Theory and Evidence..

The Quality of Public Information: Does it affect the predictive power of analysts' recommendations?

by

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An honors thesis submitted in partial fulfillment

of the requirements for the degree of

Bachelor of Science

Undergraduate College

Leonard N. Stern School of Business

New York University

May 2007

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TABLE OF CONTENTS

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ABSTRACT

This paper examines the impact of disclosure quality on the accuracy of analysts' recommendations. Our findings suggest that a high quality of disclosure negatively impacts the accuracy of analyst's recommendations whereas an average quality of disclosure positively impacts the accuracy. The excess return of high disclosure quality firms over average disclosure quality firms indicate that the incremental value of greater disclosure quality also has a negative impact on the accuracy of favorable and unfavorable recommendations, but has a positive impact on the accuracy of "hold" recommendations, suggesting that analysts are mainly developers of private information rather than interpreters of public information.

I. INTRODUCTION

Financial analysts are an integral part of the capital markets, providing earnings forecasts, buy/sell recommendations, and other information to brokers, money managers, and institutional investors. The information analysts use in their evaluations is obtained through two sources - private information and public information. Private information refers to information that analysts are privy to, such as access to discussions with company executives, visits to company premises, and company forecasts of accounting data.

In October 2000, the U.S. Security and Exchange Commission's Regulation Fair Disclosure (Reg. FD) was adopted in an effort to prevent selective disclosure of so-called "material" or market-moving information to small groups of analysts or large investors. Designed to increase confidence among individual investors in the capital markets, Reg. FD leveled the information playing field because investors became privy to the same information as analysts at the same time. For the most part, Reg. FD has ended the days when some analysts allowed themselves to be spoon-fed information by companies in return for special access. Instead, analysts must now find more challenging indirect ways to assess the health of companies.[1] Therefore, it is unlikely that analysts have access to significant private information to form their recommendations anymore.

On the other hand, public information is information that is available to everyone. Although all publicly traded firms must meet minimum disclosure requirements set by the SEC, firms vary substantially in the amount of additional information they provide to the capital markets. Even for mandatory disclosures, such as those found in annual

[1] Jane Tisdale, "Worst Fears Over Reg FD Unrealized," 2004, State Street Global Advisers, April 2007 <http://www.ssga.com/library/povw/janetisdaleworstfearsover20041001/page.html>

financial statements, firms have substantial discretion in the informative nature of the disclosures and the amount of detail provided. For example, firms have discretion in the number of segments they report, how they aggregate operations into segments, and whether they include segmental data in quarterly reports. Discretion in disclosure is even more pronounced for press releases and direct contact with analysts.[2]

In this paper, we investigate the association between disclosure quality and the accuracy and predictive power of analysts' recommendations. We focus on the profitability of investment strategies involving consensus analyst recommendations. The consensus is a natural choice, as it takes into account the information implicit in the recommendations of all the analysts following a particular stock. It is arguably the analyst statistic that is most easily accessed by investors as it appears on many financial websites and is incorporated into the databases of several financial information providers.

We compare three different datasets of differing disclosure quality and measure their impact on the accuracy of analysts' consensus recommendations. The first dataset is a sample of high disclosure quality firms collected from the Association for Investment Management and Research (AIMR) Survey (2000). The survey, administered to analysts and portfolio managers, measures the disclosure quality of publicly traded companies and ranks the top fifty firms. Among other items, the evaluations are based on consistent and timely reporting of information, detailed segmented or disaggregated information, analysis of performance and financial position, explanation of forward-looking information, such as strategic plans and forecasts, and clarification of detailed numbers.

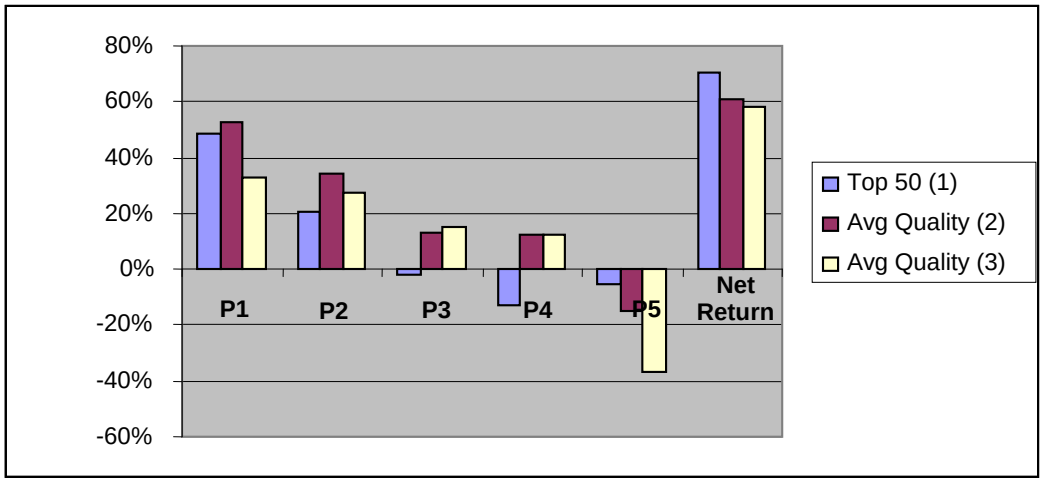
[2] Mark Lang and Russell Lundholm, "Corporate Disclosure Policy and Analyst Behavior," The Accounting Review 1996: 468.

The second dataset is a sample of average disclosure quality firms, consisting of all firms with at least one monthly consensus recommendation from the I/B/E/S database and return data from the Center for Research and Security Pricing (CRSP) database for the period 1999-2000. With an average sample size of about 5,000 firms, this dataset essentially mimics the market, assuming that on average, the typical firm in the market will have average disclosure quality.

The third dataset is similar to the second dataset, in that it is also a sample of average disclosure quality firms, but it controls for characteristics of the Top50 dataset, such as industry, size, and market risk. The goal of this dataset is to ensure that the two samples have similar characteristics and have a level playing field in comparing returns based on analysts' recommendations. The sample size for this dataset is about 400 firms.

Using these three datasets, we test the association between the quality of disclosure and the accuracy of analysts' recommendation. For our sample period of 1999-2000, we find that buying stocks with the most favorable consensus recommendations earns an annualized geometric mean return of 48%, 52%, and 33% for the three varying categories of disclosure quality respectively (See Figure 1 on the next page). On the other hand, buying stocks with the least favorable consensus recommendations earns an annualized geometric mean of only -5%, -15%, and -37% for the three datasets respectively. As a benchmark, during the same period, an investment in a value-weighted market portfolio earns an annualized geometric mean return of 6%. Since each dataset earns an excess return over the market, analysts' recommendations seem to be significant for all levels of disclosure quality.

Figure 1:
Annualized Geometric Market-Adjusted Mean Returns, 1999-2000



The figure presents returns earned by portfolios formed on the basis of analysts' consensus recommendations for the 3 different categories of disclosure quality. P1 represents the most favorable recommendations, whereas P5 represents the least favorable recommendations. The details on portfolio construction are further explained in Section 6 entitled "Research Design."

However, the incremental value of disclosure quality, measured through the mean monthly excess return of high disclosure quality firms over average disclosure quality firms, has a negative impact on the accuracy of favorable and unfavorable recommendations, but has a positive impact on the accuracy of "hold" recommendations for both datasets of average disclosure quality. The results indicate that the quality of public information, as a single factor, does not have a positive effect on the accuracy of analysts' recommendations because analysts may rely on private information on an equal or greater basis. This would imply that analysts' access to private information is the true value driver of their recommendations. The reason for this may be that private information, such as meetings with company executives and in-house analysis, as well as analysts' ability to gather other non-public information through relationships and industry networking, provides additional qualitative insight that is more valuable to analysts than the quantitative information that is available to the public.

Even though our results show that analysts are primarily developers of private information rather than interpreters of public information, the time period of our analysis was before Reg. FD was in effect. It would be interesting to see how the results change or whether the results change, in light of the fact that Reg. FD was designed to eliminate analysts' special access to private information.

In the next section, we discuss the related literature. In Section III we present our issue and discuss our hypotheses. In Section IV, we present the data and analysis and in Section V, we explain our research methodology. In Section VI, we present our results and in Section VII, we discuss their implications. In Section VIII, we summarize our results and conclusions.

II. LITERATURE REVIEW

Our research is related to two streams of existing literature: (1) research on the properties and usefulness of analysts' recommendations and (2) research on public and private information inputs in analysts' recommendations. The research on the properties of analysts' recommendations is relevant because it puts our issue into context. With a clear understanding of the value of recommendations to investors, we can analyze the impact of that value by controlling for disclosure quality.

A. Properties and Usefulness of Analysts' Recommendations

Much of the research on the properties of analysts' recommendations sheds light on the inherent bias associated with analysts' recommendations. McNichols and O'Brien (1997) provide evidence that consensus recommendations are biased because optimistic analysts are more likely to provide recommendations than are pessimistic analysts, resulting in overly optimistic recommendations. Empirically, we observe a paucity of

"sell" recommendations and it is for this reason the market interprets a "hold" recommendation to mean "sell."

In addition, Lin and McNichols (1998) explore the incentive impacts of underwriting business by studying earnings forecasts and recommendations on firms making seasoned equity offerings from 1985-1994. They report that affiliated analysts (those working for underwriters) issue relatively optimistic long-term earnings growth and stock recommendations. Dugar and Nathan (1995), using a sample from an earlier era, find similar results, concluding that analysts appear to favorably bias their recommendations for firms that have underwritings relationships with their brokerage firms. In the wake of Reg. FD and the SEC settlement of 2002 decoupling equities research and investment banking, it would be interesting to analyze the new regulations' impact on analysts' recommendations.

Moreover, Krische and Lee (2001) find that analysts tend to recommend glamour stocks, which have high market-to-book ratios, high price-to-earnings ratios, high past sales growth, and strong price momentum, even though these stocks tend to underperform non-glamour stocks in the time they are examined. They further show that in and of itself, analyst stock-picking patterns tend to reduce the effectiveness of their picks because they fail to exploit systematic factors that lead to higher future returns. Given the inherent bias and the numerous conflict-of-interest problems, it seems unlikely that analysts' recommendations could be of any value.

However, prior research suggests that analysts' recommendations do add value. Womack (1996) discovers that analysts' recommendations are associated with abnormal returns both around the recommendation period and in the subsequent six (one) months

for downgrades (upgrades). Using a calendar time strategy, he finds significantly positive abnormal returns in the post recommendation period to portfolios formed on the basis of analysts' consensus recommendations. In later studies, Barber et al. (2001) and Krische and Lee (2001) find similar results, revealing that stocks favored by analysts out-perform stocks disfavored by analysts.

Furthermore, Jha et al. (2003) delve deeper and discern when analysts' recommendations are most useful. They find that the incremental value of recommendations is greatest when investors are in need of more "expertise" to distinguish between "good" and "bad" stocks, specifically analyzing difficult investment environments and stocks with less publicly available information. They assert that analysts appear to use their information-processing skills to corroborate or reject other publicly available information rather than provide new, private information.

B. Public vs. Private Information Inputs in Analysts' Recommendations

Given that analysts' recommendations are useful to investors, analyzing the information inputs of analysts becomes a worthwhile endeavor. However, learning about the information analysts use and understanding analysts' decision processes is no easy matter. Researchers have used surveys to simply ask analysts how they process information, protocol analysis to record analysts' thought processes as they process information, content analysis of analysts' research reports to infer the information analysts rely on to make forecasts and recommendations, and laboratory experiments to study how analysts use information.[3] Nonetheless, there is still an ongoing debate

[3] Sundaresh Ramnath et al. "A Review of Research Related to Financial Analysts' Forecasts and Stock Recommendations," Working Paper at Georgetown University 2007: 7-8.

questioning the role of analysts: Are they interpreters of public information or developers of private information?

Rogers and Grant (1997) examine 187 sell-side analysts reports issued between July 1993 and June 1994. They report that only about one-half of the information in the analysts' research reports could be found in the corresponding corporate annual reports, consistent with the notion that analysts also use other, external information. Furthermore, even within the annual report, about one-half of the information seems to have been obtained from the narrative sections (e.g. MD&A) rather than the basic financial statements. Thus, examination of analysts' reports suggests analysts do not solely rely on publicly available, quantitative information. It is important to note, though, that this analysis was performed before Reg. FD was adopted.

On the other hand, research also suggests that the quality of public information affects analysts' decisions. For example, Lang and Lundholm (1996) find that the quality of corporate disclosures affects analysts' coverage decisions as analysts appear to rely on detailed information in corporate reports. Additionally, their incentive to cover firms appears to be related to the quality of corporate disclosures. Thus, there seems to be a significant association between the quality of public information and analysts' behavior.

III. PROBLEM STATEMENT

A. Understanding the Issue

Though there is an abundance of papers written on the properties of analysts' recommendations and their value to investors, there are less papers linking disclosure quality and analyst behavior. There is even less research on disclosure quality and its impact on analysts' recommendations. Much research has been done to analyze whether

analysts evaluate public or private information to model their decisions. However, with the adoption of Reg. FD, the debate is now focused on the relationship between the quality of disclosure and its impact on the predictive power analysts' recommendations. Therefore, this paper will attempt to answer one central question:

1. Does additional disclosure beyond SEC requirements or a greater quality of overall corporate disclosure help or hurt analysts in making more accurate stock recommendations?

The issue is important because of the significant implications it has for the role of an analyst as well as for the quality of disclosure for all publicly traded firms. Before Reg. FD was in effect, the role of analysts was debated as follows: Are they interpreters of public information or developers of private information? Analysts' recommendations were considered valuable when they brought new, private information to differentiate their recommendations from others. However, now that all analysts and investors have access to the same information, greater disclosure quality may even act as a substitute for analysts' services if there is a positive correlation between disclosure quality and the accuracy of analysts' recommendations.

Additionally, since analysts' coverage of firms is related to the disclosure quality, firms may attempt to increase the quality of their disclosure to increase analyst coverage and investor following. However, if there is a relationship between disclosure quality and analysts' recommendations, then firms may provide ambiguous disclosure during unfavorable times and clear disclosure during favorable times. Thus, the significant implications make this area of research a meaningful study.

B. Hypotheses

We focus on one aspect (the impact of disclosure quality on the accuracy of analysts' recommendations), but analyze it from differing viewpoints. One viewpoint asserts that if analysts are still primarily seen as developers of private information, then their access to non-public information is what makes their recommendations valuable. Under this theory, increases in the quality of disclosure could even act as a substitute for their services, since the value driver is private information. This leads to the following hypothesis:

H1: The quality of a firm's disclosure is negatively associated with the accuracy of analysts' recommendations.[4]

An alternative hypothesis, based on the theory that analysts are mainly interpreters of public information, asserts that if more information or a higher quality of it equals an opportunity for better analysis, then the return on recommendations for high quality disclosure firms should outperform the return on recommendations for average quality disclosure firms. This leads to the following hypothesis:

H2: The quality of a firm's disclosure is positively associated with the accuracy of analysts' recommendations.

IV. DATA

To tests these hypotheses, data is collected for two distinct datasets: (1) High disclosure quality firms and (2) Average disclosure quality firms. We use the Association for Investment Management and Research (AIMR) Survey (2000) as a comprehensive measure for the quality of a firm's disclosure policy, and analyze its data to collect a

[4] This hypothesis is reasonable because the time period of our analysis is before the adoption of Reg FD.

sample of firms with high disclosure quality. The survey was administered to 2,489 analysts and portfolio managers in November 1999 and 345 returned completed questionnaires by January 2000. The average respondent had 32 years of experience in the industry and 97% of them were Chartered Financial Analysts, indicating that the respondents of the survey are knowledgeable professionals.

The survey consists of three majors sections: (1) Information Sources for Analysis (2) Important Factors in Evaluating Company Performance and (3) Leaders in Corporate Disclosure. Section 1 asks questions about financial and corporate information sources respondents currently use and perceive as important when they analyze companies. They rank different information sources, such as spoken dialogue with company executives, annual reports, and company conference calls, on a scale from 1 (not important) to 5 (extremely important). Section 2 asks respondents to name important factors of good disclosure, such as frequency and timeliness of information disclosed, consistency, and explanation of extraordinary or unusual charges, and asks them to rank the quality of those factors for most publicly traded companies on a scale from 1 (poor) to 5 (excellent).

Section 3 is the section of prime interest because it identifies the publicly traded companies that are doing a good job of disclosing financial information. Respondents had the opportunity to volunteer, unprompted, the names (no more than three) of publicly traded companies that they follow and perceive as having done the best job of disclosing financial and corporate information. This information is used to rank the top fifty firms on the quality of disclosure. Some of the factors in the evaluations include consistent and timely reporting of information, detailed segmented or disaggregated information,

analysis of performance and financial position, explanation of forward-looking information, such as strategic plans and forecasts, and clarification of detailed numbers.

An advantage of the AIMR Survey is that it captures all aspects of disclosure which are viewed as important by analysts rather than focusing on a single aspect, such as the existence of a management earnings forecast. Furthermore, the ranking of firms quantifies qualitative disclosure (e.g. management's discussion and analysis) and disclosure which may not have been reflected in published financial statements or the media (e.g. conference calls to analysts). In addition, the measures are analyzed by analysts who are primary users of financial statements and are familiar with the firms' disclosures through their use of them during the year. A potential problem, however, is that the rankings reflect analysts' perceptions of firms' disclosure policies rather than the disclosure policies themselves.

Table 2:
Descriptive Statistics for the Top 50 Disclosure Quality Firms

	Market Cap (MM)	Price to Earnings	Book to Market	Beta
Average	105755	30.57	0.25	0.91
Median	65023	19.92	0.18	0.85
Minimum	1190	2.36	0.03	0.19
Maximum	604415	144.23	1.14	1.85

Table 2 (above) provides descriptive statistics for the top fifty disclosure firms (Top50) taken from the AIMR Survey. The average market capitalization of a typical firm is about 105 billion, with a median of about 65 billion, indicating that the firms in the sample are very large in size. The price to earnings ratio ranges from 2.36 to 144.23, which shows the great deal of variation in the sample. However, the median ratio is about 20, suggesting that price to earnings is also quite high in the sample. In addition, the book

to market ratio also varies significantly, but the median is relatively low at .18, indicating that much of the sample has a low book to market ratio. The average beta for the sample is near 1, suggesting that many of the stocks in the sample move with the market. Furthermore, the firms in the sample are from various industries, ranging from beverages and cigarettes to office furniture and motor vehicles. However, it is worth noting that there are clusters of firms in the same industry including pharmaceuticals, financial services, such as banks and insurance companies, and technology, such as semiconductors and computers.

The second dataset, which is a sample of average disclosure quality firms, is designed to mimic the market with the assumption that on average, a firm in the market will have average disclosure quality. This dataset consists of all firms in the I/B/E/S database with at least one valid recommendation from January 1999 through December 2000. The time period of 1999-2000 is used to be consistent because the firms from the AIMR Survey were analyzed during the same time period. Those firms not appearing on the CRSP files (firms without return data) are dropped. Specifically, the I/B/E/S database contains 142,777 observations for the years 1999 through 2000. Dropping the 22,702 firms not appearing on the CRSP file leaves a final sample of 120,075 recommendations for the second dataset.

Furthermore, a third dataset, which is similar to the second dataset, in that it is also a sample of average disclosure quality firms, is created to control the characteristics of the Top50 dataset, such as industry, size, and book to market ratios. This dataset ensures that the two samples have similar characteristics and a level playing field in comparing returns based on analysts' recommendations. Controlling for the following

factors, we narrow the second dataset to a sample size of 400 firms, which have characteristics similar to that of the Top50 dataset.

- *Size*: Since the Top50 dataset has an overwhelming amount of large-cap firms, this sample contains large-cap firms (> 5 million market capitalization) other than those in the Top50 dataset.
- *Industry*: To control for industry, this sample only consists of firms in industries that the Top50 firms are in. Thus, no industry is represented which is not part of the Top50 sample. Furthermore, the industries with greater representation in the Top50 sample (e.g. pharmaceuticals, financial services, technology) also have greater representation in this sample.
- *Book to Market***:** Though this ratio for the Top50 sample has a large range, it is relatively low, based on the average and median. Therefore, we don't restrict the range, but control for this variable by ensuring that the average and median book to market are consistent with the Top50 sample.
- *Market Risk*: Measuring market risk by beta, we control for this factor by ensuring that average is close to 1, which is roughly equivalent to the average for the Top50 sample.

V. RESEARCH DESIGN

A. Portfolio Construction

To determine whether investors can profit from analysts' consensus recommendations, we construct portfolios based on the consensus rating of each covered firm for each of the three datasets. Each I/B/E/S database record includes, among other items, the recommendation date, and a rating between 1 and 5. A rating of 1 reflects a

strong buy recommendation, 2 a buy, 3 a hold, 4 a sell, and 5 a strong sell. This five-point scale is commonly used by analysts. If an analyst uses a different scale, I/B/E/S converts the analyst's rating to its five-point scale. The average analyst rating, Ã, for firm *i* for each month is found by summing the individual ratings of all the analysts who have outstanding recommendations for the firm for that month and then dividing by the number of recommendations. We do not calculate this average analyst rating, but rather obtain it from the Summary tab in I/B/E/S, which automatically calculates it. Using these average ratings, each covered firm is placed into one of five portfolios at the end of each month. The five portfolios are comprised of the following:

- Portfolio 1: $1.0 \leq \tilde{A} \leq 1.5$
- Portfolio 2: $1.5 < \tilde{A} \leq 2.0$
- Portfolio 3: $2.0 < \tilde{A} \leq 2.5$
- Portfolio 4: $2.5 < \tilde{A} \leq 3.0$
- Portfolio 5: $3.0 < \tilde{A}$

Thus, the first portfolio consists of the most highly recommended stocks while the fifth portfolio consists of the least favorably recommended stocks. Five portfolios are chosen to achieve a high degree of separation across firms in the sample while retaining sufficient power for statistical analysis. The cutoffs, although somewhat arbitrary, are set so that only the bottom portfolio contains firms whose consensus ratings corresponds to hold or sell recommendation, due to the relative infrequency of such ratings.[5] An additional portfolio entitled, "Net Return" is also constructed to examine the net effect of

[5] A similar approach is applied in Barber et al. (2001).

analysts' recommendations. Net Return is equivalent to buying portfolios 1 and 2, and selling short portfolios 3, 4, and 5. We sell every portfolio with a recommendation lower than a "buy" because the market interprets a "hold" recommendation as a "sell" due to the infrequency of such a rating.

After determining the composition of each portfolio *p* at the end of each month, the value-weighted return is calculated.

$$R_{pr} = \sum_{i=1}^{n_{pr-1}} x_{ir-1} R_{ir} \qquad (1)$$

where

x_{ir-1} = the market value of equity for firm *i* at the end of the month divided by the aggregate market capitalization of all firms in portfolio *p* at the end of the month

R_{ir} = the return on the common stock of firm *i* at the end of the month

n_{pr-1} = the number of firms in portfolio *p* at the end of the month

There are two reasons that the securities in each portfolio are value weighted rather than equally weighted. First, an equal weighting of returns leads to portfolio returns that are severely overstated.[6] Second, a value weighting allows for a better capture of the economic significance of our results, as the individual returns of the larger and more important firms will be more heavily represented in the aggregate return than will those of the smaller firms.

[6] This problem arises due to the cycling over time of a firm's closing price between its bid and ask (commonly referred to as the bid-ask bounce). For a more detailed discussion, see Blume and Stambaugh (1983), Barber and Lyon (1997), Canina et al. (1998), and Lyon et al. (1999).

B. Performance Evaluation

To determine whether profitable investment strategies exist with respect to analysts' consensus recommendations, a calculation of market-adjusted returns for each of the constructed portfolios is performed. It is given by R_{pt} - R_{mt} for portfolio *p* in month *t*, where R_{mt} is the month *t* return on the CRSP NYSE/AMEX/Nasdaq value-weighted market index.

We next calculate three measures of abnormal performance for each portfolio. We employ the theoretical framework of the Capital Asset Pricing Model (CAPM) and estimate the monthly time-series regression:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + \varepsilon_{pt} \qquad (2)$$

where

R_{ft} = the month *t* return on treasury bills having one month until maturity[7]

α_p = the estimated CAPM intercept (Jensen's alpha)

β_p = the estimated market beta

ε_{pt} = the regression error term

This test yields parameter estimates of α_p and β_p.

Second, we employ an intercept tests using the three-factor model developed by Fama and French (1993). To evaluate the performance of each portfolio, we estimate the following monthly time-series regression:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + \varepsilon_{pt} \qquad (3)$$

[7] This return is taken from the Center for Research and Security Pricing and (CRSP).

where

SMB_t = the difference between the month *t* returns of a value-weighted portfolio of small stock and one of large stocks

HML_t = the difference between the month *t* returns of a value-weighted portfolio of high book-to-market stocks and one of low book-to-market stocks[8]

The regression yields parameter estimates of α_p, β_p, s_p, and h_p.

A third test includes a zero investment portfolio related to price momentum, as follow:

$$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + m_p PMOM_t + \varepsilon_{pt} \qquad (4)$$

where

$PMOM_t$ = the month *t* average return of the firms with the highest 30% return over the 11 months through month t - 2, less the month *t* average return of the firms with the lowest 30% return over the 11 months through month t - 2.

In addition to estimates of α_p, β_p, s_p, and h_p, this regression yields a parameter estimate of m_p. This specification will be referred to as the four-characteristic model.

VI. RESULTS

A. Returns Based on Analysts' Recommendations

Table 3 (see Appendix A1) documents the returns for the Top50 disclosure quality firms to the various portfolios and suggests the possibility that investment strategies based on analysts' consensus recommendations could be profitable. As shown

[8] The construction of these portfolios is discussed in detail in Fama and French (1993).

in columns 3 and 4, there is a decrease in both raw and market-adjusted returns as we move from more highly to less highly recommended stocks. Portfolio 1's average monthly market-adjusted return of 4.02% translates into a cumulative return of close to 100% over the two year period, whereas Portfolio 5's average monthly market-adjusted return of -4.54% is equivalent to a cumulative return of nearly -110%, a 210 percentage point spread. In addition, the intercept from the Fama-French model indicates that the net return (purchasing favorable stock recommendation and selling unfavorable ones) on analysts' recommendations earns a mean monthly return of about .67%.

However, when controlling for market risk, size, book-to-market, and price momentum, the pattern is disrupted. The intercept test for all three models shows Portfolio 3 as having the lowest return, when in fact, Portfolio 4 should have the lowest.[9] In addition, the coefficients for Portfolio 4 should be negative because it consists of unfavorable recommendations; yet, the Fama-French and Four-Characteristic model show positive coefficients for Portfolio 4. Furthermore, only Portfolio 3 is statistically significant when controlling for variables, suggesting that a high quality of disclosure negatively impacts the accuracy of analysts' recommendations.

Table 4 (see Appendix A2) documents the returns for the average disclosure quality firms to the various portfolios and suggests the possibility that investment strategies based on analysts' consensus recommendations could be profitable. As shown in columns 3 and 4, there is a decrease in both raw and market-adjusted returns as we move from more highly to less highly recommended stocks, similar to the Top50 dataset. Portfolio 1's average monthly market-adjusted return of 3.73% translates into a

[9] Portfolio 4 should be the lowest because there is no regression data for Portfolio 5. See footnote in Appendix A1.

cumulative return close to 90% over the two year period, whereas Portfolio 5's average monthly market-adjusted return of -1.15% is equivalent to a cumulative return of nearly -30%, a 120 percentage point spread. In addition, the intercept from the Fama-French model indicates that the net return on analysts' recommendations earns a mean monthly return of about .68%, which is statistically significant at the 5% level, unlike the Top50 dataset.

After controlling for market risk, size, book-to-market, and price momentum, the intercept test for CAPM and Fama-French also indicate that more highly rated stocks have higher abnormal returns than less high rated stocks, with the exception of Portfolio 4. The abnormal return for Portfolio 1 under the Fama-French model earns .37% per month whereas the abnormal return for Portfolio 5 earns -.04% per month. Furthermore, Portfolios 1 and 2 are significant at the 1% level and Portfolio Net Return is significant at the 5% level, suggesting that less disclosure quality positively impacts the accuracy of analysts' recommendations, especially for favorable stocks.

Table 5 (see Appendix A3) documents the returns for the average disclosure quality firms controlling for characteristics of the Top50 dataset to the various portfolios and suggests the possibility that investment strategies based on analysts' consensus recommendations could be profitable. As shown in columns 3 and 4, there is a decrease in both raw and market-adjusted returns as we move from more highly to less highly recommended stocks, similar to the Top50 dataset. Portfolio 1's average monthly market-adjusted return of 2.43% translates into a cumulative return close to 60% over the two year period, whereas Portfolio 5's average monthly market-adjusted return of -4.73% is equivalent to a cumulative return of nearly -115%, a 175 percentage point spread.

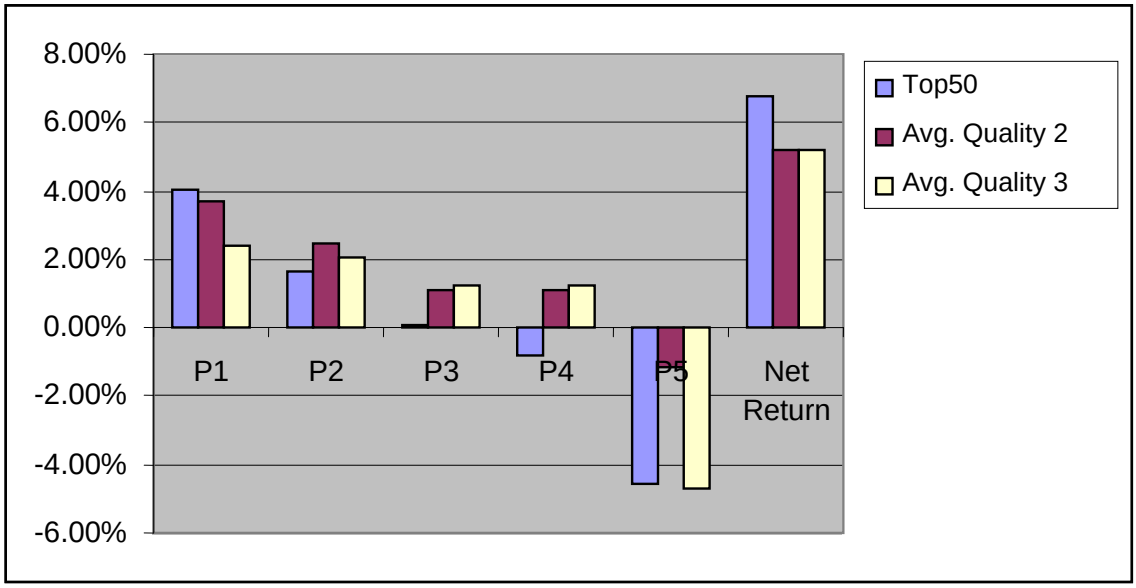
After controlling for market risk, size, book-to-market, and price momentum, the intercept test for CAPM and Fama-French also indicate that more highly rated stocks have higher abnormal returns than less high rated stocks, with the exception of Portfolio 2, which earns a higher return than that of Portfolio 1. Comparing the most favorable analysts' recommendations against the least favorable, the abnormal return for Portfolio 1 under the Fama-French model earns mean return of .13% per month whereas the abnormal return for Portfolio 5 earns a mean return of -1.2% per month. Furthermore, Portfolios 2 and 5 are significant for the CAPM model and the Fama-French model, suggesting that less disclosure quality positively impacts the accuracy of analysts' recommendations, irrespective of whether the recommendations are favorable or unfavorable.

B. Excess Returns of High Disclosure over Average Disclosure

The results suggest that less disclosure quality positively impacts the accuracy of analysts' recommendations whereas the high disclosure quality negatively impacts the accuracy of analysts' recommendations. To analyze the incremental value of disclosure quality, we compare the mean monthly returns earned by each portfolio for the three contrasting groups of disclosure quality. Figure 6 (next page) indicates that returns are greater for high disclosure firms than for average disclosure firms. Portfolio 1's return for the Top50 is slightly greater than the return for Avg. Quality 2, but is significantly higher than the return for the average disclosure quality firms that have matching characteristics of the Top50 (Avg. Quality 3). Thus, the results suggest that greater disclosure quality positively impacts the accuracy of favorable recommendations, when controlling for

variables between the datasets. This contradicts our earlier findings which suggests the opposite conclusion.

Figure 6:
Top 50 vs. Average Quality Disclosure - Mean Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000



This figure presents the mean monthly market-adjusted returns earned by portfolios according to average analysts' recommendations, comparing the returns of the Top50 disclosure quality firms against the returns of the average disclosure quality firms. Average Quality (2) represents all average disclosure quality firms, whereas Average Quality (3) represents average disclosure quality firms that similar characteristics to that of the Top50 dataset.

Furthermore, Portfolio 5's return for the Top50 is substantially lower than the return for Avg. Quality 2, but is similar to the return for the average disclosure quality firms that have matching characteristics of the Top50 (Avg. Quality 3). Thus, the results indicate that less disclosure quality does not impact the accuracy of unfavorable recommendations. This also contradicts our earlier findings that lower disclosure quality actually increases the accuracy of recommendations.

Portfolio Net Return's returns for both average disclosure quality firms are roughly equivalent, but the Net Return for the Top50 is noticeably higher than the

average disclosure quality firms. This suggests that, overall, the level of disclosure quality impacts the accuracy of analysts' recommendations even though it has no significant impact on unfavorable recommendations.

However, despite these findings, the excess return of the Top50 disclosure quality firms over the average disclosure quality firms is not statistically significant for most of the portfolios. Table 7 (see Appendix A4), which presents the excess return over the first average disclosure quality dataset, shows that the most favorable recommendations earn a mean market-adjusted excess return of .30%, while the least favorable recommendations earn a mean market-adjusted excess return of -3.93%. The Net Return for the Top50 is 157 basis points higher than that the Net Return for average disclosure quality firms. However, none of these portfolios are significant; only Portfolio 3 is statistically significant at the 5% level. This suggests that the incremental value of greater disclosure quality is minimal, if anything, in regard to the accuracy of analysts' recommendations.

Furthermore, the intercept tests show that the coefficients for Portfolio 1 and 2, which contain the most favorable recommendations, have negative coefficients, indicating that the return on the Top50 is less than the return on average disclosure quality firms, when we control for market risk, size, book-to-market, and price momentum. For example, the intercept for Portfolio 2 from the Fama-French model, which is significant at the 10% level, indicates that higher quality disclosure firms earn a mean monthly return of .16% less than average disclosure quality firms for favorable recommendations.

On the other hand, portfolios of unfavorable recommendations, which are not statistically significant, earn similar returns. For instance, the Top50 firms earn -.03%

less than average disclosure quality firms for Portfolio 4. However, the intercept for Portfolio 3 from the Fama-French model, which is statistically significant at the 5% level, indicates that Top50 firms earn .41% less than average disclosure quality firms. Since Portfolio 3 consists mainly of hold recommendations (and we sell this portfolio to calculate our return), this suggests that greater disclosure quality positively impacts the accuracy of analysts' "hold" recommendations. Thus, the incremental value of greater disclosure quality has a negative impact on favorable recommendations, no or minimal impact on unfavorable recommendations, and a positive impact on "hold" recommendations.

Table 8 (see Appendix A5) presents the excess return of the Top50 dataset over the second average disclosure quality dataset which matches the characteristics of the Top50 dataset; the only different characteristic is the difference in the level of disclosure quality. Table 8 shows that the most favorable recommendations earns a mean market-adjusted excess return of 1.59%, while the least favorable recommendations earns a mean market-adjusted excess return of -.19%, neither of which is statistically significant. The Net Return for the Top50 is 155 basis points higher than that the Net Return for average disclosure quality firms, which is statistically significant at the 10% level only for the CAPM model. This would suggest that the incremental value of greater disclosure quality is minimal, if anything, in regard to the accuracy of analysts' recommendations. However, an increase in disclosure quality seems to improve the accuracy of analysts' recommendations, on a net basis even though it has no significant impact on favorable and unfavorable recommendations alone.

Nonetheless, when we control for market risk, size, book-to-market, and price momentum, the intercept tests suggests that only Portfolio 3 is significant. The intercept for Portfolio 3 from the Fama-French model, which is statistically significant at the 1% level, indicates that higher disclosure quality firms earn .51% less than average disclosure quality firms. Since Portfolio 3 consists mainly of hold recommendations (and we sell this portfolio to calculate our return), this suggests that greater disclosure quality positively impacts the accuracy of analysts' "hold" recommendations.

On the other hand, Portfolio 1, which contains the most favorable recommendations, is not significant and earns similar returns for both categories of disclosure quality. For example, the Top50 firms earn a mean return of .12% per month more than the average disclosure quality firms for Portfolio 1. Portfolio 2 has a negative coefficient of -.012, suggesting that higher disclosure quality firms can even earn less than lower disclosure firms for favorable recommendations. The portfolios of unfavorable recommendations are not significant and earn similar returns for both categories of disclosure quality. Thus, the incremental value of greater disclosure has no impact or a negative impact on favorable and unfavorable recommendations, but has a positive impact on "hold" recommendations. Therefore, the results this dataset are similar to the results for the second dataset, which also consists of average disclosure quality firms.

VII. IMPLICATIONS

Overall, analysts' recommendations are useful for both high disclosure quality firms as well as average disclosure quality firms. However, the mean monthly excess return of high disclosure quality firms over average quality firms indicates that the

incremental value of greater disclosure quality has a negative impact on the accuracy of favorable and unfavorable recommendations, but has a positive impact on the accuracy of "hold" recommendations.

An interpretation of our results suggests that the quality of public information, as a single factor, does not have a positive effect on the accuracy of analysts' recommendations because analysts may rely on private information on an equal or greater basis. This would imply that analysts' access to private information is the true value driver of their recommendations. The reason for this may be that private information, such as meetings with company executives and in-house analysis, as well as analysts' ability to gather other non-public information through relationships and industry networking, provides additional qualitative insight that is more valuable to analysts than the quantitative information that is available to the public. A possible reason that a greater quality of public information is valuable for "hold" recommendations may be that analysts are able to realize that a stock will likely be a "hold" recommendation by analyzing the high quality publicly available information and thus, the additional private information adds no incremental value.

Though our results show that analysts are primarily developers of private information rather than interpreters of public information, the time period of our analysis was before Reg. FD was in effect. It would be interesting to see how the results change or whether the results change, in light of the fact that Reg. FD was designed to eliminate analysts' special access to private information. Since Reg. FD allows all analysts and investors to have access to the same information at the same time, greater disclosure quality may act as a substitute for analysts' services if analysts are seen as simple

interpreters of public information. However, this is probably unlikely considering that analysts have become more diligent in the post Reg. FD world by "crafting more thoughtful mosaics of publication information and personal deduction."[10] The new environment requires analysts to do more leg work to research, challenging them to find more imaginative ways to gather data from various sources, such as visits to regional offices as well as interaction with a company's customers, suppliers, and competitors. In a way, analysts' ability to easily gather such information from various sources is an advantage they have over investors, which is similar to their advantage of having access to private information in the pre-Reg. FD environment. Therefore, as long as analysts are successful in this more thorough approach, they will be perceived as more than simple interpreters of public information.

VIII. CONCLUSION

Though our analysis documents a significant association between disclosure quality and the accuracy of analysts' recommendations, it is important to note that our analysis was constrained and limited in several respects because controlling for these issues in future research on this topic will lead to more robust results.

First, even though the AIMR Survey provides analysis of the level of disclosure quality for publicly traded companies as a whole, it only ranks the top fifty firms in terms of highest disclosure quality, causing our sample size of high disclosure quality firms to be very low. A greater sample size would lead to more accurate, statistically significant results. Secondly, the time period for our analysis was a unique time in stock market

[10]Jane Tisdale, "Worst Fears Over Reg FD Unrealized," 2004, State Street Global Advisers, April 2007 <http://www.ssga.com/library/povw/janetisdaleworstfearsover20041001/page.html>

history for several reasons. The market was booming in light of the tech bubble, but was on the verge of bursting. In addition, though, it was a time when equities research and investment banking was still under one roof, which probably resulted in many biased recommendations. We were constrained to use this time period because the AIMR Survey was conducted during these years, but testing another time period would lead to more robust results.

Additionally, the AIMR Survey reported that the overall quality of disclosure of companies, in general, wasn't that great in 1999-2000. For example, only 5% of respondents felt that the overall quality of corporate disclosure was excellent, whereas the majority felt that most publicly traded companies were doing an average or below average job of disclosing financial or corporate information. Furthermore, one out of ten respondents felt that the overall quality of corporate disclosure had deteriorated over the past few years. In light of the poor quality of disclosure, our sample of high disclosure quality firms taken from the AIMR Survey may not truly have high disclosure quality, potentially causing our results to be insignificant. Lastly, another weakness in the results may be that the AIMR Survey's rankings were based on analysts' perceptions of disclosure quality instead of the actual disclosure quality of the firm. This would create a fruitless dataset leading to inaccurate results.

Thus, even though we found that greater disclosure quality negatively impacts the accuracy of analysts' recommendations, it still remains an open question whether such an association is intact in the wake of Reg. FD and the impact it has had on analysts' use of public and private information in forming their recommendations. Further research on

this topic while controlling for the weaknesses of our analysis will probably lead to interesting and noteworthy results.

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APPENDIX (A1)

Table 3:
Top 50 Disclosure Quality Firms - Percentage Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000

Portfolio	Beta	Mean Raw Return	Mean Market Adjusted Return	Intercept from CAPM	Intercept from Fama-French	Intercept from Four-Characteristic
1 (most favorable)	1.87	4.13%	4.02%	0.080**	0.025	0.023
2	1.12	1.97%	1.63%	0.022**	0.017	0.017
3	-0.03	0.90%	0.11%	-0.045***	-0.043**	- 0.036**
4	0.58	0.82%	-0.83%	-0.027	0.005	0.012
5 (least favorable)[11]		-4.54%	-4.54%			
Net Return	1.79	4.77%	6.74%*	0.157**	0.068	0.048

This table presents percentage monthly returns earned by portfolios according to average analysts' recommendations for the Top50 disclosure quality firms from the AIMR Survey. Raw returns are the mean percentage monthly returns earned by each portfolio. Market-adjusted returns are the value-weighted returns less the return on a value-weighted NYSE/AMEX/Nasdaq index. The CAPM intercept is the estimated intercept from a time-series regression of the portfolio return ($R_p - R_f$) on the market excess return ($R_m - R_f$). The intercept for the Fama-French three-factor model is the estimated intercept from a time-series regression of the portfolio return on the market excess return ($R_m - R_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four characteristic intercept is estimated by adding a zero-investment price momentum portfolio (PMOM) as an independent variable. The mean net return assumes that portfolios 1 and 2 are purchased, and 3, 4, and 5 are sold short. Each t-statistic pertains to the null hypothesis that the associated return is zero. The t-statistics for returns that are significant at a level of 1%, 5% or 10% are displayed as ***, **, or * respectively.

[11] The sample size of Portfolio 5 was too low to run an effective any time-series regression, resulting in a lack of coefficients for beta and the alpha intercepts.

APPENDIX (A2)

Table 4:
Average Disclosure Quality Firms - Percentage Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000

Portfolio	Beta	Mean Raw Return	Mean Market Adjusted Return	Intercept from CAPM	Intercept from Fama-French	Intercept from Four-Characteristic
1 (most favorable)	1.49	1.48%	3.73%***	0.060***	0.037***	0.031***
2	1.21	1.23%	2.49%***	0.035***	0.032***	0.031***
3	0.43	0.44%	1.11%	-0.015**	- 0.002	0.001
4	0.43	0.20%	1.09%	-0.015	0.008	0.006
5 (least favorable)	1.04	-2.14%	-1.15%	-0.010	- 0.004	0.013
Net Return	2.81	4.21%	5.17%*	0.133***	0.067**	0.043

This table presents percentage monthly returns earned by portfolios according to average analysts' recommendations for average disclosure quality firms. Raw returns are the mean percentage monthly returns earned by each portfolio. Market-adjusted returns are the value-weighted returns less the return on a value-weighted NYSE/AMEX/Nasdaq index. The CAPM intercept is the estimated intercept from a time-series regression of the portfolio return ($R_p - R_f$) on the market excess return ($R_m - R_f$). The intercept for the Fama-French three-factor model is the estimated intercept from a time-series regression of the portfolio return on the market excess return ($R_m - R_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four characteristic intercept is estimated by adding a zero-investment price momentum portfolio (PMOM) as an independent variable. The mean net return assumes that portfolios 1 and 2 are purchased, and 3, 4, and 5 are sold short. P1 - P5 is equivalent to portfolio 1 less portfolio 5. Each t-statistic pertains to the null hypothesis that the associated return is zero. The t-statistics for returns that are significant at a level of 1%, 5% or 10% are displayed as ***, **, or * respectively.

APPENDIX (A3)

Table 5:
Average Disclosure Quality Firms (Dataset 3) - Percentage Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000

Portfolio	Beta	Mean Raw Return	Mean Market Adjusted Return	Intercept from CAPM	Intercept from Fama-French	Intercept from Four-Characteristic
1 (most favorable)	0.85	3.00%	2.43%***	0.017*	0.013	0.015
2	1.11	2.64%	2.07%***	0.026***	0.028***	0.028***
3	0.56	1.81%	1.24%	-0.007	0.007	0.009
4	0.33	1.79%	1.22%	-0.018	0.020	0.025*
5 (least favorable)	-.44	-5.24%	-4.73%	-0.128***	- 0.123*	- 0.11
Net Return	1.22	5.53%	5.19%	0.059	- 0.002	- 0.011

This table presents percentage monthly returns earned by portfolios according to average analysts' recommendations for average disclosure quality firms controlling for other variables. Raw returns are the mean percentage monthly returns earned by each portfolio. Market-adjusted returns are the value-weighted returns less the return on a value-weighted NYSE/AMEX/Nasdaq index. The CAPM intercept is the estimated intercept from a time-series regression of the portfolio return ($R_p - R_f$) on the market excess return ($R_m - R_f$). The intercept for the Fama-French three-factor model is the estimated intercept from a time-series regression of the portfolio return on the market excess return ($R_m - R_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four characteristic intercept is estimated by adding a zero-investment price momentum portfolio (PMOM) as an independent variable. The mean net return assumes that portfolios 1 and 2 are purchased, and 3, 4, and 5 are sold short. Each t-statistic pertains to the null hypothesis that the associated return is zero. The t-statistics for returns that are significant at a level of 1%, 5% or 10% are displayed as ***, **, or * respectively.

APPENDIX (A4)

Table 7:
Top 50 vs. Average Disclosure Quality - Mean Excess Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000

Portfolio	Beta	Mean Raw Return	Mean Market Adjusted Return	Intercept from CAPM	Intercept from Fama-French	Intercept from Four-Characteristic
1 (most favorable)	0.38	2.65%	0.30%	0.020	- 0.012	- 0.008
2	-0.09	0.74%	-0.86%	-0.013	- 0.016*	- 0.015
3	-0.46	0.46%	-1.00%	-0.031**	- 0.041***	- 0.037**
4	0.15	0.62%	-1.92%	-0.013	- 0.003	0.007
5 (least favorable)[12]		-2.40%	-3.93%			
Net Return	0.69	0.56%	1.57%	0.051	0.014	0.007

This table presents percentage excess monthly returns earned by portfolios according to average analysts' recommendations. Raw returns are the mean percentage monthly returns earned by each portfolio for the Top50 disclosure quality firms less the raw returns earned for the average disclosure quality firms. Market-adjusted returns are the value-weighted returns less the return on a value-weighted NYSE/AMEX/Nasdaq index for the Top50 firms less the market-adjusted returns for the average disclosure quality firms. The CAPM intercept is the estimated intercept from a time-series regression of the portfolio return ($R_p - R_f$) on the market excess return ($R_m - R_f$). The intercept for the Fama-French three-factor model is the estimated intercept from a time-series regression of the portfolio return on the market excess return ($R_m - R_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four characteristic intercept is estimated by adding a zero-investment price momentum portfolio (PMOM) as an independent variable. The mean net return assumes that portfolios 1 and 2 are purchased, and 3, 4, and 5 are sold short. Each t-statistic pertains to the null hypothesis that the associated return is zero. The t-statistics for returns that are significant at a level of 1%, 5% or 10% are displayed as ***, **, or * respectively.

[12] The sample size of Portfolio 5 was too low to run an effective any time-series regression, resulting in a lack of coefficients for beta and the alpha intercepts.

APPENDIX (A5)

Table 8:
Top 50 vs. Average Disclosure Quality (Dataset 3) - Mean Excess Monthly Returns Earned by Portfolios on the Basis of Analysts' Recommendations, 1999-2000

Portfolio	Beta	Mean Raw Return	Mean Market Adjusted Return	Intercept from CAPM	Intercept from Fama-French	Intercept from Four-Characteristic
1 (most favorable)	1.03	1.14%	1.59%	0.062	0.012	0.008
2	.016	-0.67%	-0.44%	-0.004	- 0.012	- 0.011
3	.588	-0.91%	-1.13%	-0.038***	- 0.051***	- 0.045**
4	.243	-0.98%	-2.05%	-0.009	- 0.015	- 0.013
5 (least favorable)[13]		0.70%	-0.19%			
Net Return	1.39	-0.76%	1.55%	0.106*	0.067	0.056

This table presents percentage excess monthly returns earned by portfolios according to average analysts' recommendations. Raw returns are the mean percentage monthly returns earned by each portfolio for the Top50 disclosure quality firms less the raw returns earned for the average disclosure quality firms. Market-adjusted returns are the value-weighted returns less the return on a value-weighted NYSE/AMEX/Nasdaq index for the Top50 firms less the market-adjusted returns for the average disclosure quality firms. The CAPM intercept is the estimated intercept from a time-series regression of the portfolio return ($R_p - R_f$) on the market excess return ($R_m - R_f$). The intercept for the Fama-French three-factor model is the estimated intercept from a time-series regression of the portfolio return on the market excess return ($R_m - R_f$), a zero-investment size portfolio (SMB), and a zero-investment book-to-market portfolio (HML). The four characteristic intercept is estimated by adding a zero-investment price momentum portfolio (PMOM) as an independent variable. The mean net return assumes that portfolios 1 and 2 are purchased, and 3, 4, and 5 are sold short. Each t-statistic pertains to the null hypothesis that the associated return is zero. The t-statistics for returns that are significant at a level of 1%, 5% or 10% are displayed as ***, **, or * respectively.

[13] The sample size of Portfolio 5 was too low to run an effective any time-series regression, resulting in a lack of coefficients for beta and the alpha intercepts.