Do Analysts Practice What They Preach and Should Investors Listen?

Effects of Recent Regulations

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ABSTRACT: From 1994 to 1998, Bradshaw (2004) finds that analysts' stock recommendations relate *negatively* to residual income valuation estimates but *positively* to valuation heuristics based on the price-to-earnings-to-growth ratio and long-term growth. These results are surprising, especially considering that future returns relate positively to residual income valuation estimates and negatively to heuristics. Using a large sample of analysts for the 1993-2005 period, we consider whether recent regulatory reforms affect this apparent inconsistent analyst behavior. Consistent with the intent of these reforms, we find that the negative relation between analysts' stock recommendations and residual income valuations is diminishing following regulations. We also show that residual income valuations, developed using analysts' earnings forecasts, relate more positively with future returns. However, we document that stock recommendations continue to relate negatively with future returns. We conclude that recent regulations have affected analysts' outputs – forecasted earnings and stock recommendations – but investors should be aware that factors other than identifying mispriced stocks continue to influence how analysts recommend stocks.

Keywords: Stock recommendations, residual income valuations, valuation heuristics, future returns, regulations.

Data Availability: All data are available from public sources.

I. INTRODUCTION

Using an extensive sample of sell-side financial analysts, we first examine how Regulation Fair Disclosure (Reg FD) and other recent regulatory reforms (e.g., NASD Rule 2711, NYSE Rule 472, and the Global Research Analysts Settlement) affect the relation between analysts' stock recommendations and (1) theoretically-derived residual income models versus (2) valuation heuristics based on the price-to-earnings to growth (PEG) ratios and long-term growth (LTG) forecasts. Our second set of tests involves one-year-ahead excess stock returns. We examine the impact of regulations on relation between future returns and (1) stock recommendations, (2) residual income models, and (3) valuation heuristics. Finally, we consider the extent to which residual income models and valuation heuristics are incremental to stock recommendations in explaining future returns after regulations are implemented.

This research is important because it speaks directly to an issue of great interest to investors and regulators: To what extent do regulations impact financial information provided by an important user group (i.e., financial analysts)? Given the widespread availability of financial analysts' earnings forecasts and stock recommendations, our results have practical importance to the investment community and regulators, as well as implications for academic research. While our first set of tests provides understanding of how analysts incorporate their own earnings forecasts into their stock recommendations, our tests of future returns have direct importance to investors. Furthermore, given the historical problems associated with stock recommendations, the extent to which valuation estimates (based on analysts' earnings forecasts) provide explanatory power beyond stock recommendations for future returns will be particularly important to investors.[1]

[1] We do not suggest that all investors use both analysts' earnings forecasts and stock recommendations when making investment decisions. Sophisticated investors may use analysts' earnings forecasts and ignore their stock

Presumably, analysts use their own publicly issued earnings forecasts to derive intrinsic value estimates. In this case, one should expect these estimates to relate to analysts' stock recommendations (e.g., Schipper 1991). When earnings-based intrinsic value estimates are above (below) the current stock price, analysts would issue a buy (sell) recommendation. If instead, analysts' recommendations are based on other factors (beyond sophisticated earnings-based valuation estimates), then valuation estimates may provide incremental explanatory power beyond recommendations for future stock performance.

In an interesting recent study, Bradshaw (2004) uses a sample of U.S. firms from 1994 to 1998 and finds that residual income valuations, developed using analysts' earnings forecasts, do not relate as expected with analysts' recommendations. Analysts give more favorable recommendations to stocks with lower residual income valuations relative to current price.[2] Instead, analysts' recommendations align more closely with their LTG forecasts and the PEG ratio. These findings suggest that analysts give the highest recommendations to growth stocks, and among growth stocks, they give the highest recommendations to the firms for which the value of growth estimated by the PEG model exceeds the current stock price. Bradshaw (2004) concludes that analysts rely on simple heuristics rather than more sophisticated residual income valuations to recommend stocks.[3]

Bradshaw (2004) also finds that residual income valuations, developed using analysts' earnings forecasts, relate *positively* to future excess stock returns. In other words, analysts'

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recommendations. Unsophisticated investors may be more likely to rely on analysts' stock recommendations, which require minimal analytical processing. As an example, Bonner et al. (2003) find that sophisticated investors have greater knowledge of the analyst- and forecast-specific factors that predict forecast accuracy, and they use these factors to predict the relative accuracy of analysts' forecast revisions.

[2] In certain specifications, Bradshaw (2004) finds no relation between residual income valuations and stock recommendations.

[3] These results are consistent with those in Gleason et al. (2007) who conclude that analysts rely on simple heuristics rather than formal valuation models in setting price targets. Bradshaw and Brown (2005) conclude that analysts face greater incentives to provide accurate earnings forecasts than target prices.

earnings forecasts are useful inputs into residual income valuation models, yet they tend to relate negatively or insignificantly to analysts' stock recommendations. Furthermore, LTG forecasts, which most closely align with analysts recommendations, relate *negatively* to future returns. It seems that analysts recommend stocks with strong growth potential, even if such potential is already impounded into the stock price. Consistent with these results, Bradshaw (2004) shows that stock recommendations are not significantly associated with buy-and-hold one-year future returns.[4] Recommendations do not appear to capture stocks' intrinsic values relative to their current prices.

Why do analysts appear to avoid using their valuable earnings forecasts in a sophisticated manner in setting their recommendations (i.e., fail to practice what they preach)? This surprising result makes this area of research interesting and motivates further examination of the link between valuation estimates and recommendations, and their relations to future stock returns. It could be that analysts have incentives other than using their recommendations to signal mispriced stocks. In fact, analyst behavior has received wide-spread criticism in the financial press and several groups have called for reforms to the analyst industry.[5] We examine how recent regulations (e.g., Reg FD, NASD Rule 2711, NYSE Rule 472, and the Global Research Analysts Settlement) affect the way valuation estimates map into recommendations and subsequently relate to future stock returns. Specifically, we test for differences in these relations between the 1993-1999 and 2000-2005 periods to determine the impact of Reg FD. Then, we tests for differences between the 2000-2002 and 2003-2005 periods to test for effects of other regulations.

[4] Other recent studies find mixed results on the usefulness of stock recommendations (Womack 1996; Barber et al. 2001, 2003; Mikhail et al. 2004; Li 2005; Gleason et al. 2007).
[5] Boni and Womack (2002) provide a useful overview of these issues and list many references to both practitioner and research articles.

Our results show that several important relations change across the regulation periods, while some interesting relations seem unaffected by the regulations. Prior to Reg FD, we find results generally consistent with Bradshaw (2004), even though our sample is substantially larger than his. Following Reg FD, we show that the negative relation between recommendations and residual income valuations becomes significantly smaller and even turns positive for one of our models. However, this change appears to be attributable primarily to regulations other than Reg FD. LTG forecasts continue to have a positive relation with recommendations in the post-Reg FD period, but the relation is weaker. PEG valuations have an increasingly positive relation with stock recommendations over our regulatory period.

In our next set of tests, we examine how valuations and recommendations relate to future stock returns. Like Bradshaw (2004), we find that residual income valuations relate positively to future returns. This relation becomes more positive following Reg FD. Furthermore, the increasing positive relation appears attributable to Reg FD as we find no evidence of an impact of other regulations. We find that the relation between LTG forecasts and future stock returns is significantly negative in the pre-Reg FD period and immediately following Reg FD. After regulations subsequent to Reg FD, LTG and future stock returns become slightly less negatively related. Finally, and perhaps of greatest interest to investors, stock recommendations have a significantly *negative* relation with future stock returns. Even though analysts' earnings forecasts are useful (in residual income valuation models) for predicting stock performance, their recommendations seem to predict the opposite performance. We find that the negative relation between recommendations and future stock performance persists after Reg FD but subsequent regulations have significantly reduced this negative relation. Overall, we conclude that regulatory reforms seem to be adjusting analysts' outputs (i.e., earnings forecasts and stock

recommendations) in the expected direction, but the adjustment may be incomplete. Reg FD has played a greater role in increasing the usefulness of earnings forecasts, whereas regulations subsequent to Reg FD have had a greater effect on stock recommendations.

In the next section we summarize the related literature and discuss our framework for analyzing the analyst/investor relation, highlight objectives of recent regulations (and discuss some research findings related to these regulations), and present our hypotheses. In Section III we briefly describe the valuation models, and in Section IV we discuss our sample selection and descriptive statistics. Section V provides our main empirical findings as well as results from additional analyses. Section VI concludes.

II. PRIOR RESEARCH AND HYPOTHESES

In this section, we first describe the framework in which we analyze the analyst/investor relation. Then we focus on identifying factors that can affect this relation when examining analysts before and after recent regulatory reforms. Finally, we present our hypotheses.

Analyst/Investor Relation

Schipper (1991) encourages research to help better understand how earnings forecasts relate to stock recommendations. She argues that forecasts should be viewed as an input into producing a final output (i.e., a recommendation) and not just a standalone final output. We expect the following relations between analysts and investors. First, analysts gather firm-specific, industry-specific, and economy-wide information to generate earnings forecasts. Next, analysts input these earnings forecasts into a valuation model to compute an intrinsic value of the firm. Then, analysts issue recommendations based on comparing estimates from these valuation

models with current stock prices. When the model indicates an intrinsic value above (below) the current price, analysts will issue a buy (sell) recommendation. Investors then adjust prices for the analyst's recommendation. If the academic research correctly identifies the analyst's *unobservable* valuation model, then a positive relation between valuation estimates and *observable* stock recommendations is expected.

Bradshaw (2004) examines whether valuation estimates based on analysts' earnings forecasts are consistent with their stock recommendations. He considers two residual income models, the PEG model, and LTG forecasts.[6] All valuation estimates rely on analysts' earnings forecasts. Perhaps surprisingly, he finds that residual income valuations are either unrelated to or *negatively* related to recommendations. But, these valuations are *positively* associated with future stock performance.[7] In addition, he finds that recommendations are *unrelated* to future stock performance.[8] From this evidence, one concludes that analysts' earnings forecasts provide useful information to investors for predicting future stock performance but analysts' recommendations do not. In other words, analysts do not appear to practice (recommend) what they preach (forecast). Our primary objective is to investigate the effects of recent regulations affecting analysts' work environments on the above relations.

Mitigating Factors

Several factors provide possible explanations for Bradshaw's surprising results. For example, after issuing an earnings forecast, the analyst might not employ rigorous valuation

[6] Details on these four models appear in Section III.
[7] Frankel and Lee (1998) also find a positive relation between residual income valuations and future stock performance.
[8] Womack (1996) and Barber et al. (2001) find that recommendation changes are associated with future stock returns. Other recent studies find mixed results on the usefulness of stock recommendations (Barber et al. 2003; Mikhail, Walther, and Willis 2004; Li 2005; Gleason et al. 2007). The combined evidence suggests that analysts' earnings forecasts provide useful information for measuring intrinsic values but that analysts' recommendations do not. Barber et al. (2006) suggest that market prices react slowly to the information contained in recommendations.

models but instead rely on simple heuristics, whereas investors rely on more sophisticated residual income models. Bradshaw finds evidence consistent with LTG forecasts being the most important determinant of stock recommendations, regardless of the degree to which these expectations are already impounded in stock prices. These results suggest that analysts tend to rely on valuation heuristics to a greater extent than on more "theoretically driven" residual income models. These archival results are consistent with findings in broad surveys of analysts (e.g., Barker 1999; Block 1999) as well as detailed analyses of small samples of research reports (e.g., Bradshaw 2002). Bradshaw (2002) examines 103 U.S. analyst reports and finds that analysts frequently support their stock recommendations with a PEG model. Asquith et al. (2005) investigate *Institutional Investor* "All American" analysts, presumably the most sophisticated analysts, and find that only 13 percent of their reports refer to discounted cash flows in formulating price targets. Results in Gleason et al. (2007) are also consistent with analysts' use of simple heuristics rather than more rigorous residual income models.

In addition, in setting their recommendations, analysts may consider factors other than the intrinsic value estimates relative to current stock prices. Rather than maximizing gains to investors, analysts may be serving personal objectives, such as increasing their compensation, improving relations with management, garnering investment banking business for the brokerage firm, "hyping" the stock to garner brokerage trading volumes, and increasing the value of shares personally owned (e.g., Lin and McNichols 1998; Michaely and Womack 1999, 2005; Ertimur et al. 2007; Ke and Yu 2007). For example, Gimein (2002) claims that investment advice offered by analysts is "so dishonest and fraught with conflicts of interest that it has become worthless" (see also Heflin et al. 2003). As evidence of this, prior research demonstrates that affiliated analysts (i.e., those having direct investment banking business with the firm) issue more

optimistic forecasts (Dugar and Nathan 1995; Lin and McNichols 1998; Dechow, Hutton, and Sloan 2000). Das, Levine, and Sivaramakrishnan (1998) and Lim (2001) suggest that forecast optimism is used to increase access to management, especially in cases where the information asymmetry between management and investors is high.[9]

If stock recommendations are set based on incentives other than (only) identifying mispriced stocks, then the relation between stock recommendations and future stock performance is expected to be low or even negative. This may further explain why Bradshaw (2004) finds no significant relation between the level of analyst recommendations and future annual excess returns during his 1994-1998 sample period.[10] These alternative motivations are certainly consistent with the well-documented optimistic bias in analysts' stock recommendations.[11]

Regulatory Reforms

In recent years several important developments in the regulatory environment have affected sell-side financial analysts, and these reforms have the potential to significantly change analysts' incentives or behavior and therefore their output (e.g., earnings forecasts and stock recommendations). Our study tests whether relations between recommendations and valuation

[9] Francis et al. (2004) provide an in-depth review of the evidence on security analyst independence and conclude that there is strong evidence that U.S. analysts behave in a biased manner. Using the tests in Bradshaw (2004), Barniv et al. (2008) investigate common law versus code law countries and conclude that analyst bias is more pervasive in common law countries. This result is consistent with analysts' stock recommendations in common law countries being affected more by factors other than identifying mispriced stocks.

[10] Jegadeesh et al. (2004) find that recommendation levels are positively related to subsequent returns only for firms with favorable quantitative characteristics such as value stocks and positive momentum stocks. Womack (1996) and Barber et al. (2001) examine changes in analysts' recommendations and conclude that these are positively associated with future excess returns. In this paper, we choose to follow Bradshaw (2004) and Jegadeesh et al. (2004) and examine recommendation levels. First, we want to be able to compare our results with those in Bradshaw (2004). Second, we want to examine recommendations the way a non-computer generated trading investor would process recommendations. Such an investor would find a stock, check out the outstanding recommendations, and then buy/not buy/sell.

[11] For example, Jegadeesh et al. (2004) report that approximately 80 percent of the recommendations are Buy or Strong Buy, and only five percent are Sell or Strong Sell.

estimates are affected by changes in the regulatory environment over time and thus sheds light on whether potential changes in the relations are consistent with the objectives of the reforms.

Reg FD, issued by the Securities and Exchange Commission (SEC) in October 2000, prohibits firms from selectively disclosing management information to analysts. The purpose of the reform was to level the playing field by giving all equal access to material information released by management. Some contend that prior to Reg FD, analysts would purposely bias their earnings forecasts to gain favor with management, thereby allowing easier access to inside information or investment banking business. If Reg FD eliminates the ability to gain privileged information, then one motivation for providing purposely biased earnings forecasts has been eliminated, presumably leading to improved usefulness of earnings forecasts.

Herrmann et al. (2008) find evidence to support this notion.[12] They conclude that Reg FD reduces the incentive for analysts to provide optimistically biased forecasts of internationally diversified firms, potentially improving the quality of analyst forecasts and the decisions of investors based on those forecasts. Others may argue that Reg FD has not led to improved earnings forecasts. Some research suggests that forecast accuracy decreases and forecast dispersion increases following Reg FD (e.g., Bailey et al. 2003; Agrawal et al. 2006). Based on their findings, Agrawal et al. (2006) conclude that a reduction has occurred in both selective guidance and the quality of analyst forecasts after Reg FD. Thus, although the intent of Reg FD is clear and should indicate a strengthened association between analysts' earnings forecasts and their stock recommendations, there is mixed empirical evidence regarding the possible effects of Reg FD on analysts' work environment and their earnings forecasts.

[12] Using the extent of a multinational firm's international operations to proxy for analysts' need to gather privileged information from management, Herrmann et al. (2008) show that the relation between forecast bias (optimism) and international diversification significantly declines (and even disappears) in the post-Reg FD period.

In addition to Reg FD, other recent regulatory reforms also potentially impact the output of financial analysts. Because of huge investor losses as a result of the crash of technology stocks between 2000 and 2002, regulators came under pressure to "fix" analysts' research reports. It was analysts' overly optimistic research reports that were often cited as a key factor leading to the run up of security prices in the late 1990's. For example, by the end of 1999, less than one percent of analysts provided "sell" recommendations (Bogle 2002). The investing public argued that analysts employed by brokerage firms that offered both investment banking business and research reports faced a conflict of interest. The conflict arose because in an attempt to maintain investment banking business for the brokerage firm, analysts faced pressure to provide favorable research reports (i.e., buy recommendations) instead of providing objective research to the investment community. As a result of these criticisms, regulators proposed NASD Rule 2711 (Research Analysts and Research Reports) and an amendment to NYSE Rule 472 (Communications with the Public) in 2002. In general, the proposed regulatory changes were directed at limiting interactions and flow of information between analysts who provide recommendation reports and the investment banking business of the brokerage firm.[13] These proposals were formally accepted by the SEC on July 29, 2003.[14]

In December, 2002, the SEC announced the Global Research Analyst Settlement which was enforced in April, 2003. Here, the SEC reached a legal settlement with the New York Attorney General, NASD, NYSE, state regulators, and ten of the top U.S. investment firms. The

[13] For a complete description of the rules see "www.nyse.com/pdfs/rule472.pdf" for NYSE Rule 472 (2002) and "finra.complinet.com/finra/display/display.html?rbid=1189&element_id=1159000466" for NASD Rule 2711 (2002).

[14] Rule 2711 covers restrictions on relationships between the investment banking and research departments, restrictions on review of a research report by the subject company, prohibition of certain forms of research analyst compensation, prohibition of promise of favorable research, restrictions on personal trading by research analysts, and disclosure requirements. This rule was introduced on May 10, 2002, but its implementation was subsequently delayed several times (SEC 2002). It seems likely that the mere "threat" of its implementation could have an effect on analyst behavior.

settlement describes how analysts from leading banks provided misleading information to investors, allegedly because of investment banking incentives.[15] In particular, the settlement discloses that analysts issued positive public information that conflicted with their negative views about the stock (De Franco et al. 2007). In other words, as discussed above, investment banking incentives can lead to misleading analyst behavior.[16]

There is some evidence that these regulations have impacted analysts' recommendations. Kadan et al. (2006) show that prior to these regulations, analysts were 40 percent more likely to issue an optimistic recommendation for stocks that had recently undergone an initial public offering or seasoned equity offering. This probability increased by an additional 12 percent when the recommendation was made by an affiliated analyst. These effects vanished after regulations. Barber et al. (2006) support this notion by documenting a decrease in the overall percentage of buys in broker ratings between January 2000 and June 2003, particularly among sanctioned investment banks. Consistent with these findings, Ertimur et al. (2007) and Ke and Yu (2007) show that the improvement is analysts' recommendations around recent regulations was greater for analysts that likely faced higher conflicts of interest.[17]

In summary, recent regulations have addressed bias in analysts' earnings forecasts and stock recommendations. If these regulations have had their intended effects, we should observe

[15]The settlement also enforces the brokerage firms to make structural changes in the production and dissemination of analyst research.

[16] The SEC further issued several releases governing investment firms' disclosure practices in 2003 (e.g., Regulation Analyst Certification, AC, 2003). Regulation AC requires certifications by analysts that the views expressed in their research reports accurately reflect their personal views. Analysts are required to disclose whether they receive any direct or indirect compensation for their reports. Analysts who cannot certify that they have not received compensation for a specific report must disclose the magnitude and source of the compensation. Finally, the Sarbanes-Oxley Act came into effect in 2002, potentially affecting the quality of financial reporting and thus the work of financial analysts.

[17] Specifically, Ke and Yu (2007) provide an interesting study of how analyst ability, analyst independence, and investor sentiment affect the efficiency with which analysts incorporate their own earnings forecasts into stock recommendations around recent regulations.

an increase in the usefulness of analysts' output – earnings forecasts and stock recommendations. This leads us to the following set of hypotheses.

H1: Following recent regulations, the relation between analysts' stock recommendations and earnings forecast-based residual income (heuristic) valuations is expected to become more (less) positive.

H2: Following recent regulations, the relation between earnings forecast-based residual income valuations and future stock returns is expected to become more positive.

H3: Following recent regulations, the relation between analysts' stock recommendations and future stock returns is expected to become more positive.

III. A BRIEF DESCRIPTION OF VALUATION MODELS

In this section, we briefly describe the valuation models used in this paper.[18] Following prior literature (e.g., Ohlson 1995; Frankel and Lee 1998; Bradshaw 2004), we estimate the residual income model as the present value of expected residual income for the next five years plus a terminal value:

$$V_t = BVPS_t + \sum_{\tau=1}^{5} \frac{E_t[\,RI_{t+\tau}\,]}{(1+r)^{\tau}} + \frac{E_t[\,TV_{t+5}\,]}{(1+r)^{5}}. \quad (1)$$

To estimate (1), we require availability of book value per share (*BVPS*) in year *t* from Compustat and forecasted earnings per share for years *t+1* and *t+2* from I/B/E/S. If available, we use analysts' forecasts of years *t+3* through *t+5*. If not available, we extrapolate earnings

[18] For more on these models, see Frankel and Lee (1998), Lee et al. (1999), Liu et al. (2002), Easton (2004), and Hope et al. (2008).

forecasts for these years using the earnings forecast for year *t+2* and the long-term growth forecast.[19] Residual income (*RI*) equals forecasted earnings, less the discount rate (*r*) times the prior year's book value. Future book values are extrapolated from book value in year t using the clean surplus assumption (i.e., $BVPS_{t+1} = BVPS_t + EPS_{t+1} - DPS_{t+1}$), where future earnings, EPS_{t+1}, are forecasted earnings, and future dividends, DPS_{t+1}, are measured using the assumption of a constant payout ratio based on year *t*.

Due to the importance of assumptions embedded in the terminal value (*TV*) computation, we estimate two versions of the residual income model (Bradshaw 2004). The first, V_{RI1}, assumes that abnormal profits are driven away over time due to competitive pressures. In practice we build in a fade rate (ω) that implies that residual income reverts to zero over ten years:

$$V_{RI1,t} = BVPS_t + \sum_{\tau=1}^{5} \frac{E_t[RI_{t+\tau}]}{(1+r)^{\tau}} + \frac{\omega E_t[RI_{t+5}]}{(1+r-\omega)(1+r)^5} \tag{2}$$

The second specification of the residual income valuation model (V_{RI2}) assumes that residual income in the terminal year persists in perpetuity, which is a more optimistic assumption than the fade-rate assumption used for V_{RI1}:

$$V_{RI2,t} = BVPS_t + \sum_{\tau=1}^{5} \frac{E_t[RI_{t+\tau}]}{(1+r)^{\tau}} + \frac{E_t[RI_{t+5}]}{r(1+r)^5}. \tag{3}$$

Barker (1999), Block (1999), Bradshaw (2002), and Chen et al. (2004) discuss how analysts use price-earnings based techniques in practice. Numerous articles in the financial press describe the pervasiveness of the use of the "PEG ratio" as a basis for stock recommendations. For example, Peter Lynch advocates the PEG ratio in his book *One Up on Wall Street* (Lynch 2000). The *PEG* ratio is defined as:

[19] For example, if forecasted earnings for year t+2 equal $1.00 and the long-term growth forecast is 10 percent, then forecasted earnings for year t+3 is $1.10, forecasted earnings for year t+4 is $1.21, and forecasted earnings for year t+5 is $1.33. To provide this extrapolation, we require that forecasted earnings for year t+2 be positive.

$$PEG_t = \frac{P_t / E_t[EPS_{t+2}]}{LTG_t * 100}, \quad (4)$$

where P is stock price, $E_t[EPS_{t+2}]$ is forecasted earnings per share in year $t+2$, and LTG is the long-term growth forecast. Following Bradshaw (2004), we compute the PEG valuation as:

$$V_{PEG,t} = E_t[EPS_{t+2}] * LTG_t * 100 \quad (5)$$

V_{RI1}, V_{RI2}, and V_{PEG} are divided by current stock price. To the extent that the valuation estimate is greater (less) than current price, the valuation model suggests an under (over) priced stock and therefore higher (lower) future returns, on average.

Finally, although not a valuation estimate per se, we include LTG forecasts as our fourth metric. This is important since LTG forecasts seem to be the primary measure used by analysts in setting their recommendations prior to regulations (Bradshaw 2004), yet they have a strong *negative* relation with future stock returns. We are interested in the impact that recent regulations have on the use of heuristics by analysts. While an increase in the relation between residual income valuations and stock recommendations might provide indirect evidence of a reduced reliance on heuristics, this is not necessarily the case. We believe it is important to provide a direct test. Providing results for each of these contrasting relations (heuristics versus theoretically-driven residual income values) provides additional evidence for understanding the link between analysts' earnings forecasts and their recommendations.

IV. DATA, SAMPLE, AND DESCRIPTIVE STATISTICS

We obtain data on annual consensus earnings forecasts, projections of long-term earnings growth, and stock recommendations from I/B/E/S for the sample period January 1993 – May

2005 for an extensive sample of firms.[20] Our initial sample includes 425,158 observations that have stock recommendations and data necessary to create our four valuation estimates.[21] Next, we exclude observations for months without changes in stock recommendations.[22] Since recommendations can be fairly sticky across months, using only months that involve a change in recommendations provides a more realistic setting of when analysts are more likely to incorporate current information into their recommendations (as opposed to current recommendations reflecting stale information). The final sample of consists of 187,889 monthly observations representing 8,079 firms. We have 112,477 observations for our pre-Reg FD (1993-1999) sample and 75,412 observations for our post-Reg FD (2000-2005) sample. Note that our pre-Reg FD sample is substantially larger than the one employed by Bradshaw (2004) of 15,318 observations over the 1994-1998 period (with LTG available, which we require for all of our tests).[23] Within the post-Reg FD sample, we have 36,799 observations prior to other regulations (2000-2002) and 38,613 observations for 2003-2005 (after other regulations). We refer to the periods before and after other regulations as the pre-OtherReg and post-OtherReg periods.

Panel A of Table 1 presents descriptive statistics for the pre- and post-Reg FD periods. Consistent with our prediction that Reg FD should reduce analyst optimism, the mean recommendation (*REC*) is significantly lower (at the one percent level) in the post-Reg FD era (3.72) than in the pre-Reg FD era (3.96) (1 = Strong Sell to 5 = Strong Buy). The percentage of buy and strong buy recommendation decreases from 67.7 to 47.1, and the percentage of sell and

[20] Bradshaw (2004) uses First Call as his source for analyst data. First Call and I/B/E/S differ in that First Call includes consensus data for a month only if the consensus was revised during the month. I/B/E/S is more comprehensive in that it includes all months, including those with no changes in the consensus. We base our main results on using change months only (consistent with Bradshaw), but we show later in the paper that results are robust to using the full sample of observations.

[21] Results are similar if we relax the requirement that *LTG* forecasts be available (and thus have larger sample sizes).

[22] As a sensitivity test near the end of the paper, we discuss results when all months are included. All conclusions are unaffected. In addition, we have estimated all models after excluding consensus recommendations based on just one recommendation and the results are similar to those reported.

[23] As discussed below, we find results similar to Bradshaw (2004) for the pre-Reg FD period with a few exceptions.

strong sell recommendations increases from 1.1 to 4.4 percent. The means of V_{RI1}/P and V_{RI2}/P significantly increase and V_{PEG}/P and *LTG* significantly decrease.[24] As expected, firm size (market value of equity) increases. In addition, the number of analysts per firm also increases.

[Place TABLE 1 here]

Consistent with their high recommendation levels, analysts estimate high long-term growth rates (*LTG*) for the companies they follow – 18.9 percent and 18.0 percent for the pre- and post-Reg FD periods, respectively (and the difference is significant at the one percent level). In untabulated analyses, we find that the mean actual annual earnings growth is 8.4 percent and 11.5 percent in these periods. These findings suggest that *LTG* projections are high and optimistically biased, but that this optimism has decreased somewhat in the post-Reg FD period.

Panel B presents the results for the pre-OtherReg period (2000-2002) and post-OtherReg period (2003-2005). The mean recommendation continues to significantly decline, going from 3.89 to 3.58.[25] The percentage of buy and strong buy recommendations decreases from 57.2 to 42.1, and the percentage of sell and strong sell recommendations increases from 2.6 to 5.2 percent, and. V_{RI1}/P, V_{RI2}/P, and V_{PEG}/P increase significantly, but *LTG* forecasts decrease significantly from 20.2 percent to 15.9 percent. These results suggest that the major decreases in analysts' recommendations and *LTG* projections appear following other regulations.

Panels C and D of Table 1 provide correlations between variables. Consistent with the intent of regulations, the correlations between residual income valuations and stock

[24]The fact that the mean recommendation *REC* is a buy and the mean residual income valuation estimates (V_{RI1}/P and V_{RI2}/P) are less than one suggests that analysts rely on more than just these valuations when deciding their stock recommendations (Bradshaw 2004). Unlike the residual income valuations, the *PEG* valuation is greater than the current price for the pre-Reg FD period (1.14) but is below current price for the post Reg FD (0.79).

[25] One potential alternative reason for the decline in recommendation levels over our sample period could be deteriorating economic conditions. We cannot exclude this possibility. However, it should be noted that recommendations are generally made with the explicit understanding that they represent whether a stock will underperform or outperform the market in general, and not necessarily whether the stock price is expected to decrease or increase. Thus, it is not necessarily the case that poorer economic conditions would lead to reduced recommendations in general.

recommendations increase over time. However, there is an increase in the positive correlation between V_{PEG}/P and recommendations, even though the correlation between V_{PEG}/P and future returns becomes insignificant post Reg FD and then becomes negative after other regulations. The correlation between residual income valuations and future returns is increasing, but that improvement occurs only around Reg FD. *LTG* forecasts and residual income valuations are negatively correlated, explaining why residual income valuations and future returns are positively correlated, while *LTG* forecasts and future returns are negatively correlated.

V. REGRESSION RESULTS

As in Bradshaw (2004), each coefficient reported in the tables represents the mean coefficient from 12 subsample regressions. The 12 subsamples are created by partitioning all observations based on one-year-ahead earnings forecast horizons (i.e., months t-1 to t-12). This controls for systematic differences in earnings forecast characteristics as the end of the period nears (Brown 2001; Bradshaw 2004). It is an empirical regularity that analysts walk down their forecasts as the year passes, and forecasts made near the end of the year are more accurate and less optimistic than those made near the beginning of the year. By running the regression for each fiscal month, we prevent mixing short-horizon earnings forecasts with long-horizon forecasts. In other words, we prevent mixing valuation estimates generated from more optimistic, less accurate forecasts (i.e., long-horizon forecasts) with those generated from less optimistic, more accurate forecasts (i.e., short-horizon forecasts).[26] Reported t-statistics are based on the

[26] As an example of this issue, we find that V_{RI1}/P uniformly decreases over the 12-month horizon. The mean of V_{RI1}/P is 12 percent lower in month t-1 compared to month t-12. The same decreasing pattern is observed for V_{RI2}/P (14 percent lower in month t-1) and V_{PEG}/P (24 percent lower in month t-1). Thus, Bradshaw's (2004) approach directly controls for this horizon effect in analysts' forecasts.

standard error of the monthly coefficients, using the adjustment for serial correlation across months.[27,28]

The adjusted R^2s presented are means across the 12 months. We estimate the regressions using quintile rankings of the independent variables. The quintile rankings are designated by allocating observations in equal numbers to quintiles within each month based on the distribution of the variable in that month. The quintile rankings are scaled to range between 0 and 1.[29]

Tests of Effects of Regulatory Reforms on Relations between Stock Recommendations and Valuation Estimates (Hypothesis 1)

To test the effect of Reg FD on the relation between valuation estimates and stock recommendations, we estimate the following model.

$$REC = \alpha_0 + \alpha_1 RegFD + \alpha_2 VALUATION + \alpha_3 VALUATION * RegFD + \varepsilon \quad (6)$$

where *VALUATION* is one of the four valuation estimates and *RegFD* is an indicator variable that takes the value of one following implementation of Reg FD, zero otherwise. α_2 provides an estimate of the relation between recommendations and valuations in the pre-Reg FD period. If α_3 is greater (less) than zero, then the relation between recommendations and valuations has increased (decreased) following Reg FD.

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[27] Standard errors are multiplied by an adjustment factor, $\sqrt{\frac{(1+\Phi)}{(1-\Phi)} - \frac{2\Phi(1-\Phi^n)}{n(1-\Phi)^2}}$, where n is the number of months and Φ is the first-order autocorrelation of the monthly coefficient estimates (Abarbanell and Bernard 2000; Bradshaw 2004).

[28] Since each of the fiscal month regressions contains multiple observations for the same firm, there is likely some residual dependence, understating the standard error in each of the monthly regressions. However, the monthly coefficients are unbiased. And since we base our reported t-statistics on the mean of the monthly coefficients (not the monthly standard errors), the reported significance levels are unaffected.

[29] We have also estimated the models using five-group, three-group, and two-group (above/below median) ordered logit regressions. Untabulated results show that no inferences are affected with these alternative estimation techniques.

Table 2 presents regression results. Contrary to what one might expect but consistent with Bradshaw's (2004) 1994-1998 results, the table shows that analysts' recommendations are positively related to heuristic-based valuation estimates but are negatively related to more rigorous residual income valuations in the pre-Reg FD period. Directly related to H1, we find that the interactions of both V_{RI1}/P and V_{RI2}/P with *RegFD* are positive and significant at the one percent level. These findings support the first hypothesis that Reg FD will better align analysts' recommendations with residual income valuations, which were developed using analysts' earnings forecasts. Also consistent with H1, we find that recommendations are significantly less positively associated with *LTG* following Reg FD (i.e., the interaction term is negative and significant at the one percent level), suggesting a reduced reliance on *LTG*. However, in contrast to our prediction, the relation between stock recommendations and *PEG* valuation slightly increases following Reg FD.[30] In conclusion, for three of the four models the results provide support for the first hypothesis, suggesting significant effects of Reg FD on the association between analyst recommendations and valuation estimates.

[Place TABLE 2 here]

For our test of the effects of other regulations, we estimate a similar model but limit the sample period to the post-Reg FD era and repeat the above test after replacing *RegFD* with *OtherReg*, an indicator variable that takes the value of one for the 2003-2005 period (post-OtherReg) and zero for the 2000-2002 period (pre-OtherReg).

$$REC = \alpha_0 + \alpha_1 Other\ Re\ g + \alpha_2 VALUATION + \alpha_3 VALUATION * Other\ Re\ g + \varepsilon \qquad (7)$$

Table 3 presents regression results. The coefficients on V_{RI1}/P and V_{RI2}/P are significantly negative, indicating that residual income valuations remain significantly negatively related to

[30]Coefficient estimates in the post-Reg FD period are as follows (untabulated): V_{RI1}/P is significantly negative, V_{RI2}/P is not significantly different from zero, and V_{PEG}/P and *LTG* are significantly positive.

recommendations after Reg FD but before other regulations. The relation between residual income valuations and recommendations becomes significantly more positive after other regulations, as indicated by their interactions with *OtherReg*. These results are consistent with the first hypothesis. In fact, untabulated results show that the coefficient on V_{RI1}/P is indistinguishably different from zero in the post-OtherReg period and the coefficient on V_{RI2}/P becomes significantly positive. Thus, it appears that other regulations have played a greater role than has Reg FD in aligning residual income valuations and analysts' recommendations. At least with respect to V_{RI2}/P, the puzzling negative relation between residual income valuations and recommendations now appears to be positive, as one might expect prior to observing results in prior literature.

[Place TABLE 3 here]

Contrary to our first hypothesis, we do not detect a decline in the relation between *REC* and heuristics (*LTG* and V_{PEG}/P) after other regulations. The relation between *REC* and V_{PEG}/P continues to increase. The relation between *REC* and *LTG* also increases after having been reduced immediately following Reg FD.

To summarize, the results in Tables 2 and 3 suggest that recent regulations have had an effect on analyst behavior. Specifically, we document a greater reliance on residual income valuations in arriving at stock recommendations following recent regulations. These results are consistent with the objectives of Reg FD and the other regulations and provide support for H1. However, the results for the effects of regulations on heuristics-based valuation estimates (V_{PEG}/P and *LTG*) are mixed for Reg FD and contrary to expectations for other regulations.

Tests of Relations between Future Excess Returns and Valuation Estimates (Hypothesis 2) and Stock Recommendations (Hypothesis 3)

We now turn to testing the relation of future excess returns with both valuation estimates and stock recommendations. We compute one-year-ahead buy-and-hold size-adjusted returns (*SAR*) as:

$$SAR_i = \left[\prod_{\tau=1}^{12} (1 + r_{i,t+\tau}) - \prod_{\tau=1}^{12} (1 + r_{size,t+\tau}) \right], \tag{8}$$

where $r_{i,t+\tau}$ is the monthly raw stock return for firm i in month $t+\tau$, and $r_{size,t+\tau}$ is the month $t+\tau$ return of the size decile to which firm i belongs as of the beginning of the fiscal year. Using I/B/E/S price and dividend data (supplemented with Compustat data), we cumulate returns beginning in the month subsequent to the date of the consensus recommendation. We chose to use a one-year-ahead return horizon for two reasons. First, this is the horizon employed by Bradshaw (2004) so our results are directly comparable to his. Second, recommendations are generally provided by analysts with the intention of giving guidance over an extended period of time (e.g., 6 to 24 months).

To test the second hypothesis, we run the following regression to estimate the relation between future excess returns and the valuation estimates:

$$SAR = \beta_0 + \beta_1 RegFD + \beta_2 VALUATION + \beta_3 VALUATION * RegFD + \varepsilon \tag{9}$$

For the third hypothesis, we consider the relation between future returns and stock recommendations.

$$SAR = \beta_0 + \beta_1 RegFD + \beta_2 REC + \beta_3 REC * RegFD + \varepsilon \tag{10}$$

Panel A of Table 4 shows regression results for (9) and (10). Consistent with the findings of Frankel and Lee (1998) and Bradshaw (2004), we document that both V_{RI1}/P and V_{RI2}/P are

positively and significantly related to future excess returns before Reg FD. In addition, we find that this positive relation increases following Reg FD (and in fact doubles). These results provide support for the second hypothesis. The coefficients on *LTG* and V_{PEG}/P are *negatively* related to future excess returns prior to Reg FD. The introduction of Reg FD did appear to make V_{PEG}/P significantly less negatively related to future returns (i.e., the interaction is positive and significant at the one percent level). For *LTG*, on the other hand, there is no significant effect of Reg FD. The final column of Panel A in Table 4 shows that recommendations are negatively related to future excess returns. After enactment of Reg FD, this negative relation persists. This suggests that Reg FD had no impact on the seemingly irrational relation between analyst recommendations and security returns.

[Place TABLE 4 here]

In Panel B, we examine whether valuations are incremental to stock recommendations. As discussed previously, to the extent that analysts' recommendations are not derived based on valuation models, the two can provide incremental effects. We first note that results for all four valuation estimates (reported in Panel A) and the effects of Reg FD are unaffected by adding recommendations to the regression. This provides further evidence that analysts' stock recommendations are influenced by many other factors. The biggest difference in the pre-Reg FD period is for *LTG*. Much of this variable's explanatory power is lost when testing for an incremental effect, which is consistent with our earlier result that recommendations appear most closely related to *LTG* (as opposed to residual income valuations). Results for the post-Reg FD are also very similar. Perhaps the most interesting result is that when controlling for V_{PEG}/P or *LTG*, the relation between stock recommendations and future excess returns becomes even more negative in the post-Reg FD period. This is not the case for residual income valuations. The

ability of residual income valuations to explain future returns prevents the negative relation between recommendations and future returns from becoming increasingly negative.

Table 5 provides analyses of effects of other regulations (*OtherReg*) on the relations between future returns and valuation estimates and recommendations. The main findings reported in Panel A are as follows. First, the positive relation between residual income valuations and future returns remains the same before and after other regulations. Second, the other regulations do seem to have had an effect on the relation between stock recommendations and future returns, as the interaction effect is significantly positive. These results provide support for the third hypothesis. When we consider the incremental effects of valuations and stock recommendations for future returns (reported in Panel B), only one conclusion changes. The negative relation between stock recommendations and future returns does not become weaker when controlling for *LTG* (i.e., column 4 of Panel B). In general, the results in Table 5 further demonstrate that other regulations relate primarily to improvements in stock recommendations (as opposed to analysts' earnings forecasts) and this improvement is incremental to valuation estimates based on analysts' earnings forecasts.

[Place TABLE 5 here]

Sensitivity Analyses

Results for observations with no change in consensus

Recall that we base our results on using only monthly observations for which there has been a revision in the consensus recommendation. We use these observations to be consistent with Bradshaw (2004). However, as a sensitivity analysis, we repeat the tests using the full sample of observations from I/B/E/S data (i.e., including monthly observations with no change in

consensus recommendation). This approach has the advantage of significantly increasing the sample size and thus the power of our tests. In fact, the sample size increases to 425,128. However, the results are quite similar to those reported previously, which provides some assurance that our findings are not unduly influenced by the use of a smaller sample.

Standard errors adjusted for clustering at the firm level

In Tables 2-5 we report coefficients using the mean coefficient from 12 fiscal month regressions. As an alternative, we consider estimating coefficients using a pooled model and use firm cluster adjusted standard errors. The pooled model has the disadvantage (as discussed previously) of mixing long-horizon and short-horizon earnings forecasts but the advantage of not relying on the average of only 12 monthly coefficients, which potentially reduces statistical power. Under this alternative approach, we find that coefficients are remarkably close to those reported in the tables. All conclusions reported from Tables 2 and 3 (i.e., the relations between stock recommendations and the four valuation estimates) are unaffected.

We do, however, notice some differences for results reported in Tables 4 and 5 (i.e., the relations with future returns). *LTG* is significantly more negatively related to future returns after Reg FD but significantly less negatively related to future returns after other regulations. These results are consistent with other regulations having their intended effect of reducing analysts' reliance on heuristics in setting stock recommendations. Furthermore, the conclusion that the increasing positive relation between residual income valuations and future returns is attributable primarily attributable to Reg FD (and not other regulations) is even more apparent. In summary, while we note some differences in results, overall conclusions regarding the effectiveness of regulations are unaffected.

Bear market and bull market effects

Our research period can be characterized by periods of primarily a bull market until March 2000, bear market from April 2000 through March 2003, and another bull market commencing in April of 2003. To test whether our inferences are affected by bull versus bear markets in addition to the effects of regulatory reforms, we re-estimate regressions using bull or bear monthly indicators.[31] The overall tenor of our results is the same. We do find that bull markets have positive effect on analysts' recommendations and excess returns in the pre-Reg FD.

VI. CONCLUSION

To date there has been surprisingly little research on analysts' recommendations and analysts' use of valuation models. A priori, the relation seems straightforward. Analysts input their earnings forecasts into the theoretically correct valuation model, such as a residual income model, to develop a valuation estimate. Analysts compare this valuation to current stock price. To the extent that the valuation estimate exceeds current stock price, analysts would issue a buy recommendation. Alternatively, if the valuation estimate is below the current stock price, analysts would issue a sell recommendation. Thus, it seems likely that residual income valuations and stock recommendations would have a positive relation and each would relate positively to future returns. Furthermore, if stock recommendations completely capture the information in valuation estimates, then valuation estimates would have no incremental explanatory power for future returns. However, while these arguments seem consistent with rational analyst behavior, prior research documents that these relations do not exist as expected

[31] For the entire 1993-2005 research period, we use a monthly indicator that equals one during bull markets and zero during the bear markets. We also use the monthly indicator for separate analysis during the post-Reg FD periods (2000-2005) and find no significant effects.

and in some cases exist in the opposite direction.

As an example, Bradshaw (2004) shows that residual income valuations, developed using analysts' earnings forecasts, relate negatively to analysts' recommendations yet relate positively to future returns. Why are analysts' earnings forecasts in residual income valuation models useful to investors (i.e., help in predicting future stock performance) yet analysts do not appear to use them in setting their recommendations? In other words, why do analysts not practice (recommend) what they preach (forecast)?

Because of these inconsistencies (along with the crash of technology stocks in the early 2000's), analyst activity has come under severe public scrutiny. Regulators were called upon to "fix" the analyst industry. The SEC enacted Regulation Fair Disclosure (Reg FD) in 2000, which prohibited management from disclosing material information to selected analysts. Some contend that analysts purposely biased their forecasts to gain favor with management, thereby allowing easier access to privileged information. Reg FD disallows the release of privileged information and therefore reduces at least one of the incentives for analysts to bias their forecasts.

Analysts were also criticized for the apparent conflict of interest that existed within brokerage firms. Analysts in the research department (i.e., those providing stock recommendations) felt pressure from those in the investment banking department to provide only favorable reports. Issuance of unfavorable reports could reduce investment banking business, a tremendous source of revenue for brokerage firms. Thus, analysts had incentives in issuing their recommendations beyond providing objective, reliable information to the investing public. In response, the SEC accepted NASD Rule 2711, NYSE Rule 472, and the Global Research Analyst Settlement in late 2002 and 2003. In general, these regulations address research analysts' conflicts of interest and limit interactions and flow of information between an analyst and the

investment banking business of the brokerage firm.

We are interested in the extent to which these regulations had their intended effects. Using a large sample of stock recommendations over the 1993-2005 period, we first examine the relation between analysts' stock recommendations and (1) theoretically-derived residual income models versus (2) valuation heuristics (i.e., price-to-earnings to growth (PEG) ratio and long-term growth (LTG) forecast). We then examine the relation between future returns and (1) stock recommendations, (2) residual income models, and (3) valuation heuristics. Finally, we consider the extent to which residual income models and valuation heuristics are incremental to stock recommendations in explaining future returns. We examine changes in these relations in the pre-Reg FD period (1994-1999) versus the post-Reg FD period (2000-2005). Within the post-Reg FD period, we examine changes before (2000-2002) and after (2003-2005) other regulations (i.e., NASD 2711, NYSE Rule 472, and Global Research Analyst Settlement).

We report the following results. The documented negative relation between stock recommendations and residual income valuations diminishes in the post-Reg FD period and even becomes positive following other regulations. We also find evidence of a reduced analyst reliance on long-term growth forecasts in providing a stock recommendation in the post-Reg FD period. For our tests of a relation with future returns, we show that residual income valuations have an increasingly positive relation in the post-Reg FD period. This change is due primarily to Reg FD itself rather than other regulations. This finding implies that Reg FD had the effect of increasing the useful of earnings forecasts to investors. Also of interest to investors is our finding that the negative relation between stock recommendations and future returns still persists but is diminishing following regulations subsequent to Reg FD. Thus, it appears that in many ways regulations are having their intended effects but the effects on analysts' outputs may be

incomplete.

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TABLE 1
Descriptive Statistics

Panel A: Descriptive Statistics for Pre- and Post-Reg FD Periods

	Pre Reg-FD (1993-1999) N = 112,477			Post Reg-FD (2000-2005) N = 75,412			Difference	
Variables	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**t-test**	**Wilcoxon Z**
REC	3.96	4.00	0.53	3.72	3.75	0.54	-92.5***	-89.7***
%Buy	67.7%			47.1%				
%Sell	1.1%			4.4%				
V_{RI1}/P	0.63	0.58	0.37	0.66	0.62	0.43	19.0***	24.2***
V_{RI2}/P	0.70	0.66	0.42	0.77	0.74	0.53	32.1***	45.0***
V_{PEG}/P	1.14	1.06	1.03	0.79	0.85	1.23	-65.7***	-81.0***
LTG	18.85	16.07	10.47	18.01	15.17	10.22	-17.4***	-20.8***
SAR	-0.027	-0.092	0.598	-0.038	-0.090	0.514	-3.41***	1.62
MV	5,127	821	18,215	7,471	1,249	24,248	22.6***	51.7***
NUM	9.42	7.00	7.02	10.56	9.00	7.13	34.2***	41.2***

Panel B: Descriptive Statistics for Pre- and Post-OtherReg Periods

	Pre-OtherReg (2000-2002) N = 36,799			Post-OtherReg (2003-2005) N = 38,613			Difference	
Variables	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**t-test**	**Wilcoxon Z**
REC	3.89	3.89	0.51	3.58	3.60	0.54	-74.7***	-74.1
%Buy	57.2%			42.1%				
%Sell	2.6%			5.2%				
V_{RI1}/P	0.62	0.55	0.49	0.71	0.66	0.36	28.9***	51.2***
V_{RI2}/P	0.65	0.62	0.57	0.89	0.85	0.46	62.3***	86.6***
V_{PEG}/P	0.74	0.87	1.54	0.83	0.82	0.84	10.9***	-13.6***
LTG	20.22	16.97	11.61	15.91	14.53	8.18	-58.6***	-48.8***
SAR	-0.041	-0.0982	0.513	-0.032	-0.104	0.515	1.95*	-0.69
MV	7,270	1,094	24,464	7,663	1,408	24,039	2.22**	20.6***
NUM	10.41	9.00	6.94	10.70	9.00	7.31	5.47***	3.42***

(Table 1 continued on next page)

TABLE 1 (continued)
Descriptive Statistics

Panel C: Pearson Correlations Before (1993-1999) and After (2000-2005) Reg FD[a]

	REC	*SAR*	V_{RI1}/P	V_{RI2}/P	V_{PEG}/P	*LTG*
REC	•	-0.119	-0.195	-0.129	0.228	0.339
SAR	-0.146	•	0.091	0.064	-0.163	-0.267
V_{RI1}/P	-0.127	0.197	•	0.935	0.460	-0.296
V_{RI2}/P	-0.075	0.170	0.888	•	0.543	-0.206
V_{PEG}/P	0.267	-0.017	0.466	0.545	•	0.407
LTG	0.283	-0.350	-0.307	-0.264	0.273	•

Panel D: Pearson Correlations Before (2000-2002) and After (2003-2005) OtherReg[b]

	REC	*SAR*	V_{RI1}/P	V_{RI2}/P	V_{PEG}/P	*LTG*
REC	•	-0.168	-0.170	-0.101	0.199	0.233
SAR	-0.115	•	0.209	0.188	-0.001	-0.411
V_{RI1}/P	-0.003	0.178	•	0.918	0.506	-0.305
V_{RI2}/P	0.113	0.148	0.860	•	0.603	-0.265
V_{PEG}/P	0.324	-0.053	0.460	0.584	•	0.136
LTG	0.269	-0.225	-0.267	-0.185	0.413	•

REC = mean consensus analyst recommendation, 1 = Strong Sell, 2 = Sell, 3 = Hold, 4 = Buy, 5 = Strong Buy.
%Buy = the percentage of recommendations rated Buy or Strong Buy.
%Sell = the percentage of recommendations rated Sell or Strong Sell.
V_{RI1} = residual income valuation with a five-year forecast horizon and a terminal value with a fade-rate assumption.
V_{RI2} = residual income valuation with a five-year forecast horizon and a terminal value with a perpetuity assumption.
V_{PEG} = forecasted earnings per share for a two-year forecast horizon times *LTG* (x 100).
LTG = consensus (median) projected long-term growth in earnings.
P = share price on the date of the consensus recommendation calculation.
SAR = annual size-adjusted return beginning the month following the recommendation.
MVE = market value of equity.
NUM = number of analysts following.
[a] Pearson correlations before (after) Reg FD are above (below) the diagonal.
[b] Pearson correlations before (after) other regulations are above (below) the diagonal.

TABLE 2
Relation between Recommendations and Valuation Estimates
Before (1993-1999) and After (2000-2005) Reg FD

Intercept	4.009***	3.954***	3.635***	3.536***
	(385.8)	(247.6)	(280.1)	(1891.9)
RegFD	-0.262***	-0.279***	-0.151***	-0.043*
	(-7.53)	(-7.58)	(-6.53)	(-1.89)
V_{RI1}/P	-0.304***			
	(-7.75)			
V_{RI2}/P		-0.186***		
		(-4.69)		
V_{PEG}			0.382***	
			(24.1)	
LTG				0.625***
				(103..2)
V_{RI1}/P**RegFD*	0.187***			
	(5.52)			
V_{RI2}/P**RegFD*		0.225***		
		(6.07)		
V_{PEG}/P**RegFD*			0.065**	
			(2.02)	
*LTG*RegFD*				-0.214***
				(-16.9)
Adjusted R^2	0.109	0.096	0.145	0.193

The table presents the results of regressions of consensus stock recommendations on valuation estimates. Regressions are estimated based on one-year-ahead earnings forecast horizon (i.e., months t-1 to t-12). The table presents mean coefficients for these 12 monthly regressions. t-statistics are based on the standard error of the coefficient estimates across the 12 months, adjusted for autocorrelation in the monthly coefficients based on as assumed AR(1) autocorrelation structure. Standard errors are multiplied by an adjustment factor, $\sqrt{\frac{(1+\Phi)}{(1-\Phi)} - \frac{2\Phi(1-\Phi^n)}{n(1-\Phi)^2}}$, where n is the number of months and Φ is the first-order autocorrelation of the monthly coefficient estimates. Adjusted R^2s presented are means across the 12 months. The regressions are estimated using quintile rankings of the independent variables. The quintile rankings are designated by allocating observations in equal numbers to quintiles within each month. The quintile rankings are scaled to range between 0 and 1 (e.g., (QUINTLE-1)/4)). *RegFD* equals 1 if an observation is in the post-Reg FD period (2000-2005) and zero otherwise (1993-1999). Other variables are defined in Table 1.
*, **, *** reflect significance at the 0.10, 0.05, and 0.01 level, respectively, based on two-tailed t-tests.

TABLE 3
Relation between Recommendations and Valuation Estimates
Before (2000-2002) and After (2003-2005) Other Regulations (OtherReg)

Intercept	4.022***	3.982***	3.805***	3.733***
	(760.5)	(661.5)	(537.3)	(437.1)
OtherReg	-0.346***	-0.412***	-0.378***	-0.283***
	(-9.15)	(-8.46)	(-9.48)	(-24.6)
V_{RI1}/P	-0.206***			
	(-8.90)			
V_{RI2}/P		-0.093***		
		(-4.33)		
V_{PEG}/P			0.309***	
			(40.1)	
LTG				0.347***
				(15.8)
V_{RI1}/P**OtherReg*	0.206***			
	(12.3)			
V_{RI2}/P**OtherReg*		0.293***		
		(24.2)		
V_{PEG}/P**OtherReg*			0.298***	
			(20.5)	
*LTG*OtherReg*				0.110***
				(8.08)
Adjusted R^2	0.102	0.292	0.165	0.150

The table presents the results of regressions of consensus stock recommendations on valuation estimates. Regressions are estimated based on one-year-ahead earnings forecast horizon (i.e., months t-1 to t-12). The table presents mean coefficients for these 12 monthly regressions. t-statistics are based on the standard error of the coefficient estimates across the 12 months, adjusted for autocorrelation in the monthly coefficients based on as assumed AR(1) autocorrelation structure. Standard errors are multiplied by an adjustment factor, $\sqrt{\frac{(1+\Phi)}{(1-\Phi)} - \frac{2\Phi(1-\Phi^n)}{n(1-\Phi)^2}}$, where n is the number of months and Φ is the first-order autocorrelation of the monthly coefficient estimates. Adjusted R^2s presented are means across the 12 months. The regressions are estimated using quintile rankings of the independent variables. The quintile rankings are designated by allocating observations in equal numbers to quintiles within each month. The quintile rankings are scaled to range between 0 and 1 (e.g., (QUINTLE-1)/4)). *OtherReg* equals 1 if an observation is in the post-other regulation period (2003-2005) and zero otherwise (2000-2002). Other variables are defined in Table 1.
*, **, *** reflect significance at the 0.10, 0.05, and 0.01 level, respectively, based on two-tailed t-tests.

TABLE 4
Relation between Annual Size-adjusted Returns and Stock Recommendations and Valuation Estimates Before (1993-1999) and After (2000-2005) Reg FD

Panel A: Individual Effects

Intercept	-0.095***	-0.073***	0.173***	0.246***	0.531***
	(-13.5)	(-7.91)	(18.2)	(29.2)	(29.9)
RegFD	-0.051	-0.055	-0.161	-0.005	0.067***
	(-1.64)	(-1.68)	(-5.17)	(-0.10)	(0.69)
V_{RI1}/P	0.176***				
	(12.4)				
V_{RI2}/P		0.124***			
		(7.69)			
V_{PEG}/P			-0.310***		
			(-11.2)		
LTG				-0.501***	
				(-30.4)	
REC					-0.139***
					(-33.6)
V_{RI1}/P*RegFD	0.148***				
	(3.36)				
V_{RI2}/P*RegFD		0.175***			
		(3.50)			
V_{PEG}/P*RegFD			0.280***		
			(7.35)		
*LTG*RegFD*				-0.061	
				(-1.34)	
*REC*RegFD*					-0.019
					(-0.89)
Adjusted R^2	0.019	0.014	0.022	0.088	0.018

(Table 4 continued on next page)

TABLE 4 (continued)
Relation between Annual Size-adjusted Returns and Stock Recommendations and Valuation Estimates Before (1993-1999) and After (2000-2005) Reg FD

Panel B: Incremental Effects

Intercept	0.401***	0.452***	0.526***	0.306***
	(34.5)	(37.0)	(24.4)	(22.9)
RegFD	-0.009	0.020	0.084	0.208
	(-0.16)	(0.33)	(0.75)	(2.60)**
V_{RI1}/P	0.137***			
	(10.7)			
V_{RI2}/P		0.098***		
		(6.70)		
V_{PEG}			-0.271***	
			(-9.15)	
LTG				-0.490***
				(-28.2)
REC	-0.123***	-0.132***	-0.097***	-0.017***
	(-39.1)	(-38.2)	(-13.1)	(-4.44)
V_{RI1}/P*RegFD	0.166***			
	(4.49)			
V_{RI2}/P*RegFD		0.199***		
		(4.69)		
V_{PEG}/P*RegFD			0.304***	
			(6.54)	
*LTG*RegFD*				-0.043
				(-1.02)
*REC*RegFD*	-0.014	-0.023	-0.065**	-0.056***
	(-1.08)	(-1.56)	(-2.26)	(-5.90)
Adjusted R^2	0.032	0.029	0.033	0.089

The table presents the results of regressions of buy-and-hold annual size-adjusted returns on valuation estimates and consensus stock recommendations. Regressions are estimated based on one-year-ahead earnings forecast horizon (i.e., months t-1 to t-12). The table presents mean coefficients for these 12 monthly regressions. t-statistics are based on the standard error of the coefficient estimates across the 12 months, adjusted for autocorrelation in the monthly coefficients based on as assumed AR(1) autocorrelation structure. Standard errors are multiplied by an adjustment factor, $\sqrt{\frac{(1+\Phi)}{(1-\Phi)} - \frac{2\Phi(1-\Phi^n)}{n(1-\Phi)^2}}$, where n is the number of months and Φ is the first-order autocorrelation of the monthly coefficient estimates. Adjusted R^2s presented are means across the 12 months. The regressions are estimated using quintile rankings of the independent variables. The quintile rankings are designated by allocating observations in equal numbers to quintiles within each month. The quintile rankings are scaled to range between 0 and 1 (e.g., (QUINTLE-1)/4)). *RegFD* equals 1 if an observation is from the post-Reg FD period (2000-2005) and zero otherwise (1993-1999). Other independent variables are defined in Table 1. *, **, *** reflect significance at the 0.10, 0.05, and 0.01 level, respectively, based on two-tailed t-tests.

TABLE 5
Relation between Annual Size-adjusted Returns and Stock Recommendations and Valuation Estimates Before (2000-2002) and After (2003-2005) Other Regulations (OtherReg)

Panel A: Individual Effects

Intercept	-0.160***	-0.145***	-0.051***	0.349***	0.674***
	(-18.6)	(-14.7)	(-7.2)	(7.8)	(7.2)
OtherReg	0.121***	0.143***	0.147***	-0.128	-0.190***
	(6.12)	(4.43)	(7.47)	(-1.40)	(-3.61)
V_{RI1}/P	0.344***				
	(7.47)				
V_{RI2}/P		0.329***			
		(6.19)			
V_{PEG}/P			0.005		
			(0.24)		
LTG				-0.652***	
				(-9.72)	
REC					-0.182***
					(-9.20)
V_{RI1}/P**OtherReg*	-0.054				
	(-0.65)				
V_{RI2}/P**OtherReg*		-0.083			
		(-0.76)			
V_{PEG}/P**OtherReg*			-0.102**		
			(-2.63)		
*LTG*OtherReg*				0.283*	
				(1.93)	
*REC*OtherReg*					0.074***
					(3.67)
Adjusted R^2	0.045	0.038	0.004	0.135	0.027

(Table 5 continued on next page)

TABLE 5 (continued)
Relation between Annual Size-adjusted Returns and Stock Recommendations and Valuation Estimates Before (2000-2002) and After (2003-2005) Other Regulations (OtherReg)

Panel B: Incremental Effects

Intercept	0.449***	0.527***	0.680***	0.620***
	(8.03)	(8.75)	(6.97)	(7.11)
OtherReg	-0.069	-0.057	-0.197***	-0.169
	(-0.90)	(-0.76)	(-3.68)	(-2.10)**
V_{RI1}/P	0.310***			
	(7.36)			
V_{RI2}/P		0.310***		
		(6.28)		
V_{PEG}/P			0.063**	
			(1.96)	
LTG				-0.626***
				(-8.61)
REC	-0.151***	-0.168***	-0.191***	-0.072***
	(-11.6)	(-11.9)	(-7.77)	(-2.79)
V_{RI1}/P*OtherReg	-0.017			
	(-0.20)			
V_{RI2}/P*OtherReg		-0.037		
		(-0.37)		
V_{PEG}/P*OtherReg			-0.100**	
			(-2.31)	
*LTG*OtherReg*				0.281
				(1.62)
*REC*OtherReg*	0.042*	0.042***	0.090***	0.010
	(2.02)	(2.70)	(3.96)	(0.17)
Adjusted R^2	0.063	0.061	0.029	0.142

The table presents the results of regressions of buy-and-hold annual size-adjusted returns on valuation estimates and consensus stock recommendations. Regressions are estimated based on one-year-ahead earnings forecast horizon (i.e., months t-1 to t-12). The table presents mean coefficients for these 12 monthly regressions. t-statistics are based on the standard error of the coefficient estimates across the 12 months, adjusted for autocorrelation in the monthly coefficients based on as assumed AR(1) autocorrelation structure. Standard errors are multiplied by an adjustment factor, $\sqrt{\frac{(1+\Phi)}{(1-\Phi)} - \frac{2\Phi(1-\Phi^n)}{n(1-\Phi)^2}}$, where n is the number of months and Φ is the first-order autocorrelation of the monthly coefficient estimates. Adjusted R^2s presented are means across the 12 months. The regressions are estimated using quintile rankings of the independent variables. The quintile rankings are designated by allocating observations in equal numbers to quintiles within each month. The quintile rankings are scaled to range between 0 and 1 (e.g., (QUINTLE-1)/4)). OtherReg equals 1 if an observation is in the post-other regulation period (2003-2005) and zero otherwise (2000-2002). Other variables are defined in Table 1. *, **, *** reflect significance at the 0.10, 0.05, and 0.01 level, respectively, based on two-tailed t-tests.