Revenues and Earnings as Key Value Drivers in Various Contexts:
Implications for Financial Management and Statement Analysis

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Abstract

This study examines the relative information content of revenues and earnings in various contexts. Although it is clear that investors' perception of the information content of accounting variables is colored by the contextual framework, the information content literature has not focused on the contextual analysis of information in revenues. I find that in contexts in which current earnings are a weak indicator of future earnings the role of earnings (revenues) is relatively less (more) important: High R&D firms, loss-reporting firms, and industries with oligopolistic competition. Due to relatively high earnings management, earnings have lower information content in the fourth quarter than in the first three fiscal quarters. Overall, these results have important implications for financial management and for financial statement users, in understanding the role earnings and revenues play in different contexts, such as R&D intensity, firm specification, and industry characteristics.
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1. Introduction

On April 14, 2003, IBM announced quarterly earnings that were lower than Wall Street expectations (as measured by Thomson First Call). The company’s quarterly revenues, on the other hand, were higher than expected. IBM reported its earnings after the market close; the next day its shares rose by 3.4%.

The IBM example is an apt illustration of the topic explored in this study: The relative explanatory power of earnings and revenues in determining stock returns. Why did the company’s stock price increase, even though its earnings had fallen below expectations? The reason could be, as one analyst stated, that "The slight earnings miss was not significant and the company did well considering the economy and the war." On the other hand, the 3.4% rise in share price may have been due to revenues exceeding the consensus analyst estimate.

During the preliminary earnings announcement companies usually announce revenues and earnings. Therefore the research questions explored in this study are focused on these two variables and can be summarized as follows: What is the role of revenues in explaining stock returns after controlling for earnings? Moreover, does the role of revenues and earnings vary in different contexts such as R&D intensity, negative earnings, magnitude of earnings management and industry concentration? A related issue is the comparison between revenues and earnings as explanatory variables of stock returns. This comparison is also meaningful for company- and industry-specific features.

Revenues may have an incremental influence on stock returns over earnings, because they generate current earnings and cash flows, and they may also serve as a
proxy for future performance. Jegadeesh and Livnat (2004a,b) argue that the importance of revenues is reflected by the fact that firms announce revenues, rather than other financial variables, in the preliminary earnings announcement and analysts provide revenues forecast in addition to earnings forecast. Further, as Ertimur et al. (2003, p.185) point out "since firms announce both revenues and earnings in the preliminary earnings announcement, investors can use the disclosure of revenues to better assess and interpret the quality of the disclosed earnings signal." Therefore, the relative role of revenues as value driver and indicator of future cash flows is expected to be more important in contexts in which current earnings are a weak indicator of future earnings. These contexts may include intensive R&D and loss-reporting firms, industries with oligopolistic competition and fiscal quarters with relatively high earnings management.

These research questions are related to the information content literature initiated by Ball and Brown (1968) and Beaver (1968). During the last four decades, over one thousand studies have been published on this topic; many of these have dealt with relations between accounting variables and stock returns, and the primary focus has been on earnings (and cash flows), rather than on revenues, as explanatory variables of stock returns.¹ The issue of information content and value drivers is of obvious interest to many groups: equity investors and analysts, debt holders, rating agencies, regulators and standard setters.

While, as stated, the bulk of the information content literature has concentrated on earnings and cash flows, one strand does investigate the information content of revenues and proxies for future revenues. Hopwood and McKeown (1985) and Hoskin et al. (1986) focus on the association between revenues and stock returns in a variety of industries, and find that revenues do not have an incremental influence
on stock returns. In contrast, Swaminathan and Weintrop (1991), Rees and Sivaramakrishnan (2001), Ertimur et al. (2003) and Jegadeesh and Livnat (2004a,b) find that revenues incrementally explain stock returns beyond earnings. Anthony and Ramesh (1992) find that revenues have higher explanatory power for firms in their early stages; while Livnat (2003) shows that the magnitude of the post-earnings announcement drift is positively correlated with the sign of the revenues surprise. Recent studies in the high-tech sector have focused on the information content of proxies for expected revenues instead of revenues.² Although it is clear that investors' perception of the information content of accounting variables is colored by their contextual framework – company specification, industry structure and macroeconomic conditions – the information content literature has not focused on the contextual analysis of information in revenues. Contextual analysis may assist internal and external financial statement users in understanding the relative importance of revenues and earnings in various firm and industry contexts.

This study extends Ertimur et al. (2003) and Jegadeesh and Livnat (2004a,b) by providing contextual framework for the incremental explanatory power of revenues (earnings) over earnings (revenues) in determining stock returns. Contextual framing makes it possible to understand the role that revenues and earnings play given the magnitude of earnings management, in high R&D companies compared to low R&D companies, in loss-reporting firms relative to profitable firms, and in industries with oligopolistic competition compared with monopoly or industries with low concentration. Moreover, the study extends previous studies by investigating market reaction to conflicting earnings and revenues surprise, in various firm- and industry-specific circumstances.
In investigating the information content of revenues and earnings, I follow the methodology of Jegadeesh and Livnat (2004a) by using portfolio and regression analysis. The sample includes 280,113 quarterly observations for 10,729 companies over 1974-2003. In the portfolio analysis all observations are ranked according to earnings surprise and revenues surprise assigned into quintiles. I then examine market reaction to earnings and revenues surprise for twenty-five portfolios (i.e. market reaction when revenues surprise is in its $i_{th}$ quintile and earnings surprise is in its $j_{th}$ quintile). Earnings (revenues) surprise is calculated as the standardized difference between earnings (revenues) per share and the expected earnings (revenues) per share, where expectations are based on the same quarter last year, plus an average drift. Market reaction is defined as size-adjusted returns (SAR) – raw returns, minus the return on the size portfolio that contains the firm; however, I also use market-adjusted returns (MAR) – raw returns, minus the return on the value-weighted NYSE index – and find similar results. In the regression analysis an examination is performed of the explanatory power of earnings in determining stock returns after controlling for revenues, and vice versa, in different contexts, such as R&D intensity, degree of earnings management and the level of industry concentration. I use a Fama-MacBeth (1973) type regression by performing 30-yearly regressions.

The results in the full sample show that earnings and revenues both have information content for investors, each having an incremental effect on abnormal returns after controlling for the other. Moreover, portfolio analysis shows that market reaction to increases in earnings (revenues) surprise is positive whatever the level of revenues (earnings) surprise. The comparison between earnings and revenues as explanatory variables of stock returns shows that, in the full sample, market reaction
to high (low) earnings surprise is positive (negative) regardless of the level of revenues surprise. Regression analysis leads to similar results, the coefficient estimate of earnings surprise being about twice as large as that of revenues surprise. The overall conclusion from these analyses is that, in the entire sample, the explanatory power of earnings is higher than that of revenues. This result is consistent with Ertimur et al. (2003) and Jegadeesh and Livnat (2004a).

As expected, the contextual analyses show that the information content of revenues and earnings relate to earnings precision and earnings persistence as reflected by firm and industry characteristics such as R&D intensity, negative earnings, industry concentration and the magnitude of earnings management. Regarding R&D intensity, portfolio and regression analyses show that in high R&D companies the role of revenues (earnings) appears to be more (less) important than in low R&D companies. As a result, and in contrast to the results in the full sample, in high R&D companies the explanatory power of earnings is not higher than that of revenues. This result may arise from the important role of the future performance indicator in high R&D companies, due to their relatively high uncertainty. As already mentioned, previous studies show that revenues serve as an indicator of earnings persistence and have relatively high autocorrelation. Therefore, revenues play a more important role in high R&D companies. The result regarding high R&D companies is also consistent with Anthony and Ramesh (1992), who find that market reaction to unexpected revenues is higher for firms in the early stages of their life cycle. The result regarding the lower explanatory power of earnings in high R&D companies is a result of low earnings persistence and precision, and is consistent with Kothari et al. (2002), who find positive relations between R&D expenditure and earnings variability. Ertimur et al. (2003) and Jegadeesh and Livnat (2004a) find that
the explanatory power of revenues and earnings is higher in growth companies than in value companies. However, R&D is an additional factor beyond growth, the results in my study being robust to the inclusion of the market-to-book ratio as an explanatory variable.

In loss-reporting firms, the explanatory power of earnings and revenues is smaller than in the full sample. However, the decrease in the explanatory power of earnings is higher than the decrease in the explanatory power of revenues. Therefore, the domination of earnings as an explanatory variable of stock returns in companies with negative EPS diminishes. This finding is consistent with Hayn (1995), who finds that the explanatory power of earnings is lower in loss-reporting firms.

As for industry characteristics, revenues play a more important role when an industry is ruled by two to three dominant companies, that is, in oligopolistic competition. In industries with oligopolistic competition, market strategy plays a more important role, because a larger market share is an investment that might yield an ability to dictate prices and terms of supply in the future. The explanatory power of revenues is not higher in a monopolistic environment, because market power already exists. Interestingly, the explanatory power of revenues is weaker when industry concentration is at its lowest level, due to the fact that market share does not change significantly in relation to competitive ability. Robustness testing indicates that these results occur for the full sample and for manufacturing companies (4-digit SIC codes 2000-3999).

Another investigation is performed regarding the differences in the explanatory power of earnings and revenues between fiscal quarters. I find that the explanatory power of earnings is significantly lower in the fourth fiscal quarter than in the first three fiscal quarters. This result is consistent with Cohen et al. (2004) who
find that the magnitude of earnings management is higher in the fourth fiscal quarter. Insofar as earnings management decreases earnings precision, it also decreases the role of earnings as a value driver.⁶

The comparison between revenues and earnings as value drivers shows that negative earnings surprise accompanied by positive revenues surprise leads to significantly negative SAR. In high R&D companies and in industries with oligopolistic competition there are conflicting results, such that negative earnings surprise accompanied by positive revenues surprise does not lead to significant changes in SAR. This finding is consistent with the previously results of the study regarding the important role of revenues in high R&D companies and in industries with oligopolistic competition. However, positive earnings surprise accompanied by negative revenues surprise leads to positive SAR for the full sample, as well as for high R&D companies and for companies operating in oligopolistic competition.

Overall, this study has important implications for financial management and for financial statement users, in that it highlights the important role played by revenues as a proxy for future cash flows in contexts in which current earnings are a weak indicator of future earnings: high R&D companies, loss-reporting companies, industries with oligopolistic competition and quarters with relatively high earnings management.

The study proceeds as follows: In section 2, I review the literature and motivate my analysis. Section 3 develops testable predictions. Section 4 discusses the sample and the variables. Section 5 contains empirical results for the entire sample. Sections 6, 7 and 8 include detailed results for the contextual analysis. Section 9 investigates the market reaction to conflicting earnings and revenues surprise, and section 10 provides concluding remarks and plans for further research.
2. **Background and Literature Review**

Kothari (2001) reviews the information content literature for the late 1980s and 1990s, and many textbooks analyze the connection between stock returns (or firm value) and earnings (e.g. Palepu et al. (2000) and Penman (2001)). Earlier surveys for the 1970s and 1980s include Lev and Ohlson (1982) and Lev (1989). Holthausen and Watts (2001) critically review the literature, arguing that its contribution to standard setting is modest, as most of the studies do not seek to develop a descriptive theory of accounting and standard setting. In a wider perspective, Kothari (2001) refers to the investigation of the relations between accounting variables and stock prices as capital-market studies, which he divides into four categories: fundamental analysis and valuation, tests of capital market efficiency, the role of accounting in contracts and in the political process, and disclosure regulations. My study falls into the category of fundamental analysis and valuation.

Since Ball and Brown (1968) and Beaver (1968), researchers have concluded that, of all the accounting variables, earnings have the highest explanatory power over various time intervals, though most find that earnings explain only 5% to 15% of the variation in stock returns. Numerous studies have tried to explain and improve the explanatory power of the variation in stock returns by:

- Adding the concept of earnings persistence (e.g. Subramanyam and Wild (1996) find that the probability of termination decreases the information content of earnings);
- Investigating non-linear relations (e.g. Das and Lev (1994) and Lipe et al. (1998));
- Using the aggregation of earnings across years as the explanatory variable (Ohlson and Penman (1992) and Easton et al. (1992));
• Attributing the low explanatory power to the earnings’ lack of timeliness and to the hypothesis that stock prices lead earnings changes (Beaver et al. (1980), Collins et al. (1994) and Ayers and Freeman (1997));

• Including the earnings forecast as an explanatory variable for stock returns (Liu and Thomas (2000));

• Claiming that the explanatory variable should be the accounting earnings’ prediction rather than stock returns (Penman (1992) and Abarbanell and Bushee (1997));

• Indicating that, when the sample includes only loss-reporting firms, the explanatory power of earnings decreases significantly (Hayn (1995));

• Pointing out the information content of management’s earnings forecast;\textsuperscript{11}

• Analyzing the post-announcement drift, meaning the under-reaction of stock prices to earnings surprise;\textsuperscript{12}

• Referring to the relationship between stock returns and other accounting parameters. For example, Lev and Thiagarajan (1993) examine the information content of some accounting parameters (fundamentals) in various macroeconomic situations, while Lipe (1986) indicates the information content of earnings components.

Several studies find a positive relationship between cash flows (and accrual components of earnings) and stock returns, although earnings seem to have a higher explanatory power.\textsuperscript{13} A conflicting study by Bernard and Stober (1989) indicates that cash flows do not have a significant incremental effect over earnings, while Das and Lev (1994) show that the returns/cash flows relationship is non-linear.

Although the information content of revenues has not been the focus of the information content literature, it has nevertheless been investigated at several levels:
(1) Hopwood and McKeown (1985) and Hoskin et al. (1986) find that revenues do not have an incremental influence on stock returns.

(2) Anthony and Ramesh (1992) show that unexpected revenues growth and capital expenditure have more of an impact on returns during the firm’s growth stage, due to the efforts made to achieve cost or demand advantages over competitors.

(3) Livnat (2003) shows that the magnitude of the earnings post-announcement drift is stronger when revenues surprise and earnings surprise have the same sign.

(4) Liu et al. (2000) evaluate several multiples by comparing the stock price to the price predicted by the multiples. In their study, the use of revenues in multiples leads to the worst result.


(6) Swaminathan and Weintrop (1991), Rees and Sivaramakrishnan (2001), Ertimur et al. (2003) and, recently, Jegadeesh and Livnat (2004a,b) indicate that revenues have incremental explanatory power in determining stock returns. Jegadeesh and Livnat (2004a) also indicate that stock returns are related to past revenue surprises, while Jegadeesh and Livnat (2004b) show that although investors react to revenues surprises they do not fully incorporate them.

In this study, I extend Ertimur et al. (2003) and Jegadeesh and Livnat (2004a,b) by analyzing the information content of earnings and revenues in various contexts. Jegadeesh and Livnat (2004a) find that both revenues and earnings have information content, and the incremental explanatory power of earnings is higher than
the incremental explanatory power of revenues. Jegadeesh and Livnat also indicate that persistence of earnings is positively correlated with the sign of revenues surprise, and that post-announcement abnormal returns are positively correlated with revenues surprise.

My main contribution to this branch of the literature lies in investigating the information content of earnings and revenues according to firm-specific attributes (R&D intensity, magnitude of earnings management and sign of earnings) and industry specification (degree of concentration). In addition, I use contextual analysis to examine market reaction to negative (positive) earnings surprise accompanied by positive (negative) revenues surprise.

The study contributes to financial statement analysis in understanding the role earnings and revenues play, according to the specification of the firm being analyzed and the industry in which the firm operates. External financial statement users (analysts, investors and debt holders) and internal users (management) can use the contextual results to predict market reaction to earnings strategy (strategy that is aimed at increasing earnings) and market share strategy (strategy that is aimed at increasing revenues). Such prediction is expected to be more precise when it is based on firm and industry characteristics, such as R&D intensity, sign of earnings and industry concentration.

3. Predictions

Prior literature suggests that revenues and earnings each have incremental explanatory power in determining stock returns after controlling for the other. The economic interpretation for the information content of revenues can be divided into two categories: the first and trivial explanation is that revenues generate current
earnings and cash flows; the second explanation is that revenues serve as an indicator of persistence and future performance. Jegadeesh and Livnat (2004a,b) show that revenues are an indicator of persistence in earnings' growth, Gu et al. (2004) find that the persistence of earnings surprise increases when it is driven by revenues surprise rather than by expenses surprise, while Ertimur et al. (2003) show that revenues have relatively high autocorrelation. Ghosh et al. (2005) contribute to this line of research by showing that earnings for companies with sustained increases in both earnings and revenues are more persistent, and future operating performances (measured as return on assets) are higher than for companies with sustained increase just in earnings. Therefore, based on prior literature, I expect both revenues and earnings to have incremental explanatory power in determining stock returns, after controlling for each other.

Since revenues have relatively high autocorrelation, and they serve as an indicator of future performance, my second prediction is that the explanatory power of revenues is higher for companies with relatively high uncertainty and lower earnings precision, such as high R&D companies. Amir et al. (2003) imply the importance of a future performance indicator in high R&D companies. They find that the incremental contribution of analysts is higher in high R&D companies than in low R&D companies. Another reason for the importance of revenues in high R&D companies may be driven by a life cycle argument. Anthony and Ramesh (1992) find that market reaction to unexpected revenues is higher for firms in the early stages of their life cycle, due to the efforts made to achieve cost and demand advantages over competitors, while Jegadeesh and Livnat (2004a) and Ertimur et al. (2003) find that revenues play a more important role in growth companies than in value companies.
Furthermore, regarding loss-reporting firms, I expect the relative information content of revenues to be higher, since they are an indicator of future activity. Hayn (1995) finds that the explanatory power of earnings is indeed lower in loss-reporting firms, while Amir et al. (2003) find that the contribution of analysts is higher in loss-reporting firms, thereby implying the importance of a variable that captures future activity in loss-reporting companies.

With regard to industry concentration, I expect revenues to have a higher explanatory power in industries with oligopolistic competition. An oligopoly is a market structure generally consisting of only a few competing companies, where each company accounts for a significant portion of market wide sales. In cases of oligopolistic competition, a larger market share may be regarded as an investment that can yield an ability to dictate future prices and supply terms. For this reason, I expect revenues to be a significant indicator of future outcomes and to be more important for firms operating in industries with oligopolistic competition. This argument may be strengthened by the discussion concerning excess capacity as an investment in entry deterrence. In summarizing the usage of excess capacity, Martin (2002, pp.227-239) concludes that “…investment in capacity can be used to influence investment decision of rivals. This may deter or delay rival investment, and allow incumbent to condition market structure in a way that allows the exercise of market power.” In our context, revenues may serve as a proxy for capacity, thereby conditioning market structure in a way that allows the exercise of market power.

My last expectation regarding the information content of revenues and earnings relates to the effect of fiscal quarter on market reaction. Cohen et al. (2004) find that earnings management is higher in the fourth fiscal quarter than in the first three. Since earnings management is negatively correlated with earnings precision, I
expect to find that the role of earnings as a key value driver is less important in the fourth quarter than in the first three.

To sum up, I expect both revenues and earnings to have information content, and revenues to have relatively higher explanatory power in high R&D companies, loss-reporting companies and in industries with oligopolistic competition. Furthermore, due to a higher likelihood of *earnings management* in the fourth quarter, I expect to find that earnings have lower explanatory power in the fourth quarter.

4. Sample and Variables

The initial sample includes all public companies covered by the Compustat and CRSP databases over the period 1974-2003. Observations with missing data needed to calculate size-adjusted returns (SAR), standardized unexpected earnings (SUE) and standardized unexpected revenues (SURG) are deleted. Also excluded are financial institutions and public utilities (4-digit SIC codes 6000-6999 and 4900-4999) because these industries are regulated and they may not be comparable to other industries in terms of financial reporting. To reduce the effects of extreme observations the sample is trimmed at 1% and 99% for SUE and SURG, and at 99% for SAR. Nearly 5% of observations are removed in this process.

Table 1 presents the number of observations in each year. The table is divided into four categories: the full sample (280,113 observations for 10,279 companies), SIC codes 2000-3999 (158,945 observations for 5,080 companies), the R&D sample (152,582 observations for 5,916 companies), and companies with negative earnings per share (72,129 observations for 8,154 companies).

As for the R&D sample, the extreme 3% of the highest observations for the R&D-to-revenues ratio (RDR) are deleted (RDR higher than 293.7%). In this process
4,955 observations are removed. R&D expenditure and revenues used to calculate RDR are in annual terms.

(Table 1 about here)

I calculate abnormal stock returns as size-adjusted stock returns around quarterly earnings announcements. Size-adjusted returns (SAR) are calculated as raw returns minus the return on the equally weighted return on the portfolio of all companies in the same size decile. The 4-day returns window contains days -2 through +1, where day 0 is the earnings announcement date, as stated in Compustat. I also use market-adjusted returns (MAR) as an alternative measure of abnormal returns. MAR are calculated as raw returns, minus the return on the value-weighted NYSE index. The results are similar across measures of abnormal returns.

Quarterly earnings per share (EPS) are calculated as basic earning per share, excluding extraordinary items, minus after statutory federal tax special items. In Compustat items:

\[ EPS = \frac{data_{19} \times data_{32} \times (1 - tax)}{data_{15} \times data_{17}} \]

Quarterly sales per share (SPS) are calculated as net sales divided by the number of common shares used to calculate EPS:

\[ SPS = \frac{data_{2}}{data_{15} \times data_{17}} \]

In calculating SUE and SURG I follow the methodology of Jegadeesh and Livnat (2004a) by calculating SUE as the standardized difference between EPS and the expected EPS:

\[ SUE_{t,i} = \frac{EPS_{t,i} - E(EPS_{t,i})}{S_{t,i}} \]
where $EPS_{i,t}$ is EPS for firm $i$ in quarter $t$, $E(EPS_{i,t})$ is the expected EPS for firm $i$ in quarter $t$, and $S_{i,t}$ is the standard error of $[EPS_{i,t} - E(EPS_{i,t})]$. $E(EPS_{i,t})$ is calculated as the EPS in the same equivalent quarter of the previous year, plus an average drift:

$$E(EPS_{i,t}) = EPS_{i,t-4} + D_{i,t}$$

where $D_{i,t}$ is the average drift of EPS over 8 quarters:

$$D_{i,t} = \frac{\sum_{j=1}^{8}(EPS_{i,t-j} - EPS_{i,t-j-4})}{8}$$

As previously stated, $S_{i,t}$ is the standard error of the unexpected part of the EPS and is calculated as:

$$S_{i,t} = \frac{1}{7} \sqrt{\frac{\sum_{j=1}^{8}(EPS_{i,t-j} - E(EPS)_{i,t-j})^2}{8}}$$

SURG is calculated using a similar procedure.

Table 2 contains descriptive statistics for SAR, MAR, SUE and SURG. For all categories, mean and median SAR are equal to zero, as expected by design. For all categories, mean SUE is negative but the median is close to zero. Interestingly, SUEs are similar across categories. Mean and median SURG are positive for all categories, but SURG is higher for companies with high RDR than for those with low RDR, as expected.

(Table 2 about here)

Table 3 presents a detailed depiction of the R&D-to-revenues ratio (RDR) distribution. The extreme 3% of the observations highest in RDR are deleted (RDR higher than 293.7%). In this process 4,955 observations are removed. The mean RDR is higher than the median, due to extreme observations of high RDR. About
30% of the observations have an RDR of less than 1%. However, it should be noted that it is the ordinary value rather than the absolute value of RDR that influences the research. The division of RDR into quintiles indicates that mean and median SAR equal zero for the first four quintiles, and are slightly negative for high R&D companies. As to SURG and SUE, there is no monotonic change across quintiles. As expected, in high R&D companies, there is a significant difference between the mean and median SURG.

(Table 3 about here)

5. General Empirical Results

5.1. Correlation analysis

Table 4 presents the Pearson and Spearman correlations between SUE and SURG. As expected, they are positive and significantly different from zero at the 1% level. They are only between 0.28 and 0.36, suggesting that earnings and revenues provide different signals. The correlation between SUE and SURG is significantly higher over 1974-1988 than over 1989-2003.

(Table 4 about here)

5.2. Market reaction to SUE and SURG: Portfolio analysis

Table 5 presents the effect of earnings and revenues surprise on size-adjusted returns (SAR). Panels A and B present SAR for variable-sized portfolios. All observations are ranked according to earnings surprise and revenues surprise and assigned into quintiles. Each cell presents SAR for portfolios containing observations that are in quintile i of SUE and in quintile j of SURG. For example, Cell (SUE1, SURG1) contains observations that are in the lowest quintile of both SUE and
SURG. Panels C and D present the number of observations in each cell of panels A and B.

Panels A1, A2 and A3 describe market reaction to revenues and earnings surprise in the full sample, over 1974-1988 and over 1989-2003, respectively. As expected, higher SUE or SURG leads to higher SAR, implying that both earnings and revenues serve as explanatory variables of stock returns. The differences in mean SAR between the first and the fifth quintile of SUE in the full sample, over 1974-1988 and over 1989-2003 are 3.93%, 4.10% and 3.83%, respectively (significantly different from zero at the 1% level). The differences in mean SAR between the first and the fifth quintile of SURG in the full sample, over 1974-1988 and over 1989-2003 are 2.80%, 2.40% and 3.02%, respectively (significantly different from zero at the 1% level).

The differences between extreme cells (between cell (SUE1, SURG1) and cell (SUE5, SURG5)) in the full sample, over 1974-1988 and over 1989-2003 are 5.18%, 4.95% and 5.33%, respectively (significantly different from zero at the 1% level).

Moreover, the market reaction to an increase in SUE is positive, unconditional on the level of SURG. Market reaction to an increase in SURG is also positive, regardless of the level of SUE for the full sample. However, over 1974-1988, there is a slight decrease in abnormal returns when moving from cell (SUE3, SURG2) to cell (SUE3, SURG3), and over 1989-2003, there is a slight decrease in abnormal returns when moving from cell (SUE4, SURG2) to cell (SUE4, SURG3). These two exceptions do not change the overall view, namely the positive relationship between revenues surprise and abnormal returns. The positive relationship between SAR and earnings (revenues) over revenues (earnings) implies that revenues and earnings are
two distinct signals affecting stock returns. This result is consistent with Jegadeesh and Livnat (2004a).

I now examine market reaction to earnings surprise vs. revenues surprise. As reported in panel A, SAR is positive in the fifth quintile of SUE, regardless of the level of SURG (significant at the 1% level, except for cell (SUE5, SURG1) over 1989-2003). Moreover, SAR is negative in the first quintile of SUE, regardless of the level of SURG (significant at the 1% level). According to these results, earnings dominate revenues with regard to market reaction. Overall, the results in panel A are consistent with Ertimur et al. (2003) and Jegadeesh and Livnat (2004a) and suggest that both earnings and revenues act as key value drivers (over the full sample and in each of the two sub-periods), but that the market reaction to earnings is stronger than the reaction to revenues.

Panel B presents the effect of R&D intensity on market reaction. Panel B1 describes the results in the R&D sample, and panel B2 (panel B3) describes the results when RDR is higher (lower) than 5%. As reported in panel B, higher SUE or SURG leads to higher SAR and, overall, market reaction to an increase in SUE (SURG) is positive, unconditional on the level of SURG (SUE).

However, there is an important distinction between high R&D companies (panel B2) and low R&D companies (panel B3). In low R&D companies, SAR is positive (negative) when SUE is in its highest (lowest) quintiles, regardless of the level of SURG (significant at the 1% level). The result is different for high R&D companies, where low SUE with high SURG leads to negative, but not significant, SAR of -0.26% (t-stat of -0.96), and high SUE with low SURG leads to negative SAR of -1.11% (significant at the 1% level). This finding suggests that, in contrast to the full sample and to low R&D companies, in high R&D companies, revenues are not
dominated by earnings as a key value driver. The reason is that, in high R&D companies, an estimator of stability and future performance has higher information content due to their high uncertainty and low earnings precision; in such situations, revenues may function as a credible estimator of steadiness, as discussed in section 3.

It should be mentioned that, in panel B2 (high R&D companies), cells (SUE1, SURG5) and (SUE5, SURG1) contain only 1,191 and 978 observations, respectively, as reported in panel D2. To strengthen the conclusions regarding the effect of R&D on market reaction, a regression analysis is performed and reported in sections 5.3 and 6.1.

(Table 5 about here)

I now focus on the incremental influence of SUE and SURG on SAR. Table 6 panel A (panel B) presents the incremental effect of earnings surprise (revenues surprise). As stated in panel A (panel B) the difference in SAR between the highest and the lowest quintile of SUE (SURG) is positive in all the SURG (SUE) quintiles (significant at the 1% level). This result is valid for all the different samples (over 1974-1988, 1989-2003 and the R&D sample). These results are consistent with Jegadeesh and Livnat (2004a) and imply, once again, that revenues and earnings serve as key value drivers and each of them has an incremental effect over the other. Interestingly, the incremental influence of revenues on SAR is higher over 1989-2003 than over 1974-1978. This finding may result from the lower correlation between SUE and SURG over 1989-2003 than over 1974-1988. The economic explanation for the differences could be the economic boom of the early 1990s, and the importance of revenues as an indicator for persistence and future performance may be higher in volatile periods.
Focusing on panel B, differences in the effects of revenues over the samples can be identified. The incremental effect of SURG in high R&D companies is, on average, double the effect observed in low R&D companies (about 3.0% in comparison with 1.6%, the difference being significant at the 1% level). This result strengthens the conclusion that revenues play a more important role in high R&D companies.

To summarize the results presented in Tables 5 and 6, it can be seen that both earnings and revenues have information content, the influence of earnings dominating that of revenues. However, in high R&D companies, the role of revenues is more important due to their high uncertainty and the persistence parameter requirement. As a result, in high R&D companies the information content of earnings is not higher than that of revenues.

(Table 6 about here)

5.3. Regression analysis

To examine market reaction to earnings and revenues surprise, I also use regression analysis. I use a Fama-MacBeth (1973) type regression by performing 30-yearly regressions.

Table 7 presents regression results for equation (1):

\[ SAR_{i,t} = \alpha_0 + \alpha_1 \times SURG_{i,t} + \alpha_2 \times SUE_{i,t} + \epsilon_{i,t} \]  

(1)

To test robustness, I also used the market-to-book ratio as an additional explanatory variable in the regression analysis process, and found that the results are robust to the inclusion of a growth parameter. Table 7 contains the following categories:

(2) Firms with negative EPS.
(3) The R&D sample, divided into high and low R&D companies.

(4) The H index sample. The H index is the average Herfindahl-Hirshman Index (HHI) for each industry, HHI being an index of industry concentration, calculated as the sum of the squares of market shares in revenues for each firm. The value of HHI lies between 0 and 10,000, where 10,000 means a single company in the industry, and a value of zero indicates that the industry is characterized by a number of infinitesimally small firms. When there are N equal-size companies, HHI equals 1/N. The H sample is divided into three sub-categories:

(a) Industries with HHI under 4,000.
(b) Industries with HHI between 4,000 and 6,000.
(c) Industries with HHI over 6,000.

In all the categories, both SUE and SURG are positive (significant at the 1% level). Adj-R² is in the range of 0.03-0.05 as found in similar studies. As expected, adj-R² is lower for firms with negative EPS, where earnings and revenues have less explanatory power. The coefficient estimate of SUE is about 0.0033 for most categories, except for firms with negative EPS, where the coefficient estimate is lower (0.0016), consistent with Hayn (1995).

In contrast, the coefficient estimate of SURG varies across categories, being higher for 1989-2003 than for 1974-1988 (consistent with Table 6, as discussed in section 5.2.). The coefficient estimate of SURG in high R&D companies is higher than observed in low R&D companies, consistent with the results in Tables 5 and 6. The coefficient estimate of SURG is lower in firms with negative EPS. The effect of the EPS sign on market reaction is further discussed in section 6.2. As for the HHI index (the concentration test), the coefficient estimate of SURG is higher when HHI
lies between 4000 and 6000, as expected. This result implies that revenues play a more important role in industries with oligopolistic competition, where two to three dominant companies rule the market. In this situation, market strategy plays an important role, because, in an oligopoly, a larger market share is an investment that can yield an ability to dictate future economic parameters in the market. The effect of industry concentration is discussed in detail in section 7.

Focusing on the differences in the explanatory power of SUE and SURG, it can be seen that in most categories the association of SUE with SAR is higher than the association with SURG. However, in high R&D companies, coefficient estimates of SUE and SURG are similar. The result regarding R&D companies is consistent with Tables 5 and 6, and further discussed in section 6.1.

In sum, the results in Table 7 support the previous conclusions that both earnings and revenues have information content and the influence of earnings dominates that of revenues. However, in high R&D companies and in industries with two to three dominant companies, I find that the role of revenues is more important. Regarding R&D companies, the results show that the domination of earnings over revenues as an explanatory variable for stock returns diminishes in high R&D companies. The domination of earnings as an explanatory variable of stock returns is also diminished for firms with negative EPS, due to the small explanatory power of SUE and SURG.

(Table 7 about here)

6. The Effect of Firm’s Specification on Market Reaction

6.1. The effect of R&D on market reaction

Table 8 presents the regression analysis for equation (2):
\( SAR_{i,t} = \beta_0 + D + \beta_1 \cdot SURG_{i,t} + \beta_2 \cdot SUE_{i,t} + \beta_3 \cdot D \cdot SURG_{i,t} + \beta_4 \cdot D \cdot SUE_{i,t} + \epsilon_{i,t} \) (2)

D is a dummy variable that obtains the value of “1” if RDR is higher than 5%, and “0” otherwise. As found in section 5.3, the coefficient estimate of both SUE and SURG is positive and statistically significant at the 1% level. The results also confirm my prediction regarding the influence of earnings and revenues in firms with high R&D. The coefficient estimate of \( D \cdot SURG \) (\( D \cdot SUE \)) is positive (negative) and significant at the 1% level (2% level). These results imply that revenues (earnings) have higher (lower) explanatory power in determining stock returns in high R&D companies. However, the change is greater, in absolute terms, for revenues.

As previously stated, these results stem from the fact that the environment of high R&D companies is characterized by higher uncertainty regarding future performance and low earnings persistence, where Kothari et al. (2002) find positive relations between R&D expenditure and earnings variability. It is an environment that evokes a need for parameters that serve as proxies for stability and further persistence, and one such parameter is revenues. This is consistent with Ertimur et al. (2003), Jegadeesh and Livnat (2004a,b), Gu et al. (2004) and Ghosh et al. (2005) regarding persistence of revenues, and with Anthony and Ramesh (1992), who find that market reaction to unexpected revenues is higher for firms in the early stages of their life cycle. Ertimur et al. (2003) and Jegadeesh and Livnat (2004a) also show that revenues and earnings have higher information content in growth companies than in value companies. To test robustness, I also used the market-to-book ratio as an additional explanatory variable in the regression process, including it as a growth parameter, and found that it does not change the results, implying that R&D is an additional factor beyond growth. In addition, the motivation for testing the R&D effect is different as explained above, and the results regarding earnings surprise are
therefore opposite to the results in Ertimur et al. (2003) and Jegadeesh and Livnat (2004a) regarding growth companies.

(Table 8 about here)

6.2. The market reaction to negative EPS

Table 9 presents the regression analysis for equation (3):

\[
SAR_{it} = \gamma_0 + D_L + \gamma_1 \cdot SURG_{it} + \gamma_2 \cdot SUE_{it} + \gamma_3 \cdot D_L \cdot SURG_{it} + \gamma_4 \cdot D_L \cdot SUE_{it} + \eta_{it}
\]  

(3)

\(D_L\) is a dummy variable that obtains the value of “1” if EPS is negative, and "0" otherwise. The sample is trimmed at 1% and 99% for SUE and SURG, and at 99% for SAR. Nearly 5% of the observations (12,017) are removed in this process.

The coefficient estimate of \(D_L \cdot SURG\) and \(D_L \cdot SUE\) is negative and significant at the 1% level, implying that earnings and revenues have lower information content in loss-reporting firms. The results regarding SUE are consistent with Hayn (1995). However, the influence of the EPS sign on the explanatory power of earnings is greater than the influence on revenues, because in loss-reporting firms investors look at revenues as a "feasible" measure of future outcomes.

(Table 9 about here)

To sum up the effect of firm's specification on market reaction, it can be concluded that in high R&D companies and in loss-reporting companies, due to lower earnings precision and earnings persistence, revenues rather than earnings have higher information content. Amir et al. (2003) indicate that analysts play a more important role in high R&D companies and in loss-reporting companies, implying that in these kinds of companies, indicators of future performance are more valuable. In the context of this study, revenues are indicators of future outcomes, as discussed in section 3.

Table 10 presents regression results for equations (4) – (6). These regressions are used to analyze the effect of industry concentration on the information content of revenues.

In panel A, I present the regression results for equation (4):

\[ SAR_{t,i} = \delta_0 + D_{HHI} + \delta_1 \times SURG_{t,i} + \delta_2 \times SUE_{t,i} + \delta_3 \times D_{HHI} \times SURG_{t,i} + \xi_{t,i} \tag{4} \]

\(D_{HHI}\) is a dummy variable that obtains the value of “1” if HHI is between \(Y\) and \(Z\), and “0” otherwise. The sample is trimmed at 1% and 99% for SUE and SURG, and at 99% for SAR. Nearly 5% of the observations (14,038 for the full sample, and 7,469 for SIC codes 2000-3999) are removed in this process. For robustness testing, panel A is divided into two categories: the full sample and SIC codes 2000-3999. SIC codes 2000-3999 represent the manufacturing division.16

Consistent with Table 7, the results in panel A show that the information content of SURG is significantly higher when HHI lies between 4000 and 6000. The coefficient estimate of SURG in an oligopolistic competition environment is about 33% higher than in other forms of competitions. In industries with oligopolistic competition, market strategy plays an important role because a larger market share can yield an ability to influence future economic variables, such as prices. Interestingly, the explanatory power of revenues is weaker when HHI lies between 0 and 2000 (significant at the 4% level, in the full sample). This result can be explained by the fact that, at the lowest edge of HHI, market share does not change that much since it does not lead to an ability to dictate prices or supply terms.17 Several studies regarding the influence of industry concentration on profitability have found that, when HHI is relatively low (under 2500), differences in HHI do not change
profitability (Stigler (1964), Collins and Preston (1966)), implying that when HHI is relatively low, market share strategy is less important.

Panels B and C present the results of equations (5) and (6), respectively:

\[
SAR_{ij} = \chi_0 + \chi_1 \times SURG_{ij} + \chi_2 \times SUE_{ij} + \chi_3 \times D2030 \times SURG_{ij} + \chi_4 \times D3035 \times SURG_{ij} + \chi_5 \times D3540 \times SURG_{ij} + \chi_6 \times D4060 \times SURG_{ij} + \chi_7 \times D6070 \times SURG_{ij} + \chi_8 \times D70100 \times SURG_{ij} + \psi_{i,j} \]  

(5)

\[
SAR_{ij} = \kappa_0 + \kappa_1 \times SURG_{ij} + \kappa_2 \times SUE_{ij} + \kappa_3 \times D0020 \times SURG_{ij} + \kappa_4 \times D2030 \times SURG_{ij} + \kappa_5 \times D3035 \times SURG_{ij} + \kappa_6 \times D3540 \times SURG_{ij} + \kappa_7 \times D4060 \times SURG_{ij} + \mu_{i,j} \]  

(6)

\(Dxw\) is a dummy variable that obtains the value of “1” if HHI is between x and w, and “0” otherwise (e.g. D0020 is a dummy variable that obtains the value of “1” if H is between 0 and 2,000, and “0” otherwise).

As reported in panels A and B, \(D4060 \times SURG\) is statistically significant for the full sample and SIC codes 2000-3999. The results of regressions (5) and (6) confirm the conclusion that revenues surprise plays a more important role when HHI lies between 4000 and 6000, that is, in an oligopolistic competition environment.

(Table 10 about here)

8. Effect of Fiscal Quarter on Market Reaction

Table 11 presents the explanatory power of revenues and earnings across different quarters. This investigation is performed since earnings management is expected to be a stronger factor in the fourth quarter than in the first three quarters (Cohen et al. (2004)). To the extent that earnings management decreases earnings precision and does not affect revenues precision, earnings are expected to have a weaker explanatory power relative to revenues in quarters with more intensive earnings management.\(^{18}\)

Panel A presents regression results for equation (7):
\[ SAR_{i,t} = \nu_0 + D_4 + \nu_1 \times SURG_{i,t} + \nu_2 \times SUE_{i,t} + \nu_3 \times D_4 \times SURG_{i,t} + \nu_4 \times D_4 \times SUE_{i,t} + \zeta_{i,t} \] (7)

D_4 is a dummy variable that obtains the value of “1” for the fourth quarter, and “0” otherwise. As expected, the results of panel A indicate that the explanatory power of earnings is significantly decreasing in the fourth quarter. The change in the explanatory power of revenues is not significantly different from zero, which reduce the domination of earnings as key value driver.

Panel B presents results for equation (8):

\[ SAR_{i,t} = \theta_0 + \sum_{i=1}^{3} D_i + \theta_1 \times SURG_{i,t} + \theta_2 \times SUE_{i,t} + \theta_3 \times D_1 \times SURG_{i,t} + \theta_4 \times D_2 \times SUE_{i,t} \]

\[ + \theta_5 \times D_4 \times SURG_{i,t} + \theta_6 \times D_1 \times SUE_{i,t} + \theta_7 \times D_2 \times SUE_{i,t} + \theta_8 \times D_3 \times SUE_{i,t} + \phi_{i,t} \] (8)

D_i is a dummy variable that obtains the value of “1” for the i_th quarter, and “0” otherwise. Consistent with panel A, the results of panel B indicate that the explanatory power of earnings is higher in first three fiscal quarters relative to the fourth quarter, due to the fact that most contracts are less incentives to manage accounting numbers before knowing the annual results. However it should be noted that *earnings management* may not be the only reason for lower explanatory power of earnings in the fourth quarter. Alternative explanations, in this context, may relate to interim reporting requirement and the integral approach to quarterly earnings that influence time-series properties of quarterly earnings. This might leads to higher forecast error and lower information content of earnings in the fourth quarter.19

(Table 11 about here)

9. Market Reaction to Conflicting Earnings and Revenues Surprises

Panel A (panel B) of Table 12 presents market reaction to negative (positive) SUE and positive (negative) SURG. The object of the table is to use another method to test investor reaction to earnings vs. their reaction to revenues, in different contexts.
(R&D intensity and industry concentration). As reported in Table 12, for the full sample, earnings have higher information content than revenues, SAR being positive (negative) when SUE is positive (negative), significant at the 1% level. However, over 1989-2003 SAR is about zero when SUE is negative and SURG is positive. This result is consistent with my previous results regarding the higher information content of revenues for 1989-2003, as discussed in section 5.2.

For high R&D companies, negative SUE with positive SURG does not lead to significant negative SAR. This result is stronger regarding industries with HHI between 4000 and 6000, where mean SAR is positive, but not significantly different from zero, when SUE is negative and SURG is positive. However, when SUE is positive and SURG is negative, SAR is positive and statistically significant in high R&D companies and in an oligopolistic competition environment. These results confirm my previous conclusions that, relative to earnings, revenues play a more important role in high R&D companies, loss-reporting companies, and in oligopolistic industries.

The reason for this could be that in high R&D companies, when SUE is negative and SURG is positive, there is optimism regarding future outcomes because R&D may serve as investment, and revenues may be seen as a proxy for future returns. Regarding industries with oligopolistic competition, when SUE is negative but SURG is positive, market reaction is not unfavorable because positive SURG implies higher market share. Higher market share is an investment that might yield higher earnings in the future, as discussed in section 3. The results in Table 12 may assist management in deciding between an earnings strategy and a market share strategy.

(Table 12 about here)
10. Concluding Remarks and Further Research

This study examines the information content of revenues and earnings and shows, using several methods, that each parameter has an incremental effect on abnormal returns after controlling for the other. The general conclusion from comparing the information content of these two variables is that the explanatory power of earnings in determining stock returns is higher.

The main contribution of this study is its examination of the information content of earnings and revenues according to firm and industry specification. In addition, I use contextual analysis to examine market reaction to opposite signs of earnings and revenues surprise. I find that in high R&D companies, the role of revenues is more important than in low R&D companies, due to high uncertainty, low earnings precision and persistence, and the requirement for an indicator of future outcomes, previous studies having indicated that revenues may serve as a suitable indicator of persistence. Thus, in high R&D companies the explanatory power of earnings is not higher than the explanatory power of revenues. The domination of earnings over revenues is also diminished in firms that report losses. In loss-reporting firms, the explanatory power of earnings and revenues is lower than in profitable firms, but the decrease in the explanatory power of earnings is higher. This result is consistent with Hayn (1995), who finds that the information content of earnings is lower in companies with losses. As expected, I also find that the explanatory power of earnings is significantly lower in quarters with relatively high earnings management. Turning to industry concentration, the influence of revenues on stock returns is shown to be higher when industry is ruled by two to three dominant companies in an environment of oligopolistic competition. In industries with oligopolistic competition, market share strategy is important, because a larger market
share yields ability to influence future economic parameters in the market, such as prices. For the same reason, the explanatory power of revenues is weaker when market structure is close to perfect competition. Where there is low concentration, increasing market share is negligible and does not result in a marked change in competitive ability.

In comparing the influence of earnings and revenues on stock returns, I find that negative earnings surprise, accompanied by positive revenues surprise, leads to negative abnormal returns in the full sample, but does not lead to negative abnormal returns in high R&D companies or in industries with oligopolistic competition. However, positive earnings surprise, accompanied by negative revenues surprise, leads to positive abnormal returns in the full sample, as well as in high R&D companies and in situations of oligopolistic competition. The results emphasize the importance of revenues in specific contexts, and are consistent with previous studies demonstrating the lower information content of earnings in loss-reporting companies.

The study has implications for financial statement analysis because it may assist analysts in analyzing revenues and earnings data according to firm- and industry-specific features. It may also assist management in deciding between a strategy that is aimed at increasing earnings and a strategy that is aimed at increasing revenues and market share, two strategies that do not always complement each other.

Further research is planned to include analysis of the influence of switching cost (consumer's cost of switching from one brand to another) and macroeconomic variables on the information content of revenues. The information content of revenues is hypothesized to be positively correlated with switching cost and the volatility of macroeconomic parameters, since in high volatility situations an indicator of future outcomes is more important. The prediction regarding switching
cost is explained by Martin (2002, p.273): “If consumers incur costs in switching suppliers, then incumbent may strategically expand output, as a way of attracting consumers and making entry more difficult. This involves some sacrifice of short-run profit, a strategic investment in a customer base.”
References


Davis, A.K., “The value relevance of revenues for Internet firms: Does reporting grossed-up or barter revenue make a difference?” Working Paper (September 2001)


Endnotes


2 Jurion and Talmor (2001), Davis (2001), Lazer et al. (2001) and Bagnoli et al. (2001) for Internet companies, and Amir and Lev (1996) for the wireless communications industry.

3 The level of industry concentration depends on the number of companies in the industry and the degree of inequality among them (e.g. inequality in sales).

4 Similarly, Amir et al. (2003) find that the contribution of analysts to valuation carries relatively greater weight in high R&D companies.

5 Jegadeesh and Livnat (2004a, p.9) indicate that "...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." Jegadeesh and Livnat (2004a) also indicate that stock returns are related to the revenue surprise in the previous quarter. Ertimur et al. (2003) refer to revenues persistence and find that first and second autocorrelation of changes in revenues are high relative to changes in expenses, while Ghosh et al. (2005) indicate that companies with sustained increase in earnings and revenues have higher earnings persistence, higher subsequent return on assets and higher earnings response coefficients than companies without sustained increase in revenues.

6 Cohen et al. (2004, P. 24) argue that "This result is consistent with the notion that most contracts are based on annual numbers and, as a result, there is no benefit in managing accounting numbers before knowing what the results will be."

7 Nevertheless, the study mentions that many value-relevance studies have an objective beyond providing information for standard setters, and in particular, they seek to assess the usefulness of accounting numbers in equity valuations.

8 According to another, wider classification also used by Kothari (2001), this study falls in the category of "methodological capital market research."

9 Ball and Brown (1968) find a positive correlation between the sign of earnings surprise and abnormal returns. Beaver (1968) tests the information content of earnings by using trading volumes and price volatility as indicators of increased information flow, and find that both trading volumes and price volatility are significantly higher around earnings announcements.

10 Lev (1989, p.155) points out that “The correlation between earnings and stock returns is very low, sometimes negligible. Moreover, the nature (parameters) of the returns/earnings relation exhibits considerable instability over time. These findings suggest that the usefulness of quarterly and annual earnings to investors is very limited.”


14 Even though revenues may serve as a proxy for market share, market power is not solely dependent on market concentration and market share. It is also a function of entry condition, substitute products, demand elasticity and switching costs. In the extreme, in a perfect contestable market and where there are no entry or leaving costs/barriers, even a monopoly cannot, in the long run, set a price that is higher than the minimum average cost. It should also be noted that an increase in revenues is not necessarily translated into an increase in market share.

15 HHI was calculated annually for each industry using public companies covered by the Compustat with data on annual revenues.

16 “The manufacturing division includes establishments engaged in the mechanical or chemical transformation of materials or substances into new products. These establishments are usually described as plants, factories, or mills and characteristically use power driven machines and materials handling equipment. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement. Also included is the blending of materials, such as lubricating oils, plastics resins, or liquors.” (SIC)

17 The Department of Justice and the Federal Trade Commission in the U.S.A., in evaluating horizontal mergers, regard markets with HHI below 1000 as unconcentrated, between 1000 and 1800 as moderately concentrated and above 1800 as highly concentrated. However, I used 4-digit SIC codes for industry code, whereas using 2-digit SIC codes would have led to a lower concentration.

18 In addition, discretionary write-offs tend to be larger in the fourth quarter, which leads to lower information content of earnings. See, for example, Elliott and Shaw (1988) and Elliott and Hanna (1996).

19 See, for example, Collins et al. (1984), Mendenhall and Nichols (1988), Salamon and Stober (1994) and Rangan and Sloan (1998).
Martin (2002, p.239) refers to switching cost as follows: “The act of consumption often involves an investment in product-specific-knowledge. Once one has learned how food is laid out in a particular local grocery store, it is easier and more efficient to shop there than to explore some other local grocery store. Once one has learned how to use a particular word processor, it requires less effort to upgrade to later generations of the same word processor than to switch to some other word processor. This kind of product-specific knowledge creates a cost, to the consumer, of switching from one brand to another.”
Notation

- SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;

- MAR – market-adjusted returns – raw returns, minus the return on the value-weighted NYSE index;

- SUE – earnings surprise – earning per share, minus expected earnings per share;

- SURG – revenues surprise – sales per share, minus expected sales per share.

- RDR – R&D-to-revenues ratio – average ratio of R&D expenditure to sales. High (low) R&D companies are companies with RDR higher (lower) than 5%;

- H index – the average Herfindahl-Hirshman Index (HHI) for each industry. HHI is an index of industry concentration, and is calculated as the sum of the squares of market shares in revenues for each firm.
Table 1
Sample Selection

<table>
<thead>
<tr>
<th>Year</th>
<th>Full Sample</th>
<th>SIC Codes 2000-3999</th>
<th>R&amp;D Sample</th>
<th>Negative EPS</th>
</tr>
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<td>1974</td>
<td>5,352</td>
<td>3,498</td>
<td>2,927</td>
<td>571</td>
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<td>7,721</td>
<td>8,066</td>
<td>4,851</td>
</tr>
<tr>
<td>2000</td>
<td>14,657</td>
<td>7,499</td>
<td>7,987</td>
<td>5,413</td>
</tr>
<tr>
<td>2001</td>
<td>15,340</td>
<td>7,835</td>
<td>8,677</td>
<td>6,627</td>
</tr>
<tr>
<td>2002</td>
<td>15,591</td>
<td>7,949</td>
<td>9,034</td>
<td>6,404</td>
</tr>
<tr>
<td>2003</td>
<td>11,491</td>
<td>5,923</td>
<td>6,461</td>
<td>4,211</td>
</tr>
<tr>
<td>All</td>
<td>280,113</td>
<td>158,945</td>
<td>152,582</td>
<td>72,129</td>
</tr>
<tr>
<td>Number of companies</td>
<td>10,279</td>
<td>5,080</td>
<td>5,916</td>
<td>8,154</td>
</tr>
</tbody>
</table>

Notes:
1. Initial sample includes all observations with data sufficient to calculate earnings surprise (SUE), revenues surprise (SURG) and size-adjusted returns (SAR). I exclude financial institutions (1-digit SIC code = 6) and public utilities (2-digit SIC code = 49). In addition, the sample is trimmed at 1% and 99% for SUE and SURG, and at 99% for SAR. Nearly 5% of the observations are removed in this process.
2. The table is divided into four categories: a) the full sample, b) industrial companies with SIC codes 2000-3999 (for industry concentration test), c) the R&D sample – companies with data on R&D expenses, and d) firms with negative EPS.
## Table 2
### Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1974-2003</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAR</td>
<td>280,113</td>
<td>0.00</td>
<td>0.08</td>
<td>-0.04</td>
<td>-0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>MAR</td>
<td>280,113</td>
<td>-0.00</td>
<td>0.09</td>
<td>-0.04</td>
<td>-0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>SUE</td>
<td>280,113</td>
<td>-0.22</td>
<td>3.69</td>
<td>-2.03</td>
<td>0.01</td>
<td>1.89</td>
</tr>
<tr>
<td>SURG</td>
<td>280,113</td>
<td>0.20</td>
<td>3.75</td>
<td>-2.25</td>
<td>0.32</td>
<td>2.60</td>
</tr>
</tbody>
</table>

| **1974-1988** |      |      |         |      |        |      |
| SAR      | 95,261 | 0.00  | 0.06    | -0.03 | -0.00  | 0.03 |
| SUE      | 95,261 | -0.19 | 3.77    | -2.12 | 0.09   | 2.05 |
| SURG     | 95,261 | 0.30  | 3.83    | -2.23 | 0.37   | 2.77 |

| **1989-2003** |      |      |         |      |        |      |
| SAR      | 184,852 | -0.00 | 0.09    | -0.04 | -0.00  | 0.04 |
| SUE      | 184,852 | -0.24 | 3.64    | -1.99 | -0.02  | 1.81 |
| SURG     | 184,852 | 0.16  | 3.70    | -2.26 | 0.29   | 2.51 |

| **Full Sample** |      |      |         |      |        |      |
| SAR      | 152,582 | 0.00  | 0.09    | -0.04 | -0.00  | 0.04 |
| SUE      | 152,582 | -0.24 | 3.71    | -2.06 | 0.01   | 1.91 |
| SURG     | 152,582 | 0.19  | 3.74    | -2.26 | 0.32   | 2.60 |

| **R&D Sample** |      |      |         |      |        |      |
| SAR      | 57,858  | -0.00 | 0.10    | -0.06 | -0.00  | 0.05 |
| SUE      | 57,858  | -0.23 | 3.68    | -2.02 | -0.03  | 1.89 |
| SURG     | 57,858  | 0.23  | 3.69    | -2.12 | 0.42   | 2.58 |

| **High H index** |      |      |         |      |        |      |
| SAR      | 94,724  | 0.00  | 0.08    | -0.03 | -0.00  | 0.04 |
| SUE      | 94,724  | -0.25 | 3.73    | -2.09 | 0.04   | 1.92 |
| SURG     | 94,724  | 0.17  | 3.77    | -2.33 | 0.26   | 2.62 |

| **Under 4000** |      |      |         |      |        |      |
| SAR      | 227,632 | 0.00  | 0.08    | -0.04 | -0.00  | 0.04 |
| SUE      | 227,632 | -0.22 | 3.68    | -2.03 | 0.01   | 1.90 |
| SURG     | 227,632 | 0.21  | 3.75    | -2.25 | 0.33   | 2.61 |

| **Between 4000 & 6000** |      |      |         |      |        |      |
| SAR      | 35,811  | -0.00 | 0.09    | -0.04 | -0.00  | 0.04 |
| SUE      | 35,811  | -0.26 | 3.71    | -2.06 | -0.01  | 1.86 |
| SURG     | 35,811  | 0.16  | 3.73    | -2.29 | 0.26   | 2.55 |

| **Over 6000** |      |      |         |      |        |      |
| SAR      | 16,670  | -0.00 | 0.09    | -0.04 | -0.00  | 0.04 |
| SUE      | 16,670  | -0.23 | 3.66    | -1.99 | 0.00   | 1.90 |
| SURG     | 16,670  | 0.18  | 3.72    | -2.29 | 0.33   | 2.55 |

**Notes:**
1. For sample selection, see Table 1.
2. Variable definitions:
   - SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
   - MAR – market-adjusted returns – raw returns, minus the return on the value-weighted NYSE index;
   - SUE – earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share.
### Table 3
**Distribution of the R&D-to-Revenues Ratio (RDR)**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>11.39%</td>
<td>0.2954</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quintiles of RDR</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; Quintile</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; Quintile</th>
<th>3&lt;sup&gt;rd&lt;/sup&gt; Quintile</th>
<th>4&lt;sup&gt;th&lt;/sup&gt; Quintile</th>
<th>5&lt;sup&gt;th&lt;/sup&gt; Quintile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SAR</strong></td>
<td>0.00/0.00</td>
<td>0.00/-0.00</td>
<td>0.00/-0.00</td>
<td>-0.00/-0.00</td>
<td>-0.01/-0.01</td>
</tr>
<tr>
<td><strong>SUE</strong></td>
<td>-0.27/0.03</td>
<td>-0.26/0.02</td>
<td>-0.22/0.07</td>
<td>-0.22/0.05</td>
<td>-0.23/-0.11</td>
</tr>
<tr>
<td><strong>SURG</strong></td>
<td>0.17/0.22</td>
<td>0.15/0.25</td>
<td>0.20/0.30</td>
<td>0.25/0.40</td>
<td>0.20/0.42</td>
</tr>
</tbody>
</table>

**Notes:**
1. The table presents the distribution of RDR.
2. RDR is defined, for each company, as the average ratio of R&D expenditure to sales. The R&D expenditure and revenues used to calculate RDR are in annual terms.
3. The extreme 3% of the highest RDR observations are deleted (RDR higher than 293.7%), thereby removing 4,955 observations.
Table 4
Correlation between Earnings Surprise and Revenues Surprise

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson</td>
<td>0.30</td>
<td>0.34</td>
<td>0.28</td>
</tr>
<tr>
<td>Spearman</td>
<td>0.31</td>
<td>0.36</td>
<td>0.29</td>
</tr>
<tr>
<td>N</td>
<td>280,113</td>
<td>95,261</td>
<td>184,852</td>
</tr>
</tbody>
</table>

Note:
For sample selection, see Table 1.
Table 5
Market Reaction to Earnings Surprise (SUE) and Revenues Surprise (SURG): Portfolio Analysis

Panel A1: Mean Size-Adjusted Returns (SAR) for 1974-2003

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE1</td>
<td>-2.33%</td>
<td>-1.45%</td>
<td>-0.59%</td>
<td>-0.10%</td>
<td>0.55%</td>
</tr>
<tr>
<td>SUE2</td>
<td>-2.07</td>
<td>-1.16</td>
<td>-0.31</td>
<td>0.58</td>
<td>1.46</td>
</tr>
<tr>
<td>SUE3</td>
<td>-1.98</td>
<td>-0.94</td>
<td>-0.14</td>
<td>0.58</td>
<td>1.62</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.40</td>
<td>-0.52</td>
<td>0.37</td>
<td>0.91</td>
<td>1.99</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.65</td>
<td>0.19</td>
<td>1.02</td>
<td>1.73</td>
<td>2.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE2</td>
<td>-2.07</td>
<td>-1.16</td>
<td>-0.31</td>
<td>0.58</td>
<td>1.46</td>
</tr>
<tr>
<td>SUE3</td>
<td>-1.98</td>
<td>-0.94</td>
<td>-0.14</td>
<td>0.58</td>
<td>1.62</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.40</td>
<td>-0.52</td>
<td>0.37</td>
<td>0.91</td>
<td>1.99</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.65</td>
<td>0.19</td>
<td>1.02</td>
<td>1.73</td>
<td>2.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE2</td>
<td>-1.90</td>
<td>-0.99</td>
<td>-0.06</td>
<td>0.70</td>
<td>2.12</td>
</tr>
<tr>
<td>SUE3</td>
<td>-1.65</td>
<td>-0.75</td>
<td>-0.14</td>
<td>0.96</td>
<td>1.93</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.44</td>
<td>-0.59</td>
<td>0.39</td>
<td>1.04</td>
<td>2.14</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.79</td>
<td>0.09</td>
<td>0.60</td>
<td>1.49</td>
<td>2.73</td>
</tr>
</tbody>
</table>

Panel A2: Mean Size-Adjusted Returns (SAR) for 1974-1988

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE1</td>
<td>-2.22%</td>
<td>-1.09%</td>
<td>-0.15%</td>
<td>0.32%</td>
<td>1.65%</td>
</tr>
<tr>
<td>SUE2</td>
<td>-1.90</td>
<td>-0.99</td>
<td>-0.06</td>
<td>0.70</td>
<td>2.12</td>
</tr>
<tr>
<td>SUE3</td>
<td>-1.65</td>
<td>-0.75</td>
<td>-0.14</td>
<td>0.96</td>
<td>1.93</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.44</td>
<td>-0.59</td>
<td>0.39</td>
<td>1.04</td>
<td>2.14</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.79</td>
<td>0.09</td>
<td>0.60</td>
<td>1.49</td>
<td>2.73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE2</td>
<td>-1.90</td>
<td>-0.99</td>
<td>-0.06</td>
<td>0.70</td>
<td>2.12</td>
</tr>
<tr>
<td>SUE3</td>
<td>-1.65</td>
<td>-0.75</td>
<td>-0.14</td>
<td>0.96</td>
<td>1.93</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.44</td>
<td>-0.59</td>
<td>0.39</td>
<td>1.04</td>
<td>2.14</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.79</td>
<td>0.09</td>
<td>0.60</td>
<td>1.49</td>
<td>2.73</td>
</tr>
</tbody>
</table>

Panel A3: Mean Size-Adjusted Returns (SAR) for 1989-2003

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE1</td>
<td>-2.41%</td>
<td>-1.62%</td>
<td>-0.77%</td>
<td>-0.40%</td>
<td>0.15%</td>
</tr>
<tr>
<td>SUE2</td>
<td>-2.16</td>
<td>-1.26</td>
<td>-0.41</td>
<td>0.46</td>
<td>1.19</td>
</tr>
<tr>
<td>SUE3</td>
<td>-2.11</td>
<td>-1.05</td>
<td>-0.20</td>
<td>0.42</td>
<td>1.47</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.43</td>
<td>-0.51</td>
<td>0.39</td>
<td>0.85</td>
<td>1.87</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.52</td>
<td>0.26</td>
<td>1.23</td>
<td>1.86</td>
<td>2.92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE2</td>
<td>-2.16</td>
<td>-1.26</td>
<td>-0.41</td>
<td>0.46</td>
<td>1.19</td>
</tr>
<tr>
<td>SUE3</td>
<td>-2.11</td>
<td>-1.05</td>
<td>-0.20</td>
<td>0.42</td>
<td>1.47</td>
</tr>
<tr>
<td>SUE4</td>
<td>-1.43</td>
<td>-0.51</td>
<td>0.39</td>
<td>0.85</td>
<td>1.87</td>
</tr>
<tr>
<td>SUE5</td>
<td>-0.52</td>
<td>0.26</td>
<td>1.23</td>
<td>1.86</td>
<td>2.92</td>
</tr>
</tbody>
</table>

-1.97 -0.94 0.05 0.75 1.86
Panel B1: Mean Size-Adjusted Returns (SAR) for R&D Sample (all observations with data on R&D expenses)

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURG1</td>
<td>-2.43%</td>
<td>-1.67%</td>
<td>-0.76%</td>
<td>-0.08%</td>
<td>0.49%</td>
</tr>
<tr>
<td>SURG2</td>
<td>-2.11</td>
<td>-1.32</td>
<td>-0.21</td>
<td>0.61</td>
<td>1.42</td>
</tr>
<tr>
<td>SURG3</td>
<td>-2.09</td>
<td>-1.05</td>
<td>-0.21</td>
<td>0.58</td>
<td>1.72</td>
</tr>
<tr>
<td>SURG4</td>
<td>-1.43</td>
<td>-0.30</td>
<td>0.39</td>
<td>1.00</td>
<td>2.06</td>
</tr>
<tr>
<td>SURG5</td>
<td>-0.62</td>
<td>0.33</td>
<td>1.26</td>
<td>1.79</td>
<td>3.03</td>
</tr>
<tr>
<td></td>
<td>-1.99</td>
<td>-0.94</td>
<td>0.08</td>
<td>0.88</td>
<td>2.11</td>
</tr>
</tbody>
</table>

Panel B2: Mean Size-Adjusted Returns (SAR) for R&D High (R&D expenses higher than 5% of revenues)

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURG1</td>
<td>-2.78%</td>
<td>-2.18%</td>
<td>-1.34%</td>
<td>-0.96%</td>
<td>-1.11%</td>
</tr>
<tr>
<td>SURG2</td>
<td>-2.71</td>
<td>-1.77</td>
<td>-0.86</td>
<td>0.26</td>
<td>0.59</td>
</tr>
<tr>
<td>SURG3</td>
<td>-2.88</td>
<td>-1.56</td>
<td>-0.51</td>
<td>0.26</td>
<td>1.47</td>
</tr>
<tr>
<td>SURG4</td>
<td>-1.66</td>
<td>-0.52</td>
<td>0.35</td>
<td>0.74</td>
<td>1.72</td>
</tr>
<tr>
<td>SURG5</td>
<td>-0.26</td>
<td>0.36</td>
<td>1.57</td>
<td>1.80</td>
<td>3.16</td>
</tr>
<tr>
<td></td>
<td>-2.39</td>
<td>-1.31</td>
<td>-0.18</td>
<td>0.59</td>
<td>1.82</td>
</tr>
</tbody>
</table>

Panel B3: Mean Size-Adjusted Returns (SAR) for R&D Low (R&D expenses lower than 5% of revenues)

<table>
<thead>
<tr>
<th>SURG</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SURG1</td>
<td>-2.23%</td>
<td>-1.42%</td>
<td>-0.39%</td>
<td>0.26%</td>
<td>1.26%</td>
</tr>
<tr>
<td>SURG2</td>
<td>-1.74</td>
<td>-1.00</td>
<td>0.12</td>
<td>0.81</td>
<td>1.81</td>
</tr>
<tr>
<td>SURG3</td>
<td>-1.62</td>
<td>-0.67</td>
<td>-0.03</td>
<td>0.82</td>
<td>2.00</td>
</tr>
<tr>
<td>SURG4</td>
<td>-1.37</td>
<td>-0.17</td>
<td>0.51</td>
<td>1.16</td>
<td>2.27</td>
</tr>
<tr>
<td>SURG5</td>
<td>-0.75</td>
<td>0.30</td>
<td>1.03</td>
<td>1.79</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td>-1.75</td>
<td>-0.70</td>
<td>0.25</td>
<td>1.05</td>
<td>2.29</td>
</tr>
</tbody>
</table>
### Panel C1: # of Observations for 1974-2003

<table>
<thead>
<tr>
<th>SUE</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>21,699</td>
<td>12,604</td>
<td>8,965</td>
<td>7,127</td>
<td>5,593</td>
</tr>
<tr>
<td>SURG2</td>
<td>12,537</td>
<td>13,725</td>
<td>11,866</td>
<td>9,907</td>
<td>7,943</td>
</tr>
<tr>
<td>SURG3</td>
<td>8,728</td>
<td>11,864</td>
<td>13,139</td>
<td>12,417</td>
<td>9,843</td>
</tr>
<tr>
<td>SURG4</td>
<td>6,813</td>
<td>10,078</td>
<td>12,268</td>
<td>13,846</td>
<td>12,980</td>
</tr>
<tr>
<td>SURG5</td>
<td>6,210</td>
<td>7,714</td>
<td>9,747</td>
<td>12,960</td>
<td>19,631</td>
</tr>
</tbody>
</table>

### Panel C2: # of Observations for 1974-1988

<table>
<thead>
<tr>
<th>SUE</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>7,623</td>
<td>4,479</td>
<td>3,032</td>
<td>2,285</td>
<td>1,613</td>
</tr>
<tr>
<td>SURG2</td>
<td>4,317</td>
<td>4,905</td>
<td>4,104</td>
<td>3,286</td>
<td>2,422</td>
</tr>
<tr>
<td>SURG3</td>
<td>2,946</td>
<td>4,072</td>
<td>4,548</td>
<td>4,262</td>
<td>3,210</td>
</tr>
<tr>
<td>SURG4</td>
<td>2,210</td>
<td>3,178</td>
<td>4,237</td>
<td>4,824</td>
<td>4,586</td>
</tr>
<tr>
<td>SURG5</td>
<td>1,938</td>
<td>2,396</td>
<td>3,117</td>
<td>4,384</td>
<td>7,205</td>
</tr>
</tbody>
</table>

### Panel C3: # of Observations for 1989-2003

<table>
<thead>
<tr>
<th>SUE</th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>14,076</td>
<td>8,121</td>
<td>5,952</td>
<td>4,795</td>
<td>4,013</td>
</tr>
<tr>
<td>SURG2</td>
<td>8,204</td>
<td>8,845</td>
<td>7,702</td>
<td>6,686</td>
<td>5,507</td>
</tr>
<tr>
<td>SURG3</td>
<td>5,755</td>
<td>7,783</td>
<td>8,607</td>
<td>8,133</td>
<td>6,675</td>
</tr>
<tr>
<td>SURG4</td>
<td>4,619</td>
<td>6,849</td>
<td>7,979</td>
<td>9,082</td>
<td>8,418</td>
</tr>
<tr>
<td>SURG5</td>
<td>4,300</td>
<td>5,356</td>
<td>6,708</td>
<td>8,250</td>
<td>12,340</td>
</tr>
</tbody>
</table>
### Panel D1: # of Observations for R&D Sample

<table>
<thead>
<tr>
<th></th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>12,131</td>
<td>6,936</td>
<td>4,873</td>
<td>3,715</td>
<td>2,858</td>
</tr>
<tr>
<td>SURG2</td>
<td>6,844</td>
<td>7,581</td>
<td>6,541</td>
<td>5,316</td>
<td>4,226</td>
</tr>
<tr>
<td>SURG3</td>
<td>4,573</td>
<td>6,506</td>
<td>7,197</td>
<td>6,902</td>
<td>5,335</td>
</tr>
<tr>
<td>SURG4</td>
<td>3,674</td>
<td>5,408</td>
<td>6,630</td>
<td>7,643</td>
<td>7,157</td>
</tr>
<tr>
<td>SURG5</td>
<td>3,290</td>
<td>4,078</td>
<td>5,274</td>
<td>6,933</td>
<td>10,935</td>
</tr>
</tbody>
</table>

### Panel D2: # of Observations for R&D High

<table>
<thead>
<tr>
<th></th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>4,941</td>
<td>2,578</td>
<td>1,772</td>
<td>1,300</td>
<td>978</td>
</tr>
<tr>
<td>SURG2</td>
<td>2,525</td>
<td>2,971</td>
<td>2,531</td>
<td>2,028</td>
<td>1,515</td>
</tr>
<tr>
<td>SURG3</td>
<td>1,610</td>
<td>2,412</td>
<td>2,826</td>
<td>2,732</td>
<td>1,989</td>
</tr>
<tr>
<td>SURG4</td>
<td>1,302</td>
<td>2,043</td>
<td>2,448</td>
<td>2,928</td>
<td>2,851</td>
</tr>
<tr>
<td>SURG5</td>
<td>1,191</td>
<td>1,567</td>
<td>1,992</td>
<td>2,582</td>
<td>4,235</td>
</tr>
</tbody>
</table>

### Panel D3: # of Observations for R&D Low

<table>
<thead>
<tr>
<th></th>
<th>SUE1</th>
<th>SUE2</th>
<th>SUE3</th>
<th>SUE4</th>
<th>SUE5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SURG1</td>
<td>7,193</td>
<td>4,364</td>
<td>3,101</td>
<td>2,405</td>
<td>1,881</td>
</tr>
<tr>
<td>SURG2</td>
<td>4,293</td>
<td>4,623</td>
<td>4,040</td>
<td>3,265</td>
<td>2,718</td>
</tr>
<tr>
<td>SURG3</td>
<td>2,980</td>
<td>4,079</td>
<td>4,303</td>
<td>4,238</td>
<td>3,343</td>
</tr>
<tr>
<td>SURG4</td>
<td>2,399</td>
<td>3,337</td>
<td>4,215</td>
<td>4,716</td>
<td>4,274</td>
</tr>
<tr>
<td>SURG5</td>
<td>2,078</td>
<td>2,536</td>
<td>3,286</td>
<td>4,316</td>
<td>6,726</td>
</tr>
</tbody>
</table>

**Notes:**

1. Panels A and B present size-adjusted returns (SAR) for variable-sized portfolios. All observations are ranked according to earnings surprise (SUE) and revenues surprise (SURG) and assigned into quintiles. Each cell presents SAR for portfolios that contain observations that are in quintile i of SUE and in quintile j of SURG. For example, cell (SUE1, SURG1) contains observations that are in the lowest quintile of both SUE and SURG.
2. Size-adjusted stock returns in bold face are significant at the 1% level.
3. Panels C and D present the number of observations in each cell of panels A and B.
Table 6
Incremental Reaction of Size-Adjusted Returns (SAR) to Earnings Surprise (SUE) and Revenues Surprise (SURG)

Panel A: Incremental Reaction of Size-Adjusted Returns (SAR) to Earnings Surprise (SUE), Conditional on the Level of Revenues Surprise (SURG)

<table>
<thead>
<tr>
<th></th>
<th>SAR in SUE5 – SAR in SUE1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SURG1</td>
</tr>
<tr>
<td>Full Sample</td>
<td></td>
</tr>
<tr>
<td>1974-2003</td>
<td>2.88%</td>
</tr>
<tr>
<td>1974-1988</td>
<td>3.87</td>
</tr>
<tr>
<td>1989-2003</td>
<td>2.56</td>
</tr>
<tr>
<td>R&amp;D Sample</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>2.92</td>
</tr>
<tr>
<td>R&amp;D High</td>
<td>1.67</td>
</tr>
<tr>
<td>R&amp;D Low</td>
<td>3.49</td>
</tr>
</tbody>
</table>

Panel B: Incremental Reaction of Size-Adjusted Returns (SAR) to Revenues Surprise (SURG), Conditional on the Level of Earnings Surprise (SUE)

<table>
<thead>
<tr>
<th></th>
<th>SAR in SURG5 – SAR in SURG1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SUE1</td>
</tr>
<tr>
<td>Full Sample</td>
<td></td>
</tr>
<tr>
<td>1974-2003</td>
<td>1.68</td>
</tr>
<tr>
<td>1974-1988</td>
<td>1.43</td>
</tr>
<tr>
<td>1989-2003</td>
<td>1.89</td>
</tr>
<tr>
<td>R&amp;D Sample</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1.81</td>
</tr>
<tr>
<td>R&amp;D High</td>
<td>2.52</td>
</tr>
<tr>
<td>R&amp;D Low</td>
<td>1.48</td>
</tr>
</tbody>
</table>

Notes:
1. The table presents the differences in size-adjusted returns between the extreme quintile of SUE (SURG), conditional on the level of SURG (SUE).
2. All size-adjusted returns are significant at the 1% level
Table 7  
Market Reaction to Earnings and Revenues Surprise:  
Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>SURG (t-stat)</th>
<th>SUE (t-stat)</th>
<th>Adj-R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full Sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974-2003</td>
<td>0.0015</td>
<td>0.0033</td>
<td>0.04</td>
<td>280,113</td>
</tr>
<tr>
<td></td>
<td>(13.78)</td>
<td>(35.63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1974-1988</td>
<td>0.0011</td>
<td>0.0035</td>
<td>0.05</td>
<td>95,261</td>
</tr>
<tr>
<td></td>
<td>(10.52)</td>
<td>(26.47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1989-2003</td>
<td>0.0020</td>
<td>0.0031</td>
<td>0.03</td>
<td>184,852</td>
</tr>
<tr>
<td></td>
<td>(21.06)</td>
<td>(26.46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Firms with negative EPS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0010</td>
<td>0.0016</td>
<td>0.01</td>
<td>72,129</td>
</tr>
<tr>
<td></td>
<td>(5.53)</td>
<td>(13.34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R&amp;D Sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>0.0018</td>
<td>0.0033</td>
<td>0.05</td>
<td>152,582</td>
</tr>
<tr>
<td></td>
<td>(16.34)</td>
<td>(36.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>0.0024</td>
<td>0.0029</td>
<td>0.04</td>
<td>57,858</td>
</tr>
<tr>
<td></td>
<td>(11.59)</td>
<td>(21.81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>0.0015</td>
<td>0.0033</td>
<td>0.05</td>
<td>94,724</td>
</tr>
<tr>
<td></td>
<td>(19.09)</td>
<td>(37.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 4000</td>
<td>0.0015</td>
<td>0.0033</td>
<td>0.04</td>
<td>227,632</td>
</tr>
<tr>
<td></td>
<td>(13.07)</td>
<td>(35.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 4000 and 6000</td>
<td>0.0020</td>
<td>0.0034</td>
<td>0.05</td>
<td>35,811</td>
</tr>
<tr>
<td></td>
<td>(10.72)</td>
<td>(23.83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 6000</td>
<td>0.0015</td>
<td>0.0032</td>
<td>0.05</td>
<td>16,670</td>
</tr>
<tr>
<td></td>
<td>(7.21)</td>
<td>(13.76)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. The table presents regression results for equation (1):
   \[ SAR_{i,t} = \alpha_0 + \alpha_1 \cdot SURG_{i,t} + \alpha_2 \cdot SUE_{i,t} + \epsilon_{i,t} \]
2. Variable definitions:
   - SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
   - SUE - earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share.
3. High (low) R&D firms are companies with an R&D-to-revenues ratio higher (lower) than 5%.
4. H index is the average Herfindahl-Hirshman Index (HHI) for each industry. HHI is an index of industry concentration, and is calculated as the sum of the squares of market shares in revenues for each firm. The value of HHI lies between 0 and 10,000, where 10,000 means a single company in the industry and a value of zero indicates that the industry is characterized by a number of infinitesimally small firms. When there are N equal-sized companies, HHI equals 1/N.
### Table 8
**Effect of R&D on Market Reaction**

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>D</th>
<th>SURG</th>
<th>SUE</th>
<th>D*SURG</th>
<th>D*SUE</th>
<th>Adj-R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-0.0047</td>
<td>0.0015</td>
<td>0.0033</td>
<td>0.0008</td>
<td>-0.0004</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-6.61</td>
<td>19.09</td>
<td>37.09</td>
<td>4.30</td>
<td>-2.57</td>
<td>152,582</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. The table presents regression results for equation (2):
   \[
   \text{SAR}_{i,t} = \beta_0 + D + \beta_1 * \text{SURG}_{i,t} + \beta_2 * \text{SUE}_{i,t} + \beta_3 * D * \text{SURG}_{i,t} + \beta_4 * D * \text{SUE}_{i,t} + \varepsilon_{i,t}
   \]
2. Variable definitions:
   - SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
   - SUE - earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share;
   - D – a dummy variable that obtains the value of “1” if the R&D-to-revenues ratio (RDR) is higher than 5%, and “0” otherwise.
3. The extreme 3% of the highest RDR observations are deleted (RDR higher than 293.7%), thereby removing 4,955 observations.
Table 9
Market Reaction to Negative EPS

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>D_L</th>
<th>SURG</th>
<th>SUE</th>
<th>D*SURG</th>
<th>D*SUE</th>
<th>Adj-R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-0.0223</td>
<td>0.0014</td>
<td>0.0033</td>
<td>-0.0005</td>
<td>-0.0014</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>-23.51</td>
<td>14.31</td>
<td>33.86</td>
<td>-3.73</td>
<td>-8.92</td>
<td>280,113</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. The table presents regression results for equation (3):

\[ SAR_{it} = \gamma_0 + D_L + \gamma_1 \times SURG_{it} + \gamma_2 \times SUE_{it} + \gamma_3 \times D_L \times SURG_{it} + \gamma_4 \times D_L \times SUE_{it} + \eta_{it} \]

2. Variable definitions:
   - SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
   - SUE – earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share;
   - D_L – a dummy variable that obtains the value of “1” if earning per share is negative, and “0” otherwise.
Table 10  
Effect of Industry Concentration on Market Reaction

Panel A - Equation (4):

\[ SAR_{i,t} = \delta_0 + D_{HHI} + \delta_1 \cdot SURG_{i,t} + \delta_2 \cdot SUE_{i,t} + \delta_3 \cdot D_{HHI} \cdot SURG_{i,t} + \xi_{i,t} \]

<table>
<thead>
<tr>
<th>D_{HHI} = 1 if H is between:</th>
<th>Full Sample</th>
<th>SIC Codes 2000-3999</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adj-R² = 0.04; N = 280,113</td>
<td>Adj-R² = 0.05; N = 158,945</td>
</tr>
<tr>
<td></td>
<td>D_{HHI} (t-stat)</td>
<td>SURG (t-stat)</td>
</tr>
<tr>
<td>0-2000</td>
<td>-0.0001 (-0.29)</td>
<td>0.0016 (14.44)</td>
</tr>
<tr>
<td>2000-4000</td>
<td>0.0004 (1.07)</td>
<td>0.0015 (12.11)</td>
</tr>
<tr>
<td>3000-3500</td>
<td>-0.0009 (-2.09)</td>
<td>0.0015 (13.72)</td>
</tr>
<tr>
<td>3500-4000</td>
<td>0.0016 (2.39)</td>
<td>0.0015 (13.77)</td>
</tr>
<tr>
<td>4000-6000</td>
<td>-0.0003 (-0.52)</td>
<td>0.0015 (13.43)</td>
</tr>
<tr>
<td>6000-7000</td>
<td>-0.0011 (-1.38)</td>
<td>0.0015 (13.69)</td>
</tr>
<tr>
<td>7000-10000</td>
<td>0.0004 (0.34)</td>
<td>0.0015 (13.61)</td>
</tr>
</tbody>
</table>
Panel B - Equation (5):

\[ SAR_{t,j} = \chi_0 + \chi_1 * SURG_{t,j} + \chi_2 * SUE_{t,j} + \chi_3 * D2030 * SURG_{t,j} + \chi_4 * D3035 * SURG_{t,j} + \chi_5 * D3540 * SURG_{t,j} + \chi_6 * D4060 * SURG_{t,j} + \chi_7 * D6070 * SURG_{t,j} + \chi_8 * D70100 * SURG_{t,j} + \psi_{t,j} \]

<table>
<thead>
<tr>
<th></th>
<th>SURG (t-stat)</th>
<th>SUE (t-stat)</th>
<th>D2030* SURG (t-stat)</th>
<th>D3035* SURG (t-stat)</th>
<th>D3540* SURG (t-stat)</th>
<th>D4060* SURG (t-stat)</th>
<th>D6070* SURG (t-stat)</th>
<th>D70100* SURG (t-stat)</th>
<th>Adj-R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Sample</td>
<td>0.0014 (10.11)</td>
<td>0.0033 (35.63)</td>
<td>0.0001 (1.03)</td>
<td>0.0003 (2.20)</td>
<td>0.0001 (0.64)</td>
<td>0.0007 (4.28)</td>
<td>0.0001 (0.40)</td>
<td>0.0002 (0.80)</td>
<td>0.04</td>
<td>280,113</td>
</tr>
<tr>
<td>SIC Codes 2000-3999</td>
<td>0.0015 (9.64)</td>
<td>0.0034 (36.26)</td>
<td>0.0001 (1.08)</td>
<td>0.0001 (0.40)</td>
<td>0.0003 (1.39)</td>
<td>0.0007 (3.80)</td>
<td>-0.0001 (-0.40)</td>
<td>-0.0002 (-0.70)</td>
<td>0.05</td>
<td>158,945</td>
</tr>
</tbody>
</table>

Panel C - Equation (6):

\[ SAR_{t,j} = \kappa_0 + \kappa_1 * SURG_{t,j} + \kappa_2 * SUE_{t,j} + \kappa_3 * D0020 * SURG_{t,j} + \kappa_4 * D2030 * SURG_{t,j} + \kappa_5 * D3035 * SURG_{t,j} + \kappa_6 * D3540 * SURG_{t,j} + \kappa_7 * D4060 * SURG_{t,j} + \mu_{t,j} \]

<table>
<thead>
<tr>
<th></th>
<th>SURG (t-stat)</th>
<th>SUE (t-stat)</th>
<th>D0020* SURG (t-stat)</th>
<th>D2030* SURG (t-stat)</th>
<th>D3035* SURG (t-stat)</th>
<th>D3540* SURG (t-stat)</th>
<th>D4060* SURG (t-stat)</th>
<th>Adj-R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Sample</td>
<td>0.0015 (7.61)</td>
<td>0.0033 (35.73)</td>
<td>-0.0002 (-0.80)</td>
<td>-0.0001 (-0.29)</td>
<td>0.0001 (0.56)</td>
<td>-0.0000 (-0.15)</td>
<td>0.0005 (2.32)</td>
<td>0.04</td>
<td>280,113</td>
</tr>
<tr>
<td>SIC Codes 2000-3999</td>
<td>0.0014 (5.46)</td>
<td>0.0034 (36.42)</td>
<td>0.0001 (1.47)</td>
<td>0.0003 (1.07)</td>
<td>0.0002 (0.74)</td>
<td>0.0005 (1.55)</td>
<td>0.0008 (3.30)</td>
<td>0.05</td>
<td>158,945</td>
</tr>
</tbody>
</table>

Notes:

1. Variable definitions:
   - SAR – size-adjusted returns - raw returns, minus the return on the size portfolio that contains the firm;
   - SUE – earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share;
   - HHI – the average Herfindahl-Hirshman Index for each industry. HHI is an index of industry concentration, and is calculated as the sum of the squares of market shares in revenues for each firm. The value of HHI lies between 0 and 10,000, where 10,000 means a single company in the industry and a value of zero indicates that the industry is characterized by a number of infinitesimally small firms. When there are N equal-sized companies, HHI equals 1/N;
   - D_{HHI} is a dummy variable that obtains the value of “1” if HHI is between Y and Z, and “0” otherwise;
   - D_{xw} is a dummy variable that obtains the value of “1” if HHI is between x and w, and “0” otherwise (e.g. D0020 is a dummy variable that obtains the value of “1” if H is between 0 and 2,000, and “0” otherwise).
### Table 11
Effect of Fiscal Quarter on Market Reaction

**Panel A - Equation (7):**

\[ SAR_{i,t} = \nu_0 + D_4 + \nu_1 \times SURG_{i,t} + \nu_2 \times SUE_{i,t} + \nu_3 \times D_4 \times SURG_{i,t} + \nu_4 \times D_4 \times SUE_{i,t} + \xi_{i,t} \]

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>( D_4 ) (t-stat)</th>
<th>SURG (t-stat)</th>
<th>SUE (t-stat)</th>
<th>( D_4 \times SURG ) (t-stat)</th>
<th>( D_4 \times SUE ) (t-stat)</th>
<th>Adj-R(^2)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>0.0012</td>
<td>0.0016</td>
<td>0.0035</td>
<td>-0.0001</td>
<td>-0.0007</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>t-stat</td>
<td>1.95</td>
<td>15.03</td>
<td>34.28</td>
<td>-1.23</td>
<td>-6.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Panel B – Equation (8):**

\[ SAR_{i,t} = \theta_0 + \sum_{i=1}^{3} D_i \times \theta_1 \times SURG_{i,t} + \theta_2 \times SUE_{i,t} + \theta_3 \times D_1 \times SURG_{i,t} + \theta_4 \times D_2 \times SURG_{i,t} + \theta_5 \times D_3 \times SURG_{i,t} + \theta_6 \times D_1 \times SUE_{i,t} + \theta_7 \times D_2 \times SUE_{i,t} + \theta_8 \times D_3 \times SUE_{i,t} + \varphi_{i,t} \]

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>( D_1 ) (t-stat)</th>
<th>( D_2 ) (t-stat)</th>
<th>( D_3 ) (t-stat)</th>
<th>SURG (t-stat)</th>
<th>SUE (t-stat)</th>
<th>( D_1 \times SURG ) (t-stat)</th>
<th>( D_2 \times SURG ) (t-stat)</th>
<th>( D_3 \times SURG ) (t-stat)</th>
<th>( D_1 \times SUE ) (t-stat)</th>
<th>( D_2 \times SUE ) (t-stat)</th>
<th>( D_3 \times SUE ) (t-stat)</th>
<th>Adj-R(^2)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>0.0011</td>
<td>-0.0018</td>
<td>-0.0028</td>
<td>0.0014</td>
<td>0.0028</td>
<td>0.0002</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0009</td>
<td>0.0006</td>
<td>0.0006</td>
<td>0.04</td>
<td></td>
</tr>
</tbody>
</table>
Variable definitions:

- SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
- SUE - earnings surprise – earning per share, minus expected earnings per share;
- SURG – revenues surprise – sales per share, minus expected sales per share;
- $D_i$ – a dummy variable that obtains the value of “1” for the $i_{th}$ quarter, and “0” otherwise.
Table 12

Market Reaction to Opposite Signs of Earnings and Revenues Surprise

Panel A: Size-Adjusted Returns (SAR) when Earnings Surprise (SUE) is Negative and Revenues Surprise (SURG) is Positive.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.16%</td>
<td>-0.52%</td>
<td>0.01%</td>
<td>0.10%</td>
<td>0.15%</td>
<td>0.10%</td>
<td>0.05%</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>4.06</td>
<td>-11.01</td>
<td>1.04</td>
<td>2.47</td>
<td>0.88</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>61,246</td>
<td>19,531</td>
<td>41,715</td>
<td>13,955</td>
<td>20,100</td>
<td>7,760</td>
<td>4,702</td>
</tr>
<tr>
<td># of companies</td>
<td>8,767</td>
<td>3,379</td>
<td>7,526</td>
<td>2,483</td>
<td>2,845</td>
<td>1,142</td>
<td>649</td>
</tr>
<tr>
<td>SAR (median)</td>
<td>-0.48%</td>
<td>-0.52%</td>
<td>-0.38%</td>
<td>-0.56%</td>
<td>-0.48%</td>
<td>-0.40%</td>
<td>-0.38%</td>
</tr>
</tbody>
</table>

Panel B: Size-Adjusted Returns (SAR) when Earnings Surprise (SUE) is Positive and Revenues Surprise (SURG) is Negative.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.04%</td>
<td>1.09%</td>
<td>1.02%</td>
<td>0.50%</td>
<td>1.21%</td>
<td>0.83%</td>
<td>0.89%</td>
<td></td>
</tr>
<tr>
<td>t-statistic</td>
<td>22.40</td>
<td>19.50</td>
<td>16.07</td>
<td>3.90</td>
<td>18.16</td>
<td>6.43</td>
<td>5.42</td>
</tr>
<tr>
<td>N</td>
<td>51,630</td>
<td>16,728</td>
<td>34,902</td>
<td>10,548</td>
<td>17,893</td>
<td>6,556</td>
<td>3,921</td>
</tr>
<tr>
<td># of companies</td>
<td>8,350</td>
<td>3,222</td>
<td>6,889</td>
<td>2,226</td>
<td>2,765</td>
<td>1,104</td>
<td>625</td>
</tr>
<tr>
<td>SAR (median)</td>
<td>0.32%</td>
<td>0.37%</td>
<td>0.29%</td>
<td>-0.22%</td>
<td>0.46%</td>
<td>0.28%</td>
<td>0.32%</td>
</tr>
</tbody>
</table>

Notes:
1. High (low) R&D firms are companies with an R&D-to-revenues ratio higher (lower) than 5%.
2. H index is the average Herfindahl-Hirshman Index (HHI) for each industry. HHI is an index of industry concentration, and is calculated as the sum of the squares of market shares in revenues for each firm. The value of HHI lies between 0 and 10,000, where 10,000 means a single company in the industry and a value of zero indicates that the industry is characterized by a number of infinitesimally small firms. When there are N equal-sized companies, HHI equals 1/N.
### Table 13

“Full” Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>$D_{RD}$</th>
<th>$D_L$</th>
<th>$D_H$</th>
<th>SURG</th>
<th>$D_{RD} \times$ SURG</th>
<th>$D_L \times$ SURG</th>
<th>$D_H \times$ SURG</th>
<th>SUE</th>
<th>$D_{RD} \times$ SUE</th>
<th>$D_L \times$ SUE</th>
<th>$D_H \times$ SUE</th>
<th>Adj-R$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>-0.0023</td>
<td>-0.0228</td>
<td>-0.0000</td>
<td>0.0014</td>
<td>0.0008</td>
<td>-0.0005</td>
<td>0.0005</td>
<td>0.0034</td>
<td>-0.0003</td>
<td>-0.0015</td>
<td>0.0000</td>
<td>0.06</td>
</tr>
<tr>
<td>t-stat</td>
<td>-3.52</td>
<td>-25.42</td>
<td>-0.07</td>
<td>20.21</td>
<td>3.74</td>
<td>-2.50</td>
<td>3.12</td>
<td>36.09</td>
<td>-1.96</td>
<td>-8.33</td>
<td>0.21</td>
<td>152,425</td>
</tr>
</tbody>
</table>

Notes:
1. This table presents Fama-MacBeth (1973) type regression results for equation (8):

$$SAR_{ij} = \lambda_0 + D_{RD} + D_L + \lambda_1 * SURG_{ij} + \lambda_2 * D_{RD} \times SURG_{ij} + \lambda_3 * D_L \times SURG_{ij} + \lambda_4 * D_H \times SURG_{ij}$$
$$+ \lambda_5 * SUE_{ij} + \lambda_6 * D_{RD} \times SUE_{ij} + \lambda_7 * D_L \times SUE_{ij} + \lambda_8 * D_H \times SUE_{ij} + \omega_{ij}. $$

2. Variable definitions:
   - SAR – size-adjusted returns – raw returns, minus the return on the size portfolio that contains the firm;
   - SUE – earnings surprise – earning per share, minus expected earnings per share;
   - SURG – revenues surprise – sales per share, minus expected sales per share;
   - $D_{RD}$ – a dummy variable that obtains the value of “1” if the R&D-to-revenues ratio (RDR) is higher than 5%, and “0” otherwise;
   - $D_L$ – a dummy variable that obtains the value of “1” if earning per share is negative, and “0” otherwise;
   - $D_H$ – a dummy variable that obtains the value of “1” if Herfindahl-Hirshman Index (HHI) is between 4,000 and 6,000, and “0” otherwise. HHI is an index of industry concentration, and is calculated as the sum of the squares of market shares in revenues for each firm.