NBER WORKING PAPER SERIES

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Working Paper 9544
http://www.nber.org/papers/w9544

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 2003

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NBER Working Paper No. 9544
March 2003
JEL No. G12, G14, G24

ABSTRACT

Analysts' earnings forecasts are influenced by their desire to win investment banking clients. We hypothesize that the equity bull market of the 1990s, along with the boom in investment banking business, exacerbated analysts' conflict of interest and their incentives to adjust strategically forecasts to avoid earnings disappointments. We document shifts in the distribution of earnings surprises, the market's response to surprises and forecast revisions, and in the predictability of non-negative surprises. Further confirmation is based on subsamples where conflicts of interest are more pronounced, including growth stocks and stocks with consecutive non-negative surprises; however shifts are less notable in international markets.

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Equity research analysts make up a highly influential part of the investment industry. Investors pore over analysts' research reports and recommendations in order to obtain clues about the future prospects of a stock. Firm managers try to cultivate favorable coverage by analysts, so as to attract investor attention and boost their company's stock price. Brokerage firms heavily promote research by their analysts as a means of soliciting trading business from investors, as well as underwriting and merger advisory business from firms. So much attention is devoted in the financial news outlets to the pronouncements of analysts that a handful of individuals, who command high profiles and high salaries to match, have attained the status of media celebrities. The influence of analysts is backed up by many academic studies (see, for example, Givoly and Lakonishok (1979), Womack (1996), Barber et al. (2001)) which find that changes in analysts' earnings forecasts and recommendations contain information about future stock returns. Busse and Green (2002), for instance, study television broadcasts of analyst opinions during part of 2000, and find that traders respond within seconds, considerably faster than the reaction time in earlier years.

The rise in analysts' fortunes is intimately intertwined with the boom in the equity market during the 1990s. Many firms, especially those in the technology, media and telecommunications sectors, took advantage of their lofty valuations during this period to raise capital. Analysts played a prominent role in drumming up demand for these stocks (Shiller (2000)), with many analysts continuing to tout them well after the speculative excesses of the period became obvious. With the unravelling of the boom, however, the analyst community has come under fire. Numerous commentators chide the analyst community for "perpetuating a mania that fueled its own demise" (Santoli (2001)). The central damning charge against analysts is that instead of providing impartial research they tend to be cheerleaders for the firms they cover. The abundance of buy recommendations and the paucity of sell recommendations, for instance, has frequently been cited as evidence of a lack of objectivity (Anderson and Schack (2002)). As another example, forecasts of long-term growth in earnings consistently overshoot realized growth rates (Chan, Karceski and Lakonishok (2002)). Public skepticism about the quality of Wall Street equity research has led to calls for increased regulatory oversight of securities firms, including proposals to spin off the research divisions of brokerage firms.

Analysts may not always issue objective forecasts for a number of reasons. Their opinions may be

colored by personal career considerations. In the past, analysts were especially reliant on firm managers for information. As a result, they may have been reluctant to issue negative opinions that would antagonize firm management and jeopardize their access to managers. Even with recent regulations governing fair disclosure, this motivation may still be at work. Importantly, securities firms in general do not explicitly charge clients for research. Rather, analysts' research contribute to a security firm's revenues in other ways. One lucrative source of revenue is from investment banking business. Accompanying the bull market of the 1990s was a spurt in investment banking activity, with companies raising capital and engaging in merger and acquisition deals. Analysts started to take an active role in securing underwriting business. An analyst may issue a bullish opinion about a stock in order to curry favor with executives who can direct future investment banking business to the brokerage firm. Another source of revenues is from trading commissions. In order to draw a larger clientele into buying a stock, an analyst may be predisposed to be more optimistic. In a nutshell, analysts are compensated for roles beyond providing accurate and timely research to investors. This exposes them to potential conflicts of interest that may undermine their objectivity.

An alternative response to these allegations is that research analysts use the existing information available to come up with opinions that are, at least on average, unbiased. However, unanticipated events occur, or the research may have been based on faulty information, possibly deliberately supplied by managers to tone down expectations (or even to mislead the public). Thus, analysts' forecasts and recommendations can be wide off the mark through no fault of their own. With the benefit of hindsight, nonetheless, it is easy to find a convenient scapegoat in analysts' research. Biases in analyst forecasts might also be attributable to psychological factors that are unrelated to conflicts of interest. Humans are prone to a variety of cognitive biases that lead to systematic judgmental errors, such as the tendency to extrapolate past trends too far into the future.[1]

There are several ways in which analysts can express their opinions about a stock. They forecast long-term growth rates and target price levels, and they issue buy or sell recommendations for a stock. By far the most intense and sustained attention in the media, however, is lavished on analyst estimates of earn-

[1] See Kahneman and Lovallo (1993) for evidence from experimental studies in psychology. In the context of analyst behavior, see DeBondt and Thaler (1990), and Abarbanell and Bernard (1992).

ings. Furthermore, investors in recent years appear to have placed increasing emphasis on a firm's earnings performance. Francis, Schipper and Vincent (2002a), Landsman and Maydew (2002) find that the absolute magnitude of abnormal returns, as well as abnormal volume, around earnings announcement dates have increased from the 1980s to the 1990s. Additionally, Francis et al. (2002b) report an increase over time in the market reaction to analyst forecast reports as well as earnings announcements. The popular perception in recent years is that an earnings disappointment represents extremely bad news. The stock price is sent plummeting, at least in the short term. Managers' compensation packages are dragged down if this occurs, and investor enthusiasm for the stock wanes.

Companies are hence under heavy pressures to ensure that earnings do not fall short of targets such as security analysts' forecasts. Managers exercise some discretion with respect to the timing, and magnitude, of various revenue and expense items. They can thus manipulate earnings through accruals, for example (see Chan et al. (2002)). Another way to avoid disappointments is to manage forecasts. Management can guide analysts into toning down their forecasts, making it easier to match or surpass them. On their part analysts may lend a helping hand by shaving their projections as the earnings announcement date approaches. If investors do not see through such manipulation by managers and analysts, the stock price receives a boost.

This paper examines whether analysts bias their opinions in favor of a company by adjusting their estimates in order to help managers match or exceed expectations. We focus on biases in earnings estimates for a number of reasons. First, in light of the heavy emphasis investors and the media devote to earnings results, the forecasted earnings number provides a natural vehicle for an analyst to paint a flattering picture of a firm's prospects. Numerous articles in the popular press provide anecdotal evidence that analysts engage in manipulation of their forecasts (see Fox(1997), McGee (1997), and Vickers (1997)). From a researcher's standpoint, it is relatively easier to check for bias in earnings estimates, compared to the other outputs from analysts' research. Stock recommendations, as well as target price forecasts and estimates of long-term growth rates, extend over an unspecified horizon. As a result, it is hard to reconcile them with realized performance in order to detect biases. Estimates on the other hand are issued each quarter, so they can be confronted against realizations on a regular basis when earnings are announced.

We argue that recent U.S. market conditions have increased the predisposition of analysts toward positive

surprises. We develop evidence in support of this argument along several lines. First, we document the distribution of earnings surprises at the announcement date with a large cross-section of firms, and track its evolution over an extended sample period. One way to deliver a pleasant surprise at the announcement date is for managers or analysts to adjust opportunistically the path of estimates within the quarterly reporting period. We also examine these within-quarter adjustments for traces of analyst bias.

Analysts' predisposition to positive surprises is likely to be especially pronounced in firms that enjoy favorable investor sentiment, such as stocks that trade at high relative valuation levels. Accordingly, we also provide results for the sample partitioned into growth and value subsets. Firms that have a track record of consistently exceeding expectations are especially sought after by investors. As another way of verifying that there are subsets of stocks where the pressure to manage surprises is particularly pronounced, we analyze the frequency of consecutive quarters of non-negative surprises (relative to the frequency expected by chance). We round out our analysis with a regression model to predict the probability of a non-negative earnings surprise based on characteristics such as relative valuation levels, the time-path of within-quarter adjustments of estimates, and the sequence of past surprises.

To trace out more clearly firms' and analysts' evolving incentives to manage surprises, we also examine how the stock market responds to earnings surprises, and whether this response has heightened over time. We study returns immediately surrounding earnings announcements, and also over relatively longer horizons. In addition, we consider investors' relative valuations of firms that consistently surpass expectations.

The incentives for firms and managers to manage earnings surprises is likely to be weaker in foreign equity markets. Compared to the U.S. and the U.K., conflicts of interest due to investment banking business are less severe in other markets. The overall level of initial public offering activity is lower and in general competition for investment banking business is less keen. The compensation for analysts also is generally lower. To throw into sharper relief our results on the U.S., we provide similar evidence on foreign markets.

Our general findings are as follows. Over the period 1984–2001, the cross-sectional distribution of earnings surprises in the U.S. undergoes a pronounced shift. In particular the proportion of non-negative surprises climbs over time from 48.88 percent in the late 1980s to 75.59 percent in 1999–2000. There is strong evidence that the increased incidence of non-negative surprises arises from strategic adjustments of

analyst forecasts over the reporting period. In cases where earnings fall short of the consensus three months before the announcement, analysts become more willing in recent years to revise downward their estimates by enough to yield a non-negative surprise upon announcement. These patterns are more pronounced for growth firms than for value firms. As well, there are more instances where firms meet or surpass expectations for several quarters in a row than can be attributed to chance. At the height of the bull market during the late 1990s, for example, growth firms who enjoy four consecutive quarters of non-negative surprises occur 35.4 percent more often than the expected frequency. The upshot is that the likelihood of a non-negative surprise becomes increasingly predictable over time, based on a firm's value-growth orientation, the sign of past surprises, and the sign of the most recent revision in the consensus estimate. In contrast to the U.S., foreign markets do not exhibit an increased disposition to positive earnings surprises.

Our analysis of the market reaction to earnings surprises buttresses these findings. Over our sample period the responsiveness of returns to surprises and forecast revisions grows, although the impact of surprises is dominant. As well, firms associated with a consistent history of at least matching expectations fetch markedly higher relative valuations. To a growing extent, therefore, managers and analysts have an incentive to manage earnings and forecasts so as not to disappoint investors.

The remainder of the paper is organized as follows. In section I we develop our argument concerning how analysts' conflict of interest can give rise to biases in earnings estimates, and describe the sample and methodology. Section II describes the distribution of earnings surprises. Section III checks on the price impact of earnings surprises. We examine the degree of persistence in earnings surprises in section IV, as well as the valuation of firms who display persistence in earnings surprises. Section V develops probit models to predict the likelihood of a non-negative surprise. The international evidence is described in section VI. A final section concludes.

I. Background

A. The predisposition to positive surprises

The existence of an optimism bias in analysts' forecasts is well-documented in many studies (Fried and Givoly (1982), Klein (1990)). Early in the reporting period, analysts' estimates on average tend to be biased upward, and they are adjusted downward over the period. By the time of the announcement date, the consensus estimate is generally aligned with actual earnings.

While this may have been the pattern in earlier years, recent market conditions may have worked to compromise analysts' impartiality, increasing their bias for at least some stocks. In particular, the lofty valuations produced by the strong bull market of the 1990s encouraged a surge in firms' equity issuance. Ritter and Welch (2002) report that the volume of initial public offerings (adjusted for inflation) approximately doubled from the 1980s to the 1990–94 period, doubled again from 1995–98, and doubled yet again (to $65 billion per year) from 1999 to 2000, ultimately declining in 2001 to $34 billion. The average underwriting fee for seasoned equity offerings also climbed in real terms from $2.7 million in the late 1980s to $5.3 million in the late 1990s (Mola and Loughran (2002)). Krigman, Shaw and Womack (2001) survey corporate chief financial officers and find that firms place the highest priority on research coverage when selecting an underwriter.

Firms' eagerness for coverage, and security firms' thirst for lucrative investment banking business, suggest that the independence of research analysis may be traded off against the chance to win clients. An industry executive compares current market conditions with the past by noting that now "top analysts are truly neck and neck with top investment bankers, because the two now go hand in hand. The number of research analysts that had the capacity to bring in significant numbers of deals was very limited in the 1980's."[2]

We thus posit that there is an upward trend over time in the tendency of analysts to generate positive earnings surprises. Earnings surprise is measured as the difference between actual earnings per share and the consensus estimate immediately prior to the announcement date (our methodology is spelled out in more

[2] Morgenson (2001).

detail in subsequent sections). Note that this point provides one basis for distinguishing between different explanations for analyst biases. Under the alternative hypothesis that forecasts are formed objectively and errors arise from unforeseen events, there should not be any trend over time in the distribution of earnings surprises. Similarly, human foibles in forecasting should not display trends over time.

However, an analyst's predisposition to help firm managers beat the estimate is not likely to apply equally to all firms. The accuracy of earnings forecasts still forms one basis of an analyst's compensation (see the evidence in Hong and Kubik (2002)). An analyst may thus issue unbiased forecasts for many stocks. The importance of not falling short of expectations, however, is especially high for growth stocks or stocks that have consistently done better than expected in terms of past earnings. In such cases there is likely to be a heavy dose of investor optimism about future prospects that is built into the stock price. Since the bar for future performance is set very high, a disappointing earnings announcement can be unduly harsh on the stock price (see La Porta et al. (1997)). Managers, and analysts indirectly, will thus come under particularly intense pressure to ensure that earnings do not fall short of forecasts. Growth firms are also more frequently involved in capital-raising activity, so disappointing earnings may hinder their access to capital. To keep their current investment banking clients (and to attract future business), analysts have an incentive to avoid earnings disappointments. Lastly, growth stocks that capture investors' enthusiasm are likely to experience intensive trading activity. An analyst may not wish to imperil this source of trading commission income, and so may be more inclined to smooth the way for a positive surprise. Conversely, there is less reason to be a booster for firms that are out of favor with investors, such as stocks with poor past performance or value stocks. These are less likely to be heavily traded, and since they have not been growing they are unlikely to be potential investment banking clients.

In short, we argue that the probability of a positive surprise is ex ante predictable. Observable characteristics such as a firm's value-growth orientation and its past success in beating expectations are likely to be associated with the likelihood of a positive surprise. Such characteristics denote the extent of potential conflicts of interest which may compromise the accuracy of analysts' earnings forecasts.

There is some existing evidence in the finance literature on analyst biases due to conflicts of interest. They center mostly on stock recommendations, however, and stop short of the late 1990s, when the conflicts

of interest were particularly acute. Michaely and Womack (1999), for example, investigate analyst recommendations around initial public offerings. Dugar and Nathan (1995) also study earnings estimates but their sample period spans only six years and ends in 1988.

B. Data and methodology

We analyze the quarterly earnings forecasts for all domestic common equity issues covered on the IBES Daily Detail Earnings Estimate History File. Our sample period extends from the second quarter of 1984, when the number of available firms becomes sufficiently large, to the first quarter of 2001.

The consensus forecast of a firm's earnings that is commonly extracted from the IBES database is the mean over all analysts' estimates that are outstanding as of the middle of a month (the Thursday before the third Friday of the month). To safeguard against the possibility that any bias we uncover is a consequence of using a stale measure of expectations, we construct a customized consensus estimate that is more timely than a monthly consensus mean. Specifically, on each day prior to an announcement of quarterly earnings, we find the median of all valid estimates for a firm. A forecast by an individual analyst is considered to be valid unless it is placed by IBES on the stopped estimate file. As a further safeguard we require a firm to have at least five valid forecasts. After applying these criteria there are on average 1157 firms in the sample each quarter.[3]

We use the median forecast to avoid giving too much weight to an individual prediction that may be relatively extreme. Using the median for the consensus also provides a simple intuitive interpretation of our results. In a case where realized earnings exceed the median, for example, we can be sure that at least half the analysts issued estimates that are below actual earnings. Such instances thus provide a direct validation of the hypothesis that each analyst has an incentive to generate a positive surprise.

In related research DeGeorge, Patel and Zeckhauser (1999) highlight the importance of meeting psychological threshold levels for earnings. Zero net income represents one important perceptual baseline, for

[3]Both actual and forecasted earnings are from the same source (IBES), so that the two can be meaningfully compared. IBES (as well as the other major databases supplying actual and forecasted earnings data) ensures that the reported earnings number corresponds to what the majority of analysts are forecasting. Abarbanell and Lehavy (2000) compare forecast errors from different data sources. Their results suggest that the distribution of forecast errors is generally quite similar across different data vendors.

example, as does the consensus estimate. Similarly, coming in with a slight improvement, such as one or two cents per share over expected earnings, might represent a psychologically important focal point. Such discrete demarcations, however, are blurred if earnings are split-adjusted. Accordingly, we work with actual and forecasted earnings per share as they originally appeared. The IBES convention of reporting earnings on a split-adjusted basis introduces tricky issues, however. With the upward spiral in stock prices in the late 1990s, it is not uncommon to have cumulative split adjustment factors in excess of a hundred. The adjustment factor for Cisco Systems, for example, is 288 (as of mid-2001). In this case a difference of one cent between actual and forecasted earnings as they were originally reported translates into a split-adjusted difference of roughly three-hundredths of a cent. This overflows the precision of the data reported on the IBES summary files, creating the impression that the earnings surprise is zero. The problem is particularly acute for successful, high-flying stocks, who also have stronger incentives to manage earnings and forecasts so as not to disappoint. We are in a unique position to address such issues, because we work with a customized data file from IBES that carries earnings and estimates as they were originally reported. Spot checks of our measures of actual and forecast earnings indicate that they generally agree with other sources, such as the Dow Jones News Retrieval Service and the IBES consensus estimate from the Summary file.

II. The distribution of earnings surprises

A. All firms

Table 1 summarizes the frequency distribution of earnings surprises over all firms in the sample. The distribution is tabulated every quarter and the results are then averaged over quarters. We provide averages over the whole sample period (1984Q2 to 2001Q1) and for various sub-periods. In particular, the later sub-periods generally coincide with the increase in market exuberance (and hence indirectly the potential for analyst conflicts of interest) over 1995Q1 to 1998Q4, its peak (1999Q1 to 2000Q1), as well as its unravelling after 2000Q2.

In panel A, over the entire sample period the mean earnings surprise is -2.32 cents per share, so on average actual earnings fall short of the latest consensus forecast. There is an upward drift in the mean

surprise over time, however. In the earlier subperiods the mean surprise is -5.8 cents in the first subperiod (1984Q2–1989Q4), enters positive territory in the 1995Q1–1998Q4 subperiod, and peaks at 1 cent in 1999Q1–2000Q1. This behavior is not driven by unexpectedly bad or good performance of a minority of firms: the upward drift over time is just as striking for the median surprise. This starts at -0.86 cents in the first subperiod, and also peaks at 1 cent in the 1999–2000 subperiod. The behavior of both the mean and median surprise thus indicates a rise over time in the tendency for analyst estimates to come in below actual earnings and generate a positive surprise.

The cross-sectional dispersion of surprises has declined as well. The standard deviation of the distribution diminishes from 37.76 percent in the first subperiod to 8.19 percent over 1999–2000, and stands at 10 percent in the last subperiod.[4] The quartiles of the distribution in panel A also confirm the downward trend in the dispersion of surprises.[5] The reduced variability in surprises is consistent with the argument that in recent years managers and analysts have engaged in a concerted effort to manage surprises.

Panels B and C provide additional details on the distribution of surprises. Over the full sample period, on average 48.57 percent of the surprises are positive (actual earnings exceed the forecast). The overall average masks an increase over time in the frequency of positive surprises. In the first subperiod, 43.3 percent of the cases are positive, and the frequency of positive surprises during the first part of the 1990s is similar. The frequency rises above fifty precent in 95Q1–98Q4, peaks at 59.48 percent and falls to 54.95 percent in the last sub-period. Recall that we record the consensus forecast one day before the announcement date. Since the time-window between the consensus and the announcement is so short, it is unlikely that there is a systematic bias due to unexpectedly favorable overall economic conditions. Hence there is no reason to expect that the probability of a positive surprise should differ notably from the probability of a negative

[4] In the calculations of the means and standard deviations, we mitigate the impact of outliers and data errors by trimming all surprises at the 1-st and 99-th percentiles of the distribution; in addition all surprises larger than five dollars per share in absolute value are excluded from these calculations. Our tabulations of the frequency distributions, on the other hand, do not exclude any observations.

[5] In the earlier years of our sample period, there may be an inconsistency between the nature of the actual earnings reported by a firm, and the earnings forecasted by analysts. For example, a firm may have reported earnings after extraordinary items, while analysts may have projected earnings on an operating basis. Since 1985, IBES has adjusted reported earnings to place them on an equivalent basis to what analysts forecast. The earlier inconsistencies may affect the summary statistics reported in panel A.

surprise, even if it were argued that business conditions were unexpectedly robust in the late 1990s. Instead, the trend in the distribution of surprises tracks the trend in market valuations, as well as the trend in the volume of underwriting and investment banking activity activity noted above.

There is a similar trend in the frequency of zero surprises. The percentage of cases where the surprise is zero increases from less than ten percent before 1994 to about 16 percent in the later part of the sample period. This may reflect improvements in forecast accuracy due to better dissemination of information over time, but it may also reflect an increase in the desire of managers and analysts to avoid disappointments. Together, analysts and managers may be managing earnings and expectations in order to tame negative surprises. All in all, the incidence of negative surprises has tumbled from 51.13 percent in the first sub-period, to 24.41 percent when valuations peaked during 1999Q1–2000Q1, and 28.45 percent in the last sub-period (see figure 1).

Panel C of Table 1 uses a finer partition of the histogram to give more clues on how the distribution of surprises has shifted. The buildup in the positive side of the distribution is concentrated in the interval from zero to two cents per share. For example, in the 1984–89 subperiod 25.12 percent of the cases fall in the interval between 0 and 2 cents (inclusive). At the height of the market during the 1999–2000 subperiod this part of the distribution accounts for 58.86 percent of the observations. In spite of the large increase in the frequency of positive surprises over these subperiods, cases where the surprise exceeds 2 cents actually fall from 23.76 percent in 1984–89 to 16.73 percent in 1999–2000. These results are consistent with a growing tendency for firms and analysts to manage surprises, either through managing earnings or through adjusting forecasts. Overall, the percentage of large surprises (either positive or negative) in excess of two cents in absolute value diminishes from 54.88 percent in 1984–89 to 26.80 percent in 1999–2000. Intriguingly, despite the reduction in the magnitude of surprises over the sample period, the market response to the information contained in earnings surprises has not diminished (see, for example, Francis et al. (2002), Landsman and Maydew (2002)).

The analysis so far has been concerned with the dollar magnitude of earnings surprises. Even when the surprise amounts to several cents, however, it may still be small relative to the level of earnings. Accordingly, we also report in the last two columns of panel B the frequency of cases where the surprise is small in either

absolute dollar magnitude or in relative terms. Specifically, a small positive surprise denotes a firm-quarter where the earnings surprise is greater than zero and not more than one cent, or when the ratio of the surprise to the absolute value of the estimate is greater than zero and not more than five percent. Small negative surprises where actual earnings narrowly fall short of the consensus, are defined in a corresponding manner.

Small positive surprises make up 13.98 percent of the observations in the first subperiod. At the market peak during 1999Q1–2000Q1, the percentage climbs to 22.58 percent in 1999–2000. In sum, small and zero surprises make up an increasing percentage of the sample over time: from 19.56 percent in the first subperiod to 38.69 percent in 1999–2000. Conversely, small negative surprises become less likely in the recent subperiod, as the percentage of such cases drops from 13.32 percent in 1984–89 to 8.17 percent in 1999–2000. The rise in the likelihood of small surprises reinforces the impression that the management of surprises has grown over time. Specifically, beating forecasts by a wide margin may not be wholly desirable, because the bar for future performance might be raised too high in this event. To avoid this, managers may try to rein in earnings or defer them for future quarters.

The evidence in Table 1 suggests that managers and analysts have increased their efforts in recent years to avoid letting down investors' hopes with respect to earnings performance. In particular, the decrease over time in the dispersion of surprises reflects an increasing tendency to manage expectations.[6] Further, the rise in the incidence of positive surprises is consistent with managers' and analysts' increasing predisposition to put the best face on earnings performance and to steer clear of bad news about earnings.

B. Growth and value firms

The ballooning of valuations in the late 1990s was not uniform across different equity classes. For example the price-to-earnings multiple for growth stocks hovered around 1.5 times the price-earnings multiple for value stocks until the late 1990s.[7] From 1998 on, however, the ratio soared, so the valuation gap between

[6]The dispersion may also be reduced if the overall level of earnings declined sharply over time. However, the magnitude of earnings per share is not markedly different across the sub-periods. For example, the cross-sectional average earnings per share in the first sub-period is 78 cents per share and 44 cents in the last sub-period.

[7]These statistics are based on a comparison of the ratios of price to forecasted earnings between the Russell 1000 growth index and the Russell 1000 value index, as reported by Salomon Smith Barney.

growth and value firms widened dramatically in favor of growth firms, before peaking at about 3.5 times in early 2000. In particular, firms in the technology sector commanded very high valuations, accounting for roughly a third of the market value of the S&P 500 index. Similarly, Chan, Karceski and Lakonishok (2000) report a striking widening over the late 1990s in the dispersion of returns across equity classes segregated by size and book-to-market.

During the same period many growth firms, particularly those in the technology, media and telecommunications sectors, were intensively engaged in raising capital as well as merger activity. Firms and analysts would thus have been been especially anxious to paint a rosy picture of these firms' earnings prospects in order to maintain favorable investor sentiment. Further, given growth firms' steep valuations in the late 1990s, the penalties for earnings disappointments were potentially harsher for growth firms. These considerations suggest that the incentives to manage surprises are more acute for growth firms. To follow up on this line of thinking, Table 2 reports the distribution of surprises for value (panel A) and growth (panel B) firms. Value firms are those whose book-to-market value of equity ratios exceed the median NYSE firm; growth firms have positive book-to-market ratios that place them in the bottom quartile based on NYSE firms. The breakpoints are chosen so as to obtain a roughly comparable number of firms in each group.

The two sets of firms share similar distributions of earnings surprises up to the mid-1990s. In the first sub-period, for example, the percentage of positive surprises is about 45 percent for value firms and 44 percent for growth firms. Thereafter, the distributions of the two groups diverge sharply. Growth firms enjoy an increasing tendency for positive surprises over the later sub-periods. For these stocks the incidence of positive surprises rises to 67.10 percent in 1999–2000. On the other hand, negative surprises in this group fall from 47.03 percent in the first sub-period to 15.08 percent in 1999–2000. At the market peak from 1999–2000 the average surprise for growth firms is 1.74 cents, as opposed to only 0.10 cents for value firms. In comparison, changes in the distribution for value firms are much milder. The proportion of positive surprises for value firms in 1999–2000 (51.57 percent) is not much different than the proportion at the beginning of the entire sample period.

To sum up, the tendency to tilt surprises toward zero and above is more pronounced for growth firms than for value firms. If analyst forecasts are unbiased, there is no reason to think that the distribution of surprises

should differ across different kinds of firms. On the other hand, the incentives to manage surprises have become sharper in recent years for growth firms. As a result, analysts' conflicts of interest are exacerbated, creating a bias in their forecasts for growth firms.

C. The distribution conditional on earnings forecast error

Under the hypothesis of forecast rationality a forecast made early in the quarter is as unbiased as a forecast later in the quarter. Put another way, the sign of the forecast error based on the estimate late in the quarter should resemble the sign of the forecast error based on the estimate early in the quarter. In particular if the original forecast error is negative one should expect to observe on average a negative surprise upon announcement. In recent years, however, as the tolerance for earnings disappointments has fallen, managers and analysts come under pressure to manipulate earnings or forecasts in order to forestall bad news. Suppose, for example, that as the announcement date approaches it becomes increasingly clear that actual earnings will under-perform the outstanding forecast. The desire to maintain a reputation as a good forecaster will prompt analysts to lower their estimates. With the added pressure in recent years to avoid earnings disappointments, managers and analysts also face an extra urgency to moderate expectations. Managers will hence try to guide down forecasts. Analysts may be motivated to lower their estimates by enough to eke out a non-negative surprise at the announcement date. The reverse situation – where it becomes clear that earnings will exceed original expectations – yields a less sharp prediction. Nonetheless, in such cases analysts will still try to ensure that when the actual numbers are released there are no unpleasant surprises.

In Table 3 we check on this hypothesis by splitting the sample into two sets of firms, based on whether the forecast error early in the quarter is at least zero or strictly negative. In panel A of each part of the table, we calculate the error based on the consensus three months prior to the release of actual earnings. In panel B of each part of the table we replicate the experiment using the forecast error based on the consensus one month prior to the actual announcement.

Part I of Table 3 reports for all firms the frequency of positive, negative and zero earnings surprises, conditional on the sign of the forecast error earlier in the quarter. Cases where the forecast error early in the quarter is negative (actual earnings fall short of original expectations as given by the consensus taken

three months before announcement) indicate firms who require more of a helping hand from analysts to come out at least equal to expectations. In the first subperiod (1984–89), of the firms with negative forecast errors based on the consensus three months prior to announcement, 82.86 percent experience a negative earnings surprise when actual results are released. The fraction of negative surprises in this group drops markedly to 58.68 percent in the 1999–2000 subperiod. Conversely, there is an upsurge in the proportion of cases where the negative forecast error is transformed into a zero or positive surprise by the time of the announcement date. In the 1999–2000 subperiod, 18.19 percent of the cases start with a negative forecast error three months ago, but enjoy a zero earnings surprise upon announcement. An additional 23.14 percent of the cases turn from a negative forecast error into a positive announcement surprise. The implication is that analysts become more willing in recent years to adjust their estimates strategically within a quarter so as to generate a positive surprise upon the announcement of actual earnings.

Conditioning on a positive or zero forecast error three months before announcement also turns up signs of strategic adjustment of estimates to avoid disappointments. When the original forecast three months prior to announcement is below or equal to realized earnings, in the first subperiod 81.97 percent of the cases experience a positive announcement surprise and 8.52 percent experience a zero surprise. During the 1999–2000 subperiod the frequency of positive surprises is roughly the same (82.10 percent) while the frequency of zero surprises climbs to 16.04 percent. As a result, the proportion of negative surprises diminishes from 9.51 percent in the 1980s to a mere 1.86 percent in 1999–2000.

Panel B provides results when the forecast error is based on the consensus one month prior to the announcement date. Compared to panel A, analysts at this later date have more information about what earnings are likely to be. Many may already have revised their forecasts, so as a result the findings in panel B are more muted. Nonetheless, the evidence still suggests that some strategic adjustments in estimates take place over the time left till the results are reported. Of the firms with negative forecast errors, for example, 80.72 percent suffer a negative surprise during the 1999–2000 subperiod, below the 94.39 percent observed in the first subperiod. In 9.69 percent of the cases during the 1999–2000 subperiod, the negative error as recently as one month before the announcement date turns into a positive announcement surprise.

Part II of Table 3 provides results for value and growth firms separately. To avoid clutter, only the

results from conditioning on the forecast error based on the consensus three months before announcement are reported. When the forecast error is negative, the proportion of negative surprises is roughly the same for value and growth stocks in the first subperiod. We hypothesize, however, that in more recent years the incentives to manage forecasts are higher for growth firms. In support of this argument, for growth firms with negative forecast errors the percentage of negative surprises declines in 1999–2000 to 48.94 percent (from 83.76 percent in the first subperiod). Similarly, the incidence of zero surprises swells to 24.86 percent (relative to 5.24 percent from 1984–89). In the case of value firms, the shifts in the distribution are less stark. For example, given a negative forecast error, the frequency of negative surprises changes from 80.19 percent in the first subperiod to 64.21 percent in 1999–2000.

The results from Table 3 provide further confirmation of our hypothesis that analysts' incentives jeopardize their objectivity. In particular, during bullish markets analysts seem to adjust strategically their forecasts in order to avoid negative earnings surprises. These incentives are especially pronounced for firms with high valuations (growth firms), who are also more likely to be sources of investment banking business, compared to firms with relatively low valuations (value stocks). Of courese, it is not possible to identify unambiguously whether it is analysts or firm managers (or both parties) who engage in manipulating surprises. Managers may be responsible through the guidance they supply analysts or through their discretion over accounting methods. In any event, given the close ties between managers and analysts and the repeated process of providing earnings estimates every quarter, it is implausible that analysts persistently fail to see through any manipulation carried out by managers.

III. The price impact of earnings surprises

In this section we flesh out some of the forces behind the incentives for firms and analysts to manage surprises. We focus on two aspects of these market incentives.

The first issue concerns investors' response to earnings news. In particular, there is a widely held perception among market commentators that investors view a negative earnings surprise as a cause for alarm, and jettison stocks that miss expectations. If this is so, then the observed decline in the incidence of negative

surprises during the exuberant period of the late 1990s suggests that the market was punishing more severely stocks that disappoint expectations. In this section we examine whether this is the case.

As noted above, one way to avoid an earnings disappointment is to adjust strategically the forecast. However, such downward revisions generally trigger a negative stock price reaction. If analysts engage in these adjustments, the implication is that downward revisions in estimates in recent years are penalized less severely (at least in terms of the short-term price response), compared to missing expectations. In this section we also examine the differential penalties for estimate revisions and earnings disappointments.

We carry out our analysis by estimating each quarter cross-sectional regressions of the form

$$r_{it} = \gamma_0 + \gamma_1 S_{it} + \epsilon_{it} \tag{1}$$

$$r_{it} = \gamma_0 + \gamma_1 S_{it} + \gamma_2 \Delta F_{it} + \upsilon_{it}. \tag{2}$$

We analyze buy-and-hold returns r_{it} for firm i in quarter t over two horizons: an announcement window starting three days before to one day after the announcement date of quarterly earnings, or a longer horizon starting three months before to the day after the announcement. The current quarter's surprise for the firm divided by the stock price on the day prior to announcement is denoted by S_{it}. The forecast revision, ΔF_{it}, denotes the difference between the most recent pre-announcement consensus estimate and the estimate three months before announcement, all scaled by the stock price on the pre-announcement day. The variable ΔF_{it} captures all the revisions in the consensus forecast over the current quarter. For a large fraction of the sample the surprise is zero, thereby attenuating the estimated slope from the regressions. To get a sharper reading of the association between returns and surprises, therefore, we apply the regression to firms where actual earnings differ from the consensus by at least two cents.

Table 4 reports the time-series averages of the regression slopes as well as the cross-sectional standard deviation of returns over the respective horizon. There is a striking increase over the sample period in the cross-sectional dispersion of returns during the announcement window (part I). It starts at 5.28 percent at the beginning of the sample period, grows to 12.31 percent over 1999–2000 and is 13.96 percent at the end of the period. The enhanced variability in announcement window returns is suggestive of the increasing importance that investors have attached in recent years to firms' earnings. Note that the market has become more

sensitive even though our evidence indicates that earnings surprises are, to an increasing extent, manipulated by firms and analysts.

The average regression slopes for earnings surprises in the regression for five-day announcement window returns climbs steadily up to the late 1990s. In the first subperiod the average slope is 0.3382, while during the heyday of the stock market boom from 1999–2000 the average slope is 3.7907. While the regression slope increases over this period the economic impact may not go up correspondingly, because the cross-sectional dispersion of surprises is smaller in the later subperiods (see Table 1). To get at the underlying economic penalties and benefits from surprises, we calculate the difference between the return when the fitted regression is evaluated at the 90-th percentiles of the regressors, and the return evaluated at the 10-th percentiles of the regressors. The predicted spreads confirm our finding that even though the dispersion of surprises has shrunk over time the overall impact has increased. In the 1999–2000 subperiod, for example, the regression yields a large difference in returns of 4.01 percent, compared to 0.72 and 2.17 percent in the first and second subperiods, respectively. These results help to explain the motivation that firms and analysts have in recent years to manage earnings surprises.

After taking into account the surprise, there is virtually no relation between announcement window returns and the revision from what the forecast was three months ago. The slope coefficients are small and not statistically significant, as are the predicted return spreads. Whatever impact the revisions have is already incorporated into the stock price prior to the announcement date.

To confront the importance of earnings surprises versus estimate revisions, we have to look at longer horizons. Accordingly, in part II of the table we examine returns over a period starting three months before and ending one day after the announcement date. To control for overall market movements we match each stock with a portfolio based on its rank by size and book-to-market ratio, and deduct the matched portfolio's buy-and-hold return from the stock's buy-and-hold return.[8] The regressions in part II of Table 4 are based on

[8]The reference portfolios comprise all domestic common equities listed on the New York, American and Nasdaq markets with available data on the CRSP and Compustat files. At the end of June each year stocks are ranked by market value of common equity and placed in one of three groups: the largest 200, the next largest 800, and the remaining 2000. Within each size category, stocks are ranked by their book to market value of common equity from high (value) to low (growth) and split into two groups with roughly equal market capitalization. This yields six size-value control portfolios. The classification procedure follows Chan, Karceski and

these excess returns. The incentive to adjust downward strategically analysts' forecasts should be stronger if the market's response, at least in the short term, to a revision is weaker than its response to a surprise (so $\gamma_1 > \gamma_2$ in equation (2)).

Both S and ΔF influence returns over a longer horizon. However, the coefficient on earnings surprise is generally larger than the coefficient on forecast revision. The average coefficient on earnings surprise over the whole sample period is 3.8635, while the coefficient for forecast revision is 3.2431. Both are reliably different from zero over the whole sample period.[9] During the peak from 1999–2000 both coefficients take on larger values than the overall averages; however the coefficient on the surprise variable is still larger (7.0002 versus 5.8871 for the revision variable). To assess the full impact of surprises and revisions, we have to take into account the differences in the cross-sectional dispersions of the two variables. In this regard, the return spread associated with earnings surprises dominates the spread associated with forecast revisions. Over the entire sample period the spread is 6.80 percent for the earnings surprise variable, and 2.68 percent for forecast revisions. Although the spreads for both variables are higher during the peak from 1999–2000, the spread for earnings surprise is still larger than the spread for revisions (8.01 percent versus 3.60 percent).

The broad conclusion from the regressions is that there are potential payoffs, at least in the short run, to managing surprises. The stock price impact of surprises dominates the impact of forecast revisions.

Lakonishok (2000), and is meant to reflect the behavior of the widely-used Russell indexes.

[9] Another interpretation of model (2) is as follows. The surprise as a percent of the pre-announcement price is $S = \frac{A-FLAST}{PLAST}$ where A is actual earnings, $FLAST$ is the latest consensus estimate before the announcement, and $PLAST$ is the price one day before the announcement. The estimate revision as a percent of the pre-announcement price is $\Delta F = \frac{FLAST-FFIRST}{PLAST}$ where $FFIRST$ is the consensus three months before announcement. Manipulation of equation (2) yields

$$r_{it} = \gamma_0 + (\gamma_1 - \gamma_2)S_{it} + \gamma_2 \frac{A - FFIRST}{PLAST} + \upsilon_{it}. \tag{3}$$

In this regard $\gamma_1 - \gamma_2$ measures the impact of the percentage earnings surprise on returns given the news about earnings as represented by the percentage forecast error based on the estimate three months ago. The impact of earnings news relative to original expectations $FFIRST$ is measured by γ_2. We work with model (2) as formulated in the text because it facilitates an evaluation of the penalty from revising the estimate down versus the reward from under-estimating actual earnings. Bartov et al. (2002) provide estimates of equation (3).

These results also fit in with the rise in the management of surprises observed during the late 1990s, when valuations were particularly extravagant. An intriguing corollary to this is that the market apparently takes the surprise at face value, and does not see through the increasing tendency of firms and analysts to make strategic adjustments to actual earnings or estimates in order to paint a rosy picture of earnings results.[10]

IV. The persistence of earnings surprises

Investors' attention is especially drawn to stocks that have a consistent record of meeting or exceeding expectations. The classic example of a stock that has delivered an unbroken string of positive surprises, and become highly sought after by investors, is Microsoft. In a related context, Chan, Karceski and Lakonishok (2002) document that stocks with a consistent history of high past growth in earnings are handsomely rewarded by investors. In this section we narrow our focus to firms that are associated with favorable surprises for several consecutive quarters. We argue that such cases represent instances where the management of surprises takes on an added importance.

If surprises are managed to an equal extent across all firms, the frequency of non-negative surprises will be high but there will be no excess persistence under our measure (the observed number and the expected number of consecutive non-negative surprises will be equal). Excess persistence arises if a subset of companies is more intensively engaged in managing surprises than the population at large. In these cases analysts and managers are attempting to avoid disappointments at almost any cost. Given the rich valuations commanded by many companies during the late 1990s, our conjecture is that during this period the incentive to avoid negative surprises is particularly acute, and hence the likelihood of excess persistence is higher. By the same token, persistence in the later subperiods should be exacerbated among growth firms compared to value firms, because the inflated valuations of many growth stocks probably left them most vulnerable to any surprises.

[10] It could be argued that, irrespective of the relative magnitude of the market's response to revisions and surprises, managers and analysts pay more heed to what happens when actual earnings are reported. Individual analysts' updates of their estimates are spread out over the quarter, so the attention of investors and the media to revisions is diffuse. In contrast a company's announcement of earnings is likely to receive concerted media coverage, so the focus of investors and journalists is more intense.

A. Continuations in earnings surprises

Our procedure for uncovering persistence in earnings surprises follows Chan, Karceski and Lakonishok (2002). At the end of each quarter we consider all stocks that survive over a given future horizon. We use horizons from one (the quarter that has just ended) to ten quarters. For each horizon we find the proportion of companies that have earnings surprises that are zero or higher in each quarter over the horizon. This proportion is compared to the proportion that would be expected if a non-negative surprise is random and occurs independently across quarters. For the expected proportion in a given quarter we use the empirical proportion of non-negative surprises realized each quarter in the sample period. That is, at the end of quarter q the expected proportion of firms with non-negative surprises over each of the next H quarters is given by

$$\Pi_{h=1}^{H} p_{q+h-1} \tag{4}$$

where p_j is the proportion of firms that have non-negative surprises realized in quarter j. The calculations are repeated at each quarter-end, and the actual and expected proportions are averaged over all quarter-ends.

Panel A of Table 5 describes the results based on all firms. For the overall sample period, on average 59.3 percent of the firms experience a non-negative surprise in a given quarter. Since we calibrate the expected proportion from the realized sample proportions, the expected and realized proportions match for a horizon of one quarter. Firms that experience four consecutive quarters of non-negative surprises make up 25.8 percent of the sample on average. We should observe 14.9 percent of firms accomplish this solely by chance, so the observed incidence is 10.9 percent higher than expected. Firms that have a string of eight consecutive non-negative quarterly surprises constitute 12.5 percent of the sample, which is 9.5 percent more than expected by chance.

The excess persistence above the expected level generally rises over the subperiods. In the first subperiod, for example, the persistence at four quarters is 6.2 percent more than expected, and at eight quarters is 2.9 percent more than expected. As the relative valuations of growth and value stocks diverge more and more sharply over time, the differences between the observed and expected frequencies of consecutive non-negative surprises also mount. In the late 1990s, the difference at four quarters is 17.3 percent and at eight quarters is 21.1 percent. The trend suggests that the management of surprises becomes more intense in a

period of rising markets for at least some firms, including perhaps those who are most vulnerable to shifts in investor exuberance.[11]

Panels B and C of Table 5 replicate the analysis for value and growth firms respectively. The definitions of these categories are as in Table 2. In the case of value stocks, persistence over the expected level is meager. Even at the market peak during the late 1990s, the difference between the actual and expected frequencies of four consecutive non-negative surprises is 2 percent. For these firms, at least, there is no differential incentive to manage surprises. On the other hand, the differences between actual and expected frequencies are large for growth firms, particularly in the late 1990s. Growth firms enjoy non-negative surprises for four quarters in a row by 35.4 percent more than expected. The corresponding differences during the first sub-period for growth firms are much lower. The percentage of growth firms who generate non-negative surprises for eight quarters consecutively during the late 1990s is especially striking (51.2 percent, or a margin of 42.5 percent above expected). This is a strong clue that for a substantial number of growth firms during the peak of the bull market, negative earnings surprises were viewed as intolerable, and the management of surprises was an overriding concern.

B. Persistence and valuations

This section investigates whether investors anticipate continuations in earnings surprises, and whether they reward companies that consistently meet or beat expectations. We do this by seeing whether firms that display consecutive surprises of the same sign are associated with different valuations either on an ex ante or an ex post basis. This analysis also underscores the motivations that firms and analysts have to manage surprises.

We take the ratio of book to market value of equity as our valuation measure. This variable is widely employed: for example, Chan, Karceski and Lakonishok (2002) use it to examine how the market responds to consistently high growth in earnings. It is also relatively well-behaved in that it sidesteps issues involving

[11] We obtain qualitatively similar results if we look at firms with consecutive quarterly surprises that are strictly positive. For example, over the whole sample period the fraction of firms that beat the consensus estimate for four quarters in a row is 15 percent or 8.5 percent more than expected. In the 1999–2000 subperiod the corresponding fraction for four consecutive positive surprises is 28 percent, or 16 percent more than expected.

negative earnings or low base values of earnings that bedevil other indicators such as the price-to-earnings ratio. Specifically, at each calendar quarter-end we identify the stocks that experience runs of consecutive non-negative quarterly surprises (the run can be from one to ten quarters in length). We measure the median book-to-market ratios for each sample of stocks, both at the beginning of the run and at the end of the run. As a basis of comparison, we perform the same calculations for stocks that do not achieve consecutive runs of non-negative surprises. This procedure is repeated each quarter, and the statistics averaged over all quarter-ends are reported in Table 6.

Table 2 suggests that non-negative surprises are more prevalent for growth firms. This finding is reinforced in Table 6. In any given quarter the firms that experience a non-negative surprise in that quarter have a beginning median book-to-market ratio of 0.45, compared to 0.52 for firms with a negative surprise. More generally, stocks that are associated with runs of consecutive non-negative surprises tend to have somewhat lower ex ante book-to-market ratios than firms that do not achieve runs. Over the entire sample period, for example, firms that have four consecutive non-negative surprises have a median book-to-market ratio of 0.40 at the beginning, compared to 0.48 for firms that do not enjoy runs of four consecutive non-negative surprises. A possible explanation for this is that the firms that subsequently have consecutive non-negative surprises already have a history of non-negative surprises.

The change in book-to-market ratios from the beginning to the end of the horizon indicate how market valuations respond to a run of successive non-negative surprises. Although a single quarter where the surprise is non-negative has no effect on the book-to-market ratio, valuations show a response after longer runs of surprises. Over a horizon of four quarters, for example, firms that enjoy a streak of consecutive non-negative surprises start with a median book-to-market ratio of 0.40 (or are valued at roughly 2.5 times book value) while the comparison sample has a median ratio of 0.48 (or trade at about 2 times book). At the beginning, then, the firms that subsequently enjoy a run of four quarters are trading at 1.2 times ($\frac{2.5}{2}$) the multiple of the comparison sample. At the end of the streak their valuations are 1.4 times the multiple of the comparison group. Investors become even more enthusiastic about stocks that enjoy eight successive quarters of non-negative surprises: their relative valuations with respect to the comparison sample climb from 1.2 times at the beginning to 1.7 times at the end.

Chan, Karceski and Lakonishok (2000) find that the stock market performance of value and growth stocks diverged widely during the late 1990s. There is related evidence on this in Table 6. In the 1999Q1–2000Q1 subperiod, for example, stocks that enjoy four quarters of non-negative surprises are rewarded at the end of their streak with a relative multiple of 1.8 ($\frac{0.49}{0.28}$). The stark differences in relative valuations provide another hint that the incentives of managers and analysts to manage surprises were exacerbated during the late 1990s.

Our results on the valuation impact of quarterly earnings surprises echo those on long-term earnings growth in Chan, Karceski and Lakonishok (2002). Chan et al. (2002) find that ex ante valuation ratios do not predict future long-term growth in earnings. Instead, investors tend to extrapolate past growth and bid up the values of firms that display persistence in past growth. In the present context, the strategic adjustment of forecasts by analysts exaggerates the degree of persistence in quarterly surprises. However, investors appear to overlook this distortion and handsomely reward stocks that consistently match or exceed estimates.

V. Predicting non-negative earnings surprises

We can formalize the degree to which there is persistence in quarterly surprises, as well as the contributing role of analyst behavior, as follows. In particular, we develop a probit model for the incidence of a non-negative surprise, based on the sign of previous quarterly surprises individually as well as collectively, whether analysts have revised upward their estimates over the reporting period, and the stock's value-growth orientation. Define the variable y_{it} such that it takes the value of one if firm i's earnings surprise in quarter t is non-negative, and zero otherwise. The full model is:

$$\begin{aligned} y_{it} &= \gamma_0 + \gamma_1 S^+_{it-1} + \gamma_2 S^+_{it-2} + \gamma_3 S^+_{it-3} + \gamma_4 S^+_{it-4} + \gamma_5 RUN4_{it-1} \\ &\quad + \gamma_6 \Delta F^+_{it} + \gamma_7 VALUE_{it-1} + \gamma_8 GROWTH_{it-1} + \epsilon_{it}. \end{aligned} \tag{5}$$

The explanatory variable S^+_{t-j}, $j = 1, ..., 4$ takes the value of one if the firm's earnings surprise in quarter $t - j$ is non-negative and zero otherwise. Similarly $RUN4_{t-1}$ takes the value of one if all four previous quarterly earnings surprises are non-negative and zero otherwise; ΔF^+_t is one if the difference between the consensus estimate immediately prior to the current quarterly announcement date and the consensus one

month ago is non-negative, and otherwise the variable is zero. For stocks whose book-to-market value of equity as of the prior quarter is ranked above the median for NYSE firms, the variable $VALUE_{it-1}$ takes the value of one and is zero otherwise. The variable $GROWTH_{it-1}$ equals one if the stock's book-to-market value of equity as of the prior quarter is positive and is below the 25-th percentile of NYSE stocks, and equals zero otherwise. We allow for persistence by including the sign of the four most recent past surprises. In addition we hypothesize that a string of consecutive surprises of the same sign is an indication that managers and analysts are more prone to managing surprises, raising the likelihood that a negative surprise will be forestalled. The strategic adjustments of estimates over the current reporting period provides a further clue as to whether the surprise will be favorable. Analysts are less likely to raise their estimates if this would endanger the chances of a non-negative surprise. Finally, the high valuations of growth firms leave them more exposed to the penalties of a negative surprise, and they are also more likely to be current or potential investment banking clients. As a result, their incentives to manage surprises are larger, raising the ex ante probability of a non-negative surprise. The model is estimated at each calendar quarter-end. Table 7 reports statistics based on the time series of the estimated coefficients.

As a starting point, part I of Table 7 estimates the model using information only about past surprises and forecast revisions. Over the entire sample period the probability of a non-negative surprise is positively and reliably related to each of the explanatory variables. In particular, the occurrence of a run of consecutive non-negative surprises is strongly related to the likelihood of a subsequent non-negative surprise. The slope coefficient is 0.1276 with a t-statistic of 4.27. The slope coefficient for estimate revisions is also reliably positive, so prior adjustments in analyst estimates reliably predict non-negative surprises. The predictability in the incidence of non-negative surprises is consistent with the argument that managers and analysts manage surprises so as to avoid disappointments and give a favorable impression of the firm's earnings performance. To add weight to this argument, the predictive power of runs and estimate revisions is enhanced over the 1999–2000 subperiod. The coefficients of both variables are about 0.19, larger than the estimates over the overall period. As well, the chi-square statistic for the joint significance of the variables in the model is markedly higher during the late 1990s, indicating that a non-negative surprise became much more predictable in those years.

Part II of Table 7 extends the model beyond lagged surprises and forecast changes to include the firm's book-to-market orientation. In line with our results from the earlier tables, the likelihood of a non-negative surprise is sharply higher for growth firms than for value firms. This is particularly so at the height of market exuberance during the 1999–2000 subperiod. The average coefficient for the growth indicator in quation (5) is 0.2157 during this subperiod, compared to the value indicator's coefficient of -0.2294 (the t-statistics are 4.19 and -6.65 respectively). As another perspective on the difference between growth and value firms, we evaluate equation (5) using the estimated coefficients from part II of Table 7. In the case of a value firm whose four previous surprises are negative and where the forecast revision is negative, the model yields an estimated probability that the next quarterly surprise is non-negative of about 32 percent for the overall period. For a growth firm whose four previous surprises are all non-negative and where the forecast revision is upward, the corresponding estimated probability is 81 percent for the overall period. The difference is particularly stark in the 1999–2000 subperiod when relative valuations were most out of line: for the same comparison the probability is 38 percent for value firms and as much as 93 percent for growth firms.

VI. International evidence

Compared to the U.S. market, the investment banking industry abroad is less developed, and the volume of restructuring, initial public offering and other underwriting activity has generally been lower. Further, the industry is less competitive. On their part analysts are much less visible and did not achieve the same celebrity status as their U.S. brethren. Accordingly, the potential conflicts of interest that undermine analyst research tend to be weaker in foreign markets. As a result, the experience of non-U.S. markets provides a valuable test case to check for analyst biases induced by conflicts of interest.

In particular, we hypothesize that there should be a less pronounced shift over time in the distribution of earnings surprises in foreign markets. To verify this hypothesis we examine the set of foreign stocks covered on the International IBES file. Quarterly earnings reports are in general not available for foreign companies, so we work with annual earnings announcements. For each firm, we construct a consensus estimate given by the median of all valid outstanding analyst forecasts (we continue to require that the stock must have at least

five outstanding forecasts). A further complication for the international sample is that in a large number of cases earnings are released with a substantial delay after the fiscal year-end. It is not uncommon, for example, for the release date to follow the end of the fiscal year by six months or more. By the time earnings are publicly announced at this late date, investors probably have a good idea of what actual earnings will turn out to be. Spot checks of the data, for example, yield numerous instances where the most recent forecast of nearly every analyst prior to the announcement date exactly matches actual earnings. The implicaton is that many individuals already have access to the information on actual earnings before the public announcement date. To circumvent this issue we take the consensus forecast one month before the announcement date, when there is potentially still some uncertainty as to actual earnings.[12]

Table 8 provides results on the percentage of positive, negative and zero surprises for the overall period (1987–2001) as well as for subperiods. To ease comparisons with the U.S. evidence, we use annual subperiods that correspond as closely as possible to those in the earlier tables (although note that for the sake of statistical efficiency in Table 8 we average the years 1998 and 1999, and the last subperiod comprises the years 2000–2001). We also report the median surprise scaled by the absolute value of the consensus estimate. On average there are 2776 firms per year for the entire sample of non-U.S. firms.

In sharp contrast to the U.S., there is no evidence of a predisposition to positive surprises in the pooled sample of foreign markets (panel A). The median surprise (relative to the absolute value of the consensus) in every subperiod is negative. Moreover the distribution of surprises is fairly stable over time. During the first subperiod (1987–89), for example, positive surprises occur in 39.40 percent of the cases while negative surprises account for 49.82 percent of the cases. Over the 1998–99 subperiod the corresponding percentages are 40.41 and 57.92 percent respectively. In short, the distribution for the pooled international sample is reminiscent of what is observed for the U.S. in the 1980s, when conflicts of interest were less pervasive in the analyst community.

The other panels of Table 8 break out the international sample into subsets which resemble to a greater

[12]We also replicate our analysis using the consensus two months before the announcement date, as well as the consensus immediately prior to the announcement date. The results do not indicate a pronounced tilt toward positive surprises in foreign markets in general, nor in the more recent subperiod.

or lesser extent market conditions in the U.S., so as to sort out more clearly the role of analyst conflicts of interest. Panel B reports the distribution of surprises for the major developed markets, as represented by countries in the Morgan Stanley Capital International EAFE (Europe, Australia and Far East) index.

Of the individual countries in the EAFE index, the Japanese market makes up the dominant component (in terms of the number of companies covered by IBES as well as market capitalization) over much of this period. However, the performance of the Japanese equity market during the 1990s was generally lackluster, and investment banking activity did not surge as in the U.S. As a result, there may have been less compelling pressures to manage earnings surprises. In line with this conjecture, the distribution of earnings surprises in Japan (panel C) does not show any signs of an increased predisposition to positive surprises over time.

On the other hand, the U.K. market, as well as many European markets, enjoyed a boom during the 1990s, especially in the technology and telecommunication sectors. They may thus have witnessed, as in the U.S., a rise in investor exuberance as well as elevated valuations. Panel D provides results for stocks drawn from the Continental European markets within EAFE. The proportion of negative surprises exceeds fifty percent in every subperiod, so the median surprise is less than zero in all the subperiods. Even during the peak years of 1998–99, 50.99 percent of the surprises are negative. In this respect, the tilt toward positive surprises witnessed in the U.S. does not extend to the continental European markets. While the incidence of positive surprises in the European countries experiences some signs of a shift, the break is much milder compared to the U.S. evidence. The percent of positive surprises in panel D, for example, stands at 36.77 percent during the late 1980s and rises to 47.06 percent in 1998–99.

The U.K. sample (panel E) is particularly interesting because the U.K. and U.S. share many similar market features and institutional arrangements. In particular, the conflicts of interest prevalent in the U.S. investment banking industry might also exist in the U.K. In the U.K. the proportion of positive surprises rises from 44.96 percent in the late 1980s to 59 percent in 1998–1999. There is hence some evidence supportive of the view that firms and analysts in the U.K., like their counterparts in the U.S., have become more prone to managing surprises.

VII. Conclusion

As the boom in the equity market of the 1990s faltered, security analysts in the U.S. came under increasing fire for the quality of their research. The popular perception is that the incentives for analysts have shifted, so that instead of being impartial providers of unbiased opinions, they have become cheerleaders for the firms they cover. One hypothesis is that because research does not in general directly generate revenues for brokerage firms, analysts are susceptible to conflicts of interest that may lead to biases in analyst opinions. Their impartiality may be compromised because they are also expected to secure underwriting and other investment banking business, so they have an incentive to paint a flattering picture of a company's earnings performance.

Analyst research may be tilted to favor a stock in several ways. Long-term growth rates in earnings or price targets may be overstated, the stock may receive a bullish buy recommendation, or an analyst may adjust forecasted earnings to ensure that actual earnings do not come up short of the estimate. Given the wide attention in the media to stocks' earnings performance, earnings forecasts provide a natural forum for examining analyst biases. Moreover, analysts explicitly specify the horizon over which their estimates apply and actual earnings are released four times a year, making the detection of any biases relatively more straightforward.

We check for biases induced by analyst conflicts of interest by tracking the behavior over time in quarterly earnings surprises (the difference between actual earnings and the consensus forecast of analysts). Our results indicate that the cross-sectional distribution of earnings surprises in the U.S. has undergone a pronounced shift. In particular, there is a rise in the proportion of non-negative earnings surprises over time, from 48.88 percent in the late 1980s to 75.59 percent in 1999–2000. The coincidence of this shift with the climb in the equity market as well as in underwriting activity is one clue that analyst bias due to conflicts of interest is a culprit here. More generally, this evidence suggests an expansion over time in the management of earnings surprises. This may take the form of firm managers' smoothing of reported earnings, as well as analysts' adjustments of their estimates (possibly with the guidance of firms) to yield good news upon the announcement of actual results.

Our evidence on analyst conflicts of interest is sharpened by narrowing the focus to two sets of firms: growth firms, and firms that have experienced several consecutive quarters of non-negative surprises. Compared to value firms, growth firms are more likely to raise fresh capital and to carry out mergers or acquisitions. Analysts thus have stronger incentives to accomodate the interests of these potentially lucrative investment banking clients. We confirm that growth firms are more likely to be associated with non-negative surprises, compared to value firms. During 1999–2000, for example, on average 84.91 percent of the firm-quarter surprises are positive (compared to 52.96 percent during 1984–1989) for growth firms. Changes in the distribution are comparatively milder for value firms (the proportion of non-negative surprises is 47.90 percent in the late 1980s and 65.81 percent in 1999–2000).

Firms that experience several consecutive quarters of non-negative surprises are particularly likely to be instances of surprise management by firm managers and analysts. We document that there are more cases of such runs of surprises than can be attributable to chance, and there is an upward trend in the frequency of runs. During 1999–2000, the number of stocks that are expected to have six consecutive non-negative surprises, to take an example, due solely to chance is 16.6 percent. The actual frequency of such cases is 38.2 percent, or more than twice the expected frequency. The results from a probit model confirm that the probability of a non-negative surprise can be reliably predicted from a firm's value-growth orientation, the sign of the most recent surprise, the occurrence of a run, and the direction of the most recent consensus revision. In particular the predictive power of the sign of the forecast revision suggests that managers and analysts are opportunistically adjusting earnings estimates in order to avoid disappointments.

To flesh out the underlying motives for managers and analysts to engage in such behavior, we also explore the market's response to earnings surprises, forecast revisions and to runs of surprises. We confirm that the response of returns to surprises has been heightened in recent years. The average estimated slope in a regression of announcement window returns on the earnings surprise is 3.7907 in 1999–2000, compared to 0.3382 in 1984–1989. Since the impact of an announcement surprise dominates the impact of a previous forecast revision, there is room for managers and analysts to engage in strategic manipulation of estimates over a quarter. Moreover, investors handsomely reward stocks that achieve runs of non-negative surprises. Stocks that enjoy eight consecutive quarters of non-negative surprises see their valuations (price-to-book

ratio relative to stocks not subject to this experience) rise from 1.2 times at the outset to 1.7 times at the end. The overall conclusion is that the incentives to manipulate actual and forecasted earnings so as to steer clear of disappointments have been exacerbated in recent years.

A final, persuasive piece of evidence comes from outside the U.S. market. The links between investment banking and analyst research are in general weaker in foreign markets, so they provide a natural test case. For the sample of foreign markets as a whole, the distribution of earnings surprises does not display an increasing disposition to positive surprises, unlike the U.S. data. On the other hand, the U.K. enjoyed a booming equity market in the late 1990s, especially for the technology and telecommunication sectors, and offers close parallels to the U.S. in terms of investment banking activity and the media attention given to analysts. Tellingly, of the foreign markets the U.K. displays the strongest signs of an increased disposition to positive surprises. The proportion of positive surprises climbs from 44.96 percent in the late 1980s to 59 percent in 1999–2000. The non-U.S. results thus point a finger at the role of analyst conflicts of interest in generating biases in earnings forecasts.

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Table 1
Summary statistics and frequency distribution of earnings surprise, all firms

Earnings surprise S for each firm in each quarter is the difference between actual quarterly earnings per share and the most recent consensus forecast prior to the announcement date. Earnings surprises are measured in cents per share (based on number of shares outstanding as of the earnings announcement date), and are computed for all firms with data on the historical IBES file with forecasts from at least five analysts. Numbers reported in the table are averages over all quarters from 1984Q2 to 2001Q1. In panel B, cases are counted as small positive if the surprise relative to the absolute value of forecast earnings F satisfies $0 < \frac{S}{|F|} \leq 0.05$ or $0 < S \leq 1$; cases are counted as small negative if $-0.05 \leq \frac{S}{|F|} < 0$ or $-1 \leq S < 0$.

A. Summary statistics

Sample period	Mean	Median	Standard deviation	25th percentile	75th percentile
84Q2–89Q4	-5.80	-0.86	37.76	-8.71	4.78
90Q1–94Q4	-1.93	0.02	16.69	-4.37	3.28
95Q1–98Q4	0.54	0.76	7.87	-0.98	2.79
99Q1–00Q1	1.00	1.00	8.19	-0.20	3.40
00Q2–01Q1	0.06	0.75	10.00	-0.88	3.15
Overall	-2.32	0.01	20.72	-4.53	3.68

B. Percentage of positive, negative, zero & small surprises

Sample period	Percentage of cases: Positive	Negative	Zero	Small positive	Small negative
84Q2–89Q4	43.30	51.13	5.58	13.98	13.32
90Q1–94Q4	46.36	43.92	9.73	16.92	12.93
95Q1–98Q4	53.91	29.81	16.28	24.32	11.29
99Q1–00Q1	59.48	24.41	16.11	22.58	8.17
00Q2–01Q1	54.95	28.45	16.60	20.94	9.30
Overall	48.57	40.69	10.74	18.32	12.11

C. Distribution of earnings surprise (cents per share)

Sample period	Percentage of cases: Below -2	$-2 \leq S < -1$	$-1 \leq S < 0$	$0 \leq S \leq 1$	$1 < S \leq 2$	Above 2
84Q2–89Q4	31.12	14.49	5.51	11.08	14.04	23.76
90Q1–94Q4	21.37	14.95	7.59	19.12	18.96	18.01
95Q1–98Q4	10.80	11.25	7.76	32.03	24.09	14.06
99Q1–00Q1	10.07	7.86	6.48	32.01	26.85	16.73
00Q2–01Q1	12.38	9.10	6.97	31.46	24.45	15.65
Overall	20.82	13.06	6.81	21.11	19.41	18.79

Table 2
Frequency distribution and summary statistics of
earnings surprise, classified by value or growth

At the beginning of each calendar quarter, all firms with data on book and market value of equity are ranked and sorted by the ratio of book-to-market value of equity. Firms with positive book-to-market ratios and ranked in the top 50 percent based on NYSE breakpoints are classified as value firms; firms with positive book-to-market ratios and ranked in the bottom 25 percent are classified as growth firms. Within each classification, the earnings surprise for a firm in a quarter is the difference between actual quarterly earnings per share and the most recent consensus forecast prior to the announcement date. Earnings surprises are measured in cents per share (based on number of shares outstanding as of the earnings announcement date), and are computed for all firms with data on the historical IBES file with forecasts from at least five analysts. Numbers reported in the table are averages over all quarters from 1984Q2 to 2001Q1. Cases are counted as small positive if the surprise, S relative to the absolute value of forecast earnings F satisfies $0 < \frac{S}{|F|} \leq 0.05$ or $0 < S \leq 1$; cases are counted as small negative if $-0.05 \leq \frac{S}{|F|} < 0$ or $-1 \leq S < 0$.

Sample period	Percentage of cases: Positive	Negative	Zero	Small positive	Small negative	Mean	Median	Standard deviation
				A. Value firms				
84Q2–89Q4	44.87	52.10	3.03	10.72	9.55	-9.26	-1.56	49.42
90Q1–94Q4	46.51	47.44	6.05	13.04	10.55	-3.06	-0.24	20.81
95Q1–98Q4	51.46	36.57	11.97	20.95	11.42	0.08	0.55	9.24
99Q1–00Q1	51.57	34.19	14.24	18.24	10.11	0.10	0.70	9.39
00Q2–01Q1	46.25	39.66	14.08	16.54	9.82	-1.72	0.25	11.81
Overall	47.48	45.03	7.50	14.70	10.34	-4.11	-0.40	26.39
				B. Growth firms				
84Q2–89Q4	43.54	47.03	9.43	18.06	17.26	-1.55	-0.22	18.47
90Q1–94Q4	47.11	38.67	14.22	21.21	15.87	-0.59	0.24	10.25
95Q1–98Q4	57.39	22.58	20.03	26.96	10.22	0.95	1.00	6.11
99Q1–00Q1	67.10	15.08	17.81	26.03	5.76	1.74	1.20	6.51
00Q2–01Q1	62.12	19.00	18.88	22.37	7.90	1.41	1.25	6.96
Overall	50.67	34.82	14.50	21.92	13.80	-0.27	0.39	11.59

Table 3
Frequency distribution and mean of earnings surprise, classified by forecast errors relative to consensus estimate one and three months prior to announcement

Each calendar quarter, the earnings forecast error (actual quarterly earnings per share minus the consensus estimate) is calculated for all firms with data on the historical IBES file with forecasts from at least five analysts. Part I of the table reports results for all firms. In panel A, the earnings forecast error is based on the consensus estimate three months prior to the earnings announcement date; in panel B the earnings forecast error is based on the consensus estimate one month before the announcement date. Firms are classified into two groups: those with forecast errors greater than zero, and those with strictly negative errors. Within each classification, earnings surprise for a firm in that quarter is the difference between actual quarterly earnings per share and the consensus forecast the day before the announcement date. Earnings surprises are measured in cents per share (based on the number of shares outstanding as of the announcement date). In part II of the table, firms are ranked by the ratio of book to market value of equity and classified into two groups. Firms with positive book-to-market ratios and ranked in the top 50 percent based on NYSE breakpoints are classified as value firms; firms with positive book-to-market ratios and ranked in the bottom 25 percent are classified as growth firms. Numbers reported in the table are averages over sub-periods and the whole period from 1984Q2 to 2001Q1.

Part I. All firms

Sample period	% of surprises:				% of surprises:			
	Positive	Negative	Zero	Mean	Positive	Negative	Zero	Mean
	A. Forecast error based on estimate 3 months ago							
	Positive or zero error				Negative error			
84Q2–89Q4	81.97	9.51	8.52	11.78	13.67	82.86	3.47	-20.79
90Q1–94Q4	82.51	4.76	12.72	6.28	17.11	73.46	9.44	-8.80
95Q1–98Q4	80.30	2.67	17.03	3.81	20.70	61.87	17.43	-3.52
99Q1–00Q1	82.10	1.86	16.04	3.96	23.14	58.68	18.19	-4.00
00Q2–01Q1	81.67	2.21	16.12	4.04	20.36	60.68	18.96	-5.17
Overall	81.73	5.51	12.76	7.26	17.43	72.07	10.50	-11.05
	B. Forecast error based on estimate 1 month ago							
	Positive or zero error				Negative error			
84Q2–89Q4	87.49	2.49	10.02	12.50	3.89	94.39	1.71	-21.32
90Q1–94Q4	83.81	1.60	14.59	6.46	5.60	89.80	4.60	-10.53
95Q1–98Q4	79.06	1.05	19.90	3.66	8.75	80.81	10.44	-5.13
99Q1–00Q1	80.25	0.64	19.12	3.83	9.69	80.72	9.59	-5.92
00Q2–01Q1	79.32	0.63	20.04	3.87	9.45	79.90	10.64	-7.13
Overall	83.41	1.64	14.95	7.50	8.29	87.99	5.72	-12.37

Part II. Value and growth firms

Sample period	% of surprises: Positive	Negative	Zero	Mean	% of surprises: Positive	Negative	Zero	Mean
	A. Value firms, based on estimate 3 months ago							
	Positive or zero error				Negative error			
84Q2–89Q4	86.39	9.64	3.98	17.63	17.12	80.19	2.69	-30.13
90Q1–94Q4	87.07	6.06	6.87	9.97	19.05	74.32	6.64	-12.59
95Q1–98Q4	83.73	3.51	12.76	4.91	22.57	65.14	12.29	-4.44
99Q1–00Q1	81.68	2.60	15.73	4.77	21.36	64.21	14.44	-4.80
00Q2–01Q1	81.73	2.64	15.63	4.85	19.81	66.09	14.10	-6.59
Overall	85.34	6.21	8.44	10.69	19.44	72.92	7.64	-15.68
	B. Growth firms, based on estimate 3 months ago							
	Positive or zero error				Negative error			
84Q2–89Q4	75.57	10.37	14.06	7.00	11.01	83.76	5.24	-10.60
90Q1–94Q4	78.47	3.90	17.63	3.74	15.04	72.52	12.45	-4.91
95Q1–98Q4	78.25	1.99	19.76	2.95	19.39	58.31	22.30	-2.56
99Q1–00Q1	82.58	1.08	16.34	3.37	26.20	48.94	24.86	-2.79
00Q2–01Q1	81.24	1.64	17.12	3.35	21.88	54.19	23.93	-3.01
Overall	77.90	5.30	16.80	4.61	15.92	70.16	13.91	-6.01

Table 4
Sensitivity of returns to earnings surprise

Each calendar quarter, the following cross-sectional regressions are estimated:

$$r_{it} = \gamma_0 + \gamma_1 S_{it} + \epsilon_{it}$$

$$r_{it} = \gamma_0 + \gamma_1 S_{it} + \gamma_2 \Delta F_{it} + \upsilon_{it}.$$

Buy and hold returns r_{it} for each firm i in quarter t are from three days before to one day after the announcement of quarterly earnings (part I of the table), or from three months before to one day after the announcement of quarterly earnings (part II of the table). Returns are in excess of the return on a control portfolio of stocks matched by size and book-to-market. The earnings surprise, S_{it}, is the actual quarterly earnings per share minus the most recent consensus estimate prior to the announcement date, scaled by the stock price the day before the announcement date; the estimate revision ΔF is the difference between the most recent consensus estimate prior to the announcement date and the consensus three months ago, scaled by the stock price the day before the announcement date. The regressions are based on all firms with data on the historical IBES file with forecasts from at least five analysts, and where actual and consensus forecast earnings differ by at least two cents in absolute value. In each quarter, the difference between the 90th and 10th percentiles of the distribution of S or ΔF is multiplied by the corresponding slope estimate to give the predicted return spread. The cross-sectional standard deviation of excess returns over the respective horizons is also reported. Numbers reported in the table are averages over subperiods and all quarters from 1984Q2 to 2001Q1. An asterisk denotes that the coefficient or return spread is at least two standard errors away from zero.

Part I. Return from three days before to one day after announcement

Sample period	Coefficient S	Predicted spread %	Coefficient S	Predicted spread %	Coefficient ΔF	Predicted spread %	Standard deviation %
84Q2–89Q4	0.3382*	0.72*	0.4901*	1.26*	0.0229	0.02	5.28
90Q1–94Q4	1.4051*	2.17*	1.4114*	2.27*	0.0394	0.04	7.05
95Q1–98Q4	2.7588*	2.81*	2.6679*	2.84*	-0.3834	-0.26	8.65
99Q1–00Q1	3.7907*	4.01*	3.7107*	4.25*	0.1630	0.10	12.31
00Q2–01Q1	2.4360*	3.41*	2.4930*	3.56*	-1.3928	-1.11	13.96
Overall	1.5988*	2.52*	1.6281*	2.87*	-0.1408	-0.12	7.62

Part II. Return from three months before to one day after announcement

Sample period	Coefficient S	Predicted spread %	Coefficient S	Predicted spread %	Coefficient ΔF	Predicted spread %	Standard deviation %
84Q2–89Q4	1.4166^{*}	3.03^{*}	1.4633^{*}	3.75^{*}	1.5557^{*}	1.39^{*}	11.81
90Q1–94Q4	3.9635^{*}	6.12^{*}	3.5894^{*}	5.78^{*}	2.1134^{*}	1.94^{*}	14.81
95Q1–98Q4	7.9056^{*}	8.07^{*}	6.7283^{*}	7.19^{*}	6.1389^{*}	4.22^{*}	18.69
99Q1–00Q1	7.6195^{*}	8.02^{*}	7.0002^{*}	8.01^{*}	5.8871^{*}	3.60	29.97
00Q2–01Q1	4.6871^{*}	6.58^{*}	3.6554^{*}	5.28^{*}	3.7062	2.98	26.47
Overall	4.3410^{*}	6.85^{*}	3.8635^{*}	6.80^{*}	3.2431^{*}	2.68^{*}	16.51

Table 5
Persistence in earnings surprise

In each calendar quarter over the period 1984Q2 to 2001Q1 the sample comprises all domestic stocks with available data on the IBES historical file and with coverage by at least five analysts. For each firm, its earnings surprise, the difference between actual quarterly earnings per share and the most recent consensus forecast prior to the announcement date, is calculated in each of the following one to ten quarters (or until delisting). The number of firms with non-negative earnings surprises in every quarter for the indicated number of quarters (from one to ten) is reported as a percentage of the number of firms in the original sample. The expected fraction is based on the actual frequency of non-negative earnings surprises over all firms realized in each of the following one to ten quarters and assuming independence over time. The reported numbers are averages over subperiods and over all quarters. In panel A of the table, all firms are eligible for inclusion in the sample. In panels B and C of the table, firms are ranked by the ratio of book to market value of equity as of the prior quarter and classifed either as value stocks (with positive book-to-market ratios and ranked in the top 50 percent based on NYSE breakpoints), or growth stocks (with positive book-to-market ratios and ranked in the bottom 25 percent).

		Firms with non-negative earnings surprise each quarter for number of quarters:									
Sample period		1	2	3	4	5	6	7	8	9	10
(A): All firms											
84Q2–89Q4	Percent non-negative	48.9	29.0	18.5	12.4	8.8	6.3	4.5	3.3	2.5	1,9
	Expected percent	48.9	24.3	12.2	6.2	3.2	1.6	0.8	0.4	0.2	0.1
	Difference	0.0	4.7	6.3	6.2	5.6	4.7	3.7	2.9	2.3	1.8
90Q1–94Q4	Percent non-negative	56.1	39.3	29.7	23.4	19.3	16.1	13.6	11.6	10.2	9.0
	Expected percent	56.1	32.4	19.2	11.7	7.3	4.6	3.0	2.0	1.3	0.9
	Difference	0.0	6.9	10.5	11.7	12.0	11.5	10.6	9.6	8.9	8.1
95Q1–98Q4	Percent non-negative	70.2	56.0	46.5	39.8	34.6	30.8	27.5	24.6	21.9	19.7
	Expected percent	70.2	49.7	35.4	25.5	18.5	13.5	9.9	7.2	5.3	3.8
	Difference	0.0	6.3	11.1	14.3	16.1	17.3	17.6	17.4	16.6	15.9
99Q1–00Q1	Percent non-negative	75.6	63.8	55.4	48.3	43.0	38.2	34.0	29.8	27.5	–
	Expected percent	75.6	57.2	42.6	31.0	22.7	16.6	12.1	8.7	6.4	–
	Difference	0.0	6.6	12.8	17.3	20.3	21.6	21.9	21.1	21.1	–
00Q2–01Q1	Percent non-negative	71.6	58.6	50.4	45.9	–	–	–	–	–	–
	Expected percent	71.6	50.0	35.3	26.1	–	–	–	–	–	–
	Difference	0.0	8.6	15.1	19.8	–	–	–	–	–	–
Overall	Percent non-negative	59.3	42.5	32.4	25.8	21.2	17.7	14.8	12.5	10.7	9.1
	Expected percent	59.3	36.4	23.0	14.9	9.8	6.5	4.4	3.0	2.0	1.4
	Difference	0.0	6.1	9.4	10.9	11.4	11.2	10.4	9.5	8.7	7.7

Sample period		Firms with non-negative earnings surprise each quarter for number of quarters: 1	2	3	4	5	6	7	8	9	10
(B): Value firms											
84Q2–89Q4	Percent non-negative	47.9	27.9	16.6	11.0	7.5	5.2	3.2	2.1	1.3	1,0
	Difference from expected	-1.0	3.7	4.4	4.8	4.4	3.5	2.4	1.6	1.1	0.9
90Q1–94Q4	Percent non-negative	52.6	34.3	23.3	17.3	13.8	11.4	9.5	8.1	6.9	5.8
	Difference from expected	-3.5	2.0	4.1	5.6	6.5	6.7	6.5	6.1	5.6	4.9
95Q1–98Q4	Percent non-negative	63.4	46.6	35.5	28.2	23.0	19.4	16.3	13.7	11.4	9.6
	Difference from expected	-6.8	-3.0	0.1	2.7	4.6	6.0	6.5	6.5	6.1	5.8
99Q1–00Q1	Percent non-negative	65.8	50.8	40.4	33.1	29.3	25.2	21.0	17.0	12.9	–
	Difference from expected	-9.8	-6.3	-2.2	2.0	6.6	8.6	8.9	8.3	6.4	–
00Q2–01Q1	Percent non-negative	60.3	44.0	35.6	37.7	–	–	–	–	–	–
	Difference from expected	-11.2	-6.0	0.3	11.6	–	–	–	–	–	–
Overall	Percent non-negative	55.0	36.7	25.6	19.3	15.1	12.0	9.5	7.6	6.1	5.0
	Difference from expected	-4.3	0.4	2.6	4.4	5.3	5.5	5.1	4.6	4.0	3.6
(C): Growth firms											
84Q2–89Q4	Percent non-negative	53.0	34.6	24.9	18.0	13.6	10.1	7.1	5.5	4.4	3.7
	Difference from expected	4.1	10.4	12.7	11.8	10.4	8.5	6.3	5.1	4.2	3.5
90Q1–94Q4	Percent non-negative	61.3	47.3	39.7	34.2	30.1	26.5	23.5	21.1	19.3	17.6
	Difference from expected	5.3	14.9	20.5	22.5	22.8	21.8	20.5	19.1	18.0	16.7
95Q1–98Q4	Percent non-negative	77.4	67.8	61.5	56.7	52.5	49.0	45.3	42.2	39.0	36.3
	Difference from expected	7.2	18.2	26.1	31.2	34.0	35.5	35.4	35.0	33.7	32.5
99Q1–00Q1	Percent non-negative	84.9	77.5	72.3	66.4	62.3	56.9	54.7	51.2	49.3	–
	Difference from expected	9.3	20.4	29.7	35.4	39.7	40.3	42.6	42.5	42.9	–
00Q2–01Q1	Percent non-negative	81.0	72.5	67.3	66.3	–	–	–	–	–	–
	Difference from expected	9.5	22.5	32.0	40.2	–	–	–	–	–	–
Overall	Percent non-negative	65.2	51.2	43.2	37.0	32.3	28.1	24.6	21.7	19.4	17.2
	Difference from expected	5.9	14.9	20.2	22.1	22.5	21.6	20.2	18.8	17.3	15.9

Table 6
Book-to-market ratios at beginning and end of horizon for
firms with consecutive non-negative earnings surprises

At every calendar quarter-end over the sample period, the earnings surprise (the difference between actual quarterly earnings per share and the most recent consensus forecast prior to the announcement date) is calculated for each stock in the current quarter and over each of the subsequent nine quarters (or until delisting). Ten sets of stocks are formed, where each set comprises firms that have non-negative earnings surprises in every quarter over the indicated horizon of consecutive quarters (from one to ten). The median ratio of book-to-market value of equity is measured at the beginning of the horizon and also at the end of the horizon for each set. The reported number is the median ratio averaged over all quarter-ends for these stocks (panel A). The same procedure is applied to all stocks that do not have consecutive non-negative surprises over the indicated horizon (panel B). The sample period is 1984Q2–2001Q1, and the sample includes all domestic firms listed on the New York, American and Nasdaq markets with data on the IBES historical file with coverage by at least five analysts.

		Number of consecutive non-negative quarterly surprises									
Sample period starting		1	2	3	4	5	6	7	8	9	10
(A) Firms with consecutive non-negative surprises											
84Q2–89Q4	At beginning	0.55	0.53	0.50	0.49	0.46	0.44	0.46	0.42	0.41	0.41
	At end	0.55	0.50	0.46	0.41	0.38	0.33	0.33	0.29	0.26	0.28
90Q1–94Q4	At beginning	0.47	0.45	0.42	0.40	0.39	0.39	0.39	0.39	0.39	0.40
	At end	0.46	0.42	0.38	0.35	0.33	0.32	0.31	0.30	0.30	0.30
95Q1–98Q4	At beginning	0.36	0.34	0.33	0.32	0.32	0.32	0.32	0.32	0.32	0.32
	At end	0.36	0.33	0.31	0.30	0.29	0.28	0.27	0.26	0.26	0.25
99Q1–00Q1	At beginning	0.33	0.31	0.29	0.29	0.29	0.29	0.29	0.28	0.26	
	At end	0.33	0.31	0.29	0.28	0.27	0.27	0.26	0.24		
00Q2–01Q1	At beginning	0.30	0.28	0.27	0.27						
	At end	0.32	0.31	0.31							
Overall	At beginning	0.45	0.43	0.41	0.40	0.39	0.38	0.39	0.38	0.37	0.38
	At end	0.45	0.41	0.38	0.36	0.33	0.31	0.31	0.29	0.28	0.28
(B) Firms without consecutive non-negative surprises											
84Q2–89Q4	At beginning	0.58	0.58	0.57	0.56	0.56	0.55	0.55	0.55	0.53	0.52
	At end	0.59	0.58	0.57	0.57	0.56	0.56	0.55	0.56	0.55	0.56
90Q1–94Q4	At beginning	0.52	0.51	0.50	0.49	0.48	0.48	0.47	0.47	0.47	0.47
	At end	0.53	0.53	0.53	0.50	0.49	0.48	0.46	0.45	0.44	0.44
95Q1–98Q4	At beginning	0.43	0.42	0.40	0.39	0.39	0.38	0.38	0.37	0.37	0.37
	At end	0.46	0.45	0.44	0.44	0.43	0.43	0.42	0.42	0.41	0.41
99Q1–00Q1	At beginning	0.49	0.46	0.43	0.41	0.37	0.36	0.36	0.36	0.34	
	At end	0.52	0.51	0.50	0.49	0.48	0.48	0.47	0.44		
00Q2–01Q1	At beginning	0.46	0.41	0.36	0.30						
	At end	0.55	0.52	0.50							
Overall	At beginning	0.52	0.50	0.49	0.48	0.48	0.47	0.47	0.47	0.46	0.45
	At end	0.53	0.53	0.52	0.51	0.50	0.49	0.49	0.48	0.47	0.47

Table 7
Probit estimates for predicting non-negative earnings surprises

The full model is

$$y_{it} = \gamma_0 + \gamma_1 S^+_{it-1} + \gamma_2 S^+_{it-2} + \gamma_3 S^+_{it-3} + \gamma_4 S_{it-4} + + \gamma_5 RUN4_{it-1} + \gamma_6 \Delta F^+_{it} + \gamma_7 VALUE_{it-1} + \gamma_8 GROWTH_{it-1} + \epsilon_{it}.$$

The variable y_{it} takes the value of one if firm i's earnings surprise in quarter t is non-negative and zero otherwise. The earnings surprise is the actual quarterly earnings per share minus the most recent consensus estimate prior to the announcement date. S^+_{it-j} for j = 1,...,4, takes the value of one if the stock's earnings surprise in quarter $t-j$ is non-negative and zero otherwise. $RUN4_{it-1}$ is set to one if the stock's earnings surprise in every one of the previous four quarters is non-negative, and is zero otherwise. ΔF^+_t equals one if the difference between the consensus estimate immediately prior to the announcement date and the consensus estimate one month ago for the stock is non-negative and equals zero otherwise. $VALUE_{it}$ takes the value of one if stock i is a value stock (with last quarter's book-to-market value of equity ranked above the 50-th percentile of NYSE stocks) and zero otherwise; $GROWTH_{it}$ takes the value of one if the stock is a growth stock (with last quarter's book-to-market value of equity positive and ranked below the 25-th percentile of NYSE stocks) and zero otherwise. The model is estimated each calendar quarter, and statistics are calculated for the time series of coefficient estimates. Numbers reported in the table are estimated coefficients (with t-statistics in parentheses), the chi-square statistic χ^2 for the joint significance of the slope coefficients (with its corresponding p-value in statistics), all averaged over subperiods and over all quarters from 1984Q2 to 2001Q1.

Part I.

$$Model:\ y_{it} = \gamma_0 + \gamma_1 S^+_{it-1} + \gamma_2 S^+_{it-2} + \gamma_3 S^+_{it-3} + \gamma_4 S_{it-4} + + \gamma 5 RUN4_{it-1} + \gamma_6 \Delta F^+_{it} + \epsilon_{it}.$$

Sample period	Variable							χ^2
	Constant	S^+_{t-1}	S^+_{t-2}	S^+_{t-3}	S^+_{t-4}	$RUN4_{t-1}$	ΔF^+	
84Q2–89Q4	-0.4892	0.4521	0.2338	0.1273	0.1660	0.0058	0.0463	24.02
	(-12.37)	(11.88)	(5.20)	(3.00)	(3.48)	(0.07)	(1.33)	(0.04)
90Q1–94Q4	-0.5482	0.5189	0.2344	0.1204	0.2304	0.1697	0.1279	70.53
	(-8.44)	(12.81)	(8.72)	(4.04)	(10.74)	(4.93)	(2.36)	(0.00)
95Q1–98Q4	-0.3336	0.5330	0.2265	0.1917	0.0878	0.1899	0.1692	107.32
	(-8.42)	(19.14)	(7.40)	(5.87)	(2.78)	(6.92)	(8.84)	(0.00)
99Q1–00Q1	-0.2609	0.6354	0.2737	0.1847	0.0628	0.1958	0.1932	140.76
	(-2.69)	(70.05)	(5.95)	(4.04)	(1.16)	(2.91)	(11.23)	(0.00)
00Q2–01Q1	-0.4781	0.6627	0.3171	0.1669	0.1113	0.1624	0.1351	152.83
	(-2.74)	(10.46)	(5.87)	(10.91)	(1.13)	(2.36)	(1.89)	(0.00)
Overall	-0.4502	0.5207	0.2405	0.1482	0.1551	0.1276	0.1195	76.55
	(-15.12)	(26.16)	(13.09)	(8.07)	(7.63)	(4.27)	(5.62) (0.01)	

Part II.

$$Model:\ y_{it} = \gamma_0 + \gamma_1 S^+_{it-1} + \gamma_2 S^+_{it-2} + \gamma_3 S^+_{it-3} + \gamma_4 S_{it-4} + + \gamma_5 RUN4_{it-1} + \gamma_6 \Delta F^+_{it} + \gamma_7 VALUE_{it-1} + \gamma_8 GROWTH_{it-1} + \epsilon_{it}.$$

Sample period	Variable									
	Constant	S^+_{t-1}	S^+_{t-2}	S^+_{t-3}	S^+_{t-4}	$RUN4_{t-1}$	ΔF^+	VALUE	GROWTH	χ^2
84Q2–89Q4	-0.5107	0.4560	0.2033	0.1158	0.1580	0.0286	0.0474	0.0239	0.1232	25.30
	(-8.34)	(10.14)	(4.49)	(2.44)	(2.88)	(0.31)	(1.05)	(0.45)	(1.93)	(0.04)
90Q1–94Q4	-0.5339	0.5226	0.2342	0.1167	0.2118	0.1713	0.1268	-0.0430	0.0433	69.48
	(-7.32)	(12.39)	(9.67)	(3.50)	(11.02)	(4.35)	(2.23)	(-1.50)	(1.33)	(0.00)
95Q1–98Q4	-0.3083	0.5413	0.2287	0.1817	0.0760	0.1627	0.1638	-0.0808	0.1020	108.74
	(-6.09)	(17.48)	(6.55)	(5.54)	(2.08)	(6.35)	(8.82)	(-2.20)	(2.72)	(0.00)
99Q1–00Q1	-0.0954	0.6049	0.1939	0.1486	0.0039	0.2040	0.1900	-0.2294	0.2157	146.83
	(-0.76)	(41.66)	(3.63)	(2.55)	(0.06)	(2.34)	(8.16)	(-6.65)	(4.19)	(0.00)
00Q2–01Q1	-0.4833	0.6603	0.2707	0.1948	0.1278	0.0940	0.1535	-0.1762	0.1991	144.90
	(-3.92)	(10.58)	(10.40)	(3.86)	(1.78)	(1.33)	(3.80)	(-2.40)	(3.17)	(0.00)
Overall	-0.4332	0.5225	0.2228	0.1400	0.1404	0.1245	0.1191	-0.0555	0.1049	76.94
	(-11.66)	(24.41)	(12.39)	(7.01)	(6.47)	(3.84)	(5.09)	(-2.47)	(4.29)	(0.01)

Table 8
Frequency distribution and summary statistics of earnings surprise, international sample

Earnings surprise S for each firm in each quarter is the difference between actual quarterly earnings per share and the consensus forecast one month prior to the announcement date. Earnings surprises are based on number of shares outstanding as of the earnings announcement date, and are computed for all firms with data on the historical International IBES file with forecasts from at least five analysts. The median is also reported for the earnings surprise relative to the absolute value of forecast earnings. Numbers reported in the table are averages over selected years, and over all years, from 1987 to 2001. In panel B of the table the sample consists of firms on the Morgan Stanley Europe, Australia and Far East (EAFE) markets; in Panel C the sample includes firms on the Continental European markets.

(A) All international

Sample period	Percentage of cases: Positive	Negative	Zero	Median
(A) All international				
1987–1989	39.40	49.82	10.78	-0.17
1990–1994	38.91	55.08	6.01	-1.27
1995–1997	41.97	54.78	3.25	-1.35
1998–1999	40.41	57.92	1.67	-3.57
2000–2001	39.62	58.96	1.42	-4.82
Overall	39.91	54.87	5.22	-1.85
(B) EAFE				
1987–1989	39.89	48.38	11.73	0.00
1990–1994	39.37	54.22	6.42	-1.04
1995–1997	45.73	50.72	3.55	-0.26
1998–1999	42.33	56.02	1.65	-2.12
2000–2001	42.37	56.24	1.39	-3.16
Overall	41.54	52.86	5.60	-1.10
(C) Japan				
1987–1989	53.60	45.91	0.49	1.48
1990–1994	32.47	66.45	1.08	-8.01
1995–1997	45.73	53.22	1.05	-2.44
1998–1999	28.01	71.30	0.69	-14.25
2000–2001	46.76	52.93	0.32	-1.45
Overall	41.24	57.97	0.78	-4.74
(D) Continental Europe				
1987–1989	36.77	54.73	8.51	-1.20
1990–1994	35.72	56.21	8.08	-1.49
1995–1997	44.92	51.52	3.56	-0.41
1998–1999	47.06	50.99	1.95	-0.35
2000–2001	42.25	55.93	1.82	-4.13
Overall	40.15	54.24	5.61	-1.42
(E) U.K.				
1987–1989	44.96	31.82	23.23	0.01
1990–1994	47.21	46.75	6.04	0.01
1995–1997	56.87	39.97	3.16	1.13
1998–1999	59.00	38.86	2.14	1.47
2000–2001	39.00	60.48	0.53	-5.11
Overall	49.17	43.18	7.65	-0.25