7.63) | (6.12) | (4.65) | (-0.37) |
| $\beta_{ea,q3}$ | 0.058 | 0.060 | 0.053 | -0.007 |
| (5.55) | (5.40) | (2.35) | (-0.33) |
| Avg. Adj. R$^2$ | 0.192 | 0.122 | 0.170 |

| Panel B: Estimates of Current Sales and Expectations elements |
| Current Sales element | $= \frac{1}{2} \cdot (\beta_{beg} - \beta_{end})$ | 0.015 | 0.016 | -0.006 | -0.022 |
| (2.40) | (2.36) | (-2.47) | (-3.82) |
| Expectations element | $= \beta_{end}$ | 0.088 | 0.023 | 0.254 | 0.231 |
| (8.82) | (2.83) | (18.09) | (15.79) |
| Total ERT | $= \frac{1}{2} \cdot (\beta_{beg} + \beta_{end})$ | 0.103 | 0.039 | 0.248 | 0.209 |
| (9.81) | (8.65) | (11.28) | (6.93) |

Panel A presents the mean (t-statistic) parameter estimates from the following linear with EA coefficient regression model estimated annually from 1973 to 2009:

$$N_{f,t} = \alpha_t + \sum_{j=1}^{14} \alpha_{jt} + \sum_{j=2}^{51} \beta_{jt} \cdot \text{ret}_{jt} + \epsilon_{jt}$$

subject to: $\beta_{jt} = \beta_{jt}^{beg} + \frac{1}{254} \cdot \left( \beta_{jt}^{end} - \beta_{jt}^{beg} \right) \cdot \tau + \beta_{jt}^{q4} \cdot e_{jt}^{q4} + \beta_{jt}^{q3} \cdot e_{jt}^{q3} + \beta_{jt}^{q2} \cdot e_{jt}^{q2} + \beta_{jt}^{q1} \cdot e_{jt}^{q1}.$

The dependent variable, $N_{f,t}$, is firm $j$’s annual net income in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $\text{ret}_{jt}$ is the daily stock return of firm $j$ on day $t$, computed as the change in stock price plus dividends on day $t$ scaled by stock price at the beginning of fiscal year $t$, where $t$ is the number of trading days relative to the first day of fiscal year $t$. $e_{jt}^{q4}$ is an indicator variable equal to 1 if day $t$ is within a 3-day window centered on the prior fiscal year’s fourth quarter earnings announcement date of firm $j$. $e_{jt}^{q4}, e_{jt}^{q3}, e_{jt}^{q2}$ and $e_{jt}^{q1}$ are indicator variables equal to 1 if day $t$ is within a 3-day window centered on the current fiscal year’s first, second, and third quarter earnings announcement dates, respectively, of firm $j$. $\beta_{jt}^{beg}$ ($\beta_{jt}^{end}$) is the estimated net income/daily return coefficient on the first (last) day of the fiscal year ending at $t$. $\beta_{jt}^{q4}$ is the estimated incremental net income/daily return coefficient on the 3-days centered on the prior fiscal year’s fourth quarter earnings announcement date of firm $j$. $\beta_{jt}^{q3}, \beta_{jt}^{q2}$ and $\beta_{jt}^{q1}$ are the estimated incremental net income/daily return coefficients on the 3-days centered on the current fiscal year’s first, second, and third quarter earnings announcement dates, respectively, of firm $j$. $\alpha_t$ is the regression intercept (not reported) and $\epsilon_{jt}$ are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998].

Panel B presents the mean (t-statistic) estimates of the current sales and expectations elements computed as linear combinations of $\beta_{jt}^{beg}$ and $\beta_{jt}^{end}$ from the linear coefficient regression model (Panel A). The first column summarizes parameter estimates for the full sample of 83,363 observations. The second column presents model parameters estimated for the sub-sample of 44,066 observations with a positive annual stock return in fiscal year $t$ ($\text{ret}_{jt} > 0$). The third column presents model parameters estimated for the sub-sample of 39,297 observations with a negative annual stock return in fiscal year $t$ ($\text{ret}_{jt} < 0$). The fourth column presents the difference between parameter estimates in the second and third columns.
Table 5

<table>
<thead>
<tr>
<th></th>
<th>Full Sample</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.036</td>
<td>0.015</td>
<td>0.056</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(13.03)</td>
<td>(3.88)</td>
<td>(25.50)</td>
</tr>
<tr>
<td>$\rho_{beg}$</td>
<td></td>
<td>0.024</td>
<td>0.006</td>
<td>0.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12.86)</td>
<td>(2.99)</td>
<td>(20.46)</td>
</tr>
<tr>
<td>$\rho_{end}$</td>
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<td>0.004</td>
<td>0.001</td>
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<td>(3.41)</td>
<td>(2.86)</td>
<td>(1.20)</td>
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<td>Current Sales element</td>
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<td>0.006</td>
<td>0.054</td>
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<td></td>
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<td>(12.86)</td>
<td>(2.99)</td>
<td>(20.46)</td>
</tr>
<tr>
<td>Expectations element</td>
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<td>0.010</td>
<td>0.055</td>
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<td>Total ERT</td>
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<td>0.010</td>
<td>0.055</td>
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<tr>
<td></td>
<td></td>
<td>(19.12)</td>
<td>(3.96)</td>
<td>(24.12)</td>
</tr>
</tbody>
</table>

Panel B: Variance-adjusted gross margin/daily return analysis

<table>
<thead>
<tr>
<th></th>
<th>Full Sample</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\rho_{beg}$</td>
<td></td>
<td>0.026</td>
<td>0.025</td>
<td>0.030</td>
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<tr>
<td></td>
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<td>(13.23)</td>
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<td>(11.07)</td>
</tr>
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<td>$\rho_{end}$</td>
<td></td>
<td>0.003</td>
<td>-0.001</td>
<td>0.002</td>
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<td></td>
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<td>(1.23)</td>
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<td>(0.59)</td>
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<td>Current Sales element</td>
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<td>0.013</td>
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<td>(6.37)</td>
<td>(9.02)</td>
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<td>-0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>Total ERT</td>
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<td>0.012</td>
<td>0.016</td>
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<tr>
<td></td>
<td></td>
<td>(8.71)</td>
<td>(4.48)</td>
<td>(5.97)</td>
</tr>
</tbody>
</table>

Panel C: Variance-adjusted period expense/daily return analysis

<table>
<thead>
<tr>
<th></th>
<th>Full Sample</th>
<th>Positive</th>
<th>Negative</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\rho_{beg}$</td>
<td></td>
<td>0.015</td>
<td>0.018</td>
<td>0.011</td>
</tr>
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<td>(7.66)</td>
<td>(4.35)</td>
</tr>
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<td>-0.002</td>
<td>-0.010</td>
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<td>(-1.43)</td>
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<td>(7.60)</td>
<td>(8.68)</td>
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<td>Expectations element</td>
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<td></td>
<td></td>
<td>(2.66)</td>
<td>(6.05)</td>
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(continued)
Panel A presents the mean (t-statistic) parameter estimates from the following linear coefficient regression model estimated annually from 1973 to 2009:

\[ N_{jt}^{adj} = \sum_{\tau=0}^{251} \rho_{\tau t} \cdot ret_{jt\tau}^{adj} + \varepsilon_{jt} \]

subject to: \( \rho_{\tau t} = \rho_{t \, beg} + \frac{1}{251} \left( \rho_{t \, end} - \rho_{t \, beg} \right) \cdot \tau \).

The dependent variable, \( N_{jt}^{adj} \), is the variance-normalized annual net income of firm \( j \) in year \( t \) equal to \( (N_{jt} - \bar{N}_{kt}) / \sigma_t(N_{jt} - \bar{N}_{kt}) \), where \( N_{jt} \) is the annual net income of firm \( j \) in fiscal year \( t \) scaled by stock price at the beginning of fiscal year \( t \), \( \bar{N}_{kt} \) is the average \( N_{jt} \) across all firms within industry \( k \) (based on industry classifications defined in Barth, Beaver and Landsman [1998]) to which firm \( j \) belongs in year \( t \), and \( \sigma_t(N_{jt} - \bar{N}_{kt}) \) is the cross-sectional standard deviation of the industry-adjusted annual net income for all firms in year \( t \). \( ret_{jt\tau}^{adj} \) is the variance-normalized daily stock return of firm \( j \) on day \( \tau \) equal to \( \left( ret_{jt\tau} - \bar{ret}_{kt\tau} \right) / \sigma_{\tau t}(ret_{jt\tau} - \bar{ret}_{kt\tau}) \), where \( ret_{jt\tau} \) is the change in stock price plus dividends on day \( \tau \) scaled by stock price at the beginning of fiscal year \( t \) of firm \( j \), \( \tau \) is the number of trading days relative to the first day of fiscal year \( t \), \( \bar{ret}_{kt\tau} \) is the average \( ret_{jt\tau} \) on day \( \tau \) across all firms within industry \( k \) and year \( t \), and \( \sigma_{\tau t}(ret_{jt\tau} - \bar{ret}_{kt\tau}) \) is the cross-sectional standard deviation of the industry-adjusted daily stock return of firm \( j \) on day \( \tau \) within year \( t \). Mean (t-statistic) estimates of the current sales and expectations elements of earnings recognition timeliness (ERT) are computed as linear combinations of \( \rho_{t \, beg} \) and \( \rho_{t \, end} \) from the linear coefficient regression model. Panel B (Panel C) presents results for the linear coefficient model where the dependent variable, \( N_{jt}^{adj} \), is replaced by \( GM_{jt}^{adj} \) (\( PE_{jt}^{adj} \)), which is the variance-normalized annual gross margin (period expense) of firm \( j \) in year \( t \) computed in the same manner as \( N_{jt}^{adj} \) (described above).
Figure 1
Estimates of the Intra-year Net Income/Daily Return Coefficients for the Linear Coefficient Regression Model based on the Full Sample

This figure plots the mean estimate of the net income/daily return coefficient estimate, $\beta_\tau$, as a function of the number of trading days relative to the first day of the current fiscal year, $\tau$. The mean is the average of annual coefficients estimated via the following linear coefficient regression model for each year, 1973 to 2009:

$$NI_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{t=0}^{251} \beta_{tt} \cdot ret_{jt} + \epsilon_{jt}$$

subject to: $\beta_{tt} = \beta_{tt}^{beg} + \frac{1}{251} \cdot (\beta_{tt}^{end} - \beta_{tt}^{beg}) \cdot \tau$.

The dependent variable, $NI_{jt}$, is firm $j$’s annual net income in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $ret_{jt}$ is the daily stock return of firm $j$ on day $\tau$, computed as the change in stock price plus dividends on day $\tau$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\beta_{tt}^{beg}$ ($\beta_{tt}^{end}$) is the estimated net income/daily return coefficient on the first (last) day of the fiscal year ending at $t$. $\alpha_t$ is the regression intercept (not reported) and $\alpha_{kt}$ are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. The model is estimated for the full sample of 102,563 observations.
Figure 2

Estimates of the Intra-year Net Income/Daily Return Coefficients for the Linear Coefficient Regression Model Partitioned by the Sign of the Annual Return

This plots the mean estimate of the net income/daily return coefficient estimate, \( \beta \), as a function of the number of trading days relative to the first day of the current fiscal year, \( \tau \). The mean is the average of annual coefficients estimated via the following linear coefficient regression model for each year, 1973 to 2009:

\[
N_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{t=0}^{251} \beta_{\tau t} \cdot \text{ret}_{jt} + \epsilon_{jt}
\]

subject to: \( \beta_{\tau t} = \beta_{\tau t}^{beg} + \frac{1}{251} \cdot (\beta_{\tau t}^{end} - \beta_{\tau t}^{beg}) \cdot \tau \).

The dependent variable, \( N_{jt} \), is firm \( j \)'s annual net income in fiscal year \( t \) scaled by stock price at the beginning of fiscal year \( t \). \( \text{ret}_{jt} \) is the daily stock return of firm \( j \) on day \( \tau \), computed as the change in stock price plus dividends on day \( \tau \) scaled by stock price at the beginning of fiscal year \( t \), where \( \tau \) is the number of trading days relative to the first day of fiscal year \( t \). \( \beta_{\tau t}^{beg} \) (\( \beta_{\tau t}^{end} \)) is the estimated net income/daily return coefficient on the first (last) day of the fiscal year ending at \( t \). \( \alpha_t \) is the regression intercept (not reported) and \( \alpha_{kt} \) are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. The model is estimated separately for a sub-sample of 54,472 observations with a positive annual stock return in fiscal year \( t \left( \sum_{t=0}^{251} \text{ret}_{jt} \geq 0 \right) \), and for a sub-sample of 48,091 observations with a negative annual stock return in fiscal year \( t \left( \sum_{t=0}^{251} \text{ret}_{jt} < 0 \right) \).
Figure 3
Estimates of the Intra-year Gross Margin/Daily Return Coefficients for the Linear Coefficient Regression Model Partitioned by the Sign of the Annual Return

\[
\beta_{\text{beg}} = 0.382 \\
\beta_{\text{end}} = 0.064
\]

LEGEND:

\[\text{POSITIVE} \quad \beta_{\text{beg}} = 0.354 - 0.332 \cdot \frac{\tau}{251} \quad \text{(NEGATIVE)}\]

\[\text{POSITIVE} \quad \beta_{\text{end}} = 0.032 \quad \text{(POSITIVE)}\]

\[\beta_{\text{end}} = 0.064 \quad \text{(NEGATIVE)}\]

\[\beta_{\text{end}} = 0.032 \quad \text{(POSITIVE)}\]

This figure plots the mean estimate of the gross margin/daily return coefficient estimate, \(\beta_{\tau}\), as a function of the number of trading days relative to the first day of the current fiscal year, \(\tau\). The mean is the average of annual coefficients estimated via the following linear coefficient regression model for each year, 1973 to 2009:

\[
GM_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{t=0}^{251} \beta_{\tau} \cdot \text{ret}_{jft} + e_{jt}
\]

subject to: \(\beta_{\tau} = \beta_{\text{beg}} + \frac{1}{251} \cdot (\beta_{\text{end}} - \beta_{\text{beg}}) \cdot \tau\).

The dependent variable, \(GM_{jt}\), is firms \(j\)'s annual gross margin (i.e., sales less cost of goods sold) in fiscal year \(t\) scaled by stock price at the beginning of fiscal year \(t\). \(\text{ret}_{jft}\) is the daily stock return of firm \(j\) on day \(\tau\) scaled by stock price at the beginning of fiscal year \(t\), where \(\tau\) is the number of trading days relative to the first day of fiscal year \(t\). \(\beta_{\text{beg}}\) (\(\beta_{\text{end}}\)) is the estimated gross margin/daily return coefficient on the first (last) day of the fiscal year ending at \(t\). \(\alpha_t\) is the regression intercept (not reported) and \(\alpha_{kt}\) are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. The model is estimated separately for a sub-sample of 54,472 observations with a positive annual stock return in fiscal year \(t\) \((\sum_{t=0}^{251} \text{ret}_{jft} \geq 0)\), and for a sub-sample of 48,091 observations with a negative annual stock return in fiscal year \(t\) \((\sum_{t=0}^{251} \text{ret}_{jft} < 0)\).
Estimates of the Intra-year Period Expense/Daily Return Coefficients for the Linear Coefficient Regression Model Partitioned by the Sign of the Annual Return

This figure plots the mean estimate of the period expense/daily return coefficient estimate, $\beta_\tau$, as a function of the number of trading days relative to the first day of the current fiscal year, $\tau$. The mean is the average of annual coefficients estimated via the following linear coefficient regression model for each year, 1973 to 2009:

$$PE_{jt} = \alpha_t + \sum_{k=1}^{14} \alpha_{kt} + \sum_{t=0}^{251} \beta_{t} \cdot ret_{jt} + \epsilon_{jt}$$

subject to: $\beta_{t} = \beta_{t}^{beg} + \frac{1}{251} \cdot (\beta_{t}^{end} - \beta_{t}^{beg}) \cdot \tau$.

The dependent variable, $PE_{jt}$, is firm $j$’s annual period expenses (i.e., net income less gross margin) in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $ret_{jt}$ is the daily stock return of firm $j$ on day $t$, computed as the change in stock price plus dividends on day $t$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\beta_{t}^{beg}$ ($\beta_{t}^{end}$) is the estimated period expense/daily return coefficient on the first (last) day of the fiscal year ending at $t$. $\alpha_t$ is the regression intercept (not reported) and $\alpha_{kt}$ are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. The model is estimated separately for a sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jt} \geq 0$), and for a sub-sample of 48,091 observations with a negative annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jt} < 0$).
Figure 5
Estimates of the Intra-year Net Income/Daily Return Coefficients for the Linear and Linear with EA Coefficient Regression Models by the Sign of the Annual Return

This figure plots the mean estimate of the net income/daily return coefficient estimate, $\beta_t$, as a function of the number of trading days relative to the first day of the current fiscal year, $\tau$. The mean is the average of annual coefficients estimated via the following linear coefficient regression model for each year, 1973 to 2009:

$$N_{jt} = \alpha_t + \sum_{k=1}^{14} a_{kt} + \sum_{t=0}^{251} \beta_{t\tau} \cdot ret_{jt} + \epsilon_{jt}$$

The dependent variable, $N_{jt}$, is firms' annual net income in fiscal year $t$ scaled by stock price at the beginning of fiscal year $t$. $ret_{jt}$ is the daily stock return of firm $j$ on day $\tau$, computed as the change in stock price plus dividends on day $\tau$ scaled by stock price at the beginning of fiscal year $t$, where $\tau$ is the number of trading days relative to the first day of fiscal year $t$. $\alpha_t$ is the regression intercept (not reported) and $a_{kt}$ are fixed-effect parameters (not reported) based on industry classifications defined in Barth, Beaver and Landsman [1998]. $\beta_{t\tau}$ is the net income/daily return coefficient on day $\tau$ estimated for firms with annual fiscal period ending in year $t$. The linear coefficient model (represented by a dashed line) constrains $\beta_{t\tau}$ as follows:

$$\beta_{t\tau} = \beta_{t\tau}^{beg} + \frac{1}{251} \left( \beta_{t\tau}^{end} - \beta_{t\tau}^{beg} \right) \cdot \tau$$

where $\beta_{t\tau}^{beg}$ ($\beta_{t\tau}^{end}$) is the estimated net income/daily return coefficient on first (last) day of the annual fiscal period ending at $t$. The linear with EA coefficient model (represented by a solid line) constrains $\beta_{t\tau}$ as follows:

$$\beta_{t\tau} = \beta_{t\tau}^{beg} + \frac{1}{251} \left( \beta_{t\tau}^{end} - \beta_{t\tau}^{beg} \right) \cdot \tau + \beta_{t\tau}^{31} \cdot ea_{jt}^{q3} + \beta_{t\tau}^{32} \cdot ea_{jt}^{q3} + \beta_{t\tau}^{33} \cdot ea_{jt}^{q3}$$

where $ea_{jt}^{q3}$ is an indicator variable equal to 1 if day $\tau$ is within a 3-day window centered on the prior fiscal year's fourth quarter earnings announcement date of firm $j$. $ea_{jt}^{q1}, ea_{jt}^{q2}$ and $ea_{jt}^{q3}$ are indicator variables equal to 1 if day $\tau$ is within a 3-day window centered on the current fiscal year's first, second, and third quarter earnings announcement dates, respectively, of firm $j$. $\beta_{t\tau}^{beg}$ ($\beta_{t\tau}^{end}$) is the estimated net income/daily return coefficient on first (last) day of the annual fiscal period ending at $t$. $\beta_{t\tau}^{31}$ is the estimated incremental net income/daily return coefficient on the 3-days centered on the prior fiscal year's fourth quarter earnings announcement dates, respectively, of firm $j$. The model is estimated separately for a sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jt} \geq 0$), and for a sub-sample of 48,091 observations a negative annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jt} < 0$).
This figure plots the standard deviation of industry-adjusted daily returns, $\sigma_\tau$, as a function of the number of trading days, $\tau$, relative to the first day of the fiscal year. $\sigma_\tau$ is the annual time series average of $\sigma_{\tau t}$, which is the cross-sectional standard deviation of industry-adjusted daily returns on day $\tau$ for all firms in year $t$. Industry classifications are based on Barth, Beaver and Landsman [1998]. The model is estimated separately for the full sample of 102,563 observations, for a sub-sample of 54,472 observations with a positive annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jtt} \geq 0$), and for a sub-sample of 48,091 observations with a negative annual stock return in fiscal year $t$ ($\sum_{t=0}^{251} ret_{jtt} < 0$).