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# INFORMATION CONTENT OF SALES AND EARNINGS FORECAST REVISIONS

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# Information Content of Sales and Earnings Forecast Revisions

This study investigates the information content of revisions in security analysts' sales and earnings forecasts. By examining forecast revisions for both these variables, we hope to be able to better explain unsystematic returns. Prior forecasting research has focused on the information content of earnings forecasts (Patell, 1976; Penman, 1980) and earnings forecast revisions (Lobo, 1982), which appear to be capable of explaining a portion of unsystematic returns. Lev and Ohlson (1982) have suggested that other accounting variables might also provide information relevant to explaining still more of the unsystematic returns. With the exception of earnings, sales revenues are the most widely cited and forecasted accounting variable pertaining to periodic performance. Hence, sales forecast revisions were examined to determine whether they complement the information contained in earnings forecast revisions.

The research demonstrates that sales forecast revisions do contain information which complements earnings forecast revisions. The results reveal that knowledge of either the sign, or the magnitude of both information variables (sales and earnings forecast revisions) provides more information than either variable taken separately. Moreover, using the magnitude of the two information variables, a significant nonlinear interaction is observed between sales and earnings forecast revisions and unsystematic returns around the time of the forecast revisions.

## Theoretical Basis

There are several reasons why one might expect sales forecasts to convey information beyond that contained in earnings forecasts. Although sales and earnings series are highly correlated across firms and over time, they may be more relevant to investors when used in combination with one another than when used individually. For example, an upward revision in a sales forecast combined with a downward revision in an earnings forecast may convey more information than a downward earnings forecast revision alone.

Although prior studies have examined the information content of managements' earnings forecasts, we note that most public announcements of earnings forecasts are accompanied by sales forecasts as well. Because of the tendency for predictions of sales and earnings to be released together, it is likely that the information content attributed to earnings forecasts may have, in fact, been complemented (or mitigated) by an accompanying (yet unexamined) sales forecast. In short, results reported to date are likely to be strengthened by the inclusion of a sales forecast information variable. Hence, examination of the information content of revisions in both sales and earnings forecasts may explain a greater portion of unexpected security returns than either variable alone.

While sales and earnings series are related to one another in a mechanical sense (earnings being the residual of sales after considering expenses), they do provide distinctly different information. Earnings is considered to be an important variable that may contain information about expected future cash flows of the entity. However, because of the many allocation decisions made by managers in formulating earnings, the earnings variable may provide other signals important for valuing the firm. For example, Zmijewski and Hagerman (1981) examined a number of accounting policy choices made by managers in an effort to depict the "income strategy" signaled by the firm. Jensen and Meckling (1976) have suggested that managers whose salaries are related to accounting numbers may wish to make accounting allocation decisions (e.g., useful lives of depreciable assets, etc., as well as observable decisions such as the accounting policies for inventory, depreciation, etc.) so as to maximize their own utility. Alternatively, Watts and Zimmerman (1978) have pointed out that these managers might be constrained from making accounting allocation decisions that maximize their utility (via earnings maximizing allocations) due to "political costs" associated with having a high earnings profile. The combined effect of these studies suggests that earnings may be smoothed or otherwise manipulated by managers in achieving some constrained utility maximizing income strategy. Hence, earnings may provide more or less information about expected future cash flows of the entity depending on the extent of activities aimed at influencing earnings in economic and noneconomic ways.

There is no complete theory to explain how managers make all of the various allocation decisions that affect accounting earnings (and, presumably, earnings forecasts). However, it seems reasonable to assume that many different forms of signals could be communicated through accounting earnings because of the many managerial decisions that influence earnings (Gonedes, 1975). Conversely, sales is relatively free of these allocation decisions. As a result, it is possible that sales forecasts provide information that either enhances or complements earnings forecasts. Sales revenues represent the gross cash (or near cash) inflows from operations, and contain important information about market share and growth in firm size. Sales data also provide a good interfirm comparative performance measure since they are not subject either to allocations or to price changes, both of which limit the interfirm comparability of earnings measures.

Theory suggests that sales forecasts might provide information beyond that which is conveyed by forecasts of earnings, and might be expected to incrementally explain unsystematic returns. Alternatively, if sales forecasts do not contain information beyond that contained in earnings forecasts, one must question their relevance as well as the economic justification for costs associated with providing them.

## RESEARCH DESIGN

The objective of this research was to determine whether revisions in sales forecasts could explain unsystematic returns not explained by earnings forecast revisions, or vice versa. To do so, we needed a source of sales and earnings forecasts that were revised periodically. Value Line is the only available data base that systematically provides quarterly updates of sales and earnings forecasts for a large number of firms; therefore, it was used as the primary data source.

### Sample Selection and Data

Our target sample was 100 firms. We started with 115 firms randomly selected from those December 31 year-end firms that had quarterly earnings (EPS) and sales data available on Compustat or in Moody's for the period 1965 to 1982. These historical data were needed to measure the standard deviation of the actual series used to deflate the sales and earnings forecast information variables. The 18 year interval represents 10 years of pretest period data (1965-1974) and eight years (1975-1982) of test period data. From these firms, we eliminated 15 that did not have quarterly sales and earnings forecast data available in Value Line for the period 1975 to 1982. The study also required firms to have daily CRSP data for the period 1970 to 1982. Four firms were deleted due to missing CRSP data, leaving 96 in the sample.

Only December 31 year-end companies were used in order to permit the assumption that all analysts' forecasts for, say, the second quarter of a calendar year were between 6 and 9 months before each fiscal year end. This uniformity of time frame was expected to be an important variable having informational consequences permitting analysis of the results by quarter. By controlling for the year-end of the sample firms, quarterly effects of sales and earnings forecasts revisions could be examined on a cross sectional basis, (e.g., the second quarter revisions of the information variables would be occurring during the same three month interval for all sample firms, and would represent a uniform number of quarters remaining until the end of the current fiscal year).

The CRSP data were required for estimating unsystematic security returns for the period 1975-1982. The combined data sets provided a total of 2,976 (96 firms times 31 quarters) firm/quarter observations for the study. One observation from this set was deleted because of a very large unsystematic return.

Information Variables

The two variables of interest were revised sales and revised earnings forecasts. Prior evidence suggests that there is information content in earnings forecast revisions (Lobo, 1982; Imhoff and Lobo, 1984). The change in the forecasts from one quarter to the next was the information variable of interest here in explaining unsystematic returns.

To represent the "new" information contained in the quarterly sales and earnings forecasts, we measured the revised forecast information variables as follows:

$$VE = \frac{VLE_{q-1} - VLE_{q-2}}{\sigma_E} \tag{1}$$

where:

$VE$ = earnings forecast information variable

$VLE_{q-1}$ = one-quarter-ahead Value Line earnings forecast for quarter q.

$VLE_{q-2}$ = two-quarter-ahead Value Line earnings forecast for quarter q.

$\sigma_E$ = the standard deviation of the actual quarterly earnings series estimated using the 40 quarters of earnings immediately preceding quarter q.

Also:

$$VS = \frac{VLS_{q-1} - VLS_{q-2}}{\sigma_S} \qquad (2)$$

where:

VS, VLS, and $\sigma_S$ are defined as above except that S designates sales.

These two information variables express the revisions in both sales and earnings forecasts relative to the standard deviation observed in their historical distributions. The premise underlying these measures is that a given amount of change in a forecast may have more or less information depending on the historical volatility of the series being predicted. For example, a one million dollar revision in the sales (or earnings) forecast may contain more information if the standard deviation of the series were $500,000 instead of, say, $10,000,000. Moreover, it has been empirically demonstrated that deflating earnings forecast revisions by standard errors provides an information metric that explains a larger percentage of the variation in unsystematic returns than do several other metrics (Imhoff and Lobo, 1984).

In addition to the VS and VE information variables, a joint information variable of the following form was also examined:

$$VES = VE \times VS \qquad (3)$$

This "interaction term" will be positive when the revised sales and earnings forecasts are both in the same direction (both upward or both downward revisions), and negative when the direction of the forecast revisions differ. In tests which follow, this interaction term will permit a more complete test of the influence of either VS or VE on unsystematic return. The interaction term allows for the unsystematic returns to be differentially affected by unit changes in sales or earnings forecast revisions, depending on the value of the forecast revisions (Kmenta, 1971, p. 455).

These independent "information" variables provided relative measures of the information conveyed in the sales and earnings forecast revisions. In some cases there were no revisions in either the earnings forecast, or the sales forecast, or both. Of the 2,975 observations, a total of 213 observations included a zero value for either the earnings (176 no revision cases) or the sales (141 no revision cases) information variable. Our results include these no revision cases because the no forecast revision case may also be informative.[1]

The dependent variable was examined in two forms: first, as the simple average of the unsystematic weekly return for the three weeks surrounding the release of the Value Line forecast; and second, as the three week average unsystematic return deflated by the standard error of the return regression equation over the 104 week estimation period. These variables were computed as follows:

$$u_{it} = R_{it} - (\hat{\alpha} + \hat{\beta} R_{mt}) \tag{4}$$

where:

$R_{it}$ = return for firm i in week t

$R_{mt}$ = return on market portfolio in week t

$\hat{\alpha}, \hat{\beta}$ = market model coefficients estimated using weekly returns from week -105 to week -2.

and:

$$y_{it} = \frac{u_{i-1} + u_{i_0} + u_{i+1}}{3} \tag{5}$$

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[1]The entire set of results was examined both with and without these no revision observations. There were no significant differences or inconsistencies in the two sets of results; therefore, reporting both would be redundant.

where:

$y_{it}$ = the average $u_{it}$ for the three week period surrounding the week of the Value Line forecast release.

and:

$$S_{y_{it}} = \frac{y_{it}}{s_{it}} \qquad (6)$$

where:

$s_{it}$ = the standard error of the market model regression for the 104 week estimation period for firm i at time t.

The two measures of unsystematic return were both computed for each firm over the 31 quarterly revisions during the period 1975-1982.

## HYPOTHESES

The statistical tests performed on the data were designed to evaluate the impact of the information variables on unsystematic returns in two ways. First, the signs of the information variables were examined to determine the relationship between various good news (upward forecast revisions) - bad news (downward forecast revisions) combinations on unsystematic returns. The 2,975 firm-quarter observations were grouped into portfolios formed contingent on the sign of VS, VE, and VS VE combinations to test the basic hypothesis that the unsystematic return for each of these portfolios was not significantly different from zero.

The second set of tests examined pooled time-series and cross-sectional regressions to determine whether the magnitude of unsystematic returns was related to the magnitude of the information variables (VS, VE, and VES) on a firm by firm basis. The general hypothesis that the information variables did not explain the variation in unsystematic returns was tested for both annual and quarterly time periods.

Portfolio Tests

Portfolio tests were conducted at two levels. First, the returns from four portfolios formed contingent on the sign of either VS (VS > 0; VS $\leq$ 0) or VE (VE > 0 ; VE $\leq$ 0) were examined to determine whether their unsystematic returns were significantly different from zero. It was expected that upward forecast revisions (VS or VE > 0) would be associated with positive unsystematic returns (and vice versa for downward revisions) if the forecast revisions were informative.

In addition, four other portfolios were formed contingent on the combinations of VS and VE forecast revisions (+ +, + -, - +, - -) to determine whether unsystematic returns were significantly different from zero. Analysis of these results would permit an evaluation of the differential effect of VS (VE) given the sign of VE (VS), and would also permit a direct evaluation of the sign and magnitude of the unsystematic portfolio returns when VS and VE had conflicting signs (+ - and - + combinations).

Unsystematic portfolio returns were based on the equal weighted aggregation of the $y_{it}$ and $S_{y_{it}}$ measures as defined before. Each observation was classified into one of the contingent portfolios each quarter, with the results pooled over eight years.[2]

Cross-Sectional Regression Tests

Pooled time-series and cross-sectional regressions were estimated in order to examine the relationship between the information measures (VE, VS, VES) and the two forms of unsystematic security returns. These regressions were of the following form:

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[2]Results on an annual basis were examined separately, but did not significantly add to the results pooled over all eight years.

$$Z_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \varepsilon_{it} \qquad (7)$$

$$Z_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \beta_3 VES_{it} + \varepsilon_{it} \qquad (8)$$

where:

$Z_{it}$ = either $y_{it}$ or $s_{y_{it}}$ as defined in (5) and (6) above,

VE,VS,VES = as defined in (1), (2), and (3) above, respectively,

i = designation of firm i, i = 1,...,96

t = designation of quarter t, t = 1,...,31

Equation 7 considers the VE and VS information variables, while equation 8 also includes the VES interaction term as a third possible explanatory variable. The cross-sectional regressions are reported on an overall basis as well as on a quarter by quarter basis to examine the relationship between unsystematic returns and the information variable VS, VE, and VES. These tests permit an evaluation of the relationship between the magnitude of the information variables, and the magnitude of unsystematic security returns.

## RESULTS

The sample firms represent certain biases that are reflected in the data. Given the long history of data required, the sample consists of firms that are mature and that have been reporting data beyond the minimum disclosure levels for some time. This maturity also translates to a more conservative, less risky group of firms. This unavoidable bias toward lower risk firms should be considered in extrapolating these results to other samples.

One concern of the study was the possibility that the signs of the sales and earnings information variables would always be in the same direction. Fortunately, this was not the case. Table 1 reports the frequency distributions of sales (VS) and earnings (VE) variables separately and in combination by quarter for the test period.[3] The distributions reveal that there are reasonably high frequencies for each combination of information signals. Table 2 provides descriptive statistics (panel A) and a correlation matrix (panel B) for the two measures of unsystematic returns and the three information variables. The distribution for the earnings information variable appears to be more volatile, with a higher standard deviation and greater range than the sales variable. Both measures of unsystematic return average near zero, are slightly positive in sign, and are highly correlated with one another. While the VE and VS variables are highly correlated (r = .523), the VES interaction term is weakly correlated with VE and VS.

## Differences in Portfolio Returns

The summary statistics for the portfolio results based on the individual information variables (VS or VE) are reported in Table 3. In panel A, the unsystematic portfolio returns for upward revisions of earnings are significantly greater than zero, suggesting an association between good news revisions and positive unsystematic returns. The downward or no revision firms generated negative unsystematic returns as expected, but they were not significant at the .05 level ($t \geq 1.645$). The same pattern was observed for the sales forecast revisions reported in panel B. The upward forecast revision portfolio generated significant positive residuals, while the downward or no change revisions did not. The results for earnings forecast revisions are not unlike results obtained in other studies of earnings forecasts (Givoly and Lakonishok, 1979).

The portfolio results reported in Table 4 for combinations of VS and VE provide a somewhat clearer picture of the relative effects of the sign tests.

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[3]These results were the same when the no revisions were deleted or added in with the upward revisions.

The sign of the unexpected portfolio returns for the VE, VS > 0, and for VE, VS $\leq$ 0 were significantly positive and negative respectively. When both forecast revisions were positive (negative), the unsystematic returns were significantly different from zero in the same direction. While neither downward sales nor downward earnings revisions alone were significant (from Table 3), the combination of downward (or no) revisions in both variables resulted in significant negative portfolio returns.

The marginal effect of one variable on the other may be evaluated by examining the t-statistics for the + -, - + combinations, as well as their differential effects on the t-statistics. For example, in the + - cell (VE > 0, VS $\leq$ 0), the unsystematic portfolio return (.00165 for $y_{it}$) was positive, and therefore consistent with the sign of VE but not VS. However, the magnitude of the unsystematic returns was not significantly greater than zero (t = 1.466). Moreover, holding VE > 0, the differential effect of the sign of VS is not significant ($t_{\bar{Z}_1 - \bar{Z}_2} = -0.460$).

The results in Table 4 are straightforward when both information variables have the same sign (+ +, and - -, reported in the diagonal cells). These results are stronger than those reported in Table 3, suggesting that the two variables complement one another in a meaningful way, and that evaluating both information variables may be more informative than evaluating either one alone. When the signs of these two variables conflict (VS > 0, VE $\leq$ 0 or vice versa) the unsystematic returns are not significant but are still positive in both cases. This is more apparent with VE > 0, VS $\leq$ 0 (t = 1.466) than with VE $\leq$ 0, VS > 0 (t = .396), but both combinations still result in positive unsystematic returns.

Recall from Table 3 that on an individual basis, both VE and VS generated nonzero (but not significant) negative returns. These combined results suggest that the "bad news" effect of a downward revision of one forecast variable (VS or VE) may be mitigated by a "good news" revision in the other forecast variable. In effect, it is likely that studies which examined the information content of earnings forecast revisions without considering the direction of sales forecast revisions would have been enhanced if sales had been controlled for, along with earnings. While it might be possible to say the same thing about many other variables that have not been controlled for, it is not likely that many accounting variables are forecasted simultaneously with earnings as often as is sales.

The portfolio results based on the sign of the sales and earnings forecast revisions provide some evidence suggesting that sales forecast revisions may complement and/or supplement the information contained in earnings forecast revisions. When the revision in either the sales or earnings forecast is negative, the direction of the revision in the other forecast variable appears to have an important effect on security returns. And, when sales and earnings forecast revisions are both in the same direction, the related unsystematic portfolio returns are considerably larger than the returns formed conditional on either sales or earnings forecast revisions alone.

Relationship Between Information Variables and Residual Returns

The results reported above are based on the classification of unexpected sales and earnings forecasts as positive and negative, with no consideration given for differences in magnitudes of the information variables within each classification. To explore this relationship in more detail we considered the relationship between the magnitude of the information measures and the magnitude of the unsystematic returns. In the absence of a relationship between the information variables and the market response, one could argue that the information (as defined) is not driving the results but is simply a proxy for some other variable that is responsible for the results.

To examine the relationship between $y_{it}$ (and $S_{y_{it}}$) and sales and earnings forecast revisions, the pooled time-series and cross-sectional regressions identified in equations (7) and (8) were estimated. Providing the information variables do not suffer from severe measurement error, this approach offers a more powerful test of information content.

The overall results for the pooled time-series and cross-sectional regressions are presented in Table 5. The interaction term is not included in panel A of Table 5, but is included in the panel B results. In panel A, the coefficient of the earnings information variable is significant at the .01 level whereas sales is not significant at the .05 level. These results are consistent for both the average unsystematic return measure ($y_{it}$) and the standardized measure ($S_{y_{it}}$).

In panel B, the results reveal that the earnings information measure (VE) and the interaction term (VES) are both significant at the .01 level for both measures of unsystematic returns. The interaction term (VES) seems to enhance the significance of both information variables, suggesting that the change in $y_{it}$ (or $S_{y_{it}}$) is not constant with all equal unit changes in VE or VS. The three information variables in panel B are most appropriately evaluated using an F test to determine whether all regressors involving an explanatory variable (VS or VE) are jointly zero (Kmenta, 1971, p. 456). In other words, VS may not be significant in and of itself, but may interact with VE in a significant way. Hence, to determine if VS has a significant influence on $y_{it}$, we test $\beta_2 = \beta_3 = 0$. The critical value of F ($F_{2,\infty} = 3.00$ for $\alpha = .05$; 4.61 for $\alpha = .01$) is exceeded for VS and VE as reported in panel B of Table 5. These results suggest that the magnitude of both sales and earnings forecast revisions are significantly associated with the magnitude of unsystematic returns.

The results reported in Table 5 do not differentiate by quarter. However, it is possible that information effects may not be uniform throughout the year. The regressions expressed in equations (7) and (8) were estimated on a quarterly basis in order to evaluate the information effects within the calendar year (and fiscal year for firms included here). Tables 6 and 7 report the results for equations (7) and (8) respectively for both $y_{it}$ (panel A in both Tables) and $S_{y_{it}}$ (panel B in both tables).

In Table 6 we observe a very irregular pattern in that earnings forecast revisions (VE) are only significant in the second quarter, and sales forecast revisions are only significant in the fourth quarter of the year. These results suggest that the major signal value of earnings forecast revisions arrives during the second quarter (when the expected second quarter earnings are updated from a two-quarter-ahead forecast to a one-quarter-ahead forecast). However, the information content in sales forecast revisions does not come until the final calendar quarter when sales for the fourth quarter are revised.

In Table 7, we find the interaction term has a significant effect in two ($y_{it}$) or three ($S_{y_{it}}$) of the four quarters, in addition to the significance of second quarter earnings and fourth quarter sales. The VES term is significant in the first and second quarter for $y_{it}$ (panel A), and in all but the third quarter for $S_{y_{it}}$, with a negative coefficient in every case.

To determine if the negative coefficient was consistent for the three combinations of VE and VS, results for all three cases (++, --, and mixed) were examined. The sign of the coefficient was negative in all three combinations of VE and VS.[4] As a result, the interaction term has the following effects on unsystematic returns:

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[4]These tests were based on model (8) with two additional variables (dummies) for the three alternative cases. The resulting coefficients were not only all negative, but tests for differences in size revealed no differences. This same process was also repeated on a quarterly basis, with the outcomes consistent with those reported in Table 7.

| Sign of VE | x | Sign of VS | = | Sign of VES | x | Sign of VES Coefficient | = | Effect on Unsystematic Returns ($y_{it}$) |
|---|---|---|---|---|---|---|---|---|
| + | | + | | + | | - | = | Reduces positive $y_{it}$ |
| - | | - | | + | | - | = | Increases negative $y_{it}$ |
| +/- | | -/+ | | - | | - | = | Reduces negative $y_{it}$ or Increases positive $y_{it}$ |

Unsystematic returns appear to be dampened (accentuated) by the VES interaction term when VE and VS are both positive (negative). Alternatively, unsystematic returns appear to be positively affected by the VES interaction term when VE and VS have different signs, providing an overall dampening of bad news effects. These results are consistent with the portfolio results reported earlier. Recall from the sign tests reported in Table 4 that in off-diagonal cells where VE and VS had opposite signs the unsystematic portfolio returns were both positive (though not significant).

The results of the F tests reported in Table 7 are clearer and more consistent than the evaluation of the t statistics for the three individual variables. The F statistics for both VS and VE are significant at the .05 level in all cases except for VS in the third quarter (using $y_{it}$ as the return measure in panel A). Based on the F statistics, we would conclude that both VS and VE are significantly related to unsystematic returns ($y_{it}$ and $S_{y_{it}}$) in nearly every quarter of the year.

It is interesting to note, however, that both VS and VE seem to be more informative in the second quarter. There may be a logical explanation for this outcome. For example, given that these companies all have December year ends, it is probably the case that managerial announcements regarding sales and earnings forecasts are most frequently found late in the first quarter and early in the second quarter. Although the Value Line forecasts used here were made quarterly, perhaps the verifiability of their forecast revisions is higher in the second quarter, and therefore more informative. Also, it is possible that "final" announcements of annual earnings for the most recently completed year, along with other data included in annual reports typically released at this time, are interacting with sales and earnings forecast revisions just as they appear to be interacting with one another.

## SUMMARY

This research investigated the information content of sales and earnings forecast revisions in an effort to evaluate the importance of sales forecasts. Prior research has demonstrated that earnings forecasts are informative. However, sales forecasts are often released at the same time as earnings forecasts, raising questions regarding whether they substitute for or complement one another in an information content sense.

The results based on portfolio returns formed conditional on the signs of sales and earnings forecast revisions provided some evidence that sales forecast revisions enhance our ability to explain unsystematic returns, and thereby appear to be informative. Most interesting was the observation that when a downward revision in either sales or earnings forecasts was accompanied by an upward revision in the other variable, a dampening effect on unexpected portfolio returns occurred resulting in a positive (though insignificant) residual. However, when viewed individually, downward revisions in either sales or earnings generated negative portfolio returns that approached the .05 level of significance.

The tests using pooled time-series and cross-sectional regressions provided even stronger support for the informativeness of sales forecasts. In the regressions that considered the sales-earnings interaction term in addition to the two information variables separately, the magnitude of both sales forecast revisions and earnings forecast revisions was found to be significantly and positively associated with unsystematic returns. These results were relatively strong when examined annually as well as quarterly, and suggest that both sales and earnings forecast revisions contain information that may be useful in establishing security prices.

Given the importance of future economic flows to an entity in setting prices for securities (as well as other "market" functions, including labor), much attention has been given to the prediction of future periods' accounting earnings. Results reported here suggest that predictions of future periods' sales also provide information relevant to setting prices. Moreover, the formulation of variables for both sales and earnings forecast revisions, as well as their interaction, appear to provide information measures whose magnitudes are significantly and positively associated with the magnitude of unsystematic security returns. It would seem reasonable to consider, or control for, the effects of sales in future studies of earnings forecasts.

Table 1

Frequency Distributions for
Sales and Earnings Forecast Revisions

Panel A: Overall Frequencies

| | Variable | |
|---|---|---|
| | Earnings | Sales |
| Upward Revisions (=+) | 1,565 | 1,789 |
| Downward Revisions or No Change (=-) | 1,410 | 1,186 |
| Total Observations | 2,975 | 2,975 |

Panel B: Paired Frequencies

| | Earnings/Sales Forecast Revisions (+ = upward) | | | | |
|---|---|---|---|---|---|
| Period | +/+ | +/- | -/+ | -/- | Total |
| 1st Quarter | 170 | 71 | 146 | 285 | 672[a] |
| 2nd Quarter | 497 | 62 | 106 | 103 | 768 |
| 3rd Quarter | 236 | 96 | 135 | 300 | 767 |
| 4th Quarter | 357 | 76 | 142 | 193 | 768 |
| Total | 1,260 | 305 | 529 | 881 | 2,975 |

[a]There are no 1st quarter revisions for 1975, hence the 96 fewer observations for the 1st quarter. Value Line data were collected starting in the first quarter of 1975, making the second quarter of 1975 the first forecast revision period.

## Table 2

## Descriptive Statistics and Correlation Matrix

### Panel A: Descriptive Statistics (n = 2,975)

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| $VE_{it}$ | 0.07374 | 0.99296 | -6.95990 | 6.62810 |
| $VS_{it}$ | 0.11876 | 0.58233 | -3.01350 | 5.14760 |
| $y_{it}$ | 0.00023 | 0.01925 | -0.07047 | 0.08280 |
| $S_{y_{it}}$ | 0.00610 | 0.35387 | -1.55366 | 1.87346 |

### Panel B: Correlation Matrix (n = 2,975)

| | $y_{it}$ | $S_{y_{it}}$ | $VE_{it}$ | $VS_{it}$ |
|---|---|---|---|---|
| $y_{it}$ | 1.0000 | | | |
| $S_{y_{it}}$ | 0.9833 | 1.0000 | | |
| $VE_{it}$ | 0.0713 | 0.0738 | 1.0000 | |
| $VS_{it}$ | 0.0572 | 0.0572 | 0.5230 | 1.0000 |
| $VES_{it}$ | -0.0413 | -0.0452 | 0.0545 | 0.0447 |

Table 3

Portfolio Returns Conditional on Sign of Forecast Revision

Panel A: Earnings Forecast Revisions

| | Upward-Revision Firms (1,565) | | | No change and Downward-Revision Firms (1,410) | | | |
|---|---|---|---|---|---|---|---|
| (1) | (2) Mean | (3) Standard Deviation | (4) | (5) Mean | (6) Standard Deviation | (7) | (8) |
| $Z_{it}$ | $(\bar{Z}_1)$ | $(\sigma_1)$ | $t_{\bar{Z}_1}$ | $(\bar{Z}_2)$ | $(\sigma_2)$ | $t_{\bar{Z}_2}$ | $t_{\bar{Z}_1-\bar{Z}_2}$ |
| $y_{it}$ | 0.00121 | 0.01874 | 2.554 | -0.00086 | 0.01976 | -1.634 | 2.932 |
| $S_{y_{it}}$ | 0.02476 | 0.34054 | 2.876 | -0.01462 | 0.36713 | -1.495 | 3.073 |

Panel B: Sales Forecast Revisions

| | Upward-Revision Firms (1,789) | | | No change or Downward (1,186) | | | |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| $Z_{it}$ | $(\bar{Z}_1)$ | $(\sigma_1)$ | $t_{\bar{Z}_1}$ | $(\bar{Z}_2)$ | $(\sigma_2)$ | $t_{\bar{Z}_2}$ | $t_{\bar{Z}_1-\bar{Z}_2}$ |
| $y_{it}$ | 0.00087 | 0.01888 | 1.949 | -0.00075 | 0.01977 | -1.307 | 2.249 |
| $S_{y_{it}}$ | 0.01779 | 0.34417 | 2.186 | -0.01155 | 0.36747 | -1.082 | 2.216 |

## Table 4

### Portfolio Returns Found Conditional on the Combined Sign of Sales and Earnings Forecast Revisions

| | VE > 0, VS > 0 (n = 1,260) | | | VE > 0, VS ≤ 0 (n = 305) | | | $t_{\bar{Z}_1 - \bar{Z}_2}$ |
|---|---|---|---|---|---|---|---|
| | $\bar{Z}_1$ | $\sigma_{Z_1}$ | $t_{\bar{Z}_1}$ | $\bar{Z}_2$ | $\sigma_{Z_2}$ | $t_{\bar{Z}_2}$ | |
| $y_{it}$ | 0.00110 | 0.01852 | 2.108 | 0.00165 | 0.01965 | 1.466 | -0.460 |
| $s_{y_{it}}$ | 0.02200 | 0.33384 | 2.339 | 0.03616 | 0.36729 | 1.719 | -0.651 |
| | VE ≤ 0, VS > 0 (n = 529) | | | VE ≤ 0, VS ≤ 0 (n = 881) | | | $t_{\bar{Z}_3 - \bar{Z}_4}$ |
| | $\bar{Z}_3$ | $\sigma_{Z_3}$ | $t_{\bar{Z}_3}$ | $\bar{Z}_4$ | $\sigma_{Z_4}$ | $t_{\bar{Z}_4}$ | |
| $y_{it}$ | 0.00024 | 0.01973 | 0.396 | -0.00158 | 0.01976 | -2.373 | 1.768 |
| $s_{y_{it}}$ | 0.00778 | 0.36775 | 0.487 | -0.02807 | 0.36630 | -2.275 | 1.777 |
| $y_{it}$ | $t_{\bar{Z}_1 - \bar{Z}_3} = 0.777$ | | | $t_{\bar{Z}_2 - \bar{Z}_4} = 2.464$ | | | |
| $s_{y_{it}}$ | $t_{\bar{Z}_1 - \bar{Z}_3} = 0.797$ | | | $t_{\bar{Z}_2 - \bar{Z}_4} = 2.638$ | | | |

## Table 5

### Results from Pooled Time-Series and Cross-Sectional Regressions

Panel A: Equation (8); $Z_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \varepsilon_{it}$

| $Z_{it}$ | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) |
|---|---|---|---|
| $y_{it}$ | 0.00004 | 0.00110 (2.654) | 0.00091 (1.279) |
| $S_{y_{it}}$ | 0.00266 | 0.02156 (2.819) | 0.01550 (1.189) |

Panel B: Equation (9); $Z_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \beta_3 VES_{it} + \varepsilon_{it}$

| $Z_{it}$ | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) | $\beta_3$ (t value) | F Statistic $\beta_1=\beta_3=0$ | F Statistic $\beta_2=\beta_3=0$ |
|---|---|---|---|---|---|---|
| $y_{it}$ | 0.00039 | 0.00114 (2.746) | 0.00094 (1.328) | -0.00114 (-2.503) | 6.5578 | 3.8821 |
| $S_{y_{it}}$ | 0.00961 | 0.02232 (2.920) | 0.01618 (1.242) | -0.02278 (-2.721) | 7.6011 | 4.3318 |

Table 6

Quarterly Regression Results for Excluding Interaction
(Equation 7)

Panel A: $y_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \varepsilon_{it}$

| Calendar Quarter | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) |
|---|---|---|---|
| First (n=672) | -0.00112 | 0.00102 (1.152) | 0.00144 (0.842) |
| Second (n=768) | -0.00132 | 0.00245 (2.937) | 0.00102 (0.724) |
| Third (n=767) | 0.00132 | 0.00104 (1.200) | -0.00118 (-0.962) |
| Fourth (n=768) | 0.00025 | -0.00014 (-0.161) | 0.00299 (2.045) |

Panel B: $S_{y_{it}} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \varepsilon_{it}$

| Calendar Quarter | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) |
|---|---|---|---|
| First (n=672) | -0.02047 | 0.01171 (0.702) | 0.03377 (1.049) |
| Second (n=768) | -0.02454 | 0.04620 (3.108) | 0.01479 (0.588) |
| Third (n=767) | 0.02609 | 0.02173 (1.411) | -0.02560 (-1.172) |
| Fourth (n=768) | 0.00936 | 0.00566 (0.361) | 0.05244 (1.910) |

Table 7

Quarterly Regression Results Including Interaction
(Equation 8)

Panel A: $y_{it} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \beta_3 VES_{it} + \varepsilon_{it}$

| Calendar Quarter | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) | $\beta_3$ (t value) | F Statistics $\beta_1=\beta_3=0$ | F Statistics $\beta_2=\beta_3=0$ |
|---|---|---|---|---|---|---|
| First (n=672) | -0.00075 | 0.00058 (0.630) | -0.00027 (-0.139) | -0.00208 (-1.854) | 10.4434 | 9.1089 |
| Second (n=768) | -0.00100 | 0.00333 (3.708) | 0.00184 (1.227) | -0.00292 (-2.594) | 29.2915 | 13.8944 |
| Third (n=767) | 0.00145 | 0.00107 (1.237) | -0.00126 (-1.022) | -0.00063 (-0.512) | 3.4177 | 2.3792 |
| Fourth (n=768) | 0.00059 | -0.00006 (-0.068) | 0.00376 (2.427) | -0.00134 (-1.505) | 4.4879 | 12.4982 |

Panel B: $S_{y_{it}} = \beta_0 + \beta_1 VE_{it} + \beta_2 VS_{it} + \beta_3 VES_{it} + \varepsilon_{it}$

| Calendar Quarter | $\beta_0$ | $\beta_1$ (t value) | $\beta_2$ (t value) | $\beta_3$ (t value) | F Statistics $\beta_1=\beta_3=0$ | F Statistics $\beta_2=\beta_3=0$ |
|---|---|---|---|---|---|---|
| First (n=672) | -0.01378 | 0.00371 (0.215) | 0.00294 (0.080) | -0.03765 (-1.775) | 8.0547 | 9.3887 |
| Second (n=768) | -0.01841 | 0.06282 (3.932) | 0.03031 (1.182) | -0.05530 (-2.763) | 33.0144 | 15.4220 |
| Third (n=767) | 0.02990 | 0.02283 (1.477) | -0.02818 (-1.279) | -0.01895 (-0.870) | 5.3505 | 4.1648 |
| Fourth (n=768) | 0.01719 | 0.00745 (0.475) | 0.07004 (2.414) | -0.03090 (-1.849) | 6.8891 | 13.5669 |

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