

**Earnings Surprises, Growth Expectations, and Stock Returns  
or  
Don't Let an Earnings Torpedo Sink Your Portfolio\***

by

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## **Earnings Surprises, Growth Expectations, and Stock Returns**

### **Abstract**

It is well-established that the realized returns of ‘growth’ stocks have been low relative to other stocks. We show that this phenomenon is explained by a large and asymmetric response to negative earnings surprises for growth stocks. After controlling for this effect, there is no longer evidence of a stock return differential between growth stocks and other stocks. Our evidence is more consistent with investors having naively optimistic expectations about the prospects of growth stocks (e.g., Lakonishok, Shleifer, and Vishny, 1994) than with the existence of unidentified risk factors that are lower for growth stocks (e.g., Fama and French, 1992).

## **Earnings Surprises, Growth Expectations, and Stock Returns**

It is well-established that ‘growth’ or ‘glamour’ stocks have historically underperformed other stocks in terms of realized stock returns over the subsequent five years. We show that this phenomenon can be explained by the fact that growth stocks exhibit an asymmetric response to negative earnings surprises. We show that growth stocks perform similarly to other stocks in response to positive earnings surprises, but that growth stocks exhibit a much larger negative response to earnings disappointments. After controlling for the asymmetric response of growth stocks to negative earnings surprises, there is no longer evidence of a stock return differential between growth stocks and other stocks.

Our evidence provides insights into the explanation for the return differential between growth stocks and other stocks. Existing research focuses on distinguishing between two explanations for the return differential. First, growth variables such as price-to-earnings and market-to-book capture unknown systematic risk factors [Fama and French (FF, 1992)]. Second, market prices do not fully reflect information in these variables, in the sense that investors have overly optimistic expectations about the prospects of growth stocks, resulting in lower subsequent stock returns when these expectations are not met [Lakonishok, Shleifer, and Vishny (LSV, 1994)]. Laporta, Lakonishok, Shleifer, and Vishny (1997) and Bernard, Thomas, and Wahlen (1997) test the second explanation by investigating whether the differential stock returns are

clustered around subsequent earnings announcements. While both studies find some evidence of clustering, the results are weak and inconclusive.

Our paper provides a more refined test of whether the superior returns to value stocks are related to expectational errors about future earnings. We hypothesize that the return differential between growth stocks and other stocks is attributable to the large negative stock price reactions that often result when growth stocks disclose negative earnings surprises. In recent years there have been several well-publicized examples of large negative market reactions when growth firms announce earnings disappointments.<sup>1</sup> It seems natural to draw a connection between these very negative market responses to adverse earnings news and the apparent overpricing of growth stocks. By definition, these stocks are trading at high valuation multiples (high market-to-book and price-to-earnings ratios), that can only be justified by high rates of expected future earnings growth.

Our research design differs from Laporta et al. (1997) and Bernard et al. (1997) in three important respects. First, we allow for an asymmetric stock price response of growth stocks to negative earnings news. Second, we use a modified return measurement interval that allows for the fact that adverse earnings news is frequently preannounced by management, so that many of these large negative reactions occur several weeks before the earnings announcement date [Skinner (1994, 1997), Soffer, Thiagarajan and Walther (1999)]. Third, we conduct more powerful tests by measuring earnings surprises relative to analysts' consensus forecasts of quarterly earnings.

We find strong evidence that the market reaction to earnings news is asymmetric in the way that we hypothesize. Growth stocks respond similarly to other stocks in response to positive earnings surprises, but respond significantly more negatively in response to negative earnings surprises. Through regression analysis, we show that this asymmetric response *completely subsumes* the return differential between growth stocks and other stocks. Moreover, we find that this effect occurs predominantly during the weeks leading up to and including the earnings announcement date, when earnings preannouncements occur. Finally, we find that the effect is considerably weakened if one focuses exclusively on earnings announcement dates, suggesting that investors routinely anticipate earnings information through events such as preannouncements. This explains why studies focusing exclusively on earnings announcement dates, such as Laporta et al. (1997) and Bernard et al. (1997), report weak results. In short, our paper provides the most compelling evidence to date that the inferior returns to growth stocks are directly linked to earnings expectations.

The next section of the paper formulates our research hypothesis and empirical predictions. Section II describes our sample and research design. Section III presents the empirical results and section IV concludes.

## **I. Hypothesis and Empirical Predictions**

Our basic hypothesis is that the differential returns between value and growth stocks are driven by a large asymmetric response to adverse earnings news in growth stocks. We begin by illustrating this hypothesis using anecdotal data. The anecdotes

serve as a useful precursor to our large sample results, and highlight some of the institutional details surrounding earnings disclosures that guide our research design. Our large sample tests provide evidence on the generalizability of the anecdotes. The phenomenon illustrated by the anecdotes is frequently discussed by practitioners in the popular business press, where it has been termed the ‘earnings torpedo’ effect.<sup>2</sup>

Our first example is the case of Oracle’s announcement of earnings for the second quarter of 1998, previously mentioned in footnote 1. Key financial statistics relating to the announcement are reported in figure 1. Oracle’s preannouncement market-to-book and price-to-earnings ratios were 12 and 45 respectively, clearly qualifying it as a ‘growth’ or ‘glamour’ stock. Earnings for its second quarter ending in November of 1997 were forecast by analysts to be \$0.23. On December 8, Oracle announced actual earnings of \$0.19, resulting in a stock price decline of 29% despite the fact that this represented a shortfall of only \$0.04, or about 17%, of the consensus analyst forecast of earnings and was above earnings for the same quarter of the previous year (of \$0.18). This latter point is significant because Bernard et al. (1997) would define this observation as a ‘positive’ earnings surprise using their simple time-series earnings expectation model. This example clearly illustrates that earnings are expected to grow for growth stocks, so that earnings increases can represent disappointments relative to expectations. It also illustrates how a relatively small negative surprise can trigger a large stock price decline, consistent with the conventional wisdom that these large stock price declines are driven by the fact that an earnings disappointment occurred and do not depend on its particular magnitude.

Our second example is Rainforest Café's earnings disclosure for the fourth quarter of 1997. This example differs significantly from the Oracle case in that Rainforest management chose to preannounce earnings: on January 5, 1998 they announced that they expected fourth quarter earnings in the range of \$0.23-\$0.24. As is typical for preannouncements, this disclosure occurred a few days after the end of the fiscal period (ending December) but several weeks before the formal earnings announcement date. This estimate fell short of the prevailing consensus analyst forecast by \$0.01 to \$0.02, or 4% to 8% of forecast earnings. Nevertheless, both the consensus forecast of earnings and the estimated earnings range were well above earnings for the same quarter in the prior year of \$0.15. Despite the substantial increase over the prior year and the small shortfall relative to analysts' forecasts, Rainforest's stock price fell by 40% in reaction to the preannouncement, again illustrating that it is the disappointment *per se* and not its magnitude that seems to matter to stock market participants. Rainforest subsequently announced split-adjusted earnings of \$0.225 on February 4, 1998. (Actual reported earnings were \$0.15 but a 3-for-2 stock split occurred during the intervening period.) This announcement had little observable impact on stock price, illustrating why studies such as Laporta et al. (1997) and Bernard et al. (1997) that focus on earnings announcement dates potentially miss much of the price response to adverse earnings surprises, especially for growth stocks (which preannounce adverse earnings news relatively more often than other firms).

Our hypothesis leads to three key testable predictions. First, as illustrated by these examples, we predict that growth stocks reporting adverse earnings news will experience asymmetrically large negative abnormal stock returns. Second, we predict

that the large response of growth stocks to adverse earnings news will explain the anomalous return differential between growth and value stocks. Third, we predict that the asymmetrically large stock returns will be clustered around the date the adverse earnings news is disclosed to investors. This may be at the time of the regularly scheduled earnings announcement (as in the Oracle example), or at the time of an earnings preannouncement (as in the Rainforest example). We discuss each of these predictions in more detail below.

Our first prediction concerns the relation between the differential returns to value and growth stocks and the nature of the earnings surprises reported by these stocks. Basu (1977) and Dreman and Berry (1995) previously examine this relation. However, the predictions in these studies are fundamentally different from our predictions. The two prior studies both predict that stock returns will be more pronounced for high (low) growth stocks reporting negative (positive) earnings surprises. In contrast, our predictions pertain only to high growth stocks reporting negative earnings surprises. This difference is crucial, because the stock return behavior predicted in the prior studies would be expected even if the reaction to an earnings surprise was unrelated to the growth characteristics of the stock. We illustrate this point in figure 2 (a).

The table in figure 2 (a) illustrates hypothetical average abnormal returns to growth and value stocks under the assumption that the return differential to growth and value stocks is realized regardless of the sign of the subsequent earnings surprise. The rows of the table report the average abnormal returns for value and growth stocks over a one-quarter holding period. For simplicity, we assume that value stocks have a 1% average abnormal return, while growth stocks have a -1% average abnormal return, and



that stocks are distributed in equal numbers between the two categories. The columns of the table report the abnormal returns stratified by the nature of the earnings surprise reported during the quarter. For simplicity, we assume that stocks reporting a positive earnings surprise have an average abnormal return of 5% and stocks reporting a negative earnings surprise have an average abnormal return of -5%. We also assume that stocks are distributed 50% in each of the surprise categories (i.e., firms are equally likely to miss or beat expectations, but no firms exactly meet expectations).

The above assumptions provide the numbers for cells in the All row and column of the table. The distribution of the returns among the other cells depends on the relation between the growth characteristics and the stock price response to earnings surprises. The table in figure 2 (a) is prepared under the assumption that the 2% return differential between growth and value stocks occurs regardless of the earnings surprise that is reported. For example, the average abnormal return for firms reporting a positive earnings surprise is 5%. Hence, growth firms reporting positive earnings surprises have an average abnormal return of 5% plus -1% to give 4%, while value firms reporting positive earnings surprises have an average abnormal return of 5% plus 1% to give 6%. The key feature of the returns in figure 2 (a) is that the average return differential between growth and value stocks is the same regardless of the sign of the earnings surprise. Thus, this table presents exactly the relation that would be expected if the two effects are completely unrelated. The table in figure 2 (a) contains the abnormal return behavior predicted by Basu (1977) and Dreman and Berry (1995). Average abnormal returns are more pronounced for growth (value) stocks reporting negative (positive) earnings surprises.

The table in figure 2 (b) illustrates the average abnormal returns to growth and value stocks under the assumption that the return differential to growth and value stocks is completely concentrated in subsequent negative earnings surprise quarters. The All rows and columns are prepared using the same assumptions that are used in figure 2 (a). However, the distribution of the returns between the other cells is completely different from figure 2 (a). The average abnormal returns for firms reporting positive earnings surprises are the same regardless of the value/growth classification. The entire differential between value and growth stocks is concentrated in firms reporting negative earnings surprises. Because only 50% of securities are assumed to report negative surprises, the average return differential between value and growth stocks is magnified to 4% for these securities, thus maintaining the average differential across all stocks of 2%. The key feature of the returns in figure 2 (b) is that the differential returns from growth and value stocks are only realized during quarters when negative earnings surprises are reported. Figure 2 (b) illustrates the first and second of the three predictions that we test in this study. First, we see a large asymmetric negative reaction to negative earnings surprises in growth stocks. Second, there is no evidence of a value/growth return differential in stocks reporting positive earnings surprises, indicating that the value/growth return differential is entirely concentrated in firms reporting negative earnings surprises.

Our third and final prediction is that the differential returns to growth and value stocks are concentrated around the release of earnings news. Evidence in support of this prediction corroborates the link between the differential return behavior and earnings surprises. Such evidence is not presented in either Basu (1977) or Dreman and Berry

(1995). Past research by Laporta et al. (1997) and Bernard et al. (1997) focuses on the returns to growth and value stocks during short (2-3 day) windows centered on quarterly earnings announcement dates. However, as in the Rainforest Café example, investors frequently receive earnings information ahead of the formal earnings announcement date, and this ‘preemption’ of earnings news is more likely in the case of adverse earnings surprises. Preemption occurs for two reasons. First, there has been a growing trend for management to preannounce earnings [Skinner (1994, 1997), Kasznik and Lev (1995), and Soffer, Thiagarajan and Walther (1999)]. The evidence indicates that preannouncements predominantly convey adverse earnings news and are more likely in litigation intensive industries, which tend to be industries with high growth firms (e.g., computer hardware and software, drugs, electrical equipment, and retail).<sup>3</sup> By announcing adverse earnings news early, these firms accelerate the associated stock price decline, thus avoiding large stock price declines on the earnings announcement date and reducing the expected costs of any potential stockholder litigation.<sup>4</sup> The second reason for preemption is that earnings announcements that convey bad news tend to be delayed beyond firms’ usual announcement dates [Chambers and Penman (1984)]. Thus, investors interpret a failure to report on the usual announcement date as a signal of bad earnings news. Taken together, the above evidence has important implications for our research design, suggesting that negative earnings surprises in growth firms are more likely to be preannounced than other earnings surprises. Since these observations are also those that we hypothesize will exhibit an asymmetrically large stock price response to earnings news, it is critical that our research design uses a return measurement interval that captures these preannouncements.

## II. Sample and Research Design

Our sample is based on quarterly earnings forecasts obtained from the I/B/E/S historical database. The database contains 139,027 observations with non-missing data on the consensus forecast of quarterly earnings, realized quarterly earnings, and stock prices between 1984 and 1996. We use the consensus forecast provided by I/B/E/S in the final month of the fiscal quarter for which earnings is being forecast. I/B/E/S collects the forecast data through the first half of the month and releases the forecast data around the middle of the month. Thus, we can be sure that the forecasts do not contain any information from earnings preannouncements made after the middle of the final month of the quarter. We also require that sample firms have the required data to compute the growth/value measures (described below) on COMPUSTAT and daily stock return data for at least one quarter on CRSP. These requirements reduce the final sample size to 103,274 firm-quarter observations.

Our research design consists of classifying firm-quarters on the basis of growth/value characteristics and tracking their subsequent stock return and earnings surprise characteristics. Prior research shows that the differential returns for growth and value stocks persist for five years after the date the growth/value characteristics are measured (LSV). We therefore track stock return and earnings surprise characteristics over the 20 quarters following the measurement of the growth/value characteristics. For example, growth/value characteristics measured using data from the fourth quarter of 1989 are related to stock returns and earnings surprises for each of the subsequent 20 quarters (i.e., the first quarter of 1990 through the fourth quarter of 1994).

We measure growth/value characteristics in a similar manner to previous research. We focus on the market-to-book ratio, since this variable has received the most attention in previous research. We measure market-to-book (MB) as the market value of outstanding shares at the end of the quarter divided by book value of common equity at the end of the quarter. We also report results using the price-to-trailing earnings ratio (PE) and the I/B/E/S median analyst forecast of long-term earnings growth.

We measure the earnings surprise for a quarter by subtracting the median forecast of quarterly EPS from realized quarterly EPS. We then create three indicator variables, which we label SURPRISE, GOOD and BAD. SURPRISE takes on the value of  $-1$  if the earnings surprise is negative,  $0$  if the earnings surprise is  $0$ , and  $1$  if the earnings surprise is positive. GOOD takes on the value of  $1$  if the earnings surprise is positive and zero otherwise. BAD takes on the value of  $1$  if the earnings surprise is negative and zero otherwise. Finally, we create a continuous variable that captures both the sign and magnitude of the forecast error, which we label FE. FE is the earnings surprise divided by the stock price at the end of the final month of the fiscal quarter for which earnings is being forecast. We winsorize the 1% tails of this variable to mitigate problems with outliers.

Throughout the paper we compute stock returns as buy-hold with-dividend stock returns. We then compute abnormal returns by subtracting the return over the corresponding period on a size-matched portfolio.<sup>5</sup> The size-matched portfolio is constructed by allocating all firm-quarter observations in our sample to decile portfolios on the basis of market capitalization at the beginning of the quarter. An equal-weighted portfolio return is computed for each size portfolio in each quarter. Raw buy-hold returns

for individual securities are then adjusted by subtracting the return on the portfolio to which the security belongs based on its market capitalization at the beginning of the quarter. Our objective is to examine stock return behavior over the 20 quarters following the measurement of the growth/value characteristics and to relate the returns to the earnings surprises reported in each of these 20 quarters. To this end, we cumulate abnormal returns over four different intervals for each quarter. These intervals are illustrated in figure 3.

The first abnormal return measurement interval begins two days after the announcement of earnings for the previous quarter and ends the day after the announcement of earnings for current quarter. Quarterly earnings announcement dates are obtained from COMPUSTAT. We refer to the quarterly return measured over this interval as ‘fullret’. This interval averages 63 trading days in length. We next divide this interval into two sub-intervals, the later of which is designed to capture earnings-related announcements. The first interval begins two days after the announcement of earnings for the prior quarter and ends thirteen trading days prior to the end of the current fiscal quarter. The second interval begins twelve trading days prior to the end of the current fiscal quarter and ends the day after the announcement of earnings for the current quarter. Evidence in Skinner (1997) and Soffer et al. (1999) indicates that over 75% of all earnings preannouncements occur within two weeks of the fiscal quarter end. Hence, we expect all but a small portion of earning surprises to be announced during this latter period. Also, the two intervals each average 31 trading days in length, so return comparisons across the two intervals are simplified. We refer to the stock returns cumulated over the former interval as ‘preret’ and over the latter interval as ‘postret’.

Finally, we measure stock returns around the quarterly earnings announcement date, which we define as the three-day period beginning one day prior to the earnings announcement date and ending on the day after the announcement date. We use this return measurement interval for comparisons with prior research that also uses this interval (e.g., Laporta et al. (1997) and Bernard et al. (1997)). Recall that we expect this interval to miss much of the response to negative earnings surprises since most adverse earnings news tends to be preannounced. We refer to the return measured over this interval as ‘aret’.

### **III. Empirical Results**

We begin by reporting descriptive evidence on each of our predictions. We next provide formal statistical tests of our predictions using regression analysis. Finally, we conduct robustness tests using alternative measures to classify firms as ‘growth’ or ‘glamour’ stocks.

#### *A. Descriptive Evidence*

Table I provides descriptive evidence on the relation between the MB effect and earnings surprises. This table stratifies our sample of firm-quarter observations into quintiles based on the MB ratio and then divides each quintile into three categories based on the sign of the earnings surprise. Each of the resulting 15 cells in table I reports the mean quarterly abnormal stock returns (fullret). Each cell also reports the number of observations falling into that cell and the proportion of each row’s total number of

observations falling into that cell. The column at the far right and the row at the bottom of the table report the grand averages across the earnings surprise portfolios and the growth portfolios respectively.

Focusing first on the rightmost column, we see clear evidence of the previously documented MB effect in returns. The average abnormal return declines monotonically from 0.66% for the low growth quintile to -0.58% for the high growth quintile. This represents a 1.24% quarterly differential, which translates into a 5.05% compound annual return differential. This return differential is somewhat smaller than the 8-10% differential reported in previous research, such as LSV. However, their research design is based on decile portfolios, and is not restricted to firms for which analysts' forecasts are available. Moving to the bottom row, we see the well-documented return differential between firms reporting negative versus positive earnings surprises. The average quarterly abnormal return for firms reporting negative surprises is -5.04%, while the corresponding return for positive surprises is 5.50%. Firms reporting a zero surprise report a positive return of 1.63%. This latter result reflects the fact that firms are more likely to report a negative surprise (47.8%) than a positive surprise (40.2%) so that a zero surprise for the remaining firms (12.0%) is actually a better than expected outcome. The fact that there are more positive surprises than negative surprises overall reflects the well-known average over-optimism in sell-side analysts' earnings forecasts.

Table I provides descriptive evidence on our first two predictions. Recall from Figure 2 (b) that these predictions require that all of the MB return differential is concentrated in the negative earnings surprise portfolios. The evidence in Table I shows this to be the case. The mean abnormal returns for the zero and positive surprise



portfolios show no systematic trend as a function of growth. If anything, the high growth portfolio returns actually seem to be slightly higher than the low growth portfolio returns, opposite to what is necessary to explain the overall value vs. growth effect. However, the negative surprise portfolios tell a different story. The mean abnormal returns decline monotonically across growth portfolios from a high of  $-3.57\%$  for portfolio 1 to a low of  $-7.32\%$  for portfolio 5. The pattern of returns clearly coincides with the asymmetric response to negative surprises depicted in figure 2 (b), rather than with the unrelated effects depicted in figure 2 (a). This pattern indicates that the predictable lower returns for high MB firms are realized when these firms subsequently report negative earnings surprises.

There is one problem with our comparisons between the predicted results depicted in figure 2 (b) and the results that we report in table I. Figure 2 (b) holds the proportion of securities in the positive and negative surprise portfolios at 50% each. However, in table I, the relative proportions are not constant. Table I includes the 'Zero' portfolio, and the proportion of firms that fall into the 'Zero' portfolio increases as we move up the growth portfolios. The reason for the changing proportions is not clear. One possibility is that managers of growth firms try harder to manage earnings to meet analysts' expectations, perhaps because they are aware of the large stock price penalty that could result if they miss and report a negative surprise.<sup>6</sup> Another possibility is that growth firms have lower EPS numbers, and since EPS is rounded to the nearest penny, these firms are less likely to 'miss' forecast earnings by a small amount.<sup>7</sup> Because the proportion of firms in the positive and negative surprise portfolios is lower for the higher growth portfolios, it could be argued that the associated abnormal stock returns should be

more extreme to reflect the lower likelihood of these events. To address this problem, we construct an equal-weighted version of table I in table II. Table II is constructed by assigning to each of the observations in the zero surprise portfolios its average portfolio return and then allocating these observations to the corresponding negative and positive surprise portfolios in such a way as to equalize the number of securities in these portfolios. In short, we use information about the subsequent earnings surprise to allocate securities in equal numbers to a portfolio consisting of relatively ‘bad news’ surprises and a portfolio consisting of relatively ‘good news’ surprises. By constructing the portfolios in this manner we can more clearly see how growth affects the stock price response to positive and negative earnings news. Given the 50/50 split, we know that for overall abnormal returns to be mean zero, the mean returns to positive and negative earnings news must be the same in absolute value (as we see in the bottom row of table II).<sup>8</sup>

The results in table II are consistent with the pattern in figure 2 (b). The returns for each of the positive surprise portfolios fluctuate within a small range around the mean return of 4.75%, but show no systematic relation to growth. In contrast, the results for the negative surprise portfolios exhibit a systematic decline across growth portfolios, declining monotonically from –3.57% for portfolio 1 to –6.26% for portfolio 5. The results in table II thus reinforce the idea that the MB return differential is entirely attributable to stocks reporting subsequent ‘Bad News’ earnings surprises. In summary, the results in tables I and II provide descriptive evidence in support of our first and second predictions. In support of our first prediction, there is clear evidence of an asymmetrically large negative reaction to earnings disappointments for high growth

firms. In support of our second prediction, there is no evidence of a MB effect in the zero or positive earnings surprise portfolios, indicating that the MB effect is entirely concentrated in firms reporting subsequent negative earnings surprises.

Our third prediction is that the asymmetric returns to growth and value are concentrated around the release of earnings news. Figure 4 provides descriptive evidence on this prediction. Figure 4 plots the returns to a hedge portfolio that takes a long position in a portfolio of low MB stocks and an offsetting short position in a portfolio of high MB stocks. We assign stocks to quintiles based on MB at the end of each quarter and then track the mean stock returns for each quintile over the subsequent five years. The hedge portfolio returns are computed by subtracting the highest quintile mean returns from the lowest quintile mean returns. To distinguish between the stock price movements attributable to earnings news versus other factors, such as risk, we divide each of the annual returns into two components. The first component represents the cumulative abnormal return over the four quarterly ‘preret’ return periods. Recall that the ‘preret’ return period begins two days after the announcement of last quarter’s earnings and ends 13 days before the end of the fiscal quarter. This return measurement interval is designed to avoid the release of earnings news, including earnings preannouncements. The second component represents the cumulative abnormal return over the four quarterly ‘postret’ return periods. This return measurement interval begins 12 days before the end of the quarter and ends on the day after the earnings announcement and is designed to capture the release of earnings news, including any preannouncements. Thus, our third prediction is that the returns to the MB hedge portfolio will be concentrated in the ‘postret’ period.

Consistent with previous research, such as FF and LSV, figure 4 demonstrates that our MB hedge portfolio yields systematic positive returns. The cumulative five-year return is just below 20%. This return differential is somewhat smaller than that documented in previous research for three reasons. First, we use quintiles rather than deciles, so differences between the extreme portfolios are smaller. Second, by restricting the sample to the larger, more closely followed stocks in I/B/E/S, we restrict attention to stocks for which these types of strategies are typically less profitable.<sup>9</sup> Third, our sample period is concentrated in the 1980s and 1990s, where the MB effect is somewhat weaker than in the 1960s and 1970s. The unique feature of figure 4 that is important for our study is that the return differential is clearly concentrated in the second half of each year (postret) as we see from the steeper slope in that interval. Recall that we have constructed the ‘postret’ return measurement interval to capture the release of earnings-related news. Figure 4 provides clear evidence that the MB return differential is concentrated around the release of earnings news. In fact, returns during the first half of the year (preret) account for less than 20% of the total predictable returns to the MB hedge portfolio.

Finally, to vividly illustrate the asymmetric response of returns to earnings news for growth stocks, figure 5 plots quarterly abnormal returns (fullret) against earnings surprises (FE) separately for growth and value stocks.<sup>10</sup> Figure 5 clearly shows how the relation between stock returns and earnings surprises differs between growth and value stocks. For value stocks the relation is fairly symmetric – for both positive and negative surprises the return/earnings relation looks similar, with returns increasing in the magnitude of the earnings surprise to a maximum of a little over 5% in absolute value for

both good and bad news.<sup>11</sup> In contrast, for growth stocks we see a very different response to positive and negative surprises. When earnings news is positive, returns climb steeply over a small range of forecast error, to a maximum a little over 10% (thus even when the news is good, the reaction is stronger for growth stocks). However, when firms miss their forecasts the effect is dramatic. For even small forecast errors (of less than 0.5% of stock price) the stock price reaction declines rapidly into the -10% to -15% range, and continues to increase more slowly beyond this, into the -15% to -20% range. The sharp drop is the earnings “torpedo” – the fact that firms miss analysts’ forecasts, even by small amounts, causes disproportionately large stock price declines. It is the fact of the missed forecast, rather than its magnitude, that seems to “matter” to investors. Another aspect of our results that is clear from figure 5 is the fact that when earnings news is positive, growth stocks outperform value stocks, but that when growth stocks disappoint, they underperform value stocks by substantially more than they outperform when the news is good. As our regressions show, it is this large differential reaction to bad news that accounts for the overall underperformance of growth stocks. We turn to these regressions next.

### *B. Regression Analysis*

In this section, we provide statistical tests of our predictions using regression analysis. We begin in table III by regressing stock returns on growth portfolio membership and both the sign of the earnings surprise and the magnitude of the earnings surprise. We further allow for a growth variable interaction with each of these explanatory variables. The purpose of these regressions is to demonstrate that the negative relation between growth and future stock returns (the MB effect) is robust to the

inclusion of various earnings surprise metrics including those that control for the magnitude of the earnings surprise. However, these regressions do not allow for an asymmetric response to negative earnings surprises. In table IV, we allow for an asymmetric response to negative earnings surprises using the following regression model:

$$R_{it\tau} = \alpha + \beta_1.Growth_{it} + \beta_2.Good_{it\tau} + \beta_3.Bad_{it\tau} + \beta_4.(Good_{it\tau}*Growth_{it}) + \beta_5.(Bad_{it\tau}*Growth_{it}) + \varepsilon_{it\tau} \quad (1)$$

where

$i$  indexes firms,  $t$  indexes calendar quarters in which growth portfolio assignments are made, and  $\tau$  indexes the 20 subsequent quarters over which we track returns and earnings surprises for each growth (firm-quarter) observation;

$Growth_{it}$  = growth quintile to which firm  $i$  is assigned in quarter  $t$  (0 = low growth quintile, ... 4 = high growth quintile);

$R_{it\tau}$  = The announcement-to-announcement (fullret) abnormal stock return for firm  $i$  in quarter  $t+\tau$ ;

$Good_{it\tau}$  = indicator variable taking the value of 1 if the firm-quarter observation reports a positive earnings surprise in quarter  $t+\tau$  and 0 otherwise;

$Bad_{it\tau}$  = indicator variable taking the value of 1 if the firm-quarter observation reports a negative earnings surprise in quarter  $t+\tau$  and 0 otherwise.

As an alternative specification, we also estimate regressions of the following form, and report these results in table V:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot \text{Good}_{it\tau} + \beta_3 \cdot \text{Bad}_{it\tau} + \beta_4 \cdot \text{FE}_{it\tau} + \beta_5 \cdot (\text{Good}_{it\tau} * \text{Growth}_{it} * \text{FE}_{it\tau}) + \beta_5 \cdot (\text{Bad}_{it\tau} * \text{Growth}_{it} * \text{FE}_{it\tau}) + \varepsilon_{it\tau} \quad (2)$$

where all variables are as defined above and  $\text{FE}_{it\tau}$  is the forecast error defined as realized EPS for firm  $i$  in quarter  $t+\tau$  minus the corresponding consensus analyst forecast of EPS, deflated by the firm's stock price at the end of fiscal quarter  $t+\tau$ .

This specification allows for a differential (good vs. bad) stock price response *per unit of earnings surprise* across growth quintiles, and so allows for an asymmetric response that is a function of the magnitude of the forecast error. Specification (2) is thus the appropriate specification if investors react asymmetrically to both the sign and the magnitude of negative earnings surprises in growth stocks, while (1) is more appropriate if (as we hypothesize) the asymmetric reaction is a function of the sign, but not the magnitude, of the surprise. We find that specification (1) explains the value vs. growth phenomenon better than (2), consistent with the idea that missing analysts' forecasts by even small amounts results in large stock price declines for growth stocks.

We also estimate specification (1) using alternative return measurement intervals in the dependent variable and report these results in table VI. These regressions illustrate that the MB effect and its relation to earnings surprises is concentrated in the 'postret' return measurement interval, when most earnings news is released.

Our basic sample consists of approximately 103,000 firm-quarters, giving us potentially 2.06 million regression observations as we track each firm-quarter over the subsequent 20 quarters. The actual ‘full’ sample is on the order of 1.4 million observations, primarily because we lose firm-quarters at the end of our sample period as we move forward through the 20 quarters, and because of missing earnings announcement dates. We conduct our regression results both at the annual level, where we include each of the four firm-quarters from each of the five subsequent years, and at the entire sample level, where we include all 20 firm-quarters.

Turning to the regression results in table III, we first estimate a simple regression of return on growth. As expected based on previous research, growth loads with a significantly negative coefficient in each of the five years. The coefficients have a simple interpretation in this regression. The intercept provides an estimate of the expected quarterly abnormal return for the low growth quintile, and the coefficient on growth provides an estimate of the expected quarterly abnormal return differential between adjacent growth quintiles. Focusing on the ‘All 20 Quarters’ regression, the intercept is 0.0065 ( $t = 23.97$ ) and the coefficient on growth is  $-0.0032$  ( $t = -23.63$ ). These coefficients indicate an annual abnormal return to the lowest growth quintile of 2.6% ( $4 \times .65\%$ ) and an annual abnormal return to the highest growth quintile of  $-2.5\%$  ( $\{4 \times [0.65\% - 4 \times 0.32\%]\}$ ) for an annual average differential of 5.1%.

The next regression includes growth, surprise (defined earlier as a  $+1/0/-1$  indicator variable reflecting the sign of the earnings surprise), and a  $\text{surprise} \times \text{growth}$  interaction. This regression allows the sensitivity of abnormal returns to earnings surprises to vary as a function of the growth quintile to which the stock belongs. The



coefficient on growth remains negative and statistically significant in all regressions. As expected, the coefficient on surprise is consistently positive and highly statistically significant, indicating that stock returns are correlated with the sign of earnings surprises. In addition, the coefficient on the surprise\*growth interaction is consistently positive and statistically significant, indicating that the stock returns of high growth firms are more responsive to earnings surprises than those of low growth firms. The final regression in table III also includes the earnings forecast error (defined earlier) and a forecast error\*growth interaction. Surprise, forecast error, and their respective growth interactions all load with positive coefficients, indicating that stock returns respond to both the sign and the magnitude of forecast errors, and that these responses are increasing in growth. Nevertheless, even after controlling for all of these effects (which substantially increase the explanatory power of the regressions), the coefficient on the growth main-effect variable remains reliably negative. Thus, none of the regressions in table III explain the value vs. growth phenomenon. However, none of these regressions allow for an asymmetric response to good and bad news earnings surprises.

We now move on to table IV, which estimates the regression specification in (1) that allows for an asymmetric response to good and bad news earnings surprises. In this specification, the intercept measures the expected abnormal quarterly return on a low growth, zero earnings surprise observation. The coefficient on growth measures the return differential on zero earnings surprise observations in adjacent growth quintiles. The coefficients on the good (bad) indicator variables measure the incremental return for a low growth observation reporting a positive (negative) earnings surprise. Finally, the coefficient on the good\*growth (bad\*growth) interaction measures the return differential

on positive (negative) earnings surprise observations in adjacent growth quintiles. If the MB effect is independent of earnings surprises (as depicted in figure 2 (a)), then we should observe significantly negative coefficients on growth, good\*growth, and bad\*growth – i.e., the effect should manifest itself regardless of the sign of the earnings surprise. However, if the MB effect is concentrated in firms reporting negative earnings surprises (as depicted in figure 2 (b)), then we should only see significantly negative coefficients on bad\*growth.

Consistent with our predictions, the results in table IV demonstrate that the MB effect is concentrated in negative earnings surprise observations. None of the coefficients on growth or good\*growth are negative, and some are significantly positive. To the extent these coefficients are zero or positive, these results indicate that there is either no differential performance between value and growth stocks or that growth stocks outperform value stocks in those states of the world where earnings news is neutral or positive. Thus, the fact that we know that value outperforms growth in these data cannot be explained by the no news or good news observations. In contrast, the coefficients on bad\*growth are consistently negative and highly statistically significant, indicating that (consistent with figure 2 (b)) the stock price response to bad news is much more pronounced for growth stocks. Thus, it must be that the return differential is embedded in this set of observations. We also test statistically whether the absolute value of the coefficients on bad\*growth are larger than those on good\*growth. If the response to earnings surprises were symmetric within growth quintiles, these two coefficients would sum to zero. Table IV reports an F-statistic to test the restriction that they sum to zero, and the null is uniformly rejected at very small probability levels. Thus, the results in

table IV provide clear evidence of an asymmetrically large response to negative earnings surprises in high growth firms.

Table V next presents the results of the alternative specification in (2), which expands the table IV specification to include the magnitude of the forecast error (FE) in the asymmetric growth interaction. Specification (2) does not perform as well as specification (1) in explaining the asymmetric response of the value vs. growth phenomenon. In particular, the coefficient on growth remains reliably negative in several of the table V regressions, including the overall results. In contrast, this coefficient is never negative (and is sometimes significantly positive) in table IV. In addition, the asymmetric reaction to bad news for growth stocks is much more clearly evident in table IV than in table V. In table IV, the coefficient on bad\*growth is consistently four to five times larger than that on good\*growth, while in table V the analogous coefficient for bad news is only one to two times as large as that on good news. Overall, these results indicate that it is the simple fact of an earnings disappointment that matters for investors in growth stocks, rather than its magnitude.

One final point, of particular current relevance, can be made here. The fact that some of the coefficients on growth and growth\*good are positive indicates that, once we control for the large, asymmetric response of growth stocks to bad news, 'growth' sometimes outperforms 'value;' i.e., when earnings news is neutral or positive (see also figure 5). Thus, the fact that growth stocks have generally outperformed value stocks during 1997 and 1998 is not inconsistent with our results or predictions. Instead, this reflects the fact that strong economic fundamentals have led to unusually strong overall earnings performance, so that the last two years have seen relatively few negative

earnings surprises – those states of the world in which growth stocks underperform have been relatively uncommon. Nevertheless, as our example illustrates, when growth firms do report adverse earnings surprises the effects are dramatic.

To test our third prediction, Table VI reports a subset of the regressions in tables III and IV using alternative return measurement intervals for the dependent variable. In the interest of brevity, we only report results for the ‘All 20 Quarters’ sample.<sup>12</sup> The table reports both the simple regression of returns on growth and the full regression specification from table IV that allows for an asymmetric response to earnings surprises. Each regression is first reported using the same ‘fullret’ quarter returns as shown in tables III and IV as a benchmark. We then report each of the regressions using the ‘preret,’ ‘postret,’ and ‘aret’ return measurement intervals. Recall that ‘preret’ spans the first half of the period between formal earnings announcements, when little earnings news is released while ‘postret’ captures the second half of this period, when most earnings news is released. Finally, ‘aret’ captures the three-day announcement window itself, but excludes any preemptive earnings disclosures.

Focusing first on the simple regressions of returns on growth, we find a negative and statistically significant coefficient for all four return measurement periods. However, we also see that the relative magnitudes vary considerably. The coefficient in the ‘fullret’ regression is  $-0.0032$ , versus  $-0.0005$  in the ‘preret’ regression and  $-0.0026$  in the ‘postret’ regression. Thus, over 80% of the overall MB effect is concentrated in the ‘postret’ period, despite the fact that ‘preret’ and ‘postret’ each average 31 days. The coefficient on ‘aret’ is only  $-0.0005$ . Thus, the three-day earnings announcement window captures less than 20% of the total MB effect. This result is broadly consistent

with the findings of Laporta et al. (1997) and Bernard et al. (1997), who also find that only a small portion of the total MB effect is concentrated in the formal earnings announcement period. Overall, these results confirm that the MB effect is concentrated in the 31 days leading up to earnings announcements, but that only a small part of the effect is concentrated in the three-day announcement window. This is consistent with much of the MB effect being driven by preemptive earnings disclosures, and in particular with the tendency for managers of growth firms to preannounce adverse earnings news.

The second set of regressions in table VI investigate how the asymmetric response of growth stocks to negative earnings surprises varies across the different return measurement intervals. The first regression uses the ‘fullret’ return measurement interval, and confirms our previous (table IV) finding that the MB effect is concentrated in growth firms that report negative earnings surprises. The regressions using ‘preret’ and ‘postret’ generally confirm this finding although the results are much stronger in the ‘postret’ returns. In both regressions, the coefficients on growth and good\*growth are non-negative while those on bad\*growth are again relatively large in magnitude and strongly significant. Note, however, that the R-squared of the ‘postret’ regression is almost four times as large as in the ‘preret’ regression, consistent with most of the earnings-related variation in returns occurring during the ‘postret’ period (the R-squareds are 6.3% and 1.7%, respectively). Finally, the results for the regression using ‘aret’ are somewhat different. In this regression, there is no evidence of an asymmetrically large reaction to negative earnings surprises for growth firms (although the coefficient on bad\*growth is still reliably negative), and the coefficient on growth is significantly negative, though relatively small. When combined with the strongly significant results

for the ‘postret’ period (which includes ‘aret’), these results suggest that most adverse earnings news, especially for growth stocks, is anticipated by investors, so that the accompanying stock price reactions generally occur before the earnings announcement period. These results are consistent with Soffer et al.’s (1999) findings that earnings preannouncements tend to be made by growth firms that are disclosing bad news. Thus, most significant bad news is released prior to the earnings announcement date and is not reflected in ‘aret’.

### *C. Alternative Measures of Growth*

All tests conducted thus far have used the MB ratio as a measure of ‘growth’ or ‘glamour’. Prior research identifies a number of alternative measures of ‘growth’ or ‘glamour’ that also have predictive ability with respect to future stock returns. Two of the most frequently encountered growth proxies are price-to-earnings ratios (LSV) and analysts’ forecast of long-term earnings growth [Dechow and Sloan (1997), LaPorta (1996)]. In table VII, we provide our basic regression analysis using these alternative measures of growth to demonstrate that our results are not sensitive to the particular measure of growth that is employed. We measure the price-to-earnings ratio as the ratio of stock price to most recent annual EPS at the end of each fiscal quarter. We measure long-term growth using the median forecast of long-term growth provided by I/B/E/S in the last month of the fiscal quarter. We then examine (as before) the relation between stock returns, growth portfolio membership, and earnings surprises over the subsequent 20 quarters.

Table VII reports remarkably similar results across all measures of growth. The first two rows of Table VII first presents our original results for the MB ratio for benchmarking purposes, and then presents results for the price-to-earnings ratio (PE) and analyst forecasts of long-term-growth (LTG). In all three cases, a simple regression of quarterly abnormal returns on growth yield a significantly negative coefficient of similar magnitude, ranging from  $-0.0026$  for PE to  $-0.0033$  for LTG. These coefficients translate to annual return differentials between the lowest and highest growth quintiles of 4.16% and 5.12% respectively. When we allow for an asymmetric response to negative earnings surprises, the negative coefficient on growth disappears for all three measures, the coefficients on good\*growth are all reliably positive, and the coefficients on bad\*growth are all reliably negative and significantly larger in absolute value than those on good\*growth. These results provide strong evidence of a large asymmetric response to negative earnings surprises for growth firms and confirm that all of the MB, PE and LTG return differentials are realized in firm quarters when negative earnings surprises are released.

#### **IV. Conclusion**

We demonstrate that growth stocks exhibit an asymmetrically large response to negative earnings surprises. We further show that this asymmetric response to negative earnings surprises completely explains the return differential between ‘growth’ and ‘value’ stocks. Another way of stating this result is that the lower returns of growth stocks relative to value stocks all relate to the realized returns in quarters when negative

earnings surprises are announced. Growth stocks perform at least as well as value stocks in quarters when zero earnings surprises or positive earnings surprises are announced. We further show that the inferior performance of growth stocks is concentrated in the 31 days leading up to quarterly earnings announcements, when most earnings-related news is released. However, we find that relatively little of the return differential is observed at the formal earnings announcement date, which we suspect is because growth firms tend to preannounce negative earnings surprises (Skinner, 1997; Soffer et al., 1999).

Our results have important implications for the explanation of the return differential to growth stocks. LSV argue that the return differential arises because investors initially have overly optimistic expectations about the future earnings' prospects of growth stocks, leading to subsequent price declines when these expectations are not met. Our evidence is directly consistent with LSV's argument – we show that these price declines are sudden and occur during relatively short periods of time when adverse earnings news is released, confirming that this is an earnings-related phenomenon.<sup>13</sup> Alternatively, others, such as FF, argue that the lower returns to growth stocks reflect the fact that these stocks are less risky on some dimension that has not been identified by academics, but that is priced by investors. Our findings make this argument less plausible, and put the onus on proponents of this view to explain why the risk premium to value investors is only realized in those states of the world where negative earnings surprises are experienced.

Our evidence also has implications for managers' financial reporting and disclosure strategies. If managers of growth firms are aware that their firms' stock prices will suffer large downward adjustments when they report earnings disappointments, they



have incentives to manage reported earnings and/or manage analysts' expectations of reported earnings to avoid negative earnings surprises. For example, managers may decide to 'smooth' earnings over a long period of time to make their earnings more easily predictable for analysts and avoid the likelihood of future earnings shortfalls.<sup>14</sup> A number of recent studies document evidence of earnings and expectations management for capital market reasons. Rangan (1998) and Teoh, Welch, and Wong (1998) find that firms manage earnings upward around the time that they issue new equity. Brown (1998), Burgstahler and Eames (1998), and Dechow, Patel, and Zeckhauser (1999) all report evidence consistent with the idea that managers manage both reported earnings and analysts' expectations of earnings to avoid negative surprises, and Brown finds that this result is especially pronounced for growth stocks. Myers and Skinner (1999) find that there are many more firms with long strings of consecutive increases in quarterly earnings than would be expected by chance and report some evidence that managers of these firms practice income smoothing to help achieve this result. Finally, Matsumoto (1998) provides evidence that growth firms try to manage analysts' earnings expectations to avoid reporting negative earnings surprises. The evidence provided in this paper provides a framework for understanding why managers engage in such behavior.

## Footnotes

<sup>1</sup> On December 8, 1997 Oracle Corp. reported second quarter EPS of 19 cents, *up* 4% from year-earlier levels, but four cents below consensus analyst forecasts. As a result of this announcement, Oracle stock dropped 29% in one day on volume of 171 million shares (28 times normal and a record for any stock trading over \$1) and lost about \$9 billion in market value. Prior to the disclosure, Oracle's was trading at a price 45 times earnings, consistent with investors having high expectations of future earnings growth. See The Wall Street Journal, December 10, 1997, at A1.

<sup>2</sup> See, for example, "Watch Out for Those Terrible Torpedo Stocks", The Financial Post, June 27, 1991, p. 11.

<sup>3</sup> For example, Soffer et al. (1999) report that 67% of the preannouncements in their sample convey adverse earnings news.

<sup>4</sup> Skinner (1997) provides evidence consistent with the idea that earlier disclosure of adverse earnings news reduces expected litigation costs. However, there are other reasons managers preannounce adverse earnings news more often than other earnings news; for example, to preserve their reputation and credibility with security analysts who follow their firm's stock.

<sup>5</sup> Our results are robust to alternative methods of computing abnormal returns, including a simple market adjustment and a market model adjustment. We explicitly avoid making an adjustment for the MB effect, because our objective is to explain the MB effect.

<sup>6</sup> See Brown (1998) and Degeorge et al. (1999) for evidence that managers manage reported earnings and/or analysts' expectations of earnings to reduce the chances of reporting a negative surprise. In particular, Brown (1998) documents that: (1) the

proportion of firms that exactly meet analyst forecasts (report zero surprises) has increased through time, and (2) this pattern is driven by growth stocks. Our findings in Table I are consistent with these results.

<sup>7</sup> Consistent with this possibility, the mean level of forecast earnings for portfolio 5 is \$0.23, while for portfolio 1 it is \$0.32.

<sup>8</sup> In other words, we control for the fact that the relative frequency of the different types of earnings news varies as a function of growth, which makes the table I comparisons difficult to interpret.

<sup>9</sup> The fact that the use of size-adjusted returns yields almost identical inferences to market-adjusted or market model adjusted returns in our tests supports this explanation.

<sup>10</sup> More specifically, to create the plot for ‘value’ and ‘growth’ we take the bottom and top growth quintiles (as before) respectively and within each of these form 20 portfolios by ranking the observations based on FE. We then plot the mean returns against the mean forecast error for each of these 20 portfolios and join these points using the Excel smooth line charting feature.

<sup>11</sup> The non-linear, S-shaped relation between earnings and returns is noted by Freeman and Tse (1992), as well as others since then.

<sup>12</sup> The results display a consistent pattern during each of the five component years.

<sup>13</sup> Our evidence may also shed light on recent psychological explanations for anomalous stock market behavior, such as those offered by Daniel, Hirshleifer, and Subrahmanyam (1998) or Barberis, Shleifer, and Vishny (1998). For example, Barberis et al. (1998) argue that stock prices overreact to consistent patterns of good or bad news. This is consistent with the notion that growth stocks gradually become overpriced as investors

observe a series of consistently good earnings reports, but then “fall to earth” when those stocks report earnings disappointments and investors realize their expectations were overly optimistic.

<sup>14</sup> Of course, this begs the question of what costs or frictions are in place that allow these strategies to “work” in an efficient capital markets setting. We do not attempt to answer this question, but view our work as documenting another part of this empirical phenomenon.

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**Figure 1**

Summary financial statistics on two negative earnings surprises announced by growth firms.

	<b>Oracle December 9, 1997</b>	<b>Rainforest Café January 5, 1998</b>
<b>MB ratio</b>	12	4
<b>PE ratio</b>	45	55
<b>Forecast Earnings</b>	\$0.23	\$0.25
<b>Announced Earnings</b>	\$0.19	range of \$0.23-\$0.24
<b>Year Ago Earnings</b>	\$0.18	\$0.15
<b>Announcement Day Stock Return</b>	-29%	-40%
<b>Type of Announcement</b>	scheduled earnings announcement	earnings pre- announcement

**Figure 2**

Illustration of alternative hypothetical abnormal return combinations for portfolios of value and growth stocks over subsequent quarters, stratified by the nature of the subsequent quarterly earnings surprises. The numbers in parentheses represent the hypothetical relative frequencies with which stocks enter a cell.

**(a) Unrelated:**

The return differential between value and growth stocks is the same regardless of the subsequent earnings surprise

Stock Type	Earnings Surprise		
	Negative	Positive	All
Value	-4% (25%)	6% (25%)	1% (50%)
Growth	-6% (25%)	4% (25%)	-1% (50%)
All	-5% (50%)	5% (50%)	0% (100%)

**(b) Asymmetric response to negative surprises:**

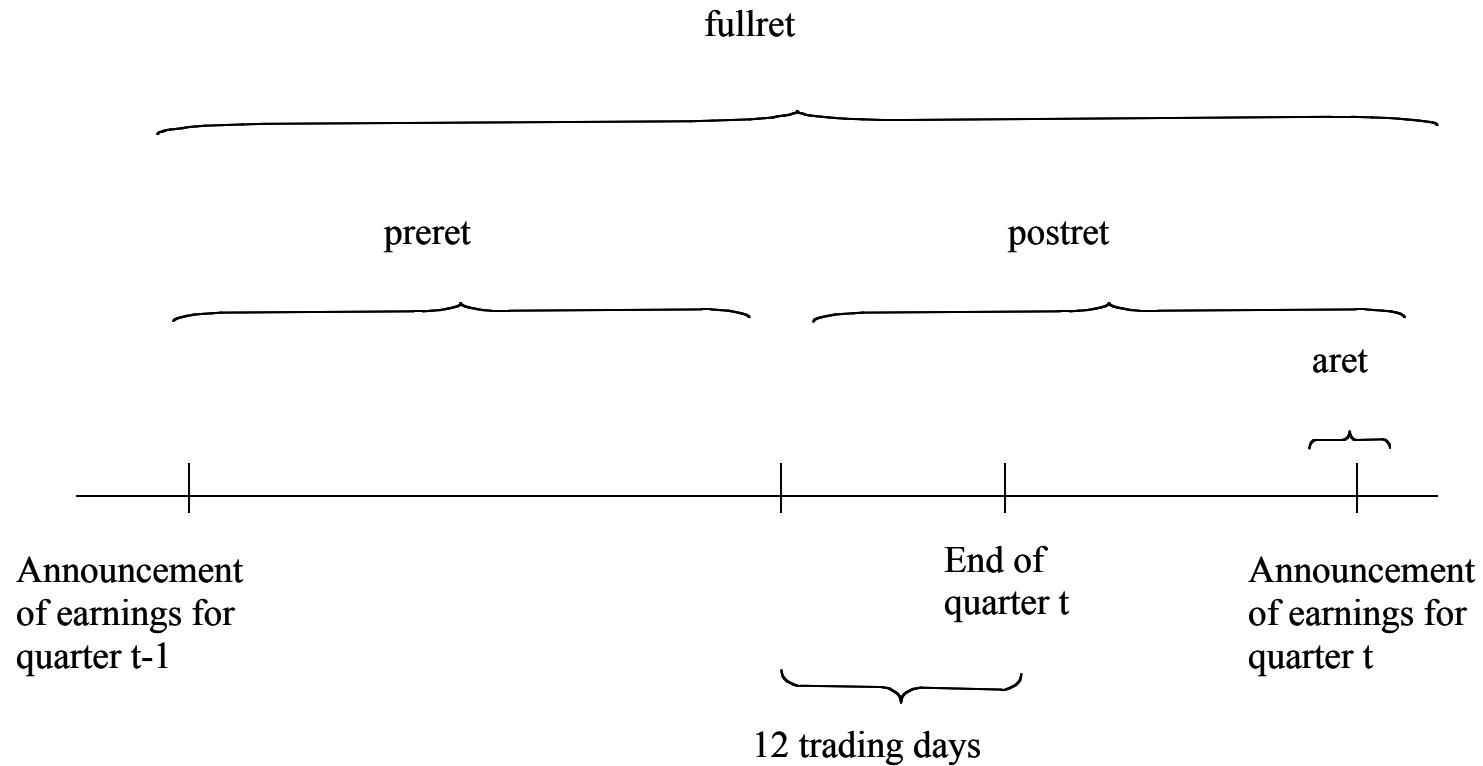
The return differential between value and growth stocks is all concentrated in subsequent negative earnings surprise quarters

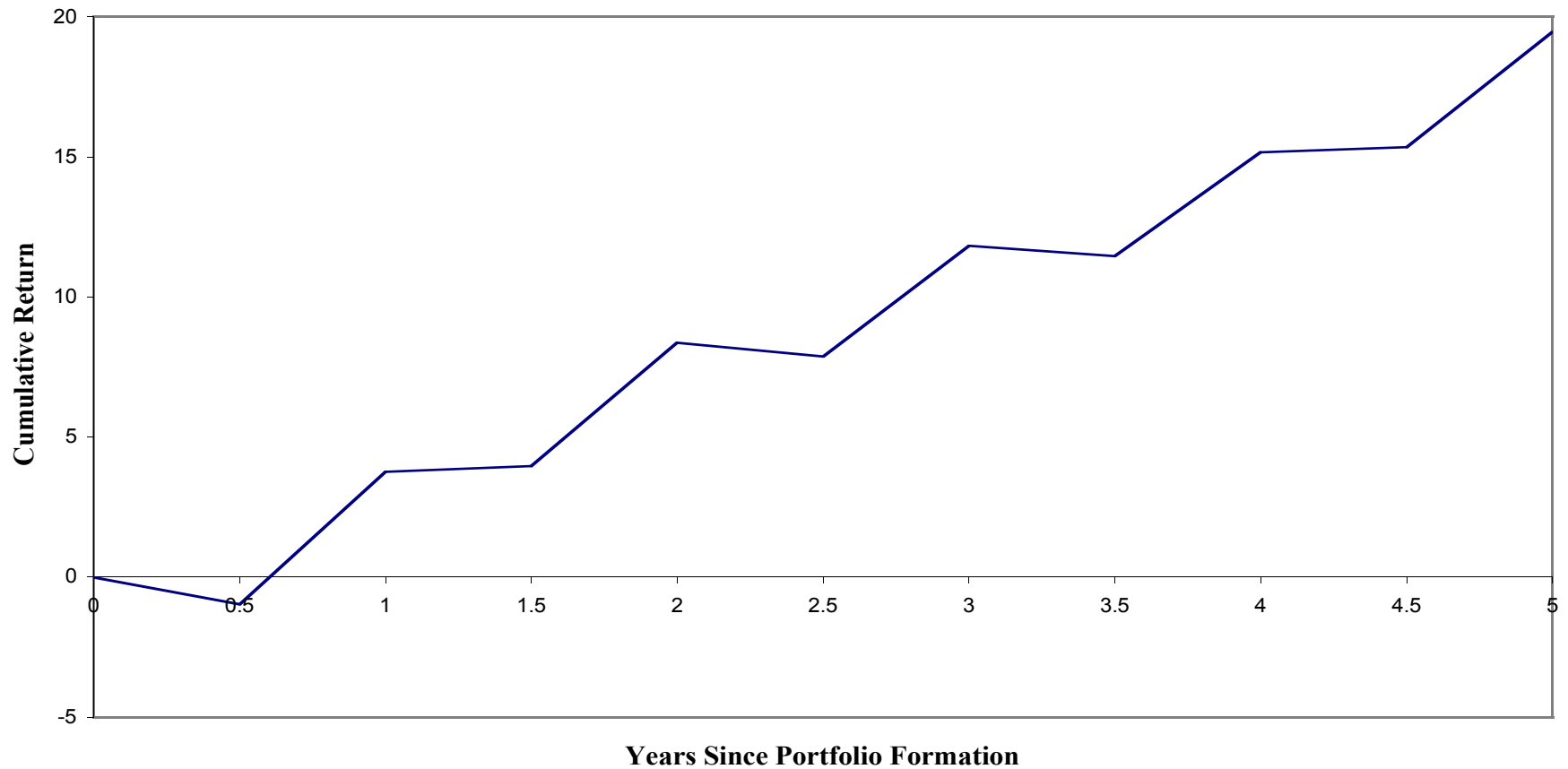
Stock Type	Earnings Surprise		
	Negative	Positive	All
Value	-3% (25%)	5% (25%)	1% (50%)
Growth	-7% (25%)	5% (25%)	-1% (50%)
All	-5% (50%)	5% (50%)	0% (100%)



**Figure 3**

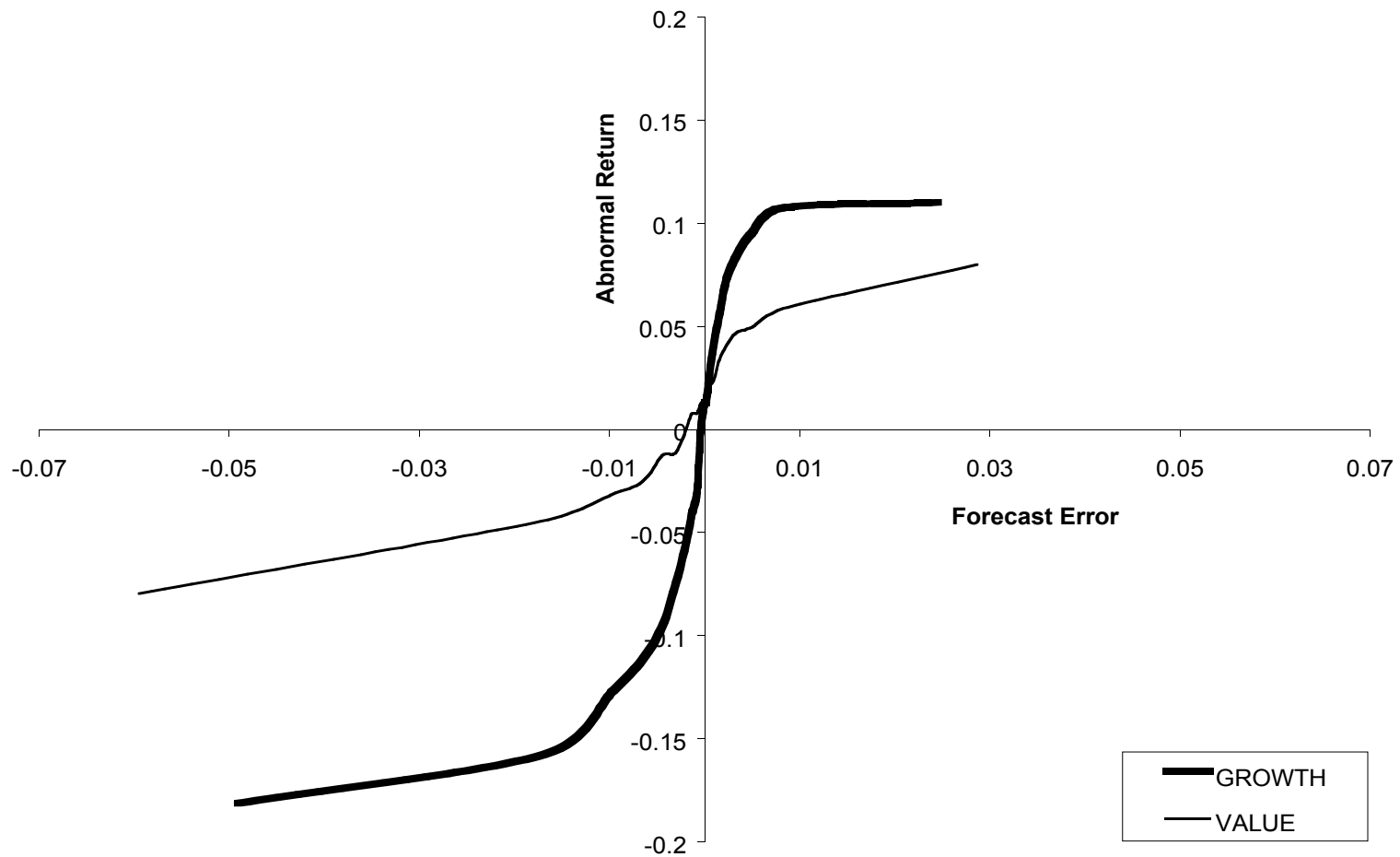
Illustration of the alternative intervals over which the abnormal stock return relating to the announcement of earnings for quarter t is measured.





**Figure 4**

Cumulative average abnormal return for a MB (market-to-book) hedge portfolio over the five years following portfolio formation. The hedge portfolio consists of a long position in the lowest quintile of MB stocks and a short position in the highest quintile of MB stocks for each of the firm-quarters in our sample. Returns for the first half of each year are cumulated over the four quarterly ‘Preret’ periods during which very little earnings information is typically released. Returns for the second half of each year are cumulated over the four quarterly ‘Postret’ periods, during which most earnings information is typically released.



**Figure 5**

Earnings surprise response functions for value and growth stocks. This graph plots the quarterly abnormal returns for value and growth stocks respectively as a function of the magnitude of the quarterly earnings forecast error. Each plot is formed by dividing the stocks into 20 portfolios based on the magnitude of the forecast error, and then plotting the mean portfolio abnormal returns and forecast errors. The resulting points are joined using smoothed lines.

**Table I**  
**Mean Quarterly Abnormal Stock Returns Over the Subsequent Twenty Quarters**  
**for Portfolios of Stocks formed on Growth and the Sign (Positive, Negative, or Zero)**  
**of the Subsequent Quarterly Earnings Surprise.**

Growth is measured using the MB ratio (low MB = low growth, high MB = high growth). Stock returns are cumulated over the period beginning two days following the announcement of earnings for the previous quarter and ending on the day following the announcement of earnings for the current quarter (Fullret). Each cell reports the mean abnormal portfolio stock return, the number of observations in the portfolio, and the percentage of that row's observations falling into cell. Abnormal returns are computed using a decile-based size adjustment.

<b>Growth Portfolio</b>	<b>Earnings Surprise Portfolio</b>			
	<b>Negative</b>	<b>Zero</b>	<b>Positive</b>	<b>All</b>
<b>1</b> <b>(Low Growth)</b>	-3.57% 138,752 (50.0%)	1.13% 17,143 (6.2%)	5.44% 121,439 (43.8%)	0.66% 277,334 (100%)
<b>2</b>	-3.91% 136,405 (49.0%)	2.01% 23,803 (8.6%)	4.93% 117,842 (42.4%)	0.35% 278,050 (100%)
<b>3</b>	-4.89% 134,089 (48.3%)	1.71% 31,214 (11.3%)	5.29% 112,127 (40.4%)	-0.03% 277,430 (100%)
<b>4</b>	-5.82% 130,977 (47.3%)	1.54% 42,049 (15.2%)	5.65% 104,034 (37.5%)	-0.40% 277,060 (100%)
<b>5</b> <b>(High Growth)</b>	-7.32% 122,099 (44.1%)	1.65% 52,789 (19.1%)	6.32% 102,051 (36.8%)	-0.58% 276,939 (100%)
<b>All Growth Portfolios</b>	-5.04% 662,322 (47.8%)	1.63% 166,998 (12.0%)	5.50% 557,493 (40.2%)	0.00% 1,386,813 (100%)

**Table II**  
**Mean Quarterly Abnormal Stock Returns for the Subsequent Twenty Quarters for**  
**Portfolios of Stocks formed on Growth and the Sign (Positive or Negative) of the**  
**Subsequent Quarterly Earnings Surprise.**

Growth is Measured Using the MB Ratio (low MB = low growth, high MB = high growth). The return on the 'Zero' earnings surprise portfolio is allocated to the 'Bad' and 'Good' earnings surprise portfolios so as to equally weight observations across these two portfolios. Stock returns are cumulated over the period beginning two days following the announcement of earnings for the previous quarter and ending on the day following the announcement of earnings for the current quarter (Fullret). Each cell reports the mean abnormal portfolio stock return, the number of observations in the portfolio, and the percentage of that row's observations falling into cell. Abnormal returns are computed using a decile-based size adjustment.

<b>Growth Portfolio</b>	<b>Earnings Surprise Portfolio</b>		
	<b>Negative</b>	<b>Positive</b>	<b>All</b>
<b>1</b> <b>(Low Growth)</b>	-3.57% 138,667 (50.0%)	4.90% 138,667 (50.0%)	0.66% 277,334 (100%)
<b>2</b>	-3.79% 139,025 (50.0%)	4.49% 139,025 (50.0%)	0.35% 278,050 (100%)
<b>3</b>	-4.66% 138,715 (50.0%)	4.60% 138,715 (50.0%)	-0.03% 277,430 (100%)
<b>4</b>	-5.42% 138,530 (50.0%)	4.62% 138,530 (50.0%)	-0.40% 277,060 (100%)
<b>5</b> <b>(High Growth)</b>	-6.26% 138,470 (50.0%)	5.09% 138,469 (50.0%)	-0.58% 276,939 (100%)
<b>All Growth Portfolios</b>	-4.75% 693,407 (50.0%)	4.75% 693,406 (50.0%)	0.00% 1,386,813 (100%)

**Table III**

**Estimated Coefficients (t-statistics) from Regressions of Quarterly Stock Returns ('Fullret') on 'Growth' Portfolio Membership, the Sign of the Earnings Surprise for that Quarter (defined as -1, 0, or +1), and the Analysts' Forecast Error for the Quarter.**

Growth portfolios are MB quintiles (low MB = quintile 0, high MB = quintile 4). Growth portfolios are formed at the beginning of Year 1, and regressions employ returns and earnings data over the subsequent twenty quarters, reported in annual blocks of four quarters. We estimate regressions of the following form:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot (\text{Surprise}_{it\tau} \cdot \text{Growth}_{it}) + \beta_3 \cdot \text{FE}_{it\tau} + \beta_4 \cdot (\text{FE}_{it\tau} \cdot \text{Growth}_{it}) + \varepsilon_{it\tau}, \text{ where:}$$

$R_{it\tau}$  = the size-adjusted stock return (where the size adjustment is the return on the corresponding CRSP size-decile portfolio) for firm  $i$  in quarter  $t\tau$ , where  $t$  indexes calendar quarters and  $\tau$  indexes the 20 subsequent quarters over which we estimate these regressions;

$\text{Growth}_{it}$  = the growth quintile into which firm  $i$  was assigned in quarter  $t$  (where 0 denotes the low growth quintile and 4 denotes the high growth quintile) and growth is measured as the firm's market-to-book (MB) ratio at the end of quarter  $t$ ;

$\text{FE}_{it\tau}$  = Realized EPS for firm  $i$  in quarter  $t\tau$  minus the corresponding consensus analyst forecast of EPS, deflated by the firm's stock price at the end of fiscal quarter  $t\tau$ ; and

$\text{Surprise}_{it\tau}$  = -1 if  $\text{FE}_{it\tau}$  is negative, +1 if  $\text{FE}_{it\tau}$  is positive, and 0 otherwise.

**Table III (Continued)**

Quarters from: (number of obs.)	Intercept	Growth	Surprise	Surprise *Growth	Forecast Error	Forecast Error *Growth	Adjusted R- squared
Year 1 (n = 349,678)	.0014 (2.50)	-.0014 (-6.12)					.02%
	.0078 (14.15)	-.0034 (-14.82)	.0476 (82.76)	.0058 (24.00)			8.02%
	.0144 (26.14)	-.0022 (-9.96)	0.0110 (13.58)	.0094 (29.42)	4.0602 (58.51)	0.5498 (15.98)	10.59%
Year 2 (n = 305,416)	.0059 (10.01)	-.0029 (-12.26)					.05%
	.0085 (15.08)	-.0020 (-8.83)	.0437 (74.22)	.0054 (21.93)			7.50%
	.0135 (23.99)	-.0020 (-8.91)	.0113 (13.53)	.00077 (23.38)	3.5877 (49.61)	.5867 (16.75)	9.96%

(Continues over)

**Table III (Continued)**

Period (obs.)	Intercept	Growth	Surprise	Surprise *Growth	Forecast Error	Forecast Error *Growth	Adjusted R- squared
Year 3 (n = 269,864)	.0046 (7.57)	-.0023 (-9.28)					.03%
	.0066 (11.33)	-.0012 (-4.91)	.0405 (66.93)	.0056 (22.21)			7.35%
	.0110 (18.92)	-.0011 (-4.42)	.0093 (10.62)	.0075 (21.63)	3.2185 (44.27)	.6377 (18.12)	9.72%
Year 4 (n = 241,668)	.0045 (7.34)	-.00239 (-9.00)					.03%
	.0056 (9.31)	-.0009 (-3.48)	.0371 (59.68)	.0062 (23.94)			7.12%
	.0094 (15.83)	-.0006 (-2.44)	.0081 (8.90)	.0069 (19.25)	2.8238 (38.17)	.7371 (20.94)	9.62%

(Continues over)



**Table III (Continued)**

Period (obs.)	Intercept	Growth	Surprise	Surprise *Growth	Forecast Error	Forecast Error *Growth	Adjusted R- squared
Year 5 (n = 220,185)	.0051 (8.27)	-.0026 (-10.12)					.08%
	.0061 (10.20)	-.0014 (-5.73)	.0358 (56.90)	.0058 (21.94)			7.02%
	.0097 (16.12)	-.0012 (-4.71)	.0080 (8.49)	.0062 (16.75)	2.5912 (35.07)	.6880 (19.83)	9.45%
All 20 Quarters (n = 1,386,813)	.0065 (23.97)	-.0032 (-29.37)					.06%
	0.0092 (35.30)	-0.0026 (-23.97)	0.0414 (152.61)	0.0059 (52.21)			7.49%
	0.0137 (52.51)	-0.0025 (-23.63)	0.0123 (31.99)	0.0070 (45.57)	3.1803 (96.30)	0.5842 (37.51)	9.80%

**Table IV**  
**Estimated Coefficients (t-statistics) from Regressions of Quarterly Stock Returns ('Fullret') on 'Growth' Portfolio Membership, Good (Bad) News Indicator Variables Coded One if the Earnings Surprise is Positive (Negative) and Zero Otherwise, and Interaction Terms.**

Growth portfolios are MB quintiles (low MB = quintile 0, high MB = quintile 4). Growth portfolios are formed at the beginning of Year 1, and regressions employ returns and earnings data measured over the subsequent twenty quarters, reported in annual blocks of four quarters. We estimate regressions of the following form:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot \text{Good}_{it\tau} + \beta_3 \cdot \text{Bad}_{it\tau} + \beta_4 \cdot (\text{Good}_{it\tau} \cdot \text{Growth}_{it}) + \beta_5 \cdot (\text{Bad}_{it\tau} \cdot \text{Growth}_{it}) + \varepsilon_{it\tau}, \text{ where:}$$

$R_{it\tau}$  = the market-adjusted stock return (where the market return is the CRSP value-weighted market index) for firm  $i$  in quarter  $t\tau$ , where  $t$  indexes calendar quarters and  $\tau$  indexes the 20 subsequent quarters over which we estimate these regressions;

$\text{Growth}_{it}$  = the growth quintile into which firm  $i$  falls in quarter  $t$  (where 0 denotes the low growth quintile and 4 denotes the high growth quintile) and growth is measured as the firm's market-to-book (MB) ratio at the end of quarter  $t$ ;

$\text{Good}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is positive, and 0 otherwise; and

$\text{Bad}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is negative, and 0 otherwise.

The F-statistic is from an F-test is of the restriction that  $\beta_4 = -\beta_5$ .

**Table IV (Continued)**

Quarters from: (no. of obs.)	Intercept	Growth	Good	Bad	Good* Growth	Bad* Growth	F-statistic (p-value)	Adjusted R-squared
Year 1 (n = 349,678)	.0163 (8.53)	.0012 (1.94)	.0388 (18.55)	-.0561 (-27.31)	.0016 (2.08)	-.0099 (-13.43)	35.20 (.0001)	8.14%
Year 2 (n = 305,416)	.0112 (5.61)	.0019 (2.74)	.0411 (18.87)	-.0462 (-21.41)	.0003 (0.39)	-.0103 (-13.24)	44.95 (.0001)	7.58%
Year 3 (n = 269,864)	.0132 (6.31)	.0011 (1.49)	.0338 (14.92)	-.0473 (-21.06)	.0025 (3.04)	-.0086 (-10.68)	15.66 (.0001)	9.72%
Year 4 (n = 241,669)	.0092 (4.27)	.0023 (3.11)	.0336 (14.40)	-.0407 (-17.56)	.0021 (2.47)	-.0102 (-12.27)	25.92 (.0001)	7.63%

(Continues over)

**Table IV (Continued)**

Quarters from: (no. of obs.)	Intercept	Growth	Good	Bad	Good* Growth	Bad* Growth	F-statistic (p-value)	Adjusted R-squared
Year 5 (n = 220,186)	.0090 (4.19)	.0018 (2.33)	.0330 (14.02)	-.0386 (-16.53)	.0017 (2.00)	-.0097 (-11.51)	24.48	7.08%
All 20 quarters (n =1,386,813)	.0158 (17.02)	0.0002 (.68)	.0347 (34.42)	-.0481 (-48.20)	.0022 (5.93)	-.0095 (-26.63)	115.89 (.0001)	7.57%

**Table V**

**Estimated Coefficients (t-statistics) from Regressions of Quarterly Stock Returns ('Fullret') on 'Growth' Portfolio Membership, Good (Bad) News Indicator Variables Coded One if the Earnings Surprise is Positive (Negative) and Zero Otherwise, Forecast Error, and Growth Interaction Terms Conditioned on the Sign of the Earnings Surprise.**

Growth portfolios are MB quintiles (low MB = quintile 0, high MB = quintile 4). Growth portfolios are formed at the beginning of Year 1, and regressions employ returns and earnings data measured over the subsequent twenty quarters, reported in annual blocks of four quarters. We estimate regressions of the following form:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot \text{Good}_{it\tau} + \beta_3 \cdot \text{Bad}_{it\tau} + \beta_4 \cdot \text{FE}_{it\tau} + \beta_5 \cdot (\text{Good}_{it\tau} * \text{Growth}_{it} * \text{FE}_{it\tau}) + \beta_6 \cdot (\text{Bad}_{it\tau} * \text{Growth}_{it} * \text{FE}_{it\tau}) + \varepsilon_{it\tau}, \text{ where:}$$

$R_{it\tau}$  = the market-adjusted stock return (where the market return is the CRSP value-weighted market index) for firm  $i$  in quarter  $t\tau$ ,

where  $t$  indexes calendar quarters and  $\tau$  indexes the 20 subsequent quarters over which we estimate these regressions;

$\text{Growth}_{it}$  = the growth quintile into which firm  $i$  falls in quarter  $t$  (where 0 denotes the low growth quintile and 4 denotes the high growth quintile) and growth is measured as the firm's market-to-book (MB) ratio at the end of quarter  $t$ ;

$\text{FE}_{it\tau}$  = Realized EPS for firm  $i$  in quarter  $t\tau$  minus the corresponding consensus analyst forecast of EPS, deflated by the firm's stock price at the end of fiscal quarter  $t\tau$ ; and

$\text{Good}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is positive, and 0 otherwise; and

$\text{Bad}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is negative, and 0 otherwise.

**Table V (Continued)**

Quarters from: (no. of obs.)	Intercept	Growth	Good	Bad	FE	Good* Growth* FE	Bad* Growth* FE	Adjusted R-squared
Year 1 (n = 349,678)	.0220 (20.72)	-.0010 (-4.06)	.0232 (21.48)	-.0400 (-37.15)	2.7873 (50.17)	.6220 (13.78)	1.4270 (45.50)	10.47%
Year 2 (n = 305,416)	.0183 (16.40)	-.0009 (-3.45)	.0231 (20.30)	-.0335 (-29.78)	2.5341 (43.90)	.5677 (12.32)	1.3300 (42.62)	9.87%
Year 3 (n = 269,864)	.0164 (14.11)	-.0002 (-0.65)	.0200 (16.79)	-.0316 (-26.97)	2.2227 (38.78)	.7265 (15.96)	1.3001 (41.68)	9.63%
Year 4 (n = 241,669)	.0146 (12.17)	.0002 (0.75)	.0177 (14.37)	-.0291 (-23.91)	1.9094 (33.08)	.8574 (19.48)	1.3297 (42.96)	9.54%

(Continues over)

**Table V (Continued)**

Quarters from: (no. of obs.)	Intercept	Growth	Good	Bad	FE	Good* Growth* FE	Bad* Growth* FE	Adjusted R-squared
Year 5 (n = 220,186)	.0137 (11.20)	-.0001 (-0.22)	.0176 (14.00)	-.0262 (-21.02)	1.7797 (31.22)	.7000 (16.67)	1.2608 (41.69)	9.40%
All 20 quarters (n =1,386,813)	.0193 (37.36)	-.0012 (-10.22)	.0217 (41.05)	-.0337 (-64.53)	2.2370 (84.82)	.5207 (27.07)	1.2889 (93.37)	9.78%

**Table VI**  
**Estimated Coefficients (t-statistics) from Regressions of Stock Returns Measured Over Various Intervals on ‘Growth’ Portfolio Membership, Good (Bad) News Indicator Variables Coded One if the Earnings Surprise is Positive (Negative) and Zero Otherwise, and Interaction Terms.**

Growth portfolios are MB quintiles (low MB = quintile 0, high MB = quintile 4). Growth portfolios are formed at the beginning of Year 1, and regressions employ returns and earnings data. Measured Over the Subsequent Twenty Quarters, Providing a Sample of 1,386,813 Observations. We estimate regressions of the following form:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot \text{Good}_{it\tau} + \beta_3 \cdot \text{Bad}_{it\tau} + \beta_4 \cdot (\text{Good}_{it\tau} \cdot \text{Growth}_{it}) + \beta_5 \cdot (\text{Bad}_{it\tau} \cdot \text{Growth}_{it}) + \varepsilon_{it\tau}, \text{ where:}$$

$R_{it\tau}$  = the market-adjusted stock return (where the market return is the CRSP value-weighted market index) for firm  $i$  in quarter  $\tau$ ,

where  $t$  indexes calendar quarters and  $\tau$  indexes the 20 subsequent quarters over which we estimate these regressions;

$\text{Growth}_{it}$  = the growth quintile into which firm  $i$  falls in quarter  $t$  (where 0 denotes the low growth quintile and 4 denotes the high growth quintile) and growth is measured as the firm’s market-to-book (MB) ratio at the end of quarter  $t$ ;

$\text{Good}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is positive, and 0 otherwise; and

$\text{Bad}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is negative, and 0 otherwise.

The F-statistic is from an F-test is of the restriction that  $\beta_4 = -\beta_5$ .



**Table VI (Continued)**

Return Measurement Interval	Intercept	Growth	Good	Bad	Good* Growth	Bad* Growth	F-statistic (p-value)	Adjusted R-squared
Fullret	.0065 (23.97)	-.0032 (-29.37)						0.06%
Fullret	.0158 (17.02)	0.0002 (.68)	.0347 (34.42)	-.0481 (-48.20)	.0022 (5.93)	-.0095 (-26.63)	115.89 (.0001)	7.57%
Preret	.0009 (5.35)	-.0005 (-6.56)						0.00%
Preret	.0048 (7.71)	.0010 (4.36)	.0097 (14.23)	-.0195 (-23.57)	.0001 (0.54)	-.0034 (-14.03)	49.59 (.0001)	1.68%
Postret	.0053 (26.56)	-.0026 (-32.53)						0.08%
Postret	.0106 (15.48)	-.003 (-1.22)	.0238 (31.88)	-.0310 (-41.96)	.0020 (7.40)	-.0063 (-23.79)	72.22 (.0001)	6.34%
Aret	.0010 (11.11)	-.0005 (-13.61)						0.01%
Aret	.0023 (6.84)	-.0006 (-4.87)	.0112 (31.08)	-.0122 (-34.16)	.0015 (11.35)	-.0010 (-8.06)	3.29 (.0695)	4.26%

**Table VII**

**Estimated Coefficients (t-statistics) from Regressions of Quarterly Stock Returns ('Fullret') on 'Growth' Portfolio Membership, Good (Bad) News Indicator Variables Coded One if the Earnings Surprise is Positive (Negative) and Zero Otherwise, and Interaction Terms.**

Growth portfolios are measured using MB quintiles (low MB = quintile 0, high MB = quintile 4), PE quintiles (low PE = quintile 0, high PE = quintile 4), and LTG quintiles (low LTG = quintile 0, high LTG = quintile 4). Growth portfolios are formed at the beginning of Year 1, and regressions employ returns and earnings data measured over the subsequent twenty quarters, providing a sample of 1,386,813 observations. We estimate regressions of the following form:

$$R_{it\tau} = \alpha + \beta_1 \cdot \text{Growth}_{it} + \beta_2 \cdot \text{Good}_{it\tau} + \beta_3 \cdot \text{Bad}_{it\tau} + \beta_4 \cdot (\text{Good}_{it\tau} \cdot \text{Growth}_{it}) + \beta_5 \cdot (\text{Bad}_{it\tau} \cdot \text{Growth}_{it}) + \varepsilon_{it\tau}, \text{ where:}$$

$R_{it\tau}$  = the market-adjusted stock return (where the market return is the CRSP value-weighted market index) for firm  $i$  in quarter  $t\tau$ ,

where  $t$  indexes calendar quarters and  $\tau$  indexes the 20 subsequent quarters over which we estimate these regressions;

$\text{Growth}_{it}$  = the growth quintile into which firm  $i$  falls in quarter  $t$  (where 0 denotes the low growth quintile and 4 denotes the high growth quintile) and growth is measured as the firm's market-to-book (MB) ratio at the end of quarter  $t$ ;

$\text{Good}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is positive, and 0 otherwise; and

$\text{Bad}_{it\tau}$  = 1 if  $\text{FE}_{it\tau}$  is negative, and 0 otherwise.

The F-statistic is from an F-test is of the restriction that  $\beta_4 = -\beta_5$ .

**Table VII (Continued)**

Growth Measure	Intercept	Growth	Good	Bad	Good* Growth	Bad* Growth	F-statistic (p-value)	Adjusted R-squared
MB	.0065 (23.97)	-.0032 (-29.37)						0.08%
MB	.0158 (17.02)	0.0002 (.68)	.0347 (34.42)	-.0481 (-48.20)	.0022 (5.93)	-.0095 (-26.63)	115.89 (.0001)	7.57%
PE	.0051 (19.92)	-.0026 (-24.40)						0.04%
PE	.0137 (16.86)	.0008 (2.74)	.0338 (37.64)	-.0466 (-52.59)	.0025 (7.31)	-.0093 (-27.68)	112.16 (.0001)	7.83%
LTG	.0071 (25.21)	-.0033 (-28.52)						0.07%
LTG	.0082 (8.93)	.0031 (9.13)	.0246 (24.50)	-.0262 (-26.33)	.0086 (22.81)	-.0190 (-50.98)	211.77 (.0001)	8.61%