Do Stock Prices Fully Reflect the Implications of Special Items for Future Earnings?

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ABSTRACT

Previous research (Rendleman, Jones, and Latane [1987]; Freeman and Tse [1989]; Bernard and Thomas [1990]; and Ball and Bartov [1996]) indicates that security prices do not fully reflect predictable elements of the relation between current and future quarterly earnings. We investigate whether this finding also holds for the special items component of earnings. Given that special items are prominent in financial analysis and are assumed to have relatively straightforward implications for future earnings (special items are assumed to be largely transitory), one might expect that prices would fully impound the implications of special items for future earnings. Based on the “two-equation” approach used in Ball and Bartov [1996] and other studies (e.g., Abarbanell and Bernard [1992]; Sloan [1996]; Rangan and Sloan [1998]; and Soffer and Lys [1999]), we find that while prices reflect relatively more of the effects of special items compared to other earnings components, we still reject...
the null hypothesis that prices fully impound the implications of special items for future earnings. The “two-equation” approach assesses the consistency of coefficients in a pair of prediction and pricing equations, and thus depends on an assumed functional form. However, a less structured abnormal returns methodology like that used in Bernard and Thomas [1990] also supports the conclusion that the implications of special items are not fully impounded in prices. Specifically, a trading strategy based only on the sign of special items earns small but statistically significant abnormal returns during a 3-day window four quarters subsequent to the original announcement of special items.

1. Introduction

There is a growing body of evidence that market prices are less than perfectly efficient in that prices do not completely impound all publicly available information (e.g., Rendleman, Jones, and Latane [1987]; Freeman and Tse [1989]; Ou and Penmann [1989]; Sloan [1996]; and Frankel and Lee [1998]). One of the earlier, and arguably most influential, papers to establish this point is the paper by Bernard and Thomas ([1990], henceforth BT) which shows that the predictable relation between current and future quarterly earnings is not fully impounded in prices. In other words, current earnings have implications for expected future earnings, but when subsequent future earnings are announced, market prices react as if the predictable effect on expected future earnings had not been fully impounded in market prices. Ball and Bartov ([1996], hereafter BB) quantify the extent to which information in quarterly earnings changes is impounded in prices and conclude that prices seem to underestimate the implications of quarterly earnings changes for subsequent earnings by 50 percent on average across the four subsequent quarters.

The aggregate earnings series examined by BT and BB comprise a set of underlying components, each with potentially different implications for expected future earnings. In this study, we examine a component of earnings, special items, that has effects on expected future earnings much different from the average effect of aggregate earnings. In contrast to the persistent elements of aggregate earnings, special items are commonly viewed as transitory.¹ We assess the extent to which market prices reflect differences in the implications of special items versus the remaining components of aggregate earnings for subsequent earnings, and thus extend the literature on market efficiency in pricing earnings.

In light of results in BT and BB showing that the market does not fully impound the implications of previously announced aggregate earnings by the time of announcement of subsequent aggregate earnings, a natural question arises: Does the market fully impound properties of special items, an

¹ See discussions of special items in Elliott and Shaw [1988], Elliott and Hanna [1996], Francis, Hanna, and Vincent [1996], and in section 2, below.
earnings component that has implications for future earnings that differ sharply, and some would say obviously, from the implications of other earnings components? To address this question we adapt the “two-equation” approach in BB, where the two equations consist of a prediction equation relating past to current earnings and a pricing equation relating returns to both past and current earnings.

Empirical estimates from the prediction equation confirm that, consistent with general beliefs, special items are more transitory than the remaining components of earnings. However, estimates also reveal significant differences between the effects of positive and negative special items on future earnings. Positive special items are less than completely transitory in the sense that positive special items are followed on average by a smaller but non-zero amount of earnings of the same sign in subsequent quarters. Negative special items, on the other hand, are followed by earnings of the opposite sign in subsequent quarters. This is consistent with the conjecture that negative special items sometimes represent a shift of expenses from future periods into the current period (through, for example, restructuring charges) that reduce current income but increase future income.

Our results also suggest that prices reflect a larger proportion of the implications of special items compared to the remaining components of earnings, consistent with the proposition that because the implications of (largely) transitory special items for future earnings are relatively clear, market prices reflect relatively more of the implications of special items. Focusing on the announcement of future earnings four quarters subsequent to the original announcement (where the implications for future earnings of special items differ most from the implications of the remaining components of earnings), we find that the effect of special items on future earnings is underestimated by about 27 percent. In contrast, for aggregate earnings, BB find that the effect on future earnings four quarters subsequent to the original announcement is underestimated by approximately 75 percent.

While special items are commonly viewed as transitory on average, the implications of individual special items for future earnings may be difficult to assess. For example, one type of special item may be completely transitory and have absolutely no implications for future earnings (either for future special items or future recurring earnings realizations). However, another type of special item may incorporate temporal expense shifting and therefore have a definite implication for the future period from which the expense was shifted (see section 2). Further, users must also assess whether a special item is indicative of a new disclosure policy choice, which may in turn have implications for the frequency of future special items. Our study addresses the average behavior of special items. While our analysis allows for differences between negative and positive special items, we do not consider other differences between types of special items which may impose significant analysis costs on the users of firms’ financial reports. Exploration of other differences between types of special items is left for future research.

As explained in section 4, the Ball and Bartov approach assesses the consistency of corresponding coefficients from the prediction and pricing equations and is closely related to the methodologies used in Abarbanell and Bernard [1992], Sloan [1996], Rangan and Sloan [1998], and Soffer and Lys [1999].
We also conclude that market expectations reflect the differences in the implications for future earnings of positive versus negative special items. Although the implications differ, prices impound approximately the same proportion of the information in positive versus negative special items.

The “two-equation” approach relies on an assumed functional form relating returns to past and current earnings and it is impossible to determine the extent to which violations of related econometric assumptions might account for the observed results. However, the conclusion that the implications of special items are not fully impounded in prices can also be demonstrated by applying a simpler methodology used in BT. Specifically, we show that small but statistically significant abnormal returns can be earned during a 3-day window four quarters subsequent to the announcement of earnings and special items by adopting a trading strategy that relies only on the sign of special items. Thus, the results of the simpler trading strategy approach also support the conclusion that the predictable effects of special items on future earnings are not yet fully impounded in prices at a point approximately one year after the special items are reported.

The remainder of our paper is organized as follows. In section 2 we discuss prototypical effects of a component of earnings on expected future earnings and review relevant prior research. A description of the data is provided in section 3, and procedures and results are described in section 4, which is followed by a summary and conclusions in section 5.

2. Effects of Special Items

In this section, we describe four prototypical relations between a component of earnings (e.g., special items) in quarter \( t \) and expectations of seasonally-differenced earnings in quarters \( t+1 \) through \( t+4 \). After discussing these relations, we review prior research examining special items.

2.1 Prototypical Effects

BT ([1990], page 310) develop an example to describe the effect of an earnings innovation in quarter \( t \) on expectations of seasonally-differenced earnings for quarters \( t+1 \) through \( t+4 \). The example assumes a strong seasonal pattern with no trend. Realized earnings for quarters \( t-4 \) through \( t-1 \) are \$10.00, $10.00, $10.00, and $20.00, respectively. In the absence of earnings innovations, expected earnings for quarters \( t \) through \( t+4 \) would be $10.00, $10.00, $10.00, $20.00, and $10.00, respectively.

BT describe the empirically-estimated effect of a \$1.00 earnings innovation in quarter \( t \) on expectations of subsequent quarter earnings, where the estimated effects on expectations for quarters \( t+1 \) to \( t+4 \) are \$34, \$19, \$0.6, and \$-24 (see figure 1). We describe the hypothetical effect of a \$1.00 innovation for four prototypical effects. The two random walk prototypes represent two alternative forms of permanent effects where the entire innovation carries over, either to all subsequent quarters (for the
non-seasonal random walk) or to only the corresponding fiscal quarters of subsequent years (for the seasonal random walk). The transitory prototype represents a temporary effect where none of the innovation carries over to subsequent quarters. Finally, for the inter-period transfer prototype, the innovation has no effect on cumulative earnings but rather represents a reallocation of income among quarters so that the innovation in period $t$ is exactly matched by offsetting innovations in subsequent periods. An example of a prototypical inter-period transfer is a restructuring charge recognized in period $t$ that represents immediate recognition of costs more properly expensed in periods $t+1$, $t+2$, and subsequent periods.

(1) **Non-seasonal random walk.** Expectations shift upward by $1.00 for all subsequent quarters, so that effects on expectations of seasonally-differenced earnings in quarter $t+1$ through $t+4$ are 1.00, 1.00, 1.00, and .00.
(2) **Seasonal random walk.** Expectations shift upward by $1.00 for subsequent corresponding seasonal quarters only, so that effects on expectations of seasonally-differenced earnings in quarter $t + 1$ through $t + 4$ are .00, .00, .00, and .00.

(3) **Transitory.** Expectations for subsequent quarters are unaffected by the $1.00$ innovation, and effects on expectations of seasonally-differenced earnings in quarter $t + 1$ through $t + 4$ are .00, .00, .00, and $-1.00$.

(4) **Inter-period transfer.** Expectations for subsequent quarters are affected by the transfer of income among quarters. For example, assume the currently recognized $1.00$ earnings innovation would otherwise have been recognized in income evenly each quarter over the next twenty quarters so that subsequent earnings are reduced by $.05$ per quarter. Effects on expectations of seasonally-differenced earnings in quarter $t + 1$ through $t + 4$ are $-0.05$, $-0.05$, $-0.05$, and $-1.05$.\(^4\)

Previous evidence suggests that the time-series behavior of aggregate seasonally-differenced quarterly earnings is not well-described by any one of the four prototypes, but instead reflects characteristics of both the non-seasonal random walk and the transitory prototypes. A portion of an earnings innovation in quarter $t$ persists through quarters $t + 1$, $t + 2$ and $t + 3$ (consistent with a non-seasonal random walk) but the portion that persists is small (consistent with the transitory prototype) and declining. In quarter $t + 4$, about 76 percent of the innovation persists (consistent with a random walk) but about 24 percent reverses (consistent with the transitory prototype).

Special items are widely interpreted as transitory or, in special cases, as inter-period transfers, so the effects of special items are predicted to be substantially different from the properties of aggregate quarterly earnings, where the differences are expected to be most pronounced in quarter $t + 4$ (see discussion following equation 1 below). The empirical evidence reported below supports this prediction. Further, the characteristics of special items are empirically related to their sign—positive special items on average are best described by the transitory prototype while negative special items are best described by the inter-period transfer prototype.

### 2.2 PRIOR RESEARCH ON SPECIAL ITEMS

Special items comprise non-recurring items identified by Compustat from the income statement and the accompanying footnotes. The composition of the Compustat data item “special items” is determined not by a formal definition specified in GAAP, but rather by Compustat’s own definition.\(^5\)

\(^4\) Note that because of seasonal differencing, the effects on seasonally-differenced earnings in quarter $t + 5$ to $t + 20$ are zero, followed by effects of $+.05$ in quarters $t + 21$ to $t + 24$.

\(^5\) The Compustat manual provides a detailed definition of “Special Items” (quarterly data item number 32). Briefly, this item includes significant nonrecurring items, such as current year results of discontinued operations, natural disaster losses, and nonrecurring profit or loss on
Professional standards influence, but do not completely determine, the composition of special items because (1) components of earnings reported separately on the income statement are frequently, but not always, included in the Compustat data item “Special Items” and (2) the Compustat data item “Special Items” sometimes includes items reported in the footnotes but not shown separately on the income statement.\(^6\) Similarly, management discretion with respect to which items are reported separately in the financial statements and what information is reported in footnotes influences the composition of special items.

Previous research has examined market reactions at the release of special item information and the use of special items to manage earnings. Focusing on material write-offs of assets, Elliott and Shaw [1988] report significantly negative one- and two-day stock returns at the time of the announcement. Francis, Hanna, and Vincent [1996] conclude that the contemporaneous market reaction to special items depends on their nature. For example, their results show negative reactions to inventory write-offs (consistent with the write-offs conveying information about declines in economic circumstances) and positive reactions to restructuring charges (consistent with these items conveying information about improved future prospects). Elliott and Hanna [1996] examine market reactions to earnings after firms report multiple write-offs and find that there is a decline in the weight market participants attach to unexpected “earnings before special items” following the recognition of large special items, and a further decline in the weighting as subsequent special items are reported. They suggest at least two reasons to believe that the presence of special items in income makes it more difficult for users to determine recurring earnings. First, firms may transfer current (or future) normal operating expenses into special items, thereby increasing current (or future) earnings before special items. For example, General Motors is alleged to have shifted future expenses into current restructuring charges (a special item), thus “clearing the decks” for future profits (Forbes, March 23, 1998, p. 126). Second, write-offs may be associated with unusual and difficult to interpret economic circumstances. Elliot and Hanna also note that the earnings response coefficient related to write-offs is significantly less than the coefficient related to unexpected earnings before write-offs. This result suggests that investors view write-offs as more transitory than other components of earnings.

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\(^6\) For example, APB 30 ¶26 specifies that material events or transactions that are unusual or infrequently occurring are reported as a separate component of income from continuing operations but these items are not necessarily included in Compustat “Special Items.”
Kinney and Trezevant [1997] report that negative special items (e.g., losses on sale of assets, restructuring charges, write-downs or write-offs of assets) are more likely to be reflected as separate items on the income statement while positive special items (e.g., gains on sales of assets, gains related to pension terminations, gains related to litigation settlements) are described in notes, suggesting that separate reporting of negative items is used strategically to emphasize the transitory nature of the negative items and to “soft-pedal” the transitory nature of the positive items. They also find that firms with large positive or large negative earnings changes are more likely to recognize negative special items, consistent with smoothing (for the positive changes) and big bath (for negative changes) behaviors that would result in inter-period transfers.

In contrast to prior work that focuses on the price reaction at the announcement of special items, we analyze the extent to which the effects of special items are impounded in prices during the four quarters subsequent to the announcement of the special item. Our estimates indicate that the effects of positive and negative special items on expected future earnings are different—positive special items are largely transitory while negative special items are better characterized as inter-period transfers. Focusing on the fourth quarter subsequent to the special item (where the implications of special items differ most from the remaining components of earnings), the results indicate that prices impound a relatively larger proportion of the implications of special items compared to non-special items components, and prices reflect different implications of positive compared to negative special items.

3. Data

Our sample consists of quarterly earnings data from 1982–97 drawn from the 1997 Compustat quarterly data files, using both the active and the research files, and both current and back data files. While the back data files contain data as early as 1965, our analysis begins with 1982 because there is a substantial increase in the number of available quarterly earnings observations in 1982, and there is a substantial increase in the number of firms for which Compustat shows non-zero special items beginning in 1982. Further,
TABLE 1
Availability of Earnings (E) and Special Items (SI) on 1997 Quarterly Compustat Files. Includes Both Active and Research Files, Sample Period 1982–97

Panel A: Observations with non-missing earnings and special items available 1982–1997, classified by fiscal quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>N</th>
<th>% of All Qtrs</th>
<th>SI Non-zero</th>
<th>% of Row</th>
<th>SI Non-zero</th>
<th>% of Non-zero</th>
<th>SI Non-zero</th>
<th>% of Non-zero</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>104,577</td>
<td>25.5</td>
<td>9,289</td>
<td>8.9</td>
<td>5,003</td>
<td>53.9</td>
<td>4,286</td>
<td>46.1</td>
</tr>
<tr>
<td>2</td>
<td>105,810</td>
<td>25.8</td>
<td>12,135</td>
<td>11.5</td>
<td>7,145</td>
<td>58.9</td>
<td>4,990</td>
<td>41.1</td>
</tr>
<tr>
<td>3</td>
<td>99,414</td>
<td>24.2</td>
<td>12,121</td>
<td>12.2</td>
<td>7,576</td>
<td>62.5</td>
<td>4,545</td>
<td>37.5</td>
</tr>
<tr>
<td>4</td>
<td>100,251</td>
<td>24.5</td>
<td>23,286</td>
<td>23.2</td>
<td>16,024</td>
<td>68.8</td>
<td>7,262</td>
<td>31.2</td>
</tr>
<tr>
<td>Total</td>
<td>410,052</td>
<td>100.0%</td>
<td>56,831</td>
<td>13.8%</td>
<td>35,748</td>
<td>62.9%</td>
<td>21,083</td>
<td>37.1%</td>
</tr>
</tbody>
</table>

Panel B: Sample selection criteria

<table>
<thead>
<tr>
<th>Observations of Et and SIt (Panel A)</th>
<th>Total</th>
<th>SI Non-zero</th>
<th>SI &lt; 0</th>
<th>SI &gt; 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Less: Market value unavailable for ( t-4 )</td>
<td>156,360</td>
<td>253,692</td>
<td>38,778</td>
<td>64.7%</td>
</tr>
<tr>
<td>2. Less: One or more contiguous ( E_{t-4} ) to ( E_{t+4} ) missing</td>
<td>57,753</td>
<td>195,939</td>
<td>28,660</td>
<td>63.6%</td>
</tr>
<tr>
<td>3. Less: Scaled absolute value of ( E_t ) greater than 1</td>
<td>5,562</td>
<td>190,377</td>
<td>26,921</td>
<td>63.0%</td>
</tr>
<tr>
<td>4. Less: Non-zero but immaterial ( SI )</td>
<td>14,093</td>
<td>176,284</td>
<td>12,828</td>
<td>70.0%</td>
</tr>
<tr>
<td>5. Less: CRSP data required to compute abnormal returns unavailable</td>
<td>70,354</td>
<td>6,996</td>
<td>69.8%</td>
<td>30.2%</td>
</tr>
<tr>
<td>Final sample</td>
<td>105,930</td>
<td>6,996</td>
<td>69.8%</td>
<td>30.2%</td>
</tr>
</tbody>
</table>

Panel C: Final sample observations, classified by fiscal quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Total</th>
<th>Material SI</th>
<th>Material SI &lt; 0</th>
<th>Material SI &gt; 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>% of All Qtrs</td>
<td>% of Row</td>
<td>% of Material SI</td>
<td>% of Material SI</td>
</tr>
<tr>
<td>1</td>
<td>29,315</td>
<td>27.7</td>
<td>969</td>
<td>3.3</td>
</tr>
<tr>
<td>2</td>
<td>26,123</td>
<td>24.7</td>
<td>1,456</td>
<td>5.6</td>
</tr>
<tr>
<td>3</td>
<td>27,181</td>
<td>25.7</td>
<td>1,561</td>
<td>5.7</td>
</tr>
<tr>
<td>4</td>
<td>23,311</td>
<td>22.0</td>
<td>3,010</td>
<td>12.9</td>
</tr>
<tr>
<td>Total</td>
<td>105,930</td>
<td>100.0%</td>
<td>6,996</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

* Material special item observations defined as ((|SI|/market value of equity in \( t-4 \)) > 1%).

since our 1982–97 sample period has a relatively small overlap with the 1974–86 period used in BT and BB, we are able to confirm their principal findings using more recent data.

As shown in table 1, panel A, a total of 410,052 firm-quarter observations are available on Compustat with non-missing earnings before extraordinary items (Compustat quarterly data item #8) and non-missing special items (item #32) over the period 1982–97. Special items are non-zero for 56,831 (approximately 14 percent) of these observations. Special items occur more frequently during quarters later in the fiscal year, with about 41 percent of special items occurring in the fourth quarter. Consistent with previous research, for the year as a whole, approximately 63 percent of the non-zero
special items are negative while 37 percent are positive. However, in later quarters of the fiscal year, the proportion of negative special items grows—the proportion is about 54 percent in the first quarter and grows to almost 69 percent by the fourth quarter.\footnote{Kinney and Trezevant \cite{Kinney1997} suggest that the greater frequency of special items in the fourth quarter indicates that fourth quarter earnings may be subject to more manipulation than earnings reported in earlier quarters. However, it is also consistent with closer scrutiny of the accounts by the firm and its auditor in the fourth quarter.}

Panel B shows the effects of our sample selection criteria. For estimation purposes described below, we require earnings in nine contiguous quarters (including four quarters subsequent to quarter $t$ and, because of seasonal differencing, four quarters prior to quarter $t$). Earnings are scaled by market value of equity at the beginning of the nine quarter period, where market value of equity is computed as common shares outstanding (item #61) times the market price per share (item #14).\footnote{Bernard and Thomas \cite{Bernard1990} report that scaling by market value of equity yields similar results to scaling by the firm-specific standard deviation of seasonally-differenced earnings in defining standardized unexpected earnings ($SUE$). In their replication of BT, Bernard, Thomas, and Whalen \cite{Bernard1997} also scale by market value of equity, and Rangan and Sloan \cite{Rangan1998} scale by market value in their analysis.} The requirement of a market value scalar reduces the number of observations to 253,692, of which 38,778 have non-zero special items. The requirement of nine contiguous quarters of earnings reduces the number of observations to 195,939.

We next eliminate observations with extreme values of earnings where the absolute value of earnings exceeds beginning market value because these observations are more likely to represent data errors or unusual circumstances. (Note that because we require a 9-quarter sequence of scaled earnings, an observation is omitted when the absolute value of scaled earnings exceeds 1 in any of the 9 contiguous quarters.) This sample selection criterion reduces the sample size to 190,377, a reduction of slightly less than 3 percent.

We further restrict the sample to include only observations where special items are either zero or materially different from zero (operationally defined as special items with absolute value in excess of 1 percent of market value).\footnote{Because special items as reported on Compustat are on a pre-tax basis, we adjust special items for this and all subsequent computations to an after-tax basis. Specifically, we multiply special items by $(1 - \text{the top statutory tax rate applicable to the year of interest})$. We assume that none of the special items are permanent differences. However, it is not practical to determine the tax status of the nearly 7,000 non-zero special item observations in our sample.} This eliminates 14,093 observations where special items take on small but non-zero values, making the distinction between observations where the effect of special items on the overall earnings series is zero versus non-zero more clear-cut in the final sample.\footnote{The prior literature on special items \citep[e.g.,][]{Elliott1988} has also focused on material items.} Finally, data to compute abnormal returns at the time of subsequent quarter earnings announcements are obtained from CRSP and this data requirement eliminates another 70,354

10 Kinney and Trezevant \cite{Kinney1997} suggest that the greater frequency of special items in the fourth quarter indicates that fourth quarter earnings may be subject to more manipulation than earnings reported in earlier quarters. However, it is also consistent with closer scrutiny of the accounts by the firm and its auditor in the fourth quarter.

11 Bernard and Thomas \cite{Bernard1990} report that scaling by market value of equity yields similar results to scaling by the firm-specific standard deviation of seasonally-differenced earnings in defining standardized unexpected earnings ($SUE$). In their replication of BT, Bernard, Thomas, and Whalen \cite{Bernard1997} also scale by market value of equity, and Rangan and Sloan \cite{Rangan1998} scale by market value in their analysis.

12 Because special items as reported on Compustat are on a pre-tax basis, we adjust special items for this and all subsequent computations to an after-tax basis. Specifically, we multiply special items by $(1 - \text{the top statutory tax rate applicable to the year of interest})$. We assume that none of the special items are permanent differences. However, it is not practical to determine the tax status of the nearly 7,000 non-zero special item observations in our sample.

13 The prior literature on special items \citep[e.g.,][]{Elliott1988} has also focused on material items.
observations, reducing the sample to 105,930, of which 6,996 have non-zero special items observations. Table 1, panel C shows the frequencies of material special items by quarter for the final sample of 105,930 observations. The data in panel B show that the larger proportion of negative special items in the final sample (approximately 70 percent as shown in panel C) relative to the proportion in the original sample (approximately 63 percent as shown in panel A) is due primarily to the selection criterion that eliminated immaterial special items.

4. Experimental Procedures and Results

4.1 EFFECT OF SPECIAL ITEMS ON EXPECTED FUTURE EARNINGS

For descriptive purposes and for comparison with results in BT, we estimate the coefficient relating seasonally-differenced earnings to subsequent values of seasonally-differenced earnings using a single-stage cross-sectional estimation procedure. Specifically, we estimate the following equation for \( k = 1, \ldots, 4 \):

\[
(E_{t+k} - E_{t+k-4}) = b_{0k} + b_{1k}(E_t - E_{t-4}) + \epsilon_{tk}.
\]

We estimate (1) only for \( k = 1, \ldots, 4 \) because prior evidence indicates that the coefficients relating current earnings and expected future earnings quickly decay to values near zero at lags longer than four.

As discussed earlier, special items are widely believed to be either transitory or inter-period transfers. In the transitory case, the effect of special items on seasonally-differenced earnings in subsequent quarters should be to move the coefficient for lags 1, 2, and 3 toward 0 and the coefficient for lag 4 toward \(-1\). In the inter-period transfer case (where a special item represents current recognition of a revenue or expense which would otherwise have been recognized over a number of subsequent quarters), the effect of the special item should be to further decrease the coefficients for lags 1, 2, and 3 toward 0, perhaps even making them negative, while the coefficient for lag 4 should move toward \(-1\), perhaps even becoming more negative than \(-1\).

Table 2, panel A reports estimates of equation (1) for \( k = 1, \ldots, 4 \). The first row of panel A shows the estimated coefficients from (1) for the subsample of observations where special items are zero in quarter \( t \). To provide a comparison of our estimates with those from previous research, the bottom row of panel A shows the means of the autocorrelations reported by BT (1990, table 1, page 310). BT do not specifically consider special items, but because the preponderance of earnings observations have special items

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14 This cross-sectional approach is also used in Rangan and Sloan [1998] and Soffer and Lys [1999].
Table 2
Cross-Sectional Estimates of Regression Coefficients Relating Seasonally-Differenced Earnings in Four Quarters Subsequent to Quarter t. All Variables Scaled by Market Value of Equity at Beginning of Quarter t – 4. (N = 105,930)

<table>
<thead>
<tr>
<th>Panel A: Estimated coefficients $b_{1k}$ from model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\left(E_{t+k} - E_{t+k-4}\right) = b_{0k} + b_{1k}(E_t - E_{t-4}) + e_{tk}$</td>
</tr>
<tr>
<td>$k$</td>
</tr>
<tr>
<td>SI in quarter $t$:</td>
</tr>
<tr>
<td>SI = 0</td>
</tr>
<tr>
<td>SI &gt; 0*</td>
</tr>
<tr>
<td>SI &lt; 0*</td>
</tr>
<tr>
<td>Bernard and Thomasb</td>
</tr>
</tbody>
</table>

All differences between estimated coefficients (pairwise comparisons of coefficients among the three groups) are significant at the .05 level in two-tailed tests.

<table>
<thead>
<tr>
<th>Panel B: Estimated coefficients $b_{1k}$ and $b_{2k}$ from model:</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\left(E_{t+k} - E_{t+k-4}\right) = b_{0k} + b_{1k}SI + b_{2k}(E_t - SI - E_{t-4}) + e_{tk}.$</td>
</tr>
<tr>
<td>Estimates of $b_{1k}$</td>
</tr>
<tr>
<td>$k$</td>
</tr>
<tr>
<td>SI in quarter $t$:</td>
</tr>
<tr>
<td>SI &gt; 0*</td>
</tr>
<tr>
<td>SI &lt; 0*</td>
</tr>
<tr>
<td>Pairwise comparison:</td>
</tr>
<tr>
<td>SI &lt; 0* vs. SI &gt; 0*</td>
</tr>
<tr>
<td>Estimates of $b_{2k}$</td>
</tr>
<tr>
<td>$k$</td>
</tr>
<tr>
<td>SI in quarter $t$:</td>
</tr>
<tr>
<td>SI &gt; 0*</td>
</tr>
<tr>
<td>SI &lt; 0*</td>
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<tr>
<td>Pairwise comparison:</td>
</tr>
<tr>
<td>SI &lt; 0* vs. SI &gt; 0*</td>
</tr>
</tbody>
</table>

Notes:
* Restricted to material special item observations defined as $(|SI/MVE| > 1\%)$.
* Bernard and Thomas (1990, Table 1, 310) means of firm-specific autocorrelations.
Significance levels based on bootstrap evaluations of significance:
* significantly different from 0 at the .05 level in a two-tailed test.
** significantly different from 0 at the .01 level in a two-tailed test.
+++ significantly different from −1 at the .01 level in a two-tailed test (applies only for estimates of $b_{14}$).

Equal to zero, the signs and magnitudes of autocorrelations reported by BT should be most comparable to estimated coefficients for the zero special items subsample. As expected, the coefficients in the first row are similar to those reported by BT. The coefficients are positive but declining across lags 1 to 3, consistent with an earnings innovation that persists over three

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15 For a much smaller subsample consisting of firms with sufficiently long time-series, we performed the two-stage approach used in Bernard and Thomas and in earlier studies, i.e., we estimated firm-specific autocorrelations and obtained cross-sectional means. The cross-sectional mean of the individual-firm time-series autocorrelations for this subsample showed the same pattern as the cross-sectional coefficients reported in table 2.
subsequent quarters, with the persistence decaying rapidly toward 0.\textsuperscript{16} The negative coefficient at lag 4 indicates that a portion of the innovation persists in the fourth subsequent quarter (which is equivalent to the more common statement that a portion of the innovation reverses). The negative coefficient at lag 4 is closer to 0 (the value expected if the entire innovation persists as in a random walk process) than to −1 (the value expected if the entire innovation reverses as in a transitory earnings process).

The two middle rows of panel A show estimated coefficients for two additional subsamples, comprising observations with special items in quarter \( t \) that are either materially positive or materially negative. For both positive and negative special items, the effects of a material special item on the coefficients are broadly consistent with the effects expected based on widely-held beliefs that special items are transitory: The coefficients at lags 1, 2, and 3 are closer to 0 and the magnitude of the coefficient at lag 4 is closer to −1.

Panel B provides further evidence on the effects of special items on future earnings and on differences between positive and negative special items. Seasonally-differenced earnings in each of the four quarters subsequent to quarter \( t \) are regressed on earnings in quarter \( t \) decomposed into two components, the special item in quarter \( t \) and the remaining component of earnings seasonally-differenced with quarter \( t−4 \).\textsuperscript{17} The coefficients relating the special item in quarter \( t \) with seasonally-differenced earnings are broadly consistent with expectations.\textsuperscript{18} Focusing on positive special items, the coefficients at lags 1, 2, and 3 are small, positive and significantly different from 0. The coefficient at lag 4 (−.918) is close to, and not significantly different from, −1. These coefficients suggest that positive special items are largely (but not completely) transitory as a small portion of an earnings innovation persists over subsequent quarters. Focusing on negative special

\textsuperscript{16} The significance levels reported in table 2 are based on bootstrap evaluations of significance because of concerns with cross-sectional correlation in the error terms. We also conducted conventional \( t \)-tests that provided qualitatively similar assessments of significance, except that the conventional tests tended to provide more highly significant results and, therefore, a few more coefficients were significantly different from zero (or one) using the conventional tests.

\textsuperscript{17} Note that the lack of seasonal differencing for special items in quarter \( t \) is equivalent to seasonal differencing as long as special items in quarter \( t−4 \) is equal to zero, which holds for most but not all observations.

\textsuperscript{18} Although it is not the primary focus of their paper, Rangan and Sloan [1998], table 1 shows that the lag 4 coefficient is most negative for observations in the fourth fiscal quarter. This finding could be due to increasing estimation error as the year progresses as discussed in Rangan and Sloan (page 358) but it could also be due, at least in part, to the greater frequency of special items in the fourth fiscal quarter (which would account for more negative coefficients). To examine this issue, we computed the lag 4 coefficient by fiscal quarter. For all observations pooled together, there is a more negative lag 4 coefficient in the fourth quarter as reported in Rangan and Sloan [1998]. However, for only those observations with zero special items, there is little evidence of a more negative coefficient in the fourth quarter. Thus, it appears that the more negative coefficient in the fourth quarter is due at least in part to the higher frequency of special items in the fourth quarter.
items, the coefficients at lags 1, 2, and 3 are significantly negative. The coefficient at lag 4 (−1.277) is significantly more negative than −1. These coefficients suggest that the effects of negative special items are similar to the inter-period transfer prototype discussed in section 2.1. That is, negative special items tend to be followed by positive earnings innovations in each of the four subsequent quarters, consistent with the proposition that negative special items in quarter $t$ include current recognition of expenses that would otherwise have been recognized in subsequent quarters, thereby decreasing income in quarter $t$ and increasing income in subsequent quarters. The pairwise comparisons of coefficients for positive versus negative special items show that differences between the coefficients for negative special items and for positive special items are statistically significant at lags one, two, and four. Thus, in later analyses we report results for positive and negative special items separately.

Finally, for completeness, panel B also shows estimates of $b_{2k}$, the coefficient relating the earnings innovation in period $t+k$ to the earnings innovation before special items in period $t$. The pattern of coefficients and magnitudes are similar to the results in previous research and in panel A for earnings where special items are zero. The coefficients at lags 1, 2, and 3 are positive and declining; the coefficient at lag 4 is negative, and the magnitudes are comparable to those reported by BT and in panel A.

4.2 EFFECT OF SPECIAL ITEMS REFLECTED IN MARKET PRICES

Given that special items have effects on expected future earnings that are significantly different than the effects of other earnings innovations, we now turn to the question: “Do market prices fully impound the effect of special items on the expectations of future earnings?” To provide initial evidence on this question, we adopt the “two-equation” approach used in BB and other studies (e.g., Abarbanell and Bernard [1992]; Sloan [1996]; Rangan and Sloan [1998]; and Soffer and Lys [1999]). To illustrate this approach, consider two events, A and B where A precedes B in time and the outcome of A is relevant in predicting the outcome of B. When the outcome of A is revealed in an efficient market, the implications of A for B should be fully impounded in prices. Therefore, the market reaction at the announcement of B should be a reaction relative to the expectation of B conditioned on A. A generic research question is whether market prices impound the implications of A for B. The econometric specification used to evaluate this question comprises two equations. The first equation (the “prediction equation”) specifies the conditional dependence of B on A. The second equation (the “pricing equation”) specifies the market reaction at the announcement of B conditioned on the information in A. The test of whether market prices impound the implications of A for B is a test for the consistency of the coefficients in the two equations.

With respect to our investigation of special items, we estimate a prediction equation that specifies the relation between seasonally-differenced earnings and special items in quarter $t$ to $t+3$ and seasonally-differenced earnings in
quarter \( t + 4 \) (see equation 2 below). Then we estimate a pricing equation that specifies a relation between cumulative abnormal returns in quarter \( t + 4 \) and seasonally-differenced earnings in \( t + 4 \) (see equation 4 below). As explained in more detail below, the test of whether market prices prior to \( t + 4 \) impound the implications of previous earnings and special items for seasonally-differenced earnings in \( t + 4 \) is conducted by comparing the coefficients from these two equations.

Our analysis focuses primarily on the relation between special items and prices at the announcement of earnings four quarters subsequent to the special item for two reasons. First, as indicated in table 2, lag 4 is the lag most affected by special items. That is, the differences between the prediction coefficients for special items versus other components of earnings are larger at lag 4 than at lags 1, 2, or 3. Second, and more importantly, to the extent that special items are transitory or inter-period transfers, the effects of special items on pricing coefficients are more clearly distinguishable at lag 4 from the “partial-impounding” effect reflected in the implied pricing coefficients reported in BB. When a substantial transitory or inter-period transfer component is added to earnings, efficient prices will result in pricing coefficients closer to zero at lags 1, 2, or 3 than those for the earnings series without the component. At the same time, the “partial-impounding” effect results in pricing coefficients closer to zero than for the actual earnings series, i.e., somewhere between those implied by a seasonal random walk \( \{0, 0, 0, 0\} \) and those implied by estimates from actual earnings series, estimated by BT as \( \{.34, .19, .06, -.24\} \). Thus, at lags 1, 2, and 3, it is difficult to distinguish between the hypothesis that the market fully impounds the effects of special items versus the hypothesis that the market partially impounds the effects of aggregate earnings because the effect of fully impounding the effects of special items is in the same direction as the “partial-impounding” effect identified in BB.\(^{19}\) In contrast, at lag 4, the effect of impounding special items in prices works in the opposite direction from the partial impounding effect. That is, the predicted effect of special items is to decrease the pricing coefficient at lag 4 toward \(-1\), while the partial-impounding effect increases the pricing coefficient toward 0.

To operationalize the prediction and pricing equations, we define standardized, seasonally-differenced earnings for quarter \( t + 4 \), denoted as \( SUE_{t+4} \), where the standardization is by market value of equity as explained in section 3. The significant dependence in seasonally-differenced quarterly earnings implies that the expectation of seasonally-differenced earnings is

\[^{19}\text{To illustrate, compare the pricing coefficients expected if the market fully impounds the effects of special items versus the implied coefficient reported by BB showing “partial impounding” at lag 1. The estimates in panel A of table 2 suggest that prices that fully impound the effects of special items should reflect a pricing coefficient of .186 for earnings including positive special items or .088 including negative special items (where either of these values is closer to zero than the value for total earnings with zero special items of .343). Table 4, panel A of BB shows that the implied pricing coefficient at lag 1 is only .199 (again closer to zero than the coefficient for earnings of .443).}\]
a function of (at least) the four preceding values of seasonally-differenced earnings. Although our focus is on the effect of special items in quarter $t$ (i.e., $S_I$), it is important to control for the effect of special items in intervening periods. Accordingly, in order to separately analyze the effects of special items in all quarters, we decompose standardized, seasonally-differenced earnings for quarters $t, t+1, t+2, \text{ and } t+3$ into two components, $SUEPRE$ and $SI$. The standardized special item is denoted by $SI$. Standardized, seasonally-differenced earnings minus the special item is denoted by $SUEPRE$ (because this is seasonally-differenced earnings prespecial items).

Consistent with previous research, the prediction equation for $SUE$ in quarter $t+4$ is written as a linear function of earnings information from the four preceding quarters:

$$SUE_{t+4} = b_0 + b_1 SUEPRE_{t+3} + b_2 SI_{t+3} + b_3 SUEPRE_{t+2} + b_4 SI_{t+2} + b_5 SUEPRE_{t+1} + b_6 SI_{t+1} + b_7 SUEPRE_t + b_8 SI_t + e_{t+4}$$

(2)

Note that $b_7$ provides an estimate of the effect of pre-special items earnings in quarter $t$ on earnings four quarters subsequent to quarter $t$ (i.e., the $SUE$ in quarter $t+4$) while $b_8$ provides an estimate of the effect of the special items component of earnings in quarter $t$.

Following the analysis in BB, we assess the market’s implied weightings for past earnings in forming expectations of subsequent earnings. Assume the market response to an earnings announcement in quarter $t+4$ can be estimated as

$$CAR_{t+4} = a_0 + \beta_1 e_{t+4} + \omega_{t+4}$$

(3)

where $CAR_{t+4}$ is the cumulative abnormal return associated with the earnings announcement for quarter $t+4$ (defined more fully below), $e_{t+4}$ is the unexpected portion of earnings and $\omega_{t+4}$ is white noise. If the market’s expectation of earnings fully impounds the effects of previously announced earnings on expected earnings, unexpected earnings can be approximated by the error term, $e_{t+4}$, from (2). Substituting for $e_{t+4}$ from (2) into (3) yields the pricing equation:

$$CAR_{t+4} = a_0 + \beta_1 SUE_{t+4} - (b_0 + b_1 SUEPRE_{t+3} + b_2 SI_{t+3} + b_3 SUEPRE_{t+2} + b_4 SI_{t+2}$$
\[+ b_5 SUEPRE_{t+1} + b_6 SI_{t+1} + b_7 SUEPRE_t + b_8 SI_t )] + \omega_{t+4} = k^* + a_0 SUE_{t+4} + a_1 SUEPRE_{t+3} + a_2 SI_{t+3} + a_3 SUEPRE_{t+2} + a_4 SI_{t+2} + a_5 SUEPRE_{t+1} + a_6 SI_{t+1} + a_7 SUEPRE_t + a_8 SI_t + \omega_{t+4}$$

(4)

where $k^* = a_0 - \beta_1 b_0, a_0 = \beta_1, \text{ and } a_i = -\beta_1 b_i, i = 1, \ldots, 8.$

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20 Earnings in quarters $t+1, t+2, \text{ or } t+3$ include non-zero special items in approximately 25 percent of the 6,996 cases where there is a special item in quarter $t$ and in approximately 10 percent of the 98,934 cases where there are no special items in quarter $t$. 
The estimated coefficients from (4), combined with the estimate of $\beta_1$ (i.e., $a_0$), imply values for the market’s assessment of the relations among seasonally-differenced earnings and special items, e.g., the implied value for $b_1$ is $-a_1/a_0$. These implied coefficients can be compared with the estimates obtained from direct estimation of (2) to assess the extent to which market expectations as of the start of the CAR accumulation period impound the predictable effects of earnings innovations.

If the market fully impounds the predictable effects of seasonally-differenced earnings as of the beginning of the CAR accumulation period, the ratio of implied to actual coefficients is expected to be 100 percent. If, on the other hand, the market completely ignores the predictable relations between seasonally-differenced earnings, the ratios are expected to be 0 percent. Thus, ratios of zero would be consistent with the strict form of the BT conjecture that market expectations for earnings follow a seasonal random walk. Other values for the ratios have corresponding interpretations: If the market only partially reflects the predictable relations in earnings then the ratio of the implied to actual coefficients is expected to be between 0 percent and 100 percent, while if the market over-weights predictable effects of earnings innovations, then the ratio is expected to exceed 100 percent.

We define $CAR$ in equation (4) as the return over a three day window beginning two days before the day of the $t+4$ quarterly earnings announcement date as reported on Compustat, consistent with BT and BB. In sensitivity analysis reported later in the paper, we explore longer return accumulation periods beginning earlier than two days prior to the announcement.

To facilitate comparisons to prior results in BT and BB, we conduct the initial analysis using $SUE$s and $SUEPRE$s transformed into decile ranks. That is, $SUE$s are ranked, each $SUE$ is replaced by its decile rank minus one, and the result is divided by nine, to yield a rank variable transformed to be between 0 and 1. We also define a corresponding $SI$ rank variable that is

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21 Note that $SUE_{t+4}$ in (4) is seasonally-differenced relative to earnings in period $t$ including the period $t$ special item. However, the specification in (4) is econometrically equivalent to an alternative specification in which $SUE_{t+4}$ is seasonally-differenced relative to earnings in period $t$ excluding the period $t$ special item. When $SI_t$ is excluded from $SUE_{t+4}$, its effect is impounded in the coefficient on $SI_t$. Denoting this coefficient as $a_8^*$, the coefficient on $SI_t$ is therefore interpreted as an estimate of $-\beta_1(b_8 + 1)$ and the implied value of $b_8$ is $-(a_8^*/a_0) - 1$. This implied value of $b_8$ from the alternative specification is identical to the implied value of $b_8 = -(a_8/a_0)$ from (4) reported in the tables. Except for the difference between $a_8$ and $a_8^*$, the alternative specification yields coefficient estimates identical to those from (4) because it includes the same set of independent variables.

22 Note that the effect of cross-sectional correlation on the validity of assessed levels of significance is likely to be minimal because we aggregate results from almost 60 separate quarters and even for the cases which are drawn from the same quarter, the three-day return periods overlap in only a small proportion of cases. In any event, where significance is evaluated based on the bootstrap technique, the bootstrap evaluation accounts for the effect of cross-sectional correlation.

23 See Bernard and Thomas ([1990], page 325) or Ball and Bartov ([1996], page 326).
**Table 3**

Comparison of Implied Coefficients from Regression of CAR on Lagged SUEPREs and SIs to Actual Regression Coefficients from Regression of SUE on Lagged SUEPREs and SIs Where SUE, SUEPRE, and SI are Based on Standardized Ranks of Seasonally-Differenced Quarterly Earnings (SUE Ranks).

(N = 105,930)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pred. Sign</th>
<th>Actual Coef</th>
<th>t-stat.</th>
<th>Pred. Sign</th>
<th>Coefficient</th>
<th>t-stat.</th>
<th>Implied b* =</th>
<th>Ratio</th>
<th>Mishkin χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>.355</td>
<td>169.75</td>
<td>−</td>
<td>− .661</td>
<td>−28.34</td>
<td>−a_{i}/a_{0}</td>
<td>41%</td>
<td>189.66**</td>
</tr>
<tr>
<td>SUE(_{t+4})</td>
<td></td>
<td>.360</td>
<td>120.84</td>
<td>+</td>
<td>4.530</td>
<td>63.54</td>
<td>b^*</td>
<td>182%</td>
<td>5.14*</td>
</tr>
<tr>
<td>SUEPRE(_{t+3})</td>
<td>+</td>
<td>.150</td>
<td>14.37</td>
<td>−</td>
<td>−1.241</td>
<td>−5.11</td>
<td>.274</td>
<td>92%</td>
<td>4.98*</td>
</tr>
<tr>
<td>SI(_{t+3})</td>
<td>+</td>
<td>.132</td>
<td>41.50</td>
<td>−</td>
<td>−.431</td>
<td>−5.78</td>
<td>.095</td>
<td>35%</td>
<td>3.66</td>
</tr>
<tr>
<td>SUEPRE(_{t+2})</td>
<td>+</td>
<td>.040</td>
<td>3.94</td>
<td>−</td>
<td>−.635</td>
<td>−2.72</td>
<td>.140</td>
<td>53%</td>
<td>1.20</td>
</tr>
<tr>
<td>SI(_{t+2})</td>
<td>+</td>
<td>.046</td>
<td>14.55</td>
<td>−</td>
<td>−.293</td>
<td>−3.95</td>
<td>.065</td>
<td>139%</td>
<td>3.74</td>
</tr>
<tr>
<td>SUEPRE(_{t+1})</td>
<td>+</td>
<td>.009</td>
<td>0.92</td>
<td>−</td>
<td>−.506</td>
<td>−2.15</td>
<td>.112</td>
<td>119.4%</td>
<td>8.40**</td>
</tr>
<tr>
<td>SI(_{t+1})</td>
<td>+</td>
<td>−.218</td>
<td>−72.87</td>
<td>+</td>
<td>.258</td>
<td>3.63</td>
<td>−.057</td>
<td>26%</td>
<td>106.34**</td>
</tr>
<tr>
<td>SUEPRE(_{t})</td>
<td>−</td>
<td>−.544</td>
<td>−56.30</td>
<td>+</td>
<td>1.802</td>
<td>7.92</td>
<td>−.398</td>
<td>73%</td>
<td>8.40**</td>
</tr>
<tr>
<td>SI(_{t})</td>
<td>−</td>
<td>−.544</td>
<td>−56.30</td>
<td>+</td>
<td>1.802</td>
<td>7.92</td>
<td>−.398</td>
<td>73%</td>
<td>8.40**</td>
</tr>
</tbody>
</table>

Notes:

* SUEPREs are seasonally-differenced earnings before special items decile ranks transformed as per BT such that \(\left[\left(\text{SUEPRE decile rank}-1\right)/9\right]\) is between 0, 1. SI is the effect of the special item on the transformed SUEPRE rank. SI is zero when special items are zero.

* CARs (market-adjusted returns) winsorized at 1 and 99 percentiles.

* χ² statistic based on procedure in Mishkin (1983) as applied by, for example, Soffer and Lys (1999) and Rangan and Sloan (1998).

* Ratio significantly different from 100 percent at the .05 level in a two-tailed test.

** Ratio significantly different from 100 percent at the .01 level in a two-tailed test.

The effect that inclusion of the SI would have on the SUEPRE rank so the SI rank can vary between −1 and +1.

Estimates of the coefficients from equation (2) are reported in the prediction equation column of table 3. Consistent with the results in table 2, panel A, the coefficients for SUEPREs at lags 1–3 are positive and declining (.360, .132, and .046) and the coefficient at lag 4 is negative (−.218) and highly significant. The SI coefficients at lags 1–3 are closer to zero than the corresponding coefficients on SUEPRE, but still positive and declining (.150, .040, and .009). The SI coefficient at lag 4 (−.544) is closer to −1 than the coefficient on SUEPRE at lag 4. Thus, estimates of the coefficients from equation (2) relating earnings with earnings from the four previous quarters are qualitatively consistent with results in table 2 relating SUE and earnings from
a single previous quarter. The estimates are also generally consistent with results from previous research that did not separately consider the effects of special items.

The pricing equation column of table 3 reports estimates of equation (4) using the SUEPRE and SI rank variables and a simple market-adjusted abnormal return ($R_{it} - R_{mt}$) where $R_{mt}$ is the equal-weighted CRSP market index. While BT and BB use size-adjusted returns, Bernard, Thomas, and Wahlen [1997] replicate the earlier BT results using market-adjusted returns. We obtain similar results (unreported) using either a value-weighted market index or size-adjusted returns. To reduce the influence of CAR outliers, we winsorize the CAR distribution at the 1 and 99 percentiles ($−19$ and $+23$ percent, respectively). The estimated coefficients on the lagged SUEPREs and SI are all significant in the predicted direction, indicating that the market does not completely ignore predictable relations in earnings. Additionally, the implied coefficient on SI is significantly larger than the coefficient on SUEPRE at the .001 level. Thus, the estimates provide evidence that the market at least partially impounds the different effects of earnings that contain a special item and interprets special items as more transitory (more likely to reverse four quarters hence) than other components of earnings.

We compute the ratio of the implied to actual effects at each lag to assess the extent to which the market impounds the predictable effects of earnings and special items. The column in table 3 labeled “Ratio” reports the ratios of the implied coefficient derived from (4) to the actual coefficient from (2). Following Soffer and Lys [1999], Sloan [1996], and Rangan and Sloan [1998] we use the Mishkin [1983] procedure to assess whether the ratio is 100 percent. This procedure uses an iterative nonlinear estimation to derive a likelihood ratio (chi-square) test of the null hypothesis that the implied coefficients from the CAR regression are the same as the observed SUE regression coefficients.24

We first consider the ratios related to the SUEPREs. The ratios of the implied to actual coefficients shown in table 3 are generally similar to the

24 As discussed in Liu and Singh ([1997], 274), while likelihood ratio tests are in principle superior to bootstrap evaluations of significance when the parametric model holds, the bootstrap evaluation maintains its desirable properties even in cases when the parametric model fails. Therefore, we also evaluated significance of our main results using bootstrap procedures from Noreen (1989, pages 69–70). To illustrate the bootstrap procedure for table 3, we select 1,000 bootstrap samples of size 105,930, selected with replacement from the 105,930 observations used in table 3. For each of the 1,000 bootstrap samples, estimates of actual coefficients and implied coefficients are used to calculate ratios. For each of the SUEPRE and SI variables, the estimated standard deviation of the 1,000 ratios generated from the bootstrap samples is calculated. These standard deviations are then used to calculate a z-statistic, computed as the estimated ratio shown in table 3 minus the hypothesized value divided by the standard deviation of the ratio estimated based on the 1,000 generated ratios. Under the assumptions described above, the z-statistic is distributed as a standard normal variate under the null hypothesis. Inferences about statistical significance based on the unreported bootstrap results are similar to those reported in the tables for the parametric Mishkin technique.
ratios reported in BB table 4 (41 percent versus 45 percent; 72 percent versus 50 percent; 139 percent versus 119 percent; and 26 percent versus 22 percent). Despite differences including a sample period which has relatively little overlap with the BB sample period, a different method of standardizing earnings, and our use of market-adjusted returns, the estimated ratios in table 3 are generally within one standard deviation of the ratios reported in BB. Of particular importance is the ratio for SUEPRE related to the fourth lag. The ratio is 26 percent (and significantly less than 1 as indicated by the Mishkin test) which is quite close to the ratio reported in BB (22 percent). Thus, the results here and in BB are consistent with approximately 75 percent underestimation of the effects of earnings at lag 4.

With respect to special items, the ratio for quarter $t$ (lag 4) is 73 percent, which is significantly different from 100 percent at the .01 level as indicated by the Mishkin test. Thus, the market appears also to underestimate the effect of special items on subsequent earnings at lag 4. However, the underestimation for special items is smaller than for the other components of earnings—the effect of other components is underestimated by about 75 percent (as noted above), while the effect of special items is underestimated by only about 27 percent.

Note that our results reinforce the conclusion in BB that market expectations are not well described by the naive seasonal random walk model. If the market used the naive seasonal random walk discussed by BT for all components of earnings, we would expect the implications of transitory items at lag 4 to be less fully reflected in prices, because transitory items are highly inconsistent with a seasonal random walk, i.e., while a seasonal random walk posits that earnings innovations are completely persistent at lag 4, transitory items do not persist at all.

While our study focuses primarily on special items in quarter $t$ (lag 4), it is potentially important to include special items in quarters $t + 1$, $t + 2$, and $t + 3$ separately to control for differences in the correlations of special items versus other components of earnings (as suggested by a reviewer). However,

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25 More precisely, we estimated the standard errors of the ratios by bootstrapping our data. For each of the four pairs of ratios, the difference between our estimated ratio and the estimated ratio reported in BB should have a standard error of approximately twice the standard deviation for our ratios (since both estimates are random variables). For all four pairs, the difference between our estimated ratio and the ratio reported in BB is less than the estimated standard deviation of the difference. Also note that because our variable SUEPRE excludes SI, it is not strictly comparable to the corresponding SUE variable from BB. Nonetheless, because SI is predominately 0, the results from BB for SUEs are expected to be similar to our results for SUEPREs.

26 The bootstrap indicates that the ratio is also significantly greater than 0. Taken together, the Mishkin test and the bootstrap test suggest that while market prices impound a significant proportion of the future implications of current earnings, prices do not fully reflect the implications of current period earnings.

27 The bootstrap significance tests confirm that this ratio is significantly different from 100 percent. Also, as with the ratio for SUEPRE at lag 4, the bootstrap test indicates that the ratio is significantly greater than 0.
because the denominators of the ratios for special items in these quarters are close to zero (consistent with the conjecture that special items in these quarters have little impact on predicted SUE in quarter \( t + 4 \)), the standard deviations of the ratios are large, and consequently even large values of these ratios are sometimes not significant. For example, the ratios for \( t + 1 \) and \( t + 2 \) (corresponding to lags 2 and 3 where the actual coefficients in the denominator are near zero) are numerically large (353 percent and 1194 percent) but nonetheless are not significantly different from 100 percent. However, the numerically smaller ratio of 182 percent for quarter \( t + 3 \) (lag 1) is significantly different from 100 percent at the .05 level, where the significance of the smaller ratio for quarter \( t + 3 \) is due to the fact that the actual coefficient in the denominator is farther from zero, contributing to a substantially smaller standard error.

The analysis in table 3 uses SUE, SUEPRE, and SI ranks to be closely consistent with BT and BB, where ranks were intended by BT to "guard against the potential for difficulties with outliers." However, ranks ignore information in the relative magnitudes of the earnings changes and special items and have the additional disadvantage that the coefficients on ranks are not directly interpretable, e.g., even if we expect the lag 4 coefficient on a transitory component of earnings to be equal to \(-1\), there is no reason to expect the coefficient on the rank of a transitory component of earnings to be equal to \(-1\). Accordingly, in the remaining analysis we use seasonally-differenced earnings scaled by the market value of equity as our SUE variable, and refer to this variable as a SUE score to distinguish it from the SUE decile rank.\(^{28}\)

As before, the SUE variable is decomposed into SUEPRE and SI for lags 1–4. Panel A of table 4 presents the ratios of implied to actual coefficients based on equations 2 and 4 (as in table 3) but using scores instead of ranks. To conserve space, we report results in the remaining tables for SUEPRE and SI only for quarter \( t \), both because we expect to find effects of special items to be most pronounced for quarter \( t \) (i.e., at lag 4) and also because estimated ratios for intervening quarters typically have such high standard deviations that even large ratios are not statistically significant.\(^{29}\)

In comparison to the results using ranks, the ratio in table 4 for SUEPRE using scores is substantially larger at 58 percent compared to 26 percent using ranks, though the Mishkin test indicates that the ratio remains

\(^{28}\) As indicated earlier, to mitigate the influence of outliers for our analysis of SUE scores, we omit an earnings observation if the absolute value of scaled earnings exceeds 1.

\(^{29}\) To summarize the unreported results using scores, the ratios for SUEPRE and SI for quarter \( t + 3 \) are always significantly different from 100 percent, consistent with the direction of the differences in table 3 using ranks. The ratios for quarter \( t + 1 \) are never significantly different from 100 percent, consistent with the lack of significance in table 3.

The results for quarter \( t + 2 \) are mixed. The ratio on SUEPRE is significantly different from 100 percent using scores for panel B of table 4, consistent with results in table 3 (but the ratios for panels A and C of table 4 are not significant). The ratio on SI is not significant using scores for panel B of table 4, consistent with table 3 (but the ratios for panels A and C of table 4 are significantly different from 100 percent).
Comparison of Implied Coefficients from Regression of CAR on Lagged SUEPREs and SIs to Actual Regression Coefficients from Regression of SUE on Lagged SUEPREs and SIs with SUE, SUEPRE, and SI Standardized by Market Value (SUE Scores)

**Prediction equation**

\[ SUE_{t+4} = b_0 + b_1 SUEPRE_{t+3} + b_2 SI_{t+3} + b_3 SUEPRE_{t+2} + b_4 SI_{t+2} + b_5 SUEPRE_{t+1} + b_6 SI_{t+1} + b_7 SUEPRE_t + b_8 SI_t + \epsilon_{t+4} \]  

(2)

**Pricing equation**

\[ CAR_{t+4} = k^* + a_0 SUE_{t+4} + a_1 SUEPRE_{t+3} + a_2 SI_{t+3} + a_3 SUEPRE_{t+2} + a_4 SI_{t+2} + a_5 SUEPRE_{t+1} + a_6 SI_{t+1} + a_7 SUEPRE_t + a_8 SI_t + \omega_{t+4} \]  

(4)

---

**Table 4**

<table>
<thead>
<tr>
<th>Panel A: All observations (N = 105, 930)</th>
<th>Actual</th>
<th>Implied</th>
<th>Ratio</th>
<th>Mishkin</th>
</tr>
</thead>
<tbody>
<tr>
<td>( SUEPRE_t )</td>
<td>-.255</td>
<td>-.148</td>
<td>58%</td>
<td>12.14**</td>
</tr>
<tr>
<td>( SI_t )</td>
<td>-1.140</td>
<td>-.863</td>
<td>76%</td>
<td>14.20**</td>
</tr>
</tbody>
</table>

**Panel B: Restricted to zero and negative \( SI \) (N = 103, 819)**

| Actual | Implied | Ratio | Mishkin |
| \( SUEPRE_t \) | -.248 | -.152 | 61% | 99.13** |
| \( SI_t \) | -1.240 | -.950 | 76% | 8.75** |

**Panel C: Restricted to zero and positive \( SI \) (N = 101, 045)**

| Actual | Implied | Ratio | Mishkin |
| \( SUEPRE_t \) | -.251 | -.104 | 45% | 17.70** |
| \( SI_t \) | -.944 | -.724 | 77% | 3.80 |

---

\( a \): SUEPRE is seasonally-differenced earnings before special items and SI is special items, each scaled by beginning market value of equity.

\( b \): CARs (market-adjusted returns) winsorized at 1 and 99 percentiles.

\( c \): \( b_i^* = a_i / a_0 \).

\( d \): \( \chi^2 \) statistic based on procedure in Mishkin (1983) as applied by, for example, Soffer and Lys (1999) and Rangan and Sloan (1998).

**Ratio significantly different from 100 percent at the .05 level in a two-tailed test.**

**Ratio significantly different from 100 percent at the .01 level in a two-tailed test.**

significantly less than 100 percent at the .01 level. The ratio for SI using scores is almost identical to the ratio using ranks (76 percent using scores in table 4 and 73 percent using ranks in table 3). Also consistent with the results based on ranks, the implied coefficient on special items is closer to \(-1\) than the implied coefficient on \( SUEPRE \), i.e., market prices reflect the fact that the coefficient on special items is further removed from a seasonal random walk (a coefficient of \( 0 \)) than the coefficient on other components of earnings. Finally, and again consistent with the results based on ranks, expectations impounded in market prices account for a larger proportion of the effect of special items, compared to other components, on future seasonally-differenced earnings.

The analysis in table 2 suggests that positive special items are highly, but not completely, transitory while negative special items have characteristics of inter-period transfers in that negative special items represent current recognition of costs that would otherwise have been recognized in subsequent periods. Therefore, panels B and C in table 4 presents results for negative and positive special items separately. Differences between the estimates in
panels B and C are consistent with the differences identified in table 2. The implied coefficient on positive special items is less negative than the implied coefficient on negative special items, which suggests that the market recognizes that the actual coefficient on negative special items is more negative than for positive special items. However, the results also show prices reflect similar proportions of the information in negative and positive special items, as the ratios of the implied to actual coefficients for negative special items and for positive special items are nearly identical at 76 and 77 percent. The ratio for negative special items turns out to be significantly less than 100 percent at the .01 level while the ratio for positive special items just misses significance at the .05 level—although the ratios have similar values, the ratio for negative special items has a lower standard error. Thus, we can reject the null hypothesis that the market completely impounds the information in negative special items for future seasonally-differenced earnings, but not for positive special items. In summary, market prices not only reflect differential effects of special items compared to other components of earnings (as shown in results in table 3 and panel A of table 4), but also reflect differential effects of negative versus positive special items.

4.3 TESTS USING ALTERNATIVE RETURN ACCUMULATION PERIODS

The results reported in tables 3 and 4 focus on expectations immediately preceding the announcement of earnings in quarter \( t + 4 \), consistent with the focus in \( BT \) and \( BB \). Soffer and Lys [1999] and Dechow, Rangan, and Sloan [1996] argue that conclusions about expectations impounded in prices depend on the point in time at which expectations are inferred. Soffer and Lys point out that expectations immediately prior to the announcement of quarter \( t + 4 \) earnings reflect not only information from the past time series of reported earnings, but also any additional information about quarter \( t + 4 \) earnings that has become available to the market during the quarter. As a result of this additional information, expectations impounded in prices become increasingly sophisticated during the quarter so that expectations immediately prior to the announcement of earnings effectively impound more information than expectations earlier in the quarter. To test this conjecture, Soffer and Lys examine expectations impounded in prices at various points in time, ranging from approximately 60 trading days prior to the earnings announcement up through 2 days prior to the announcement, and find that the extent to which time-series properties of earnings at lag 1 are impounded in expectations increases throughout the quarter leading up to the earnings announcement. Similarly, Dechow, Rangan, and Sloan [1996] show that the magnitude of estimated coefficients from (4) varies with the length of the \( CAR \) accumulation period. Thus, the results in tables 3 and 4 should be interpreted as conclusions about market expectations immediately prior to earnings announcements.

To examine whether our conclusions with respect to the special items component of earnings at lag 4 differ for expectations assessed earlier in the quarter, we calculate the ratios of implied to actual coefficients, based on
TABLE 5
Comparison of Implied Coefficients from Regression of CAR on Lagged SUEPREs and SIs to Actual Regression Coefficients from Regression of SUE on Lagged SUEPREs and SIs with SUE, SUEPRE, and SI Standardized by Market Value (SUE Scores) and CAR Computed Using Fama-French Returns for Alternative Return Accumulation Periods

<table>
<thead>
<tr>
<th>Prediction equation$^a$</th>
<th>Pricing equation$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SUE_{t+4} = b_0 + b_1 SUEPRE_{t+3} + b_2 SI_{t+3} + b_3 SUEPRE_{t+2} + b_4 SI_{t+2} + b_5 SUEPRE_{t+1}$</td>
<td>$CAR_{t+4} = k^* + a_0 SUE_{t+4} + a_1 SUEPRE_{t+3} + a_2 SI_{t+3} + a_3 SUEPRE_{t+2} + a_4 SI_{t+2}$</td>
</tr>
<tr>
<td>$+ b_0 SI_{t+1} + b_7 SUEPRE_t + b_8 SI_t + e_{t+4}$</td>
<td>$+ a_5 SUEPRE_{t+1} + a_6 SI_{t+1} + a_7 SUEPRE_t + a_8 SI_t + \omega_{t+4}$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equation</th>
<th>(-60,0)</th>
<th>(-45,0)</th>
<th>(-30,0)</th>
<th>(-15,0)</th>
<th>(-2,0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$SI_t$</td>
<td>84%</td>
<td>62%</td>
<td>72%</td>
<td>79%</td>
<td>81%</td>
</tr>
<tr>
<td>$SUEPRE_t$</td>
<td>24%</td>
<td>59%</td>
<td>55%</td>
<td>88%</td>
<td>53%</td>
</tr>
<tr>
<td>$SUEPRE_{t+3}$</td>
<td>83%</td>
<td>107%</td>
<td>81%</td>
<td>77%</td>
<td>43%</td>
</tr>
</tbody>
</table>

$^a$ SUEPRE is seasonally-differenced earnings before special items and $SI$ is special items, each scaled by beginning market value of equity.

$^b$ CARs computed using Fama-French returns winsorized at 1 and 99 percentiles.

$^c$ Return accumulation periods defined in trading days relative to quarter $t+4$ earnings announcement date.

equations 2 and 4, for alternative return accumulation periods. Specifically, we consider five different starting points for the return accumulation periods, $-60, -45, -30, -15,$ and $-2$ trading days prior to the quarter $t+4$ earnings announcement date, corresponding closely to the periods considered in Soffer and Lys.$^{30}$ The additional data requirements imposed by the longer return accumulation periods lead to a slightly smaller set of observations in table 5 ($N=105,045$) relative to table 4 ($N=105,930$). There is evidence in the literature that over longer return cumulation windows, the simple market-adjusted returns and size-adjusted returns used in earlier analyses do not adequately control for risk. Accordingly, for this analysis we calculated risk-adjusted returns using daily versions of the three Fama-French risk factors, as described in Busse [1999] and Bollen and Busse [2001]. In order to allow for the possibility of risk changes associated with the special item reported in quarter $t$, we estimate the parameters of the three-factor model

$^{30}$ Soffer and Lys [1999] use periods with the same 15 trading-day spacing, but define the periods starting forward from the quarter $t+3$ earnings announcement date rather than back from the quarter $t+4$ announcement date. For purposes of our analysis, the approach adopted here results in a larger number of observations because it does not require the date of announcement of previous quarter earnings. The only substantive difference between the periods defined by the two approaches is that the return accumulation period beginning 60 trading-days prior to the quarter $t+4$ announcement may begin prior to the announcement of quarter $t+3$ earnings in a small number of cases, while the corresponding return accumulation period in Soffer and Lys cannot begin prior to the quarter $t+3$ announcement.
over a window beginning after the announcement of quarter \( t \) earnings and surrounding the announcement of quarter \( t + 4 \) earnings. Specifically, the estimation window includes returns for 250 trading days, consisting of the 125 days before and 125 days after the longest return accumulation period (which extends from day \(-60\) to day 0 relative to the announcement of quarter \( t + 4 \) earnings). We use the parameters estimated during the estimation period to calculate prediction errors during the return accumulation period, referred to as Fama-French abnormal returns.

The ratios of implied to actual coefficients for the five different return accumulation periods are shown in Table 5. As with the results in Table 4, the ratios were calculated using equations 2 and 4, replacing \( \text{CAR} \) with Fama-French abnormal returns as the dependent variable in equation 4. However, to simplify and shorten the presentation, we only display the ratios for \( \text{SI} \) and \( \text{SUEPRE} \) in quarter \( t \) (lag 4) and \( \text{SUEPRE} \) in \( t + 3 \) (lag 1). \( \text{SI} \) and \( \text{SUEPRE} \) in quarter \( t \) are included to show how the conclusions in earlier tables are affected by different return accumulation periods. \( \text{SUEPRE} \) in quarter \( t + 3 \) is included to compare results to Soffer and Lys [1999] and Dechow, Rangan, and Sloan [1996]. Moving across the table, results are presented for return accumulation periods that begin progressively closer to the earnings announcement date. The last of the five sets of results corresponds to the accumulation period used in Table 4 (day \(-2\) through day 0) and the results are similar to those reported in Table 4, where the relatively small differences are due to the method of calculating abnormal returns.

Focusing on special items in quarter \( t \), the ratios are relatively consistent for the various accumulation periods, with the ratios ranging from 62 percent to 84 percent. In particular, there is no apparent monotonic relation between the ratios and the length of the accumulation period. Thus, this supplementary analysis on expectations with respect to special items impounded in prices at various points in time continues to point to the overall conclusion that the effects of special items on future earnings are largely, but not completely, impounded in market prices.

Turning to the ratios for earnings before special items in quarter \( t + 3 \) (lag 1), there is a clear difference between the results in Table 5 and those reported in earlier research with respect to earnings from the immediately preceding quarter. Soffer and Lys [1999] and Dechow, Rangan, and Sloan [1996] report that the ratio at lag 1 (i.e., the proportion of the effect at lag 1 impounded in expectations) is small for accumulation periods beginning about 60 days in advance of the earnings announcement but the proportion increases substantially as the announcement date approaches. In contrast, the results in Table 5 show that the ratio is above 80 percent for

\[31 \text{ Soffer and Lys report ratios of implied to actual coefficients at lag one that decrease monotonically from 52 percent to } -7 \text{ percent for five increasingly long accumulation periods. Similarly, Dechow, Rangan, and Sloan [1996] report an implied lag 1 coefficient that is positive immediately preceding the earnings announcement while the implied coefficient decreases monotonically and eventually becomes negative toward the beginning of the quarter.}\]
the 3 longest accumulation periods, and decreases substantially to 43 percent for the shortest accumulation period. While an exploration of the reasons for this difference is left for future research, we note that whereas the results reported in table 5 using Fama-French abnormal returns are not consistent with previous research, results (unreported) using simple market-adjusted returns are similar to those in previous research.

4.4 NON-REGRESSION TESTS OF EFFECT OF SPECIAL ITEMS REFLECTED IN PRICES

The results reported in tables 3 and 4 depend critically on the structure imposed by the two equation approach which specifies the functional form of the relation between current and past earnings and the functional form of the relation between current market returns and current and past earnings. As a check on the sensitivity of our conclusions to this assumed structure, we present results of a less structured test like that used in BT. If the implications of special items for future earnings are fully impounded in prices, it should not be possible to construct a trading strategy based on past special items which generates a future abnormal return. From this perspective, a significant relation between abnormal returns at the announcement of quarterly earnings in quarter \( t + 4 \) and the sign of the special item in quarter \( t \) is interpreted as evidence that predictable effects of special items are not fully impounded in prices.

The CAR at the announcement of quarter \( t + 4 \) earnings is \(-0.069\) percent using market-adjusted returns (\(-0.139\) percent using Fama-French returns) for firms with positive special items in quarter \( t \) (although neither negative return is statistically different from 0 with \( t \)-statistics of \(-0.44\) and \(-0.87\), respectively) and \(+0.601\) percent using market-adjusted returns (\(+0.456\) percent using Fama-French returns) for firms with negative special items in quarter \( t \) (with significant corresponding \( t \)-statistics of 5.54 and 4.15, respectively). Note that the pattern of significance here is consistent with results in table 4 showing the implied ratio for positive special items is not significantly different from 100 percent while the implied ratio for negative special items is significantly less than 100 percent. The return to a trading strategy portfolio consisting of a long position in firms reporting negative special items and a short position in firms reporting positive special items would, on average, earn a significantly positive three-day return of \(0.67\) percent using market-adjusted returns (\(0.60\) percent using Fama-French returns) with a corresponding \( t \)-statistic of 3.50 (3.06).\(^{32}\) Thus, without relying on a specific functional form, these results support the earlier conclusion based on results in tables 3 and 4 that information about past special items is not fully

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\(^{32}\) As in BT, this trading strategy is literally executable only if the \( t + 4 \) announcement date is known in advance. Because recent evidence in Bagnoli, Kross, and Watts [2000] suggests that announcement dates are reasonably predictable, this does not appear to be an important limitation. Note also that although the portfolio return is statistically significant, it is debatable whether the before transactions costs return is economically significant.
impounded in prices, consistent with the conjecture that market prices underanticipate the reversal in quarter $t + 4$ of special items from quarter $t$.

5. Summary and Conclusions

Previous research suggests stock prices are inefficient in that they only partially impound the implications of current earnings for expected future earnings. We explore the limits of these findings by focusing on a component of earnings, special items. The fact that special items receive substantial attention and are assumed to have straight-forward implications for expected future earnings (special items are generally assumed to be transitory) suggests that, unlike the results for non-special items earnings components, prices will fully reflect the implications of special items for future earnings. On the other hand, Bernard and Thomas [1990] demonstrate patterns of security returns that are consistent with a seasonal random walk earnings expectations model. If seasonal random walk expectations are applied to special items, and special items are largely transitory, prices will be highly inconsistent with the implications of special items for future earnings.

We find that market expectations are sophisticated in that prices reflect differences in the implications of special items and non-special items components of earnings for expected future earnings. Further, prices reflect differences in the implications of positive and negative special items. Positive special items are less than completely transitory in that positive special items are followed by a smaller but non-zero amount of earnings of the same sign in subsequent quarters. Negative special items are like inter-period transfers in that they are followed by earnings of the opposite sign in subsequent quarters. We find that prices impound approximately the same proportion of information related to future earnings conveyed by positive and negative special items.

As in BB, we use a “two-equation” approach to estimate the proportion of the effect on future earnings impounded in prices. This approach indicates that prices reflect relatively more of the future earnings effects of special items compared to non-special items components of earnings. Specifically, while the BB study and our study both suggest that the market underestimates the effect of an earnings innovation on seasonally-differenced earnings four quarters in the future by about 75 percent, the corresponding percentage underestimation for special items is only 27 percent. Nonetheless, we reject the null hypothesis that prices fully reflect the implications of special items for future earnings. This latter result suggests a market inefficiency with respect to the pricing of special items similar to that observed for earnings as a whole. To provide further evidence of a potential inefficiency, we examine the return to a trading strategy in which a portfolio is formed by taking a long position in firms reporting negative special items four quarters earlier and a short position in firms reporting positive special items. We find that this portfolio earns a small but statistically significant three-day return around the earnings announcement four quarters subsequent to a
special item. Thus, consistent with the conclusion from the “two-equation” approach, this analysis indicates that prices do not fully reflect the implications of special items for future earnings.

REFERENCES


