THE CHANGE IN FINANCIAL ANALYSTS' FORECAST ATTRIBUTES FOR VALUE AND GROWTH STOCKS

by

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Presented to the Faculty of the Graduate School of

The University of Texas at Arlington in Partial Fulfillment

of the Requirements

for the Degree of

DOCTOR OF PHILOSOPHY

THE UNIVERSITY OF TEXAS AT ARLINGTON

May 2007

ACKNOWLEDGEMENTS

First and foremost, I want to express my deepest love and gratitude to my wife, Leslie, and my children, Sophie and Nico, for their support and encouragement during the doctoral process and during the dissertation. I could not have successfully completed all the required tasks without their unconditional love and understanding.

Also, I thank Dr. Peggy Swanson for her long-term guidance and friendship. Our many conversations have kept me encouraged and enthusiastic about this new career. In addition, I appreciate Dr. Larry Lockwood for his tireless assistance and attention to detail. Throughout the dissertation process he was both a wonderful mentor and colleague. Moreover, I am grateful for the constructive suggestions from Dr. John Gallo and Dr. William Crowder that generated many other research topics.

My final words of appreciation are for Dr. Vincent Apilado, my supervising professor. Thanks for your positive attitude and confidence in me. You have shown me the ways to becoming a scholar and I will never forget those valuable lessons. You are a wonderful advisor.

May 7, 2007

ABSTRACT

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AND GROWTH STOCKS

Publication No. ______

Pieter Johannes de Jong, PhD.

The University of Texas at Arlington, 2007

Supervising Professor: Vince P. Apilado

This research will concentrate on the changes in earnings forecasts, forecast accuracy and forecast dispersion for growth and value stocks after Reg FD. Each topic is presented in a separate essay.

The first essay tests if growth and value stock returns respond more to forecasted earnings changes than they do to changes in earnings and whether these stock returns respond in a different fashion before and after Reg FD. This phenomenon is stronger for growth stock portfolio strategies than it is for value stock portfolios. After Reg FD, the overall impact of earnings expectations on stock returns is smaller, especially for growth stock returns.

The second essay examines financial analysts' earnings forecast accuracy in value and growth stocks before and after the introduction of Reg FD. Accuracy for both stock groups (value and growth stocks) has improved after the introduction of Reg FD. The results in this essay provide additional evidence indicating that analysts did not just misinterpret available news but consciously tried to maintain relationships with managers. However, Reg FD efficiently limited these relationships between managers of growth firms and analysts so that the monetary advantage from manipulating earnings forecasts before the introduction of Reg FD no longer exists.

The third essay evaluates the hypothesis stating that forecast dispersion, on both growth and value stock returns, has increased after the introduction Reg FD. However, the increased dispersion found at the second quarter of 2001 drastically dissipates at the second quarter of 2002, although value stock forecast dispersion before earnings announcement and value stock belief jumbling remain higher. The results in this essay suggest that corporate voluntary disclosure created a greater variety of opinions and, therefore, more uncertainty about value stocks. Also, value stock returns have a stronger inverse relationship with dispersion because financial analysts have become more uncertain about value firms' performance. The bigger the disagreement about a stock's value, the higher the market price relative to the true value of the stock, and the lower its future return.

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CHAPTER 1

INTRODUCTION

1.1 Hypotheses

A great deal of empirical research has agreed that financial analysts are important intermediaries in capital markets between disclosure and usage of financial information. Analysts have always been an important link between firms and investors. Research documented that individual investors typically use private financial analysts' earnings forecasts to guide them in their stock purchase decisions (see Brown and Rozeff, 1978; and Nagy and Obenberger, 1994).

However, these studies did not focus on the importance of earnings forecasts with regards to growth (or glamour) and value (or out-of-favor) stocks. The choice of these stock groups for this study is motivated by evidence in La Porta *et al* (1997) who find that individual investors' interest in value stocks peaked due to forecast revisions as the result of better than expected earnings announcements of these firms. Nonetheless, Jagadeesh *et al* (2004) find that financial analysts endorsed growth stocks to attract institutional clients who typically invest more heavily in growth firms. More importantly, Skinner and Sloan (2002) report that growth stocks exhibit an asymmetrically large negative response to negative earnings surprises.

Managers of firms with high growth prospects had more incentive to manage analysts' expectations of reported earnings to avoid negative earnings surprises (see Matsumoto, 2002) while analysts were inclined to report favorable earnings in order to maintain good relationships with the managers of those firms (Lim, 2001).

The Security and Exchange Commission (SEC) implemented Regulation Fair Disclosure (Reg FD 17 CFR 243) in October 2000 and the Sarbanes-Oxley Act (17 CFR 210-74) in October 2002, thereby challenging those relationships. The Reg FD essentially meant that financial analysts and regular investors would have the same publicly available information about the firms, whereas the Sarbanes-Oxley Act expanded the Reg FD requirements to create enforceable obligations for timely and non-selective mandated disclosure obligations.

Previous literature has documented some of the changing behaviors of financial analysts after the introduction of Reg FD. Research indicates that forecast dispersion increased (see Bailey *et al*, 2003; and Agrawal, Chadha and Chen, 2006) directly after the Reg FD went into effect, although Heflin, Subramanyam and Zhang (2003) argue that the increase in dispersion was minimal. Chiyachantana *et al* (2004) and Irani (2004) find a decrease in the level of information asymmetry. Additionally, Agrawal, Chadha and Chen (2006) find evidence of an increase in forecast accuracy after Reg FD, especially for small or unprofitable firms in certain industries. This research will concentrate on the changes in earnings forecasts, forecast accuracy and forecast dispersion for growth and value stocks after Reg FD, thereby addressing several significant hypotheses.

1.1.1 Earnings Forecast Hypothesis

Elton, Gruber and Gultekin (1981) discuss that knowing analyst' earnings forecasts cannot lead to excess returns in an efficient market. Any information contained in the consensus estimate of earnings per share should already be included in the stock price. However, Brown (1990) and Lys and Sohn (1990) show that financial analysts' earnings forecasts influence stock price movement. More importantly, Elton, Gruber and Gultekin (1981) provide evidence that stock prices respond more to earnings forecast changes than they do to changes in earnings themselves. In addition, La Porta (1996) documents that financial analysts' long-run expectations explain the higher returns of value stocks. Chiyachantana *et al* (2004) and Irani (2004) show that the information environment in which analysts form their expectations about future earnings has changed after the introduction of Reg FD.

Research documents important changes in the information environment relative to the introduction of Reg FD, and research documents the effect of analyst expectations on value versus growth stocks, but no link between the two has been examined. This portion of the study will test if growth and value stock returns respond more to earnings forecast changes than they do to actual earnings changes for both value and growth stocks separately and whether these stocks respond differently before and after Reg FD.

Evidence of higher stock returns linked to changes in earnings expectations indicates that stock returns respond more to earnings forecast changes than they do to changes in actual earnings. However, a decrease in the stock return response to earnings forecast changes after Reg FD suggests that investors perceive forecast changes to be less valuable. A smaller growth stock return reaction to changes in earnings forecasts after Reg FD indicates that investors realize that Reg FD effectively reduced selective disclosure of information between analysts and growth firm's management. An equal value stock return response to changes in earnings forecasts before and after Reg FD suggests that earnings forecast changes do not explain the higher returns of value stocks even though long-term earnings growth rate forecasts do (see La Porta, 1996).

First, the effects of expectations growth (proxied by one-quarter change in earnings forecasts) and actual earnings growth on value- and growth stock returns are tested by forming one-year ahead stock return portfolios on the basis of expectations growth and book-to-market ratios, and by forming one-year ahead stock return portfolios on the basis of actual earnings growth and book-to-market ratios, respectively. Second, multi-factor Fama-French (1992, 1993, 1995) regressions are used to investigate whether the effects of earnings expectations growth and actual earnings growth on value- and growth stock returns have changed after the introduction of Reg FD.

1.1.2 Financial Analysts' Accuracy Hypothesis

Previous research showed empirical evidence that value stocks earn higher returns than growth stocks (see Fama and French, 1992, 1993, 1995; Lakonishok, Schleifer and Vishny, 1994; and Chan and Zhang, 1998). Fama and French (1992, 1993, 1995) attribute the higher returns in value stocks to higher distress risk due to substantial uncertainty in future earnings. Lakonishok, Schleifer and Vishny (1994) and La Porta (1996), on the other hand, introduce an extrapolation (or judgment bias) hypothesis in which financial analysts are too optimistic about growth stocks and too pessimistic about value stocks as evidenced by differences in forecast accuracy.

This study will examine changes in forecast accuracy of financial analysts' earnings forecasts separately for value and growth stocks before and after Reg FD. Before Reg FD, research indicates that financial analysts' forecasts are inaccurate and various reasons for this bias are given. First, analysts may be inefficient users of the available information (see De Bondt and Thaler, 1990; Lys and Sohn, 1990; Klein, 1990; Abarbanell and Bernard, 1992; and Easterwood and Nutt, 1999). Second, analysts may have a monetary incentive to report favorable earnings estimates in order to establish good rapport with top executives (see Stickel, 1992; Francis and Philbrick, 1993; Carleton, Chen, and Steiner, 1998; and Lim, 2001). Matsumoto (2002) shows that the monetary incentive is even larger for growth firms. Reputation and herding behavior (mutual imitation) amongst financial analysts have been pointed out as a third reason (see Sharfstein and Stein, 1990). After Reg FD, Bailey *et al* (2003), Heflin *et al* (2003) and Agrawal, Chadha and Chen (2006) report that the accuracy of the forecasts deteriorated even more, primarily due to the information asymmetry. The forecast accuracy suffered because private communications between managers and financial analysts could not longer exist after the introduction of Reg FD.

Evidence of an overall decrease in forecast accuracy for value and growth stocks after Reg FD indicates that Reg FD has altered the information environment and leveled the playing field for all investors. Evidence of an increased forecast accuracy for value stocks after Reg implies that financial analysts are biased towards growth stocks and that the forecast accuracy differences are driven by analysts' conscious choice and are not caused by information asymmetry.

1.1.3 Analysts' Forecast Dispersion Hypothesis

Before Reg FD, value stocks were found to have different dispersion in earnings forecast than growth stocks (see Diether, Malloy and Scherbina, 2002; and Doukas, Kim and Pantzalis, 2004). Diether, Malloy and Scherbina (2002) find that stocks with higher dispersion earn lower future returns. They argue that dispersion served as a proxy for difference in opinion. However Doukas, Kim and Pantzalis (2004) find that value stocks have considerably higher dispersion and they suggested that higher returns from investment in value stocks reflect compensation for bearing risk associated with higher analysts' earnings forecast dispersion. They show that dispersion explained the cross-sectional difference between value and growth stocks with a multifactor model. Barth, Kasznik and McNichols (2001) show that the difference in forecast dispersion for value stocks relative to growth stocks is due to the differences in analyst coverage for value and growth firms. Analyst coverage and valuation efforts are significantly greater for growth firms with larger research and development expenses relative to value firms.

Other research showed that dispersion of earnings forecasts displayed changes throughout the implementation of Reg FD. Mohanram and Sunder (2002), Bailey *et al*

(2003), Irani and Karamanou (2003) and Agrawal, Chadha and Chen (2006) document an increase in financial analysts' earnings forecast dispersion directly after the introduction of Reg FD. Their research finds that the increase in forecast dispersion was due to the lack of available private information after Reg FD, thereby increasing the uncertainty of the analysts. On the other hand, Heflin, Subramanyam and Zhang (2003) do not find any change in the dispersion of analyst forecasts. Mohanram and Sunder (2002) attributes the different results in Heflin, Subramanyam and Zhang (2003) to an alternative methodology over a different period of time post Reg FD.

This portion of the research will investigate the difference in effect of forecast dispersion on growth and value stock returns before and after Reg FD. This segment will test whether the increase in earnings forecast dispersion has a significantly different impact on value stock returns relative to growth stock returns before and after the regulatory change and whether the change in dispersion pre and post Reg FD is identical for value and growth stocks. Evidence of a larger effect of dispersion for value stock returns after Reg FD indicates that financial analysts have either become more uncertain about the future earnings of value stocks or the lack of private information has a larger effect on the dispersion of value stock returns.

1.2 The Contribution of the Study

This study is the first to identify and examine changes in earnings forecasts, forecast accuracy and forecast dispersion for value and growth stocks pre and post Reg FD. First, the first earnings forecast null hypothesis is that growth and value stocks respond more to changes in earnings forecasts than they do to earnings changes for both value and growth stocks separately. The second earnings forecast null hypothesis is that growth stocks respond less to earnings forecast changes after Reg FD and that there is an equal value stock return response before and after Reg FD. The first earnings forecast null hypothesis suggests that Reg FD has constrained the flow of information that analysts need to generate their earnings forecasts. Moreover, the second earnings forecast null hypothesis suggests that investors realize that Reg FD effectively reduced selective disclosure for growth firms and that earnings forecast changes do not explain the higher returns of value stocks.

Second, the first financial analysts' accuracy null hypothesis is that forecast accuracy of financial analysts' earnings forecasts for both value and growth stocks has decreased after Reg FD. The second accuracy null hypothesis is that forecast accuracy for value stocks has increased. The first accuracy null hypothesis suggests that Reg FD has altered the information environment, thereby decreasing the quality of the forecasts. The second accuracy null hypothesis implies that financial analysts are biased towards growth stocks although they have an economic and reputation incentive for accurate forecasts across all stocks. This also implies that the forecast accuracy differences are driven by analysts' conscious choice and are not caused by information asymmetry.

Last, the first forecast dispersion null hypothesis is that forecast dispersion on both growth and value stock returns has increased after the introduction of Reg FD. The second dispersion null hypothesis is that the effect of forecast dispersion on value stock returns is larger than it is for growth stock returns after Reg FD. The first dispersion null hypothesis indicates that Reg FD increased the uncertainty amongst the financial analysts, while the second null hypothesis suggests that the difference in the dispersion effects reflects the higher perceived risk of value stocks and not the variation in value and growth stock valuation.

1.3 Organization of Dissertation

This dissertation will provide a three-essay approach with one chapter per essay. Each chapter reviews the relevant research, describes the data, identifies the contributions to the literature, and describes the methodology. Each chapter will also have a section where the empirical results are presented and interpreted with a focus on their implications. The earnings forecast hypothesis will be presented in Chapter 2. Chapter 3 reviews the financial analysts' forecast accuracy hypothesis and Chapter 4 evaluates the dispersion hypothesis. Chapter 5 provides an overall summary and conclusions, and identifies areas for continuing research.

CHAPTER 2

CHANGES IN EARNINGS FORECASTS

2.1 Introduction

Individual investors use financial analysts' earnings forecasts to earn high returns on their stock investments (e.g., Brown and Rozeff, 1978; and Nagy and Obenberger, 1994). Research shows that stocks with a higher ratio of book value of common equity to market value typically have higher stock returns than growth stocks. The difference in returns has been attributed to higher distress risk due to substantial uncertainty in future earnings for value stocks or a judgment bias (see Fama and French, 1992, 1993, 1995; Lakonishok, Schleifer and Vishny, 1994; and Chan and Zhang, 1998).

Additionally, Jagadeesh *et al* (2004) find that financial analysts endorsed growth stocks to attract institutional clients who typically invest more heavily in growth firms. More importantly, Skinner and Sloan (2002) report that growth stocks exhibit an asymmetrically large negative response to negative earnings surprises. Managers of firms with high growth prospects had more incentive to manage analysts' expectations of reported earnings to avoid negative earnings surprises (see Matsumoto, 2002) while analysts were inclined to report favorable earnings in order to maintain good relationships with the managers of those firms (Lim, 2001). The introduction of Reg

FD on October 23, 2000 brought about significant changes in the financial forecasting environment by reducing selective disclosure. That way, all market participants are ensured of all the necessary earnings information to form their expectations about future stock returns.

This essay examines whether stock returns respond more to analysts' earnings forecast changes than they do to actual earnings changes for both value and growth stocks before and after Reg FD. The impetus for this research is to investigate whether the impact of earnings forecast growth (a proxy for earnings forecast changes) on stock returns has changed (e.g., Elton, Gruber and Gultekin, 1981) after the introduction of Reg FD. This essay also researches if the stock return reactions to earnings forecast changes are significantly different for value and growth stocks after the introduction of Reg FD. Proponents of Reg FD argue that eliminating selective disclosure changes the information environment, thereby changing financial analysts' expectations about stock performance, like value and growth stock returns.

Evidence of a stronger stock return reaction to changes in earnings forecasts than to changes in actual earnings indicates that stock returns respond more to changes in analyst' expectations. However, a decrease in the stock return response to earnings forecast changes after Reg FD suggests that investors perceive analysts' earnings forecasts to be less valuable. A smaller growth stock return reaction to changes in earnings forecasts after Reg FD indicates that investors realize that Reg FD effectively reduced analysts' earnings management of growth firms. An equal value stock return response to changes in earnings forecasts before and after Reg FD suggests that changes in analysts' earnings expectations do not explain the higher returns of value stocks, even though research showed that long-term earnings growth rates attribute to higher value stock returns (see La Porta, 1996).

Several studies (see Gleason and Lee, 2003; Chiyachantana *et al*, 2004; and Irani, 2004), after the introduction of Reg FD, provide evidence of a change in the information environment in which analysts are forming their earnings forecasts. To date no research has examined the stock reaction of growth and value stocks to changes in earnings forecasts pre-and post Reg FD.

2.1.1 Organization

Section 2.2 reviews relevant previous research and identifies this essay's contribution to the literature. Section 2.3 describes the data and methodology with results and related findings provided in Section 2.4. Section 2.5 provides conclusions and implications.

2.2 Literature Review

2.2.1 Changing Information Environment

Financial analysts play an important role in the financial markets and one of the many tasks they perform is providing consensus earnings forecasts to individual investors to help them make appropriate investing decisions (e.g., Brown and Rozeff, 1978). Availability of information is the key to generating those financial analysts' earnings forecasts and any major change to the access of information will therefore alter the quality and quantity of this important attribute in financial analysis. The SEC made such a change with Reg FD, the initial intent of which was to enhance the fairness of the markets by eliminating selective disclosure to certain market participants. Some researchers have studied the effects of Reg FD on the financial analysts' information environment.

Chiyachantana *et al* (2004) and Irani (2004) consider full disclosure of information a double-edge sword. On one hand, Reg FD increases the level of openness in corporate communication, while on the other hand fair disclosure undermines the role of the financial analyst and compels firms to be more cautious about the release of information. Chiyachantana *et al* (2004) study the change in information environment by testing the changes in bid-ask spreads before earnings announcements. Previous research shows negative correlations between the level of private information (e.g., information asymmetry) and market liquidity, suggesting that spreads are likely to be wider when there are more informed traders in the market. A greater level of corporate disclosures reduces the symmetry of information, reduces bid-ask spreads, and thereby increases market liquidity (see Diamond and Verrecchia, 1991). Chiyachantana *et al* study the impact of Reg FD on market liquidity by forming matched samples of firms that included earnings announcements in both the pre- and post-FD period from November 1, 1999 to July 31, 2001 and propose that a greater level of corporate disclosures reduces the asymmetry of information. They find that Reg FD has been effective in decreasing the level of information asymmetry by demonstrating that bid-ask spreads were significantly smaller in the post-FD period.

Additionally, Irani (2004) studies the effect of Reg FD on the information environment by using conference calls, a medium used by firms to disclose information to market participants. He investigates whether Reg FD resulted in increased relevance of conference calls to financial analysts as measured by improvements in consensus earnings forecasts and accuracy of those forecasts. He conjectures that whenever Reg FD reduces information asymmetry, relatively more about a firm's future earnings becomes known during open conference calls. Conference calls made during the 1998-1999 period comprise the pre-FD sample, while conference calls made in 2001 are in the post-FD sample. Irani (2004) finds that conference calls in the post-FD period provide more information useful in improving forecasting attributes then they did in the pre-FD period. He also shows that Reg FD has been successful in eliminating selective disclosure of information to analysts, thereby changing the information environment.

2.2.2 Analysts' Earnings Forecasts and Stock Returns

Earnings forecasts are an important factor in forecasting stock returns because earnings move with cash flows that reveal the financial condition of the firm. Since the market expectations of accounting earnings are not directly observable, researchers have used consensus earnings forecasts to proxy for the unobservable market expectations. Elton, Gruber and Gultekin (1981) and Givoly (1985) research to what extent expectations about firm characteristics are incorporated into security prices. Elton, Gruber and Gultekin (1981) compute the actual growth rate in earnings, the financial analysts' consensus forecast of the growth rate in the per share earnings and the actual growth minus the forecasted growth on a sample consisting of a total of 913 one-year forecasts of the fiscal years 1973, 1974, and 1975 and a total of 696 two-year forecasts of fiscal years 1974, and 1975. Other studies typically used historical extrapolations of past data to represent market expectations of future earnings.

Elton, Gruber and Gultekin (1981) and Givoly (1985) show that expectations are important and are incorporated into the current stock prices in a rational fashion. They also observe larger excess returns by having knowledge concerning the error in the growth estimate, than knowing the actual growth of accounting earnings itself. Although accounting earnings might contain information that could help explain stock returns (see Lamont, 1998), evidence points out that earnings are noisier measures of expected returns than other characteristics, such as dividends (see Fama and French, 1988). Before the introduction of Reg FD, value stocks earned higher returns than growth stocks (see Fama and French, 1992, 1995; Lakonishok, Shleifer and Vishny, 1994; La Porta, 1996; and Skinner and Sloan, 2002). Fama and French (1992, 1995) attribute the value premium to relative distress while Lakonishok, Shleifer and Vishny (1994) argue that the return differential was due to a judgment bias in which financial analysts are too optimistic about growth stocks and too pessimistic about value stocks. More importantly, La Porta (1996) provides evidence that the cross-section of stock returns is actually driven by analysts' long-term expectations. He constructs annual one-year-ahead portfolios of stocks that are sorted based on financial analysts' five-year earnings growth rates and found that investment strategies that use analysts' expectations to form portfolios consisting of stocks with low expected earnings growth (value stocks) earn on average 20 percent more than the portfolios of stocks with higher expected earnings growth in the post-formation time period from June 1982 to June 1990.

Additionally, Gleason and Lee (2003) research some of the effects of consensus earnings expectations on stock returns in the pre-FD period from October 1993 to December 1998 while controlling for several firm characteristics including book-to-market ratio and also conclude that consensus earnings forecast growth explains cross-sectional variation in stock returns by using multi-factor regressions. However, they caution that analysts' expectations would have a different impact on growth and value stock returns after Reg FD due to the change in the information environment.

2.2.3 Contributions to the Literature

This essay is the first to identify and examine differences in financial analysts' changes in forecasts and changes in earnings between value and growth stocks pre-and post Reg FD. First, this research looks into whether growth and value stocks respond more to earnings forecast changes than they do to earnings changes for both value and growth stocks separately pre-and post Reg FD. Second, this essay also investigates if the stock return reactions to changes in earnings forecast are significantly different for value and growth stocks after the introduction of Reg FD. The contributions of this essay are related to the seminal studies focusing on these major issues. Elton, Gruber and Gultekin (1981) show that stock returns respond more to analysts' expectations as proxied by consensus earnings forecast growth than they do to accounting earnings changes whereas La Porta (1996) demonstrate that expected long-term earnings growth rates explain the higher returns of value stocks versus growth stocks. He shows that a contrarian investment scheme, that involved investing in stocks with lower expected growth rates outperformed the stocks that were expected to grow much faster. Additionally, Lakonishok, Shleifer and Vishny (1994) provide evidence that value strategies yield higher returns because these strategies exploit the suboptimal behavior of the typical investor.

Recent research has shown that the information environment in which analysts form their expectations about future earnings has changed after the introduction of Reg FD (see Chiyachantana *et al*, 2004; and Irani, 2004). A smaller response of value and growth stock returns to earnings forecast changes after Reg FD suggests that Reg FD has reached its intended goal of promoting full and fair disclosure of information that analysts need to generate their earnings revisions. Additionally, a smaller growth stock return reaction to changes in earnings forecasts after Reg FD indicates that investors realize that Reg FD effectively reduced selective disclosure of information pertaining to growth firms, even though analysts were shown to endorse growth stocks (see Skinner and Sloan, 2002; Matsumoto, 2002; and Jagadeesh *et al*, 2004) before the introduction of Reg FD.

2.3 Data and Methodology

2.3.1 Description of the Data and Sample Selection

The data for this study were extracted from different sources, I/B/E/S through the Institutional Brokers Estimate System, COMPUSTAT and CRSP through the Center for Research on Security Prices. The raw I/B/E/S data consist of a daily one-year-ahead earnings forecasts prepared in the years 1982-2003. To test the hypothesis whether earnings forecast changes have a larger impact on value and growth stock returns than actual earnings changes do before and after the introduction of Reg FD, only data that meet specific conditions are included in the study.

First, the data is restricted to the time period from 1998 to 2003 in order to have a symmetrical period on either side of the introduction of the Reg FD. Second, the consensus forecasts are restricted to the one-year-ahead forecasts in the 1st and 2nd quarter of years 1998 to 2003 because the SEC approved Reg FD on August 10, 2000 (third quarter) and Reg FD was implemented on October 23, 2000 (fourth quarter). Furthermore, significant evidence on firm's performance is already contained in the earnings forecasts of these quarters (see Elton, Gruber and Gultekin, 1981). Third, firms that have stock return data from CRSP daily NYSE, AMEX and NASDAQ files are used. The available stock return data from CRSP is matched with analysts' earnings forecast data from I/B/E/S and accounting data from COMPUSTAT. To ensure that the earnings forecasts from I/B/E/S and the accounting data for COMPUSTAT are known before the returns they are used to explain, the accounting data from the fiscal year-end and the forecast data at the 2nd quarter for calendar year *t* are matched with the returns for January of year *t* +1 to December of year *t* + 1.[1]

This research uses the firm's lagged common equity (COMPUSTAT items 59 plus 35) to compute the ratio of book value of equity to current market value of equity (outstanding shares times the stock price) for the 2nd quarter.[2] The change from the first to the second earnings forecast is available at the second quarter earnings announcement and is computed with the I/B/E/S daily one-year-ahead earnings forecast data. However, the actual second earnings data will not be available for several weeks after the second quarter earnings announcement, therefore the change in cumulative earnings is calculated with the last eight previous quarter earnings starting with the first quarter earnings of the same fiscal year *t*. Since not all firms announce their second quarter earnings in the same quarter, only firms with fiscal years ending on December 31 are included in the sample. The total number of stocks in the final sample averages 651 per year.

2.3.2 Methodology

2.3.2.1 Full Sample Portfolio Formations

Womack (1996) provides evidence that stock prices are significantly influenced by analysts' recommendation changes. Furthermore, stocks with low long-run earnings

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[1] This procedure is similar to the described methods from Fama and French (1992) and La Porta (1996). However, both studies use return data from July *t* to June *t* +1.

[2] COMPUSTAT data item 59 corresponds to quarterly total common equity and data item 35 corresponds to the deferred taxes

growth rate forecasts have higher returns (e.g., La Porta, 1996). The basis of the earnings forecast change hypothesis is that the effect of a change in analysts' earnings expectations on stock returns is larger than the effect of actual earnings changes on stock returns (e.g., Elton, Gruber and Gultekin, 1981). These principles must hold true for the complete sample period from the second quarter of 1998 to the second quarter of 2003 before discernable differences in value and growth stock return behavior before and after the introduction of Reg FD could be investigated.

Consensus earnings forecasts are generated every day and are adjusted to incorporate new events. These one-year-ahead earnings forecasts are annual earnings forecasts for the entire next fiscal year. This study investigates the impact of earnings forecast changes after the second quarter earnings announcement on stock returns in the next fiscal year from January t +1 to December t +1. At the moment of the second quarter earnings announcement the financial analyst obtains earnings information and uses that information to adjust his earnings forecasts. This adjustment in forecasted earnings incorporates the growth in forecasted earnings relative to the actual cumulative earnings change. In order to compare changes in one-year-ahead earnings forecasts with changes in actual earnings, quarterly earnings are adjusted to reflect annual earnings changes.

The change in actual cumulative EPS from the last eight quarters evaluated at the second quarter of fiscal year t is defined as the actual cumulative EPS from the first half of eight previous quarters minus the actual cumulative EPS from the latter half of previous eight quarters divided by the current stock price at the second quarter earnings announcement date. Letting $ED_{2,t}$ stand for the difference in growth of actual EPS,

$$ED_{2,t} = ((E_{1,t} + E_{4,t-1} + E_{3,t-1} + E_{2,t-1}) - (E_{1,t-1} + E_{4,t-2} + E_{3,t-2} + E_{2,t-2})) / P_{2,t}, \tag{1}$$

where E_t is the quarterly actual EPS. Knowledge of the actual change in reported earnings during the fiscal year is an important variable affecting stock returns (see Lamont, 1998).

The second variable, $FED_{2.t}$, measures information about analyst's expectations of future earnings beyond the information already incorporated in the earnings figure available at the second quarter. The forecasted growth in future earnings from fiscal year $t-1$ to fiscal year t is defined as the difference between the consensus forecasted earnings-per-share in the 2nd quarter of fiscal year t minus the consensus forecasted earnings-per-share in the 2nd quarter of fiscal year $t-1$ divided by the current stock price at the second quarter earnings announcement date. Letting $FED_{2.t}$ stand for the difference in forecasted earnings,

$$FED_{2,t} = \left(FE_{2,t} - FE_{2,t-1}\right) / P_{2,t}, \tag{2}$$

where FE_t is the quarterly forecasted EPS.

The equally-weighted monthly average returns for all stocks at the 2nd quarter in fiscal year t that have available I/B/E/S data are computed from January $t + 1$ to December $t + 1$ from 1999 to 2004 and are matched with firms' book-to-market ratios (BE/ME). BE/ME is the book value of common equity plus balance sheet deferred taxes for December of fiscal year $t - 1$, over current market equity for 2nd quarter of year *t*. The next step in the procedure is to first rank the stocks on the basis of BE/ME and classify the stocks into BE/ME quintiles. Then, within each BE/ME quintile the stocks are sorted based on $FED_{2.t}$ rankings to create $FED_{2.t}$ quintiles within each BE/ME quintile to form 25 portfolios each with one average monthly return. The average monthly return for each individually ranked portfolio of stocks is the time-series average of the monthly equal-weighted portfolio returns one year after portfolio formation in years 1998 to 2003 with annual rebalancing. Subsequently, within each BE/ME quintile the stocks are sorted based on $ED_{2,t}$ rankings to create $ED_{2,t}$ quintiles within each BE/ME quintile to form 25 portfolios each with one average monthly return.

These procedures result in a 5-by-5 matrix for the BE/ME-$FED_{2.t}$ quintile combinations with 25 stock portfolios and in a 5-by-5 matrix for the BE/ME-$ED_{2,t}$ ranked stock portfolios. The average monthly equal-weighted returns in the resulting 25 BE/ME-$FED_{2.t}$ portfolios are compared against the average monthly equal-weighted returns in the resulting 25 BE/ME-$ED_{2,t}$ portfolios in order to study the return differentials. For statistical inference, the Wilcoxon rank-sum tests and the two sample difference-in-means tests are used in this analysis (see McClave, Benson and Sincich, 1999).[3]

[3] The two sample difference-in-means test assumes that the sample populations follow the normal distribution whereas the Wilcoxon rank-sum test does not require this assumption.

2.3.2.2 Regression Analysis

The analysis continues to investigate whether investors' return expectations are either influenced by analysts' forecasted earnings growth or by actual earnings growth. The impact of analysts' earnings forecast changes on one-year ahead stock return portfolios are compared against the impact of actual earnings changes over the full period of portfolio formations as well as the pre- and post-FD periods. Fama and French (1993) suggest that a three-factor time-series model might explain the cross-section of returns. Their three factors are RMF, the excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-firm portfolio subtracted from the return on the small-firm portfolio, and HML, the return on an arbitrage portfolio consisting of the return on the portfolio of high-BE/ME stocks minus the return on the portfolio of low-BE/ME stocks.[4]

To test the hypothesis whether returns are more sensitive to changes in analysts' expectations than to actual earnings changes, two additional factors for the asset-pricing model by Fama and French (1993) are constructed. To construct an analysts' expectations factor (EXP), firm-year observations are ranked by $FED_{2,t}$ and two equal-weighted return portfolios are formed on the basis of the top 30 percent and bottom 30 percent $FED_{2,t}$ rankings. The variable EXP is the return difference between the top 30 percent and bottom 30 percent portfolio returns. Additionally, an earnings change

[4] These factors are available from Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/).

factor (EARN) is constructed by using firm-year observations and ranking them by $ED_{2,t}$ to form two equal-weighted return portfolios on the basis of the top 30 percent and bottom 30 percent $ED_{2,t}$ rankings. The variable EARN is the return difference between the top 30 percent and bottom 30 percent portfolio returns.

Average monthly returns are computed for January of year t +1 to December t + 1 for these portfolios to obtain a return series of 72 monthly observations from January 1999 to December 2004. Average excess monthly returns (in excess of the risk-free rate) are calculated for the 5-quintile BE/ME portfolios and one total group, including all stocks. The portfolio groups of interest are the high-BE/ME (or value stock) portfolio and the low-BE/ME (or growth stock) portfolio.

The average excess monthly return series are regressed on the factors RMF, SMB, HML, EXP, and EARN to obtain factor sensitivities (slope coefficients) with variations of the following model:

$$R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + xEXP(t) + rEARN(t) + e(t), \tag{3}$$

The slope coefficients on EXP and EARN determine investors' expected returns premiums if analysts' expectations (EXP) or earnings changes (EARN) are of any concern to investors. The null hypothesis that the slope coefficients (or factor loadings) are not priced in the market (i.e., will have zero value) is tested against the alternative hypothesis that all the factors are priced.

This study continues to investigate whether the effects of earnings forecasts on the stock returns are asymmetric before and after the introduction of Reg FD, which would indicate that negative earnings forecasts would have a larger effect on the returns than the positive earnings forecasts would have (e.g. Cover, 1992). This would imply that analysts could induce higher stock returns by purposefully lowering their earnings forecasts. To test this hypothesis in the regression analysis, a dummy (d-asym) is created that is assigned a value of 1 if the earnings forecasts are negative and a value of zero otherwise. The statistical significance of the parameter coefficient on this dummy will indicate the possibility of asymmetry between negative and positive earnings forecasts in relation to the value and growth stock returns.

The robustness of the statistical inference on the coefficients in model (3) is dependent on the time-series properties of the data. It has to be assumed that the ordinary least squares (OLS) regression generates efficient and consistent parameter estimates in order to conjecture that the slope coefficients on EXP and EARN are indeed significantly different from zero and have an impact on stock returns. Granger and Newbold (1974) discuss that whenever non-stationary time-series data are used in a regression, the parameter estimates could be spurious. To avoid these problems, the order of integration in the data is investigated with the Augmented Dickey Fuller test (ADF) (Dickey and Fuller, 1979, 1981) and the KPSS test (Kwiatkowski *et al*, 1992). The ADF test is a unit root test that is based on the t-ratio of the parameter ρ, in the following regression:

$$\Delta X_t = \mu + \delta t + \rho X_{t-1} + \sum_{i=2}^{\eta} \psi_i \Delta X_{t-i+1} + \varepsilon_t \,, \qquad (4)$$

where Δ is the first difference operator, X_t, is the series under consideration and η is large enough to ensure that ε_t is stationary random error (white noise). The null hypothesis of non-stationarity is rejected when ρ 's value is significantly negative. The appropriate order of autoregression has to be determined first according to the Akaike (1981) information criterion, AIC, before regression (4) could be applied. The distribution of the ADF statistic is nonstandard and requires the use of critical values tabulated by MacKinnon (1994).

A problem with the ADF test is that it may have low power against stationary near-unit root processes. As an alternative, Kwiatkowski *et al* (1992) present a KPSS test where the null hypothesis is that the data series is stationary. They show that time-series data can be composed into three components: a deterministic time trend, a random walk and a stationary error, as in the following model:

$$y_t = \delta_t + r_t + \varepsilon_t \,, \qquad (5)$$

where $r_t = r_{t-1} + u_t$ and the $u_t \sim i.i.d(0, \sigma_u^2)$. The stationarity null hypothesis implies that $\sigma_u^2 = 0$. Under the null hypothesis, y_t is stationary around a constant ($\delta = 0$) or trend-stationary ($\delta_t \neq 0$). Kwiatkowski *et al* (1992) demonstrate that two regressions from model (5) could be estimated: a regression with a constant or a regression with a constant and a time trend. Using the residuals from either regression, the LM statistic is computed:

$$LM = T^{-2}\sum_{t=1}^{T} S_t^2 / S_{\varepsilon_t}^2 , \qquad (6)$$

where $S_{\varepsilon_t}^2$ is the estimate of the variance of $\varepsilon_t S_t = \sum_{i=1}^{t} e_i$. By relaxing the assumptions about the behavior of ε_t, the LM test in (6) becomes:

$$v = T^{-2}\sum_{t=1}^{T} S_t^2 / S^2(l) , \qquad (7)$$

where l is the lag truncation parameter. Two test statistics, η_μ and η_τ are shown to represent the level-stationary case and the trend-stationary case, respectively. The distribution of the LM test is nonstandard and Kwiatkowski *et al* provide the critical values by Monte Carlo simulation.

The impact of analysts' earnings expectations on one-year ahead stock return portfolios are compared against the impact of actual earnings changes over the full period of portfolio formations as well as the pre- and post-FD periods. In order to determine if the model specifications are acceptable and the slope coefficients of the EXP and EARN parameters are of any significance, the parameters of the model where excess monthly average return series from January 1999 to December 2004 is regressed on the factors RMF, EARN, EXP with the modified time-series regression model in (3) are contrasted to the parameters of the model where the excess monthly average return is regressed on RMF, SMB, HML, EXP, and EARN in the same time period.

The analysis continues to investigate whether the introduction of Reg FD affects the estimation of the parameter coefficients in model (3) over the entire time post-formation period. If the introduction and implementation of Reg FD has an impact on the estimation of the parameter coefficients in model (3), the data should then not be pooled together over the full sample period but estimated with two regressions, each with distinctly different post-formation time periods to make proper inference of the estimators in the pre- and post FD periods. To test the null hypothesis that the return data exhibit a structural break at the introduction of Reg FD and that the data for the pre-FD period and the data for the post-FD period should be estimated with different regression models, the regression model in (3) is subjected to Chow's (1960) structural break test. Consider the linear regression model:

$$y = X\beta + u\,, \tag{8}$$

where β is a vector containing k elements. The observations for this model are split into two subsets at the specified breakpoint corresponding with the introduction of Reg FD. The Chow test is used to test the null hypothesis that $\beta_1 = \beta_2$ conditional on the same error variance in both regressions. The test statistic is computed as follows:

$$F_{chow} = \frac{(S_c - (S_1 + S_2))/k}{(S_1 + S_2)/(N_1 + N_2 - 2k)}\,, \tag{9}$$

where S_c is the sum of squared residuals from the combined data, S_1 is the sum of squares from the first regression, S_2, the sum of squares from the second regression. N_1 and N_2 are the observations in each group and k is the total number of parameters. The test statistics follows the F distribution with k and $N_1 + N_2 - 2k$ degrees of freedom.

2.4 Empirical Results

2.4.1 Portfolio Formation Results

The one-year ahead average monthly returns for the 5-quintile BE/ME portfolios for all formation periods from the second quarter of 1998 to the second quarter of 2003 are shown in Table 1. The High-Low column shows that, in the period from January 1999 to December 2004, value stocks earned 4.612 percent more than growth stocks. This evidence confirms the findings that value stocks typically earn higher returns than growth stocks (see Fama and French, 1992, 1995; Lakonishok, Shleifer and Vishny, 1994; La Porta, 1996; and Skinner and Sloan, 2002). The superior behavior of value stock portfolios is not consistent for all the average returns one year after portfolio formation.

Table 1 shows that in 1999 the average monthly returns for value stocks are significantly lower than growth stock returns. Chan and Lakonishok (2004) find a similar pattern in their recent reevaluation of value versus growth performance and argued that the difference in performance between value and growth stock in the late 1990s was not grounded in fundamental patterns of profitability growth. In fact, their interpretation is that investor sentiment reached exaggerated levels of optimism about the prospects for technology, media, and telecommunications stocks. The All column shows that along the studied years in the sample, the monthly average returns display a similar pattern as that of the average monthly returns of the CRSP equal-weighted portfolio.

Table 2 reports the average and median values of the earnings expectations growth and the actual earnings growth. The results from both Panels shows that expected growth means and the actual growth means have the same signs across the 25 formed BE/ME portfolios but the actual growth means are on average twice the magnitude as the expected growth means. The results from the High-Low column in Panel A show that the difference in means for earnings expectations growth between growth and value stocks range from –3.900 percent for stocks with low earnings forecast growth to 1.039 percent for stocks with high earnings forecast growth while the High-Low row in Panel A indicates that the difference in means for expectations growth between stocks with high expected growth and stock with low expected growth ranges from 4.876 percent for growth stocks to 9.815 percent for value stocks. The results from the High-Low column in Panel B show that the difference in means for actual earnings growth between growth and value stocks range from -4.625 percent for stocks with low actual earnings growth to 3.534 percent for stocks with high actual earnings growth while the High-Low row shows that the difference in means for actual earnings growth between high earnings growth and low earnings growth range from 12.796 percent for growth stocks to 20.955 percent for value stocks.

These results indicate that growth stocks with low earnings growth are expected to have larger (i.e. less negative) future earnings relative to value stocks with low actual earnings growth. On the other hand, value stocks with high earnings growth are expected to have higher future earnings growth than growth stocks with high actual earnings growth. This implies that the change in earnings forecasts is affected by the change in actual earnings although in smaller proportions.

Table 3 reports the average monthly returns of the 5 BE/ME quintile portfolios that are sorted in 5 quintiles on the basis of expected growth in cumulative earnings at the announcement date in the second quarter of year t, and the 5-quintile portfolios are also sorted in 5 quintiles on the basis of the actual cumulative change in earnings known at the second quarter in year t. The High-Low column in Panel A shows that the monthly average return is higher for value stocks from the low-expectations portfolio to the high-expectations portfolio and that the difference in returns is statistically significant except for expectations-growth portfolios 3, where the monthly average return is higher for value stocks but the difference is not statistically significant. These results correspond to the results from Panel A in Table 2 that indicate that the mean as well as the median consensus earnings forecast growth for expectations-growth portfolio 3 is close to zero. This implies that value stocks with a minimal or no change in earnings forecast only have a slightly higher monthly average return relative to growth stock with a minimal or no change in earnings forecast.

The High-Low column in Panel B shows that the monthly average return is higher for value stocks from the low-earnings portfolio to the high-earning portfolio except for earnings-growth portfolio 3, where the monthly average return is higher for growth stocks even though the difference in returns is not statistically significant. This result corresponds to the results from Panel B in Table 2 indicating that the mean actual earnings growth for earnings-growth portfolio 3 is close to zero. This implies that value stocks with a minimal or no change in actual earnings have a lower monthly average return relative to growth stock with a minimal or no change in actual earnings.

The All column in Panel A from Table 3 shows that average monthly returns for all stocks one year after the portfolio formation are higher for lower expected earnings growth. The All column shows that the return difference between the low-expectations earnings growth and the high-expectations earnings growth is 3.278 percent. La Porta (1996) reports that contrarian strategies that use analysts' long-term earnings growth rate forecasts to form portfolios yield high returns. Specifically, when stocks were sorted by the expected growth rate in earnings, low-expected growth rate stocks outperformed high-expected growth rate stocks. The High-Low row in Panel A reports that the difference in returns between low-expected earnings growth stocks and high-expected earnings growth stocks is negative and statistically significant for all the BE/ME group except for the BE/ME group in column 3. The High-Low row in Panel A also shows that the difference in returns between low-expected earnings growth stocks and high-expected earnings growth stocks is 8.039 percent for growth stocks and is statistically significant while the difference in returns between low-expected earnings growth stocks and high-expected earnings growth stocks is 0.508 percent for value stocks and that this difference in returns is not statistically significant. This implies that the difference in returns between stocks with low expected earnings and stock with high-expected earnings is larger and significant for growth stocks while there is a minimal difference in returns between low- and high-expected earnings growth for value stocks.

Panel B of Table 3 shows that by construction, sorting stocks by actual earnings growth after stocks are sorted by BE/ME produces a wide range of average monthly returns. The stock returns in the All column and the stock returns that are sorted on BE/ME generally appear to react inversely to higher reported earnings, even though the difference in returns for value stocks is not statistically significant. However, growth stocks with the highest actual earnings growth have less negative returns and stocks in BE/ME portfolio 3 with high actual earnings growth have higher returns than the stocks with low actual earnings growth in that same portfolio.

Panel C sets forth the differences between the average monthly returns from the BE/ME-expectations growth portfolio combinations and the average monthly returns for the BE/ME-earnings growth portfolio combinations. The All column shows that stocks with low expected earnings growth have higher returns than stocks with low actual earnings growth but that stocks with high expected earnings growth have lower returns than stocks with high actual earnings growth. The High-Low row from Panel C shows that All stocks respond more to expected earnings changes than they do to changes in actual earnings. The High-Low row also shows that growth stocks respond more to changes in expected earnings than they do to changes in actual earnings while it appears that value stocks respond more to actual earnings changes than they do to changes in expected earnings, although this result is not statistically significant.

2.4.2 Time-Series Analysis

2.4.2.1 Stationarity Tests

Table 4 shows the ADF and KPSS test results. The null hypothesis of non-stationary time-series data for the ADF tests is rejected for all series at the 1% significance level. The null hypothesis of stationary time-series data for the KPSS test cannot be rejected for any series at the 5% significance level. Thus it is presumed that the series are stationary in levels and that the parameter coefficients from the regression model in (3) are consistent and efficient.

2.4.2.2 Regression Results

This section assesses the role of analysts' changes in earnings expectations and actual earnings growth in explaining the cross-section of stock returns in a multivariate setting. Average monthly returns were computed for January t +1 to December t + 1 for these portfolios to obtain a return series of 72 monthly observations for the portfolio formation period from the second quarter of 1998 to the second quarter of 2003. Average excess monthly returns (in excess of the risk-free rate) are then computed for the 5-quintile BE/ME portfolios and one total group, including all stocks. The average excess monthly returns from the post-formation periods are regressed on the independent factors RMF, SMB, HML, EXP, and EARN. The variable EXP is the return difference between the top 30 percent and bottom 30 percent portfolio returns and the variable EARN is the return difference between the top 30 percent and bottom 30 percent portfolio returns.

Table 5 shows the Pearson correlation coefficients for all the independent variables used in subsequent regressions. The results show that there are statistically significant correlations between RMF and SMB, RMF and HML, RMF and EXP, RMF and EARN, SMB and HML, SMB and EXP, HML and EXP and EXP and EARN.

Table 6 shows the average monthly time-series returns for all stocks, the BE/ME group, and the EARN and EXP variables for 1999 to 2004. The All row shows that the returns for EXP and EARN in the years from 1999 to 2004 are similar. The results also show that there is an inverse cyclical relationship between the returns for the EXP and EARN variables in the pre-FD years; when the returns for EXP are higher, the returns on EARN are lower and vice versa. However, the difference in EXP and EARN returns is minimal in the post-FD years 2002 and 2003.

Fama and French (1993) discuss that intercepts that are close to zero in regressions that use RMF, SMB, and HML to absorb common time-series variation do a good job of explaining the cross-section of average stock returns. To determine whether the model in (3) adequately explains stock returns, a seemingly unrelated regression (SUR) is used to test the null hypothesis that the intercepts in the regressions with RMF, SMB, HML, EXP, and EARN are jointly equal to zero for the 5-quintile BE/ME portfolios. Like OLS, the SUR method assumes that all the regressors are independent variables, but SUR uses the correlations among the errors in different equations to improve the regression estimates. Table 7 shows the slope coefficients, their associated t-statistics, and the results for the F-tests for all the stocks in the BE/ME groups for two model specifications.

The model specification in Panel B does not include the SMB and the HML variables in order to determine if the correlation between SMB and EARN, and HML and EXP (see Table 5) would affect the adequacy of the regression models that do include SMB and HML. The F-test result in Panel A of Table 7 indicate that the null hypothesis that the intercepts are jointly equal to zero cannot be rejected at the 1% level of significance. The F-test result in Panel B of table shows that the null hypothesis that the intercepts are jointly equal to zero could be rejected at the 1% level. However, the higher R^2 values of the regressions in Panel A of Table 7 show that the regression model with SMB and HML in combination with EARN and EXP explain a larger fraction of the average monthly returns. The R^2 values of the regressions in Panel A of Table 7 range from 0.8233 to 0.8883 by adding the SMB and HML factors, while the R^2 values of the regressions in Panel B range from 0.5002 to 0.8518. These results indicate that including those factors helps explain the cross-section of returns better.

Previous results from the All columns in Table 3 indicate that the relationship between changes in expectations growth and returns as well as the relationship between actual earnings growth and returns is inverse. Table 8 shows the slope coefficients, their associated t-statistics for all stocks in the sample from January 1999 to December 2004 with four different model specifications. All estimated coefficients for the CRSP/COMPUSTAT/IBES sample have the expected sign and the coefficients on RMF, SMB, and HML are all statistically significant. The coefficients on EXP and EARN in the model with EXP and EARN confirm the findings in Tables 5 and 6, indicating that the relationship between EXP and EARN over the years form 1999 to 2004 is positive.

Table 8 also shows that the parameter coefficient on EXP of –0.237 is negative and statistically significant at the 5% level in the model with all independent variables and that the parameter coefficient on EARN is positive but not statistically significant. This result is confirmed in the model with SMB and HML where the parameter coefficient on EXP is –0.237 and also statistically significant at the 5% level. This means that average monthly stock returns for all stocks in the post-formation period from January of 1999 to December of 2004 respond more to earnings expectations growth than they do to actual earnings growth. Negative changes in earnings forecasts do not appear to have a larger effect on stock returns, as indicated by the statistical insignificance of the dummy (d-asym) parameter.

Table 8 also reports the Chow test statistic testing the null-hypothesis whether the return data do not exhibit a structural break at the introduction of Reg FD. The Chow test statistic of 2.10 shows that the null hypothesis can be rejected at the 10% significance level and that the data for the pre-FD period and the data for the post-FD period should be estimated with different regression models.

Table 9 reports the estimated regression coefficients of all stocks in the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and in the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003 with four different models. All the coefficients on RMF, SMB, and HML have the expected signs and statistical significance, while the parameter coefficients on EXP and EARN in A3 and B3 show the positive relationship between these variables in the pre-FD years and the inverse relationship in the post-FD years. The coefficients on EXP and EARN of the regression model A4 show that before Reg FD a negative relationship between earnings expectations growth and stock returns exists but that there is a positive relationship between actual earnings growth and stock returns. The coefficient on EXP in regression A4 is -0.493 and statistically significant at the 5% significance level, while the coefficient on EARN is 0.185 but not statistically significant. The results are confirmed with the regression coefficients on EXP and EARN in model A2 that shows that the coefficient on EXP is –0.832 and statistically significant at the 5% while the coefficient on EARN is not statistically significant. These results provide evidence that investors who use a contrarian investment strategy based on changes in analysts' expectations to form stock portfolios earned higher returns before the introduction of Reg FD. These results are similar to La Porta's (1996) results. He found that stocks with lower long-term earnings forecast growth rate have higher returns. Even though the relationship between earnings forecasts and stock returns is inverse, stock returns do not react more to negative earnings forecasts and there is no evidence of asymmetry in stock return response.

The coefficients on EXP and EARN of regression B4 in Table 9 show that after Reg FD, there is a negative relationship between actual earnings growth and stock returns but a positive relation between changes in earnings forecasts and returns, respectively. The coefficient on EXP in regression B4 is 0.039 and not statistically significant, while the coefficient on EARN is –0.106 and also not significant. The results from model B2 confirm that the parameter coefficient on EXP is positive and the coefficient on EARN is negative. The results in Table 9 also show that the parameter coefficient on EXP changes from –0.394 in A4 to 0.039 in regression B4.

These findings imply that investors realized that after the introduction of Reg FD, analysts' earnings expectations do not contain more pertinent information beyond the information that is already incorporated in publicly available quarterly earnings. After Reg FD, a contrarian investment strategy that is based on financial earnings forecast growth does not have a higher payoff any longer. The results from Table 9 do not provide any evidence on the effects of earnings expectations- and earnings growth on the cross-section of average returns before and after the introduction of Reg FD. The analysis continues to investigate the effects of EXP and EARN on the cross-section of returns, while comparing the pre-and post FD periods.

Table 10 shows the estimated regression coefficients of growth stocks from the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The coefficients on HML in models A1 and A4 show that there was a value premium on growth stocks before Reg FD while the coefficients on HML in B1 and B4 correctly indicate that there is an inverse relationship between growth stocks and the value premium after Reg FD. The coefficients on EARN and EXP in regressions A3 and B3 show that the relationship between the returns on EXP and EARN is inverse before Reg FD and positive after Reg FD.

The regression coefficients on EXP and EARN in A2 and A4 indicate that before Reg FD growth stocks reacted more to earnings forecast changes than they did to actual earnings changes. The coefficients on EXP in A2 and A4 are both negative and statistically significant while the statistically insignificant coefficient on EARN is negative in A2 and A4. These results provide evidence that the previous findings from Table 3 indicating that growth stock returns generally react more to changes in earnings expectations than they do to actual earnings growth primarily took place before the introduction of Reg FD and that the growth stock returns do not react asymmetrically to either positive or negative earnings forecast changes.

Panel B of Table 10 reports the estimated regression coefficients of growth stocks for the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The coefficients on EXP and EARN of regressions B2 and B4 show that the coefficient on EARN is also positive and but only statistically insignificant, while the coefficient on EXP is remains negative but turns insignificant in both regressions. These results imply that investors who use a contrarian investment portfolio containing growth stocks based primarily on analysts' earnings expectations does not result in higher returns after the introduction of Reg FD.

Table 11 shows the estimated regression coefficients of value stocks from the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The regression coefficients on EXP and EARN in A2 and A4 indicate that before Reg FD value stocks covary minimally with either earnings forecast-or actual earnings changes but that the coefficient on EXP is negative and that the coefficient on EARN is positive in both regressions. The parameter coefficients on EARN and EXP are statistically insignificant in all regressions from Panel A.

Panel B of Table 11 reports the estimated regression coefficients of value stocks for the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The coefficients on EXP and EARN of regressions B2 and B4 show that the coefficient on EARN is negative and statistically insignificant in both regressions, while the coefficient on EXP is positive and statistically insignificant. The parameter coefficients on d-asym in A5 and B5 are positive and statistically insignificant, showing that the value stock returns do not respond asymmetrically to negative changes in earnings forecasts. These results confirm the previous findings from Table 3 indicating that value stock returns generally do not react to changes in earnings expectations or react to changes in actual earnings before and after the introduction of Reg FD. This implies that investors did not pay much attention to earnings expectations growth or actual earnings growth in making their value strategies before and after the introduction of Reg.

2.5 Conclusion and Implications

This essay investigates whether stock returns react more to earnings forecast changes than they do to earnings changes for both value and growth stocks before and after Reg FD. Specifically, this essay researches if the stock return reactions to change in financial earnings forecasts are significantly different for value and growth stocks after the introduction of Reg FD. The results show that on average value stock portfolios earn higher returns than growth stock portfolios. The results also indicate that before Reg FD contrarian portfolio-formation strategies that are based on changes in analysts' earnings expectations earn higher returns than buy-and-hold strategies that are based on actual earnings growth. Additionally, the evidence shows that stock returns generally do not respond asymmetrically to negative earnings forecast changes. These results draw a parallel to the findings by La Porta (1996) who finds that on average portfolios that were selected on the basis of lower long-term earnings growth rate forecasts outperformed the portfolios that were selected on basis of higher long-term earnings growth rate forecasts.

This phenomenon is stronger for growth stock portfolio strategies than it is for value stock portfolios. Actually, neither analysts' earnings expectations growth or actual earnings growth seem to have much impact on the one-year post-formation returns for value stocks. Interestingly, the overall impact of earnings expectations on stock returns dissipates after the introduction of Reg FD. This trend is again stronger for growth stocks because it appears that value stock investors do not use change in earnings forecasts or earnings growth in their investment decisions. By and large, earnings expectations growth and actual earnings growth have negligible and insignificant effects on the returns of value stocks.

The evidence that growth stock returns do not react to earnings forecast changes any longer after the introduction of Reg FD could be interpreted in the following ways. First, investors cannot earn excess returns any longer by trading in the opposite direction of short-term change in earnings expectations. This shift in the effect of earnings expectation growth on stock returns after the introduction of Reg FD is related to the change in investors' investment strategies. The smaller growth stock return reaction to changes in earnings forecasts after Reg FD indicates that investors realize that Reg FD effectively reduced communication between analysts and growth firm's managers.

Second, investors realized that after the introduction of Reg FD, earnings forecasts could no longer contain more information than what is contained in publicly available quarterly earnings. Availability of information is the key to generating financial analysts' earnings forecasts and any major change to the access of information will alter this attribute in financial analysis. It confirms the findings of Chiyachantana *et al* (2004) and Irani (2004) who find that Reg FD has been successful in reducing selective disclosure of information to analysts, thereby changing the information environment.

CHAPTER 3

FINANCIAL ANALYSTS' ACCURACY

3.1 Introduction

The relationship between financial analyst forecast attributes and investment decisions has attracted a considerable amount of research effort over the last three decades. Evidence points out that earnings forecasts are increasingly used to represent market expectations of corporate earnings (e.g., Brous, 1992) and that earnings estimates play a significant role in determining investors' buy and sell decisions for common stocks (see Brown and Rozeff, 1978). Moreover, financial analyst earnings forecasts have a significant impact on stock returns (see Womack, 1996). Other research shows that stocks with a higher ratio of book value of common equity to market value typically have higher stock returns than growth stocks (see Fama and French, 1992, 1993, 1995; Lakonishok, Schleifer and Vishny, 1994; and Chan and Zhang, 1998).

Despite these facts, investors are only willing to rely on financial analyst earnings forecasts if they believe those forecasts are correct and precise (e.g., Brown and Rozeff, 1978; and Brennan and Hughes, 1991). Since analyst livelihood and reputation are tied to the accuracy of their forecasts, it seems reasonable to assume that analysts would want their forecasts to be precise (e.g., Mohanty and Aw, 2006).

Nevertheless, other research has documented that financial earnings forecasts tend to be inaccurate for various reasons. First, analysts are inefficient users of the available information in that they underestimate less relevant news, overestimate salient news and are systematically optimistic in their forecasts (e.g., De Bondt and Thaler, 1990; Francis and Philbrick, 1993; Kang, O'Brien, and Sivaramakrishnan, 1994; and Easterwood and Nutt, 1999). Second, reputation and herding behavior (mutual imitation) amongst financial analysts have been pointed out as other explanations for analyst inaccuracy (see Sharfstein and Stein, 1990). Third, analysts might also have a monetary incentive to report favorable earnings estimates in order to establish good rapport with top executives (e.g., Francis and Philbrick, 1993; Carleton, Chen and Steiner, 1998; Michaely and Womack, 1999; and Lim, 2001). Matsumoto (2002) shows that this monetary incentive is even larger for growth firms. Managers of growth firms and analysts could be enticed to manage future earnings especially since growth firms appear to have asymmetrically large negative responses to negative earnings announcements (see Skinner and Sloan, 2002).

The Securities and Exchange Commission (SEC) has implemented a ruling in the latter part of 2000 to curb the unfair advantage of these relationships between managers and professional analysts. The introduction of Reg FD (Reg FD 17 CFR 243) on October 23, 2000 has brought about significant changes in the financial forecasting environment by reducing selective disclosure. Reg FD challenges the relationships between managers and analysts so that corporate managers can no longer use corporate information to guide financial analysts who feel pressured to provide favorable earnings forecasts (e.g., Carleton, Chen, and Steiner, 1998).

This essay will test the difference in forecast accuracy of financial analyst earnings forecasts before and after Reg FD for value and growth stocks. This research is motivated by the question whether earnings forecast accuracy for value and growth stocks has changed after the introduction of Reg FD. The first hypothesis in this essay is that forecast accuracy of financial analyst earnings forecasts for both value and growth stocks has increased after Reg FD. Analysts serve as catalysts to communicate information to the market and relationships between managers and analysts would increase the likelihood of more accurate earnings forecasts. Firms now have to either disclose information publicly or refrain from discussing it with analysts. Opponents feel, therefore, that Reg FD will lead to "cookie-cutter" disclosures resulting in less accurate forecasts. However, proponents of Reg FD argue that regulating the flow of information might ultimately result in more accurate forecasts.

This essay also investigates whether the financial earnings forecast accuracy is significantly different for value and growth stocks separately after the introduction of Reg FD. The second hypothesis in this study is that forecast accuracy for value stocks has increased more relative to growth stocks after Reg FD. Skinner and Sloan (2002) document that growth stocks, in particular, have asymmetrically negative responses to negative earnings surprises. In fact, analysts have a monetary incentive to generate inaccurate earnings forecasts for growth stocks (see Lim, 2001; and Matsumoto, 2002). More precise forecasts for value stocks relative to growth stocks after the introduction of Reg FD would imply that the forecast accuracy differences are driven by analyst conscious choice and are not caused by differences in the information environment.

Dissimilarities in earnings forecast accuracy between value and growth stocks would imply that financial analysts are biased towards growth stocks although they have an economic and reputation incentive for accurate forecasts across all stocks. They would also suggest that before Reg FD financial analysts deliberately manipulated growth stock forecasts to cultivate and maintain relationships with growth firms' managers (e.g., Lim, 2001; and Matsumoto, 2002) but that reduction in selective disclosure could have eliminated these relationships.

3.1.1 Organization

Section 3.2 reviews relevant previous research and identifies this essay's contribution to the literature. Section 3.3 describes the data and methodology with results and related findings provided in Section 3.4. Section 3.5 provides conclusions and implications.

3.2 Literature Review

3.2.1 Earnings Forecast Accuracy after Reg FD

Brown and Rozeff (1978) and Brown (1993) report that employed security analysts process a significant amount of information to generate their earnings forecasts and that financial analyst earnings forecasts are the most frequently used proxy for market expectations in capital market research. Since analyst compensation and reputation are contingent on the accuracy of these forecasts, one would expect these forecasts to be rational and unbiased. Rational expectations theory suggests that economic agents are optimizers that act rationally to the available information. Availability of information is the key in providing precise earnings forecasts and any major change to the access of information could affect the accuracy of the earnings forecasts. On October 23, 2000, the voluntary disclosure practices of firms with publicly traded securities became subject to the terms of Reg FD.

Recent research has looked into the impact of Reg FD on the financial analyst earnings forecasts accuracy. Agrawal, Chadha and Chen (2006) and Findlay and Mathew (2006) document the effects of the introduction of Reg FD on the accuracy of earnings forecasts. They recognize the opposite sides of Reg FD's implications. On one side, regulation of the flow of information would not and could not impair the precision of the earnings forecasts because firms would increase the quality and quantity of information dissemination through public disclosures, while on the other hand firm management might curtail detailed public information out of fear for competitors' advantage. Moreover, Agrawal, Chadha and Chen (2006) study the impact of Reg FD on the accuracy of earnings forecasts by investigating the behavior of forecast errors following Reg FD. Previous research documents that before Reg FD not only analysts have monetary incentive to report favorable earnings estimates (e.g., Stickel, 1992; Francis and Philbrick, 1993; Carleton, Chen, and Steiner, 1998; and Lim, 2001) but also firms' management benefits from contact with analysts (e.g., Degeorge, Patel and Zeckhauser, 1999).

Agrawal, Chadha and Chen (2006) research forecast errors by using a regression model with the forecast error as the dependent variable in both the pre- and post FD period from August 10, 2000 to January 10, 2001. They compute four independent variables to represent firm characteristics and use their model at the level of the individual analyst as well as at the level of the consensus forecast. The authors hypothesize that the job of predicting earnings estimates would become harder because Reg FD's rules prohibit pre-announcement disclosure to financial analysts. They provide evidence that financial analyst earnings forecasts become less accurate directly after the introduction of Reg FD, both at the level of the individual analyst and at the consensus level due to the change in information flow.

Additionally, Findlay and Mathew (2006) examine analyst performance to determine whether analysts generate superior earnings forecast because they are more adept at interpreting the available information or because they are privy to selective disclosure. They explore the effects of Reg FD on financial analyst earnings accuracy by using a regression model that includes two additional variables that measure private information flow through selective disclosure: brokerage-house size and analyst company-specific experience. Findlay and Mathew (2006) argue that if Reg FD reduces selective disclosure those two variables would become less useful in explaining forecast accuracy following Reg FD. They estimate the change in forecast error pre- and post FD in the period from 1984 to 2001 and find that the brokerage-house size and analyst company-specific experience variables become insignificant after the introduction of Reg FD. They present evidence that forecast accuracy declines because analysts have restricted access to private information due to the change in the financial environment after the introduction of Reg FD.

3.2.2 Earnings Forecast Accuracy in Value and Growth Stocks

Many individual investors rely on financial analyst earnings forecasts for stock recommendations (see Brown and Rozeff, 1978; and Brennan and Hughes, 1991) if they believe those forecasts are correct. Since analyst compensation and reputation are dependent on the accuracy of these forecasts, one would expect these forecasts to be accurate. However, research documents that analyst earnings forecasts are inaccurate.

Several reasons have been given as to why forecasts are not precise. Analysts are systematically optimistic and overreact to positive information (see De Bondt and Thaler, 1990; Francis and Philbrick, 1993; Kang, O'Brien, and Sivaramakrishnan, 1994; and Easterwood and Nutt, 1999). Also reputation and herding behavior amongst financial analysts have been pointed out as reasons for inaccuracy (see Sharfstein and Stein, 1990). Furthermore, financial analysts wish to cultivate relationships with the firm's management, especially when the stock recommendations for that particular firm are less than favorable (see Stickel, 1992; Francis and Philbrick, 1993; Michaely and Womack, 1999; and Lim, 2001).

Other research provides evidence that financial analyst bias is different for value stocks than it is for growth stocks. Lakonishok, Sheifer, and Vishny (1994) hypothesize that financial analysts tend to get overly excited about stocks that have done well in the past and buy them up, so that these "glamour" stocks become overpriced. On the other hand, analysts overreact to stocks that have done poorly, oversell them, and these out-of-favor "value" stocks then become under-priced. Lakonishok, Sheifer, and Vishny (1994) form 10-decile portfolios on the basis of book-to-market ratio (BE/ME) where focusing on long-horizon (of up to five years) returns with various investment strategies in the time period from April 1963 to the end of April 1990. They conclude that investors have consistently underestimated the performance of value stocks on the basis of their past growth rates. Also, financial analysts are too optimistic about growth stocks and too pessimistic about value stocks. However, Doukas, Kim, Pantzalis (2002) and Mian and Teo (2004) find that high book-to-market (or value) stocks actually display higher forecast errors than growth stocks in a sample period from 1976 to 1997, indicating that analysts might actually not be excessively optimistic about growth stocks.

Nevertheless, Lim (2001) and Matsumoto (2002) present additional evidence for the difference in analyst bias for value stocks versus growth stocks by documenting that analysts knowingly bias their forecasts to improve growth firms' management access. Carleton, Chen and Steiner (1998) and Michaely and Womack (1999) also find that analysts have a propensity for inflating the forecasts for the firms that they follow but Michaely and Womack (1999) conclude that this practice is not intentional.

3.2.3 Contributions to the Literature

This essay will test the difference in value and growth stock earnings forecast accuracy before and after Reg FD. First, this research investigates whether forecast accuracy for value and growth stocks has changed as a result of the introduction of Reg FD. Second, this study deals with the differences in forecast accuracy for value and growth stocks separately to see if the forecast errors for value stocks are higher.

This study extends the literature by addressing important issues arising from prior research. Lakonishok, Schleifer and Vishny (1994) document that financial analysts are too optimistic about growth stocks and too pessimistic about value stocks, and Lim (2001) and Matsumoto (2002) document that analysts deliberately distort their forecasts to develop relationships with growth firms' management. In addition, Agrawal, Chadha and Chen (2006) and Findlay and Mathew (2006) show that the forecast accuracy has declined due to the regulation of information flow after the introduction of Reg FD. Differences in findings of pre/post Reg FD growth stock forecast accuracy and findings of pre/post Reg FD value stock forecast accuracy would not only indicate that, in general, financial analyst forecast accuracy has changed after Reg FD, but also suggest that financial analysts had an incentive to generate inaccurate earnings forecasts for growth stocks before the introduction of Reg FD. This tendency of more precise forecasts for value stocks relative to growth stocks would in turn imply that the forecast accuracy differences were driven by analyst conscious choice to bias their forecasts and that a change in information flow due to Reg FD has halted this practice.

3.3 Data and Methodology

3.3.1 Description of the Data and Sample Selection

The data for this study were extracted from two different sources, I/B/E/S through the Institutional Brokers Estimate System and COMPUSTAT. The raw I/B/E/S data consist of a file of one-quarter-ahead mean consensus earnings forecasts while the COMPUSTAT database consists of accounting data, including announced earnings figures. Consistent with Agrawal, Chadha (2006), Findlay and Mathew (2006) and Mohanty and Aw (2006), this research will test whether consensus forecasts are accurate earnings predictors for value and growth stocks. Only firms that have I/B/E/S and COMPUSTAT data available for each year in the 1985-2005 period are included, which provides 84 consecutive quarters of data per firm.[5] The consensus earnings forecast is defined as the mean of all brokers' latest one-quarter-ahead unrevised estimate of the firms' earnings, which is compared to the actual quarterly earnings of that firm.

Subsequently, the stocks in this sample are ranked on the basis of each stock's book-to-market ratio (BE/ME) for each year in the 1985-2005 period to form a stock portfolio for each year. The BE/ME is the ratio of book value of equity (COMPUSTAT item 59 + 35) in December of year t-1 over the current market value of equity (outstanding shares times the stock price) at the second quarter of fiscal year t.[6] The stocks from each year's portfolios are merged to form one combined portfolio of stocks

[5] COMPUSTAT data spans to December 2005.
[6] COMPUSTAT data item 59 corresponds to the quarterly total common equity and data item 35 corresponds to the deferred taxes.

that consistently have the highest BE/ME over the entire 1985-2005 period. The top 30 stocks with the highest BE/ME ratio from this combined portfolio are selected to represent the value stock group. Additionally, stocks from each year's portfolios are merged to form one combined portfolio of stocks that consistently have the lowest BE/ME over the 1985-2005 period and the bottom 30 stocks with the lowest BE/ME ratio are selected to represent the growth stock group. Following Mohanty and Aw (2006), analyst consensus forecast data from quarter t-1 is matched with earnings-per-share before extraordinary items (COMPUSTAT item 19) on the date of the firm's earnings announcement for each quarter t. Each group (value and growth stocks) contains 30 individual firms with 84 quarters of data for a total of 2520 observations for each variable. To evaluate the effects of the introduction of Reg FD on the time-series properties of the value and growth stock data, a Reg FD dummy is added with a number 1 for years up to the second quarter of 2000, a zero otherwise.

3.3.2 Methodology

The methodology section is divided into five parts. The first part describes the theoretical and empirical relationship between earnings and earnings forecasts. The second part discusses the individual unit root test methods while the third part pertains to panel unit root tests. The fourth part covers individual cointegration methodology and the fifth part discusses panel cointegration tests.

3.3.2.1 Theoretical and Empirical Model

This study introduces a model that has its theoretical justifications from the rational expectations model from Aggarwal, Mohanty and Song (1995). The rational expectations hypothesis states that economic agents should make use of all available information in forming expectations. This rational expectations hypothesis implies that the market's subjective probability distribution for any variable should be identical to its objective probability distribution, conditional on all available information. There should not be any systematic patterns in the forecast errors, and more importantly, the errors should be white noise. Aggarwal, Mohanty and Song (1995) demonstrate that for a variable Y_t, the subjective market expectations are equal to the objective expectations that are conditional on the available information set at time t-1:

$$E_m(Y_t \mid \phi_{t-1}) = E(Y_t \mid \phi_{t-1}), \tag{10}$$

where ϕ_{t-1} is the set of information available at time t-1.

This research investigates the relationship between earnings forecasts and actual earnings by assuming that the rational expectations condition in equation (10) holds. This condition implies that the market equilibrium relation between earnings forecasts and actual earnings should be written as follows:

$$E(Y_t - Y_t^e \mid \phi_{t-1}) = 0, \tag{11}$$

where Y_t^e is the one-quarter-ahead earnings forecast of the actual earnings figure Y_t at the end of period t-1. The equation in (11) implies that the forecast errors have zero means and are uncorrelated with information from the information set ϕ_{t-1}.

The theoretical model from Aggarwal, Mohanty and Song (1995) is tested with an empirical forecast model (e.g., Muth, 1961). This forecast model includes analysts that are engaged in rational forecasting of firms' future earnings. It is assumed that the forecast errors are uncorrelated with the expected value of the forecast. All analysts in the forecast model know the information set ϕ_{t-1} in equation (11) that includes all firm-specific economic and technological (private as well as public) information on which these forecasts are based.

The forecast function that incorporates each analyst's activities, is given by:

$$Y_t = \beta_0 + \beta_1 Y_t^e + \varepsilon_t, \qquad (12)$$

where $\beta_0 = 0$, $\beta_1 = 1$ and $E(\varepsilon_t) = 0$. The conditions in equation (12) impose the rational expectations restrictions, in that there are no systematic patterns in the earnings forecast errors. More importantly, the forecast errors are white noise. The forecast function relates analyst earnings forecasts and actual earnings to the firm-specific economic and technological information available to each analyst. However, traditional regression tests for equation (12) will lead to incorrect inferences if earnings forecasts and actual earnings are non-stationary and follow unit root processes. In this case, cointegration will yield more appropriate parameter coefficients in testing the relationship between earnings forecasts and actual earnings (see Granger, 1981; and Engle and Granger, 1987). If there exists a stationary linear combination of the non-stationary earnings forecast and actual earnings data, earnings forecasts and actual earnings are considered cointegrated. This cointegrating relationship between earnings forecasts and actual earnings implies that these variables cannot move independently of each other.

Granger (1981) and Engle and Granger (1987) have derived the general equivalence between cointegrated variables and an error correction mechanism. The cointegration vectors, given by $\beta' Zt$, of the cointegrated analyst forecast equilibrium in equation (12) are tested by imposing the β restriction $[1, -1]'$. This necessary condition implies that the normalized beta coefficient in each firm's cointegrating relationship between earnings forecast and actual earnings should be negative and statistically significant if the forecast errors indeed exhibit white noise. Under the rational expectation (i.e., convergence) assumption an increase (decrease) in earnings forecasts is associated with an increase (decrease) in actual earnings for each firm to retain cointegrating relations in the long run.

This essay researches the differences in expected cointegrating relationships between earnings forecasts and actual earnings for value and growth stocks to determine whether overall earnings forecast accuracy for both value and growth stocks has increased after Reg FD, and whether forecast accuracy for value stocks has increased more relative to growth stocks. The cointegrating relationship between earnings forecast and actual earnings for value and growth stocks has to be more convergent if overall earnings forecasts accuracy has increased after the introduction of Reg FD. Nevertheless, it is also expected that the relationship between earnings forecasts and actual earnings for value stocks relative to the relationship for growth stocks is more convergent, because analysts are found to have an incentive to offset growth firms' negative earnings surprises (see Skinner and Sloan, 2002; and Lim, 2001). In this case, an increase in earnings forecast from the previous quarter would be related to a decrease in actual earnings.

3.3.2.2 Individual Unit Root Tests

The first step is to determine whether earnings forecasts and actual earnings are stationary and, if not, whether they are integrated of the same order. The Augmented Dickey-Fuller (ADF) (1981) and the Ng-Perron (MZ_{α}) (2001) tests are used to check the individual firm time-series data for stationarity. Research has documented that unit root tests might suffer from low power and size distortion, especially when the data exhibit a large negative moving-average unit root. Simulations have shown a strong association between the lag-length and the loss of power of unit root tests (e.g., Ng and Perron, 1995; and Lopez, 1997). Ng and Perron (2001) suggest that local GLS-detrending of the time-series data as well as modifying the lag-length procedure increase the power of the unit root test.

3.3.2.3 Panel Unit Root Tests

The earnings forecast and actual earnings data are also subjected to panel data unit root tests. Frankel and Rose (1996) argue that such panel tests have greater power than the univariate version. Panel unit root tests typically assume homogenous dynamic behavior of the individuals across the panel primarily because of the small time dimension of the panel data available during previous research. However, the use of value and growth stock data in the panel raises the issue of plausibility of the dynamic homogeneity assumption. Im, Pesaran and Shin (2003) propose an alternative testing procedure for heterogeneous dynamic panels, which is based on averaging individual unit root test statistics for panels. The test is based on the relevant ADF test with regression:

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-i} + \varepsilon_{it}, \tag{13}$$

where $\alpha_i = (1-\phi_i)\mu_i$, $\beta_i = -(1-\phi_i)$ and $\Delta y_{it} = y_{it} - y_{i,t-1}$. The null hypothesis of a unit root in equation (13) is $\beta_i = 0$ for all i. The equation in (13) allows for some (but not all) of the individual series to have unit roots under the alternative hypothesis. Im, Pesaran and Shin (2003) compute the panel unit root test by estimating each individual firm's β_i via equation (13). They define a $tbar_{NT}$ statistic as the arithmetic mean of the N individual ADF t-statistics that are derived from OLS estimates of the individual firm's β_i. Under the zero contemporaneous correlation assumption, the $tbar_{NT}$ statistic follows a normal distribution so that critical values and p-values could be obtained from the standard normal distribution.

3.3.2.4 Individual Cointegration Tests

Non-stationarity in earnings forecast data and actual earnings data requires the use of cointegration techniques (see Granger, 1981; Engle and Granger, 1987; and Johansen 1988, 1991). In this study, the estimation of the cointegrating relationship between earnings forecasts and actual earnings for each firm is carried out using the maximum likelihood procedure of Johansen (1988, 1991). Johansen (1988, 1991) has derived two test statistics to test for the number of cointegrating vectors. The first statistic λ_{max} tests the null of r cointegrating vectors versus the alternative of r+1, while the trace statistic is a likelihood ratio test of the null of r cointegrating vectors versus the general null of p cointegrating vectors. A procedure for testing for the appropriate deterministic specification is provided in Johansen (1994), since the asymptotic distribution of the test statistics for cointegration depends upon the specification of the deterministic components. Johansen (1994) demonstrates that the distribution of these tests is mixed Gaussian and can be analyzed within the standard likelihood ratio framework using the standard $\chi 2$ distribution.

The study continues to research the plausibility of white noise in the forecast errors by imposing linear restrictions on the elements of β. These tests of linear restrictions are also conducted using the likelihood ratio framework. The form of the test statistic is,

$$G_{\hat{\beta}} = -T \sum_{i=1}^{r} \ln\left[(1-\hat{\lambda}_i)/(1-\hat{\lambda}_i^{*}) \right], \qquad (14)$$

where λi^*'s are the eigenvalues from the restricted model. The statistic G has an asymptotic $\chi 2$. Besides testing the theoretical restriction [1, -1]′ on the cointegration vectors, the equation in (14) also allows for zero-restrictions on the β matrix. To evaluate the effects of Reg FD on the time-series properties of the value- and growth stock data, this study tests whether the Reg FD dummy could be excluded from all the individual cointegrating relations. The exclusion of the Reg FD dummy from the individual firm's cointegration relationship between earnings forecast and actual earnings implies that the introduction of Reg FD did not affect the earnings forecast accuracy for value and growth stocks. It is expected that the Reg FD dummy cannot be excluded from the individual cointegrating relations.

3.3.2.5 Panel Cointegration Tests

Since the Johansen tests are frequently criticized for their low power, two additional tests are included. The estimation of the cointegrating relationship between earnings forecasts and actual earnings for the both panels of firms is carried out using panel cointegration techniques based on Pedroni (2000, 2001) and Westerlund (2005). The theory suggests that both earnings forecasts and actual earnings exhibit features that are common across the firms in each panel, allowing for cross-sectional dependence. Pedroni (2000, 2001) proposes a technique based on Fully Modified Ordinary Least Squares (FMOLS) principles for estimating and testing hypotheses for cointegrating panels that allows for a degree of heterogeneity across the individuals of the panel. Consider the following cointegrated system for panel data:

$$y_{it} = \alpha_i + x_{it}^{'}\beta + u_{it}, \tag{15}$$

$$x_{it} = x_{i,t-1} + e_{it}, \tag{16}$$

where $\xi_{it} = [u_{it}, e_{it}^{'}]$ is stationary with covariance matrix Ω_i. Following Phillips and Hansen (1990), a semi-parametric correction can be made to the OLS estimator that eliminates the second order bias caused by the fact that the regressors are endogenous. Pedroni's (2000, 2001) panel FMOLS estimator is:

$$\hat{\beta}_{FM} - \beta = \left(\sum_{i=1}^{N} \hat{\Omega}_{22i}^{-2} \sum_{t=1}^{T} (x_{it} - \overline{x}_t)^2 \right)^{-1} \bullet \sum_{i=1}^{N} \hat{\Omega}_{11i}^{-1} \hat{\Omega}_{22i}^{-1} \left(\sum_{t=1}^{T} (x_{it} - \overline{x}_t) u_{it}^{*} - T \hat{\gamma}_i \right), \tag{17}$$

$$\hat{u}_{it}^{*} = u_{it} - \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{21i}, \quad \hat{\gamma}_i = \hat{\Gamma}_{21i} + \hat{\Omega}_{21i}^{0} - \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{21i} \left(\hat{\Gamma}_{22i} + \hat{\Omega}_{22i}^{0} \right), \tag{18}$$

where the covariance matrix can be decomposed as $\Omega_i = \Omega_i^0 + \Gamma_i + \Gamma_i$ where Ω_i^0 is the contemporaneous covariance matrix, and Γ_i is the weighted sum of autocovariances. Also $\hat{\Omega}_i^0$ denotes the appropriate estimator of Ω_i^0. The panel FMOLS estimator in (17) follows the standard normal distribution. In this study, actual earnings for value and growth stocks are regressed on earnings forecasts to infer the statistical properties and the magnitude of the resulting cointegrating vector. The panel FMOLS estimator in (17) also allows for testing of the null hypothesis that β = 1 in equation (3), that implies a precise one-quarter-ahead earnings forecast of the firm's quarterly earnings. A larger parameter coefficient on β in the value stock panel relative to the β parameter in the growth stock panel suggests that the relationship between earnings forecasts and actual earnings is more convergent for value stocks that it is for growth stocks, implying that value firms' earnings forecasts are more accurate.

Westerlund (2005) uses a factor model in which the errors of the researched equation are generated by both idiosyncratic innovations and unobservable factors that are common across the members of the panel. The Durbin-Hausman tests, designed to test the null hypothesis of no cointegration against the alternative of cointegration, are shown to have small size distortions and greater power than other popular panel cointegration and individual Johansen cointegration tests.

Consider the following representation of the relationship between analysts' forecasts and future earnings:

$$ce_{it} = \alpha_i + \beta_i rd_{it} + \mu_{it}, \tag{19}$$

$$\mu_{it} = F_t \lambda_i + e_{it}, \tag{20}$$

where F_t is a 1 x K vector of common factors and λ_i is a conformable vector of factor loadings. Equation (19) is the representation of the relationship between one-quarter-ahead forecasts and actual earnings. The null hypothesis of no cointegration could be tested by inferring whether e_{it} is I(1), or equivalent, whether ρ_i = 1. Westerlund (2005) proposes to first estimate equation (19) by OLS and then to estimate the common factors by applying the principal components method to the OLS residuals. A test of no cointegration could be constructed by subjecting the de-factored and first-differenced residuals to a unit root test,

$$\hat{e}_{it} = \rho_i \hat{e}_{it-1} + z_{it}, \tag{21}$$

The series $\hat{e}_{it}$ is I(0) when forecasts and future earnings are cointegrated throughout the panel, and it is I(1) if they are not. The first panel cointegration statistic DH_P, is constructed under the maintained assumption that ρ_i = 1 for all i, while DH_G, is not. Both statistics are composed of two estimators of ρ_i that have different probability limits under the alternative hypothesis of cointegration but share the property of consistency under the null of no cointegration. The precise forms of the statistics are:

$$DH_P \equiv \hat{\sigma}^2 \gamma_0^{-2} (\tilde{\rho} - \hat{\rho})^2 E_{22}, \tag{22}$$

$$DH_G \equiv \sum_{i=1}^{N} \hat{\sigma}_i^2 \gamma_{i0}^{-2} (\tilde{\rho}_i - \hat{\rho}_i)^2 E_{i22}, \tag{23}$$

3.4 Empirical Results

The empirical results section is divided into three parts. The first part reports the individual unit root test results as well as the panel unit root test results. The second part covers the individual cointegration test results and the panel cointegration test results. The third part of this section provides a summary of results.

3.4.1 Unit Root Tests Results

The results of the ADF and Ng-Perron MZ_α tests for value and growth stocks are displayed in Table 12 and Table 13, respectively. Column 2 in Panel A of Tables 12 and 13 shows the values of the ADF test statistics for analyst forecast of each stock, while column 4 in Panel A of Tables 12 and 13 shows the values of the ADF test statistics for EPS of each stock. Column 3 in Panel A of Tables 12 and 13 shows the values of the Ng-Perron MZ_α test statistic for the forecast data of each stock, and column 5 in Panel A shows the Ng-Perron MZ_α test statistic for EPS of each firm. Column 5 in Panel B of Table 12 shows the IPS test statistics for forecasts and EPS of the whole panel of value stocks. Column 5 in Panel B of Table 13 shows the IPS test statistics for forecasts and EPS of the entire panel of growth stocks.

In Table 12, the ADF results for value stocks indicate that the null of a unit root in the forecast data cannot be rejected for any of the firms and that the null of a unit root in the EPS data is rejected for 5 of the 30 firms. The Ng-Perron MZ_{α} statistics in Table 12 show that the null of a unit root in the value stock forecast data could be rejected in 13 of the 30 firms, while the Ng-Perron MZ_{α} statistics indicate that the null of a unit root in the value stock EPS data series could be rejected for 8 out of 30 firms.

In Table 13, the ADF results for growth stocks indicate that the null of a unit root in the forecast data cannot be rejected for any of the firms and that the null of a unit root in the EPS data is rejected for 4 of the 30 firms. The Ng-Perron MZ_{α} statistics in Table 13 show that the null of a unit root in the growth stock forecast data could be rejected in 8 of the 30 firms, while the Ng-Perron MZ_{α} statistics indicate that the null of a unit root in the growth stock EPS data series could be rejected for 9 out of 30 firms.

While there are some contradictory results for these data series, the overall evidence suggests that these series are non-stationary. The data series are also subjected to panel unit root tests (see Im, Pesaran and Shin, 2001) to verify the individual unit root tests. Frankel and Rose (1996) argue that such panel tests have greater power than the individual unit root tests. The IPS panel unit root statistics at the bottom of Tables 12 and 13 indicate that the null of a unit root cannot be rejected for either data series in the value stock group or the growth stock group. All forecasts and EPS data in the value stock group as well as the growth stock group will be treated as an I(1) variable in the subsequent analysis.

3.4.2 Cointegration Test Results

To test for the presence of cointegration between forecasts and EPS in each firm Johansen's (1991) procedure is used. This particular estimator is the Gaussian MLE when the errors are normally distributed. This allows standard statistical inference when conducting hypothesis tests.[7] To evaluate the effects of the introduction of Reg FD on the time-series properties of the value and growth stock data, a Reg FD dummy is added with a number 1 for years up to the second quarter of 2000, a zero otherwise. Results from applying the Johansen procedure to each firm (value and growth stocks) are displayed in Panel A of Tables 14 and 15. The estimated trace statistics for the null hypotheses of $r = 0$ and $r \leq 1$, respectively, are shown in columns 2 and 3, where r is the number of cointegrating vectors. These statistics can be compared to the simulated critical values (see Johansen, 1995).[8] The 95% critical values are 14.32 and 3.85 for the null hypotheses of $r = 0$ and $r \leq 1$, in that order.

The evidence in column 2 of Table 14 suggests that the null of no cointegration between forecasts and EPS in value stocks could be rejected for 29 value firms. Column 3 of Table 14 shows that the null of at most one cointegrating vector cannot be rejected in 4 out of the 30 value firms. The evidence in column 2 of Table 15 indicates

[7] Haug (1996) and Gonzalo (1994) show that the Johansen estimator performs well even when the normality assumption is violated.
[8] The inclusion of a shift dummy in the cointegration space alters the critical values. The applicable critical values are simulated in CATS 2.0.

that the null of no cointegration between forecasts and EPS in growth stocks could be rejected in 23 out of 30 firms. Column 3 of Table 15 shows that the null of at most one cointegrating vector cannot be rejected in 18 out of the 30 firms. The evidence in both tables suggests that forecasts and EPS in value stocks as well as in growth stocks are cointegrated.

Since the Johansen tests are frequently criticized for their low power, an additional test is performed. An extension of the cointegration analysis is to employ a panel test for cointegration. Columns 2 and 4 in Panel B of Tables 14 and 15 display the DH_G and DH_P statistics with their respective p-values at columns 3 and 5. The DH_G and DH_P statistics indicate that the null hypothesis of no cointegration between forecasts and EPS can be rejected for the entire panel of value stocks. Additionally, the DH_G and DH_P statistics in Table 15 indicate that the null hypothesis of no cointegration between forecasts and EPS can be rejected for the entire panel of growth stocks.

Panel A of Tables 14 and 15 also report the results of the white noise restriction that the cointegrating vector is equal to [1, -1]′. Column 4 in Tables 14 and 15 presents the normalized estimate of the cointegrating parameter, i.e. $[1,-\beta]'$. The values of the associated LR test statistics are reported in column 5, while column 6 presents the p-values of the LR test statistics. These LR tests are distributed $\chi^2(2)$. The LR test statistics in column 5 show that the white noise restriction could be rejected for 14 out of 30 value firms. However, the normalized betas of 21 firms show a negative value, implying a convergent relationship between the one-quarter-ahead earnings forecasts and actual quarterly earnings of these firms. Even though the earnings forecasts might not be accurate, the forecasts contain important information and follow the direction of the actual earnings figures. The LR test statistics in column 5 of Table 15 show that the white noise restriction could be rejected for 16 out of 30 growth firms, while the normalized betas, shown in column 4 of Table 15, show a negative value at 8 growth firms.

This evidence indicates that in the period from 1985 to 2005 analyst one-quarter-ahead earnings forecasts for value stocks and growth stocks have not been accurate. However, this evidence does not differentiate forecast inaccuracies between value stock and growth stock panels. Column 6 in Panel B of Tables 14 and 15 shows the results of Pedroni's FMOLS estimators and their respective p-values that will provide proof of the sign and the level of the panel-cointegrating vector for the value stock- and the growth stock groups. Table 14 shows that the $\hat{\beta}_{FMOLS}$ for the value stock panel over the entire sample period is 0.660 and statistically different from $\beta = 1$, confirming the results of column 4 in Panel A of Table 14. Earnings forecasts for value stocks appear to be imprecise but the relation between forecasts and actual earnings is convergent over time. Table 15 shows that the $\hat{\beta}_{FMOLS}$ for the growth stock panel over the entire sample period is –0.530 and also statistically different from $\beta = 1$. This evidence indicates that the relationship between earnings forecasts and actual earnings is divergent and suggests that analyst earnings forecasts for growth stocks are not overly optimistic as proposed by Lakonishok, Schleifer and Vishny (1994) but that analysts are trying to curtail negative earnings surprises (e.g., Stickel, 1992; Francis and Philbrick, 1993; Carleton, Chen, and Steiner, 1998; and Lim, 2001).

Column 7 in Panel A of Tables 14 and 15 shows the results of the test whether the introduction of Reg FD has any effect on the cointegration relation between forecasts and EPS in value and growth stocks. Column 8 in Tables 14 and 15 shows the p-values of the test of zero-restrictions on the β-matrix. Column 7 in Table 14 shows that for value stocks the null of Reg FD dummy exclusion cannot be rejected in 22 out of 30 firms. Column 7 in Table 15 shows that for growth stocks the null of Reg FD dummy exclusion cannot be rejected in 24 out of 30 firms. This evidence suggests that the introduction of Reg FD did not change the accuracy of the forecasts of actual earnings over the long term in the majority of value and growth stocks.

Since the traditional individual cointegration tests suffer from low power, the stock groups are also subjected to panel tests that have fewer limitations for heterogeneous panels (see Pedroni, 2000, 2001; and Westerlund, 2005). The full sample period is divided into two sub-periods; one from the first quarter of 1985 to the second quarter of 2000 and another from the third quarter of 2000 to the last quarter of 2005. Column 6 in Panel B of Tables 14 and 15 shows the $\hat{\beta}_{FMOLS}$ parameter coefficients for the value and growth stock panels before and after the introduction of Reg FD. The results for the value stock panel in Panel B of Table 14 show a $\hat{\beta}_{FMOLS}$ coefficient of 0.550 before Reg FD and a coefficient of 0.690 after Reg FD, indicating that earnings forecast accuracy for value stocks improved slightly after the introduction of Reg FD. The results for the value stock panel in Panel B of Table 15 show a $\hat{\beta}_{FMOLS}$ coefficient of -0.810 before Reg FD and a coefficient of 0.290 after Reg FD, indicating that earnings forecast accuracy for growth stocks significantly improved after the introduction of Reg FD as evidenced by the change in sign of the $\hat{\beta}_{FMOLS}$ parameter coefficient.

3.4.3 Summary of Results

The ADF and Ng-Perron unit root test results for the value and growth stock quarterly earnings and earnings forecast data, albeit contradictory, suggest that these series are non-stationary. Panel unit root tests confirm that the null of a unit root cannot be rejected for either data series in the value stock group or the growth stock group. The evidence from the individual Johansen cointegration tests suggests that quarterly earnings and forecasts in value stocks as well as in growth stocks are cointegrated. An additional panel test for cointegration also indicates that the null hypothesis of no cointegration between forecasts and EPS can be rejected for the value stock panel as well as for the growth stock panel.

The white noise restriction could be rejected for 14 out of 30 value firms. However, evidence shows that there is a convergent relationship between the one-quarter-ahead earnings forecasts and actual quarterly earnings of value firms, implying that value firm earnings forecasts contain important information and follow the direction of the actual earnings figures. The white noise restriction could be rejected for 16 out of 30 growth firms and the normalized betas of only 8 firms show a negative value. This evidence indicates that in the period from 1985 to 2005 analyst one-quarter-ahead earnings forecasts for value stocks and growth stocks have not been accurate.

Panel tests confirm that earnings forecasts for value stocks appear to be imprecise but the relation between forecasts and actual earnings for value stocks is convergent over time. However, the relationship between earnings forecasts and actual earnings for growth stocks is divergent and suggests that analyst earnings forecasts for growth stocks are not overly optimistic but that analysts are trying to curtail negative earnings surprises. Also, evidence from panel tests shows that the earnings forecast accuracy for value stocks improved slightly after the introduction of Reg FD while earnings forecast accuracy for growth stocks significantly improved.

3.5 Conclusions and Implications

This study examines financial analyst earnings forecast accuracy in value and growth stocks before and after the introduction of Reg FD. A ranking procedure based on the book-to-market ratio is used to select stocks that are representative for each group (value stocks or growth stocks). A model is derived that allows analysts' earnings forecasts to conform to the rational expectations hypothesis. This model is used to research if overall earnings forecast accuracy for both value and growth stocks has increased after Reg FD, and whether forecast accuracy for value stocks has increased more relative to growth stocks. The results indicate that there is a cointegrating relationship between forecasts and EPS for all stocks in the value stock group as well as in the growth stock group, implying that forecasts and EPS data have a long-run equilibrium relation.

Using quarterly data for 84 quarters (first quarter of 1985 to the last quarter of 2005) for a combined sample of 60 value and growth stocks, only a small portion of the sample firms' earnings forecasts are found to be consistent with the rational expectations hypothesis and that value stock earnings forecasts are more accurate than growth stock earnings forecasts. The disparity in forecast accuracy between growth and value stocks must be related to the difference in financial analyst earnings forecast properties because value stocks and growth stocks do not have inherently dissimilar qualities in the stock markets.

The results show that accuracy for both stock groups (value and growth stocks) has improved after the introduction of Reg FD even though financial analyst earnings forecasts for value stocks are relatively more accurate. The regulation of the flow of information has forced firms to communicate more effectively via the public channels despite the fact that early evidence reported the opposite (see Agrawal, Chadha and Chen, 2006; and Findlay and Mathew, 2006).

More importantly, the evidence in this study suggests that the relationship between earnings forecasts and actual quarterly earnings for growth stocks before Reg FD was divergent, meaning that analysts would use their skills to offset potential negative earnings surprises. Skinner and Sloan (2002) reported that growth stocks, in particular, have asymmetrically negative responses to negative earnings surprises, while

Lim (2001) and Matsumoto (2002) documented that analysts would have a monetary incentive to generate inaccurate earnings forecasts. The results in this study provide additional evidence indicating that analysts did not just misinterpret available news (see De Bondt and Thaler, 1990; Lys and Sohn, 1990; Klein, 1990; Abarbanell and Bernard, 1992; and Easterwood and Nutt, 1999) but confirm that analysts consciously tried to maintain relationships with managers (see Lim, 2001). However, Reg FD efficiently limited these relationships between managers of growth firms and analysts so that the monetary advantage from manipulating earnings forecasts before the introduction of Reg FD no longer exists.

CHAPTER 4

EARNINGS FORECAST DISPERSION

4.1 Introduction

Brown and Rozeff (1978) argue that financial analysts are important intermediaries in financial markets. In particular, they provide earnings forecast information to individual investors to help them make appropriate investing decisions. Investors perceive variations in those earnings forecasts around the average forecast, or forecast dispersion, as valuable information about firms' future economic performance (e.g., Givoly and Lakonishok, 1984). Research has documented that stocks with a higher ratio of book value of common equity to market value (value stocks) typically have larger forecast dispersion than stocks with lower ratio of book value of common equity to market value (growth stocks) (see Diether, Malloy and Scherbina, 2002; and Doukas, Kim and Pantzalis, 2004).

Also, evidence suggests that forecast dispersion is influenced by the quantity and quality of financial disclosures and that any significant change to the access of this financial information could alter forecast dispersion (see Swaminathan, 1991 and Dechow *et al*, 1996). The SEC has made such a change with Reg FD, the intent of which is to enhance the fairness of the markets by eliminating selective disclosure. Reg FD, supposedly, elevates investors' confidence in the integrity of the capital markets.

Opponents of Reg FD argue that eliminating selective disclosure changes the information environment, thereby transforming financial analysts' opinions about stocks. Although several studies (see Bailey *et al*, 2003; and Irani and Karamanou, 2003) provide evidence of a change in the information environment in which analysts are forming their opinions, none of them research whether those opinions for growth and value stocks have actually changed and what effect dispersion has on value and growth stock returns after the introduction of Reg FD.

In this essay, a forecast dispersion proposition is researched that tests the difference in value and growth stock earnings forecast dispersion before and after Reg FD. This proposition is that earnings forecast dispersion has increased after the introduction of Reg FD for both value and growth stocks ("increased dispersion proposition"). Bailey *et al* (2003) find an overall increase in forecast dispersion after Reg FD but they do not distinguish between value and growth stocks. Divergence of opinion, as proxied by the dispersion of analysts' earnings forecasts, is an effective measure of analysts' uncertainty in a changing information environment (e.g., Barron and Stuerke, 1998). A higher degree of difficulty in forecasting could explain this uncertainty (e.g., Barth, Kasznik and McNichols, 2001). This research is based on the question whether the pre- and post-Reg FD changes in forecast dispersion are different for value stocks than they are for growth stocks. Evidence of an increase in value and growth stock earnings dispersion after Reg FD would indicate that Reg FD has effectively reduced selective disclosure (e.g., Bailey *et al*, 2003) but a larger change in pre-/post-FD value stock dispersion would suggest that value stocks have become more difficult to forecast.

Second, this essay examines the proposition that dispersion affects value stock returns differently than growth stock returns in periods surrounding the introduction of Reg FD ("return proposition"). Diether, Malloy and Scherbina (2002) find a negative relationship between stock returns and dispersion thereby dispelling the notion that dispersion is a proxy for risk. They conjecture that dispersion can therefore be viewed as a proxy for difference in opinions because whenever stock valuations differ, equity prices tend to reflect the view of the more optimistic investor, leading to low future returns (see Miller, 1977). On the other hand, Doukas, Kim and Pantzalis (2004) find a positive relationship between value stock returns and dispersion and argue that dispersion can be viewed as a proxy of risk. Evidence of a continued inverse relation between stock returns and dispersion after Reg FD would imply that the distinction between value and growth stock dispersion is prompted by differences in opinion for value and growth stocks and definitely not by the higher perceived risk of value stocks.

4.1.1 Organization

Section 4.2 reviews relevant previous research and identifies this essay's contribution to the literature. Section 4.3 describes the data and methodology with results and related findings provided in Section 4.4. Section 4.5 provides conclusions and implications.

4.2 Literature Review

4.2.1 The Impact of Reg FD on Dispersion

The introduction of Reg FD in October 2000 has caused quite a stir among professional financial analysts since the SEC requires firms to comply with this regulation. This rule prohibits firms from selectively disclosing material, non-public information to investment analysts or institutional investors –i.e., that issuers instead would have to publicly release such information. It essentially means that financial analysts and investors share the same information. The SEC argues that Reg FD is necessary to provide a level playing field to all investors. Nevertheless, opponents assert that forcing a level playing field would not only reduce the quantity and quality of a firm's voluntary information, but also change the financial analysts' opinions about value and growth stocks, thereby affecting forecast dispersion.

Bailey *et al* (2003) study the change in financial earnings forecast dispersion by investigating several measures of dispersion first put forth by Bamber, Barron and Stober (1997). Bailey *et al* (2003) find that these measures of dispersion increase after the introduction of Reg FD, implying that the change in information environment complicates analysts' ability to forecast earnings. Additionally, Irani and Karamanou (2003) study the impact of Reg FD on dispersion by using univariate and multivariate techniques on a sample period from the fourth quarter of 1995 to the third quarter of 2001. They regress standard deviations of the most recent annual EPS at the quarter end of the period divided by the beginning of the period stock price against a series of explanatory variables, including certain proxies for the richness of a firm's information environment (e.g., Bhushan, 1989). The authors find that Reg FD accomplished its goal in regulating the flow and quantity of information, resulting in increased earnings forecast dispersion.

4.2.2 Dispersion and Stock Returns

Analysts' earnings forecast dispersion is a forward-looking variable that reveals analysts' outlook on firms' profitability. Individual investors consider earnings forecast dispersion to contain valuable information and therefore use dispersion as a proxy for uncertainty about a firm's future economic performance to form profitable trading strategies (e.g., Givoly and Lakonishok, 1984, and Barron and Stuerke, 1998). Previous research also finds that trading strategies that included value stocks earn higher returns than growth stocks (see Fama and French, 1992, 1993, 1995). In addition, value stocks are found to have a much larger dispersion in earnings forecast than growth stocks before Reg FD (see Diether, Malloy and Scherbina, 2002; and Doukas, Kim and Pantzalis, 2004). Barth, Kasznik and McNichols (2001) show that the difference in forecast dispersion for value stocks relative to growth stocks is due to the differences in analyst coverage for value and growth firms. Analyst coverage and valuation efforts are significantly greater for growth firms relative to value firms.

Furthermore, dispersion is found to drive the difference in cross-sectional returns (e.g., Diether, Malloy and Scherbina, 2002; Doukas, Kim and Pantzalis, 2004). Diether, Malloy and Scherbina (2002) hypothesize that dispersion of earnings forecasts serves as a proxy for difference in opinion. They investigate analysts' dispersion on a sample of value and growth stocks in the period from January 1983 to November 2000. They define dispersion as the standard deviation of earnings forecasts scaled by the absolute value of the mean earnings forecast. Each month, stocks are assigned into 5 quintiles based on dispersion in analyst earnings forecasts as of the previous month and monthly portfolio returns are calculated as the equal-weighted average of the returns of all stocks in the portfolio. Additionally, portfolios are sorted on size, book-to-market ratio, and dispersion data from CRSP, COMPUSTAT and I/B/E/S to test the effect of dispersion on the return and to determine if book-to-market effects are driving the returns.

The authors use regression techniques in which dispersion in analysts' forecasts is regressed on several explanatory variables, including book-to-market ratio. They conclude that dispersion has an inverse relationship with stock returns and they attribute that relationship to analysts' difference in opinions. They hypothesize that prices will reflect a more optimistic valuation if pessimistic investors are kept out of the market by high short-sale costs. Optimists hold the stock because they have the highest valuations and suffer losses in expectations since average opinion is their best estimate (see Miller, 1977). The bigger the disagreement about a stock's value, the higher the market price relative to the true value of the stock, and the lower its future return.

Nevertheless, Doukas, Kim and Pantzalis (2004) suggest that the higher returns from investment in value stocks reflect compensation for bearing risk associated with higher analysts' earnings forecast dispersion. They research forecast dispersion on a sample of value and growth stocks in the time period from June 1983 through

December 2001. Dispersion of earnings forecasts is defined as the standard deviation of the one-year-ahead earnings forecast identified as being current as of June each year, standardized by the stock price per share at the beginning of the year. The authors form stock portfolios based on book-to-market ratio, size and dispersion, and they calculate average monthly equal-weighted portfolio returns. Doukas, Kim and Pantzalis (2004) also use several regression methods in which they regress dispersion on several variables suggested by Fama and French's (1993) three-factor models. They conclude that dispersion in analysts' earnings forecasts is considerably higher for high book-to-market (or value) stocks than it is for growth stocks. More importantly, they find a positive relationship between value stock returns and dispersion. They attribute this positive relationship to individual investors' difference in risk perception. Cash flows of growth stocks are perceived by investors as less uncertain and, therefore, less risky than the cash flows of value stocks.

4.2.3 Contributions to the Literature

This essay will test the difference in value and growth stock earnings forecast before and after Reg FD. First, this research investigates the increased dispersion proposition that states that earnings dispersion for value and growth stocks has changed after Reg FD. Second, this study will examine the effects of financial analysts' earnings forecast dispersion on value and growth stock returns to see if the change in forecast dispersion after Reg FD has a larger impact on either value stock returns or growth stock returns. The contributions of this essay are related to the seminal studies focusing on these major issues. Diether, Malloy and Scherbina (2002) and Doukas, Kim and Pantzalis (2004) document that earnings forecast dispersion is substantially higher for value stocks than it is for growth stocks before the introduction of Reg FD. Diether, Malloy and Scherbina (2002) also document a negative relationship between dispersion and returns and attributed this relationship to financial analysts' differences in opinions. In contrast, Doukas, Kim and Pantzalis (2004) report a positive relationship between dispersion and value stock returns and hypothesized that investors command a premium because of the higher perceived value stock risk. Additionally, Bailey *et al* (2003) and Irani and Karamanou (2003) show that the overall forecast dispersion has increased after the introduction of Reg FD due to the regulation of available financial information.

Variations in findings of pre/post Reg FD growth stock forecast dispersion and findings of pre/post Reg FD value stock forecast dispersion would suggest that financial analysts' perceptions for value and growth stocks have changed after Reg FD. A larger difference for value stocks would imply that Reg FD created more uncertainty for value firms among financial analysts. In addition, a more pronounced inverse relationship between value stock returns and dispersion after Reg FD would imply that the discrepancy between value and growth stock dispersion is prompted by differences in opinion for value and growth stocks and not so much by the higher perceived risk of value stocks.

4.3 Data and Methodology

4.3.1 Description of the Data and Sample Selection

The data for this study are extracted from I/B/E/S through the Institutional Brokers Estimate System, COMPUSTAT, and CRSP through the Center for Research on Security Prices. The raw I/B/E/S data consist of daily one-year-ahead earnings forecasts prepared in the years 1982-2003. Following Bamber, Barron and Stober (1997), four different measures of forecast dispersion are calculated to determine dispersion changes and stock return reactions. These measures are dispersion before the interim earnings announcement, dispersion after the interim earnings announcement, change in pre-and post earnings announcement dispersion, and belief jumbling.

Dispersion of annual earnings forecasts before interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 45 days prior to the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. Dispersion of annual earnings forecasts after interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 30 days after the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts.[9]

Change in forecast dispersion equals the standard deviation of annual earnings forecasts issued within 45 days before the interim earnings announcement, minus the standard deviation of annual earnings forecasts issued within 30 days after the interim

[9] The measures of dispersion are based on computations reported in Bamber, Barron and Stober (1997) and Bailey *et al* (2003).

earnings announcement, deflated by the absolute value of the mean pre-announcement earnings forecast. Belief jumbling around the interim earnings announcement is measured as one minus the correlation between annual earnings forecasts issued in the 45 days before the interim earnings announcement and annual earnings forecasts issued within 30 days after the interim earnings announcement.

For example, forecast dispersion before the earnings announcement measures the variation in earnings forecasts before the earnings announcement while forecast dispersion after the earnings announcement captures the variation in earnings forecasts after the earnings announcement. Belief jumbling captures the extent to which the position of individuals' expectations change relative to other analysts' expectations, without affecting the level of dispersion. Change in dispersion measures the difference between post-announcement and pre-announcement forecast dispersion. The change in dispersion is distinct from belief jumbling because earnings announcements can induce beliefs to become more (or less) divergent without changing their relative positions. To test which measure of earnings forecast dispersion has a larger impact on value and growth stock returns as a whole before and after the introduction of Reg FD, only data that meet specific conditions are included in the study.

First, the data are restricted to the time period from 1998 to 2003 in order to have a symmetrical period on either side of the introduction of Reg FD. Second, the consensus forecasts are restricted to the one-year-ahead forecasts in the second quarter of years 1998 to 2003 because the SEC approved Reg FD on August 10, 2000 (third quarter) and Reg FD was implemented on October 23, 2000 (fourth quarter).

Furthermore, there are too few annual forecasts in the first quarters to compute the measures of dispersion to make a comparison pre-and post Reg FD while the second quarter earnings forecasts contain sufficient information (see Bailey *et al*, 2003).

Third, firms that have stock return data from CRSP daily NYSE, AMEX and NASDAQ files are included. Consistent with Diether, Malloy and Scherbina (2002) and Doukas, Kim and Pantzalis (2004), the available stock return data from CRSP are matched with the computed earnings forecast dispersion data from I/B/E/S and accounting data from COMPUSTAT. To ensure that the earnings forecast dispersion measures and the accounting data for COMPUSTAT are known before the returns they are used to explain, the accounting data from the fiscal year-end and the forecast dispersion measures at the second quarter for calendar year t are matched with the returns for January of year t +1 to December of year t + 1.[10] This research uses the firm's common equity (COMPUSTAT items 59 plus 35) at December t - 1 to compute the ratio of book value of equity to current market value of equity (outstanding shares times the stock price) for the second quarter.[11] Since not all firms announce their second quarter earnings in the same quarter, only firms with fiscal years ending on December 31 are included in the sample. Fourth, each stock had to be covered by four or more analysts during the stock return months, since the measures of dispersion are

[10] This procedure is similar to the described methods from Fama and French (1992) and La Porta (1996). However, both studies use return data from July *t* to June *t* +1.
[11] COMPUSTAT data item 59 corresponds to quarterly total common equity and data item 35 corresponds to the deferred taxes.

computed by standard deviations of earnings forecasts.[12] The total number of stocks in the final sample averages 400 per year.

4.3.2 Methodology

4.3.2.1 Full Sample Portfolio Formations

Diether, Malloy and Sherbina (2002) provide evidence that stock prices are inversely related to analysts' disagreement as measured by dispersion of earnings forecasts. They also find dispersion in analysts' earnings forecasts to be considerably higher for value than for growth portfolios. Furthermore, Johnson (2004) finds that firms with more uncertain earnings (as measured by the dispersion of analyst's forecasts) have lower stock returns. These findings must hold true for the complete sample period from the second quarter of 1998 to the second quarter of 2003 before discernable differences in value and growth stock return behavior before and after the introduction of Reg FD can be investigated.

Annual consensus earnings forecasts are generated every day to forecast earnings for the following fiscal year on a "rolling" basis. These rolling forecasts are adjusted to incorporate news from quarterly earnings announcements. This study investigates the impact of measures of earnings forecast dispersion around the second quarter earnings announcement on stock returns in the next fiscal year from January t +1 to December t +1. At the moment of the second quarter earnings announcement the financial analyst obtains earnings information and uses that information to adjust his

[12] On average, 16 percent of the firms in the total sample are covered by four analysts.

earnings forecasts. This adjustment in forecasted earnings will affect the measures of dispersion of earnings forecasts.

For each of the four dispersion measures, the mean is calculated after classifying stocks into one of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of fiscal year t – 1, over current market equity for second quarter of year t. Size is the stock's current market value at the second quarter of each fiscal year. These procedures result in four 5-by-5 matrices for the BE/ME-dispersion measure quintile combinations with 25 stock portfolios in order to study the mean differences in dispersion for value and growth stocks.

Bailey *et al* (2003) find that after the introduction of Reg FD, forecast dispersion before earnings announcement, forecast dispersion after earnings announcement, and belief jumbling increased, implying that disagreement and differential informed judgment about future annual earnings increased. They use one pair of comparison quarters, post Reg FD II 2001 and pre Reg FD II 2000, with 268 observations each. This study will reevaluate these outcomes for those same quarters in Bailey *et al* (2003). Also, this study will investigate the differences-in-means for the dispersion measures for a different pair of comparison quarters, post Reg FD II 2002 and pre Reg FD II 2000, to infer whether the changes in dispersion increase or decrease after more time has passed since the adoption of this regulatory change. For statistical inference, the two sample difference-in-means tests are used in this analysis (see McClave, Benson and Sincich, 1999).[13]

4.3.2.2 Regression Analysis

The analysis continues to investigate whether investors' return expectations are influenced by dispersion of analysts' forecasts and what measure of dispersion has the largest impact on stock returns. The impact of dispersion on one-year ahead stock return portfolios are compared for all measures of dispersion to determine the strongest factor in the returns over the full period of portfolio formations as well as the pre- and post-FD periods. Fama and French (1993) suggest that a three-factor time-series model might explain the cross-section of returns. Their three factors are RMF, the excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-firm portfolio subtracted from the return on the small-firm portfolio, and HML, the return on an arbitrage portfolio consisting of the return on the portfolio of high-BE/ME stocks minus the return on the portfolio of low-BE/ME stocks.[14] Doukas, Kim and Pantzalis (2004) suggest adding a disagreement factor that captures the difference in returns of equal-weighted portfolios of firms with high and low dispersion.

To test which of the dispersion measures has the highest impact on stock returns, four additional factors for the asset-pricing model by Fama and French (1993)

[13] The sample is also subjected to the Wilcoxon tests. The Wilcoxon test results do not differ significantly from the results of the two sample difference-in-means tests.
[14] These factors are available from Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/).

are constructed. To construct an analysts' pre-earnings announcement dispersion factor (DISPRE), firm-year observations are ranked by pre-announcement dispersion and two equal-weighted return portfolios are formed on the basis of the top 30 percent and bottom 30 percent pre-announcement dispersion rankings. The variable DISPRE is the return difference between the top 30 percent and bottom 30 percent pre-announcement dispersion portfolios. A post-earnings announcement dispersion factor (DISPOST) is constructed by using firm-year observations and ranking them by post-announcement dispersion to form two equal-weighted return portfolios on the basis of the top 30 percent and bottom 30 percent post-dispersion rankings. The variable DISPOST is the return difference between the top 30 percent and bottom 30 percent post-announcement dispersion portfolios.

A change in dispersion factor (CHANGE) is constructed by using firm-year observations and ranking them by change in pre-and post earnings announcement dispersion to form two equal-weighted return portfolios on the basis of the top 30 percent and bottom 30 percent change in dispersion. The variable CHANGE is the return difference between the top 30 percent and bottom 30 percent portfolio returns. Additionally, a pre-and post earnings announcement dispersion correlation factor (JUMBLING) is constructed by using firm-year observations and ranking them by correlation between pre-and post announcement dispersion to form two equal-weighted return portfolios on the basis of the top 30 percent and bottom 30 percent dispersion correlation rankings. The variable JUMBLING is the return difference between the top 30 percent and bottom 30 percent portfolio returns.

Average monthly returns are computed for January of year t +1 to December t + 1 for these portfolios to obtain a return series of 72 monthly observations from January 1999 to December 2004. Average excess monthly returns (in excess of the risk-free rate) are calculated for the 5-quintile BE/ME portfolios and one total group, including all stocks. The portfolio groups of interest are the high-BE/ME (or value stock) portfolio and the low-BE/ME (or growth stock) portfolio. The average excess monthly return series are regressed on the factors RMF, SMB, HML, DISPRE, DISPOST, CHANGE, and JUMBLING to obtain factor sensitivities (slope coefficients) with variations of the following model:

$$R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + xDISPOST(t) + yCHANGE(t) + jJUMBLING(t) + e(t), \quad (24)$$

The slope coefficients on DISPRE, DISPOST, CHANGE and JUMBLING measure the sensitivity of the factors on the returns to determine if the measures of dispersion are of any concern to investors.[15] Pearson correlations between the variables as well as full regression models based on equation (24) establish the most effective measure of dispersion factor in determining stock returns. The null hypothesis that the slope coefficients (or factor loadings) are not priced in the market (i.e., will have zero value) is tested against the alternative hypothesis that some or all of the factors are priced.

[15] The robustness of the statistical inference on the coefficients in model (1) is dependent on the time-series properties of the data. The order of integration in the data is investigated with the Augmented Dickey Fuller test (ADF) (Dickey and Fuller, 1979, 1981) and the KPSS test (Kwiatkowski *et al*, 1992). The null hypothesis of non-stationary time-series is rejected for all series.

To determine the effects of dispersion on returns, regressions with and without the dispersion factors are used. These effects are evaluated over the full period of portfolio formations from January 1998 to December 2003 as well as the pre- and post-FD periods to see if the model specifications are acceptable and the slope coefficients of the appropriate earnings forecast dispersion measure are of any significance.

The analysis continues to investigate whether the introduction of Reg FD affects the estimation of the parameter coefficients in model (24) over the entire time post-formation period. If the introduction and implementation of Reg FD has an impact on the estimation of the parameter coefficients in model (24), the data should then not be pooled together over the full sample period but estimated with two regressions, each with distinctly different post-formation time periods to make proper inference of the estimators in the pre- and post FD periods. To test the null hypothesis that the return data exhibit a structural break at the introduction of Reg FD and that the data for the pre-FD period and the data for the post-FD period should be estimated with different regression models, the regression model in (24) is subjected to Chow's (1960) structural break test. Consider the linear regression model:

$$y = X\beta + u, \qquad (25)$$

where β is a vector containing k elements. The observations for this model are split into two subsets at the specified breakpoint corresponding with the introduction of Reg FD. The Chow test is used to test the null hypothesis that $\beta_1 = \beta_2$ conditional on the same error variance in both regressions. The test statistic is computed as follows:

$$F_{chow} = \frac{(S_c - (S_1 + S_2))/k}{(S_1 + S_2)/(N_1 + N_2 - 2k)}, \quad (26)$$

where S_c is the sum of squared residuals from the combined data, S_1 is the sum of squares from the first regression, S_2, the sum of squares from the second regression. N_1 and N_2 are the observations in each group and k is the total number of parameters. The test statistics follows the F distribution with k and $N_1 + N_2 - 2k$ degrees of freedom.

4.4 Empirical Results

The empirical results section is broken down into four parts. The first part describes the relationship between dispersion and the value premium and between dispersion and the size premium. The second part of the results section pertains to the increased dispersion proposition that investigates the change in forecast dispersion for value and growth stocks before and after the introduction of Reg FD. The third part relates to the return proposition that investigates the relationship between dispersion and stock returns for value and growth stocks before and after the introduction of Reg FD. The fourth part of this section provides a summary of results.

4.4.1 Forecast Dispersion and Portfolios

Tables 16-19 report the mean and median values of forecast dispersion before earnings announcement, forecast dispersion after earnings announcement, change in pre-and post earnings announcement, and belief jumbling for portfolios formed after classifying stocks into 1 of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. The mean value of forecast dispersion before earnings announcement in Table 16 is the highest (0.108) for the value – smallest size portfolio, while the corresponding mean for the growth – biggest size portfolio is the lowest (0.024). This is consistent with the view that value stocks have higher dispersion (see Diether, Malloy and Scherbina, 2002; and Johnson, 2004). Tests of all the mean differences for extreme portfolios (value minus growth and big minus small) sorted on BE/ME and size indicate significantly higher dispersion in the value and small-cap stocks.

Table 17 reports the mean and median values of forecast dispersion after earnings announcement among analysts. The mean value of forecast dispersion after earnings announcement among analysts in Table 17 is the highest (0.111) for the value – smallest size portfolio, while the corresponding mean for the growth – biggest size portfolio is the lowest (0.027). Tests of all the mean differences for extreme portfolios (value minus growth and big minus small), except for the fourth BE/ME quintile sorted on BE/ME and size, suggest significantly higher dispersion in the value and small-cap stocks. The results from Tables 16 and 17 imply that two dispersion measures, dispersion before announcement and dispersion after announcement, have similar values in the BE/ME and size quintiles.

Table 18 reports the mean and median values of the change between the pre-announcement and post-announcement earnings forecasts dispersion. The results indicate that there are not any significant differences between the pre-announcement forecast dispersion and the post-announcement earnings dispersion. This confirms the earlier findings that both measures of dispersion have similar values in the BE/ME and size portfolios.

Table 19 reports the mean and median values of belief jumbling. The mean value of belief jumbling among analysts is the highest (0.448) for the value – smallest size portfolio, while the corresponding mean for the growth – biggest size portfolio is the lowest (0.159). The tests of all the belief jumbling mean differences for extreme portfolios (value minus growth and big minus small), except for the third BE/ME quintile sorted on BE/ME and size indicate significantly higher dispersion in the value and small-cap stocks. The results from Tables 16-19 suggest that all measures of earnings forecast dispersion have results for the BE/ME and size portfolios in that value stocks and smaller stocks have larger dispersion.

4.4.2 Change in Forecast Dispersion

The study continues to investigate forecast dispersion before and after Reg FD by replicating the findings of Bailey *et al* (2003) for the same sample period: the second quarter of 2000 and the second quarter of 2001. Table 20 reports the summary statistics of the four measures of forecast dispersion before and after Reg FD for three different portfolios of stocks. Panel A of Table 20 reports the mean values of forecast dispersion before announcement, forecast dispersion after announcement, the change of forecast dispersion, and belief jumbling before and after Reg FD for all stocks in the sample. Consistent with the Bailey *et al* (2003) results, forecast dispersion pre-and post announcement, and change in dispersion are significantly higher after adoption of Reg

FD. Panel A of Table 20 also shows that mean belief jumbling is larger in quarter II 2001 than it is in quarter II 2000 but the difference in mean is not statistically significant.

Panel B of Table 20 reports the mean values and their differences-in-mean during the transition to Reg FD for growth stocks. The results indicate that none of the measures of dispersion significantly changed after the introduction of Reg FD and the change between pre-and post announcement dispersion actually decreased somewhat. Panel C of Table 20 reports the mean values and their differences-in-mean before and after the introduction of Reg FD for value stocks. The results from Panels B and C in Table 20 suggest that forecast dispersion for value stocks is much larger than it is for growth stocks and that all measures of forecast dispersion increased for value stocks, but not for growth stocks, after Reg FD.

Table 21 reports the mean and differences-in-mean before and after Reg FD for a different time period than used by Bailey *et al* (2003). Due to data limitations, they could not evaluate the measures of forecast dispersion beyond the second quarter of 2001. This study investigates these measures of forecast dispersion for differences between the second quarter of 2000 and the second quarter of 2002. Panel A of Table 21 reports the mean values of forecast dispersion before announcement, forecast dispersion after announcement, the change of forecast dispersion, and belief jumbling before and after Reg FD for all stocks in the sample. The results indicate that forecast dispersion before and after announcement, and belief jumbling increased but that only the difference-in-mean for belief jumbling is statistically significant.

Panel B of Table 21 reports the mean values and their differences-in-mean for growth stocks between the second quarter of 2000 and the second quarter of 2002. The results indicate that only the change between pre-and post announcement dispersion is significantly different at the 10 percent level. Panel C of Table 21 reports the mean values and their differences-in-mean before Reg FD and the second quarter of 2002 for value stocks. The difference-in-mean for forecast dispersion before announcement is 0.023 and the difference-in-mean for belief jumbling is 0.083. These results indicate that the difference-in-mean for forecast dispersion before earnings announcement and belief jumbling changed significantly for value stocks from the second quarter of 2000 to the second quarter of 2002. The results from Panels B and C in Table 21 suggest that forecast dispersion remains larger for value stocks than it is for growth stocks and that all forecast dispersion measures for value stocks increased even two years after the introduction of Reg FD.

4.4.3 Dispersion and Stock Returns

4.4.3.1 Portfolio Formations

The one-year ahead average annual returns for the 5-quintile BE/ME portfolios for all formation periods from the second quarter of 1998 to the second quarter of 2003 are shown in Table 22. The intersection of the High-Low column and the All column in Table 22 shows that, in the period from January 1999 to December 2004, value stocks earned 3.597 percent more than growth stocks. This evidence confirms the findings that value stocks typically earn higher returns than growth stocks (see Fama and French, 1992, 1995; Lakonishok, Shleifer and Vishny, 1994; La Porta, 1996; and Skinner and Sloan, 2002).

The superior behavior of value stock portfolios is not consistent for all the average returns the year after portfolio formation. The High-Low column in Table 22 shows negative values for 1999 and 2000, implying that in 1999 and 2000 the average monthly returns for value stocks are lower than growth stock returns. Chan and Lakonishok (2004) find a similar pattern in their recent reevaluation of value versus growth performance and argue that the difference in performance between value and growth stock in the late 1990s was not grounded in fundamental patterns of profitability growth. In fact, their interpretation is that investor sentiment reached exaggerated levels of optimism about the prospects for technology, media, and telecommunications stocks. The All column and the CRSP-EW column in Table 22 show that along the studied years in the sample, the monthly average returns display a similar pattern as that of the average monthly returns of the CRSP equal-weighted portfolio, implying that the IBES data is not biased.

4.4.3.2 Regression Results

This section assesses the role of dispersion of analysts' earnings forecasts in explaining the cross-section of stock returns in a multivariate setting. Equally-weighted portfolio returns were computed for January t +1 to December t + 1 for these portfolios to obtain a return series of 72 monthly observations for the portfolio formation period from the second quarter of 1998 to the second quarter of 2003. Average excess monthly returns (in excess of the risk-free rate) are then computed for the 5-quintile BE/ME portfolios and one total group, including all stocks. The average excess monthly returns from the post-formation periods are first regressed on the independent factors RMF, SMB, HML, DISPRE, DISPOST, CHANGE and JUMBLING to determine which measure of dispersion has the largest impact on stock returns over the entire sample of stocks.

Table 23 reports the average annual time-series returns for all stocks, the BE/ME group, and the DISPRE, DISPOST, CHANGE and JUMBLING variables for 1999 to 2004. The returns for DISPRE and DISPOST in the years from 1999 to 2004 are very similar, while the returns associated with CHANGE and JUMBLING do not exhibit a particular pattern. The negative returns of DISPRE, DISPOST, CHANGE and JUMBLING in the All row of Table 23 indicate that the stock returns are inversely related to all measures of dispersion. The similarity in returns shown at the DISPRE column and the DISPOST column of Table 23 implies that even though analysts altered their forecast after the interim earnings announcement throughout the sample period from 1999 to 2004, the impact on stock returns remained similar. Nevertheless, dispersion has an inverse impact on stock returns (see Diether, Malloy and Scherbina, 2003; and Johnson, 2004).

Table 24 shows the Pearson correlation coefficients of all the factors used in subsequent regressions. The results show that the null hypothesis where the correlation coefficient is zero between RMF and SMB, RMF and HML, RMF and DISPRE, RMF and DISPOST, RMF and JUMBLING, SMB and HML, SMB and DISPRE, SMB and

DISPOST, HML and DISPRE, HML and DISPOST, DISPRE and DISPOST, DISPRE and CHANGE, DISPRE and JUMBLING, DISPOST and CHANGE, and DISPOST and JUMBLING is rejected at the 5 percent level. The results also show that the null hypothesis where the correlation coefficient is zero between RMF and CHANGE is rejected at the 10 percent level. These results suggest that the variables DISPRE and DISPOST are virtually identical as evidenced by the high Pearson correlation coefficient.

Table 25 reports the magnitude and the statistical significance of the parameter coefficients in cross-sectional regressions with different model specifications. The parameter coefficients of RMF, SMB and HML of the regression models in Table 25 show that these Fama-French factors have their anticipated signs and all are statistically significant at the 1% level. The parameter coefficients on CHANGE and JUMBLING of the regression models in Table 25 also show that CHANGE and JUMBLING are insignificant in all regression models. The coefficient on DISPRE is the largest coefficient (-0.335) in the regression including CHANGE and JUMBLING, whereas the coefficient on DISPOST is –0.313. The parameter coefficients on DISPRE and DISPOST are statistically significant at the 1% level while the other measures of dispersion do not have an effect on stock returns. Due to the strong evidence supporting the impact of DISPRE on stock returns in the earlier research, the subsequent research will examine stock return reactions to this measure of dispersion.

Fama and French (1993) discussed that intercepts that are close to zero in regressions that use RMF, SMB, and HML to absorb common time-series variation do a good job of explaining the cross-section of average stock returns. To determine whether the model in (1) adequately explains stock returns, a seemingly unrelated regression (SUR) is used to test the null hypothesis that the intercepts in the regressions with RMF, SMB, HML and DISPRE are jointly equal to zero for the 5-quintile BE/ME portfolios. Like OLS, the SUR method assumes that all regressors are independent variables, but SUR uses correlations among the errors in different equations to improve the regression estimates. Table 26 reports the slope coefficients, their associated t-statistics, and the results for the F-tests for all the stocks in the BE/ME groups for two model specifications.

The regression models with the model specification in Panel A of Table 26 do not include the DISPRE variable in order to determine if the correlation between DISPRE and the other independent variables (see Table 24) would affect the adequacy of the regression models that do include DISPRE. Statistic a at the lower section of Panel A in Table 26 shows the SUR F-test result. This statistic indicates that the null hypothesis that the intercepts are jointly equal to zero can be rejected at the 5% level. Statistic b at the lower section of Panel B in Table 26 shows the SUR F-test result. This result suggests that the null hypothesis that the intercepts are jointly equal to zero can also be rejected at the 5% level. However, the higher R^2 values of the regressions in Panel B of Table 26 imply that the regression model with DISPRE in combination with RMF, SMB, and HML explains a larger fraction of the average monthly returns. The R^2 values of the regressions that exclude the DISPRE factor in Panel A of Table 26 range from 0.7749 to 0.8307, while the R^2 values of the regressions in Panel B range from 0.7929 to 0.8601. These results indicate that including DISPRE helps explain the cross-section of returns better.

Table 27 reports the slope coefficients, their associated t-statistics for all stocks in the sample from January 1999 to December 2004 with four different model specifications. The estimated parameter coefficients on RMF, SMB, and HML for the CRSP/COMPUSTAT/IBES sample have the expected sign and are all statistically significant at the 1% level. The coefficients on DISPRE in all the regression models with this independent variable indicate that the relationship between DISPRE and stock returns over the years from 1999 to 2004 is negative. Only the parameter coefficient on DISPRE is not statistically significant in the regression with RMF and DISPRE.

Table 27 also reports the Chow test statistic testing the null-hypothesis whether the return data do not exhibit a structural break at the introduction of Reg FD. Statistic a at the lower section of Table 27 shows the Chow test statistic of 3.97, suggesting that the null hypothesis can be rejected at the 1% level. This implies that the data for the pre-FD period and the data for the post-FD period should be estimated with different regression models.

Table 28 reports the estimated regression coefficients of all stocks in the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and in the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003 with four different models. All coefficients on RMF, SMB, and HML are, at least, statistically significant at the 5% level. Panels A and B of Table 28 report the parameter coefficients on DISPRE in all regressions, indicating that the relationship between DISPRE and returns in the pre-FD years as well as in the post-FD years is negative. The parameter coefficient on DISPRE (0.055) from model A2 in Panel A of Table 28 shows that, in the model where DISPRE and RMF are the independent variables, the relationship between DISPRE and returns before Reg FD is positive. The coefficient on DISPRE in regression A4 is -0.452 and is statistically significant at the 1% level. These results provide evidence that before Reg FD dispersion before interim earnings announcement had an inverse relationship with stock returns. These results are similar to the Diether, Malloy, and Scherbina (2003) results. They also found an inverse relation between dispersion and stock returns.

The coefficient on DISPRE at regression B4 of Panel B in Table 28 shows that after Reg FD, there is still a negative relationship between dispersion and stock returns but that the parameter coefficient on DISPRE (-0.124) is smaller. The results from Table 28 do not provide any evidence on the effects of dispersion before interim earning announcements on the cross-section of average returns before and after the introduction of Reg FD. The analysis continues to investigate the effects of DISPRE on the cross-section of returns, while comparing the pre-and post FD periods.

Table 29 reports the estimated regression coefficients of growth stocks from the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The coefficients on HML in models A1 and A4 in Panel A of Table 29 show that there was a value premium on growth stocks before Reg FD while the coefficients on HML in B1 and B4 correctly indicate that there is an inverse relationship between growth stocks and the value premium after Reg FD. The parameter coefficient on SMB at model A1 in Panel A of Table 29 shows that the size premium before Reg FD is significant at the 5% level while the coefficient on SMB in model A4 (0.190) in Panel A of table 29 is statistically significant at the 10% level. The parameter coefficient on SMB at model B1 in Panel B of Table 29 indicates that the size premium after Reg FD is significant at the 10% level while the coefficient on SMB in model B4 in Panel B of table 29 is statistically insignificant. This suggests that the size premium is not a factor after the introduction of Reg FD.

The coefficients on DISPRE in all regressions in Panels A and B of Table 29 show that there is an inverse relationship between growth stock returns and DISPRE before and after Reg FD. More importantly, the impact of DISPRE on growth stock returns has declined, as evidenced by the magnitude of the parameter coefficient of DISPRE at model B4 in Panel B of Table 29. This outcome confirms the results found in Tables 21 and 22 indicating that dispersion after earnings announcements from the second quarter of 2000 remained the same in the second quarter of 2001 and actually declined in the second quarter of 2002.

Table 30 reports the estimated regression coefficients of value stocks from the pre-FD portfolio formation period from the second quarter of 1998 to the second quarter of 2000 and the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The parameter coefficients of RMF, SMB and HML of all regression models in Panel A of Table 30 show that all the Fama-French factors show their anticipated signs and statistical significance at the 1% level except for the parameter coefficients on SMB in models A1 and A4. The parameter coefficients on DISPRE in all regressions, except for the parameter coefficient on DISPRE at model A2 in Panel A of Table 30, show that dispersion before earnings announcement has an inverse relation with value stock returns before and after the introduction of Reg FD.

Panel B of Table 30 reports the estimated regression coefficients of value stocks for the post-FD portfolio formation period from the second quarter of 2001 to the second quarter of 2003. The comparison between the coefficient on DISPRE at regression model A4 in Panel A of Table 30 and the coefficient on DISPRE at regression model B4 in Panel B of Table 30 shows that the impact of dispersion before earnings announcement on value stock returns has increased significantly from –0.274 before Reg FD to –0.333 after the introduction of Reg FD. That result confirms the previous findings from Tables 21 and 22 indicating that value stock dispersion before interim earnings announcements measured at the second quarter of 2000 remained higher throughout the second quarters of 2001 and 2002.

4.4.4 Summary of Findings

The results from this research suggest that value stocks and smaller stocks have larger forecast dispersion before and after earnings announcement and larger belief jumbling in the period from 1999 to 2004. Value stocks also earned 3.6 percent more than growth stocks in that same period. In addition, forecast dispersion pre-and post announcement and change in dispersion for all stocks are higher directly after Reg FD was introduced. All measures of dispersion for value stocks are increased directly after Reg FD, while none of the dispersion measures for growth stocks have changed.

However, forecast dispersion pre-and post announcement, and change in dispersion for all stocks between the second quarter of 2000 and the second quarter of 2002 have dissipated. Only change between pre-and post announcement dispersion for growth stocks increases after Reg FD. The results also indicate that forecast dispersion before announcement and belief jumbling for value stocks changed significantly from the second quarter of 2000 to the second quarter of 2002.

Furthermore, the relationship between forecast dispersion before earnings announcement and stock returns over the years from 1999 to 2004 is negative. These results are similar to Diether, Malloy, and Scherbina (2003) who also find an inverse relation between dispersion and stock returns. However, evidence suggests that the impact of forecast dispersion before earnings announcement on returns has declined. Dispersion before interim earnings announcements also has an inverse relation with value stock returns before and after the introduction of Reg FD, while the impact of dispersion before earnings announcement on value stock returns has increased after the introduction of Reg FD. On the other hand, the impact of dispersion before earnings announcement on growth stock returns has decreased after the introduction of Reg FD, even though the results are not statistically significant.

4.5 Conclusions and Implications

This study investigates the hypothesis stating that forecast dispersion, on both growth and value stock returns, has increased after the introduction Reg FD. Bailey *et al* (2003) report that dispersion before and after interim earnings announcements and belief jumbling increased at the second quarter of 2001, arguing that forecasting future earnings was more difficult after the adoption of Reg FD. This research confirms these findings for the same period but also finds that the increases in dispersion are minimal for growth stocks while the increases in dispersion measures for value stocks are significantly larger.

However, the increased dispersion found at the second quarter of 2001 drastically dissipates at the second quarter of 2002, although value stock forecast dispersion before earnings announcement and value stock belief jumbling remain higher. Barth, Kasznik and McNichols (2001) show that valuation efforts are significantly greater for growth firms relative to value firms. The results in this study suggest that corporate voluntary disclosure created a greater variety of opinions and, therefore, more uncertainty about value stocks.

Also, this essay adds to the literature by researching the impact of earnings forecast dispersion on the cross-section of returns before and after the introduction of Reg FD. The hypothesis is that the effect of forecast dispersion on value stock returns is larger than it is for growth stock returns after Reg FD. Diether, Malloy and Scherbina (2002) find that, before Reg FD, the relationship between dispersion and stock returns is negative. Moreover, this study finds that, after Reg FD, the relationship between returns and dispersion remains negative but that value stocks have become more sensitive to dispersion before earnings announcement. On the other hand, growth stocks have become less sensitive to dispersion. It is difficult to reconcile these findings with the hypothesis propagated by Doukas, Kim and Pantzalis (2004) that dispersion is actually a risk proxy. The evidence that value stocks became even more sensitive to dispersion counters the notion that dispersion could be viewed as a proxy of risk. Diether, Malloy and Scherbina (2002) hypothesize that equity prices tend to reflect the views of the more optimistic investor whenever there is a large disagreement about a stock's value, thereby lowering its future return. The results from this study confirm the hypothesis that earnings forecast dispersion can be viewed as a proxy for differences in opinion. Value stock returns have a stronger inverse relationship with dispersion because financial analysts have become more uncertain about value firms' performance. The bigger the disagreement about a stock's value, the higher the market price relative to the true value of the stock, and the lower its future return.

CHAPTER 5

OVERALL SUMMARY AND CONCLUSIONS

5.1 Overall Summary

Three hypotheses dealing with changes in earnings forecasts, forecast accuracy, and earnings forecast dispersion are developed. For each specific area, differences between value and growth stocks are identified and measured based on the methodology that is most suited for the research questions at hand.

In this study, there are several innovations to the literature. In the earnings forecast changes and the earnings forecast dispersion areas, additional Fama-French factors are calculated to capture the effects of the researched variables in the regression framework. Additionally, in the accuracy area newer panel cointegration techniques are used. These panel cointegration methods do not suffer from limitations, such as serial correlation, non-normality of error distribution and spurious estimations of parameters that are typically associated with traditional methodology.

5.2 Overall Conclusions

Overall, this study demonstrates that the introduction of Reg FD has changed the forecasting attributes of financial analysts. The changes in forecast essay (Chapter 2) shows that before Reg FD contrarian portfolio-formation strategies that are based on changes in analysts' earnings expectations earn higher returns than buy-and-hold strategies that are based on actual earnings growth. Additionally, the evidence shows that stock returns generally do not respond asymmetrically to negative earnings forecast changes. This phenomenon is stronger for growth stock portfolio strategies than it is for value stock portfolios. Actually, neither analysts' earnings expectations growth or actual earnings growth seem to have much impact on the one-year post-formation returns for value stocks.

Importantly, the overall impact of earnings expectations on stock returns dissipates after the introduction of Reg FD. This trend is stronger for growth stocks because it appears that value stock investors do not use change in earnings forecasts or earnings growth in their investment decisions. The evidence that growth stock returns do not react to earnings forecast changes any longer after the introduction of Reg FD could be interpreted in the following ways. First, investors cannot earn excess returns any longer by trading in the opposite direction of short-term change in earnings expectations. Second, investors realized that after the introduction of Reg FD, earnings forecasts could no longer contain more information than what is contained in publicly available quarterly earnings.

The financial analysts' accuracy essay (Chapter 3) indicates that there is a cointegrating relationship between forecasts and EPS for all stocks in the value stock group as well as in the growth stock group, implying that forecasts and EPS data have a long-run equilibrium relation. Using quarterly data for 84 quarters (first quarter of 1985 to the last quarter of 2005) for a combined sample of 60 value and growth stocks, only a small portion of the sample firms' earnings forecasts are found to be consistent with the rational expectations hypothesis and that value stock earnings forecasts are more accurate than growth stock earnings forecasts. The disparity in forecast accuracy between growth and value stocks must be related to the difference in financial analysts' earnings forecast properties because value stocks and growth stocks do not have inherently dissimilar properties.

The results in this essay suggest that accuracy for both stock groups (value and growth stocks) has improved after the introduction of Reg FD even though financial analysts' earnings forecasts for value stocks are relatively more accurate. More importantly, the evidence in this study provides additional evidence indicating that analysts did not just misinterpret available news (see De Bondt and Thaler, 1990; Lys and Sohn, 1990; Klein, 1990; Abarbanell and Bernard, 1992; and Easterwood and Nutt, 1999) but confirm that analysts consciously tried to maintain relationships with managers (see Lim, 2001). However, Reg FD efficiently limited these relationships between managers of growth firms and analysts so that the monetary advantage from manipulating earnings forecasts before the introduction of Reg FD no longer exists (e.g., Carleton, Chen, and Steiner, 1998; Lim, 2001; and Matsumoto, 2002).

The earnings forecast dispersion essay (Chapter 4) shows that forecast dispersion, on both growth and value stock returns, has increased directly after the introduction Reg FD, but that the increases in dispersion are minimal for growth stocks while the increases in dispersion measures for value stocks are significantly larger. However, the increased dispersion found at the second quarter of 2001 drastically dissipates at the second quarter of 2002, although value stock forecast dispersion before earnings announcement and value stock belief jumbling remain higher.

Moreover, the evidence in this essay suggests that, after Reg FD, the relationship between returns and dispersion remains negative but that value stocks have become more sensitive to dispersion before earnings announcement. On the other hand, growth stocks have become less sensitive to dispersion. The results from this study confirm the hypothesis that earnings forecast dispersion can be viewed as a proxy for differences in opinion. Value stock returns have a stronger inverse relationship with dispersion because financial analysts have become more uncertain about value firms' performance. The bigger the disagreement about a stock's value, the higher the market price relative to the true value of the stock, and the lower its future return.

5.3 Items for Future Study

During the study, several items for future research are identified. The overall results call for more extensive investigation of the differences between growth and value stocks after Reg FD. An efficient stock market is a fruitful source of growth and wealth, and it is pertinent to determine whether or not Reg FD has created a larger divide between growth and value stocks. First, the impact of Reg FD is considered in this study as purely an U.S. financial market phenomenon. The international stock return responses on the regulatory change could be a fertile research area. Second, the one-quarter-ahead forecast window in the accuracy essay (Chapter 3) could be expanded to include longer forecast windows, or even long-term earnings growth estimates.

Third, more sophisticated measures of dispersion could be used to investigate to what extent private information affects dispersion in earnings forecasts. If market participants continue to adjust to this regulation and depend more on public information after the introduction of Reg FD, the precision of their information signals could be overestimated. The weight that is placed on the information content of important public events could overprice the assets, thereby creating confusion (i.e., forecast dispersion). Research in market participants' overconfidence may provide further evidence on the difference between value and growth stocks.

APPENDIX A

TABLES

Table 1

Portfolios Formed on Book-to-Market Ratios: Formation Period 1998 - 2003

At the end of the second quarter, of each year *t*, 5 quintile portfolios are formed on the basis of book-to-market ratios (BE/ME). BE/ME is the book value of common equity plus balance sheet deferred taxes for fiscal year *t* over market equity for December of year *t* - 1. The equal-weighted monthly portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Average monthly return is the time-series average of the monthly equal-weighted portfolio returns (in percentages) for each year in the formation period from 1998 to 2003. The CRSP-EW column shows the average monthly return for the equal-weighted CRSP portfolio. The All column shows the average monthly return for equal-weighted portfolios in each year. The High-Low column shows the difference in average monthly returns between the high BE/ME group and the low BE/ME group. The All row shows the average monthly return for equal-weighted portfolios of the stocks in each BE/ME group.

	Book-to-Market Portfolios							
	CRSP-EW	All	Low	2	3	4	High	High-Low
All			-1.318	-0.902	2.968	3.587	3.294	4.612
1999	19.526	4.028	15.464	5.672	-1.763	-2.673	3.441	-12.023
2000	-10.139	-10.953	-12.911	-14.722	-5.252	-9.631	-12.262	0.649
2001	-13.043	-8.962	-20.024	-13.737	-2.766	-3.658	-4.681	15.343
2002	-23.366	-17.861	-26.210	-20.282	-16.561	-10.948	-15.435	10.775
2003	26.380	30.268	25.644	28.839	30.711	32.563	33.556	7.912
2004	8.993	12.683	10.129	8.821	13.438	15.867	15.148	5.019

Table 2

Average Mean and Median Values of Expectations Growth and Earnings Growth on Portfolios Formed on Book-to-Market Equity and Analysts' Expectations Growth, and Book-to-Market Equity and Earnings Growth: January 1999 - December 2004

At the end of the second quarter, of each year *t*, 5-quintile portfolios are formed on the basis of book-to-market ratios (BE/ME. The 5-quintile portfolios are then sorted in 5 quintiles on the basis of the change in expected earnings at the second quarter announcement date of year *t*, and the 5-quintile portfolios are also sorted in 5 quintiles on basis of the actual annual change in earnings from previous quarters evaluated at the second quarter in year *t*. The equal-weighted monthly portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Panel A reports the mean and median values (in percentages) of the expectation growth for the portfolios of stocks that are sorted on BE/ME and then sorted on expectations growth. The median values in Panel A are shown in brackets. Panel B reports the mean and median values (in percentages) of the actual earnings growth for the portfolios of stocks that the sorted on BE/ME and then sorted on the earnings growth rates. The median values in Panel B are shown in brackets. The High-Low columns in both Panels shows the difference in mean growth between the extreme BE/ME portfolios for expected earnings growth (Panel A) and actual earnings growth (Panel B). The High-Low row in Panel A shows the difference in mean expected earnings growth for all BE/ME groups. The High-Low row in Panel B shows the difference in mean actual earnings growth for all BE/ME groups.

Panel A. Mean and Median Values Expectations Growth

	Book-to-Market Portfolios					
Expectations Growth	Low	2	3	4	High	High-Low
Low	-2.726	-3.004	-3.492	-4.570	-6.626	-3.900
	[-2.161]	[-2.309]	[-2.312]	[-3.450]	[-4.396]	
2	-0.222	-0.284	-0.311	-0.328	-0.309	-0.086
	[-0.109]	[-0.170]	[-0.175]	[-0.235]	[-0.223]	
3	0.390	0.385	0.384	0.389	0.397	0.007
	[0.386]	[0.395]	[0.394]	[0.390]	[0.415]	
4	0.838	0.855	0.880	0.883	0.903	0.066
	[0.757]	[0.818]	[0.858]	[0.875]	[0.896]	
High	2.150	2.556	2.509	2.466	3.189	1.039
	[1.713]	[1.704]	[2.059]	[1.947]	[2.227]	
High-Low	4.876	5.560	6.000	7.036	9.815	

Panel B. Mean and Median Values Actual Earnings Growth

	Book-to-Market Portfolios					
Earnings Growth	Low	2	3	4	High	High-Low
Low	-7.211	-7.414	-8.960	-10.490	-11.836	-4.625
	[-5.114]	[-5.029]	[-5.816]	[-6.885]	[-8.109]	
2	-1.374	-1.476	-1.467	-1.471	-1.519	-0.145
	[-1.323]	[-1.510]	[-1.456]	[-1.414]	[-1.496]	
3	0.078	0.055	0.071	0.076	0.043	-0.035
	[0.109]	[0.158]	[0.165]	[0.105]	[0.097]	
4	1.064	1.187	1.141	1.134	1.286	0.222
	[1.007]	[1.140]	[1.059]	[1.078]	[1.205]	
High	5.585	4.934	5.414	5.741	9.119	3.534
	[3.556]	[3.676]	[4.161]	[4.055]	[4.511]	
High-Low	12.796	12.347	14.374	16.231	20.955	

Table 3

Average Monthly Returns on Portfolios Formed on Book-to-Market Equity and Analysts' Expectations Growth, and Book-to-Market Equity and Earnings Growth: January 1999 - December 2004

At the end of the second quarter, of each year *t*, 5-quintile portfolios are formed on the basis of book-to-market ratios (BE/ME. The 5-quintile portfolios are then sorted in 5 quintiles on the basis of the change in expected earnings at the second quarter announcement date of year *t*, and the 5-quintile portfolios are also sorted in 5 quintiles on basis of the actual annual change in earnings from previous quarters evaluated at the second quarter in year *t*. The equal-weighted monthly portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Average monthly return is the time-series of the monthly equal-weighted portfolio returns (in percentages) for each year in the formation period from 1998 to 2004. The All columns in Panel A and Panel B show the average monthly return for equal-weighted portfolios for the expectations growth groups, and the actual earnings growth groups. The last columns and last rows in Panel A and Panel B report the mean differences between the extreme portfolios and their significance levels from the corresponding *t*-statistics and the Wilcoxon rank-sum tests. Panel C reports the differences between the values of Panel B and Panel C for each BE/ME-expectation growth and BE/ME-earnings growth combination group and their significance levels from the corresponding *t*-statistics and the Wilcoxon rank-sum tests.

Panel A. Mean Returns for Change in Expected Earnings

	Book-to-Market Portfolios						
Expectations Growth	Low	2	3	4	High	All	High-Low
Low	-0.753	4.031	-0.891	4.195	2.147	1.746	2.900**
2	1.785	-0.538	5.577	2.861	3.972	2.731	2.187**
3	0.555	0.054	2.246	2.304	1.844	1.401	1.290
4	-3.455	-3.751	1.982	0.352	1.719	-0.631	5.175**
High	-8.792	-7.145	1.641	3.980	2.654	-1.532	11.446**
High-Low	-8.039**	-11.176**	2.532**	-0.215	0.508	-3.278**	

Panel B. Mean Returns for Change in Actual Earnings

	Book-to-Market Portfolios						
Earnings Growth	Low	2	3	4	High	All	High-Low
Low	-6.367	3.895	-0.369	2.835	3.378	0.674	9.744**
2	-0.275	-0.053	-0.464	5.371	2.955	1.507	3.231**
3	1.415	-5.998	6.497	2.532	0.867	1.063	-0.548
4	-2.276	-4.103	2.137	2.205	2.636	0.120	4.911**
High	-3.157	-3.157	2.842	0.652	2.536	-0.057	5.692**
High-Low	3.210**	-7.051**	3.210**	-2.183**	-0.842	-0.731	

Panel C. Difference between Expected Earnings and Actual Earnings

	Book-to-Market Portfolios						
Differences	Low	2	3	4	High	All	High-Low
Low	5.614**	0.136	-0.522	1.360	-1.231	1.071	-6.845**
2	2.061**	-0.485	6.041**	-2.510**	1.017	1.225	-1.043
3	-0.860	6.052**	-4.251**	-0.228	0.978	0.338	1.838*
4	-1.180	0.352	-0.155	-1.853*	-0.916	-0.750	0.263
High	-5.635**	-3.988**	-1.200	3.328**	0.119	-1.475	5.754**
High-Low	-11.249**	-4.124**	-0.678	1.968*	1.350	-2.546**	

* indicates significance at the 10% level, and ** indicates significance at the 5% level.

Table 4

Unit Root Tests on Average Monthly Returns and Specific Factors for All Stocks: January 1999-December 2004

The ADF test statistics and KPSS test statistics are calculated for time series data on specific variables. The variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The critical values for the ADF tests are from Fuller (1976), and the critical values for the KPSS tests are from Kwiatkowski *et al* (1992) while the lag is the number of lags to induce white noise in the residual series at the 5% level.

	ADF test		KPSS test		
	Level	Lag	Level		Lag
			η_μ	η_τ	
Average Monthly Returns R(*t*)	-6.900***	0	0.256	0.064	0
RMF	-7.949***	0	0.219	0.146	0
SMB	-9.830***	0	0.019	0.019	0
HML	-8.162***	0	0.165	0.149	0
EXP	-6.515***	1	0.440	0.164	5
EARN	-7.525***	1	0.169	0.089	0

***denotes significance at the 1% level.

Table 5

Correlation Matrix for Explanatory Variables:
January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable over different time-periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + xEXP(t) + rEARN(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The table shows the Pearson correlation coefficients and the *t*-stats of the null hypothesis where the correlation coefficient is zero.

	MKTRF	SMB	HML	EXP	EARN
MKTRF	1	0.238	-0.536	0.297	0.233
		(0.044)	(0.000)	(0.011)	(0.049)
SMB		1	-0.562	0.317	0.018
			(0.000)	(0.007)	(0.883)
HML			1	-0.477	-0.174
				(0.000)	(0.145)
EXP				1	0.453
					(0.000)
EARN					1

Table 6

Portfolios Formed on Book-to-Market Ratios: January 1999 – December 2004

At the end of the second quarter, of each year *t*, 5 quintile portfolios are formed on the basis of book-to-market ratios (BE/ME). BE/ME is the book value of common equity plus balance sheet deferred taxes for fiscal year *t* over market equity for December of year *t* - 1. The equal-weighted monthly portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Average monthly return is the time-series average of the monthly equal-weighted portfolio returns (in percentages) for each year in the formation period from 1998 to 2003 for all BE/ME groups. The EXP column shows the average time-series return for each year of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio. The EARN column shows the average time-series return for each year on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth.

	Book-to-Market Portfolios						Variables	
	All	Low	2	3	4	High	EARN	EXP
All	4.786	1.534	-1.318	-0.902	2.968	3.587	2.179	2.709
1999	20.111	4.028	15.464	5.672	-1.763	-2.673	7.198	20.369
2000	-8.121	-10.953	-12.911	-14.722	-5.252	-9.631	4.829	-0.267
2001	-10.927	-8.962	-20.024	-13.737	-2.766	-3.658	-3.051	-2.778
2002	-15.845	-17.861	-26.210	-20.282	-16.561	-10.948	0.209	0.205
2003	31.372	30.268	25.644	28.839	30.711	32.563	2.835	2.863
2004	12.128	12.683	10.129	8.821	13.438	15.867	1.053	-4.138

Table 7

Cross-Section Regression of Returns on Specific Factors for BE/ME groups with Different Model Specifications: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. Panel A shows the slope coefficients and their corresponding *t*-statistics for 5 BE/ME stock groups from 1999-2004 for asset-pricing model: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rEARN(t) + xEXP(t) + e(t)$. Panel B shows the slope coefficients and their corresponding *t*-statistics for 5 BE/ME stock groups from 1999-2004 for asset-pricing model: $R(t) - R_f(t) = a + bRMF(t) + rEARN(t) + xEXP(t) + e(t)$. Statistic [a] and statistic [b] correspond to the test value for the null hypothesis that all intercepts are jointly equal to zero with corresponding *p*-values in brackets.

Panel A.	a	bRMF	sSMB	hHML	rEARN	xEXP	Adjusted R^2
Growth	-0.002	1.220	0.142	0.033	0.276	-0.620	0.8575
	(-0.69)	(17.5)	(2.07)	(0.38)	(1.16)	(-3.36)	
2	-0.006	1.136	0.250	0.428	-0.007	-0.140	0.8883
	(-2.56)	(22.23)	(4.97)	(6.59)	(-0.04)	(-1.04)	
3	-0.005	1.070	0.319	0.732	-0.016	-0.296	0.8233
	(-2.06)	(17.73)	(5.38)	(9.55)	(-0.08)	(-1.85)	
4	-0.006	0.950	0.369	0.699	-0.084	-0.137	0.8352
	(-2.47)	(18.12)	(7.16)	(10.48)	(-0.47)	(-0.99)	
Value	-0.007	0.989	0.515	0.820	-0.038	0.008	0.8573
	(-3.1)	(18.77)	(9.93)	(12.23)	(-0.21)	(0.06)	
SUR	9.60[a]						
H0: a=0	(0.00)						

Panel B.	a	bRMF	sSMB	hHML	rEARN	xEXP	Adjusted R^2
Growth	-0.001	1.232			0.194	-0.523	0.8518
	(-0.25)	(19.79)			(0.81)	(-3.07)	
2	0.000	0.999			-0.015	-0.322	0.8128
	(-0.09)	(17.27)			(-0.07)	(-2.03)	
3	0.003	0.816			0.044	-0.705	0.5891
	(0.82)	(10.14)			(0.14)	(-3.20)	
4	0.003	0.720			-0.070	-0.470	0.5583
	(0.84)	(9.59)			(-0.24)	(-2.28)	
	0.004	0.735			-0.077	-0.308	0.5002
Value	(0.90)	(8.51)			(-0.23)	(-1.30)	
SUR	0.81[b]						
H0: a=0	(0.37)						

Table 8

Cross-Section Regression of Returns on Specific Factors for All Stocks with Different Model Specifications: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The explicit multi-factor asset pricing model is: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rEARN(t) + xEXP(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The variable d-asym is the dummy for earnings expectation, where the dummy is 1 if earnings expectations are negative. The table shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1999-2004 for four different model specifications. Statistic [a] corresponds to the test value of the Chow test for the null hypothesis of no structural break at a known location. The corresponding *p*-value of the Chow statistic is shown in brackets.

Full Sample	a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
All Stocks	-0.006	1.068	0.311	0.580				0.9045
1998-2003	(-3.13)	(24.89)	(7.36)	(11.06)				
	0.002	0.901			0.015	-0.466		0.7615
	(0.62)	(14.97)			(0.07)	(-2.82)		
	0.001				0.415	0.079		-0.0102
	(0.12)				(0.88)	(0.24)		
	-0.005	1.073	0.319	0.542	0.026	-0.237		0.9086
	(-2.80)	(25.23)	(7.63)	(10.03)	(0.18)	(-2.10)		
	-0.001	0.901				-0.366	0.005	0.7624
	(-0.13)	(15.12)				(-1.54)	(0.52)	
Two Sample	$H_0 : \beta_1 = \beta_2$							2.10^a
Chow Test								[0.07]

Table 9

Cross-Section Regression of Returns on Specific Factors for All Stocks with Different Model Specifications in Different Time Periods: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The explicit multi-factor asset pricing model is: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rEARN(t) + xEXP(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The variable d-asym is the dummy for earnings expectation, where the dummy is 1 if earnings expectations are negative. Panel A shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1999-2004 for four different model specifications before the introduction of Reg FD. Panel B shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1999-2004 for four different model specifications after the introduction of Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Pre-FD	A1.	-0.008	1.116	0.338	0.654				0.8569
1998-2000		(-2.46)	(13.85)	(5.12)	(7.26)				
	A2.	0.002	0.794			0.136	-0.832		0.7388
		(0.42)	(9.89)			(0.41)	(-3.67)		
	A3.	-0.003				0.511	-0.406		-0.0280
		(-0.39)				(0.78)	(-0.92)		
	A4.	-0.005	1.057	0.336	0.528	0.185	-0.493		0.8719
		(-1.68)	(13.19)	(5.37)	(5.22)	(0.78)	(-2.40)		
	A5.	0.000	0.797				-0.710	0.004	0.7382
		(-0.04)	(9.98)				(-2.00)	(0.31)	

Panel B.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Post-FD	B1.	-0.003	1.018	0.409	0.336				0.9612
2001-2003		(-1.95)	(26.05)	(6.86)	(4.59)				
	B2.	0.002	1.051			-0.268	0.014		0.8658
		(0.82)	(14.08)			(-1.06)	(0.07)		
	B3.	0.007				0.119	0.841		0.0635
		(0.91)				(0.18)	(1.70)		
	B4.	-0.003	1.024	0.396	0.345	-0.106	0.039		0.9593
		(-1.81)	(23.27)	(6.20)	(4.54)	(-0.73)	(0.36)		
	B5.	-0.002	1.046				0.089	0.008	0.8645
		(-0.39)	(14.01)				(0.34)	(0.89)	

Table 10

Cross-Section Regression of Returns on Specific Factors for Growth Stocks with Different model Specifications in Different Time Periods: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year growth stock returns (average raw return minus the risk-free rate) as the dependent variable over the pre-and post FD time periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + xEXP(t) + rEARN(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The variable d-asym is the dummy for earnings expectation, where the dummy is 1 if earnings expectations are negative. Panel A reports the slope coefficients and their *t*-statistics for growth stocks before the introduction of Reg FD, while Panel B shows the slope coefficients and the *t*-statistics for growth stocks after Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Pre-FD	A1.	-0.003	1.413	0.212	0.340				0.8057
1998-2000		(-0.58)	(9.84)	(1.80)	(2.12)				
	A2.	0.004	1.287			0.252	-0.845		0.8268
		(0.67)	(12.87)			(0.60)	(-2.99)		
	A3.	-0.005				0.860	-0.154		-0.0375
		(-0.37)				(0.85)	(-0.23)		
	A4.	0.002	1.288	0.208	0.071	0.346	-1.043		0.8398
		(0.34)	(9.40)	(1.94)	(0.41)	(0.86)	(-2.96)		
	A5.	0.012	1.297				-1.107	-0.016	0.8294
		(1.17)	(13.14)				(-2.53)	(-0.92)	
Panel B.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Post-FD	B1.	-0.003	1.078	0.188	-0.222				0.9403
2001-2003		(-1.13)	(20.86)	(2.39)	(-2.30)				
	B2.	-0.003	1.143			0.047	-0.093		0.9239
		(-1.20)	(19.09)			(0.23)	(-0.59)		
	B3.	0.002				0.468	0.806		0.0861
		(0.27)				(0.67)	(1.54)		
	B4.	-0.003	1.076	0.214	-0.247	0.229	-0.158		0.9400
		(-1.28)	(18.90)	(2.59)	(-2.50)	(1.21)	(-1.11)		
	B5.	-0.006	1.147				0.033	0.005	0.9250
		(-1.24)	(19.38)				(0.16)	(0.72)	

Table 11

Cross-Section Regression of Returns on Specific Factors for Value Stocks with Different Model Specifications in Different Time Periods: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year value stock returns (average raw return minus the risk-free rate) as the dependent variable over the pre-and post FD time periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + xEXP(t) + rEARN(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, EXP, the return of a portfolio consisting of the return of high-growth expectations of earnings minus the return on a low-growth earnings expectations portfolio, and EARN, the return on a portfolio consisting of the return of high earnings growth subtracted by the return of the portfolio of low earnings growth. The variable d-asym is the dummy for earnings expectation, where the dummy is 1 if earnings expectations are negative. Panel A reports the slope coefficients and their *t*-statistics for value stocks before the introduction of Reg FD, while Panel B shows the slope coefficients and the *t*-statistics for value stocks after Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Pre-FD	A1.	-0.010	0.997	0.493	0.808				0.7632
1998-2000		(-2.49)	(10.17)	(6.14)	(7.38)				
	A2.	0.001	0.587			0.035	-0.572		0.4089
		(0.19)	(5.14)			(0.07)	(-1.77)		
	A3.	-0.003				0.312	-0.257		-0.0464
		(-0.33)				(0.50)	(-0.61)		
	A4.	-0.010	0.994	0.495	0.809	0.099	-0.020		0.7482
		(-2.29)	(9.36)	(5.95)	(6.03)	(0.32)	(-0.07)		
	A5.	0.000	0.588				-0.535	0.001	0.4088
		(0.04)	(5.18)				(-1.06)	(0.07)	

Panel B.		a	bRMF	sSMB	hHML	rEARN	xEXP	d-asym	Adjusted R^2
Post-FD	B1.	-0.005	0.941	0.619	0.782				0.9403
2001-2003		(-2.18)	(18.83)	(8.11)	(8.36)				
	B2.	0.006	0.945			-0.332	0.044		0.6343
		(1.18)	(7.44)			(-0.77)	(0.13)		
	B3.	0.010				0.016	0.787		0.0321
		(1.24)				(0.02)	(1.51)		
	B4.	-0.004	0.937	0.604	0.799	-0.145	0.131		0.9384
		(-2.02)	(16.78)	(7.45)	(8.27)	(-0.78)	(0.94)		
	B5.	0.001	0.938				0.117	0.009	0.6315
		(0.07)	(7.39)				(0.27)	(0.59)	

Table 12

Unit Root Tests on Earnings Forecasts and EPS for Value Stocks: 1985 - 2005

The ADF test statistics, MZ test statistics and panel unit root IPS test statistics are calculated for time series data on quarterly earnings forecasts and actual earnings of 30 value stocks from the first quarter of 1985 to the last quarter of 2005. These value stocks are the consistently highest ranked BE/ME stocks from 1985 to 2005, selected from annually rebalanced BE/ME ranked stock portfolios. BE/ME is the ratio of book value of equity in December of year *t*-1 over the current market value of equity at the second quarter of fiscal year *t*. The critical values for the ADF tests are from Fuller (1976), and the critical values for the MZ tests are from Ng and Perron (2001). Columns 2 and 4 in Panel A report the values of the Augmented Dickey-Fuller (ADF) statistics, the * indicates rejection of the null hypothesis of a unit root, where the 5% critical value is –2.934**.** Columns 3 and 5 in Panel A show the values for the Ng and Perron MZ_α test statistics, the * indicates rejection of the null hypothesis of a unit root. The 5% critical value for the MZ_α statistic is –16.948. Panel B shows the values of the IPS test statistics of the null of a unit root in heterogeneous panels, where the 5% critical value is –2.31, as computed by Im, Pesaran and Shin (2003).

(1)	(2)	(3)	(4)	(5)
Panel A.				
Individual Unit Root Tests	**Forecasts**		**EPS**	
Firms	*ADF*	MZ_α	*ADF*	MZ_α
AETNA INC	-2.004	-7.113	-2.564	-136.200*
ALASKA AIR GROUP INC	-2.361	-8.421	-1.924	-5.229
ALCAN INC	-2.488	-26.934*	-2.332	-13.647
ASHLAND INC	-2.122	-4.555	-0.012	-0.885
BOWATER INC	-2.146	-23.660*	-2.046	-14.414
CSX CORP	-1.850	-23.639*	-2.878	-227.800*
CABOT CORP	-0.858	-12.304	-1.647	-2.333
CARPENTER TECHNOLOGY CORP	-2.604	-663.400*	-2.146	-10.835
CENTEX CORP	4.953	-1.359	0.157	-2.689
CONSOLIDATED EDISON INC	-1.266	-0.075	-2.150	-2.028
CMS ENERGY CORP	-1.854	-0.038	-2.211	-12.960
DTE ENERGY CO	-2.456	-10.190	-2.732	-19.934*
FPL GROUP INC	-0.588	-6.598	-1.364	-2.904
FORD MOTOR CO	-2.481	-57.892*	-2.037	-128.100*
HARSCO CORP	-0.652	-74.323*	-1.874	-19.296*
HELMERICH & PAYNE	-1.617	-23.412*	-3.287*	-16.313
IDACORP INC	-2.793	-25.988*	-2.844	-2.248
INTL PAPER CO	-2.556	-32.617*	-1.726	-20.746*
JEFFERSON-PILOT CORP	0.199	-19.332*	-2.599	-27.058*
KELLWOOD CO	-2.492	-8.616	-3.512*	-7.492
LINCOLN NATIONAL CORP	0.415	-5.701	-2.067	-4.189
LOUISIANA-PACIFIC CORP	-2.602	-21.018*	-1.504	-7.081
MDU RESOURCES GROUP INC	1.745	1.989	-3.464*	-0.082
NATIONAL FUEL GAS CO	-0.760	-0.040	-3.293*	-1.448
NICOR INC	-1.456	1.796	-2.098	-0.617
NORFOLK SOUTHERN CORP	-1.304	-6093.000*	-3.242*	-19.688*
NORTHEAST UTILITIES	-1.621	-16.984*	-1.342	-9.479
NISOURCE INC	-1.492	0.685	-2.564	-3.894
PENNEY (J C) CO	-2.597	-5.063	-1.889	-0.373
POTLATCH CORP	-1.922	-12.642	-1.580	-7.588

Panel B.			
Panel Unit Root Tests	**Parameter**	**Test**	**Value**
	Forecasts	IPS	-1.059
	EPS	IPS	-2.050

Table 13

Unit Root Tests on Earnings Forecasts and EPS for Growth Stocks: 1985 – 2005

The ADF test statistics, MZ test statistics and panel unit root IPS test statistics are calculated for time series data on quarterly earnings forecasts and actual earnings of 30 growth stocks from the first quarter of 1985 to the last quarter of 2005. These growth stocks are the consistently lowest ranked BE/ME stocks from 1985 to 2005, selected from annually rebalanced BE/ME ranked stock portfolios. BE/ME is the ratio of book value of equity in December of year *t*-1 over the current market value of equity at the second quarter of fiscal year *t*. The critical values for the ADF tests are from Fuller (1976), and the critical values for the MZ tests are from Ng and Perron (2001). Columns 2 and 4 in Panel A report the values of the Augmented Dickey-Fuller (ADF) statistics, the * indicates rejection of the null hypothesis of a unit root, where the 5% critical value is –2.934. Columns 3 and 5 in Panel A show the values for the Ng and Perron MZ_α test statistics, the * indicates rejection of the null hypothesis of a unit root. The 5% critical value for the MZ_α statistic is –16.948. Panel B shows the values of the IPS test statistics of the null of a unit root in heterogeneous panels, where the 5% critical value is –2.31, as computed by Im, Pesaran and Shin (2003).

(1)	(2)	(3)	(4)	(5)
Panel A.				
Individual Unit Root Tests	**Forecasts**		**EPS**	
Firms	*ADF*	MZ_α	*ADF*	MZ_α
ABBOTT LABORATORIES	2.925	-14.204	-1.585	-10.919
AMETEK INC	-0.880	-16.078	-1.17	-8.067
ANHEUSER-BUSCH COS INC	-0.994	-7.774	-2.726	-1.918
BARD (C.R.) INC	2.884	-13.598	-1.696	-7.472
BLOCK H & R INC	1.364	0.007	-1.492	-0.29
BRISTOL-MYERS SQUIBB CO	-1.560	-16.263	-1.267	-7.418
COCA-COLA CO	-0.718	-10.605	-2.888	-4.464
COLGATE-PALMOLIVE CO	-1.713	0.619	-3.353*	-48.063*
DIONEX CORP	0.663	-3.950	-1.117	-124.4*
EMERSON ELECTRIC CO	-0.330	-213.700*	-3.270*	-12.400
EQUIFAX INC	-0.385	-10.568	-2.045	-12.408
GENERAL ELECTRIC CO	-2.164	-12.379	-1.364	-8.461
GRAINGER (W W) INC	0.384	-268.500*	-2.73	-12.259
HEINZ (H J) CO	-1.640	-0.824	-1.631	-1.864
HERSHEY CO	2.096	-1.783	-2.922	-46.000*
HILLENBRAND INDUSTRIES	-1.249	-18.191*	-3.480*	12.748
ILLINOIS TOOL WORKS	1.222	-936.100*	0.064	-19.847*
JOHNSON & JOHNSON	3.199	-5.362	-2.073	-30.594*
KELLOGG CO	-0.568	-2.770	-1.033	-6.954
LILLY (ELI) & CO	-0.431	-13.329	-2.263	-4.531
MARSH & MCLENNAN COS	-0.782	-874.900*	0.108	-14.206
MCDONALD'S CORP	0.200	-0.059	-2.562	-22.469*
MCGRAW-HILL COMPANIES	3.440	-22.184*	-2.956*	-1.757
3M CO	2.296	-5711.000*	-2.587	-34.359*
NEWELL RUBBERMAID INC	-1.793	-5.675	-0.979	-9.57
PEPSICO INC	0.733	-3.437	-1.633	-6.087
PFIZER INC	-1.203	-97.748*	-0.706	-3.816
ALTRIA GROUP INC	0.711	-4.717	-2.04	-36.297*
PITNEY BOWES INC	-0.490	-12.358	-2.754	-35.463*
PROCTER & GAMBLE CO	0.492	15.138	-2.278	-13.556
Panel B.				
Panel Unit Root Tests		**Parameter**	**Test**	**Value**
		Forecasts	IPS	0.888
		EPS	IPS	-2.292

Table 14

Cointegration Tests of Earnings Forecasts and EPS in Value Stocks: 1985 - 2005

Johansen trace statistics and panel cointegration test statistics are calculated to test the relationship between actual quarterly earnings and earnings forecasts of 30 value stocks from the first quarter of 1985 to the last quarter of 2005. These value stocks are the consistently highest ranked BE/ME stocks from 1985 to 2005, selected from annually rebalanced BE/ME ranked stock portfolios. BE/ME is the ratio of book value of equity in December of year *t*-1 over the current market value of equity at the second quarter of fiscal year *t*. Column 2 in panel A shows the trace test of the null that there is no cointegration, where an asterisk indicates the rejection of the 5% critical value of 14.32. Column 3 shows the trace test of the null that there is at most one cointegrating relationship, where * indicates 5% level rejection of the 3.85 level. Column 4 shows the normalized estimate of the cointegrating parameter. Column 5 shows the value of LR test of the beta matrix restriction [1,-1], where column 6 reports *p*-values of the LR test. Column 7 shows the value of the zero-restrictions LR tests, where column 8 shows the respective *p*-values. Columns 3 and 5 in Panel B show the *p*-values for the one-sided test based on normal distribution, where column 8 in Panel B shows the *p*-value of the FMOLS test that the estimated beta is equal to 1.0 for three distinctly different time periods.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A.							
Firm Cointegration Tests	**Trace r=0**	**Trace r≤1**	$\hat{B}$	**LR**	***p*-value**	$H_\beta: R'\beta=0$	***p*-value**
AETNA INC	29.707*	4.853*	-0.650	0.448	0.799	0.175	0.676
ALASKA AIR GROUP INC	24.367*	4.093*	-0.679	3.058	0.217	2.291	0.130
ALCAN INC	40.730*	8.966*	-0.707	11.171*	0.004	8.919*	0.003
ASHLAND INC	28.572*	2.829	-0.017	25.227*	0.000	4.493	0.034
BOWATER INC	46.930*	11.310*	-0.762	7.244*	0.027	1.672	0.196
CSX CORP	22.473*	4.405*	-0.327	1.960	0.375	0.036	0.849
CABOT CORP	24.238*	2.056	0.099	9.586*	0.008	0.993	0.319
CARPENTER TECHNOLOGY CORP	35.198*	4.920*	-0.979	7.961*	0.019	7.375*	0.007
CENTEX CORP	39.267*	9.685*	0.178	17.333*	0.000	7.711*	0.005
CONSOLIDATED EDISON INC	38.218*	11.676*	0.205	16.994*	0.000	4.719*	0.030
CMS ENERGY CORP	422.336*	23.206*	-0.036	158.881*	0.000	14.181	0.000
DTE ENERGY CO	31.958*	10.086*	-0.834	0.209	0.901	0.031	0.861
FPL GROUP INC	38.861*	12.074*	-0.733	0.432	0.806	0.383	0.536
FORD MOTOR CO	21.357*	8.156*	-0.328	2.424	0.298	0.309	0.578
HARSCO CORP	10.657	1.408	-0.767	0.936	0.626	0.331	0.565
HELMERICH & PAYNE	32.585*	10.018*	-0.328	10.350*	0.006	10.071*	0.002
IDACORP INC	43.486*	11.663*	-0.533	7.703*	0.021	2.234	0.135
INTL PAPER CO	30.734*	11.175*	-0.250	8.622*	0.013	0.250	0.617
JEFFERSON-PILOT CORP	28.579*	7.227*	0.837	18.471	0.000	0.104	0.747
KELLWOOD CO	45.859*	18.706*	0.171	1.614	0.446	0.309	0.578
LINCOLN NATIONAL CORP	25.202*	0.220	0.537	17.149*	0.000	3.324	0.068
LOUISIANA-PACIFIC CORP	27.483*	7.376*	-0.976	0.075	0.963	0.071	0.791
MDU RESOURCES GROUP INC	20.588*	3.852*	0.548	1.045	0.593	0.648	0.421
NATIONAL FUEL GAS CO	63.133*	19.312*	0.273	20.768*	0.000	7.089*	0.008
NICOR INC	28.240*	7.259*	-0.330	3.938	0.140	1.722	0.189
NORFOLK SOUTHERN CORP	21.119*	6.106*	-0.387	4.399	0.111	4.341*	0.037
NORTHEAST UTILITIES	17.489*	4.362*	-0.764	1.746	0.418	0.248	0.619
NISOURCE INC	24.217*	6.040*	-0.454	7.404*	0.025	7.394*	0.007
PENNEY (J C) CO	24.033*	10.581*	0.121	2.326	0.313	1.927	0.165
POTLATCH CORP	21.463*	4.925*	-0.997	3.188	0.203	1.346	0.246
Panel B.							
Panel Cointegration Tests	DH_G	***p*-value**	DH_P	***p*-value**	$\hat{B}_{FMOLS}$	***t*-stat**	***p*-value**
1985-2005	10.600*	0.000	6.334*	0.000	0.660*	-15.790	0.000
Before Reg FD					0.550*	-13.990	0.000
After Reg FD					0.690*	-8.570	0.000

Table 15
Cointegration Tests of Earnings Forecasts and EPS in Growth Stocks: 1985 – 2005

Johansen trace statistics and panel cointegration test statistics are calculated to test the relationship between actual quarterly earnings and earnings forecasts of 30 growth stocks from the first quarter of 1985 to the last quarter of 2005. These growth stocks are the consistently lowest ranked BE/ME stocks from 1985 to 2005, selected from annually rebalanced BE/ME ranked stock portfolios. BE/ME is the ratio of book value of equity in December of year *t*-1 over the current market value of equity at the second quarter of fiscal year *t*. Column 2 in panel A shows the trace test of the null that there is no cointegration, where an asterisk indicates the rejection of the 5% critical value of 14.32. Column 3 shows the trace test of the null that there is at most one cointegrating relationship, where * indicates 5% level rejection of the 3.85 level. Column 4 shows the normalized estimate of the cointegrating parameter. Column 5 shows the value of LR test of the beta matrix restriction [1,-1], where column 6 reports *p*-values of the LR test. Column 7 shows the value of the zero-restrictions LR tests, where column 8 shows the respective *p*-values. Columns 3 and 5 in panel B show the *p*-values for the one-sided test based on normal distribution, where column 8 in Panel B shows the *p*-value of the FMOLS test that the estimated beta is equal to 1.0 for three distinctly different time periods.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A.							
Firm Cointegration Tests	**Trace r=0**	**Trace r≤1**	$\hat{B}$	**LR**	***p*-value**	$H_\beta: R'\beta=0$	***p*-value**
ABBOTT LABORATORIES	11.509	0.064	0.611	6.780*	0.034	0.075	0.784
AMETEK INC	13.248	5.591*	0.399	2.447	0.294	1.873	0.171
ANHEUSER-BUSCH COS INC	40.635*	6.781*	-0.946	22.870*	0.000	12.212*	0.000
BARD (C.R.) INC	27.068*	5.969*	0.328	3.868	0.145	0.249	0.618
BLOCK H & R INC	142.448*	47.673*	-0.436	5.416	0.067	4.210*	0.040
BRISTOL-MYERS SQUIBB CO	28.222*	5.591*	0.037	11.270*	0.004	7.068*	0.008
COCA-COLA CO	19.629*	1.531	0.746	9.073*	0.011	4.661*	0.031
COLGATE-PALMOLIVE CO	33.365*	10.616*	-0.425	3.625	0.163	0.688	0.407
DIONEX CORP	12.269	0.022	0.105	8.821*	0.012	0.017	0.896
EMERSON ELECTRIC CO	10.541	0.633	0.376	4.805	0.091	0.026	0.871
EQUIFAX INC	15.259*	0.050	-0.135	6.614*	0.037	0.410	0.522
GENERAL ELECTRIC CO	15.316*	1.769	0.744	10.007*	0.007	2.690	0.101
GRAINGER (W W) INC	10.990	2.359	0.501	6.583*	0.037	0.289	0.591
HEINZ (H J) CO	36.291*	6.718*	0.647	21.225*	0.000	0.323	0.570
HERSHEY CO	22.300*	2.947	-0.658	2.616	0.270	0.323	0.570
HILLENBRAND INDUSTRIES	16.695*	2.387	0.259	12.404*	0.002	0.074	0.785
ILLINOIS TOOL WORKS	16.821*	2.387	-0.052	2.994	0.224	0.303	0.582
JOHNSON & JOHNSON	14.912*	4.786*	-0.136	1.071	0.585	0.000	0.989
KELLOGG CO	10.716	3.003	0.098	1.527	0.466	0.363	0.547
LILLY (ELI) & CO	27.545*	0.487	0.540	14.625*	0.001	2.051	0.152
MARSH & MCLENNAN COS	11.409	2.804	0.564	4.195	0.123	0.448	0.503
MCDONALD'S CORP	17.219*	1.236	0.784	6.053*	0.048	0.180	0.671
MCGRAW-HILL COMPANIES	33.142*	6.767*	-0.814	3.292	0.193	0.748	0.387
3M CO	24.845*	11.807*	0.801	2.910	0.233	0.011	0.916
NEWELL RUBBERMAID INC	18.430*	2.286	0.803	13.423*	0.001	4.407*	0.036
PEPSICO INC	22.049*	4.790*	0.752	4.826	0.089	3.116	0.078
PFIZER INC	22.101*	2.312	0.400	11.717*	0.003	1.984	0.159
ALTRIA GROUP INC	16.715*	0.711	0.724	8.414*	0.015	8.414*	0.015
PITNEY BOWES INC	15.281*	2.977	0.270	9.710*	0.008	0.206	0.650
PROCTER & GAMBLE CO	23.092*	6.356*	0.917	4.453	0.108	0.004	0.949
Panel B.							
Panel Cointegration Tests	DH_G	***p*-value**	DH_P	***p*-value**	$\hat{B}_{FMOLS}$	***t*-stat**	***p*-value**
1985-2005	22.960*	0.000	28.877*	0.000	-0.530*	-34.910	0.000
Before Reg FD					-0.810*	-23.780	0.000
After Reg FD					0.290*	-15.840	0.000

Table 16
Dispersion of Forecasts before Earnings Announcements for Portfolios of Firms Sorted on Size and BE/ME

Dispersion of annual earnings forecasts before interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 45 days prior to the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. This table reports the mean and median (in brackets) values of dispersion of annual earnings forecasts before interim quarterly earnings announcements after classifying stocks into one of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year *t* – 1 over market equity of fiscal year *t*. The last column and bottom rows report mean and median (in brackets) differences between extreme portfolios and their significance levels from the corresponding t-statistics.

	Size Quintile						
BE/ME Quintile	Small	2	3	4	Big	All	Small-Big
Low	0.083***	0.044***	0.038***	0.044***	0.024***	0.050***	0.059**
	[0.035]	[0.030]	[0.025]	[0.022]	[0.016]	[0.026]	[0.019]*
2	0.058***	0.043***	0.036***	0.032***	0.024***	0.040***	0.034**
	[0.034]	[0.028]	[0.022]	[0.019]	[0.018]	[0.025]	[0.016]
3	0.074***	0.059***	0.043***	0.044***	0.032***	0.053***	0.042**
	[0.036]	[0.027]	[0.023]	[0.024]	[0.018]	[0.028]	[0.018]*
4	0.077***	0.065***	0.058***	0.082***	0.059***	0.073***	0.018*
	[0.046]	[0.029]	[0.029]	[0.031]	[0.038]	[0.032]	[0.008]
High	0.108***	0.063***	0.084***	0.089***	0.080***	0.087***	0.028**
	[0.062]	[0.037]	[0.042]	[0.035]	[0.039]	[0.040]	[0.023]*
All	0.079***	0.055***	0.052***	0.058***	0.044***	0.058***	0.035**
	[0.039]	[0.030]	[0.026]	[0.025]	[0.023]	[0.029]	[0.016]
High-Low	0.025**	0.019**	0.046**	0.045**	0.056**	0.037**	
	[0.027]**	[0.007]	[0.017]	[0.013]	[0.023]**	[0.014]	

* indicates significance at the 10 percent level ,** indicates significance at the 5 percent level and *** indicates significance at the 1 percent level.

Table 17

Dispersion of Forecasts after Earnings Announcements for Portfolios of Firms Sorted on Size and BE/ME

Dispersion of annual earnings forecasts after interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 30 days after the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. This table reports the mean and median (in brackets) values of dispersion of annual earnings forecasts after interim quarterly earnings announcements after classifying stocks into one of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year $t-1$ over market equity of fiscal year t. The last column and bottom rows report mean and median (in brackets) differences between extreme portfolios and their significance levels from the corresponding t-statistics.

	Size Quintile						
BE/ME Quintile	Small	2	3	4	Big	All	Small-Big
Low	0.083***	0.053***	0.038***	0.045***	0.027***	0.052***	0.056**
	[0.037]	[0.029]	[0.023]	[0.020]	[0.015]	[0.024]	[0.022]**
2	0.059***	0.042***	0.033***	0.033***	0.026***	0.040***	0.033**
	[0.035]	[0.027]	[0.020]	[0.021]	[0.017]	[0.025]	[0.018]*
3	0.073***	0.051***	0.041***	0.039***	0.033***	0.048***	0.040**
	[0.038]	[0.026]	[0.023]	[0.021]	[0.018]	[0.025]	[0.020]*
4	0.073***	0.068***	0.056***	0.111***	0.061***	0.084***	0.012
	[0.046]	[0.030]	[0.026]	[0.031]	[0.035]	[0.032]	[0.011]
High	0.111***	0.071***	0.079***	0.070***	0.072***	0.080***	0.039**
	[0.069]	[0.045]	[0.042]	[0.033]	[0.039]	[0.040]	[0.030]**
All	0.079***	0.057***	0.049***	0.059***	0.044***	0.058***	0.035**
	[0.040]	[0.029]	[0.025]	[0.025]	[0.022]	[0.028]	[0.018]*
High-Low	0.028**	0.018*	0.041**	0.025**	0.045**	0.028**	
	[0.032]**	[0.016]	[0.019]*	[0.013]	[0.024]**	[0.016]	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1 percent level.

Table 18

Change of Dispersion of Analyst Forecasts for
Portfolios of Firms Sorted on Size and BE/ME

Change in forecast dispersion equals the standard deviation of annual earnings forecasts issued within 45 days before the interim earnings announcement, minus the standard deviation of annual earnings forecasts issued within 30 days after the interim earnings announcement, deflated by the absolute value of the mean pre-announcement earnings forecast. This table reports the mean and median (in brackets) values of change in annual forecast dispersion after classifying stocks into one of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year *t* – 1 over market equity of fiscal year *t*. The last column and bottom rows report mean and median (in brackets) differences between extreme portfolios and their significance levels from the corresponding t-statistics.

	Size Quintile						
BE/ME Quintile	Small	2	3	4	Big	All	Small-Big
Low	0.0043	-0.0036	0.0086***	0.0028	0.0007	0.0030**	0.0036
	[0.0000]	[0.0000]	[0.0000]	[0.0009]	[0.0022]	[0.0000]	[-0.0022]
2	0.0057*	0.0031	0.0034	0.0066	0.0035	0.0051*	0.0022
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0009]	[0.0000]	[-0.0009]
3	0.0021	0.0076*	0.0047	0.0090**	-0.0030	0.0065***	0.0051
	[0.0009]	[0.0009]	[0.0009]	[0.0033]	[0.0004]	[0.0017]	[0.0005]
4	0.0080	-0.0008	0.0080	0.0325**	0.0128*	0.0161**	-0.0048
	[0.0010]	[0.0008]	[0.0009]	[0.0042]	[0.0087]	[0.0020]	[-0.0077]
High	-0.0013	-0.0006	0.0161**	0.0170	0.0133*	0.0097**	-0.0146*
	[0.0000]	[0.0021]	[0.0008]	[0.0033]	[0.0022]	[0.0019]	[-0.0022]
All	0.0038**	0.0012	0.0081***	0.0137***	0.0055**	0.0065***	-0.0017
	[0.0005]	[0.0000]	[0.0084]	[0.0018]	[0.0022]	[0.0009]	[-0.0017]
High-Low	-0.0050	0.0040	0.0075	0.0142*	0.0136*	0.0065	
	[0.0000]	[0.0021]	[0.0008]	[0.0034]	[0.0000]	[0.0019]	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1 percent level.

Table 19

Belief Jumbling in Analyst Forecasts for Portfolios of Firms Sorted on Size and BE/ME

Belief jumbling around interim earnings announcements is measured as one minus the correlation between annual earnings forecasts issued in the 45 days before the interim earnings announcement and annual earnings forecasts issued within 30 days after the interim earnings announcements. This table reports the mean and median (in brackets) values of belief jumbling after classifying stocks into one of 25 portfolios on the basis of the stocks' BE/ME and size quintiles. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year *t* – 1 over market equity of fiscal year *t*. The last column and bottom rows report mean and median (in brackets) differences between extreme portfolios and their significance levels from the corresponding t-statistics.

	Size Quintile						
BE/ME Quintile	Small	2	3	4	Big	All	Small-Big
Low	0.321***	0.391***	0.283***	0.311***	0.159***	0.324***	0.162**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2	0.401***	0.331***	0.219***	0.388***	0.334***	0.346***	0.067**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
3	0.301***	0.327***	0.376***	0.367***	0.313***	0.348***	-0.012
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
4	0.319***	0.362***	0.356***	0.383***	0.521***	0.361***	-0.202**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.615]	[0.000]	[-0.615]**
High	0.448***	0.367***	0.457***	0.494***	0.505***	0.452***	-0.057**
	[0.216]	[0.000]	[0.431]	[0.431]	[0.577]	[0.000]	[-0.361]**
All	0.359***	0.355***	0.338***	0.388***	0.369***	0.362***	-0.010
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
High-Low	0.127**	-0.024**	0.174**	0.183**	0.346**	0.128**	
	[0.216]**	[0.000]	[0.431]**	[0.431]**	[0.577]**	[0.000]	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1 percent level.

Table 20

Summary Statistics of Measures of Dispersion

Second Quarters 2000 and 2001

This table reports several measures of dispersion. Dispersion of annual earnings forecasts before interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 45 days prior to the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. Dispersion of annual earnings forecasts after interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 30 days after the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. Change in forecast dispersion equals the standard deviation of annual earnings forecasts issued within 45 days before the interim earnings announcement, minus the standard deviation of annual earnings forecasts issued within 30 days after the interim earnings announcement, deflated by the absolute value of the mean pre-announcement earnings forecast. Belief jumbling around interim earnings announcements is measured as one minus the correlation between annual earnings forecasts issued in the 45 days before the interim earnings announcement and annual earnings forecasts issued within 30 days after the interim earnings announcements. Panel A shows the mean values of the measures of dispersion for all stocks in the entire sample. Panel B shows the mean values of the measures of dispersion for growth stocks, while Panel C shows the mean values of measures of dispersion for value stocks. Each firm must have at least four analysts. For all panels "change" measures the mean difference after Reg FD adoption. The *p*-values are two-sided from *t*-statistics of mean-differences. "NOBS" designates the number of observation for each panel.

Summary Statistics on Measures of Disagreement

A. All Stocks		Forecast Dispersion before Announcement	Forecast Dispersion after Announcement	Change of Forecast Dispersion	Belief Jumbling
Quarter	NOBS	Mean	Mean	Mean	Mean
II 2000	305	0.067	0.062	0.015	0.831
II 2001	274	0.088	0.084	0.026	0.852
Change		0.021**	0.022**	0.010**	0.021
p-value		0.009	0.044	0.007	0.178
B. Growth					
Quarter	NOBS				
II 2000	101	0.056	0.053	0.012	0.846
II 2001	91	0.057	0.063	0.009	0.847
Change		0.001	0.010	-0.003	0.001
p-value		0.458	0.208	-0.343	0.488
C. Value					
Quarter	NOBS				
II 2000	102	0.077	0.070	0.015	0.791
II 2001	91	0.125	0.116	0.043	0.891
Change		0.048**	0.045**	0.028**	0.010**
p-value		0.008	0.009	0.020	0.004

** indicates significance at the 5 percent level.

Table 21

Summary Statistics of Measures of Dispersion
Second Quarters 2000 and 2002

This table reports several measures of dispersion. Dispersion of annual earnings forecasts before interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 45 days prior to the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. Dispersion of annual earnings forecasts after interim quarterly earnings announcements equals the standard deviation of all analysts' forecasts of annual earnings issued within 30 days after the interim earnings announcement, scaled by the absolute value of the mean annual earnings forecasts. Change in forecast dispersion equals the standard deviation of annual earnings forecasts issued within 45 days before the interim earnings announcement, minus the standard deviation of annual earnings forecasts issued within 30 days after the interim earnings announcement, deflated by the absolute value of the mean pre-announcement earnings forecast. Belief jumbling around interim earnings announcements is measured as one minus the correlation between annual earnings forecasts issued in the 45 days before the interim earnings announcement and annual earnings forecasts issued within 30 days after the interim earnings announcements. Panel A shows the mean values of the measures of dispersion for all stocks in the entire sample. Panel B shows the mean values of the measures of dispersion for growth stocks, while Panel C shows the mean values of measures of dispersion for value stocks. Each firm must have at least four analysts. For all panels "change" measures the mean difference after Reg FD adoption. The *p*-values are two-sided from *t*-statistics of mean-differences. "NOBS" designates the number of observation for each panel.

Summary Statistics on Measures of Disagreement

		Forecast Dispersion before Announcement	Forecast Dispersion after Announcement	Change of Forecast Dispersion	Belief Jumbling
A. All Stocks					
Quarter	NOBS	Mean	Mean	Mean	Mean
II 2000	305	0.067	0.062	0.015	0.831
II 2002	323	0.070	0.068	0.009	0.868
Change		0.004	0.007	-0.006	0.037*
p-value		0.314	0.171	0.131	0.077
B. Growth					
Quarter	NOBS				
II 2000	101	0.056	0.053	0.012	0.846
II 2002	107	0.047	0.053	0.003	0.873
Change		-0.009	0.000	-0.009*	0.028
p-value		0.147	0.496	0.091	0.276
C. Value					
Quarter	NOBS				
II 2000	102	0.077	0.070	0.015	0.791
II 2002	108	0.100	0.088	0.019	0.874
Change		0.023*	0.018	0.004	0.083**
p-value		0.092	0.107	0.347	0.034

* indicates significance at the 10 percent level and ** indicates significance at the 5 percent level.

Table 22

Annual Returns for Different BE/ME Portfolios: Return Period 1999 - 2004

At the end of the second quarter, of each year *t*, 5 quintile portfolios are formed on the basis of book-to-market ratios (BE/ME). BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year *t* – 1 over market equity of fiscal year *t*. The equal-weighted annual portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Average annual return is the time-series average of the annual equally-weighted portfolio returns (in percentages) for each year in the formation period from 1998 to 2003. The CRSP-EW column shows the average monthly return for the equal-weighted CRSP portfolio. The All column shows the average monthly return for equal-weighted portfolios in each year. The High-Low column shows the difference in average monthly returns between the high BE/ME group and the low BE/ME group. The All row shows the average monthly return for equal-weighted portfolios of the stocks in each BE/ME group.

			Book-to-Market Portfolios					
	CRSP-EW	All	Low	2	3	4	High	High-Low
All			1.300	2.418	4.443	5.749	4.897	3.597
1999	19.526	3.350	11.320	11.860	-3.230	0.991	-4.150	-15.470
2000	-10.139	-8.860	-9.610	-15.100	-4.320	-4.030	-10.100	-0.490
2001	-13.043	-6.780	-13.600	-7.030	-3.940	-6.240	-3.090	10.510
2002	-23.366	-17.600	-29.700	-20.700	-12.400	-12.300	-12.700	17.000
2003	26.380	30.800	27.160	29.490	32.870	34.550	29.760	2.600
2004	8.993	21.400	22.230	15.990	17.680	21.520	29.660	7.430

Table 23

Annual Returns for Different BE/ME Portfolios and Factor Variables: Return Period 1999 - 2004

At the end of the second quarter, of each year *t*, 5 quintile portfolios are formed on the basis of book-to-market ratios (BE/ME. BE/ME is the book value of common equity plus balance sheet deferred taxes for December of year *t* – 1 over market equity of fiscal year *t*. The equally-weighted monthly portfolios are then calculated for January of year *t* +1 to December of year *t* +1. Average annual return is the time-series average of the annual equally-weighted portfolio returns (in percentages) for each year in the formation period from 1998 to 2003 for all BE/ME groups. The DISPRE column shows the average time-series return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio. The DISPOST column shows the average time-series return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio. The CHANGE column shows the average time-series return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, the JUMBLING column shows the average time-series return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts.

	Book-to-Market Portfolios						Variables			
	All	Low	2	3	4	High	DISPRE	DISPOST	CHANGE	JUMBLING
All	3.718	1.300	2.418	4.443	5.749	4.897	-1.807	-1.111	-1.248	-1.898
1999	3.350	11.320	11.860	-3.230	0.991	-4.150	-28.655	-27.103	-5.767	-8.863
2000	-8.860	-9.610	-15.100	-4.320	-4.030	-10.100	11.204	12.258	-1.611	1.611
2001	-6.780	-13.600	-7.030	-3.940	-6.240	-3.090	6.898	9.286	-0.820	0.631
2002	-17.600	-29.700	-20.700	-12.400	-12.300	-12.700	11.937	8.983	4.576	-3.669
2003	30.800	27.160	29.490	32.870	34.550	29.760	-10.227	-9.700	-3.178	0.338
2004	21.400	22.230	15.990	17.680	21.520	29.660	-1.996	-0.389	-0.686	-1.437

Table 24

Correlation Matrix for Factor Variables: January 1999 - December 2004

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable over different time-periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + xDISPOST(t) + yCHANGE(t) + jJUMBLING(t) + e(t)$.

The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts. The table shows the Pearson correlation coefficients and the *t*-stats of the null hypothesis where the correlation coefficient is zero.

	MKTRF	SMB	HML	DISPRE	DISPOST	CHANGE	JUMBLING
RMF	1	0.238**	-0.536**	-0.672**	-0.665**	-0.219*	-0.293**
		(0.044)	(0.000)	(0.000)	(0.000)	(0.065)	(0.012)
SMB		1	-0.562**	-0.493**	-0.521**	0.024	-0.022
			(0.000)	(0.000)	(0.000)	(0.841)	(0.855)
HML			1	0.617**	0.640**	0.084	0.118
				(0.000)	(0.000)	(0.485)	(0.323)
DISPRE				1	0.967**	0.339**	0.300**
					(0.000)	(0.004)	(0.011)
DISPOST					1	0.244**	0.296**
						(0.039)	(0.012)
CHANGE						1	0.054
							(0.651)
JUMBLING							1

* indicates significance at the 10 percent level and ** indicates significance at the 5 percent level.

Table 25

Cross-Section Regression of Returns on Specific Factors for BE/ME Groups with Different Model Specifications: Formation Period 1998 - 2003

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The table shows the slope coefficients and their corresponding *t*-statistics for all stocks from 1998-2003 for asset-pricing model:

$$R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + xDISPOST(t) + yCHANGE(t) + jJUMBLING(t) + e(t).$$

The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts.

Full Sample	a	bRMF	sSMB	hHML	rDISPRE	xDISPOST	yCHANGE	jJUMBLING	Adjusted R^2
All Stocks	-0.005**	1.032***	0.156***	0.721***	-0.335***		0.001	0.065	0.8843
1998-2003	(-2.13)	(17.02)	(2.91)	(11.38)	(-3.50)		(0.01)	(0.69)	
	-0.004**	1.031***	0.152***	0.729***		-0.313***	-0.070	0.066	0.8858
	(-2.04)	(17.23)	(2.85)	(11.50)		(-3.65)	(-0.53)	(0.70)	
	-0.005**	1.134***	0.225***	0.667***			-0.174	-0.007	0.8645
	(-1.97)	(19.68)	(4.19)	(10.03)			(-1.24)	(-0.07)	
	-0.005**	1.027***	0.159***	0.718***	-0.322***				0.8869
	(-2.19)	(17.27)	(3.08)	(11.53)	(-3.73)				

** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

Table 26

SUR Regression of Returns on Specific Factors for BE/ME Groups with Different Model Specifications: Return Period 1999 - 2004

SUR regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts. Panel A shows the slope coefficients and their corresponding *t*-statistics for 5 BE/ME stock groups from 1999-2004 for asset-pricing model: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + e(t)$. Panel B shows the slope coefficients and their corresponding *t*-statistics for 5 BE/ME stock groups from 1999-2004 for asset-pricing model: $R(t) - R_f(t) = a + bRMF(t) + rDISPRE(t) + e(t)$. Statistic [a] and statistic [b] correspond to the test value for the null hypothesis that all intercepts are jointly equal to zero with corresponding *p*-values in brackets.

Panel A.	a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Low	-0.002	1.231***	0.140*	0.206**		0.8010
	(-0.56)	(15.05)	(1.74)	(2.06)		
2	-0.006**	1.163***	0.340***	0.561***		0.8307
	(-1.97)	(17.67)	(5.24)	(6.97)		
3	-0.005*	1.151***	0.191***	0.827***		0.7986
	(-1.65)	(16.78)	(2.83)	(9.86)		
4	-0.003	1.138***	0.182***	0.841***		0.7749
	(-1.11)	(15.62)	(2.53)	(9.44)		
High	-0.006**	1.062***	0.244***	0.896***		0.7767
	(-2.08)	(15.44)	(3.61)	(10.65)		
SUR	4.32[a] **					
H0: a=0	(0.04)					

Panel B.	a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Low	-0.002	1.117***	0.083	0.254***	-0.302**	0.8114
	(-0.65)	(11.71)	(1.00)	(2.55)	(-2.18)	
2	-0.006**	1.009***	0.263***	0.625***	-0.406***	0.8601
	(-2.30)	(14.08)	(4.23)	(8.34)	(-3.91)	
3	-0.005*	1.057***	0.144**	0.867***	-0.249**	0.8086
	(-1.77)	(13.20)	(2.08)	(10.33)	(-2.14)	
4	-0.004	1.000***	0.113*	0.899***	-0.364***	0.7994
	(-1.28)	(12.14)	(1.58)	(10.43)	(-3.05)	
	-0.006**	0.953***	0.190***	0.942***	-0.289**	0.7929
High	(-2.24)	(12.01)	(2.76)	(11.34)	(-2.51)	
SUR	5.03[b] **					
H0: a=0	(0.03)					

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

Table 27

Cross-Section Regression of Returns on Specific Factors for All Stocks with Different Model Specifications: Formation Period 1998 - 2003

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The explicit multi-factor asset pricing model is: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts. The table shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1998-2003 for four different model specifications. Statistic [a] corresponds to the test value of the Chow test for the null hypothesis of no structural break at a known location. The corresponding *p*-value of the Chow statistic is shown in brackets.

Full Sample	a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
All Stocks	-0.004**	1.149***	0.220***	0.667***		0.8654
1998-2003	(-1.89)	(21.20)	(4.12)	(10.06)		
	0.002	0.847***			-0.026	0.6660
	(0.57)	(8.74)			(-0.21)	
	0.001				-0.779***	0.3065
	(0.28)				(-5.69)	
	-0.005**	1.027***	0.159***	0.718***	-0.322***	0.8869
	(-2.19)	(17.27)	(3.08)	(11.53)	(-3.73)	
Two Sample	$H_0 : \beta_0 = \beta_1$					3.97[a] ***
Chow Test						(0.003)

** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

Table 28

Cross-Section Regression of Returns on Specific Factors for All Stocks with Different Model Specifications in Different Time Periods: Formation Period 1998 - 2003

Cross-sectional regressions are run with the excess one-year returns (average raw return minus the risk-free rate) as the dependent variable. The explicit multi-factor asset pricing model is: $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre-and post announcement dispersions of earnings forecasts. Panel A shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1999-2004 for four different model specifications before the introduction of Reg FD. Panel B shows the slope coefficients and their corresponding *t*-statistics for the full sample of stocks from 1998-2003 for four different model specifications after the introduction of Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Pre-FD	A1.	-0.007*	1.183***	0.252***	0.760***		0.8138
1998-2000		(-1.80)	(12.36)	(3.22)	(7.11)		
	A2.	-0.001	0.707***			0.055	0.5070
		(-0.16)	(4.81)			(0.27)	
	A3.	-0.005				-0.584***	0.1863
		(-0.72)				(-3.00)	
	A4.	-0.009**	1.050***	0.165**	0.832***	-0.452***	0.8565
		(-2.55)	(11.23)	(2.23)	(8.63)	(-3.24)	

Panel B.		a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Post-FD	B1.	-0.001	1.105***	0.391***	0.239**		0.9446
2001-2003		(-0.55)	(21.81)	(5.06)	(2.52)		
	B2.	0.004	1.062***			-0.113	0.8850
		(1.28)	(10.96)			(-0.93)	
	B3.	0.009				-1.056***	0.4823
		(1.45)				(-5.80)	
	B4.	-0.001	1.046***	0.360***	0.294***	-0.124	0.9459
		(-0.46)	(15.70)	(4.50)	(2.87)	(-1.34)	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

Table 29

Cross-Section Regression of Returns on Specific Factors for Growth Stocks with Different model Specifications in Different Time Periods: Formation Period 1998 - 2003

Cross-sectional regressions are run with the excess one-year growth stock returns (average raw return minus the risk-free rate) as the dependent variable over the pre-and post FD time periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre- and post announcement dispersions of earnings forecasts. Panel A reports the slope coefficients and their *t*-statistics for growth stocks before the introduction of Reg FD, while Panel B shows the slope coefficients and the *t*-statistics for growth stocks after Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Pre-FD	A1.	-0.002	1.276***	0.256**	0.396**		0.7434
1998-2000		(-0.42)	(8.51)	(2.08)	(2.36)		
	A2.	0.001	0.962***			-0.194	0.7123
		(0.11)	(6.42)			(-0.94)	
	A3.	-0.005				-1.064***	0.3721
		(-0.61)				(-4.66)	
	A4.	-0.004	1.177***	0.190*	0.450**	-0.337	0.7503
		(-0.64)	(7.16)	(1.46)	(2.65)	(-1.37)	
Panel B.		**a**	**bRMF**	**sSMB**	**hHML**	**rDISPRE**	**Adjusted R^2**
Post-FD	B1.	0.000	1.253***	0.164*	-0.398***		0.9271
2001-2003		(0.04)	(18.53)	(1.59)	(-3.15)		
	B2.	-0.001	1.208***			-0.211*	0.9129
		(-0.30)	(12.30)			(-1.71)	
	B3.	0.005				-1.283***	0.5279
		(0.72)				(-6.34)	
	B4.	0.000	1.226***	0.149	-0.372**	-0.059	0.9253
		(0.07)	(13.44)	(1.36)	(-2.66)	(-0.46)	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

Table 30

Cross-Section Regression of Returns on Specific Factors for Value Stocks with Different Model Specifications in Different Time Periods: Formation Period 1998 - 2003

Cross-sectional regressions are run with the excess one-year value stock returns (average raw return minus the risk-free rate) as the dependent variable over the pre-and post FD time periods. The explicit multi-factor asset-pricing model is $R(t) - R_f(t) = a + bRMF(t) + sSMB(t) + hHML(t) + rDISPRE(t) + e(t)$. The independent variables are: RMF, excess return (in excess of the risk-free rate) of the value-weighted market portfolio, SMB, the return on an arbitrage (zero-investment) portfolio consisting of the return on the big-company portfolio subtracted from the return on the small-company portfolio, HML, the return on an arbitrage portfolio of high book-to-market ratio (BE/ME) stocks minus the return on the portfolio of low BE/ME stocks, DISPRE, the return of a portfolio consisting of the return of high pre-announcement dispersion of earnings forecasts minus the return on a low pre-announcement dispersion of earnings forecasts portfolio, DISPOST, the return of a portfolio consisting of the return of high post-announcement dispersion of earnings forecasts minus the return on a low post-announcement dispersion of earnings forecasts portfolio, CHANGE, the return of a portfolio consisting of the return of high difference in pre-and post announcement dispersion of earnings forecasts minus the return on a low difference in pre-and post announcement dispersion of earnings forecasts, and, JUMBLING, the return of a portfolio consisting of the return of highly correlated pre-and post announcement dispersions of earnings forecasts minus the return on the lowest correlated pre- and post announcement dispersions of earnings forecasts. Panel A reports the slope coefficients and their *t*-statistics for value stocks before the introduction of Reg FD, while Panel B shows the slope coefficients and the *t*-statistics for value stocks after Reg FD.

Panel A.		a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Pre-FD	A1.	-0.010**	1.031***	0.208**	0.879***		0.6822
1998-2000		(-2.18)	(8.59)	(2.11)	(6.55)		
	A2.	-0.003	0.578***			0.324	0.2182
		(-0.42)	(3.25)			(1.33)	
	A3.	-0.007				-0.199	-0.0023
		(-0.83)				(-0.96)	
	A4.	-0.011**	0.950***	0.154*	0.923***	-0.274*	0.6914
		(-2.41)	(7.22)	(1.48)	(6.79)	(-1.40)	

Panel B.		a	bRMF	sSMB	hHML	rDISPRE	Adjusted R^2
Post-FD	B1.	-0.002	1.025***	0.477***	0.637***		0.8707
2001-2003		(-0.51)	(13.33)	(4.06)	(4.43)		
	B2.	0.007*	0.907***			-0.174	0.7068
		(1.49)	(5.90)			(-0.90)	
	B3.	0.011*				-0.979***	0.4156
		(1.74)				(-5.09)	
	B4.	-0.001	0.868***	0.393***	0.785***	-0.333**	0.8891
		(-0.38)	(9.15)	(3.45)	(5.39)	(-2.51)	

* indicates significance at the 10 percent level, ** indicates significance at the 5 percent level and *** indicates significance at the 1% level.

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