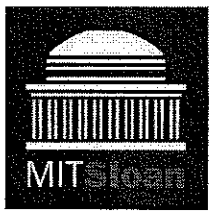

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THE WALKDOWN TO BEATABLE ANALYST FORECASTS: THE ROLES OF EQUITY ISSUANCE AND INSIDER TRADING INCENTIVES

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The Walkdown to Beatable Analyst Forecasts: The Roles of Equity Issuance and Insider Trading Incentives

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Abstract

Security regulators and the business press have alleged that firms play an "earnings-guidance game" where analysts make optimistic forecasts at the start of the year and then 'walk down' their estimates to a level the firm can beat by the end of the year. In a comprehensive sample of I/B/E/S individual analysts' forecasts of annual earnings from 1983-1998, we find strong support for the claim in the post-1992 period. We examine whether the 'walk down' to beatable targets is associated with managers' incentives to sell stock after earnings announcements on the firm's behalf (via new equity issuance) or from their personal accounts (insider trades). Consistent with these hypotheses, we find that the 'walk down' to beatable targets is most pronounced in firms that are either net issuers of equity or in firms where managers are net sellers of stock after an earnings announcement. These findings provide new insights on how capital market incentives affect communications between managers and analysts.

PDF version available from: http://mit.edu/wysockip/www/papers.htm

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1. Introduction

In this paper, we investigate allegations by security regulators and the business press that firms and analysts are involved in an "earnings-guidance game." Critics have claimed that analysts make optimistic forecasts (above actual earnings) at the start of the year and then 'walk down' their estimates to a level the firm can beat by the end of the year. We develop and test hypotheses on this pattern of analyst optimism and pessimism based on firm and managerial trading incentives to avoid a "disappointment" on the official announcement of firm earnings.

The motivation for our investigation is straightforward. The recent business press is replete with articles alleging that firms deliberately attempt to deceive or pressure analysts into making 'beatable' or pessimistic forecasts (below actual earnings). Even as far back as 5/6/91, Laurie P. Cohen, staff reporter of the *Wall Street Journal* wrote in the article "Low-Balling: How Some Companies Send Stocks Aloft" that:

> *"... after securities analysts estimate what the companies they follow will earn, the game begins. Chief financial officers or investor-relations representatives traditionally give 'guidance' to analysts, hinting whether the analysts should raise or lower their earnings projections so the analysts won't be embarrassed later.*
>
> *And these days, many companies are encouraging analysts to deflate earnings projections to artificially low levels, analysts and money managers say. If the game is played right, a company's stock will rise sharply on the day it announces its earnings – and beats the analysts' too conservative estimates."*

This alleged gaming of analysts' expectations has worried regulators. For example, Arthur Levitt, Chairman of the Securities and Exchange Commission (S.E.C.) commented on

what he terms the "game of winks and nods" in a widely reported speech made on 9/28/98 in New York:[1]

> *"This is the pattern earnings management creates: companies try to meet or beat Wall Street earnings projections ... Their ability to do so depends on achieving earnings expectations of analysts. And analysts seek constant guidance from companies to frame those expectations. Auditors, who want to retain their clients, are under pressure not to stand in the way."*

However, the claim that firms systematically beat analysts' targets runs counter to prior academic research on analysts' forecasts. Almost all past empirical studies have found systematic analyst optimism relative to actual earnings outcomes (see, for example, O'Brien, 1988 and Abarbanell, 1991). It is only recently that researchers have documented systematic analyst forecast pessimism relative to actual quarterly earnings (see Brown, 2001 and Matsumoto, 1999). We delve further into this issue by examining how capital market incentives can lead to an "earnings guidance game" where managers walk down analysts' forecasts to beatable targets.

We begin our analysis by developing a framework for the "earnings guidance game." The framework is based on three underlying regularities. First, managers care about their firms' short-term stock price level if they are about to sell shares on their personal account or on behalf of the firm *after* an earnings announcement. We focus on post-earnings announcement equity transactions because the majority of these transactions are restricted to the period after official earnings releases. Second, managers can influence analysts' earnings estimates and targets through discretionary information disclosures. Finally, the market appears to reward firms that beat analysts' latest earnings target, regardless of the path to that target. These three elements have been separately discussed and documented in prior studies. We take the next step by

[1] For the full text of the article, see www.rutgers.edu/Accounting/raw/aaa/newsarc/pr101898.htm.

combining the three elements and arguing that, together, they provide managers with strong incentives to guide analysts' forecasts to beatable targets *prior* to an earnings announcement. In other words, managers wishing to sell stock on favorable terms *after* an earnings announcement are motivated to deflate analysts' earnings targets *before* an earnings announcement.

Our framework has two major empirical predictions. First, structural changes in stock-based executive compensation and changes in insider trading rules have increased managers' incentives to achieve beatable analyst targets during the 1990's. Therefore, we predict a systematic shift toward analyst pessimism *prior* to earnings announcements during the 1990's. Second, we predict that cross-sectional variation in analyst pessimism will vary with firm and managers' demand to sell shares *after* an earnings announcement.

We test these predictions using a large sample of analyst forecasts over the past two decades. We first examine the pattern of analysts' forecasts from 1983 to 1998 in each of the 12-months in the forecast horizon leading up to an annual earnings announcement. In the period 1983-1991, we find that analysts' forecasts are systematically optimistic relative to actual earnings in both the long and short horizons prior to an earnings announcement. However, we find that there is a structural change in the 1992-1998 period. In this latter period, analysts' exhibit systematic optimism at the start of the year, but then switch to systematic pessimism in the final months prior to an earnings announcement. The greater short-horizon pessimism observed in 1990s relative to the 1980s is consistent with our time-series prediction. These findings are robust for a fixed sample of firms that existed for the full 1983-1998 sample period, indicating that the post-1992 switch to pessimism is not due to changes in sample composition.

Consistent with our cross-sectional predictions, we find that forecast pessimism *prior* to an earnings announcement is more common for firms that are about to issue new equity and

whose insiders are net sellers of the firm's stock in the period immediately following an earnings announcement. In addition, firms with net insider selling are more likely to experience a switch from optimism early in the forecast horizon to pessimism closest to the earnings announcement. Taken as a whole, the evidence is consistent with the allegation that managers systematically guide analysts toward beatable targets to sell equity on favorable terms after an official earnings announcement.

Our findings complement the results of Aboody and Kasznik (2000) who present evidence consistent with managers strategically disclosing information in order to *obtain* stock options on favorable terms. Our approach examines managerial incentives to strategically disclosing information in order to *sell* stock on favorable terms.

The rest of the paper is structured as follows. In Section 2, we develop hypotheses concerning the time-series and cross-sectional determinants of analysts' forecast bias. Section 3 presents evidence on our time-series predictions using analyst forecast data for the 1980's and 1990's. In Section 4, we test the cross-sectional predictions of forecast bias arising from the earnings expectations game between analysts and management. Section 5 concludes the paper.

2. Background and hypothesis development

In this section, we present a framework to motivate the apparent earnings-guidance game between managers and analysts. This framework identifies (i) when managers would care about short-term stock price, (ii) how managers can influence analysts' earnings targets, and (iii) how firms and managers benefit from beating analysts' earnings targets. We combine these elements to develop hypotheses on the time-series and cross-sectional variation in analysts' optimism and pessimism. We first discuss the institutional features that motivate managers to care about the

stock price specifically around the earnings announcement date. These institutional features concern the timing of insider transactions in a firm's stock and the timing of new equity sales by the firm.

Next, we discuss how analysts' forecasts influence stock prices, offer explanations as to why analysts cooperate with the managers in setting forecasts, and discuss recent empirical research indicating that managers are indeed able to influence analysts' forecasts. Finally, we discuss recent empirical results indicating that investors fixate on meeting thresholds such as analysts' forecasts, and reward good versus bad news asymmetrically. We argue that if the market rewards firms that beat analysts' latest earnings target and if managers wish to sell equity on favorable terms *after* an earnings announcement then managers have strong incentives to influence analysts' expectations to avoid an earnings disappointment.

These three elements suggest testable hypotheses about managers' capital market incentives to walk down analysts' earnings forecasts to beatable levels. The first prediction links economy-wide changes in analyst forecast bias to structural changes in managerial compensation and changes in the institutional rules governing insider trading during the 1990's. The second prediction links the cross-sectional variation in analyst forecast bias to cross-sectional variations in insider trading and new equity issuance activities.

2.1 Why and when managers care about short-term stock price

Managers intending to issue new equity on the firm's behalf clearly care about the firm's stock price level because it directly affects the proceeds from the equity sale. This effect is most pronounced around earnings announcements because new equity issues typically occur in the weeks following a public earnings announcement (Korajczyk, Lucas, and MacDonald, 1990).

Firms typically delay equity issues till after an earnings announcement when information asymmetry is the smallest between the firm and uninformed outside investors to minimize adverse selection problems. Stock-based compensation such as stock options also personally motivates managers to care about the firm's stock price by directly tying compensation to the firm's stock price performance.[2] Hall and Liebman (1998) report that stock options are a significant portion of the manager's compensation. In a sample of 498 of the largest US firms, they report that the Black-Scholes value of stock option grants comprise about 20% of the manager's compensation, and by 1994 the proportion has dramatically increased to be almost 50%. Thus, managers face increasing incentives to care about the firm's stock price from the structure of their compensation package.

Managers focus on the firm's *short-term* stock price specifically during the earnings announcement period because of insider-trading restrictions. These restrictions have arisen because regulators and boards of directors are concerned that managers may strategically use inside information to exercise stock options or trade in the firms' stock at the expense of outside investors. U.S. insider trading laws (Insider Trading and Securities Fraud Enforcement Act of 1984 and 1988) expressly prohibit this direct profit-taking opportunity by insiders. In addition, after the 1988 Insider Trading and Securities Fraud Enforcement Act, firms increasingly have instituted their own policies and procedures to regulate trading of its stock by its insiders. These restrictions generally take the form of explicit blackout periods lasting from about two months prior to the earnings announcement up to the earnings announcement date (see, for example, Bettis, Coles, and Lemmon, 1998 and Jeng, 1999). Bettis, Coles, and Lemmon report that these

[2] Managers also care about the stock price performance because poor stock price performance encourages a hostile takeover and subsequent firing by the acquiror's board of directors. An active external labor market also rewards a manager with a reputation for maintaining good stock price performance. Additionally, a manager is in a better position to bargain for higher future compensation if the stock price performance is good.

blackout periods began to be instituted in the 1990s and by 1997, 80 percent of firms have instituted formal blackout periods. Therefore, especially during the 1990s, insider trades are concentrated in a narrow window *after* an earning announcement.[3]

In sum, stock option compensation, insider trades, and new equity issues motivate managers to care about the firm's *short-term* stock price at the time when new equities are issued or when managers exercise options and trade the firm's stock. Because new equity issues and insider trades are typically restricted to the period immediately following an earnings announcement, we suggest that managers fixate on the firm's stock price around the earnings announcement itself. Consequently, the stock price level during the earnings announcement period carries special significance for firm management.

2.2 Managers' ability to manage analyst forecasts

Empirical and anecdotal evidence suggest that managers can indeed influence analysts' earnings forecasts. First, as a key provider of information to analysts, managers can affect analysts' earnings expectations by controlling the content and timing of discretionary information releases. Soffer, Thiagarajan, and Walther (2000) find that firms use pre-announcements of earnings to manage analysts' expectations. They also find that managers are selective in the content of their disclosures and appear to receive stock price benefit from managing analysts toward beatable targets.

Second, it has been argued that managers can pressure analysts to adjust their forecasts away from their true beliefs because of analysts' dependence on management for future

[3] By reducing discretion in the timing of the insider trades, the blackout feature reduces the opportunity of the managers to profit from inside information at the expense of uniformed outside investors. Permitting insider trades

information (see Francis and Philbrick (1993), and Lim (2001)). The business press has also reported incidences when analysts issuing unfavorable forecasts were shunned by the firm at investor conferences.

Third, it has also been alleged that analysts face conflicting incentives in maintaining the quality of investment research versus securing investment-banking deals. Business Week's article "Wall Street's Spin Game" (10/8/98) noted that:

> *"Most Wall Street research is pitched to institutional investors who pay the firm about a nickel a share in commissions. But if an analyst spends his time trying to land an initial public offering, the firm can earn 15 to 20 times that amount per share. Investment banking deals are much more lucrative for the brokerage firm. Merger advisory fees can be sweet as well.... But what happens when there's a conflict between objective analyses and the demands of investment bankers? ...There's no conflict. That's been settled. The investment bankers won."*

Thus, the highly lucrative underwriting deals impose pressure on analysts to cooperate with firms issuing new securities. Michaely and Womack (1999) report that analysts' recommendations are biased because of the conflict of interest introduced by the underwriting relationship. Although Mikhail, Walther, and Willis (1999) argue that career concerns motivate analysts to make more accurate forecasts, it should be recognized that firm profit incentives from trading venture investments and underwriting deals may affect career concerns and influence analysts to bias forecasts in the direction favored by client firms and managers.

2.3 Managers' incentives to achieve beatable targets

Almost all past empirical studies on earnings forecasts have found systematic analyst optimism (see, for example, O'Brien, 1988). While past studies have documented increases in the accuracy of analyst forecasts as the earnings announcement approaches, this research found

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to the period immediately after earnings announcements also reduces the adverse selection problem by minimizing

continued analyst optimism at all forecast horizons (see, for example, Brown, Foster and Noreen, 1985). It is only recently that researchers have provided some evidence of analyst pessimism in quarterly earnings forecasts (see Brown, 2001 and Matsumoto, 1999). These studies argue that management communications with analysts lead to these deflated earnings expectations.

Systematic analyst optimism implies that firms are more likely to miss rather than beat analysts' targets. This can have detrimental effects for a firm if investors' perception of the firm is influenced by whether it meets certain earnings thresholds. For example, Skinner and Sloan (1999) find an asymmetry in investor reaction to beating versus missing a threshold. In particular, they find a greater stock price drop when firms fall short of forecasts than the stock price rise when firms beat forecasts by an equivalent magnitude of earnings surprise. They also find that this asymmetry is especially pronounced for high growth firms. These results are obtained relative to a threshold consisting of analyst forecasts made in the last month prior to the earnings announcement. Thus, the threshold that drives these effects is set by very short-horizon forecasts.

The discontinuity in investor reaction to missing versus meeting or beating analysts' forecasts creates incentives for managers to guide analysts to beatable earnings forecasts prior to an earnings announcement. A slightly lower forecast can cause the firm to barely beat the forecast instead of missing it, which significantly increases the firm's expected post-earnings-announcement stock price. As reported by Bartov, Givoly, and Hayn (2000), the incremental market valuation associated with earnings surprises is independent of the path taken to achieve the earnings target. In other words, the only consensus forecast that seems salient for the stock

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the asymmetry of information between uniformed outsiders and the inside managers.

price reaction to the earnings announcement appears to be the one closest to the earnings announcement.

As discussed earlier, prior research has shown that analyst forecasts tend to be optimistic throughout the forecast horizon, but management has incentives to achieve beatable forecasts prior to an earnings announcement. Therefore, we predict a switch from analyst optimism to pessimism when managers and firms have strong incentives to maximize stock prices immediately after the earnings announcement. Below we discuss two structural changes between 1980s and 1990s that support the claim that these incentives have become stronger in the 1990s.

2.4 Hypothesis on time-series changes in analyst pessimism

Two structural changes between 1980s and 1990s are likely to have increased managerial incentives to guide analysts toward beatable earnings targets in recent years. The first structural change is the greater use of stock-based executive compensation by U.S. corporations during the 1990's. For example, Hall and Liebman (1998) present evidence on the growing use of CEO stock option compensation 1990s as compared with the 1980s. The mean salary and bonus in 1994 was $1.3 million and the mean value of stock options was $1.2 million. Between 1980 and 1994, mean salary and bonus grew 97 percent whereas mean stock option value grew an astounding 683 percent! Murphy (1998) confirms this growth and shows that the explosive growth trend in stock options continues to 1996, the latest year in his study. The increase in stock options is also widespread among firms; the percentage of CEOs receiving stock options grants increased from 30% in 1980 to 70% in 1994. The data indicates that the number of stock options granted increase dramatically in the late 1980s (the median number of grants was zero until 1985), and many of these are vested in the 1990s.

The greater predominance of exercisable stock options in the 1990s suggests greater managerial attention to stock prices. The fact that a greater number of executives now wish to sell stock in the trading periods after earnings announcements leads to greater incentives for these managers to guide analysts to avoid an earnings disappointment that would negatively affect share prices after the earnings announcement.

The second structural change occurred in May 1991 when securities regulators changed the "short-swing" rule affecting insiders' stock option exercises. Prior to 1991, Section 16b of the Securities Exchange Act requires insiders to hold shares of stocks acquired through an option exercise for at least six months before selling, or the profits will go to the firm. In May 1991, the S.E.C. effectively removed this restriction by changing the starting date of the six-month holding period from the exercise date to the option grant date. Consequently, after May 1991, managers have a more precise target date for when to exercise their stock options and immediately unload their shares, which increases their ability to affect the earnings surprise for when they trade. As discussed earlier, the firm-initiated blackout rules confining permitted insider trades to the period immediately following earnings announcements further sharpens managerial focus on the stock price during the earnings announcement period. Note that these blackout rules became more pronounced during the 1990s.

Given these structural changes in the early 1990's, we hypothesize a systematic change in managers' incentives and ability to guide analysts' earnings targets. Based on these major changes in how managers are compensated and when they can trade, we hypothesize a shift to greater analyst pessimism prior to earning announcements during the 1990's compared to the 1980's. This leads to our first hypothesis.

Hypothesis 1: *Structural changes in managerial incentives to achieve beatable forecasts leads to short-horizon pessimistic analyst forecasts prior to earnings announcements in the 1990's.*

2.5 Hypotheses on cross-sectional determinants of analyst pessimism

As we previously described, there are three empirical facts that are related to the expectations management game: (i) managers care about short term share prices if they are about to sell shares on their personal account or on behalf of the firm after an earnings announcement, (ii) managers can influence analysts' expectations through their information disclosures, and (iii) the market appears to reward firms that beat analysts' latest earnings targets. Therefore, managerial incentives to guide analysts' forecasts are strongest if the firm and/or its managers are about to sell stock. This leads to the following cross-sectional prediction:

Hypothesis 2: *The likelihood of observing short-horizon pessimistic analyst forecasts prior to an earnings announcement is increasing in management and firm demand to sell stock after an earnings announcement.*

Finding evidence in support of this hypothesis is consistent with analysts being guided toward a pessimistic target. However, an observed correlation between post-earnings announcement equity sales and short-horizon pessimism may also be interpreted as stakeholders selling shares after truly unexpected good news. If managers are truly guiding analysts toward beatable targets, then a more compelling sequence of events would be as follows: (i) analysts initially issue optimistic (or unbiased) earnings forecasts, (ii) analysts then *revise* their forecasts to become pessimistic before an earnings announcement, (iii) the firm or its insiders sell stock

after the firm beats the revised earnings target. In other words, we should observe an "opportunistic" switch from optimistic (or unbiased) to pessimistic analyst forecasts prior to firm or insider equity sales. This leads to our second cross-sectional prediction on cross-sectional determinants of expectations management:

Hypothesis 3: *The likelihood of observing a switch from optimistic to pessimistic analyst forecasts prior to an earnings announcement is increasing in management and firm demand to sell stock after an earnings announcement.*

3. Pattern of analyst bias over the forecast horizon

In this section, we investigate claims that analysts make optimistic forecasts at the start of the year and then 'walk down' their estimates to a level that the firm can beat by the end of the year. We compare the dynamic pattern of analyst bias over the forecast horizon during the 1980's and 1990's to test our time-series prediction outlined in *Hypothesis 1.*

3.1 Sample and variable construction

Data on individual analysts' forecasts of annual earnings per share are obtained from the *Institutional Brokers Estimate System (I/B/E/S) Detail History U.S. Edition* tapes from 1983 to 1998. Unlike many previous studies, we use individual analysts' forecasts to calculate consensus forecasts to avoid potential staleness of the I/B/E/S consensus forecasts (see, for example, Abarbanell and Bernard, 1992).

The data sample consists of all individual analyst forecasts of annual earnings for firms with data availability on both I/B/E/S and Compustat.[4] We consider forecasts of annual earnings made within twelve months of the annual earnings release date reported by I/B/E/S (*Actuals File*). To track forecast revisions leading up to the annual earnings announcement, we sort analysts' forecasts into twelve groups by 30-day blocks. Forecasts made less than 30 days prior to the earnings announcement are grouped in *Month-1*, forecasts between 30- and 60-day lags in *Month-2*, and so on up to *Month-12*. We then calculate a monthly consensus forecast for each firm using the median of individual analyst forecasts in that month.

The forecast error is defined as the actual earnings per share minus the median forecast of earnings per share scaled by the stock price at the beginning of the year. The stock price deflator is used to control for potential spurious relations resulting from cross-sectional scale differences in earnings per share[5]. A negative error implies an optimistic forecast whereas a positive error implies a pessimistic forecast. Formally, the forecast error, *FE*, for firm *i* in calendar year *y* and forecast horizon month-*t* is calculated as:

$$FE(i,y,t) = [Earnings\ Per\ Share\ (i,y) - Forecast\ (i,y,t)] / P(i,y^*) \qquad (1)$$

Firms' actual earnings per share are obtained from I/B/E/S for comparability with the forecast.[6] The deflator $P(i,y^*)$ is the first available stock price for firm *i* in year *y* reported in the

[4] The empirical findings documented in this section also exist for a broader sample of firms not restricted by Compustat data availability.

[5] We also replicate the analysis using total assets per share as a deflator (see Figure 2b). The general results remain unchanged using this alternate deflator.

[6] According to I/B/E/S, analyst earnings forecasts usually exclude extraordinary items and discontinued operations. The I/B/E/S actual earnings number also excludes these items and, as a result, may not correspond to a firm's bottom-line income number.

I/B/E/S Summary Tapes.[7] This stock price is typically available twelve months prior to the actual earning announcement date. To remove the influence of extreme outliers that are likely due to data-coding errors, we remove the extreme forecast errors that are greater than 10% in absolute value of share price.[8]

The initial sample consists of 681,413 analyst-firm-month-year forecast observations for the years 1983-1998. We group forecasts into five calendar sub-periods to determine if there is temporal variation in forecast errors across calendar years. The earlier sub-periods cover three years: 1983-85, 1986-88, 1989-91, 1992-94, and the final sub-period 1995-98 covers four years. Table 1 shows that the number of available observations has increased monotonically with calendar time by about three-fold between the earliest sub-period 1983-85 to the latest sub-period 1995-98. This large increase reflects the expanded coverage of the I/B/E/S database and the proliferation of analysts over time. This is likely driven by increased interest from individual investors in equities and the growth in the number of public companies in the last 16 years.

3.2 Sub-period analysis

We present three measures of forecast bias for each of twelve months prior to the earnings announcement in Table 2. Panel A presents a relative pessimism index, *%RelPess*, which measures the proportion of individual analyst forecasts that are pessimistic versus optimistic relative to the actual earnings outcome. The index is computed in each of the 12

[7] For example, Joe Analyst forecasts $1.15 EPS for XYZ Company on Nov 15, 1995 for the fiscal year ending Dec 31, 1995. I/B/E/S reports an actual EPS of $1.20 on Jan 27, 1996. I/B/E/S also reports that the 1994 fiscal year earnings release date is in January 1995, and the stock price in Feb 1995 (the first month after the release of EPS for the previous fiscal year) is $15.10. Thus, FE for month 3 (73 days lag between earnings release date and forecast date) is ($1.20-$1.15)/$15.10=0.0033 or 0.33%. The FE is considered forecast error for year 1996 because the actual earnings release date is in January 1996.

[8] For example, absolute forecast errors (|forecast EPS - actual EPS|) greater than $3/share for a company trading at $30 per share would be removed from the sample. By any reasonable metric, such outliers may be due to data-coding errors. As a robustness check, we also applied a less stringent cut-off and only removed outliers that were greater than 100% of price. The results are unchanged.

months prior to an earnings announcement. In each month, a firm is assigned a code depending on the median analyst forecast -- the code is equal to 1 if the median forecast is pessimistic, zero if it is unbiased, and -1 if it is optimistic. We then aggregate the codes across firms in each month and an index is calculated as the average value over all firm codes in each month. This index captures the relative proportion of pessimistic forecasts to optimistic forecasts in a given month.[9] We use this categorical index because it is often argued that what really matters is whether the firm beats the consensus earnings target, not by how much the firm beats the target.

For the overall sample, the *%RelPess* index has a value of -0.19 in the twelfth month prior to the earnings announcement. In other words, the majority of analyst forecasts are *optimistic* early in the year. However, by *Month-3* analysts are equally likely to be pessimistic or optimistic. In the month prior to the earnings announcement, the *%RelPess* index has a value of 0.11 indicating that analysts are net *pessimistic* in the overall sample.

Hypothesis 1 predicts a switch to greater analyst pessimism coincident with the structural changes in executive compensation and insider trading policies during the 1990's. To test this prediction, we examine the pattern of analyst pessimism in 5 sub-periods during the 1980's and 1990's. The dynamic pattern of relative pessimism in each sub-period is presented in Figure 1. Consistent with our first hypothesis, we find that the switch to pessimism only occurs in the 1992-1994 and 1995-1998 sub-periods. For example, in 1995-1998 sub-period, the switch to relative pessimism occurs as early as *Month-4* and by *Month-1* the *%RelPess* index is as high as 22%.

We complement the relative pessimism results with evidence on the mean and median forecast errors in Panel B of Table 2. Bold values for the mean and median statistics are

[9] A positive *%RelPess* value implies a higher fraction of pessimistic forecasts to optimistic forecasts and a negative

statistically different from zero at the 1% significance level. As in Panel A, high early optimism in forecasts is also observed across all periods in Panel B. The means and medians for the long horizon forecasts in the overall sample and in each sub-period are statistically and economically significant. For example, if the average price of a typical stock is about $30 (Brennan and Hughes, 1992), then a mean of 0.90% for the overall sample in *Month-12* implies a forecast error of about 27 cents and a median of 0.28% implies a forecast error of 8.4 cents.

There is also temporal variation in the forecast bias across calendar years. For all horizons, forecasts are more optimistic in the three earlier sub-periods than in the two later sub-periods. For example, the degree of optimism in *Month-12* in the 1989-1991 sub-period is twice the amount in the 1995-98 sub-period. The temporal variation, however, is not monotonic with time.

Comparing the bias patterns over time periods, Panel B indicates that forecast pessimism exists only in the latter sub-periods. The median forecast in *Month-1* is either optimistic or unbiased in the three earliest sub-periods from 1983-1991. From 1992 onwards, the median forecast in the month before an earnings announcement is significantly pessimistic. The bias pattern across forecast horizons is graphed for each sub-period in Figure 2A. The mean results in Panel B exhibit a similar pattern, but only the *Month-1* forecast in the 1995-1998 period is pessimistic. The observed pessimism is highly statistically significant, but small in magnitude. Assuming an average stock price of $30 again, the median forecast error in *Month-1* is a mere 0.9 cents in the 1992-1994 sub-period and 1.5 cents in the 1995-1998 sub-period. The small magnitude need not imply low economic significance because 'just beating' the forecast may have disproportionate informational signaling value to investors (see, for example, DeGeorge, Patel, and Zeckhauser (1999)). Overall, these univariate results present compelling evidence of a

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%RelPess value implies the opposite.

switch to systematic pessimism that is coincident with structural changes in the use of executive stock option compensation, focused insider trades in the post-earnings announcement period and the lifting of the "short-swing rule" for insiders during the 1990's.

3.3 Regression analysis of forecast pessimism

Potential confounding effects for our univariate results are changes in firm attributes between the 1980's and 1990's that may have driven the pessimism results presented in Table 2. Therefore, we undertake a multiple regression analysis to control for other determinants of systematic bias in analysts' forecasts. For example, managers of high growth firms that require capital would also care about investor perceptions and want to avoid an earnings disappointment. Therefore, we include a growth proxy as an additional determinant of forecast pessimism. We also consider firm profitability and size as additional determinants of forecast bias. Past studies have reported that large firms have less optimistic forecasts, and the forecast bias is also related to whether firms make profits or losses; see Brown (1998, 2001) and Burgstahler and Eames (1999). It is not surprising that analysts ex post turn out to be optimistic for firms reporting losses and to be pessimistic for firms reporting profits.

Our regression tests are based on firm-month observations of forecast errors. This sample is created by calculating the monthly median of individual-analyst forecast errors from the original sample presented in Table 1. The data set is a pooled time-series cross-sectional sample of 213,692 firm-month observations for the full sample period 1983-98. In Table 3, we regress the sign of individual analyst earnings forecast errors on time-period and firm-characteristic variables for the full sample period. The logistic regression model is:

$$PESS = \beta_0 + \beta_1 * P_{8688} + \beta_2 * P_{8991} + \beta_3 * P_{9294} + \beta_4 * P_{9598} + \beta_5 * Profit + \beta_6 * MB + \beta_7 * MV + \gamma_1 * Month \quad (2)$$

where *PESS* is an indicator variable that takes the value of 1 if the forecast error is greater than or equal to zero and is 0 otherwise. The forecast error, FE_{iyt} is the median forecast error for each firm *i*, for annual earnings in year *y*, in month *t* prior to the earnings announcement. The period variables, P_{8688} , P_{8991} , P_{9294} , and P_{9598} are dummy variables which equal 1 if the earnings are in the periods 1986-88, 1989-91, 1992-94, and 1995-98, respectively, and equal to 0 otherwise. *MB* is the market-to-book quintile ranking for firm i based on the market and book values of equity at the end of the previous year. *MV* is the annual market value of equity quintile ranking for firm *i* based on the market value of equity at the end of the previous year. *MV* and *MB* rankings are performed each year. *Profit* is an indicator variable taking on value one if the firm reports a profit and 0 otherwise. This *ex post* variable is used to control for truly unexpected economic performance of the firm that is unrelated to expectations management of analysts' forecasts. Month $\in$ {-12,-11,..,-2,-1} is a categorical variable for the month lag between the forecast and earnings announcement as described earlier in Section 3.

We find that even after controlling for time-period effects, profitability, and growth opportunities, the degree of optimism still decreases over the twelve months preceding the earnings announcement. As expected, the control variables for profitable firms, large market capitalization firms, and high-growth firms are significant and positively correlated with increased pessimism in analyst forecasts. More importantly, the predicted time-series pattern in analyst pessimism and optimism across sub-periods is robust to the inclusion of other determinants of analyst pessimism. In other words, one observes greater systematic analyst

pessimism in (i) the months closest to an earnings announcement and (ii) in the latter sub-periods of the overall sample.

We supplement the prior analysis with regression tests that use actual forecast errors as the dependent variable. The regression model is:

$$FE = \beta_0 + \beta_1 * P_{8688} + \beta_2 * P_{8991} + \beta_3 * P_{9294} + \beta_4 * P_{9598} + \beta_5 * Profit + \beta_6 * MB + \beta_7 * MV + \gamma_1 * Month \quad (3)$$

where FE is the price-scaled median forecast error as defined in Section 2, and the other variables are the same as regression model (2).

The results in Table 4 confirm our previous results on time variation in the forecast error bias. The three earliest sub-periods exhibit analyst optimism whereas the final two sub-periods exhibit a shift toward less optimistic analyst forecasts[10]. The results also indicate that forecasts are more pessimistic for profit firms and high market capitalization and market-to-book firms.

3.4 Robustness checks

Our forecast errors are price-deflated to allow direct comparison across firms, which is standard in the literature. However, scaling by price may introduce inter-temporal variation in the median and mean forecast bias if price-earnings ratios have changed over time. Therefore, we replicate the analysis using an alternate deflator as total assets per share, and graph the results in Figure 2B. The general pattern of increasing forecast pessimism as the horizon shrinks is robust to the choice of deflation. As before, in the two latest sub-periods 1992-1994 and 1995-1998, there is a switch in forecast errors from optimism to pessimism as the earnings announcement approaches. It should also be emphasized that switchover results from optimism to pessimism

[10] In fact, the last two periods exhibit pessimism if the mean values of the independent variables are substituted into equation (3).

(the sign change captured by our %RelPess meaure) cannot be explained by intertemporal variation in price-earnings ratios.

The time series results could also be affected by changing sample composition between 1983 and 1998. For example, a change in the composition of publicly traded companies or in the breadth of coverage on I/B/E/S may have affected the forecast bias over time. To rule out these alternative explanations, we replicate our tests using a fixed sample of firms that existed from 1986 to 1998.[11] Again, analyst forecasts are optimistic at all horizons for pre-1992 sub-sample. However, there is a switch to pessimism in the last month prior to an earnings announcement in recent years for the fixed sample of firms that existed from 1986 to 1998. Therefore, our primary results are confirmed using this fixed sample of firms.

Our main time-series results track analyst forecast bias over the annual horizon. Our trading incentive framework predicts that the shift to pessimism would also occur in quarterly earnings forecasts. Therefore, we examine the dynamic pattern in analysts' forecasts of quarterly earnings per share. For brevity, we report the median and mean forecast errors only for the 1995-98 period in Figure 3.[12] Figure 3 plots the mean and median quarterly forecast error (scaled by price) for a series of two-week windows preceding each firm's quarterly earnings announcement. Similar to the results for the annual window, we document a pattern of increasing pessimism as the quarterly earnings announcement approaches. The forecast errors are either close to zero or optimistic initially, and then become pessimistic in the two weeks preceding a quarterly earnings announcement. Our finding of pessimism in the shortest horizon is consistent with findings reported by Bagnoli, Beneish, and Watts (1999), Brown (2001), and

[11] We also confirm our findings of a switch to pessimism using the I/B/E/S median consensus forecasts from the Summary Tapes between 1983-1998.

[12] A summary of this analysis is available from the authors upon request.

Matsumoto (1999) for forecasts of quarterly earnings at a given point in time relative to the announcement date in recent periods.

In sum, we find evidence of a robust shift towards greater forecast pessimism. The timing of this shift to pessimism prior to earnings announcements is coincident with the increased use of stock-based compensation in the 1990s and regulatory changes in 1991 concerning the "short-swing rule" affecting insider's stock option exercises. These changes clearly provide increased managerial incentives to guide analysts to forecast at a level the firm can beat at the earnings announcement date.

Our finding of optimism in earlier periods and pessimism in more recent periods provides a link between past studies finding forecast optimism and the recent allegations about forecast pessimism. The optimism found in past studies was obtained from data prior to 1992, whereas allegations of pessimism are made more recently. The small magnitude of pessimism we document here is also consistent with press allegations that firms attempt to *just* beat the forecasts.

4. Cross-sectional variation in forecast bias

In this section we present empirical tests of our cross-sectional predictions contained in *Hypotheses 2* and *3*. These tests examine the impact of firm and insider trading incentives on the observed walkdown to beatable earnings targets.

4.1 New equity issuance data

We test the prediction that firms issuing new equity are more likely to beat forecasts at the earnings announcement just prior to issuance. Since a firm that is high growth would likely need new capital, and would also care about investor perceptions and want to avoid an earnings

disappointment, we include a growth proxy as an additional determinant of forecast pessimism. Similar to our regression results in Tables 3 and 4, we also consider firm profitability and size as additional determinants of forecast bias.

To measure the firm's own trading activity, we consider two dummy variables: *IssueNow* captures equity issuance in the year of the forecast and *IssueNext* captures equity issuance in the following year. *IssueNow* equals one if the firm's statement of cash flows indicates a positive sale of common and preferred stock (COMPUSTAT item #108) greater than 5% of the market value of equity for that year, and is zero otherwise. *IssueNext* equals one if the firm's statement of cash flows indicates a positive sale of common and preferred stock (item #108) greater than 5% of the market value of equity in the next year and is zero otherwise.[13] We include *IssueNow* in addition to *IssueNext* because a firm would likely experience similar pressures to avoid an earnings disappointment immediately after issuance. The issuing firm would like to avoid lawsuits from disgruntled investors unhappy with a sizeable stock price drop from an earnings disappointment, and the investment banker and analysts of the brokerage firm underwriting the issue would like to safeguard reputation.

4.2 Insider trading data

Data on insider trading activity are obtained from CDA/InvestNet covering the period 1994 to 1998, so tests on this hypothesis use forecasts from this sub-period only. CDA/InvestNet reports all insider trades that are required to be filed with the SEC, and we examine only open market purchases and sales and option exercises.[14] We eliminate trades by

[13] The empirical results using the equity issuance dummy are robust to various definitions of sale of equity shares. The regression results are qualitatively similar using equity-sale cutoffs between 1% and 20% of MVE.

[14] CDA/InvestNet lists 26 different transaction codes for insiders. We only include acquisitions and dispositions associated with open market purchases and sales, acquisitions from derivative exercises and other sales and purchases.

non-officer insiders, including block-holders, retirees, trustees, etc., in order to focus on the trading activities of those individuals that are most likely to have an impact on the reporting process of the firm. We examine insider trades in the 20 trading days immediately after the earnings announcement.

A firm is classified as a *Seller* in the year the insiders (CEO, chairman, vice presidents, and directors) are net sellers of the shares of the firm in the 20-day period after the earnings announcement, and is classified as a *Purchaser* in the year the insiders are net buyers of the firm's shares. The regression tests use the dummy variable, *InsiderSale*, which equals one for *Seller* firm-years and 0 for P*urchaser* firm-years. Our sample consists of 1,434 *Seller* and 867 *Purchaser* firm-years.

4.3 Data analysis

Table 5 compares the characteristics of the two groups of insider trades, *Sellers* and *Purchasers*. *Sellers* are, on average, higher growth firms and more likely to be issuing equity in the subsequent year or have issued equity in the current year. There are no significant differences in the size and profitability between the two groups.

Of greater interest to our study is the difference between the two groups in both the forecast bias in the final month prior to the earnings announcement and the pattern of analyst forecast bias between long and short horizons. To directly test *Hypothesis 2*, we construct a pessimism variable, $PESS_{last}$, which is equal to one if actual earnings beat or meet forecasts in the last month (month-1) prior to the earnings announcement and zero otherwise. The descriptive evidence on analyst pessimism is in Table 5. Consistent with analyst guidance

incentives associated with Insider Sales, we find that analysts are more likely to issue pessimistic forecasts for firms that have Net Insider Sales after the earnings announcements.

We also find that the *Sellers* are more likely to have a switch from optimism to pessimism during the year. Figure 4 demonstrates the general pattern. There is a shift from optimism to pessimism for firms where insiders are net sellers, whereas forecasts remain optimistic in firms where insiders are net purchasers. To document the statistical significance of this phenomenon we define the variable, *SWITCH*, to be equal to one if the first forecast (i.e. month-12) is optimistic *and* the last forecast (i.e. month-1) is pessimistic; and zero if the first and last forecasts are both optimistic. A significantly greater number of net sellers (65.3%) experienced a switch from initial optimism to final pessimism.

Table 6 reports the multivariate tests for the cross-sectional determinants of forecast pessimism. In the top panel, we run the following regression:

$$PESS_{last} = \beta_0 + \beta_1 * InsiderSale + \beta_2 * IssueNow + \beta_3 * IssueNext + \beta_4 * MB + \beta_5 * MV + \beta_7 * Profit + \varepsilon. \quad (4)$$

The variables are defined earlier. We include but do not report fixed year effects using year indicator variables in the above regression.

Consistent with our prediction in *Hypothesis 2,* we find that firms issuing equity in the following year are more likely to exhibit analyst pessimism at the end of the current year. Furthermore, there is a significant positive relation between *InsiderSale* and $PESS_{last}$, suggesting that firms beat or meet analysts forecasts have insiders who sell in the period immediately following the earnings announcement. These results are consistent with the predictions of *Hypothesis 2.* This result is robust to the inclusion of firm size, growth opportunities, and, most

importantly, profitability. It is not surprising that more profitable firms tend to beat analysts' targets because this variable captures truly unexpected good performance.

In Panel B of Table 6, we run the regression of the switch variable on the determinants.

$$SWITCH_t = \beta_0 + \beta_1 * InsiderSale + \beta_2 * IssueNow + \beta_3 * IssueNext + \beta_4 * MB + \beta_5 * MV + \beta_6 * Profit + \varepsilon. \quad (5)$$

As in Panel A, the estimated coefficients for *Profit* and *InsiderSale* variable are statistically significant. The results are consistent with insiders timing their sales to follow immediately after a good news earnings surprise, and consequently after an increase in stock price. This finding is consistent with the predictions of *Hypothesis 3.* In contrast, the new issue dummies are not statistically significant, indicating that the new issue incentive is not incrementally important to explain the switch in forecast pattern over the forecast horizon.

Overall, our results suggest that insiders guide analyst earnings targets to facilitate trading on favorable terms after an earnings announcement. This ability to benefit from the insider transactions is derived from managers' ability to guide forecasts over the horizon of the forecasts prior to trading.

5. Conclusion

This paper examines the dynamic behavior of analyst earnings forecasts leading up to earnings announcements. We document time-period and forecast-horizon variation in analyst forecast pessimism. The most striking finding is that, during the 1990's, analysts issue systematically optimistic forecasts early in the fiscal year followed by systematically pessimistic forecasts as the earnings announcement approaches. This short-horizon pessimism in forecasts is consistent with our hypotheses based on managerial and firm incentives to sell shares in the post-

announcement period. They are also consistent with recent media allegations and concerns expressed by policymakers that firms are able to guide analysts' forecasts.

We link the pattern of analyst pessimism in the 1990's with institutional and regulatory changes that create capital market incentives for managers to guide and beat forecasts in order to boost stock prices. These systematic changes include greater use of stock option compensation for managers, restrictions on trading by insiders to post-earnings announcement periods in response to the Insiders' Fraud and Securities Trading Act of 1988, and the lifting of the "short-swing rule" for insiders in 1991 allowing insiders to exercise stock options and immediately sell company stock.

Our cross-sectional predictions are motivated by the trading preferences of firms and managers after earnings announcements, which lead them to guide analysts to a systematic pattern of pessimistic forecasts prior to the earnings announcement. Consistent with our hypotheses, we find that pre-announcement forecast pessimism is strongest in firms whose managers have the highest *personal* capital market incentives to avoid earnings disappointments. Firms with managers that sell stock after an earnings announcement are more likely to have pessimistic analyst forecasts prior to the earnings announcement. Firms where the insiders are net sellers of the firm's stock are also more likely to have analysts switch from long-horizon optimism to short-horizon pessimism prior to the earnings announcement. This evidence suggests that managers opportunistically guide analysts' expectations around earnings announcements to facilitate favorable insider trades after earnings announcements.

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Table 1
Descriptive Statistics

Variable	All Years	Year Grouping 1983-85	1986-88	1989-91	1992-94	1995-98
# Analysts						
Mean	15.78	17.47	17.62	17.20	15.39	13.43
Median	14	17	16	15	14	11
Std. Dev.	10.29	9.84	10.60	11.07	9.99	9.39
Min	1	1	1	1	1	1
Max	50	40	47	50	44	46
# FirmYrs	25,623	2,130	3,805	5,080	6,210	8,398
# Forecasts	681,413	63,749	113,530	143,439	167,014	193,681
MB						
Mean	2.83	2.19	2.46	2.48	2.97	3.40
Median	2.18	1.79	1.97	2.00	2.22	2.60
Std. Dev.	2.29	1.50	1.72	1.73	2.50	2.78
Min	0.23	0.32	0.43	0.37	0.24	0.46
Max	35.94	33.49	23.51	28.21	26.09	35.94
MVE ($m)						
Mean	2,861.94	1,862.94	2,147.40	2,746.12	3,154.34	3,455.57
Median	905.51	841.68	903.13	910.20	920.91	928.50
Std. Dev.	5,072.30	2,481.70	3,079.77	4,470.97	5,423.36	6,463.42
Min	3.25	7.89	5.98	3.37	3.70	6.34
Max	44,092.08	13,622.89	19,708.78	29,418.93	38,192.50	44,092.08

The statistics for the number of analysts are based on the number of unique analysts that provided at least one forecast for a given firm in year t. The number of firm-years is calculated by identifying the number of firms in the database in each year. A firm may have multiple analysts following and multiple forecasts for a given analyst, but is counted once in each year. In each sub-period, the number of firm-years is summed across the relevant years in the sub-period. The number of forecasts is the total number of analyst forecast observations recorded in each sub-period. This number is the product of the number of years, number of firms, number of analysts per firm, and number of forecasts by each analyst in each month in the year. MB is the ratio of market value of common equity to book value of common equity in year t-1. MVE is the market value of common equity ($million) at the end of year t-1.

Table 2
Temporal Pattern of Analysts Forecasts Throughout the Year

Panel A: Relative Pessimism Index of Analyst Forecasts

Year Group	Month of Analyst Forecast Relative to Earnings Release Date*											
	Month-12	*Month-11*	*Month-10*	*Month-9*	*Month-8*	*Month-7*	*Month-6*	*Month-5*	*Month-4*	*Month-3*	*Month-2*	*Month-1*
All	-0.19	-0.19	-0.17	-0.17	-0.17	-0.14	-0.13	-0.11	-0.03	**0.00**	**0.05**	**0.11**
1983-85	-0.22	-0.25	-0.19	-0.20	-0.23	-0.22	-0.24	-0.22	-0.16	-0.12	-0.06	-0.03
1986-88	-0.30	-0.31	-0.30	-0.28	-0.29	-0.28	-0.25	-0.22	-0.19	-0.15	-0.09	-0.06
1989-91	-0.30	-0.27	-0.28	-0.28	-0.26	-0.27	-0.25	-0.22	-0.16	-0.10	-0.06	**0.00**
1992-94	-0.25	-0.23	-0.23	-0.21	-0.19	-0.16	-0.13	-0.11	-0.04	**0.01**	**0.06**	**0.12**
1995-98	-0.08	-0.08	-0.06	-0.06	-0.06	-0.03	-0.01	**0.00**	**0.09**	**0.11**	**0.16**	**0.22**

The pessimism index, *%RelPess*, is computed as the mean of a categorical variable, *CatFE*, which takes on the value 1 when an individual analyst forecast is pessimistic relative to the actual earnings outcome, 0 when an analyst forecast exactly equals actual earnings, and -1 when an individual analyst forecast is optimistic relative to the actual earnings outcome. Thus, *%RelPess* measures the relative proportion of pessimistic forecasts to optimistic forecasts at any point in time (for example, the relative proportion of pessimis tic forecasts made during the month prior to an earnings announcement). A positive *%RelPess* value imlies a higher fraction of pessimistic forecasts to optimistic forecasts and a negative value implies the opposite.

* For example, *Month-12* corresponds to an earnings forecast made in the 12th month prior to the actual earnings announcement.

Table 2 - Continued

Panel B: Mean and Median Scaled Forecast Error (in percent)

Year Group	Month of Analyst Forecast Relative to Earnings Release Date*											
	Month-12	*Month-11*	*Month-10*	*Month-9*	*Month-8*	*Month-7*	*Month-6*	*Month-5*	*Month-4*	*Month-3*	*Month-2*	*Month-1*
All years												
Mean	**-0.90**	**-0.86**	**-0.80**	**-0.75**	**-0.72**	**-0.62**	**-0.54**	**-0.46**	**-0.32**	**-0.25**	**-0.18**	**-0.08**
Median	**-0.28**	**-0.27**	**-0.22**	**-0.20**	**-0.19**	**-0.12**	**-0.10**	**-0.07**	**0.00**	**0.00**	**0.00**	**0.03**
Number	28246	25306	28545	27034	26209	30946	28935	27624	33264	30628	26313	21429
1983-85												
Mean	**-0.87**	**-0.88**	**-0.78**	**-0.79**	**-0.82**	**-0.68**	**-0.63**	**-0.54**	**-0.41**	**-0.32**	**-0.23**	**-0.16**
Median	**-0.43**	**-0.47**	**-0.33**	**-0.34**	**-0.31**	**-0.27**	**-0.24**	**-0.23**	**-0.12**	**-0.07**	**-0.03**	0.00
Number	1780	1701	1833	1906	1869	1975	2017	1947	2095	2152	1871	1402
1986-88												
Mean	**-1.18**	**-1.12**	**-1.10**	**-0.99**	**-1.01**	**-0.87**	**-0.80**	**-0.70**	**-0.55**	**-0.47**	**-0.39**	**-0.27**
Median	**-0.55**	**-0.57**	**-0.48**	**-0.42**	**-0.43**	**-0.34**	**-0.27**	**-0.21**	**-0.13**	**-0.08**	**-0.05**	**-0.03**
Number	3585	3468	3545	3639	3564	3821	3851	3696	4159	4083	3633	2596
1989-91												
Mean	**-1.22**	**-1.08**	**-1.04**	**-1.05**	**-0.96**	**-0.89**	**-0.80**	**-0.69**	**-0.56**	**-0.44**	**-0.32**	**-0.25**
Median	**-0.58**	**-0.50**	**-0.47**	**-0.46**	**-0.37**	**-0.33**	**-0.28**	**-0.22**	**-0.11**	**-0.05**	**-0.02**	0.00
Number	5112	4693	4979	4995	4762	5441	5368	5033	5759	5752	4959	3684
1992-94												
Mean	**-0.92**	**-0.87**	**-0.84**	**-0.77**	**-0.67**	**-0.58**	**-0.48**	**-0.43**	**-0.29**	**-0.20**	**-0.14**	-0.05
Median	**-0.36**	**-0.33**	**-0.28**	**-0.23**	**-0.19**	**-0.13**	**-0.09**	**-0.06**	**0.00**	0.00	**0.00**	**0.03**
Number	6551	5784	6520	6263	6054	7071	6778	6378	7738	7201	6073	4819
1995-98												
Mean	**-0.65**	**-0.65**	**-0.60**	**-0.51**	**-0.51**	**-0.45**	**-0.34**	**-0.28**	**-0.16**	**-0.09**	**-0.05**	**0.03**
Median	**-0.08**	**-0.09**	**-0.05**	**-0.04**	**-0.05**	**0.00**	0.00	0.00	**0.02**	**0.03**	**0.04**	**0.05**
Number	11218	9660	11668	10231	9960	12638	10921	10570	13513	11440	9777	8928

The forecast error is the median earnings forecast error for analysts covering firm *i*, for annual earnings announced in year *y*, in month *t* prior to the earnings announcement. The forecast error is defined as the *[Actual Earnings Per Share (i,y)-Forecast Earnings Per Share (i,y,t)]/P*(i,y-1)*, where *P*(i,y-1)* is the first stock price when the first forecast is available on I/B/E/S for firm *i* in year *y*-1. The highlighted forecasts error values are statistically different from zero at the 1% level of significance.

* For example, *Month-12* corresponds to an earnings forecast made in the 12th month prior to the actual earnings announcement.

Table 3
Multivariate Analysis: Time-Series Determinants of Pessimism

Logistic regression of analyst earnings forecast optimism/pessimism on time-period and firm-characteristic variables. The data set is a pooled time-series cross-sectional sample of 213,692 firm-month observations for the period 1983-98.

$$PESS = \beta_0 + \beta_1 * P_{8688} + \beta_2 * P_{8991} + \beta_3 * P_{9294} + \beta_4 * P_{9598} + \beta_5 * Profit + \beta_6 * MB + \beta_9 * MV + \gamma_1 * Month$$

Variable	Coefficient Estimate	Standard Error	p-value
Intercept	-1.1456	0.0289	0.0001
P_{8688}	0.0491	0.0215	0.0123
P_{8991}	0.1119	0.0205	0.0001
P_{9294}	0.2563	0.0200	0.0001
P_{9598}	0.6343	0.0188	0.0001
Profit	1.0925	0.0187	0.0001
MB	0.0585	0.0036	0.0001
MV	-0.0116	0.0038	0.0002
Month	0.0748	0.0014	0.0001
Model χ^2	9,402.2		
p value	0.0001		

PESS is an indicator variable that takes the value of 1 if *FE* is greater than zero and 0 otherwise. *FE* is the price-scaled median analyst earnings forecast error for firm *i*, for annual earnings in year *y*, in month *t* prior to the earnings announcement. It is defined as the *[Actual Earnings Per Share (i,y)-Forecast Earnings Per Share (i,y,t)]/P*(i,y-1)*, where *P*(i,y-1)* is the first stock price when the first forecast is available on I/B/E/S for firm i in year *y*-1. P_{8688}, P_{8991}, P_{9294}, and P_{9598} are dummy variables which equal 1 if the earnings are in the periods 1986-88, 1989-91, 1992-94, and 1995-98, respectively, and equal to 0 otherwise. *Profit* is a dummy variable which equals 1 if the *Actual Earnings(i,y)>0*, and equal to 0 otherwise. *MB* is the market-to-book quintile ranking for firm *i* based on the market and book values of equity at the end of year *t-1*. *MV* is the annual market value of equity quintile ranking for firm *i* based on the market value of equity at the end of year *t-1*. *MV* and *MB* rankings are done for every year. *Month* is a variable that indicates when an individual analyst earnings forecast was made. *Month* $\in$ {-12,-11,..,-2,-1} is the number of months prior to the earnings announcement date (e.g. –12 is twelve months prior to earnings announcement date).

Table 4
Multivariate Analysis: Time-Series Determinants of Forecast Error

Regression of median analyst earnings forecast errors on time-period and firm-characteristic variables. The data set is a pooled time-series cross-sectional sample of 213,692 firm-month observations for the period 1983-98.

$$FE=\beta_0+\beta_1*P_{8688}+\beta_2*P_{8991}+\beta_3*P_{9294}+\beta_4*P_{9598}+\beta_5*Profit+\beta_6*MB+\beta_7*MV+\gamma_1*Month$$

Variable	Coefficient Estimate	White Standard Error	p-value
Intercept	-0.0247	0.0004	0.0001
P_{8688}	-0.0003	0.0002	0.1121
P_{8991}	-0.0004	0.0004	0.1943
P_{9294}	0.0022	0.0002	0.0001
P_{9598}	0.0044	0.0002	0.0001
Profit	0.0206	0.0002	0.0001
MB	0.0011	0.0000	0.0001
MV	0.0002	0.0000	0.0001
Month	0.0008	0.0000	0.0001
Adj R^2	0.107		

FE is the price-scaled median earnings forecast error for analysts covering firm *i*, for annual earnings in year *y*, in month *t* prior to the earnings announcement. It is defined as the *[Actual Earnings Per Share (i,y)-Forecast Earnings Per Share (i,y,t)]/P*(i,y-1)*, where *P*(i,y-1)* is the first stock price when the first forecast is available on I/B/E/S for firm *j* in year *y*-1. P_{8688} , P_{8991} , P_{9294}, and P_{9598} are dummy variables which equal 1 if the earnings are in the periods 1986-88, 1989-91, 1992-94, and 1995-98, respectively, and equal to 0 otherwise. *Profit* is a dummy variable which equals 1 if the *Actual Earnings(i,y)>0,* and equal to 0 otherwise. *MB* is the market-to-book quintile ranking for firm i based on the market and book values of equity at the end of year *t-1*. *MV* is the annual market value of equity quintile ranking for firm *i* based on the market value of equity at the end of year *t-1*. *MV* and *MB* rankings are done for every year. *Month* is a variable that indicates when an individual analyst earnings forecast was made. *Month* $\in$ {-12,-11,..,-2,-1} is the number of months prior to the earnings announcement date (e.g. –12 is twelve months prior to earnings announcement date).

Table 5
Characteristics of Firms with Net Insider Sales and Net Insider Purchases Following an Earnings Announcement

Descriptive statistics for firms with insider purchases and insider sales following an earnings announcement. Mean values are reported with standard deviations in parentheses. T tests are reported for differences in means with p-values in parentheses. The data set is a pooled time-series cross-sectional sample of 2,301 firm-year observations for the period 1994-98.

	Net Insider Position		
Variable	**Seller**	**Purchaser**	**Difference**
	N = 1,434	*N = 867*	
MB	4.315	3.302	7.529
	(3.473)	(2.896)	(0.001)
Size	4.836	4.887	-0.807
	(1.489)	(1.432)	(0.419)
IssueNow	0.194	0.153	2.514
	(0.396)	(0.361)	(0.012)
IssueNext	0.682	0.434	11.943
	(0.466)	(0.496)	(0.001)
Profit	0.851	0.844	0.317
	(0.356)	(0.363)	(0.751)
PESS$_{last}$	0.767	0.606	5.453
	(0.423)	(0.489)	(0.001)
SWITCH	0.653	0.496	3.707
	(0.477)	(0.501)	(0.001)

PESS$_{last}$ is an indicator variable equal to 1 if *FE$_{last}$* is greater than or equal to zero, and 0 otherwise. *FE$_{last}$* is the price-scaled median earnings forecast error for analysts covering firm *i*, for annual earnings in year *y*, in month after an annual earnings announcement. It is defined as the *[Actual Earnings Per Share (i,y)-Forecast Earnings Per Share (i,y,t)]/P*(i,y-1)*, where *P*(i,y-1)* is the first stock price when the first forecast is available on I/B/E/S for firm *j* in year *y*-1.

SWITCH, is an indicator variable equal to one if the earliest forecast in the year was optimistic (i.e, *FE$_{month-12,\ year\ t}$* < 0) and the final forecast in the year either was pessimistic (i.e, *FE$_{month-1,\ year\ t}$* >= 0), and zero if the first and last forecast are both optimistic.

A firm is classified as a seller (purchaser) if the insiders (CEO, Chairman, VP, directors) are net sellers (purchasers) of company shares in the 20 trading days after an earnings announcement.

IssueNow is a dummy variable which equals if the firm's statement of cash flows indicates a positive sale of common and preferred stock (item #108) greater than 5% of the market value of equity in year *t*. *IssueNext* is a dummy variable which equals if the firm's statement of cash flows indicates a positive sale of common and preferred stock (item #108) greater than 5% of the market value of equity in year *t+1*. *MB* is the market-to-book quintile ranking for firm i based on the market and book values of equity at the end of year *t-1*. *MV* is the annual market value of equity quintile ranking for firm *i* based on the market value of equity at the end of year *t-1*. *MV* and *MB* rankings are done for every year.

Table 6
Relation of Final Forecast Pessimism and Switching from Initial Optimism to Final Pessimism with Insider Trading

Regression of (1) analyst pessimism in the final month before an earnings announcement and (2) switch from optimism to pessimism, on the sale of stock by the firm's CEO in the trading-window after the earnings announcement. The data set is a pooled time-series cross-sectional sample of 2,301 firm-year observations for the period 1994-98.

Panel A: Final Forecast Pessimism

$$PESS_{last} = \beta_0 + \beta_1 * InsiderSale + \beta_2 * IssueNow + \beta_3 * IssueNext + \beta_4 * MB + \beta_5 * MV + \beta_6 * Profit + \varepsilon$$

Variable	Coefficient Estimate	Standard Error	p-value
Intercept	-0.9624	0.1835	0.0001
InsiderSale	0.5859	0.0997	0.0001
IssueNow	0.0388	0.1287	0.7630
IssueNext	0.3068	0.1004	0.0022
MB	-0.1448	0.1486	0.3300
MV	0.2215	0.151	0.1425
Profit	1.1883	0.1221	0.0001
Model χ^2	193.221		
p value	*0.0001*		

Panel B: Switch from Optimism to Pessimism

$$SWITCH = \beta_0 + \beta_1 * InsiderSale + \beta_2 IssueNow + \beta_3 * IssueNext + \beta_4 * MB + \beta_5 * MV + \beta_6 * Profit + \varepsilon$$

Variable	Coefficient Estimate	Standard Error	p-value
Intercept	-0.6271	0.3485	0.0720
InsiderSale	0.3386	0.0968	0.0005
IssueNow	-0.1581	0.2684	0.5558
IssueNext	-0.0810	0.1910	0.6714
MB	0.2047	0.2842	0.4713
MV	0.1322	0.2870	0.6451
Profit	0.7622	0.2329	0.0011
Model χ^2	34.230		
p value	*0.0002*		

$PESS_{last}$ is an indicator variable equal to 1 if FE_{last} is greater than or equal to zero, and 0 otherwise. FE_{last} is the price-scaled median earnings forecast error for analysts covering firm *i*, for annual earnings in year *y*, in last month before an annual earnings announcement. It is defined as the *[Actual Earnings Per Share (i,y)-Forecast Earnings*

Per Share (i,y,t)]/P(i,y-1)*, where *P*(i,y-1)* is the first stock price when the first forecast is available on I/B/E/S for firm *j* in year *y*-1.

SWITCH, is an indicator variable equal to one if the earliest forecast in the year was optimistic (i.e, $FE_{month=12,\ year\ t} < 0$) and the final forecast in the year either was pessimistic (i.e, $FE_{month-1,\ year\ t} >= 0$), and zero if the first and last forecast are both optimistic.

A firm is classified as a seller (purchaser) if the insiders (CEO, Chairman, VP, directors) are net sellers (purchasers) of company shares in the 20 trading days after an earnings announcement. *InsiderSale* is an indicator variable equal to one for seller firm years and 0 for purchaser firm years.

IssueNow is a dummy variable which equals if the firm's statement of cash flows indicates a positive sale of common and preferred stock (item #108) greater than 5% of the market value of equity in year *t*. *IssueNext* is a dummy variable which equals if the firm's statement of cash flows indicates a positive sale of common and preferred stock (item #108) greater than 5% of the market value of equity in year *t+1*. *MB* is the market-to-book quintile ranking for firm i based on the market and book values of equity at the end of year *t-1*. *MV* is the annual market value of equity quintile ranking for firm *i* based on the market value of equity at the end of year *t-1*. *MV* and *MB* rankings are done for every year. *Profit* is a dummy variable which equals 1 if the *Actual Earnings(i,y)>0,* and equal to 0 otherwise

Figure 1:
% Relative Pessimism Across Calendar Years

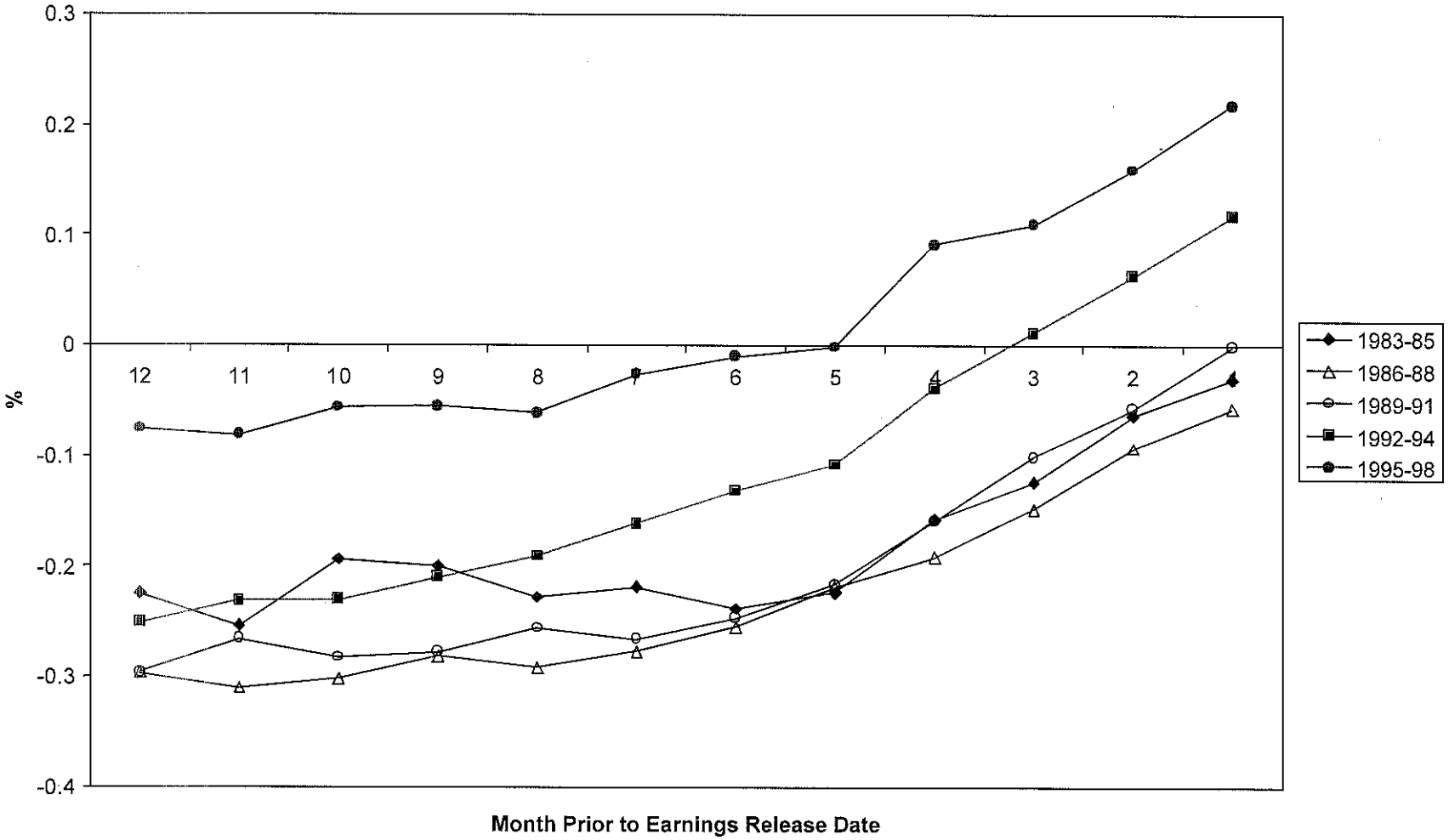

Figure 2A:
Median Forecast Error Scaled by Price

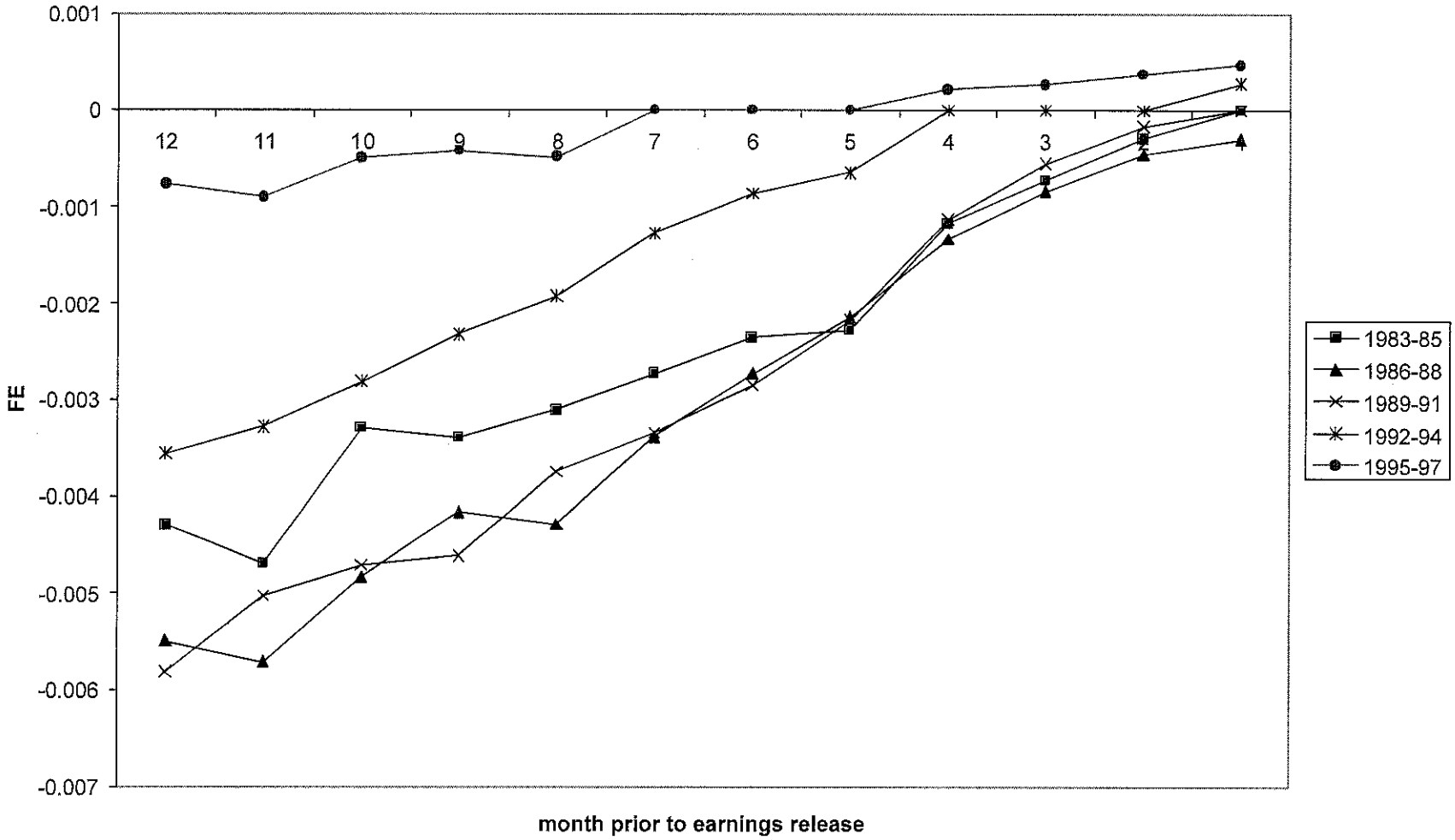

Figure 2B:
Median Forecast Error Scaled by Total Assets

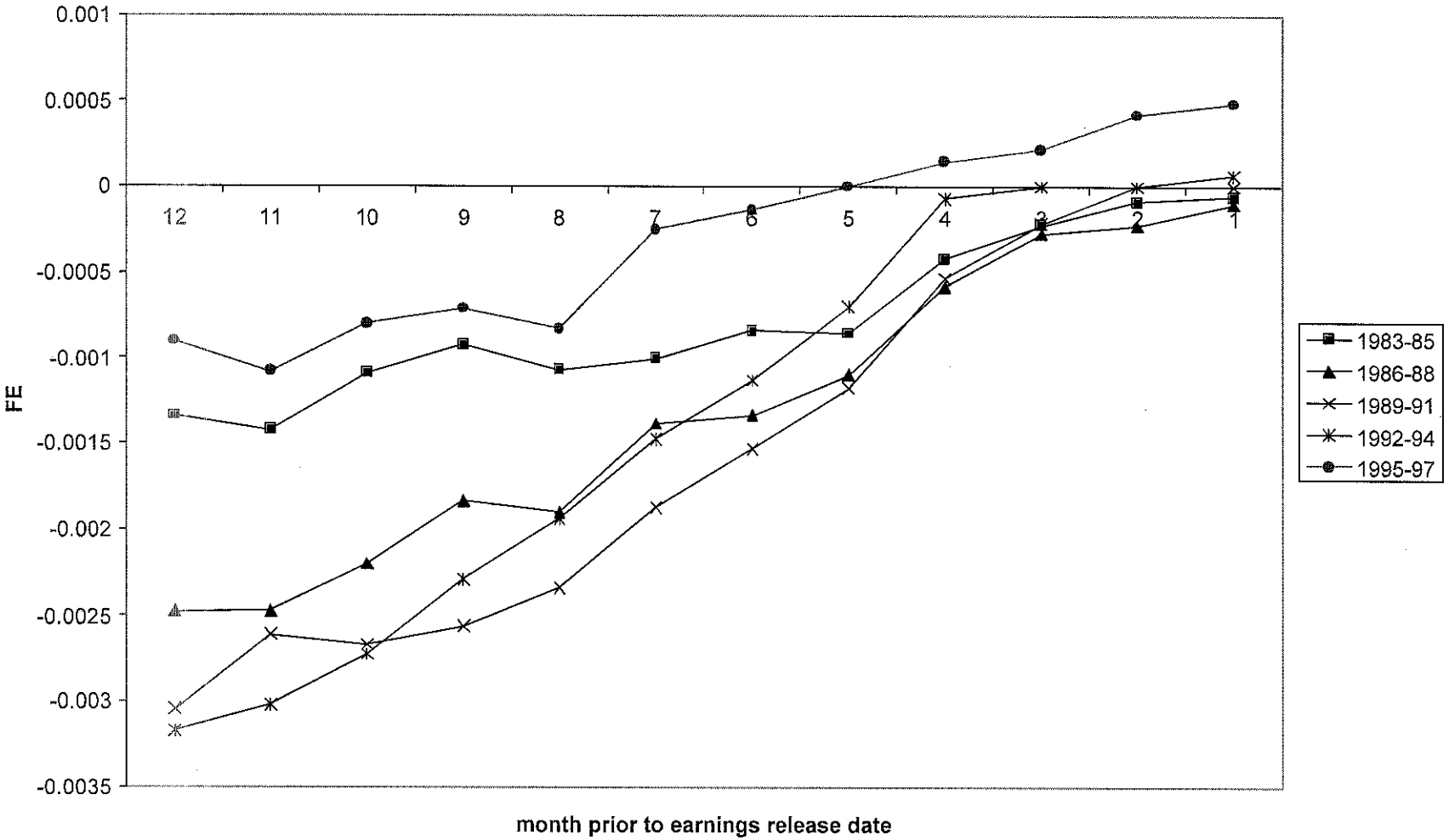

Figure 3:
Quarterly Earnings 1995 to 1998 - constructed consensus forecasts
Mean and median of the median forecast per firm (scaled by price)

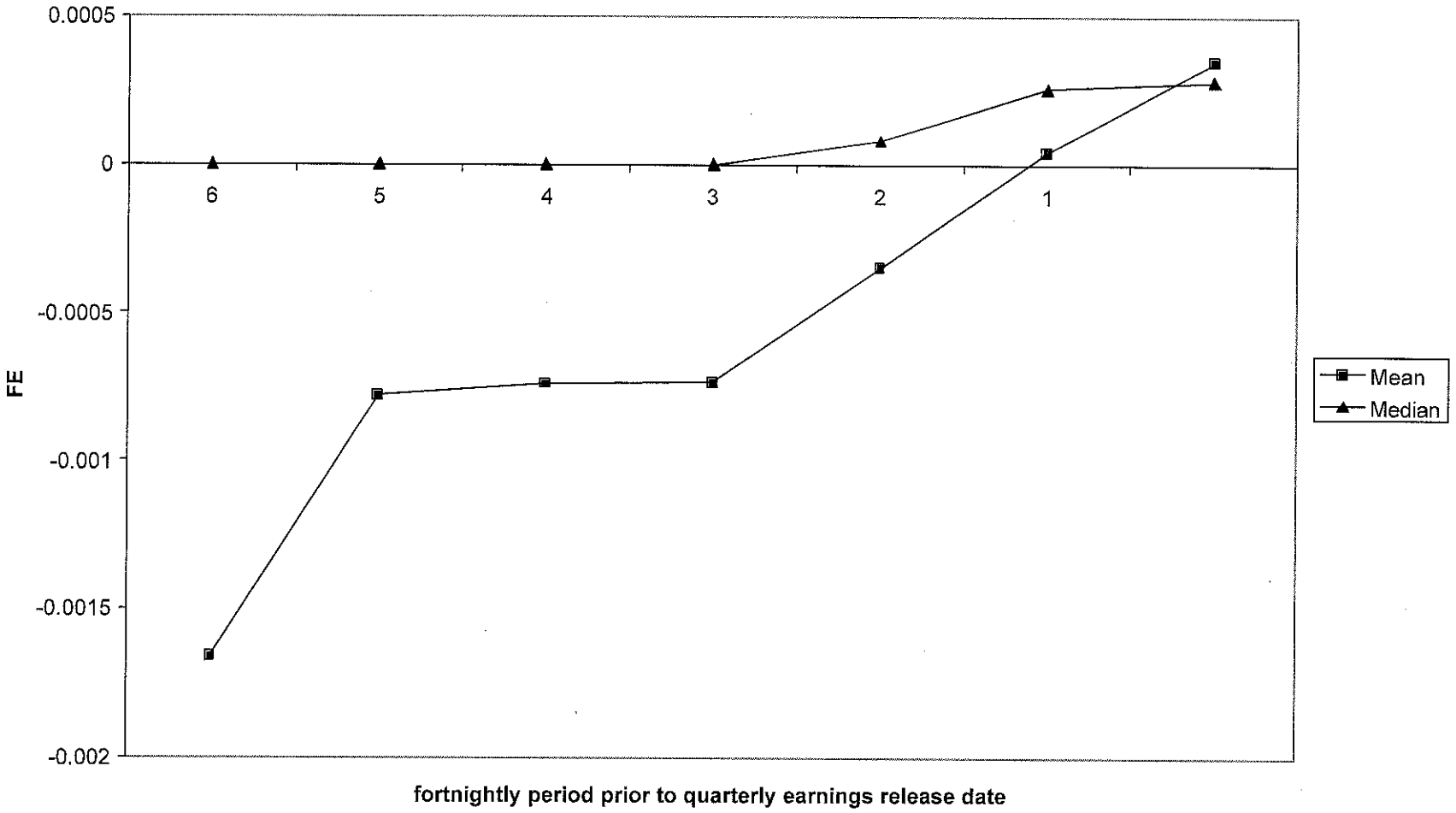

Figure 4 - InsiderSeller vs InsiderPurchaser Median Forecast Error