The Walk-down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives*

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Abstract

It has been alleged that firms and analysts engage in an "earnings-guidance game" where analysts first issue optimistic earnings forecasts and then "walk down" their estimates to a level that firms can beat at the official earnings announcement. We examine whether the walk-down to beatable targets is associated with managerial incentives to sell stock after earnings announcements on the firm's behalf (through new equity issuance) or from their personal accounts (through option exercises and stock sales). Consistent with these hypotheses, we find that the walk-down to beatable targets is most pronounced when firms or insiders are net sellers of stock after an earnings announcement. These findings provide new insights on the impact of capital-market incentives on communications between managers and analysts.

Keywords Analysts' forecasts; Earnings guidance; Insider trading; New equity issuance; Stock options

JEL Descriptors G14, G30, G38, K22, M41

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La réévaluation des prévisions des analystes à des niveaux permettant le dépassement : le rôle de l'émission d'actions et des facteurs incitatifs aux délits d'initiés

Condensé

Certains prétendent que les sociétés et les analystes se livrent à un « exercice de guidage des résultats » dans lequel les analystes produisent d'abord des prévisions de résultats optimistes pour revenir ensuite sur leurs estimations et les ramener à un niveau que les sociétés sont en mesure de dépasser lors de l'annonce officielle de leurs résultats. Les auteurs élaborent et testent des hypothèses relatives à ce passage des analystes de l'optimisme au pessimisme, à partir des facteurs qui incitent les dirigeants à vendre les actions de la société à des conditions avantageuses en évitant de décevoir les investisseurs lors de l'annonce officielle des résultats de l'entreprise.

L'analyse des auteurs repose sur cinq éléments sous-jacents à l'exercice de guidage des résultats. Premièrement, dans la majorité des opérations, les ventes d'actions par les dirigeants et par l'entreprise se déroulent sur un court laps de temps après les annonces de résultats. Deuxièmement, les dirigeants qui ont l'intention de vendre des actions pour leur propre compte ou au nom de la société après une annonce de résultats s'intéressent au cours des titres de la société à brève échéance après l'annonce. Troisièmement, les dirigeants peuvent influencer les analystes dans leurs prévisions de résultats grâce à la publication d'informations discrétionnaires, et les analystes sont, pour leur part, enclins à collaborer. Quatrièmement, les analystes tendent généralement à être optimistes dans leurs prévisions initiales. Enfin, le marché paraît gratifier les sociétés qui dépassent les dernières prévisions de résultats des analystes d'évaluations supérieures à celles qu'il octroie aux entreprises qui ne sont pas parvenues à dépasser l'objectif prévisionnel, peu importe la voie ou le moyen emprunté pour atteindre l'objectif (soit le guidage des anticipations ou la gestion des résultats). À partir de ces éléments, les auteurs font l'hypothèse que les dirigeants guident systématiquement les analystes vers des objectifs prévisionnels qui peuvent être dépassés, de sorte qu'eux-mêmes ou leurs sociétés puissent vendre des actions à des conditions avantageuses après une annonce de résultats.

Les auteurs exposent d'abord des faits qui relient l'évolution du profil des prévisions des analystes entre les années 1980 et les années 1990 et les changements institutionnels et réglementaires qui ont accentué les facteurs liés au marché financier incitant les dirigeants à guider les analystes dans leurs prévisions de résultats et à dépasser ces objectifs prévisionnels, afin de hausser le cours des actions. Ces changements systémiques incluent l'utilisation accrue de la rémunération des dirigeants sous forme d'options sur actions, la restriction des négociations par les initiés à la période postérieure aux annonces de résultats en réponse à l'*Insiders' Fraud and Securities Trading Act* de 1988 et le remaniement, en 1991, de la règle relative au délai d'attente que doivent respecter les initiés entre les opérations de négociation (« *short-swing rule* »), de façon à leur permettre de lever leurs options et de vendre immédiatement les actions de la société. L'analyse des auteurs montre qu'entre 1984 et 2001, les prévisions de résultats initiales trimestrielles et annuelles des analystes sont trop optimistes par rapport aux résultats réels finals. Lorsque la date de l'annonce des résultats approche, les analystes révisent à la baisse leurs prévisions afin qu'elles soient moins optimistes par rapport aux résultats réels. Il existe une différence essentielle entre les années

1980 et les années 1990 : les révisions moyennes et médianes des prévisions de résultats des analystes au cours de la période s'échelonnant du milieu jusqu'à la fin des années 1990 deviennent bel et bien pessimistes lorsque la date de l'annonce des résultats approche. Ce virage systématique des analystes vers le pessimisme dans les années 1990 coïncide avec les changements institutionnels et réglementaires qui ont accentué les facteurs liés au marché financier incitant les dirigeants à guider les analystes dans leurs prévisions de résultats et à dépasser ces objectifs prévisionnels, afin de hausser le cours des actions à brève échéance.

Les auteurs soumettent à des tests transversaux leur prédiction principale selon laquelle les facteurs incitatifs liés au marché financier découlant de la vente d'actions, soit à titre personnel (la levée d'options et la vente d'actions par les initiés) soit au nom de la société (l'émission de nouvelles actions), sont associés au fait que les analystes ramènent leurs prévisions à un niveau que les sociétés sont en mesure de dépasser. Dans leurs tests transversaux, les auteurs utilisent un vaste échantillon de prévisions des analystes, du milieu des années 1980 jusqu'à 2001, tirées de la base de données I/B/E/S. Les données sur la vente d'actions par les dirigeants sont tirées de la compilation, effectuée par la société Thompson Financial, des opérations d'initiés soumises à la SEC. Seules les opérations des initiés parmi les achats et les ventes sur le marché libre et la levée d'options figurent dans le calcul des ventes nettes d'actions par les dirigeants. Les auteurs mesurent les ventes d'actions au nom de la société en utilisant les données relatives aux émissions d'actions dans le trimestre au cours duquel sont annoncés les résultats et le trimestre subséquent.

Conformément à leur principale prédiction transversale, les auteurs constatent que le pessimisme dans les prévisions antérieures à l'annonce de résultats est le plus marqué dans le cas des sociétés dont les dirigeants sont le plus fortement incités par les facteurs liés au marché financier à éviter les déceptions relatives aux résultats. Les auteurs observent que les sociétés dont les dirigeants vendent des actions après une annonce de résultats sont plus susceptibles d'être associées à des prévisions pessimistes des analystes avant l'annonce des résultats. La probabilité de pessimisme des prévisions passe de 54 %, dans le cas d'une société moyenne pour laquelle n'est enregistrée aucune vente nette par les initiés, à 66 % dans le cas d'une société moyenne pour laquelle est enregistrée une vente nette subséquente par les initiés. En outre, les sociétés dont les initiés sont des vendeurs nets d'actions de l'entreprise sont également plus susceptibles d'être associées à des analystes qui passent de l'optimisme à long terme au pessimisme à court terme avant l'annonce de résultats. La probabilité du passage de l'optimisme, tôt dans le trimestre, au pessimisme, à proximité de l'annonce des résultats, augmente de 21 % chez les sociétés pour lesquelles n'est pas enregistrée de vente nette des initiés à 27 % chez les sociétés pour lesquelles est enregistrée une vente nette des initiés. Cette constatation est conforme au fait que les dirigeants orientent les analystes vers des prévisions de résultats pouvant être dépassées pour faciliter les opérations avantageuses que peuvent conclure les initiés après les annonces de résultats.

Les auteurs constatent que les résultats de leur série chronologique résistent : 1) à différents déflateurs des prévisions de résultats des analystes, 2) aux horizons prévisionnels annuel aussi bien que trimestriel, 3) à l'utilisation de la population entière des sociétés figurant dans la base de données I/B/E/S et à l'utilisation d'un échantillon déterminé de sociétés examinées durant toute la période étudiée et 4) aux ajustements visant la prise en compte des fractionnements d'actions susceptibles d'influer sur le calcul des erreurs prévisionnelles des analystes.

Ils constatent également que leurs résultats empiriques transversaux résistent : 1) à différents déflateurs des prévisions de résultats des analystes, 2) aux horizons prévisionnels annuel aussi bien que et trimestriel, 3) à l'inclusion de diverses caractéristiques des sociétés précédemment liées aux prévisions de résultats des analystes, 4) aux différents types d'analystes (précurseurs ou retardataires) et 5) aux différentes classes d'investisseurs, y inclus les investisseurs institutionnels et les investisseurs individuels.

Les constatations des auteurs complètent les résultats d'Aboody et Kasznik (2000) dont les observations confirment que les dirigeants publient de l'information à des fins stratégiques, en vue d'obtenir des options sur actions à des conditions avantageuses. L'approche des auteurs consiste à examiner les facteurs qui incitent les dirigeants à publier de l'information à des fins stratégiques dans le but de lever des options et de vendre des actions à des conditions avantageuses. Ils poussent également plus loin les études récentes portant sur les caractéristiques des sociétés qui se livrent au guidage des résultats (Matsumoto, 2002) en analysant explicitement les facteurs qui incitent directement les dirigeants à tirer profit de ce guidage. Pour conclure, les résultats empiriques de l'étude nous renseignent davantage sur l'incidence des facteurs incitatifs liés au marché financier sur les communications entre dirigeants et analystes.

1. Introduction

Security regulators and the business press have often alleged that firms and analysts are involved in an "earnings-guidance game". These critics claim that analysts issue systematically optimistic earnings forecasts at the start of the fiscal period and then "walk down" their estimates to a level the firm can beat on the formal earnings announcement. For example, Laderman (1998, 148) noted in a *Business Week* article:

> Thanks to the IR [investor relations] people and analysts, in recent years, earnings estimates for the S&P 500 in any quarter tend to start out an average 5% to 8% higher than where the earnings end up. The Street knows this and allows for analysts to whittle down the numbers as the quarter proceeds.

We develop and test hypotheses about this pattern of analyst optimism-to-pessimism based on managerial incentives to sell company stock on favorable terms by avoiding a "disappointment" on the official announcement of firm earnings. The motivation for our investigation is straightforward. As Ken Brown (2002, C1) indicates in his *Wall Street Journal* column:

> the reasons that executives became so obsessed with hitting their numbers are clear. A company that shows steady growth with few surprises often gets rewarded with a sweet premium from investors — a high stock price — which goes a long way toward keeping the executives' stock options in the money.

The business press is replete with articles alleging that firms deliberately attempt to deceive or pressure analysts into issuing "beatable" earnings targets. Even as far back as May 6, 1991, Laurie P. Cohen, staff reporter of the *Wall Street Journal* wrote 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.

Prior academic research documents that analysts issued systematically optimistic forecasts during the 1980s (see, e.g., O'Brien 1988). However, consistent with media reports of forecast pessimism, more recent empirical evidence suggests that firms attempt to meet or beat earnings-forecast benchmarks (see, e.g., Bartov, Givoly, and Hayn 2002; Burgstahler and Eames 2002; DeGeorge, Patel, and Zeckhauser 1999; Kasznik and McNichols 2002; Matsumoto 2002; and Richardson, Teoh, and Wysocki 1999). In this paper, we explore empirically whether capital-market incentives stemming from the sale of equity either on personal account (insider option exercise and stock sale) or on the firm's behalf (new equity issuance) are associated with the walk-down of analysts' forecasts to targets that are eventually beaten through successful guidance of expectations or earnings management.

We begin our analysis by developing a framework for the earnings-guidance game. The framework is based on five underlying elements outlined below, and discussed in more depth in section 2. First, in the majority of transactions, managerial and firm equity sales occur during a short window after earnings announcements. Second, managers who are about to sell shares on their personal account or on behalf of the firm after an earnings-announcement care about the firm's short-term post-announcement stock price level. Third, managers can influence analysts' earnings targets through discretionary information disclosures and analysts have incentives to cooperate. Fourth, analysts' initial forecasts generally tend to be optimistic. Finally, the market appears to reward firms that beat analysts' latest earnings target with higher valuations than those that fail to beat the target, regardless of the path to the target or how the target is achieved (that is, through guiding expectations or earnings management). On the basis of these elements, we hypothesize that managers systematically guide analysts toward beatable targets so that they or their firms can sell equity on favorable terms after an earnings announcement. According to this managerial guidance hypothesis, such guidance allows the manager to maintain favorable stock market valuations exactly when they are needed, just after earnings announcements.

In our empirical study, we test this hypothesis by examining the association between firms' and managers' equity sales after earnings announcements and (1) the walk-down in analysts' optimistic forecasts early in the fiscal period and (2) firms meeting or beating analysts' final revised earnings targets. Given that neither managers' intentions to guide analysts nor their communications with analysts can be directly observed in our sample, we follow prior empirical studies of agency models and examine principals' and agents' observable actions, after controlling for other

influences.[1] In our study, the analysts' observable actions are their beatable forecast revisions and the managers' observable actions are their post-earnings announcement equity transactions. Our evidence is consistent with the predictions of our managerial guidance hypothesis, whereas alternative interpretations do not appear to explain the totality of our results.[2]

In our tests, we use a large sample of analyst forecasts from the mid-1980s to 2001 available from I/B/E/S. Data on managers' sale of shares are obtained from Thomson Financial's compilation of insider trades that are filed with the Securities and Exchange Commission (SEC). Only insiders' trades from open-market purchases and sales and option exercises are included in the calculation of the net sale of shares by the managers. We measure the sale of shares on the firm's own behalf using data on equity issuances in the quarter of and quarter after the earnings announcement.

Consistent with our main predictions, we find that analysts' earnings forecast pessimism prior to an earnings announcement is (1) more prevalent in the late 1990s following institutional and regulatory changes that increased managers' capital-market incentives to guide and beat analysts' forecasts to boost short-term stock prices, and (2) more common for firms that are about to issue new equity and whose insiders are net sellers of the firm's stock in the quarter immediately following an 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 disclose information in order to exercise options and sell stock on favorable terms. We also contribute to the recent literature (e.g., Matsumoto 2002) examining firm characteristics that influence earnings guidance by explicitly considering firm and managers' direct incentives to profit from earnings guidance in our study.

The rest of the paper is structured as follows. In section 2, we develop our hypotheses. Section 3 describes the sample and data. Section 4 presents descriptive evidence for the behavior of earnings forecasts over the fiscal period in various calendar subperiods. In section 5, we present primary cross-sectional tests and a robustness analysis of the predictions arising from the earnings-expectations game. Section 6 concludes the paper.

2. Background and hypothesis development

In this section, we motivate the prediction that managers' capital-market trading incentives are related to their guidance of analysts' earnings forecasts. We first discuss the institutional rules governing the timing of stock-sale transactions that motivate managers to focus on the firm's stock price around earnings announcements. We then discuss how analysts' forecasts influence stock prices, suggest why analysts cooperate with managers in setting forecasts, and discuss recent empirical research consistent with managers' influencing analysts' forecasts. Finally, we discuss recent research indicating that investors fixate on meeting earnings 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 earnings announcements, then managers have strong incentives to influence analysts' expectations to avoid an earnings disappointment. We combine these elements to develop hypotheses on the cross-sectional variation in analysts' optimism and pessimism. Together, these elements suggest that insider trading and new equity issuance activities are linked to analyst forecast bias within the fiscal period.

Why and when managers care about short-term stock price

Managers intending to issue new equity on the firm's behalf care about the firm's stock price level after an earnings announcement because the stock price directly affects the proceeds the firm can raise through an equity sale. Managers care particularly about the stock price right after an earnings announcement because new equity issues typically occur in the weeks following a public earnings announcement (see, e.g., Korajczyk, Lucas, and MacDonald 1991). Lucas and MacDonald (1990) explain this timing as an attempt to minimize information asymmetry between the firm and uninformed outside investors by delaying equity issues until after an earnings announcement.

Stock-based compensation such as stock options also motivates managers to care about the firm's stock price by directly tying compensation to the firm's stock price performance.[3] Hall and Liebman (1998) report that stock options have become an increasingly important portion of managers' compensation. They report that stock option grants increased to make up almost 50 percent of chief executive officer (CEO) compensation by 1994. Thus, managers face increasing incentives to care about the firm's stock price from the structure of their compensation package.

Furthermore, managers care about the firm's short-term stock price specifically during the earnings-announcement period because of institutional constraints on insider trading. These restrictions have arisen because regulatory and corporate concerns that managers may use their 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 Sanctions Act 1984; Insider Trading and Securities Fraud Enforcement Act 1988) expressly prohibit this direct profit-taking opportunity by insiders. In response to the 1988 Insider Trading and Securities Fraud Enforcement Act, firms increasingly have instituted their own policies and procedures to regulate trading by insiders prior to earnings announcements. These restrictions generally take the form of explicit blackout periods specifically in the last two months before the earnings-announcement date (see, e.g., Bettis, Coles, and Lemmon 2000; Jeng 1999). Bettis et al. reported that firms increasingly instituted formal blackout periods during the 1990s, and that by 1997, 80 percent of firms had blackout periods.[4] Therefore, the occurrence of insiders' option exercises and stock sales are increasingly focused in a narrow window immediately after an earnings announcement. Consistent with this, Sivakumar and Waymire (1994) report a higher incidence of insider trades in the week immediately after a quarterly earnings announcement. Similarly, Noe (1999) reports that insider transactions cluster after voluntary disclosures that are favorable to stock prices.

In sum, stock option compensation, insider trading restrictions, and new equity issue guidelines motivate managers to care about the firm's short-term stock price immediately following an earnings announcement. As a result, the stock price level during the earnings-announcement period carries special significance for firm management.

Managers' ability to manage analysts' forecasts and analysts' incentives to cooperate

Empirical and anecdotal evidence suggest that managers can indeed influence analysts' earnings forecasts. 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. Cotter, Tuna, and Wysocki (2004) find that the switch to pessimistic forecasts appears to be concentrated around the release of management forecasts. Using survey data, Hutton (2003) finds that firms where managers indicated that they provide active guidance to analysts are less likely to experience negative earnings surprises. Together these papers suggest that managers are both able and willing to engage in expectations management.

Francis and Philbrick (1993) and Lim (2001) argue that managers can pressure analysts to revise forecasts away from their true beliefs because of analysts' dependence on management for future information. The business press has reported incidents of analysts who issued unfavorable forecasts being shunned by the management. Analysts may find it very difficult to do their jobs if they are ignored by management at investor conferences and if the firm does not return analysts' phone calls for information. At the extreme, there have been allegations of analysts losing their jobs after writing negative reports about favored clients.

It has also been alleged that analysts face conflicting incentives in maintaining the quality of investment research versus securing investment banking deals. Laderman (1998) asserts that

> [m]ost 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.

It is a widespread belief in the business press and among regulators that highly lucrative underwriting deals often pressure analysts to cooperate with firms issuing new securities. The SEC's investor education website specifically mentions the

potential for analyst conflict of interest because of investment banking relationships. The recent well-publicized $1.4 billion settlement between 10 major brokerages and the U.S. securities regulators stems from this very allegation that investment banking influences compromise analysts' objectivity. The legal investigation revealed many instances where analysts yielded to investment banking business pressures. The new Regulation AC, released by the SEC in April 2003, specifically requires a research analyst to certify that "the views expressed in the research report accurately reflect such research analyst's personal views". It also requires analysts to certify that his or her compensation was not directly or indirectly related to the recommendation; if it was, the extent and source of the relation must be disclosed in the report.[5]

Previous academic research has also provided some evidence that analysts yielded to client firm pressures. Collectively, Lin and McNichols (1998), Michaely and Womack (1999), Dechow, Hutton, and Sloan (2000), Teoh and Wong (2002), and Bradshaw, Richardson, and Sloan (2003) provide evidence that analysts' recommendations, forecasts, and price targets are biased because of the conflict of interests introduced by external financing and the associated potential for underwriting business.

General optimism in long-horizon forecasts

To have a walk-down from optimism to pessimism as the forecast horizon shortens, there needs to be optimism at long horizons. All past empirical studies on earnings forecasts have found systematic analyst optimism at long horizons, and we confirm this for our sample in both earlier and more recent periods. Our hypothesis is potentially consistent with different possible reasons for the pervasive initial optimism.

One possibility is an agency problem wherein analysts, on behalf of firms, make high forecasts in order to improve market perceptions of the firms.[6] The analysts benefit from covering firms that subsequently do well, so there may be a self-selection tendency for analysts to cover firms about which they are optimistic (see McNichols and O'Brien 1997). Alternatively, analysts could simply be irrationally prone to optimism. Regardless of the source of the initial optimism, our hypothesis is based on the presence of a distinct force acting toward pessimism just before earnings announcements.

Managers' incentives to achieve beatable targets

In addition to long-horizon forecast optimism, past studies have shown increased forecast accuracy as the earnings-announcement approaches. However, this research has generally found continued analyst optimism at all forecast horizons (see, e.g., Brown, Foster, and Noreen 1985). As discussed in the introduction, it is only in more recent periods that researchers have found evidence of analyst pessimism in short horizons. These authors suggest that management communications with analysts lead to the 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 (2002) find an asymmetry in investor reaction to beating versus missing a threshold consisting of analyst forecasts made in the last month prior to the earnings announcement. They find that when firms fall short of forecasts, the stock price drops more than the stock price rises when firms beat forecasts by an equivalent magnitude of earnings surprise. They also find that this asymmetry is especially pronounced for high-growth firms. 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.

Kasznik and McNichols (2002) and Bartov, Givoly, and Hayn (2002) find that the capital market provides a valuation premium to firms whose earnings meet or beat analysts' estimates. Specifically, Bartov, Givoly, and Hayn (2002, 196) find that the capital-market premium for meeting or beating forecasts remains significant after controlling for the overall earnings performance in the quarter and even despite the earlier dampening of expectations by earnings guidance. Their further tests provide evidence that the market-valuation premium persists for firms that meet or beat analysts' earnings forecasts that were revised late in the quarter. In other words, the path by which analyst forecasts come to be beaten appears to be less crucial than whether the forecast ultimately becomes beatable just prior to the earnings announcement, consistent with investor limited attention about the shifting benchmark.

Institutional forces and incentives to beat targets

Two structural changes between the 1980s and 1990s are likely to have increased managerial incentives to guide analysts toward beatable earnings targets. The first structural change is the greater use of stock-based executive compensation by U.S. corporations during the 1990s. For example, Hall and Liebman (1998) present evidence on the growing use of CEO stock option compensation in the 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 by over 680 percent. Murphy (1999) confirms this growth and shows that the explosive growth trend in stock options continued to 1996, the latest year in his study. The greater predominance of exercisable stock options in the 1990s encouraged greater managerial attention to stock prices, especially around the earnings-announcement date, given the insider-trading restrictions mentioned earlier. This increase in managerial stock sales after earnings announcements in the 1990s likely led to widespread incentives for managers to guide analysts' earnings forecasts to avoid any disappointments that would negatively affect share prices.[7]

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 of 1934 required insiders to hold shares of stocks acquired through an option exercise for at least six months

before selling, or the profits would go to the firm. In May 1991, the SEC 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, since May 1991, managers have a more precise target date for when to exercise their stock options and immediately unload their stock, typically in the trading window after earnings announcements. Thus, the incentives to avoid an earnings disappointment by guiding forecasts to a beatable target increased subsequent to 1991.

Hypotheses on cross-sectional determinants of analyst pessimism

To summarize, the key elements that are related to the expectations-management game are that 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, that managers can influence analysts' expectations through their information disclosures, and that 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 1. *The likelihood of observing short-horizon pessimistic analyst forecasts prior to an earnings announcement is increasing in management and firm incentives to sell stock after an earnings announcement. These effects are likely to be stronger in the 1990s than in earlier periods.*

Finding evidence in support of this hypothesis is consistent with analysts' being guided toward a more pessimistic target. However, another way to interpret the correlation between post-earnings-announcement equity sales and short-horizon pessimism is that stockholders sell shares after truly unexpected good news. If managers guide analysts toward beatable targets, then a stronger prediction can be derived on the basis of the following: (1) analysts initially issue optimistic (or unbiased) earnings forecasts, (2) analysts then revise their forecasts to become pessimistic before an earnings announcement, and (3) the firm or its insiders sell stock after the firm beats the revised earnings target. Therefore, we should observe an "opportunistic" switch from optimistic (or unbiased) to pessimistic analyst forecasts prior to firm or insider equity sales.[8] This leads to our second more restrictive prediction on cross-sectional determinants of expectations management:

HYPOTHESIS 2. *The likelihood of observing a switch from optimistic to pessimistic analyst forecasts prior to an earnings announcement is increasing in management and firm incentives to sell stock after an earnings announcement. These effects are stronger in the 1990s than in earlier periods.*

3. Sample and variable construction

Data on individual analysts' forecasts of quarterly and annual earnings per share are obtained from the Institutional Brokers Estimate System (I/B/E/S) Detail

History U.S. Edition tapes from 1984 to 2001. 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, e.g., Abarbanell and Bernard 1992).[9] The data sample consists of all individual analyst forecasts for firms with data availability on both I/B/E/S and COMPUSTAT.[10] To track forecast revisions leading up to the earnings' announcement, we sort analysts' forecasts into groups by 30-day blocks prior to the earnings release date over the annual horizon, and into finer two-week blocks over the quarterly horizon in the I/B/E/S Actuals File. We calculate a 30-day (or two-week) consensus forecast for each firm using the median of individual analyst forecasts within a period. We ensure that the calculation of the period's initial consensus forecast is made after the prior period's earnings announcement.

The forecast error (*FE*) 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 quarter. The stock price deflator is used to control for potential spurious relations resulting from cross-sectional scale differences in earnings per share.[11] A negative error implies an optimistic forecast (that is, bad news), whereas a positive error implies a pessimistic forecast (that is, good news). Formally, the scaled forecast error (*FESC*) for firm i in quarter q and forecast-horizon period $-t$ is calculated as:

$$FESC_{i,\,q,\,t} = [Actual\ EPS_{i,\,q} - Forecast\ EPS_{i,\,q,\,t}]/P_{i,\,q-1} \qquad (1).$$

Firms' actual earnings per share are obtained from I/B/E/S for comparability with the forecast. The deflator $P_{i,\,q-1}$ is the stock price when the first forecast is available on I/B/E/S for firm i in quarter q. For annual forecasts, the deflator is the first available stock price in the year reported in I/B/E/S, which is typically available 12 months prior to the actual earnings-announcement date.[12] For quarterly forecasts, the deflator is the first available stock price in the quarter reported in I/B/E/S, which is typically available 3 months prior to the actual earnings-announcement date. To remove the influence of extreme outliers due to data-coding errors, we remove the extreme forecast errors that are greater than 10 percent in absolute value of share price.[13]

4. Pattern of forecast bias over the fiscal horizon

In section 2, we described how significant structural changes in executive compensation and insider-trading policies may affect managerial trading incentives in the 1990s, and consequently increased managerial incentives to guide analysts' forecasts. Before testing for a relation between managers' trading behavior and forecast revisions, we first examine temporal changes in analysts' forecast bias in the period from 1986 to 2001.

Panel A of Figure 1 shows the dynamic pattern of forecast bias over the annual forecast horizon for five calendar subperiods: 1984–88, 1989–91, 1992–94, 1995–97, and 1998–2001. For each subperiod, the forecasts show a consistent walk-down pattern. All subperiod initial median forecasts are optimistic, and the forecasts

become increasingly less optimistic as the horizon shrinks toward the announcement date. A key difference across subperiods is that the median forecast crosses over to become pessimistic toward the earnings-announcement date only for the later calendar subperiods in the 1990s, consistent with the institutional changes noted for the 1990s. Furthermore, the median forecasts become pessimistic earlier in the forecast horizon as the 1990s progressed. For example, the median forecast becomes pessimistic in *Month −2* for the 1992–94 period, and in *Month −3* for 1995–97 and 1998–2001 subperiods. These findings are mirrored in the quarterly forecast data depicted in panel B of Figure 1. In this panel, one gets a more detailed picture of the short-horizon shift to pessimistic forecasts using two-week windows just prior to quarterly earnings announcements. Again, the shift to pessimism is only evident in the 1990s for the quarterly horizon.

The dynamic patterns of a shift toward pessimistic forecasts over the forecast horizon and over calendar subperiods are robust with respect to the empirical measures of forecast pessimism. For example, similar patterns are observed using mean analyst forecast errors. More important, our focus on the median forecasts indicates that the dynamic pattern of forecast bias documented here is independent of the debate on whether the mean forecast is biased.

The median forecast error in *Month 0* is only one cent in the post 1992 subperiods. The small magnitude does not imply low economic significance because "just beating" the forecast may have disproportionate informational signaling value to investors (see, e.g., DeGeorge et al. 1999). Overall, the univariate results present compelling evidence of a switch to systematic pessimism that is coincident with increased use of executive stock option compensation, greater concentration of insider trades in the post-earnings-announcement period, and the lifting of the short-swing rule for insiders during the 1990s.

Robustness checks on the temporal pattern

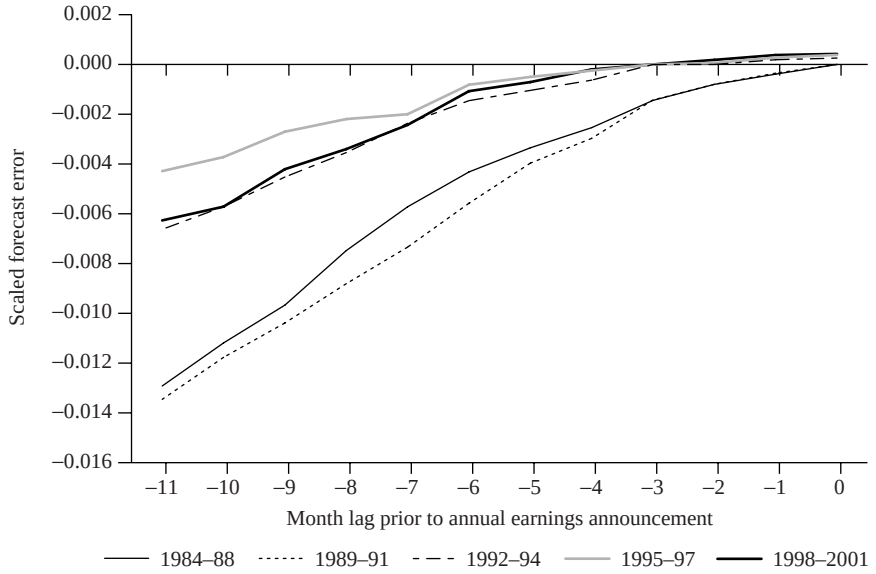
The analyst forecast errors in our sample are price-deflated to allow direct comparison across firms, which is standard in the literature. Given that scaling by price may introduce intertemporal variation in forecast bias if price–earnings ratios change over time, we also perform the tests using total assets per share as an alternative deflator. Our findings are robust using this alternative deflator. Figure 1 documents a switch in forecast error from optimism to pessimism as the horizon moves toward the earnings announcement in the subperiods after 1991. Note that the sign switch from optimism to pessimism forecasts is independent of the deflator because both price and total asset deflators are positive.

We also considered whether the time-series patterns are affected by changing sample composition during the sample period. For example, a change in the composition of publicly traded companies or in the breadth of coverage on I/B/E/S may affect the forecast bias over time. To rule this out, we replicated our tests using a constant sample of firms that existed throughout the sample period and found a similar dynamic pattern.

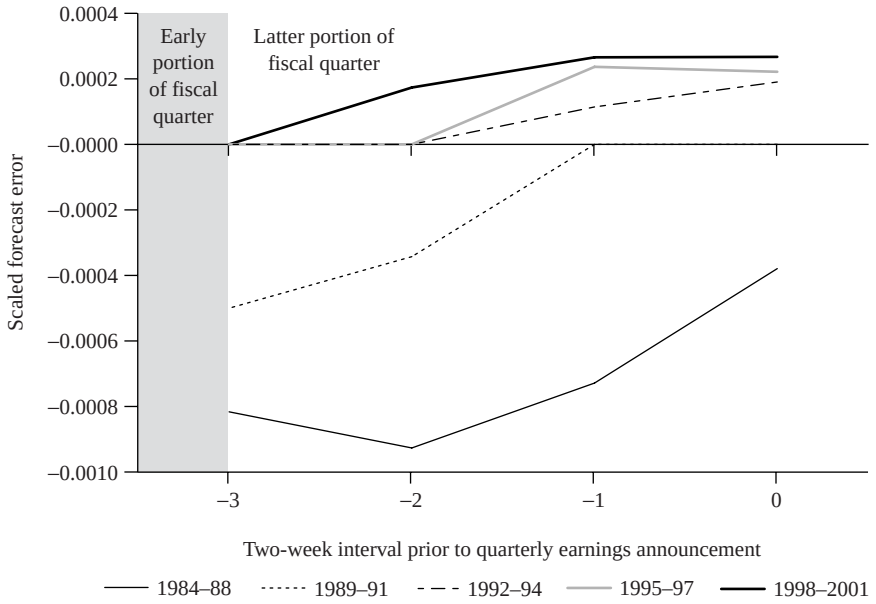
Finally, Baber and Kang (2002) report that forecast errors collected by data providers such as I/B/E/S are rounded to the nearest cent after making retroactive

Figure 1 Median scaled forecast error*

Panel A Annual forecast horizon



Panel B Quarterly forecast horizon



(The figure is continued on the next page.)

Figure 1 (Continued)

Notes:

* The sample includes all firm-year (firm-quarter) observations with data available on the I/B/E/S detail files to construct a median consensus for the monthly (two-week) periods leading up to the annual (quarterly) earnings announcement. All individual analyst forecasts are included except forecasts that create forecast errors greater than stock price (that is, scaled forecasts greater than 100 percent are excluded from the consensus measure). The most recent month (two-week) period prior to the earnings announcement is 0. The sample is broken into five subperiods: 1984–88, 1989–91, 1992–94, 1995–97, and 1998–2001.

and cumulative stock split adjustments. This data-processing artifact compresses analyst forecast errors for firms that have experienced stock splits, which can generate a conservative bias in time-series analyses of forecast errors. Specifically, firms experiencing several stock splits have smaller forecast errors early in times series. The fact that we are still able to document a concentration in small positive forecast errors in recent years speaks to the strength of the walk-down phenomenon. However, as a robustness check, we recalculate our forecast variables using an I/B/E/S data set that does not contain this stock-split problem. Our results are robust using this data set and, therefore, retroactive, and cumulative stock-split adjustments do not explain our results.

In sum, we find evidence of a robust shift toward greater final forecast pessimism. The timing of this shift to pessimism 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 provide increased managerial incentives to guide analysts to forecast beatable final earnings targets.

5. Quarterly forecast bias and trading incentives

We turn next to tests of the two hypotheses developed in section 2. Although the longer 12-month horizon is useful to show clearly the walk-down pattern over the forecast horizon, we base our tests of the relation between forecast bias and managerial trading incentives using quarterly forecasts.[14] Examining forecasts over the quarterly horizon allows us to focus our analysis on walk-down effects that are not a direct consequence of quarterly earnings announcements. Furthermore, our test results can be compared with recent studies on pessimism in the shortest horizon (e.g., Bagnoli, Beneish, and Watts 1999; Brown 2001; and Matsumoto 2002). Our empirical tests include controls for other factors that affect analyst forecast bias including firm size, growth, and profitability (e.g., Brown 2001).

Table 1 presents descriptive statistics on the sample by calendar subperiods. Firm size is measured at the start of the fiscal quarter as closing stock price at the start of the fiscal quarter (COMPUSTAT data item 14) times the number of common shares outstanding (COMPUSTAT data item 61). The book-to-market ratio is calculated as the book value of common equity at the start of the fiscal quarter

TABLE 1
Descriptive statistics for 53,653 firm-quarter observations for the period 1984–2001

Variable	All years	Year grouping				
		1984–88	1989–91	1992–94	1995–97	1998–2001
Size ($M)						
Mean	2,571	1,662	1,718	1,758	2,274	4,113
Standard deviation	10,729	3,560	4,701	4,834	7,214	17,638
Q1	137	155	108	127	132	160
Median	422	492	336	376	386	519
Q3	1,504	1,632	1,286	1,302	1,388	1,862
BM						
Mean	0.52	0.596	0.635	0.521	0.473	0.474
Standard deviation	0.38	0.375	0.426	0.324	0.299	0.435
Q1	0.27	0.347	0.346	0.292	0.257	0.217
Median	0.44	0.538	0.552	0.466	0.414	0.383
Q3	0.68	0.771	0.823	0.674	0.621	0.608
Profit Indicator						
Mean	0.87	0.90	0.90	0.90	0.88	0.82
Standard deviation	0.34	0.30	0.30	0.31	0.32	0.38
Q1	1	1	1	1	1	1
Median	1	1	1	1	1	1
Q3	1	1	1	1	1	1
IssueNow						
Mean	0.02	0.015	0.015	0.024	0.020	0.020
Standard deviation	0.06	0.055	0.055	0.073	0.064	0.065
Q1	0	0	0	0	0	0
Median	0.001	0.000	0.001	0.001	0.001	0.002
Q3	0.006	0.004	0.004	0.007	0.006	0.007
IssueNext						
Mean	0.02	0.013	0.013	0.018	0.017	0.018
Standard deviation	0.06	0.047	0.049	0.061	0.056	0.063
Q1	0	0	0	0	0	0
Median	0.001	0.000	0.001	0.001	0.002	0.002
Q3	0.006	0.004	0.004	0.006	0.006	0.007
Insider Sale Indicator						
Mean	0.65	0.666	0.645	0.668	0.682	0.611
Standard deviation	0.48	0.472	0.479	0.471	0.466	0.487
Q1	0	0	0	0	0	0
Median	1	1	1	1	1	1
Q3	1	1	1	1	1	1

(The table is continued on the next page.)

TABLE 1 (Continued)

Variable	All years	Year grouping				
		1984–88	1989–91	1992–94	1995–97	1998–2001
% Shares Sold						
Mean	0.0014	0.0010	0.0014	0.0016	0.0016	0.0013
Standard deviation	0.0038	0.0030	0.0040	0.0039	0.0040	0.0037
Q1	−0.0000	−0.0000	−0.0000	−0.0000	−0.0000	−0.0001
Median	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001
Q3	0.0013	0.0006	0.0010	0.0014	0.0016	0.0012
Value Shares Sold ($M)						
Mean	1.12	0.46	0.59	0.83	1.16	1.76
Standard deviation	3.39	1.62	1.97	2.44	3.15	4.75
Q1	−0.01	−0.01	−0.01	−0.01	−0.01	−0.02
Median	0.08	0.05	0.05	0.09	0.12	0.91
Q3	0.65	0.31	0.37	0.57	0.83	1.05
Sample size	53,653	6,368	7,098	10,172	14,348	15,667

Notes:

Size is the market capitalization as reported on COMPUSTAT at the start of the fiscal quarter. It is calculated as COMPUSTAT data item 14 (closing stock price at the end of the previous fiscal quarter) multiplied by data item 61 (number of common shares outstanding at the end of the previous quarter).

BM is the book-to-market ratio. It is calculated as the book value of common equity at the start of the fiscal quarter (COMPUSTAT data item 59) divided by market capitalization (Size) at the start of the fiscal quarter.

Profit Indicator is an indicator variable equal to one if EPS as reported on I/B/E/S for the fiscal quarter is positive, and zero otherwise.

IssueNow is the amount of equity issued in the current fiscal quarter. It is calculated as the dollar value of common and preferred equity issued (COMPUSTAT data item 84) divided by market capitalization at the start of the fiscal quarter (that is, at the end of quarter $t - 1$).

IssueNext is the amount of equity issued in the next fiscal quarter. It is calculated as the dollar value of common and preferred equity issued (COMPUSTAT data item 84) in quarter $t + 1$ divided by market capitalization at the start of quarter $t + 1$ (that is, at the end of quarter t).

Insider Sale Indicator is an indicator variable equal to one if the insiders are net sellers of stock in the 20-day period after the quarterly earnings announcement, and zero otherwise. Insiders include the CEO, chair, vice-presidents, officers, and directors. We use the following relationship codes from the Thomson Financial data base: “CB”, “D”, “DO”, “H”, “OD”, “VC”, “AV”, “CEO”, “CFO”, “CI”, “CO”, “CT”, “EVP”, “O”, “OB”, “OP”, “OS”, “OT”, “OX”, “P”, “S”, “SVP”, “VP”.

(The table is continued on the next page.)

TABLE 1 (Continued)

% Shares Sold is the fraction of shares sold by insiders in the 20-day period after the quarterly earnings announcement. This variable is calculated as the net number of shares sold by insiders divided by the number of shares outstanding at the end of the fiscal quarter. The variable is increasing in net sales (that is, negative numbers correspond to net acquisitions by insiders).

Value Shares Sold is the dollar value of shares sold by insiders in the 20-day period after the quarterly earnings announcement. This variable is calculated as the net number of shares sold by insiders multiplied by the price at which those transactions took place. The variable is increasing in net sales (that is, negative numbers correspond to net acquisitions by insiders).

(COMPUSTAT data item 59) divided by market capitalization at the start of the fiscal quarter. Consistent with growth in the economy, the market capitalization has increased and the book-market-to-book ratio has decreased from the 1980s relative to the 1990s. The average value of the profit indicator variable (one if I/B/E/S earnings per share [EPS] for the fiscal quarter are positive, and zero otherwise) shows a marked decline toward the latter half of the 1990s through 2001, consistent with the increase in the number of loss firms over time.[15]

New equity issuance data

One of our key test variables is the firm's own trading activity. We consider two equity issuance variables. *IssueNow* reflects equity issuance in the same quarter as the forecast and *IssueNext* reflects equity issuance in the quarter following the forecast. The issuance variables are measured as the dollar value of common and preferred equity issued from the statement of cash flows (COMPUSTAT data item 84) divided by market capitalization at the beginning of the quarter.[16]

We include *IssueNext* in addition to *IssueNow* 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 sizable 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. Table 1 shows a greater level of new equity issuance by firms in the 1992–2001 subperiods relative to the earlier subperiods.

Insider trading data

The second test variable measures managers' trading activity on their personal account. Insider-trading data are obtained from the Thompson Financial insider-trading data base (TFN) covering the period 1984 to 2001. TFN reports all insider trades filed with the SEC resulting from stock transactions and option exercises. We only examine open market sales and purchases of the underlying security

(transaction codes "P" and "S" as reported on the data base that originate from Form 4 filings, which include the sale of stock from option exercises). 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 include only directors and officers as "insiders" (e.g., the CEO, chair, vice-presidents, and directors) and eliminate trades by nonofficer insiders (e.g., blockholders, retirees, trustees, etc.); see the note in Table 1 for the officer relationship codes. We examine insider trades in the 20 trading days immediately after the earnings announcement.

The *Insider Sale Indicator* equals one if the insiders are net sellers of stock in the 20-day period after the quarterly earnings announcement, and zero otherwise. We also consider two other continuous measures of insider trading activity. *% Shares Sold* is the fraction of shares sold by insiders in the 20-day period after the quarterly earnings announcement. It is the calculated as the net number of shares sold by insiders divided by the number of shares outstanding at the end of the fiscal quarter. The second measure, *Value Shares Sold*, is the dollar value of shares sold by insiders in the 20-day period after the quarterly earnings announcement. This variable is the calculated as the net number of shares sold by insiders multiplied by the price at which those transactions took place. Both continuous measures are increasing in net sales (that is, negative numbers correspond to net acquisitions by insiders).

Table 1 shows a slightly higher frequency of firms with insider selling in the two 1990s subperiods (66.8 percent and 68.2 percent) than in the two subperiods beginning in the 1980s (66.6 percent and 64.5 percent). The lowest frequency of selling (61.1 percent), however, is in the very latest subperiod (1998–2001). A similar pattern is reported for the *% Shares Sold* variable. However, the *Value Shares Sold* variable indicates a monotonic increase over time, perhaps reflecting both the increasing number of stock option exercises as well as increasing stock prices over time.

Cross-sectional variation in forecast bias

Our hypotheses focus on the relation between insider trading behavior and analyst forecast bias. Thus, we group firms by the *Insider Sale Indicator* variable and compare their firm characteristics in Table 2. A firm is classified as a *Seller* in the quarter the *Insider Sale Indicator* equals one, and is classified as a *Purchaser* otherwise. The sample consists of a total of 35,287 *Seller*-quarter and 18,366 *Purchaser*-quarter observations.

Table 2 indicates that *Sellers* are, on average, higher-growth firms as measured by the book-to-market ratios than *Purchasers*. *Sellers* also are larger firms and more profitable. There is, however, no significant difference in the level of issuing activity.

The key focus of our tests is on the difference between the *Seller* and *Purchaser* groups across samples of firms that differ in the forecast bias in the final month prior to the earnings announcement and in the pattern of analyst forecast bias between long and short horizons. To test Hypothesis 1 directly, we first construct a pessimism indicator variable, $PESS_{last}$, which is equal to one if the price

scaled error of the last forecast, $FESC_{last}$, is greater than or equal to zero, and zero otherwise. In other words, the firm was able to meet or beat forecasts in the last month (*Month 0*) prior to the earnings announcement. The Pearson (Spearman) correlation between $PESS_{last}$ and $FESC_{last}$ is 0.48 (0.85). Consistent with analyst guidance incentives associated with insider sales, we find that analysts are significantly more likely to issue pessimistic forecasts for *Seller* firms (66 percent) than for *Purchaser* firms (54 percent).

Next, we calculate a walk-down indicator variable, *SWITCH*, as equal to one if the earliest forecast in the fiscal quarter was optimistic (that is, $FESC_{last} < 0$) and the final forecast in the quarter either equaled actual earnings or was pessimistic (that is, $FESC_{last} \geq 0$), and zero if the first *and* last forecast are both optimistic. This variable is coded as missing for firm-quarter observations where the earliest forecast is pessimistic. Thus, *SWITCH* turns on when the forecast was initially optimistic and the firm was able to meet or beat the forecasts at the end of the quarter. As with the $PESS_{last}$ variable, Table 2 indicates that there is also a significantly higher *SWITCH* for *Sellers* than *Purchasers*, consistent with the prediction in Hypothesis 2.

TABLE 2
Characteristics of firms with net insider sales and net insider purchases following an earnings announcement

Descriptive statistics (means) for firms with insider purchases and insider sales following an earnings announcement. The data set is a pooled time-series cross-sectional sample of 53,653 firm-quarter observations for the period 1984–2001.

	Net insider position		
Variable	Seller, $n = 35{,}287$	Purchaser, $n = 18{,}366$	*t*-statistic (*p*-value)
BM	0.458	0.618	−44.09* (<0.001)
MV	6.70	5.89	31.70* (<0.001)
IssueNow	0.0195	0.0194	0.12 (0.90)
IssueNext	0.0163	0.0158	0.92 (0.36)
Profit Dummy	0.90	0.84	17.01* (<0.001)
$PESS_{last}$	0.66	0.54	27.41* (<0.001)
SWITCH	0.27	0.21	11.22* (<0.001)

(The table is continued on the next page.)

TABLE 2 (Continued)

Notes:

A firm is classified as a seller (purchaser) if the insiders are net sellers (purchasers) of company shares in the 20 trading days after an earnings announcement. Insiders include the CEO, chair, vice-presidents, officers, and directors. We use the following relationship codes from the Thomson Financial data base: "CB", "D", "DO", "H", "OD", "VC", "AV", "CEO", "CFO", "CI", "CO", "CT", "EVP", "O", "OB", "OP", "OS", "OT", "OX", "P", "S", "SVP", "VP".

MV is the log of market capitalization as reported on COMPUSTAT at the start of the fiscal quarter. Market capitalization is calculated as COMPUSTAT data item 14 (closing stock price at the end of the previous fiscal quarter) multiplied by data item 61 (number of common shares outstanding at the end of the previous quarter).

BM, *IssueNow*, and *IssueNext* are as defined in Table 1.

Profit Dummy is equal to one if EPS as reported on I/B/E/S for the fiscal quarter is positive, and zero otherwise.

$PESS_{last}$ is an indicator variable equal to one if $FESC_{last}$ is greater than or equal to zero, and zero otherwise. $FESC_{last}$ is the price-scaled median earnings forecast error for analysts covering firm *i*, for earnings in quarter *q*, in the most recent month prior to the quarterly earnings announcement. It is defined as $[Actual\ EPS_{i,q} - Forecast\ EPS_{i,q,t}]/P_{i,q-1}$, where $P_{i,q-1}$ is the stock price when the first forecast is available on I/B/E/S for firm *i* in quarter *q*.

SWITCH is an indicator variable equal to one if the earliest forecast in the fiscal quarter is optimistic (that is, $FESC_{earliest} < 0$) and the final forecast in the quarter is pessimistic (that is, $FESC_{last} \geq 0$), and zero if the first *and* last forecast are both optimistic. This variable is coded as missing for firm-quarter observations where the earliest forecast is pessimistic.

* Significant at the 1% level.

Cross-sectional regression results on forecast pessimism

Table 3 reports the multivariate tests for the cross-sectional determinants of forecast pessimism to evaluate the influence of incentives from insider trading and equity issuance on the final forecast pessimism, after controlling for other factors. We consider two alternative dependent variables, the continuous measure of the scaled forecast error, *FESC*, and the indicator variable for whether the firm beat or met forecast, *PESS*. The measurement of these variables is described above in section 3.

The three key test variables, *InsiderSale*, *IssueNow*, and *IssueNext*, measure the incentives from insider trading and equity issuance. Both *IssueNow* and *IssueNext* are calculated as described earlier. We consider both a binary measure (*InsiderSale Indicator*) as well as a continuous measure for insider selling activity (*%Shares Sold*).[17] These variables are defined above under the heading "Insider trading data". We consider two alternative regression models that differ only in the

TABLE 3
Relation of forecast pessimism with new equity issuance and insider trading

Regression of analyst 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 158,089 firm-quarter-forecast month observations for the period 1986–2001.

Panel A: Scaled forecast error (*FESC*)

$$FESC = \beta_0 + \beta_1^{*}InsiderSale + \beta_2^{*}IssueNow + \beta_3^{*}IssueNext + \beta_4^{*}BM + \beta_5^{*}MV + \beta_6^{*}Profit + \beta_7^{*}Year + \beta_8^{*}Horizon + \gamma_1^{*}RD + \gamma_2^{*}LITIG + \gamma_3^{*}IMPLICIT + \gamma_4^{*}CHEARN + \gamma_5^{*}LABINT + \gamma_6^{*}LT\_CHEARN + \varepsilon \quad (2b)$$

	Model 1		Model 2	
Variable	*Insider Sale Dummy**	*% Shares Sold**	*Insider Sale Dummy**	*% Shares Sold**
Intercept	−0.016‡	−0.016‡	−0.017‡	−0.017‡
	(−101.4)	(−98.6)	(−94.6)	(−93.1)
InsiderSale	0.002‡	0.147‡	0.001‡	0.096‡
	(32.0)	(20.7)	(23.1)	(13.4)
IssueNow	0.003‡	0.003‡	0.002‡	0.002‡
	(5.94)	(5.65)	(4.11)	(3.85)
IssueNext	0.009‡	0.009‡	0.009‡	0.009‡
	(16.8)	(16.3)	(16.6)	(16.3)
BM	−0.001‡	−0.001‡	−0.0005‡	−0.0006‡
	(−15.8)	(−17.8)	(−6.2)	(−7.5)
MV (*logSize*)	0.0001‡	0.0002‡	0.0002‡	0.0002‡
	(7.5)	(13.6)	(9.8)	(14.1)
Profit	0.013‡	0.013‡	0.012‡	0.012‡
	(158.9)	(158.8)	(132.5)	(132.4)
Year	0.0001‡	0.0002‡	0.0002‡	0.0002‡
	(29.7)	(27.5)	(28.4)	(26.8)
Horizon	0.00054‡	0.0005‡	0.0006‡	0.0006‡
	(19.1)	(18.8)	(20.7)	(20.6)
RD			0.028‡	0.029‡
			(26.8)	(27.3)
LITIG			−0.0005‡	−0.0005‡
			(−8.5)	(−7.6)
IMPLICIT			0.00002‡	0.0001
			(0.3)	(1.72)
CHEARN			0.004‡	0.004‡
			(63.2)	(64.5)
LABINT			−0.0006‡	−0.0006‡
			(−6.4)	(−6.3)
LT_CHEARN			0.015‡	0.015‡
			(29.2)	(29.1)
Model R^2	16.0%	15.7%	19.7%	19.5%
F-value	3,764.7‡	3,677.2‡	2,668.4‡	2,637.1‡

(The table is continued on the next page.)

TABLE 3 (Continued)

Panel B: Pessimism indicator variable (*PESS*)

$$PESS = \beta_0 + \beta_1{}^{*}InsiderSale + \beta_2{}^{*}IssueNow + \beta_3{}^{*}IssueNext + \beta_4{}^{*}BM + \beta_5{}^{*}MV + \beta_6{}^{*}Profit + \beta_7{}^{*}Year + \beta_8{}^{*}Horizon + \gamma_1{}^{*}RD + \gamma_2{}^{*}LITIG + \gamma_3{}^{*}IMPLICIT + \gamma_4{}^{*}CHEARN + \gamma_5{}^{*}LABINT + \gamma_6{}^{*}LT\_CHEARN + \varepsilon \quad (2b)$$

	Model 1		Model 2	
Variable	*Insider Sale Dummy*†	*% Shares Sold*†	*Insider Sale Dummy*†	*% Shares Sold*†
Intercept	−1.64‡	−1.53‡	−2.56‡	−2.51‡
	(2,378.6)	(2,123.2)	(3,818.0)	(3,688.7)
InsiderSale	0.48‡	52.19‡	0.35‡	37.89‡
	(1,751.4)	(1,012.7)	(828.2)	(491.3)
IssueNow	1.10‡	1.05‡	0.87‡	0.82‡
	(113.2)	(102.2)	(60.7)	(54.2)
IssueNext	0.60‡	0.51‡	0.65‡	0.58‡
	(26.8)	(19.1)	(26.9)	(21.5)
BM	−0.17‡	−0.20‡	0.13‡	0.12‡
	(113.5)	(145.5)	(54.9)	(46.7)
MV (*logSize*)	−0.01§	0.02‡	0.02‡	0.05‡
	(4.7)	(49.8)	(37.1)	(157.2)
Profit	1.3266‡	1.32‡	0.92‡	0.92‡
	(5,718.2)	(5,675.9)	(2,137.0)	(2,123.3)
Year	0.0739‡	0.07‡	0.08‡	0.07‡
	(3,244.3)	(2,924.5)	(3,093.3)	(2,889.9)
Horizon	0.18‡	0.17‡	0.21‡	0.21‡
	(925.7)	(898.7)	(1,184.5)	(1,169.4)
RD			4.55‡	4.70‡
			(289.2)	(305.5)
LITIG			0.11‡	0.12‡
			(63.7)	(72.6)
IMPLICIT			0.04§	0.06‡
			(8.3)	(19.8)
CHEARN			1.24‡	1.25‡
			(9,161.6)	(9,352.1)
LABINT			0.18‡	0.17‡
			(74.3)	(69.8)
LT_CHEARN			0.97‡	0.96‡
			(69.8)	(68.5)
Model χ^2	12,257.8‡	11,624.0‡	22,870.0‡	22,567.2‡
p-value	(<0.001)	(<0.001)	(<0.001)	(<0.001)

(The table is continued on the next page.)

TABLE 3 (Continued)

Notes:

Variables are defined as follows:

FESC is the price-scaled median earnings forecast error for analysts covering firm *i*, for fiscal quarter *q* for month *t* prior to the quarterly earnings announcement. It is defined as $(Actual\ EPS_{i,q} - Forecast\ EPS_{i,q,t})/P_{i,q-1}$, where $P_{i,q-1}$ is the stock price when the first forecast is available on I/B/E/S for firm *i* in quarter *q*.

PESS is an indicator variable equal to one if *FESC* is non-negative, and zero otherwise.

InsiderSale captures the extent of insider trading in the 20-day period following the quarterly earnings announcement. Insiders include the CEO, chair, vice-presidents, officers, and directors. We use the following relationship codes from the Thomson Financial data base: "CB", "D", "DO", "H", "OD", "VC", "AV", "CEO", "CFO", "CI", "CO", "CT", "EVP", "O", "OB", "OP", "OS", "OT", "OX", "P", "S", "SVP", "VP". We use two measures for insider trading. First, we use an indicator variable, *Insider Sale Dummy.* Second, we use a continuous measure, *% Shares Sold*, capturing the fraction of firm traded.

Insider Sale Dummy is an indicator variable equal to one if the insiders are net sellers of stock in the 20-day period after the quarterly earnings announcement, and zero otherwise.

% Shares Sold, *IssueNow*, *IssueNext*, and *BM* are as defined in Table 1.

MV is as defined in Table 2.

Profit is an indicator variable equal to one if EPS as reported on I/B/E/S for the fiscal quarter is positive, and zero otherwise.

Year captures the time trend in forecast errors. It is the year in which the forecast is made less 1984 (the first year in the sample).

Horizon captures the time between the forecast and the earnings announcement. It is calculated as the number of months prior to the quarterly earnings announcement. For example, a forecast made in February (April) for a fiscal quarter ending March 31 with an announcement date of April 14 corresponds to a value of −2 (0) for *Horizon*. *Horizon* is increasing in closeness to the earnings announcement.

RD is research and development expenditure (COMPUSTAT data item 4). It is scaled by average total assets (COMPUSTAT data item 44).

LITIG is an indicator variable equal to one for high litigation risk industries as defined by Matsumoto (2002), and zero otherwise. The industry four-digit SIC codes for high litigation industries include 2833, 2836, 3570, 3577, 3600−3674, 5200−5961, and 7370−7374.

IMPLICIT is an indicator variable equal to one for industries with a high degree of reliance on implicit claims by stakeholders as defined by Matsumoto 2002, and zero otherwise. The industry four-digit SIC codes for these industries include 150−179, 245, 250−259, 283, 301, 324−399.

(The table is continued on the next page.)

TABLE 3 (Continued)

Notes:

CHEARN is an indicator variable equal to one for a positive change in earnings from the same quarter in the prior year (COMPUSTAT data item 8), and zero otherwise. This variable is the same as in Matsumoto 2002.

LABINT is a measure of labor intensity. It is calculated as [1 – (*PPE*/*Gross Assets*)]. *PPE* is property, plant, and equipment (COMPUSTAT data item 118). *Gross Assets* is calculated as the sum of total assets (COMPUSTAT data item 44) and accumulated depreciation and amortization (COMPUSTAT data item 41). See also Matsumoto.

LT_CHEARN is a measure of long-term change in earnings. It is the change in earnings from four quarters prior to the forecast quarter to four quarters after the forecast quarter. The measure is scaled by the market capitalization of the firm four quarters prior to the forecast quarter.

* *t*-statistics are reported in parentheses.

† χ^2 statistics are reported in parentheses below parameter estimates.

‡ Significant at the 1 percent level.

§ Significant at the 5 percent level.

set of control variables. The inclusion of these variables helps evaluate the incremental influence of insider trading and equity issuance incentives beyond the other incentives identified by Matsumoto 2002. The first regression model is

$$FESC \text{ or } PESS = \beta_0 + \beta_1 InsiderSale + \beta_2 IssueNow + \beta_3 IssueNext + \beta_4 BM + \beta_5 MV + \beta_6 Profit + \beta_7 Year + \beta_8 Horizon + \varepsilon \quad (2a).$$

Drawing from previous research (e.g., Brown 2001 and Matsumoto 2002), the control variables in model 1 include firm size, growth, and profitability. *Profit* is an indicator variable equal to one if EPS as reported on I/B/E/S for the fiscal quarter is positive, and zero otherwise. *MV* is the log of market capitalization as reported on COMPUSTAT at the start of the fiscal quarter (defined earlier). Because a high-growth firm would likely need new capital, and would also care about investor perceptions and want to avoid an earnings disappointment, we include a growth proxy, *BM*. It is calculated as the book value of common equity at the start of the fiscal quarter divided by market capitalization (*MV*) at the start of the fiscal quarter.

We use a pooled time-series cross-sectional regression framework, so we also include two additional variables to pick up possible changes in forecast pessimism over the calendar time as well as over the forecast horizon. *Year* captures the calendar time trend in forecast errors and is measured by the difference between the calendar year of the forecast and the base year 1984 (the first year in the sample). *Horizon* captures the time between the forecast and the earnings announcement. It is calculated as the number of months prior to the quarterly earnings announcement. For

example, a forecast made in February (April) for a fiscal quarter ending March 31 with an announcement date of April 14 corresponds to a value of −2 (0) for *Horizon*. *Horizon* is increasing in closeness to the earnings announcement.

The second regression model is

$$\begin{aligned} FESC \text{ or } PESS = {} & \beta_0 + \beta_1{}^{*}InsiderSale + \beta_2{}^{*}IssueNow + \beta_3{}^{*}IssueNext + \beta_4{}^{*}BM \\ & + \beta_5{}^{*}MV + \beta_6{}^{*}Profit + \beta_7{}^{*}Year + \beta_8{}^{*}Horizon + \gamma_1{}^{*}RD \\ & + \gamma_2{}^{*}LITIG + \gamma_3{}^{*}IMPLICIT + \gamma_4{}^{*}CHEARN + \gamma_5{}^{*}LABINT \\ & + \gamma_6{}^{*}LT\_CHEARN + \varepsilon \end{aligned} \quad (2b).$$

In addition to the control variables in the first model, model 2 includes proxies for a firm's litigation risk, reliance of financial information by noninvestor stakeholders, and further proxies for a firm's future profitability prospects. Sivakumar and Vijaykumar (2001) and Matsumoto (2002) suggest that these factors affect a firm's ability to meet or beat forecasts.

We use an indicator variable, *LITIG*, equal to one for high litigation risk industries as defined by Matsumoto 2002, and zero otherwise; see notes to Table 3 for the four-digit SIC codes considered to be high litigation risk industries. We also use the three Matsumoto variables to control for the effects on forecast pessimism that is derived from a greater reliance of financial information for implicit claims by non-investor groups. *RD* is research and development expenditure (COMPUSTAT data item 4) scaled by average total assets (COMPUSTAT data item 44). *IMPLICIT* is an indicator variable equal to one for the durable goods industries, and zero otherwise; see notes to Table 3 for the four-digit SIC codes. *LABINT*, a measure of labor intensity, is calculated as [1 − (*PPE*/*Gross Assets*)] where *PPE* is property, plant, and equipment (COMPUSTAT data item 118), and *Gross Assets* is the sum of total assets (COMPUSTAT data item 44) and accumulated depreciation and amortization (COMPUSTAT data item 41).

The final two control variables are related to the firm's current and future profitability. *CHEARN*, is an indicator variable equal to one for a positive change in earnings (COMPUSTAT data item 8) from the same quarter in the prior year, and zero otherwise. This controls for possible contemporaneous unexpected shocks to earnings that may affect the firm's ability to meet or beat forecasts independent of the strategic behavior by the firm to guide forecasts.

LT_CHEARN is calculated as the change in earnings from four quarters prior to the forecast quarter to four quarters after the forecast quarter, scaled by the market capitalization of the firm four quarters prior to the forecast quarter. The long-term change in earnings, suggested by Sivakumar and Vijaykumar 2001, controls for the possibility that the firm's long-term prospects may influence the manager's trading behavior on the firm's or the manager's own behalf, as well as the firm's ability to beat or meet current forecasts.

The ordinary least squares (OLS) pooled cross-sectional regression is run when *FESC* is the dependent variable, and a logistic regression is run when *PESS* is the dependent variable.[18] The results reported in Table 3 are consistent with the

predictions of Hypothesis 1. The three key test variables *InsiderSale*, *IssueNow*, and *IssueNext* are all highly statistically significant in the predicted direction, confirming that managerial and firm incentives to sell equity are significantly associated with whether firms meet or beat forecasts.

Taking *InsiderSale* first, Table 3 reports that greater forecast pessimism is found for firms with higher insider selling subsequent to the quarter when they beat or meet the quarterly consensus earnings forecast. In panel A, all else constant, a firm that had net insider selling after the earnings announcement and an average price–earnings (P/E) ratio of 30 would beat forecasts by an average of 5.34 percent (estimated coefficient for *InsiderSale* \$0.00178*30) more than a firm that had net insider purchase. A similar message is obtained when the dependent variable is an indicator variable of whether the firm beat or met forecasts.

The analysis in the first column of Table 3 (panel B) reports that the log odds ratio of beating or meeting increases by 48 percent when insiders are net sellers in the 20-day window following the earnings announcement. Alternatively stated, the probability of a pessimistic forecast error is 21 percent higher for a firm with net insider selling compared with a firm with net insider purchases (calculated using mean values for independent variables in the model 1 regression). The result of a positive association between forecast pessimism and insider selling is robust when insider selling is measured as a percentage of shares sold, and is also robust to the set of control variables included.

Turning to the equity issuance incentives, Table 3 reports that *IssueNow* and *IssueNext* representing equity issuance in the same quarter and in the future quarter respectively are associated with positive earnings surprises. For example, in panel A, a firm with an average P/E of 30 that issued an additional 10 percent of its market value in the quarter following the earnings announcement, on average, beat forecasts by about 2.8 percent (\$0.00929*0.1*30) more than a firm that did not issue new equity. In panel B, a firm that issues an additional 10 percent of its market value in the subsequent quarter experiences a 3 percent higher probability of beating or meeting forecasts than a firm that did not issue new equity (calculated as the marginal probability increase for an additional 10 percent of new equity in the following quarter, holding all variables at their mean values). As for *InsiderSale*, the results for the issuance variables are also robust with respect to the set of control variables included in the regression.

Furthermore, the evidence for quarterly forecasts in Table 3 further corroborates the pattern of annual forecast errors, consistent with a forecast walk-down illustrated in Figure 1. The significantly positive *Horizon* coefficient indicates that forecast pessimism increases as the forecast horizon shrinks toward the earnings announcement, consistent with a walk-down in forecasts. The significantly positive *Year* coefficient indicates that forecast pessimism has increased with calendar time from the 1980s to 2001.[19]

The results reported above are robust with respect to whether the measures of pessimism and insider selling are continuous or binary (*FESC* or *PESS*; *InsiderSale* or *% Shares Sold*), and whether a partial or full set of control variables is included in the regression. The first set of control variables includes firm size,

growth opportunities, and profitability. Not surprisingly, ex post profitable firms tend to beat analysts' targets because the earnings realization turned out to be high. Similarly, growth firms as proxied by low book-to-market ratios also demonstrate a greater likelihood of the firm beating or meeting forecasts. With one exception, the results for firm size suggest that larger firms are more able to meet or beat forecasts.

Our results for the additional control variables are consistent with the findings in past studies. Consistent with Matsumoto (2002), the model 2 regression results in Table 3 indicate that firms with high litigation risk or a high reliance on implicit claims with stakeholders are more likely to meet or beat forecasts. Consistent with Sivakumar and Vijaykumar 2001, firms with past long-term growth in earnings are also more able to beat or meet forecasts. Consistent with the managerial guidance hypotheses, our key results here indicate that the equity-issuance and managerial insider-selling incentives exert an incremental influence on forecast pessimism over these additional explanatory variables.

The cross-sectional regressions presented in Table 3 are estimated using a pooled sample from 1984–2001 (some 158,089 firm-quarter-month observations). To examine the impact of forecast horizon, our pooled sample includes multiple firm observations for each firm-quarter. This may raise a concern of dependence in the data. Specifically, we have up to three observations for each firm-quarter. The inclusion of the fixed effects horizon variable may only partially address this dependence. Therefore, as an additional robustness check on the regression specification, we run regressions using only one (the final) forecast for each firm-quarter. We exclude the horizon variable from this specification (as we have only one record per firm-quarter). The results from this reduced sample of 53,653 firm-quarter observations yield similar results. With the exception of the *IssueNow* variable, which loses significance after inclusion of the Matsumoto 2002 control variables, we continue to find strong statistical (*t*-statistics range between 6.47 and 16.55 for the alternative specifications) and economic significance for *IssueNext* and the insider selling variable (both the indicator and continuous variables) in both the *FESC* and *PESS* regressions.

As a final sensitivity check, we also perform 60 quarterly cross-sectional regressions for the *FESC* dependent variable to obtain Fama-Macbeth 1973 *t*-statistics calculated from the time series of the estimated quarterly cross-sectional regression coefficients; results are not tabulated. *Year* and *Horizon* variables are not included in this specification. We include the three control variables for firm size, growth opportunities, and profitability. Both insider-selling variables remain highly statistically significant (*t*-statistics of 10.31 for the indicator variable and 5.70 for the continuous variable). The *IssueNow* and *IssueNext* variables are marginally significant in these specifications (*t*-statistics of between 1.72 and 1.96). The lower statistical significance from the Fama-Macbeth procedure reflects the lower power from equally weighting the time-series observations (e.g., Loughran and Ritter 2000).

Determinants of the switch from initial forecast optimism to final pessimism

The empirical findings reported in the previous section are consistent with the predictions of Hypothesis 1. However, we are careful to note that the observed association between pessimistic analyst forecast revisions and our trading measures may also be consistent with managers' ex post timing equity sales when price is relatively high (after truly unexpected good earnings). However, the univariate tests reported in Table 2 indicate that *Sellers* are more likely to experience a switch from forecast optimism to pessimism during the quarter than *Purchasers*. This switching behavior seems more consistent with opportunistic guidance. Therefore, to test the more restrictive predictions of Hypothesis 2, we estimate logistic cross-sectional regressions of the *Switch* indicator variable (described under the heading "Cross-sectional variation in forecast bias") using the key test variables and the same set of control variables as in Table 3 regressions.

$$\begin{aligned} SWITCH = {} & \beta_0 + \beta_1{}^{*}InsiderSale + \beta_2{}^{*}IssueNow + \beta_3{}^{*}IssueNext + \beta_4{}^{*}MB \\ & + \beta_5{}^{*}MV + \beta_6{}^{*}Profit + \beta_7{}^{*}Year + \gamma_1{}^{*}RD + \gamma_2{}^{*}LITIG + \gamma_3{}^{*}IMPLICIT \\ & + \gamma_4{}^{*}CHEARN + \gamma_5{}^{*}LABINT + \gamma_6{}^{*}LT\_CHEARN + \varepsilon \end{aligned} \quad (3).$$

Given the definition of the *Switch* variable, the estimation of (3) is restricted to the sample of firms where the forecasts are initially optimistic.[20] The results are reported in Table 4. As in Table 3, *InsiderSale* in Table 4 is highly statistically significant, which is consistent with insiders timing their sales to follow immediately after a good news earnings surprise, and consequently after an increase in stock price. Relative to *Purchaser* firms, *Seller* firms experience a 21 percent higher probability of a switch from early optimism to final pessimism (calculated as the probability difference from comparing firms with net insider sales to firms with no net insider selling, holding all other variables at their mean values). Similarly, *IssueNow* and *IssueNext* are also highly statistically significant in model 1 regressions. An equity issuance equal to 10 percent of market capitalization in the subsequent quarter is associated with a 6 percent higher probability of a switch in early optimism to final pessimism, compared with a firm with no equity issuance in the following quarter. Although *IssueNext* remains highly significant in model 2 regressions, *IssueNow* does not, perhaps because of high correlation with the additional included variables. These results support the predictions of Hypothesis 2.

The statistically significant result for *Year* indicates that there is a greater likelihood of a switch from initial optimism to final pessimism in more recent calendar years, further confirming the predictions of Hypothesis 2. Institutional changes during the 1990s increased the firm's economic incentives to walk-down forecasts and then to beat or meet them at the earnings-announcement date.

The control variables have similar effects on the *SWITCH* indicator as on the *PESS* indicator described in Table 3. Larger firms that have more growth opportunities and that are profitable are more likely to have forecasts that switched from being optimistic to pessimistic over the forecast horizon. Finally, some of the implicit claims and litigation risk proxies are significant (*LITIG, IMPLICIT, CHEARN*), but others are not (*RD, LABINT, LT_CHEARN*).

TABLE 4
Relation of switching from initial optimism to final pessimism with new equity issuance and insider trading

Regression of a switch from forecast 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 25,414 firm-quarter observations for the period 1984–2001.

$$SWITCH = \beta_0 + \beta_1{}^{*}InsiderSale + \beta_2{}^{*}IssueNow + \beta_3{}^{*}IssueNext + \beta_4{}^{*}MB + \beta_5{}^{*}MV + \beta_6{}^{*}Profit + \beta_7{}^{*}Year + \gamma_1{}^{*}RD + \gamma_2{}^{*}LITIG + \gamma_3{}^{*}IMPLICIT + \gamma_4{}^{*}CHEARN + \gamma_5{}^{*}LABINT + \gamma_6{}^{*}LT\_CHEARN + \varepsilon \quad (3)$$

	Model 1		Model 2	
Variable	*Insider Sale Dummy**	*% Shares Sold**	*Insider Sale Dummy**	*% Shares Sold**
Intercept	−3.18†	−3.02†	−3.48†	−3.43†
	(1,142.3)	(1,112.4)	(990.5)	(973.0)
InsiderSale	0.25†	25.37†	0.21†	20.28†
	(62.0)	(33.3)	(40.0)	(19.5)
IssueNow	0.77†	0.78†	0.65‡	0.65‡
	(7.0)	(7.2)	(4.6)	(4.6)
IssueNext	0.81†	0.75‡	0.92†	0.88†
	(6.7)	(5.7)	(7.7)	(7.0)
BM	−0.30†	−0.32†	−0.16†	−0.17†
	(35.8)	(40.2)	(8.9)	(10.3)
MV (*logSize*)	0.10†	0.11†	0.10†	0.12†
	(103.5)	(138.2)	(112.8)	(142.3)
Profit	0.89†	0.89†	0.81†	0.81†
	(334.6)	(331.8)	(235.1)	(233.5)
Year	0.06†	0.06†	0.07†	0.06†
	(300.5)	(279.4)	(303.4)	(287.3)
RD			0.71	0.83
			(1.1)	(1.5)
LITIG			0.18†	0.18†
			(23.5)	(24.5)
IMPLICIT			0.12†	0.13†
			(12.0)	(14.5)
CHEARN			0.36†	0.37†
			(112.7)	(118.8)
LABINT			−0.06	−0.06
			(1.2)	(1.2)
LT_CHEARN			−0.26	−0.26
			(0.6)	(0.6)
Model χ^2	1,167.7†	1,136.1†	1,308.2†	1,286.8†
p-value	(<0.001)	(<0.001)	(<0.001)	(<0.001)

(The table is continued on the next page.)

TABLE 4 (Continued)

Notes:

This table uses only one observation for each firm-quarter. Therefore, the horizon variable is dropped from the analysis.

Variables are defined as follows:

InsiderSale captures the extent of insider trading in the 20-day period following the quarterly earnings announcement. This is measured using an indicator variable, *Insider Sale Dummy* (equal to one if the insiders are net sellers of stock in the 20-day period after the quarterly earnings announcement, and zero otherwise), or a continuous measure, *% Shares Sold* (the fraction of shares sold by insiders in the 20-day period after the quarterly earnings announcement). This variable is calculated as the net number of shares sold by insiders divided by the number of shares outstanding at the end of the fiscal quarter. The variable is increasing in net sales (that is, negative numbers correspond to net acquisitions by insiders). Insiders include the CEO, chair, vice-presidents, officers, and directors. We use the following relationship codes from the Thomson Financial data base: "CB", "D", "O", "H", "OD", "VC", "AV", "CEO", "CFO", "CI", "CO", "CT", "EVP", "O", "OB", "OP", "OS", "OT", "OX", "P", "S", "SVP", "VP".

IssueNew, *IssueNext*, and *BM* are as defined in Table 1.

Switch and *MV* are as defined in Table 2.

All other variables are as defined in Table 3.

* χ^2 statistics are reported in parentheses below parameter estimates.

† Significant at the 1 percent level.

‡ Significant at the 5 percent level.

In unreported tests, we find similar, if not stronger, results using annual forecast horizons in documenting the relation between equity issuance/insider selling and forecast pessimism and the switch from forecast optimism to pessimism. Taken together, the results from Tables 2, 3, and 4 are consistent with managers guiding analyst earnings targets to facilitate trading on favorable terms after an earnings announcement, on both the manager's and the firm's behalf. The potential for the manager or firm to benefit from these transactions is derived from the managers' ability to guide analysts over the forecast horizon prior to trading.

Robustness analysis and discussion of limitations

In this section, we report two additional robustness checks and discuss some caveats concerning the interpretation of our results. The first robustness check examines whether analyst pessimism varies with analyst type. If bias differs across analysts, then firm variation in a forecast walk-down could result from the presence of different analyst types rather than from varying incentives of managers and firms to sell stock after the earnings announcement.

We compare the forecast errors and forecast pessimism between "lead" and "follower" analysts, where "lead" and "follower" types are identified using an approach analogous to Cooper, Day and Lewis (2001). Similar to Cooper et al., we ignore forecasts in the first 30 days of the quarter and focus instead on analyst forecasts issued in the last 30 days of the quarter, which are more likely to be revisions resulting from unobservable managerial guidance. Analysts who revise their earnings forecast first in the last 30 days of the quarter are identified as "lead" analysts. To ensure that a "lead" analyst is truly a first mover, we require a 10-day quiet window preceding forecast revision of the "lead" analyst. If multiple analysts revise their forecasts on the same day, the value of the "lead" forecast is calculated as the mean of the analyst forecasts issued on that day. "Follower" analysts are identified as those analysts who revise their forecasts in the days following the "lead" analysts, but before the actual earnings announcement. The sample consists of 12,157 firm-quarter observations.

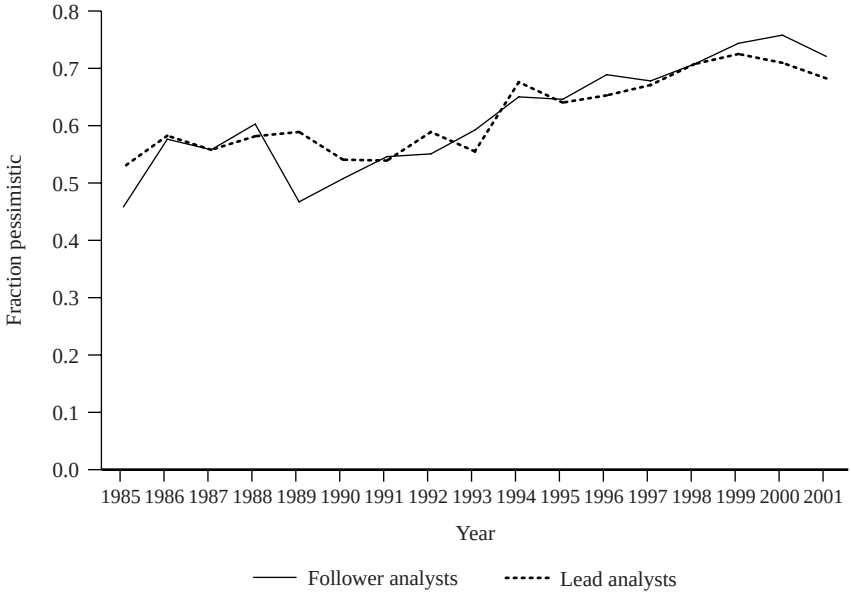
Our empirical results show no economic or statistical difference between the forecast bias properties of "lead" analysts and those of "follower" analysts. For example, the average pessimism ($PESS_{last}$) for "lead" analysts is 0.644 over the entire sample period while the average pessimism for "follower" analysts is nearly identical at 0.638, and the difference is not statistically significant. Figure 2 presents the temporal trend of pessimism in "lead" and "follower" analyst forecast revisions for the period 1985–2001. The graph shows increasing pessimism for both "lead" and "follower" analysts over the sample period, similar to the graph for the consensus forecasts in Figure 1. There is, however, no statistical difference between the two categories of analysts.

These findings are consistent with the notion that managers have strong incentives to manage the consensus of all analysts' earnings forecasts. While it may be important to first guide influential "lead" analysts, managers must ultimately guide the consensus of all analyst forecasts because the consensus earnings estimate is the benchmark used to evaluate subsequent reported earnings. Furthermore, the statistically indistinguishable difference between forecasts of lead and follower analysts is consistent with the analyst herding behavior reported in prior studies (see, for example, Hirshleifer and Teoh, 2003).

Our second robustness check examines the impact of different investor types — namely, institutional versus noninstitutional investors — on analyst forecast bias. We reestimate our main regressions using a subsample (140,906 firm-quarter-forecast month observations) with institutional holdings data available from the 2001 Spectrum data base. These regressions now include a variable measuring the fraction of shares held by institutional investors. Our main findings on the relation between insider sales and analyst forecast errors and pessimism remain robust for this subsample. Consistent with Matsumoto 2002, we also find a positive association between the fraction of institutional ownership and forecast pessimism. This finding is consistent with the argument that the increasingly short-term investment objectives of institutional investors may provide managers with additional pressures to beat short-term quarterly targets. The descriptive findings of Matsumoto also suggest that the effect is strongest for transient institutional investors.

While our empirical results are robust to a number of different specifications, as in all empirical research, caution is required in interpreting the findings. The focus of this paper is to identify determinants of (1) forecast pessimism at the end of the fiscal year, and (2) the switch from early optimism to final pessimism. In developing our hypotheses, we rely on the prior research of Bartov, Givoly, and Hayn 2002 to support our premise that analyst guidance leads to more favorable stock prices at the end of the fiscal period. This prior evidence suggests that the path by which forecasts come to be beaten is not as crucial as whether the forecast is beaten. Our finding that final pessimism and the switch from early optimism to final pessimism is concentrated in firms that are net issuers of equity or managers are net sellers of stock after an earnings announcement is consistent with these firms choosing to engage in such behavior because of managerial incentives. Therefore, our results should be interpreted as a joint test of (1) the hypothesis that the forecast path is less crucial than whether the forecast is beaten, and (2) our earnings-guidance hypothesis.

Figure 2 Temporal trend of pessimistic lead and follower analysts*



Notes:

* To identify lead and following analysts we use a procedure similar to Cooper, Day, and Lewis 2001. We focus on analysts releasing forecasts in the last month of the fiscal quarter and require there be no forecasts in the first third of the last month (that is, days −30 to −21) to ensure there is no significant news event. We then divide the forecasts made in the last 20 days into the first forecast (lead analyst) and take the average of the remaining forecasts (followers).

In this paper, we investigate expectations management as one of several tools that management has available to achieve a desired level of earnings-surprise. It should be noted that our earnings-surprise measure compares analysts' earnings estimates with a firm's reported earnings. The reported earnings number can also be managed (for example, by manipulating accruals or changing earnings definitions) to achieve the desired earnings surprise (e.g., Teoh, Welch, and Wong 1998a, 1998b; and Bradshaw and Sloan 2002). Therefore, we view our results as providing complementary (and often inseparable) evidence on both earnings and expectations management.

Several recent U.S. regulatory reforms may limit the ability of analysts and managers to engage in future earnings guidance games. The enactment of Regulation FD (Fair Disclosure), in October 2000, may limit managers' hidden opportunities to guide analysts' forecasts. In addition, the enactment of Regulation AC (Analyst Certification) in 2003 requires analysts to certify that recommendations reflect their personal beliefs. However, to the extent that none of the current regulations require firms to disclose at the time of the earnings announcement the firm's or insiders' intention to sell the firm's stock shortly after the earnings announcement, these economic incentives may still be present to encourage continuation of the earnings-guidance game.

6. Conclusion

This paper examines the dynamic behavior of analyst earnings forecasts leading up to earnings announcements. We provide evidence that links the pattern of analyst pessimism in the 1990s to 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 Insider Trading and Securities Fraud Enforcement 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 tendency of managers and firms to sell shares after earnings announcements. This can create incentives to guide analysts to systematically pessimistic forecasts just prior to the earnings announcement, so that the salient news of a positive rather than a negative surprise arrives before the share sale.

Consistent with our hypotheses, we find that pre-announcement forecast pessimism is strongest in firms whose managers have the highest capital-market incentives to avoid earnings disappointments. We find that firms with managers that sell stock after an earnings announcement are more likely to have pessimistic analyst forecasts prior to the earnings announcement. The probability of forecast pessimism increases from 54 percent for an average firm without net insider selling to 66 percent for an average firm with subsequent net insider selling. Furthermore, firms in which 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. The probability of a switch from optimism early in

the quarter to pessimism closest to the earnings announcement increases from 21 percent in firms without net insider selling to 27 percent in firms with net insider selling.[21] This evidence is consistent with managers behaving opportunistically to guide analysts' expectations around earnings announcements to facilitate favorable insider trades after earnings announcements.

Endnotes

1. Cotter, Tuna, and Wysocki (2004) examine analysts' forecast revisions in response to public managerial guidance as provided through management's earnings forecasts. However, prior to Regulation FD (SEC 2000), a large fraction of managerial guidance of analysts was not publicly observable.
2. For example, one might speculate that managers are just opportunistically taking advantage of unrelated changes in analyst forecast bias by selling shares or exercising options. However, we are not aware of any specific explanation for why their incentive to do so would cause them to behave in a way that explains our evidence.
3. Managers also care about the stock price performance because poor stock price performance encourages a hostile takeover and subsequent firing by the acquirer's board of directors. An active external labor market also rewards a manager with a reputation for maintaining good stock price performance. In addition, a manager is in a better position to bargain for higher future compensation if the stock price performance is good.
4. 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 uninformed outside investors. Limiting insider trades to the period immediately after earnings announcements also reduces the adverse selection problem by minimizing the asymmetry of information between uninformed outsiders and the inside managers.
5. See http://www.sec.gov/rules/final/33-8193.htm for full details. Part A of the Final Rule indicates the following:

> A. Certifications in Connection with Research Reports: As adopted, Regulation Analyst Certification requires that brokers, dealers, and their associated persons that are "covered persons" that publish, circulate, or provide research reports include in those research reports:
>
> (A) a statement by the research analyst (or analysts) certifying that the views expressed in the research report accurately reflect such research analyst's personal views about the subject securities and issuers; and
>
> (B) a statement by the research analyst (or analysts) certifying either:
>
> (1) that no part of his or her compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in the research report; or
>
> (2) that part or all of his or her compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in the research report. If the analyst's compensation was, is, or will be directly or indirectly related to the specific recommendations or views contained in the research report, the statement must include the source, amount, and purpose of such compensation, and further disclose that it may influence the recommendation in the research report.

6. This does not require that investors be irrational in their evaluations of forecasts. Investors may properly discount for optimism, but firms nevertheless need to induce such analyst optimism because investors would still discount a defecting firm that failed to do so, causing that firm to be viewed as worse than it really is.
7. The increased use of stock options in the 1990s may have been, in part, an endogenous favorable response by firms to the reduced agency-related costs of stock option compensation that resulted from the heightened insider-trading restrictions (discussed above under the heading "Why and when managers care about short-term stock prices"). The findings in this study suggest that we may have substituted one agency-related cost for another. The new agency cost is one that resulted from an increased incentive to play the earnings-guidance game.
8. It is important to note that our analysis of the switch from early optimistic to pessimistic forecasts does not collapse to an analysis of final pessimism. In considering the optimism–pessimism switch we exclude firm-quarter observations where the initial forecast is pessimistic. More details on variable measurement are given in section 5.
9. Our results are not driven by use of this "constructed" consensus forecast. In unreported tests we replicate our empirical analysis using the median consensus forecast as reported by I/B/E/S.
10. The empirical findings documented in this section also exist for a broader sample of firms not restricted by COMPUSTAT data availability.
11. We also replicate the analysis using total assets per share as a deflator. The qualitative results are unchanged using this alternative deflator.
12. For example, an analyst forecasts $1.15 earnings per share (EPS) for a firm on November 1, 1995 for the fiscal year ending December 31, 1995. I/B/E/S reports an actual EPS of $1.20 on January 27, 1996. I/B/E/S also reports that the 1994 fiscal year earnings release date occurs during January 1995, and the stock price in February 1995 (the first month after the release of EPS for the previous fiscal year) is $15.10. Thus, *FE* for month −2 (73 days' lag between earnings release date and forecast date) is ($1.20 − $1.15)/$15.10 = 0.0033, or 0.33 percent. We use a calendar-year timing convention, so the *FE* is considered the forecast error for year 1996 because the actual earnings release date occurs in January 1996.
13. For example, absolute forecast errors (|forecast EPS − actual EPS|) greater than $3 per share for a company trading at $30 per share are removed from the sample. Data-coding errors for forecasts and extreme small prices likely contribute to such large outliers. The 10 percent deletion rule removed 2.1 percent of the sample. We find that the mean (median) numerator of *FESC* is −0.04 (0.00) for retained firms and −1.20 (−0.66) for deleted firms. Further, we find that the mean (median) denominator of *FESC* is 28.76 (19.25) for retained firms and 5.73 (3.50) for deleted firms. Deleted firms have much larger unscaled forecast errors and lower stock prices. As a robustness check, we apply a less stringent deletion cutoff of greater than 100 percent of price that removes only 0.2 percent of the sample. Our results are qualitatively unchanged in this specification and remain statistically significant.
14. Our empirical findings are stronger in tests (not reported) using annual horizons.
15. Givoly and Hayn (2000) report a loss frequency of about 34 percent in the 1990s based on net income. Our sample is skewed toward larger (more profitable) firms with analyst

following. In addition, we use I/B/E/S income numbers, which are typically based on operating earnings.

16. The empirical results are robust to the use of an equity-issuance indicator variable based on equity-sale cutoffs from 1 percent to 20 percent of equity market value. For the indicator variables, we exclude the smallest equity issuances because they relate to additional equity issued due to the exercise of managerial options. For the continuous variables, we note that the issuance variable may be correlated with the insider trade variable via stock options exercise. The Pearson (Spearman) correlation between the insider selling and equity-issuance variables is 0.18 (0.21).
17. Regression results for the second continuous measure of insider trading (dollar value of shares traded) are similar to the fraction of shares traded variable. We do not report these results for the sake of brevity.
18. In additional tests we also considered the robustness of the regression results in panel B of Table 3 to our definition of *PESS*. If we limit our categorization of firms who meet/beat (miss) to those firms who report earnings no more than 5 cents greater (lower) than the most recent consensus analyst estimate all of our explanatory variables retain their significance. This reinforces the earlier discussion that firms need only *just* beat analyst expectations. Managerial incentives to sell equity both on the firm's behalf and from their own personal accounts are a key determinant in the discontinuity of analyst forecast errors around the zero point.
19. In unreported tests, we also interact the equity-issuance and growth variables with the temporal trend. There is some indication that these effects are more pronounced in the latter part of our sample. In addition, our findings are robust to the inclusion of annual and quarterly fixed effect variables.
20. We reran the analysis in Table 3 using this restricted sample where the initial forecasts are optimistic. The results are essentially the same, and the key variables related to our hypotheses remain statistically significant using the reduced sample.
21. Although the economic magnitude of these quarterly forecast results is modest, the annual forecast results are more substantial. This is because there is a much larger fraction of optimistic forecasts at the beginning of the fiscal year (> 70 percent) than at the start of a fiscal quarter (< 50 percent); this difference has increased in the latter years in our sample period as firms appear to walk-down forecasts to beatable levels earlier and earlier in the fiscal period.

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