Revenue Surprises and Stock Returns*

Narasimhan Jegadeesh
Goizueta Business School
Emory University
1300, Clifton Road
Atlanta, GA 30322
(404) 727-4821
Narasimhan_Jegadeesh@bus.emory.edu

and
Joshua Livnat
Department of Accounting
Leonard N. Stern School of Business
New York University
40 W. 4th St.
NY NY 10012
(212) 998 – 0022
jlivnat@stern.nyu.edu

This Version: July 2004

Abstract

This paper examines the relation between revenue surprises, and contemporaneous and future stock returns. It also investigates whether analysts update their earnings forecasts in response to revenue surprises in a timely and unbiased fashion. The results indicate that the stock price reaction on the earnings announcement date is significantly related to contemporaneous, as well as past revenue surprises. We find significant abnormal returns in the post announcement period for stocks that have large revenue surprises, after controlling for earnings surprises. Although analysts revise their forecasts of future earnings in response to revenue surprises, they are slow to fully incorporate the information in revenue surprises.

JEL Classification: G12, G14

* We would like to thank Tarun Chordia, John Lewellen, and the seminar participants at the Financial Economics and Accounting Symposium at Maryland University, and Rice University for helpful comments and suggestions. We gratefully acknowledge the contribution of Thomson Financial for providing forecast data available through the Institutional Brokers Estimate System. This data has been provided as part of a broad academic program to encourage earnings expectations research.

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Abstract

This paper examines the relation between revenue surprises, and contemporaneous and future stock returns. It also investigates whether analysts update their earnings forecasts in response to revenue surprises in a timely and unbiased fashion. The results indicate that the stock price reaction on the earnings announcement date is significantly related to contemporaneous, as well as past revenue surprises. We find significant abnormal returns in the post announcement period for stocks that have large revenue surprises, after controlling for earnings surprises. Although analysts revise their forecasts of future earnings in response to revenue surprises, they are slow to fully incorporate the information in revenue surprises.

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A large body of research investigates how the market reacts to earnings surprises (see Kothari, 2001, for a recent review). This literature documents significant positive associations between earnings surprises and abnormal returns around the preliminary earnings announcements, as well as in the post-earnings announcement period. Since earnings is a summary measure of material economic events that affect a firm in a given period, the intense focus on earnings surprises by investors and academics is not surprising.

Recent research, however, increasingly focuses on additional data in financial statements to understand how they affect future earnings, cash flows, and stock prices. For example, Sloan (1996), DeFond and Park (2001) and others examine the price impact and profitability of trading strategies based on total accruals and discretionary accruals. They show that financial statement information beyond earnings has significant value implications.

This paper examines the information conveyed by revenues during preliminary earnings announcements, beyond the information in earnings. Investors consider revenues to be one of the most important financial data. For instance, price-to-sales ratio is a commonly used valuation metric and this ratio has gained prominence in recent years. The importance of revenue is also reflected by the fact that analysts now issue revenue forecast in addition to earnings forecast for many firms.

The growing importance of revenues is due to the fact that they convey incremental information about future earnings growth. For instance, Ertimur et al. (2003) document that market prices react significantly to revenue surprises on the earnings announcement dates, after controlling for earnings surprises. Their findings suggest that the market anticipates earnings surprises accompanied by revenue surprises in the same direction to experience more persistent future earnings growth that earnings surprises not accompanied by a revenue surprise.

Firms also recognize the importance of revenues to investors, and virtually all firms report revenues during their preliminary earnings releases. In contrast, far fewer firms report other balance sheet items, such the accounts receivables and inventory that are required to compute accruals and other financial ratios during preliminary earnings releases.[1] These data become available to the market only after the SEC filings.

This paper examines the information conveyed by revenues, and investigates whether the market reacts efficiently to that information. We start by directly examining whether revenue surprises convey useful information about future earnings growth over and above the information contained in contemporaneous earnings surprises. We find that revenue surprises indeed predict more persistent future earnings growth. Specifically, after controlling for past earnings surprises, earnings growth is positively related to past revenue surprises.

We then examine whether the market fully incorporates the information about the persistence of earnings growth conveyed by revenue surprises. We know from the post-earnings announcement drift literature that the market is slow to fully incorporate the information in earnings surprises (see Bernard and Thomas (1989, 1990), and Ball and Bartov (1996)). In particular, Ball and Bartov (1996) find that investors underestimate the

[1] Chen, DeFond and Park (2002) report that for their limited sample, only 39% of the firms disclose balance sheet information that are necessary for the computation of accruals when they announce their preliminary earnings. Also, Levi (2004) finds that only firms that do not report the balance sheet items with their preliminary earnings announcement experience abnormal returns related to accruals.

persistence of future earnings growth implied by earnings surprises. An analysis of how the market processes the revenue data will shed light on whether the market reacts efficiently to information about the persistence of earnings growth conveyed by data from financial statements besides earnings.

Our analysis of how market reacts to revenue surprises comprises three sets of tests. In the first set of tests, we examine the relation between stock price reactions on earnings announcement dates and past revenue and earnings surprises. We find that the earnings announcement date returns are related to the revenue surprise in the previous quarter. We also find a similar relation between earnings growth and past revenue surprises. The evidence that both price reactions and earnings growth are related to past revenue surprises in a similar manner indicates that at the time the revenue and earnings surprises are announced the market underestimates the persistence of earnings growth implied by past revenue surprises.

This paper also examines stock returns in the period following the quarterly announcements of financial results. We find that the abnormal returns during the six-month period after earnings announcements are related to revenue surprises, after controlling for earnings surprises. The post-earnings announcement drift is significant for small firms but not significant for large firms. In contrast, the relation between earnings announcement window returns and prior quarter revenue surprise is significant for both large firms and small firms. Together, these results indicate that although the market underreaction to revenue surprises is evident within future earnings announcement windows for large firms, this underreaction is not sufficiently strong to be detected with returns over the longer post-announcement period.

Our final set of tests examine whether analysts' quarterly earnings forecasts fully incorporate the information about future earnings growth conveyed by revenue surprises. We find that analysts do take into account revenue surprises when they revise their one- to four-quarter ahead forecasts. However, future forecast errors are also related to past revenue surprises, indicating that analysts underestimate the persistence of earnings growth implied by the revenue surprises. Further tests indicate that similar to market underreactions, analysts' response to revenue surprises also exhibit delays of up to at least five or six months.

The results of this study are important for academics and practitioners. Our analysis sheds light on the information conveyed by revenue surprises, and the nature of market reactions to such information. Academics can infer from our results how market participants process information in revenue surprises, in addition to earnings surprises, and whether they process this information efficiently. These results would add to our understanding of how the market reacts to information that becomes publicly available during preliminary earnings announcements. Our study is also important for practitioners who can improve their portfolio performance by utilizing the underreaction to not only earnings surprises but also to revenue surprises. Our results would also help stock analysts use the information in revenue surprises more efficiently when they forecast earnings.

The rest of the paper is organized as follows. Section I presents the relation between revenue and earnings surprises and stock returns around earnings announcements. Section II examines the post-announcement returns for stocks classified based on revenue and earnings surprises. Section III examines how analysts revise their forecasts in response to revenue surprises, and whether they fully incorporate the information in revenue surprises in their revisions. Section VI concludes the paper.

I. Revenue and Earnings Surprise and Announcement Date Stock Returns

A. Revenue and Earnings Surprise Measure

A large body of literature examines stock price responses to earnings surprises. We follow this literature and use standardized unexpected earnings (SUE) as our measure of earnings surprise. We define SUE for firm *i* in quarter *t* as:

$$SUE_{i,t} = \frac{Q_{i,t} - E(Q_{i,t})}{\sigma_{i,t}}, \tag{1}$$

where $Q_{i,t}$ is the quarterly earnings per share from continuing operations, $E(Q_{i,t})$ is the expected quarterly EPS prior to earnings announcement, and $\sigma_{i,t}$ is the standard deviation of quarterly earnings growth.

We assume that $Q_{i,t}$ follows a seasonal random walk with drift. We estimate the drift $\partial_{i,t}$ as follows:

$$\partial_{i,t} = \frac{\sum_{1}^{8}(Q_{i,t-j} - Q_{i,t-j-4})}{8}, \tag{2}$$

and

$$E(Q_{i,t}) = Q_{i,t-4} + \partial_{i,t}. \tag{3}$$

We include only firms that had data to compute the past eight seasonal differences in quarterly earnings. Therefore, to be included in the sample, a firm should have earnings data for at least the prior 12 quarters.

Some of the earlier studies (e.g. Foster, Olsen and Shevlin (1984) and Bernard and Thomas (1989)) assume that the seasonal differences in quarterly EPS follow an AR(1) process to estimate the earnings expectations. However, Freeman and Tse (1989) and others find that announcement date returns are more highly correlated with forecast errors from a seasonal random walk model than with the forecast errors from a AR(1) model. Therefore, they suggest that the seasonal random walk model captures market's earnings expectation better than the AR(1) model, and hence we use the seasonal random walk model.

Finally, we estimate $\sigma_{i,t}$ using the first difference of quarterly earnings growth over the previous eight quarters. The estimator for $\sigma_{i,t}$ is:

$$\sigma_{i,t} == \frac{1}{7}\sqrt{\sum_{j=1}^{8}(Q_{i,t-j} - Q_{i,t-j-4} - \partial_{i,t})^2}. \tag{5}$$

We follow a similar procedure to measure revenue surprises. Specifically, we define standardized unexpected revenue growth estimate (SURGE) as:

$$SURGE_{i,t} = \frac{\text{REV}_{i,t} - E(\text{REV}_{i,t})}{\xi_{i,t}}, \tag{6}$$

where $\text{REV}_{i,t}$ is the quarterly revenue per share, and $E(\text{REV}_{i,t})$ is the expected quarterly revenue per share prior to earnings announcement, and $\xi_{i,t}$ is the standard deviation of quarterly revenue growth. As with earnings, we also assume that REV also follows a seasonal random walk and we estimate its expectation and the standard deviation in a manner similar to that for quarterly EPS.[2]

[2] As with earnings, it is unlikely that a seasonal random walk model is the most appropriate model for the time series behavior of REV for all firms. If this model is misspecified, SURGE will measure revenue surprises with error. Any measurement errors, possibly due to model misspecification, would result in an

B. Data and Sample

We use COMPUSTAT for balance sheet and income statement data, as well as earnings announcement dates. We obtain returns data from the Center for Research in Security Prices (CRSP) files. We exclude financials from the sample since the revenues of financial firms are not comparable with those of industrial firms. We also exclude utilities from the sample since their revenue growths are typically more predictable than that for industrial firms. We also exclude all firms with stock prices below $5 on the day before the earnings announcement date to eliminate small, thinly traded stocks that investors are unlikely to pay much attention to. The sample period is 1987 to 2003.

Table 1 presents the sample sizes across various years. The sample size increases progressively from 6,648 firm-quarters in 1987 to 12,324 firm-quarters in 1998, but declines to 9,957 firm-quarters by 2003. There are a total of 165,708 firm-quarter observations in the sample. We classify firms with market capitalizations smaller than the NYSE median firm at the beginning of the calendar quarter prior to earnings announcement as small firms and the others as large firms. There are 116,573 firm-quarter observations for small firms and 49,135 firm-quarter observations for large firms.

Table 2 presents the correlations between SURGE and SUE over the entire sample period, and over the 1987 to 1995 and 1996 to 2003 subperiods.[3] We compute the correlations with pooled cross-section and time-series data. As can be expected, revenues and earnings surprises are positively correlated. The correlation for the entire

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understatement of the relation between revenue surprises and stock returns and bias against finding significant results.

[3] To remove the effect of outliers, we winsorize SURGE and SUE at the 5% and 95% levels based on the cross-sectional distribution of these variables in the prior six-month period.

sample period is .26, and the correlation in the first subperiod is marginally bigger than that in the second subperiod.

Table 2 also reports the correlations for value and growth firms, and small and large firms. We classify stocks into the value and growth categories based on their book-to-market ratios. We compute a stock's book-to-market ratio on the announcement date as the ratio of the book value of equity divided by the market capitalization of equity at the end of the quarter preceding the quarter for which earnings are announced.

We assign the stocks with book-to-market ratios below the median in the previous six-month period to the ``Growth'' category, and firms with book-to-market ratios above the median to the ``Value'' category. We use the median ratios from the book-to-market distribution in the prior calendar six-month period rather than from the contemporaneous six-month period because the complete data for the contemporaneous period would not be available until the last earnings announcement in that period. The correlation is higher for growth firms than value firms. Small firms have significantly greater correlation than large firms. The correlations are about the same in all categories in the first and second subperiods.

C. Revenue Surprise and Earnings Persistence

Ertimur et al. (2002) document that stock prices react to revenue surprises on the earnings announcement date, after controlling for earnings surprises. This evidence indicates that the market anticipates future earnings growth to be more persistent when earnings surprises are driven mainly by revenue surprises rather than by unexpected changes in expenses. Do revenue surprises indeed help predict persistence in earnings growth? This section addresses this question directly.

To examine the relation between revenues surprises and future earnings growth, we fit the following regression:

$$SUE_{i,t} = \alpha + \sum_{k=1}^{4} \beta_k * SURGE_{i,t-k} + \sum_{k=1}^{4} \gamma_k * SUE_{i,t-k}. \qquad (7)$$

We use the Fama-MacBeth procedure to estimate this regression. Specifically, we fit the cross-sectional regression within each six-month period and we report the time-series averages of the regressions coefficients. We compute the *t*-statistics using the time-series standard errors of the regression coefficients.

Table 3 presents the regression estimates. The pattern of autocorrelations between SUE in current and prior quarters is similar to that reported in the literature. For instance, our SUE coefficient estimates for the past four quarters are 0.302, 0.101, 0.058, and 0.303, and the corresponding coefficients in Ball and Bartov (1996, Table 1, p. 326) are 0.443, 0.133, 0.054, and -0.215. Burgstahler et al. (2002, Table 3, p. 602) also find coefficients of simlar magnitude and signs for earnings before special items.

As Table 3 shows, the revenue surprise of the immediately preceding quarter is positively and significantly associated with the current earnings surprise. Therefore, the preceding quarter revenue surprise can help predict future earnings growth. Other prior revenue surprises do not seem to have any significant incremental ability to predict the current earnings surprise beyond prior earnings surprises. To the best of our knowledge, there is no comparable analysis for revenue surprises in prior studies.

D. Earnings announcement window returns

This subsection examines stock price reactions to earnings and revenue surprises within earnings announcement windows. We define the earnings announcement window as trading day t-2 through trading day t+1, where t is the earnings announcement date. We compute the abnormal returns $AR_{i,t}$ within this window as follows:

$$AR_{i,t} = \prod_{j=t-2}^{t+1}(1+R_{i,j}) - \prod_{j=t-2}^{t+1}(1+BR_{i,j}), \qquad (8)$$

where, R and BR are the raw stock return and return on the value-weighted size and book-to-market matched portfolio benchmark, respectively. We use the Fama-French size and book-to-market classification to determine the benchmarks. They form six value-weighted portfolios using the intersection of stocks in two size-based and three book-to-market ratio based classification. The particular portfolio among these six benchmark portfolios to which a stock belongs is the benchmark for that stock.[4]

We assign each stock to one of five SURGE quintiles during each six-month period based on the quintile cutoffs from the SURGE distribution in the previous six-month period.[5] We label these SURGE quintiles R1 through R5, where R1 is the smallest SURGE quintile and R5 is the largest SURGE quintile. We then independently rank stocks based on SUE and assign them to five SUE quintiles labeled E1 through E5. The intersections of these SURGE and SUE categories yield a total of twenty-five categories with various combinations of revenue and earnings surprises. For example, R1|E1 is the lowest SURGE and lowest SUE category, and R5|E5 is the highest SURGE and highest SUE category.

[4] We obtain the data on book-to-market portfolio returns from Professor Kenneth French's data library. The sample period for the data on this website ends on 10/31/2003. Therefore, we use the value-weighted index return as the benchmark for all stocks from 11/1/03 to 12/31/03.

[5] To avoid loss of data, we use the contemporaneous six-month SURGE distribution to determine the quintile cutoffs for the first six-month period in our sample. Our results are not sensitive to whether the first six-month period is excluded from or included in the sample.

Although we classify stocks explicitly based on SURGE and SUE, it also implicitly sorts stocks based on expense surprises.[6] For example, the R5|E5 category contains stocks with both positive earnings and revenue surprises while the R1|E5 category contains stocks with the same level of earnings surprises but with negative revenue surprises. Therefore, the growth in earnings for the R5|E5 category is driven by revenue growth while the growth in earnings for the R1|E5 category is driven by expense controls. Table 3 results indicate that revenue surprises help predict future earnings growth. Therefore, R5|E5 should have higher returns than R1|E5.

Table 4 presents the average announcement window abnormal returns. Since several earnings announcements are made within any announcement window, the returns for stocks with overlapping announcement windows will be correlated. Our standard error estimation procedure allows for this cross-sectional dependence using a modified Fama-Macbeth approach.

The Fama-Macbeth approach first computes average returns within different calendar intervals. Then the time series of average returns are used to compute the sample mean and sample standard error. Under this procedure, each calendar interval is given the same weight. However, in the averages we report in Table 4, each event is given the same weight. Therefore, each calendar interval should receive weights proportional to the number of evens within that interval.

In our modified approach, we first compute the average abnormal return around the preliminary earnings announcement dates across all events within each six-month period, from January to June and from July to December, each year. The average

[6] Expenses here indicate the sum of all costs, and equals revenue minus earnings.

abnormal return we report in each cell in Table 4 is equal to the weighted average of the abnormal returns for the six-month cohorts in the sample, where the weights are proportional to the number of observations in the respective cohorts. Specifically,

$$\overline{AR} = \mathbf{w}'\mathrm{A}, \qquad (9)$$

where,

$\overline{AR}$: Average abnormal return

$\mathbf{w}$: Vector of weights where the i^{th} element is the ratio of the number of observations in period i divided by the total number of observations over the sample period

A: Vector of average abnormal return where each element A_i is the average abnormal return for the i^{th} six-month cohort.

The variance of $\overline{AR}$ is given by:

$$\mathrm{Var}(\overline{AR}) = \mathbf{w}' V_A \mathbf{w}, \qquad (10)$$

where V_A is the variance-covariance matrix of A. The diagonal elements of V_A are the variances and the off diagonal elements are the covariances between different six-month cohort returns. Since the return measurement intervals for different six-month cohorts do not overlap, the covariances are zero. Therefore, we set the off diagonal elements of V_A to zero. The diagonal elements are set equal to the estimated variance. Specifically, let $\upsilon_{i,j}$ be the ij^{th} element of V_A. The estimator for V_A in this section is:

$$\upsilon_{i,j} = \sum_{n=1}^{N} (A_n - \overline{AR})^2 \forall i = j,$$
$$= 0 \quad \text{otherwise,}$$

where N is the number of six-month cohorts.

The announcement window returns in Table 4 are monotonically related to both SURGE and SUE, consistent with the findings in Ertimur et al (2002). Within each SUE category, high SURGE stocks outperform low SURGE stocks. Similarly, within each SURGE category, high SUE stocks outperform low SUE stocks. Therefore, both SURGE and SUE contain incremental information relative to one another.

Interestingly, even the high SURGE stocks earn negative abnormal returns in the low SUE groups. In contrast, high SUE stocks earn significantly positive abnormal returns even in the low SURGE groups. These results indicate that investors receive positive earnings news favorably even in conjunction with poor sales performance, but positive sales performance is received with disappointment if the benefits do not contemporaneously flow through to the bottom line. Panels A and B of Table 4 present the results for the two subperiods. The subperiod results are by and large similar to the full sample period results.

To further examine the information content of revenue and earnings surprises, we estimate the following regression:

$$\mathrm{AR}_{i,t} = a + b * SURG_{i,t} + c * SUE_{i,t} + e_{i,t}. \qquad (11)$$

In this model, the slope coefficients b and c are the revenues and earnings response coefficients, respectively. We follow the Fama-MacBeth procedure and fit the regression within each six-month period and we compute the t-statistics using the time-series standard deviations of the coefficients.

Table 5 presents the time-series averages of the regression coefficients. Both SURGE and SUE coefficients are reliably positive over the entire sample period. The SUE coefficient, however, is more than twice as large as the SURGE coefficient, which indicates that the market attaches much more significance to the bottom line growth than top line growth. The SUE coefficient is bigger in the first subperiod than the second subperiod, while the SURGE coefficient is bigger in the second subperiod.

Table 5 also presents the revenues and earnings response coefficients for various subsamples. Both SURGE and SUE coefficients are larger for growth stocks than for value stocks. The results are likely to be driven largely by the fact that growth stocks trade at higher price-earnings and price-to-sales multiples than value firms. Therefore, a given level of revenue surprise has a greater price impact for growth firms. In addition, the results in Table 3 indicate a stronger relation for growth firms between revenue surprises and future earnings growth, which also potentially contributes to the bigger revenues response coefficients for growth firms than value firms.

The revenues and earnings response coefficients are larger for small firms than for large firms. For example, the SURGE coefficient for small firms is .4581 compared with .1511 for large firms. This result in not particularly surprising since more information is available in the market for the large firms than for small firms. Therefore, the same level of SURGE (or SUE) conveys less information on the earnings announcement dates for large firms.

E. Timeliness of price response to revenue surprises

This subsection examines whether the market reacts efficiently to the information in revenue surprises, or whether it exhibits delayed reactions. If the market were to react efficiently, then future returns should not be related to past surprises. This subsection examines price reactions around earnings announcements. Specifically, we regress abnormal returns within earnings announcement windows against lagged revenue and earnings surprises in the following regression:

$$AR_{i,t} = \alpha + \sum_{k=1}^{4} \beta_k * SURG_{i,t-k} + \sum_{k=1}^{4} \gamma_k * SUE_{i,t-k}. \quad (12)$$

If the market prices do indeed react efficiently and fully to contemporaneous surprises, then the slope coefficients on the past surprises should be zero.

Table 6 presents the regression estimates for the full sample and for the subsamples. The relation between announcement window returns and SUE that we find is consistent with those in the literature. For example, Ball and Bartov (1996, Table2, p. 327), find that the sum of the absolute values of the coefficients of the four lags of SUE is 2.44%, compared with that of 2.48% that we find in Table 6.[7] The patter of the SUE coefficients we find is {+, +, Insignificant, -}, which is also similar to that in Ball and Bartov.

We also find that the slope coefficient on the prior quarter SURGE is significantly positive. For the full sample and for all subsamples except large firms, the coefficient on the four-quarter lagged SURGE is significantly negative. Therefore, the market does not fully react to SURGE in the quarter when it is announced.[8]

The relative magnitudes of the slope coefficients on contemporaneous and lagged surprises offer an indication of the extent of market underreaction. The one-quarter lagged SURGE coefficient is.1368. This coefficient is about 36% the coefficient on contemporaneous SURGE (.3741) in Table 5. In comparison, the slope coefficient on

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[7] Ball and Bartov use the scaled ranks of SUE in their regressions while we use the actual values of SUE.

prior quarter SUE in Table 6 is about 12% of the contemporaneous quarter SUE coefficient in Table 5. Therefore, while the market underreacts to both SUE and SURGE, relatively more of the information in SUE is incorporated in the market price on the announcement date than the information in SURGE.

The two- and three-quarter lagged SURGE coefficients are not different from zero. However, the four-quarter lagged SURGE coefficients are significantly negative for the full sample and all subsamples, except the large firm sample. This relation is somewhat puzzling since the results in Table 3 indicate that four-quarter lagged SURGE is not related to future earnings growth, after controlling for past earnings surprises. In unreported results, however, we found that four-quarter lagged SURGE is significantly negatively related to future earnings growth when SUE is not included in the regression. Perhaps, Regression (7) is not sufficiently powerful to detect the relation between earnings growth and revenue surprises beyond the first few lags. In any event, the pattern of stock price reactions to revenue surprises indicates that the market does not fully incorporate the information that these surprises convey when they are announced.

II. Post-announcement announcement drift

The post-earnings announcement drift literature finds that stock prices drift in the direction of earnings surprises for about six months after earnings announcements. For example, Jones and Litzenberger (1970), Latane and Jones (1979), Bernard and Thomas (1989), and Chan, Jegadeesh and Lakonishok (1996) among others, find that high SUE stocks outperform low SUE stocks.

The post-earnings announcement drift is generally attributed to the fact that the market does not fully react to the information about future earnings growth conveyed by

[8] To the best of our knowledge, no comparable results exist in prior studies for revenue surprises.

earnings surprises. Our results indicate that stocks with earnings surprises accompanied by revenue surprises in the same direction experience more persistent future earnings growth than stocks with the same level of earnings surprises, but smaller revenue surprises. To the extent that the market underreacts to the information about the persistence in future earnings growth, we would expect post-earnings announcement drift to be related to revenue surprises, after controlling for earnings surprises.

This section examines the post-announcement returns for stocks in various SURGE and SUE categories. We compute the average abnormal returns for each SURGE and SUE category over various horizons up to one year starting from day t+2, where day t is the preliminary earnings release date. We compute the abnormal returns as follows:

$$AR_{i,t}(6) = \prod_{j=t+2}^{T}(1 + R_{i,j}) - \prod_{j=t+2}^{T}(1 + BR_j), \qquad (13)$$

where T is the length of time after the earnings announcement date. If a stock in the sample is delisted before the end of the one-year post-announcement period then the stock is removed from the sample from that point forward.[9]

Figure 1 presents the abnormal returns for the SURGE and SUE categories during the post-announcement period for T from one to 12 months. The high SURGE categories earn positive abnormal returns over the entire post-announcement period, while the low SURGE categories earn negative abnormal returns. The results for the post-announcement abnormal returns for various SUE categories also exhibit a similar pattern and the SUE results confirm the evidence in the extant literature.

[9] We found similar results when we assumed that the value of the position at the time of delisting is invested in the size and book-to-market matched portfolio from that time forward.

The stocks in the high SURGE/ high SUE category earn the largest returns across all horizons and the stocks in the low SURGE / low SUE category earn the smallest returns. The post-announcement abnormal returns differences between the extreme SURGE categories and the extreme SUE categories increase over the first six months and then they roughly level off. The post-announcement drift generally tapers off after six months for all the SURGE and SUE categories.

Table 7 presents the six-month post-announcement abnormal returns (starting from date t+2) for the SURGE and SUE quintiles. To assess statistical significance, we compute the mean return and the standard error of the mean for each category as described in Equations (9) and (10). Since we now consider a six-month holding period, now A_i is the average six-month abnormal returns for cohort i.

With the longer holding period in this section, the return measurement intervals overlap for adjacent cohorts. For example, consider firms that announce earnings in June. These firms would be included in the corresponding January to June cohort but their returns are measured from June to November. Therefore, the return interval for these firms would overlap with the return interval for firms that announce earnings in the next July to November period, and these firms are in the next cohort. Therefore, we should allow for the six-month returns of the January to June cohort to be correlated with the six-month returns of the next July to December cohort.

To account for this correlation, we allow for the first-order serial covariance terms to be non-zero in the variance-covariance matrix V_A. We estimate the variance terms as before. Specifically, the estimator for V_A in this section is:

$$\upsilon_{i,j} = \sum_{n=1}^{N}(A_n - \overline{AR})^2 \qquad \forall i = j,$$
$$= \sum_{n=2}^{N}(A_n - \overline{AR})(A_{n-1} - \overline{AR}) \qquad \forall |i-j| = 1, \text{and} \quad (14)$$
$$= 0 \quad \text{otherwise.}$$

The results in table 7 indicate that the high SURGE stocks earn 1.82% in the first six months after earnings announcements, while the low SURGE stocks earn -2.63%. The high and low SUE stocks earn abnormal returns of 2.28% and -3.33%, respectively.[10] The return spreads are generally similar across the extreme categories for both SURGE and SUE. The return spread is larger when we consider both SURGE and SUE simultaneously. For example, the six-month abnormal return for the high SURG/high SUE category is 8.41% larger than that for the low SURG/low SUE. This return difference is larger than the spread across either the extreme SURGE categories or the extreme SUE categories.

Panel B of Table 7 reports the number of firms per quarter in each SURGE and SUE category. The number of firms along the diagonal is generally bigger that the number of firms in the off-diagonal cells, reflecting the correlation between SURGE and SUE.

Because SURGE and SUE are positively correlated, a part of the return differences across SURGE categories is attributable to the SUE effect and a part of the return difference across SUE categories is attributable to the SURGE effect. To assess the incremental effects of SURGE and SUE, we fit the following regression:

$$\text{AR}(6)_{i,t} = a + b * SURGE_{i,t} + c * SUE_{i,t} + e_{i,t} \qquad (15)$$

[10] The return difference that we find between the extreme SUE categories is larger than that in Bernard and Thomas (1989). Bernard and Thomas's (1989) sample comprises only NYSE and AMEX firms while we

Table 8 reports the regression estimates. The slope coefficients on SURGE and SUE over the entire sample period are .7643 and 1.2616, respectively. Both these estimates are statistically significant. Therefore, the market underreacts to the incremental information about the persistence of earnings growth provided by revenue surprises. Table 8 also presents the regression estimates for the subperiods. We find that the SURGE coefficient is bigger in the second subperiod than in the second subperiod, but the SUE coefficient is significantly smaller in the second subperiod. Perhaps, with all the attention that has been paid to the SUE effect in the literature, its ability to predict future returns is wearing off.

The SURGE coefficient for value firms is .7270 and for growth firms .7395. Both these coefficients are statistically significant. The SURGE coefficient for small firms is 1.0387, which is also statistically significant. The SURGE coefficient for large firms, however, is not significantly different from zero. Therefore, we do not detect any post-announcement drift related to revenue surprises for this subsample of firms.[11] This result provides an interesting contrast to our findings in Table 6, where we find that the market does indeed underreact to SURGE for large firms when we examine returns within the earnings announcement windows. The underreaction, however is not sufficiently strong outside the earnings announcement window to be detected with returns over the longer post-announcement period.

As a robustness check, we examine whether the SURGE effect is related to price momentum documented by Jegadeesh and Titman (1993). Since stock returns tend to be

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also include Nasdaq firms in our sample. More small firms trade on the Nasdaq than on NYSE and AMEX, and the SUE effect is larger among small firms than among large firms.

[11] We also did not find any significant difference between the value-weighted abnormal returns for the high and low SURGE portfolios.

high when revenue growth exceeds expectations, SURGE and price momentum are positively correlated. Therefore, it is possible that the significance of SURGE merely captures the price momentum effect.

To examine whether SURGE has incremental information after we control for both earnings and price momentum, we fit the following cross-sectional regression:

$$\text{AR}(6)_{i,t} = a + b * SURG_{i,t} + c * SUE_{i,t} + c * Mom\_Rank_{i,t} + e_{i,t}, \qquad (16)$$

where *Mom_Rank* is the decile rank based on the past six-month returns. To compute *Mom_Rank,* we rank all stocks over every six-month period based on their returns within that period. The *Mom_Rank* for the stocks in the lowest return decile is 1, and the *Mom_Rank* for the stocks in the next decile is 2 and so on. The variable $Mom\_Rank_{i,t}$ is stock *i*'s momentum rank in the six-month period ending with the month prior to the earnings announcement date.

Table 8 presents the regression estimates. The point estimates of the SURGE coefficients in Regression (16) are smaller than the corresponding coefficients in Regression (15). Therefore, a part of the SURGE effect is due to price momentum. However, except for large firms, all SURGE coefficients remain significant in Regression (16). These results indicate that the SURGE effect is not subsumed by price momentum.

III. Forecast revisions and future forecast errors

Investors typically rely on stock analysts for earnings forecasts. In fact, Kothari (2001, p. 153) notes in his review of the literature that "in recent years it is common practice to (implicitly) assume that analysts' forecasts are a better surrogate for market's expectations than time-series forecasts". Our evidence so far suggests that the market expectations do not fully reflect the information in revenue surprises. Perhaps, the bias in market expectation is related to the fact that analysts fail to fully incorporate the information in revenue surprises in their forecasts.

This section examines if the biases we find in market expectations are reflected in analysts' earnings forecasts. We examine how analysts respond to revenue and earnings surprises when they revise their earnings forecasts, and we evaluate whether they use the information in these surprises in an unbiased manner.

A. Forecast Revisions

This subsection examines how analysts use the information in SUE and SURGE to revise their forecasts. We define forecast revisions as the difference between the earnings forecast after and before an earnings announcement, divided by the price on the day before the earnings announcement. Specifically, we define the the τ -quarter ahead earnings forecast reavision $FR_{i,t+\tau}$ as:

$$FR_{i,t+\tau} = \frac{100 \times [FA_{t+\partial}(Q_{i,t+\tau}) - FA_{t-\partial}(Q_{i,t+\tau})]}{P_{i,t-1}}, \qquad (17)$$

where quarter $t+\tau$ is the τ^{th} quarter after the earnings announcement quarter, $FA_{t-\partial}(Q_{i,t+\tau})$ is the mean IBES forecast of $Q_{i,t+\tau}$ that was made in the 90-day period (using the detailed IBES file and including only the most recent forecast for each analyst) prior to the earnings announcement date, $FA_{t+\partial}(Q_{i,t+\tau})$ is the mean IBES forecast of $Q_{i,t+\tau}$ in the 10-day period beginning immediately after the earnings announcement, and

$P_{i,t-1}$ is the price on the day before the earnings announcement.[12] To ensure that analysts use the information in revenue and earnings surprises in their forecasts, we include only the forecasts that are issued after the announcement of earnings on date *t* to compute $FA_{t+\partial}(Q_{i,t+\tau})$. We winsorize the forecast revisions at plus or minus five percent to avoid the effect of outliers.

We then fit the following regression model to examine how analysts respond to revenue and earnings surprises:

$$FR_{i,t+\tau} = \varphi_{0,\tau} + \varphi_{1,\tau} * SURGE_{i,t} + \varphi_{2,\tau} * SUE_{i,t} + \varepsilon_{i,t}, \qquad (18)$$

Table 9 presents the regressions results. The SURGE coefficients for one-, through four-quarter ahead forecast revisions are .0268, .0217, .0155, and .0207, respectively. All these coefficients are significantly positive. The SURGE coefficients decline from one-quarter ahead through three-quarter ahead forecast revisions. However, the slope coefficient for the four-quarter ahead revision is larger than that for the three-quarter ahead forecast revisions. This pattern indicates that analysts anticipate the effects of revenue and earnings surprises on future earnings growth are partly temporary, but they are also expected to have a seasonal effect on future earnings growth, which accounts for the relatively large coefficient on the four-quarter ahead revision. We also find a similar pattern for the SUE coefficients across various forecast horizons. The SURGE coefficients are smaller than the SUE coefficients at all forecast horizons. Therefore, earnings surprises are expected to have a more significant impact on future earnings than revenue surprises. This pattern is consistent with the time series relation we find in Table 3. These results may also explain why high SURGE firms with low

[12] Note that a τ -quarter ahead forecast after an earnings announcement corresponds to a $(\tau+1)$ -quarter

SUE earn negative abnormal returns while high SUE firms with low SURGE earn positive returns in Table 4. In the long run, the effects of earnings surprises on future earnings outweigh the effects of any revenue surprises of a similar magnitude, but in the opposite direction.

The subsample results indicate that the SURGE and SUE coefficients are generally larger for growth firms than for value firms. Therefore, analysts expect revenue and earnings surprises to have a more persistent effect for growth firms, which is consistent with the time series relation in Table 3. The SURGE and SUE coefficients are larger for the small firms than for the large firms, and this result reflects that fact that earnings announcements contain less information for large firms relative to publicly available information.

B. Forecast errors

This subsection investigates whether analysts fully incorporate the information in SURGE and SUE when they revise their forecasts after earnings announcements. We know from prior literature that analysts are slow to incorporate the information in revenue surprises. For example, Abarbanell and Bernard (1992), Elgers and Lo (1994) and Easterwood and Nutt (1999) find that analysts do not use the information in prior year earnings growth in their forecasts of annual earnings. Specifically, these studies find a significant association between analyst forecast errors and earnings growth in the previous year. Easterwood and Nutt (1999) show that the bias depends on the sign of the actual prior change in earnings, where analysts seem to under-react to bad prior earnings news, but over-react to good prior earnings news. Thus, these studies indicate that

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ahead forecast before the announcement.

analysts do not fully incorporate the information in the most recent earnings changes in their forecasts.

We use a similar approach to test whether the quarterly earnings forecast errors are related to prior quarterly revenue and earnings surprises. If analysts exhibit similar biases in how they incorporate the information in revenues as they do with earnings, then we expect to find a similar relation between forecast errors and past revenue surprises.

We compute the forecast error relative to the mean IBES forecast in the 10-day period immediately after each earnings announcement date as follows:

$$FE_{i,t+\tau} = \frac{100 \times [Q_{i,t+\tau} - FA_{t+\partial}(Q_{i,t+\tau})]}{P_{i,t-1}}, \qquad (19)$$

where, $FA_{t+\partial}(Q_{i,t+\tau})$ is the mean IBES forecast (from the detail IBES files) in the 10-day period immediately after the earnings announcement for the τ-period ahead quarter, $Q_{i,t+\tau}$ is the IBES actual EPS for quarter $t+\tau$. We normalize the forecast errors by $P_{i,t-1}$ (the price before the earnings announcement date), which is the price we used to normalize forecast revisions in Equation (17).We winsorize the forecast errors at plus or minus five percent to avoid outliers.

The following regression model examines the relation between forecast errors and past surprises:

$$FE_{i,t+\tau} = C_0 + C_1 * SURGE_{i,t} + C_2 * SUE_{i,t} + \varepsilon_{i,t}. \qquad (20)$$

The independent variables in this regression are the same as those in Regression (18). The dependent variable in Regression (18) is forecast revision following earnings announcements, while the dependent variable in Regression (20) is the forecast error with respect to the revised forecasts.

If analysts fully incorporate the information in revenue and earnings surprises then the slope coefficients in Regression (20) should be zero. A positive slope coefficient for any independent variable would imply that analysts underreact to that variable, and a negative slope coefficient would imply that analysts overreact to that variable.

Table 10 reports the regression estimates. The regression estimates are all positive and generally significant for both SURGE and SUE for the full sample and for all subsamples. In particular, the regression coefficients are significant for the large firm subsample. The magnitude of the SURGE coefficients for large firms, however, is significantly smaller than those for small firms. The small but significant bias for large firms likely explains why we are not able to detect significant post-earnings announcement price drift over a long period, but we are able to find it in returns when we focus on the short but informative window around earnings announcements.

There are two further aspects of the results here that are striking. First, the slope coefficients here are generally larger than the slope coefficients in Table (3). These estimates imply that the forecast errors after the revisions are larger than the actual revisions. In other words, to fully account for the effects of SUE and SURGE for future earnings, the magnitude of revisions after the earnings announcements should be more than twice as large as the actual revisions.

The other striking aspect of the results here is that the slope coefficients in Regression (18) decrease with an increase in forecast horizon for one- through three-quarter ahead forecasts, the slope coefficients in Regression (20) increase with the forecast horizon. The analysts, therefore, significantly underestimate the magnitude of the permanent effect of SURGE and SUE on future earnings. Analyst underreaction that we find here is consistent with market underreaction that we found in the last section.

Overall, we find that analysts underreact to the information in SURGE and SUE when they revise their forecasts after earnings announcements. Earlier papers by Abarbanell and Bernard and Chan, Jegadeesh and Lakonishok (1996) find that analysts are slow to react to earnings surprises and price momentum when they revise their forecasts. The findings here indicate that analysts are also slow to react to revenues momentum.

C. Delay in analyst response: Further Analysis

How long do analysts take to incorporate the information in SURGE and SUE in their forecasts? To address this question, we examine the relation between SURGE and SUE and analysts' forecast errors based on forecasts that are made at different points in time. We measure the errors with respect to forecasts of future earnings as follows:

$$FE_{i,t+\tau}(T) = \frac{100 \times [Q_{i,t+\tau} - FA_T(Q_{i,t+\tau})]}{P_{i,t-1}}, \tag{21}$$

where, $FA_T(Q_{i,t+\tau})$ is the τ-quarter ahead (with respect to quarter *t*) forecast made *T* months after quarter *t* earnings announcement, and $FA_{i,t+\tau}(T)$ is the corresponding forecast errors. We use forecast errors for *T*= 1 to 12 in our analysis. To compute the consensus forecast for time *T* we use only the forecasts that were newly made between time *T-1* and *T.* Firms typically announce their subsequent quarter earnings every three months after *t.* Therefore, we define *T*=3, 6, 9 and 12 as the day before the respective quarterly earnings announcement dates, which may not be exactly *T* months after the announcement of earnings for quarter the announcement of earnings for quarter *t*.

To examine how long it takes analysts to incorporate the information in the surprises we fit the following regression:

$$FE_{i,t+\tau}(T) = C_{0,\tau} + C_{1,\tau} * SURGE_{it} + C_{2,\tau} * SUE_{i,t} + \varepsilon_{i,t,\tau}. \qquad (22)$$

Table 11 presents the regression estimates.[13] Both SURGE and SUE coefficients decline as *T* increases. For example, for the one-quarter ahead forecast error regression, the SURGE coefficients are .0258, .0138 and .0071 for the first three months. The first two of these coefficients are significant at the 1% level and the third is significant at the 5% level. The SURGE coefficients are generally significant up to T=5. Beyond T=6, the SURGE coefficients are either significant at the five percent level or insignificant.

These results indicate that it takes at least up to five months for the analysts to fully incorporate the information in SUE. Interestingly, the results in Figure 1 indicate that the post-announcement drifts in prices for the extreme SURGE portfolios are evident for up to six months. Therefore, both market reactions and analysts' response to revenue surprises exhibit similar delays.

IV. Conclusion

We find that earnings surprises that are accompanied by revenue surprises signal more persistent earnings growth than similar levels of earnings surprises not accompanied by matching revenues surprises. The prices reactions to revenue surprises

[13] Analysts tend to provide only near-term forecasts for small firms and provide longer-term forecasts for larger firms. For example, forecasts were available for many more firms for quarter τ =4 at *T=12* than at *T=1*. The firms that get new forecasts with the passage of event time tend to be smaller firms than the firms that are in the sample starting from earlier points in event time. Therefore, in order to allow for

on earnings announcement dates do take into account the incremental information conveyed by revenue surprises, but not completely. The price reactions are significantly related to past revenue surprises, and this evidence indicates that the market underreacts to the information that revenue surprises convey at the time they are announced.

This paper also examines the stock price performance in the period following the announcements of quarterly financial results. We find significant abnormal returns for stocks that have large revenue surprises after controlling for earnings surprises. However, we do not find any post-announcement drift following revenue surprises for large firms.

Further examination of forecasts errors in the quarters after the earnings announcement quarter indicates that analysts are slow to incorporate the information in revenue and earnings surprises in their earnings forecasts. Our results indicate that analysts take up to six months to incorporate the information in revenue surprises into their forecasts. To the extent that analyst forecasts reflect market expectations, these results indicate that the abnormal returns following revenue surprises and earnings surprises are related to delayed market reactions.

A natural question that arises is whether the post-announcement drift following revenue surprises would allow for profitable trading strategies. We find that the abnormal returns difference between the extreme categories of stocks screen based on both revenue and earnings surprises is 8.41% per six-month period, compared with 6.61% per six-month period between the extreme categories of stocks screen based only on earnings surprises. Therefore, investors who implement trading strategies based on earnings surprises would benefit by using revenue surprises as an additional signal.

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comparability of slope coefficients across T, we include only firms for which forecasts were available at time $T=1$.

While the profitability of trading strategies is important for practitioners, from an academic perspective, it is more important to understand how the market processes information. The evidence here adds to the literature that documents that the market tends to underreact to information. The fact that analysts only partially incorporate the information in revenue surprises and earnings surprises in their earnings forecasts likely contributes to the market underreaction. An in-depth understanding of such systematic biases will certainly contribute to a more efficient market in the future.

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Table 1: Sample size

This table presents the number of firm quarters in the sample over the January 1987 to December 2003 sample period. The sample comprises all firms on CRSP and COMPUSTAT with data available to compute revenue and earnings surprises, and book-to-market ratios. The sample excludes all financials and utilities. ``Small" firms are firms with market capitalization of equity smaller than the median NYSE firm, and ``Large" firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The sample excludes all stocks with prices below $5 as of the earnings announcement date.

Year	Number of Firm-Quarters		
	All	Small	Large
1987	6,648	4,824	1,824
1988	7,964	5,525	2,439
1989	8,183	5,835	2,348
1990	7,774	5,321	2,453
1991	7,767	5,207	2,560
1992	8,329	5,683	2,646
1993	9,081	6,457	2,624
1994	9,807	7,042	2,765
1995	10,447	7,494	2,953
1996	11,494	8,355	3,139
1997	12,003	8,759	3,244
1998	12,324	8,838	3,486
1999	11,641	8,248	3,393
2000	12,070	8,240	3,830
2001	10,106	6,757	3,349
2002	10,113	7,045	3,068
2003	9,957	6,943	3,014
All Years	165,708	116,573	49,135

Table 2: Correlation between revenue and earnings surprises

This table presents the correlation between revenue and earnings surprises. We compute revenue surprises as the unexpected changes in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. Low (high) book-to-market firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates.

Sample		1987 to 2003	1987 to 1995	1996 to 2003
All		0.26	0.26	0.25
Book-to-Market	Growth	0.29	0.30	0.28
	Value	0.23	0.24	0.22
Size	Small	0.29	0.30	0.28
	Large	0.18	0.19	0.18

Table 3: Earnings growth and past revenue and earnings surprises

The table examines the relation between earnings growth and past revenue and earnings surprises. It presents the estimates of the following regression models:

$$\text{Model: } SUE_{i,t} = \alpha + \sum_{k=1}^{4} \beta_k * SURGE_{i,t-k} + \sum_{k=1}^{4} \gamma_k * SUE_{i,t-k}$$

where $SURGE_{i,t}$ and $SUE_{i,t}$ are the revenue and earnings surprise for firm *i* in quarter *t*. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. Growth (value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

		$SURGE_{t-1}$	$SURGE_{t-2}$	$SURGE_{t-3}$	$SURGE_{t-4}$	SUE_{t-1}	SUE_{t-2}	SUE_{t-3}	SUE_{t-4}
All	1987-2003	0.0610*	-0.0121*	-0.0068	0.0012	0.3026*	0.1013*	0.0576*	-0.3032*
	1987-1995	0.0547*	-0.0054	-0.0078	0.0038	0.3093*	0.1002*	0.0594*	-0.2917*
	1996-2003	0.0681*	-0.0198*	-0.0056	-0.0018	0.2951*	0.1026*	0.0557*	-0.3162*
Book-to-Market	Growth	0.0670*	-0.0073	-0.0078	-0.0095#	0.2834*	0.0960*	0.0577*	-0.3249*
	Value	0.0548*	-0.0174#	-0.0016	0.0063	0.3176*	0.1019*	0.0548*	-0.2847*
Size	Small	0.0764*	-0.0039	-0.0133	-0.0057	0.2916*	0.0988*	0.0553*	-0.3235*
	Large	0.0530*	-0.0174*	0.0012	0.0032	0.3053*	0.1005*	0.0599*	-0.2945*

-significant at the 5% level
* -significant at the 1% level

Table 4: Earnings announcement window returns

This table presents stock abnormal returns within four-day earnings announcement windows. The earnings announcement window comprises day -2 through day +1, where day 0 is the earnings announcement date. *AR* is the stock return (expressed in percentages) in excess of book-to-market and size-matched benchmark within the four-day earnings announcement windows. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. The categories R1 through R5 are the quintiles of stocks with the smallest to the largest SURGE. The categories E1 through E5 are the quintiles of stocks with the smallest to the largest SUE. The sample period is 1987 to 2003.

Panel A: Sample period 1987 to 2003

		SUE					
		E1	E2	E3	E4	E5	Row Average
SURGE	R1	-1.97*	-0.93*	-0.05	0.56*	1.27*	-0.66*
	R2	-1.45*	-0.67*	0.05	0.87*	1.71*	-0.08
	R3	-1.38*	-0.52*	0.43*	0.85*	1.80*	0.21*
	R4	-1.10*	-0.13	0.55*	1.20*	2.07*	0.67*
	R5	-0.78*	0.29	0.97*	1.96*	3.07*	1.60*
	Column Average	-1.48*	-0.45*	0.41*	1.17*	2.21*	

Panel B: Sample period 1987 to 1995

		SUE					
		E1	E2	E3	E4	E5	Row Average
SURGE	R1	-2.22*	-1.05*	-0.17#	0.62*	1.44*	-0.77*
	R2	-1.78*	-0.76*	-0.07	0.88*	1.70*	-0.22*
	R3	-1.76*	-0.58*	0.19*	0.88*	1.56*	0.01
	R4	-1.22*	-0.47*	0.34#	1.09*	2.10*	0.51*
	R5	-1.18*	-0.03	1.02*	1.69*	3.17*	1.51*
	Column Average	-1.77*	-0.63*	0.27*	1.08*	2.24*	

Panel C: Sample period 1995 to 2003

		SUE					
		E1	E2	E3	E4	E5	Row Average
SURGE	R1	-1.77*	-0.83*	0.05	0.51*	1.13*	-0.56*
	R2	-1.15*	-0.59*	0.16#	0.87*	1.72*	0.05
	R3	-1.03*	-0.46	0.62*	0.82*	2.00*	0.38*
	R4	-0.99*	0.15	0.73*	1.29*	2.03*	0.79*
	R5	-0.48	0.54*	0.94*	2.18*	2.98*	1.67*
	Column Average	-1.23*	-0.30	0.53*	1.24*	2.18*	

-significant at the 5% level
*-significant at the 1% level

Table 5: Earnings announcement window returns: Regression results

The table examines the relation between stock returns and revenue and earnings surprises. It presents the estimates of the following regression model:

$$AR_{i,t} = a + b * SURGE_{it} + c * SUE_{i,t} + e_{i,t}$$

where *AR* is the stock return (expressed in percentages) in excess of book-to-market and size-matched benchmark within the four-day earnings announcement windows. The earnings announcement window comprises day -2 through day +1, where day 0 is the earnings announcement date. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. Growth (Value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The sample period is 1987 to 2003.

Sample		Period	SURGE	SUE
All Firms		1987-2003	0.3741*	0.9016*
		1987-1995	0.3451*	0.9914*
		1996-2003	0.4067*	0.8006*
Book-to-Market	Growth	1987-2003	0.4082*	0.9821*
	Value	1987-2003	0.3576*	0.7930*
Size	Small	1987-2003	0.4581*	1.0399*
	Large	1987-2003	0.1511*	0.4479*

*-significant at the 1% level

Table 6: Earnings announcement window returns and past revenue and earnings surprises

The table examines the relation between earnings announcement window abnormal returns and past revenue and earnings surprises. It presents the estimates of the following regression models:

$$AR_{i,t} = \alpha + \sum_{k=1}^{4} \beta_k * SURGE_{i,t-k} + \sum_{k=1}^{4} \gamma_k * SUE_{i,t-k}$$

where $SURGE_{i,t}$ and $SUE_{i,t}$ are the revenue and earnings surprise for firm *i* in quarter *t*. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. *AR* is the stock return (expressed in percentages) in excess of book-to-market and size-matched benchmark within the four-day earnings announcement windows. The earnings announcement window comprises day -2 through day +1, where day 0 is the earnings announcement date. Growth (value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

		$SURGE_{t-1}$	$SURGE_{t-2}$	$SURGE_{t-3}$	$SURGE_{t-4}$	SUE_{t-1}	SUE_{t-2}	SUE_{t-3}	SUE_{t-4}
All	1987-2003	0.1368*	0.0178	0.0106	-0.0575*	0.1140*	0.0409	0.0012	-0.0918*
	1987-1995	0.1480*	0.0102	0.0068	-0.0577#	0.1364*	0.0452	-0.0183	-0.1330*
	1996-2003	0.1242*	0.0263	0.0149	-0.0572#	0.0887*	0.0360	0.0230	-0.0455
Book-to-Market	Growth	0.1310*	0.0271	0.0344	-0.0544#	0.1491*	0.0409	0.0170	-0.1463*
	Value	0.1408*	0.0058	0.0012	-0.0626#	0.0837*	0.0527	-0.0087	-0.0410
Size	Small	0.2338*	0.0251	0.0630	-0.1565*	0.2551*	0.0436	0.0517	-0.2191*
	Large	0.0817*	0.0148	0.0132	-0.0053	0.0483*	0.0321	-0.0172	-0.0393

-significant at the 5% level
*-significant at the 1% level

Table 7: Post-announcement returns for revenue and earnings surprise portfolios

Panel A of this table presents abnormal stock returns over the six-month period following earnings announcements. The abnormal return is the stock return (expressed in percentages) in excess of book-to-market and size-matched benchmark return during the six-month period after the earnings announcement. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. The categories R1 through R5 are the quintiles of stocks with the smallest to the largest SURGE. The categories E1 through E5 are the quintiles of stocks with the smallest to the largest SUE. Panel B presents the average number of firms per quarter in the sample. The sample period is 1987 to 2003.

Panel A: Abnormal Returns

		SUE					
		E1	E2	E3	E4	E5	Row Average
SURGE	R1	-3.89*	-3.10*	-1.92	-1.47	-0.60	-2.63*
	R2	-3.25*	-1.58*	-0.70	0.10	0.67	-1.16*
	R3	-3.44*	-1.42	-0.75	0.46	1.67	-0.73
	R4	-2.92*	-1.81*	-0.44	1.05	2.01#	-0.17
	R5	-2.20*	0.02	0.71	1.85#	4.52*	1.82#
	Column Average	-3.33*	-1.70#	-0.59	0.61	2.28#	

-significant at the 5% level

*-significant at the 1% level

Panel B: Average number of firms per quarter

		SUE					
		E1	E2	E3	E4	E5	Row Average
SURGE	R1	161	103	77	65	60	466
	R2	103	102	90	79	65	439
	R3	88	96	99	95	80	457
	R4	74	88	101	115	107	485
	R5	54	67	88	112	159	480
	Column Average	480	455	454	466	472	2327

Table 8: Post-announcement returns: Regression results

The table examines the relation between stock returns over the six-month period following earnings announcement, and revenue and earnings surprises. It presents the estimates of the following regression models:

$$\text{Model (1)}: \text{AR}(6)_{i,t} = a + b * SURGE_{i,t} + c * SUE_{i,t} + e_{i,t}, \text{ and}$$

$$\text{Model (2)}: \text{AR}(6)_{i,t} = a + b * SURGE_{i,t} + c * SUE_{i,t} + c * Mom\_Rank_{i,t} + e_{i,t}$$

where AR(6) is the stock return (expressed in percentages) in excess of book-to-market and size-matched benchmark return during the six-month period after the earnings announcement. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. Mom_Rank is the decile rank assigned based on past six-month returns. Growth (Value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

Sample		Model (1)		Model (2)		
		SURGE	SUE	SURGE	SUE	Mom_rank
All Firms	1987-2003	0.7643*	1.2616*	0.7020*	1.0467*	0.4509*
	1987-1995	0.7278*	1.5476*	0.6905*	1.3696*	0.3559#
	1996-2003	0.8053*	0.9399*	0.7149#	0.6835*	0.5579#
Book-to-Market	Growth	0.7395*	1.2836*	0.6529*	1.1215*	0.3653*
	Value	0.7270*	1.3079*	0.6831*	1.0560*	0.5526*
Market Cap	Small	1.0387*	1.6067*	0.9591*	1.3977*	0.4369*
	Large	-0.0321	0.3632#	-0.0592	0.2206	0.4618#

-significant at the 5% level
* -significant at the 1% level

Table 9: Relation between forecast revisions and revenue and earnings surprises

This table presents the estimates of the following regression:

$$FR_{i,t+\tau} = \varphi_{0,\tau} + \varphi_{1,\tau} * SURGE_{it} + \varphi_{2,\tau} * SUE_{i,t} + \varepsilon_{i,t}.$$

where SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share in quarter *t* divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. $FR_{i,t+\tau}$ is the revision in τ-quarter ahead (with respect to quarter *t*) analyst forecasts following earnings announcements. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift to estimate expected revenue. We compute earnings surprises similarly.Growth (value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

Sample		Analyst Forecast Revisions							
		One Qtr Ahead		Two Qtrs Ahead		Three Qtrs Ahead		Four Qtrs Ahead	
		SURGE	SUE	SURGE	SUE	SURGE	SUE	SURGE	SUE
All firms		0.0268*	0.0681*	0.0217*	0.0503*	0.0155*	0.0396*	0.0207*	0.0500*
Book-to-market	Growth	0.0407*	0.1006*	0.0393*	0.0652*	0.0321*	0.0482*	0.0310*	0.0637*
	Value	0.0197*	0.0470*	0.0156*	0.0363*	0.0098*	0.0318*	0.0183*	0.0363*
Market Cap	Small	0.0485*	0.1511*	0.0210#	0.1128*	0.0173	0.0942*	0.0296#	0.1189*
	Large	0.0252*	0.0541*	0.0217*	0.0392*	0.0153*	0.0308*	0.0207*	0.0377*

#-significant at the 5% level
*-significant at the 1% level

Table 10: Relation between forecast errors and revenue and earnings surprises

This table presents the estimates of the regression:
$FE_{i,t+\tau} = C_{0,\tau} + C_{1,\tau} * SURGE_{it} + C_{2,\tau} * SUE_{i,t} + \varepsilon_{i,t,\tau}$,
where SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share in quarter *t* divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. $FE_{i,t+\tau}$ is the forecast error for τ-quarter ahead (with respect to quarter *t*) forecasts. Growth (value) firms are firms with book-to-market ratios below (above) the sample median. Small firms are firms with market capitalization of equity smaller than the median NYSE firm, and Large firms are firms with market capitalization of equity larger than the median NYSE firm at the beginning of the quarter prior to the earnings announcement dates. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

Sample		Forecast Quarter							
		One-Qtr Ahead		Two-Qtrs Ahead		Three-Qtrs Ahead		Four-Qtrs Ahead	
		SURG	SUE	SURG	SUE	SURG	SUE	SURG	SUE
All firms		0.0252*	0.0636*	0.0370*	0.0800*	0.0488*	0.0821*	0.0405*	0.0786*
Book-to-market	Growth	0.0457*	0.0857*	0.0458*	0.0855*	0.0442#	0.0625*	0.0777*	0.0954*
	Value	0.0166*	0.0462*	0.0313*	0.0692*	0.0508*	0.0770*	0.0233*	0.0682*
Market Cap	Small	0.0660*	0.1276*	0.0740*	0.0882*	0.1110*	0.0996*	0.0590*	0.0896*
	Large	0.0213*	0.0525*	0.0334*	0.0749*	0.0419*	0.0793*	0.0325*	0.0756*

-significant at the 5% level
* -significant at the 1% level

Table 11: Relation between forecast errors and revenue and earnings surprises in event time

This table presents the estimates of the regression:

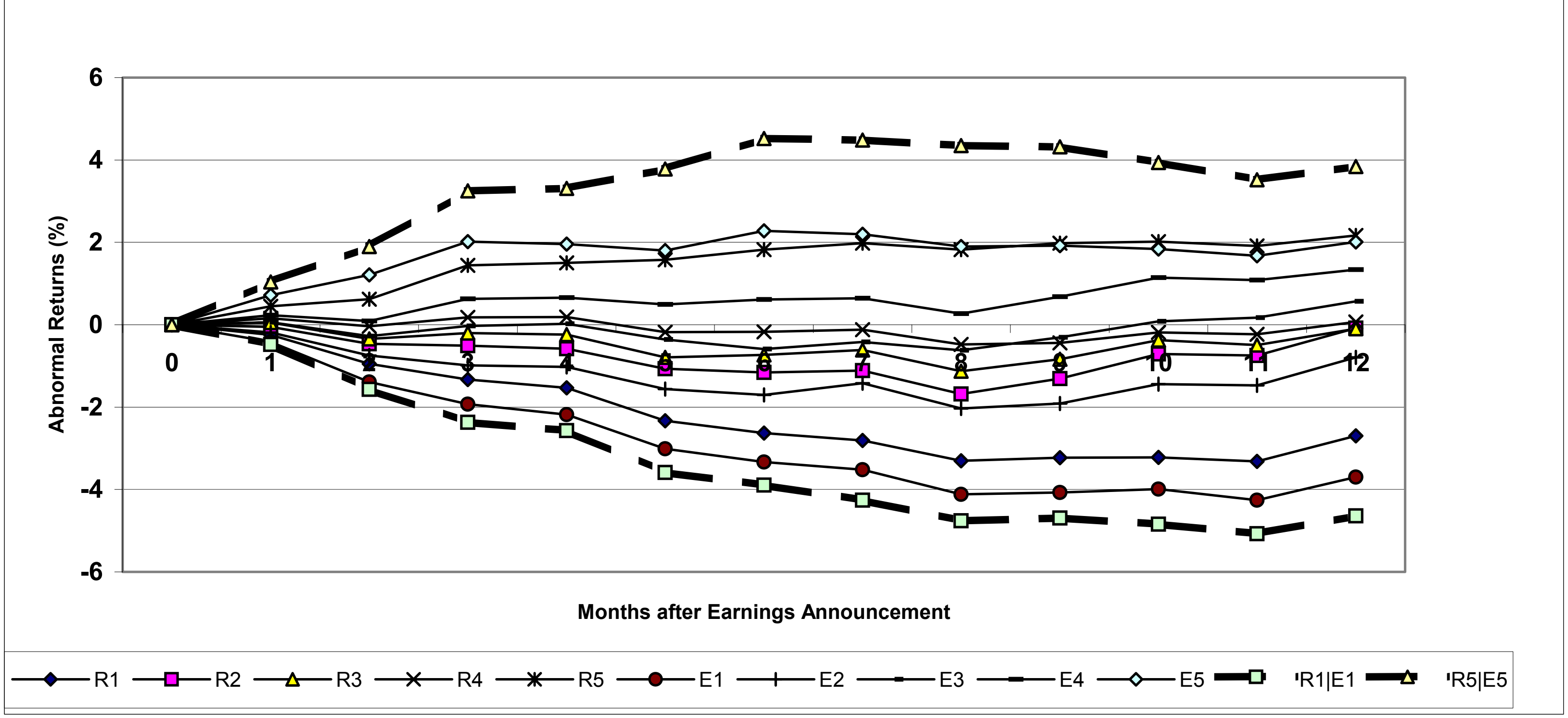
$$FE_{i,t+\tau}(T) = C_{0,\tau} + C_{1,\tau} * SURGE_{it} + C_{2,\tau} * SUE_{i,t} + \varepsilon_{i,t,\tau},$$

where SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share in quarter *t* divided by the standard deviation of revenue changes. We use a random walk with drift model to estimate expected revenue. We compute earnings surprises similarly. $FE_{i,t+\tau}(T)$ is the forecast error for τ-quarter ahead (with respect to quarter *t*) forecasts, based on forecast made *T* months after quarter *t* earnings announcement. The regression coefficients are estimated using the Fama-MacBeth procedure. The sample period is 1987 to 2003.

T	Forecast Quarter							
	One-Qtr Ahead		Two-Qtrs Ahead		Three-Qtrs Ahead		Four-Qtrs Ahead	
	SURG	SUE	SURG	SUE	SURG	SUE	SURG	SUE
1	0.0258*	0.0598*	0.0407*	0.0819*	0.0363*	0.0850*	0.0278*	0.0760*
2	0.0138*	0.0458*	0.0399*	0.0720*	0.0389*	0.0729*	0.0239#	0.0647*
3	0.0071#	0.0342*	0.0307*	0.0632*	0.0242*	0.0773*	0.0294*	0.0604*
4			0.0185*	0.0432*	0.0225*	0.0563*	0.0239*	0.0559*
5			0.0167*	0.0323*	0.0198*	0.0491*	0.0242*	0.0405*
6			0.0173*	0.0217*	0.0135	0.0440*	0.0080	0.0470*
7					0.0138#	0.0315*	0.0128#	0.0359*
8					0.0096#	0.0245*	0.0167#	0.0260*
9					0.0065	0.0194*	0.0096	0.0303*
10							0.0106	0.0176*
11							0.0084	0.0114#
12							0.0147*	0.0082

-significant at the 5% level
* -significant at the 1% level

Figure 1: Performance of Revenue and Earnings Surprise Portfolios



This figure presents the abnormal returns over various horizons up to 12 months following earnings announcements. Abnormal returns are raw returns in excess of contemporaneous book-to-market and size-matched benchmark returns. SURGE is the revenue surprise measure and SUE is the earnings surprise measure. We compute revenue surprise as the unexpected change in revenue per share divided by the standard deviation of revenue changes. We use a random walk with drift to estimate expected revenue. We compute earnings surprises similarly.The extreme groups R1 and R5 comprise the quintile of stocks with the smallest and largest SURGE, respectively and E1 and E5 comprise the quintile of stocks with the smallest and largest SUE. R1|E1 and R5|E5 comprise stocks in the intersections of these SURGE and SUE categories.