# ANALYST FORECAST ERROR:

# EVIDENCE FROM RESTATED EARNINGS AND ANALYST AFFILIATION

by

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Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy

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# GLOSSARY

Actual earnings: street earnings (IBES actuals), reported earnings, restated earnings, or final earnings.

Affiliated analysts: analysts whose employers are underwriters of covered firms within a 6-year window around earnings announcements.

Covered firms: firms that analysts follow.

Final earnings: reported earnings for non-restatement firms (because these firms never had to restate), and restated earnings for restatement firms.

GAAP earnings: earnings that are calculated based on GAAP and are filed with the SEC, and include reported earnings, restated earnings, and final earnings.

IBES actuals: see "street earnings."

Reported earnings: earnings that companies file with the SEC.

Restated earnings: earnings that companies file with the SEC to correct for prior mistakes in reported earnings due to earnings manipulation.

Restatement firms: firms that restated their earnings during the period 1997-mid 2002. Non-restatement firms: firms that did not restate their earnings in the period 1997-mid 2002.

Street earnings: earnings that are not calculated based on GAAP. This study uses street earnings provided by the majority of Thomson Financial analysts, which are called IBES actuals.

Unaffiliated analysts: analysts whose employers are not underwriters of covered firms within a 6-year window around earnings announcements.

# Analyst Forecast Error: Evidence from Restated Earnings and Analyst Affiliation

Abstract

By

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I examine analyst forecast errors using restated earnings as the benchmark. While prior research has shown analyst forecasts are only slightly below earnings, suspicion exists that some element of this may be related to analysts following company guidance. If analyst forecast accuracy occurs because of analysts' reliance on management guidance, then this superiority should diminish when using earnings that are clearer of earnings manipulation, i.e. final earnings. Final earnings are restated earnings for restatement firms, and reported earnings for non-restatement firms. In addition, if forecast errors and earnings surprises are merely the results of game playing between analysts and managers, then the appropriateness of using such benchmarks is subject to doubt.

The results of this study can be summarized as the following. Managers manipulate IBES actuals upwards from GAAP earnings for restatement firms, but not for non-restatement firms. For restatement firms, the forecast error and forecast bias of affiliated analysts are significantly greater than those of unaffiliated analysts when using IBES actuals as the benchmark, but not when using final earnings as the benchmark. This implies that both affiliated and unaffiliated analyst forecasts are closer to IBES actuals than to final earnings. Since the IBES actuals that analyst forecasts are closer to have been significantly misguided, therefore, analyst forecasts are also significantly

misguided for restatement firms. That is, both affiliated and unaffiliated analysts of restatement firms are unable to explicitly warn investors about the existence of earnings manipulation.

For non-restatement firms, there is no difference between the forecast error and forecast bias of affiliated and those of unaffiliated analysts. Hence, for the majority of firms, there doesn't need to be concern regarding the forecasts of analysts who are affiliated with covered firms due to underwriting relationships. Affiliated analysts of restatement firms issue forecasts that are above IBES actuals. However, the cause of this is unknown.

This study provides the following indicators of possible GAAP earnings and street earnings manipulation. 1) Firms with IBES actuals that are significantly different from GAAP earnings. 2) Firms that have consecutive positive earnings surprises. 3) Companies whose analysts provide overly optimistic forecasts. 4) Companies that have misstated their earnings in prior period(s).

# Analyst Forecast Error:

# Evidence from Restated Earnings and Analyst Affiliation

## CHAPTER 1

## INTRODUCTION

I investigate the appropriateness of using forecast error as the benchmark for analyst performance. This is done by examining analyst forecast error of affiliated versus unaffiliated analysts for restatement firms versus non-restatement firms. Recent studies such as Matsumoto (2002), Richardson et al. (1999), Chan et al. (2003) find that analysts provide forecasts that are slightly below earnings. These studies use street earnings as the benchmark. Chan et al. (2003) argue that the biased forecasts in recent years are due to analyst conflict of interest issues. In addition, Abarbanell and Lehavy (2002), Ciccone (2002), and Doyle and Soliman (2002) find that managers manipulate street earnings upward. Furthermore, there has been an increase in earnings restatements in recent years, which means that final earnings[1] are not reported earnings for these companies. These imply that forecast error may differ when using manipulated versus unmanipulated benchmarks, and that comparison of forecast errors using these two types of benchmarks enables us to identify possible conflict of interest issues. Therefore, I compare the forecast errors of affiliated analysts versus non-affiliated analysts, using street earnings and final earnings as benchmarks.

[1] Final earnings are restated earnings for restatement firms, and reported earnings for non-restatement firms.

Prior research showing that analysts are apparently more accurate than time-series models,[2] and that analysts appear to provide forecasts that are equal to or slightly below earnings in recent years[3] are due to managers' manipulation of earning and to analysts having conflict of interest with managers. Studies as early as Healy (1985) have found that managers manipulate earnings. On average, managers manipulate company earnings so as to present better operating results, and hence increase the value of their firms,[4] which in turn increases managers' own compensation. When caught, companies restate their earnings to correct for past manipulation of earnings. These incidents usually reflect the most severe cases of earnings manipulation, providing solid evidence that the final earnings[5] are not reported earnings for these companies.

In addition to manipulating reported earnings, managers also manipulate street earnings such as I/B/E/S actual earnings upward [Abarbanell and Lehavy (2002), Ciccone (2002), Doyle and Soliman (2002)] and guide analyst forecasts downward [Bagnoli, Beneish, and Watts (1999), Matsumoto (2002)] to achieve positive earnings surprises. The purpose of managers' manipulation of street earnings is due to the prevalent use of such measures in computing earnings surprises[6] In addition, street earnings can be manipulated more readily than GAAP earnings[7] Although analysts have two sources of information, their own private information and managers' guidance, analysts may weigh

---

[2] For example, Brown and Rozeff (1978), O'Brien (1988),Fried and Givoly (1982), Brown et al. (1987a, b), Hopwood and McKeown (1986), Lobo and Nair (1990), Lobo (1992)

[3] For example, Matsumoto (2002), Richardson et al. (1999), Chan et al. (2003).

[4] Dechow, Sloan, Sweeney (1996) argue that firms temporarily increase the market value of their firms by employing aggressive accounting policies. The majority of firms that manipulated their earnings, manipulated them upward, as seen by Kinney and McDaniel (1989).

[5] Final earnings are restated earnings for restatement firms, and reported earnings for non-restatement firms.

[6] Abarbanell and Lehavy (2003) find that academics use street earnings after 1991. In addition, they find that investors rely more on street earnings than on GAAP earnings.

[7] Abarbanell and Lehavy (2002), Ciccone (2002), Doyle and Soliman (2002) find that management manipulate street I/B/E/S actuals upwards.

managers' guidance on street earnings and analyst forecasts more than their private information.[8] This is due to analysts having serious conflict of interest issues. This was discovered as early as Lin and McNichols (1991), and Dugar and Nathan (1992).[9] By helping covered firms[10] meet or beat forecasts, analysts gain business for their employers, who are investment banks and brokers of these companies. This in turn increases analysts' compensation and funding.[11] All these factors affect the forecasts that investors rely on, and the earnings surprises to which investors react.[12] Hence, the research results of analysts providing more accurate forecasts than time-series models, and analysts having small forecast errors may be due to the game playing between managers and analysts, and not to analysts having better ability.

Analysts have incentives to provide biased and hence erroneous forecasts. The incentives arise from analysts having small base salary with potentially large bonuses which are partially based on the amount of investment banking business they help obtain for their employers.[13] In the process of asking for promotions or raises, one of the items analysts submit to their employers is the amount of investment banking fees they help generate. One of the major sources of these fees is the underwriting fees for primary offerings, which includes initial public offerings (IPOs) and seasoned equity offerings

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[8] Brown (1997), Degeorge et al. (1999), Burgstahler and Dichev (1997), Burgstahler and Eames (1999), Matsumoto (1003) show that the percentage of firms having small positive earnings surprises is higher than random.

[9] Lin and McNichols' (1991) working paper was later published in 1998, Dugar and Nathan's (1992) working paper was published in 1995.

[10] Firms that analysts follow, i.e. provide forecasts and recommendations.

[11] Cowen, Groysber, Healy (2003) describe how analysts are funded by investment banking and/or brokerage businesses of their firms.

[12] Kasznik and McNichols (2002), Chan et al. (2003), Dopuch, Seethamraju, Xu (2003) find that investors reward companies that meet or beat analyst forecasts and therefore have positive earnings surprises.

[13] United States District Court, Southern New York; Broad New Reports on Analyst/Investment Bank Conflicts Not Enough to Put Investors on Notice. Decision of Interest Section. New York Law Journal, May 28, 2004.

(SEOs).[14] In order to win businesses, analysts may be forced to issue opinions that are contrary to their real view. For example, emails from some of the analysts from firms such as Merrill Lynch & Company that were later involved the settlement with the SEC for issuing biased ratings on stocks show that analysts provided optimistic ratings of companies although they felt pessimistic toward the performances of these companies. (GAO, 2002) Moreover, a Lehman Brothers' analyst once wrote to his supervisor "...I have attempted to downgrade RSLC THREE times over the last year, but have been held off for banking reasons each time."

As a result of analysts' misconduct, lawsuits can occur. For example, ten top brokerages settled with the SEC by paying $1.43 billion for biased ratings to win investment banking business. (Associated Press, 2002) Analysts and/or their employers are not the only ones suffering consequences for their unethical behavior. Regulations have been and are being established since the negative impacts analysts have on investors caught the public's eye in 2000. In October, 2000, Regulation FD was issued to prevent private communication between managers and analysts. Later, in July 2002, the NYSE and NASD's new rules regarding analyst conflict of interest issues became effective. These rules prevent analysts from having conflict of interest with management by separating the investment banking and the research functions of investment banks.

Management's unethical behavior has also caught people's attention. Adelphia's founder and his son were convicted on July 2, 2004 for manipulating earnings, among other things. WorldCom Inc. misstated its balance sheet from 1999 to the beginning of

[14] In the court summary regarding Fogarazzo vs. Lehman Brothers, provided by New York Law Journal, May 28, 2004, the plaintiff alleged that Lehman Brothers, Inc., Goldman Sachs & Co., and Morgan Standley & Co., investment banks that issued false research report regarding RSL Communications, Inc., each generated over 64 million dollars in underwriting the RSL IPO in 1997.

2002 to hide $9 billion in expenses and was later forced to restate its earnings. Regarding managements' guidance of street earnings, the Sarbanes-Oxley Act requires managers to provide reconciliations between GAAP earnings and pro forma earnings that are provided. Management's false financial statements and analysts' deceptive reports may cost investors their lifetime savings, or even drive them into bankruptcy.

I use data from the I/B/E/S Detail File, Compustat, CRSP, the GAO-03-395R database, SEC's EDGAR filings, Lexis-Nexis, and the SDC database. I use I/B/E/S actual earnings, the earnings used as the bases for the majority of I/B/E/S analyst forecasts, to proxy for street earnings. I/B/E/S Detail File is used because it provides the exact date of individual forecasts, and offers forecasts up to four decimals points. Such quality of data is not provided by I/B/E/S Summary File. Furthermore, the paper uses the last forecast made within three months before each earnings announcement in calculating forecast errors. Finally, this study investigates forecast bias in the supplemental analyses in addition to the main analyses because larger forecast error imply greater forecast bias only if forecasts are greater than earnings.

For restatement firms, I examine the issue of analyst forecast error using restated earnings (earnings corrected for earnings manipulation) as the benchmark. The paper is an improvement of prior research because management may have manipulated the street earnings used in previous studies, while restated earnings are assumed to be cleaner of manipulation and are therefore "final earnings."[15]

The calculation of the dependent variables is as follows. Forecast error is defined as the absolute value of forecasts minus earnings divided by forecasts. For the

[15] This study uses the term 'final earnings' because restated earnings are the last earnings known by the public. There may be future restatements that are even closer to the 'real earnings' of the firms.

supplemental study, forecast bias is defined as forecasts minus earnings divided by the absolute value of forecasts. The direction of management's guidance of street earnings is defined as IBES actuals minus reported or final earnings divided by IBES actuals. The magnitude of management guidance is calculated as the absolute value of the direction of management's guidance of street earnings.

I define affiliated analysts as analysts whose employers are one of the primary offering underwriters of covered firms within a 6-year window surrounding the earnings announcement dates. This is because, before these offerings, analysts have incentive to help companies beat forecasts in order to attract underwriting businesses. (Lin and McNichols, 1998) In addition, after these offerings, affiliated analysts have incentive to help companies that issued equity in reducing uncertainty among investors. (Zhang, 2004) Although Dugar and Nathan (1995) find that there is no significant difference between the forecast errors of affiliated versus unaffiliated analysts, this study reexamines the issue using data regarding restatement versus non-restatement firms.

I find the following in terms of forecast errors: For restatement firms, contrary to the expectation, the forecast error of affiliated analysts is greater than that of unaffiliated analysts when using street earnings as the benchmark. However, the forecast error of affiliated analysts for restatement firms is insignificantly different from that of unaffiliated analysts when using final earnings as the benchmark. With regards to non-restatement firms, the difference between the forecast errors of affiliated versus unaffiliated analysts is insignificant. This goes when using either street earnings or final earnings as the benchmark. Pertaining to affiliated analysts, consistent with the conjecture, the forecast errors of non-restatement firms are smaller than those of

restatement firms when using street earnings as the benchmark. The result is insignificant, but not robust, when using final earnings as the yardstick. Finally, regarding unaffiliated analysts, the forecast error of restatement firms is insignificantly different from that of non-restatement firm. This conclusion holds when using either street earnings or final earnings as the point of reference. However, the latter result is not robust.

The results of supplemental analyses relating to forecast bias are as follows. Concerning restatement firms, as expected, affiliated analysts are more optimistic than unaffiliated analysts when using street earnings as the standard. However, the result when using final earnings as the yardstick is insignificant. With respect to non-restatement firms, the results are insignificant when using either street earnings or final earnings as the benchmark. Regarding affiliated analysts, unexpectedly, those of restatement firms are more optimistic than those of non-restatement firms when using street earnings as the yardstick. The result for using final earnings as the point of reference is significant and consistent with the expectation. For unaffiliated analysts, the forecast bias for those of restatement firms is insignificantly different from that for non-restatement firms when using street earnings as the benchmark. However, as expected, unaffiliated analysts of restatement firms are more optimistic than those of non-restatement firms.

The result of supplemental analyses regarding affiliated analysts versus unaffiliated analysts for all firms when using street earnings as the benchmark is consistent with prior studies. That is, the forecast error of affiliated analysts is

insignificantly different from that of unaffiliated analyst. However, affiliated analysts are more optimistic than unaffiliated analysts.

I find several important results with regards to management's guidance of street earnings. Management of restatement firms guide IBES actuals more upwards from final earnings and reported earnings than that of non-restatement firms. Incentives such as achieving consecutive positive earnings and consecutive earnings surprises have significant influence on such event. Firm that report losses are also more likely to guide street earnings upward from final earnings.

Overall, I find that managements are more likely to manipulate street earnings than final earnings due to earnings management incentives. This is especially so for restatement firms. In addition, both affiliated and unaffiliated analysts of restatement firms are unable to warn investors about the existence of earnings manipulation. Finally, there is no need for concern regarding analyst conflict of interest issues for most firms.

This paper contributes to the literature by bringing together the earnings restatement IBES actuals, analyst affiliation, analyst forecast error, and analyst forecast bias literature. By providing a coherent and comprehensive view with regards to the forecast error and bias, of restatement and non-restatement firms, this paper is unique. Studies such as Brown (1998), Bagnoli, Beneish and Watts (1999), Richardson, Teoh, and Wysocki(1999) show that analysts in recent years attempt to help companies beat forecasts. Analysts do so by lowering their forecasts throughout the year (Matsumoto, 2002), and across years (Brown, 1998, 2001, 2003). On the other hand, studies such as Dugar and Nathan (1995) provide evidence towards affiliated (via investment banking relationships) analysts providing more optimistic forecasts. The direction of forecasts

that benefit analysts therefore seems contradictory. This in turn influences the magnitude of forecast error. Therefore, this research provides a comprehensive view by considering factors affecting forecast error and bias from various streams of literature.

I also provide contribution in terms of methodology. Prior studies such as Brown (1998, 2001) look at whether companies beat analyst forecasts use means and medians, with simple controls in comparing the statistics. However, mean statistics cancel out positives and negative values, and both means and medians do not control for cross sectional differences. This study uses results from regression models and finds that affiliated analysts of restatement firms provide forecasts that are above street earnings. In addition, these analysts may be doing so for reasons unrelated to underwriting relationships.

This investigation contributes to the understanding of investors, regulators, and academics. Although there does not seem to be street and GAAP earnings manipulation and conflict of interest issues for non-restatement firms, such behaviors exist for restatement firms and analysts are not able to forewarn investors which firms are manipulating earnings. Therefore, investors and those who rely on analysts can rethink their relations with and reliance on analysts. Are they relying on a good source of information? Analysts and their employers can use the results to reflect on their past behavior. How can they better identify potential restatement firms? Regulators can use this information to reconfirm their efforts or increase their resolution to resolve analyst conflict of interest and earnings management issues. All parties can be rest assured about the benchmark beating game, since except for affiliated analysts of restatement firms, the

average analyst provide forecasts that are insignificantly different from street earnings. And affiliated analysts of restatement firms do not help covered firms beat forecasts.

The dissertation is organized as follows. Chapter 2 is a literature review of the research on management's manipulation and guidance of earnings and forecasts, and analysts' following management's guidance. Chapter 3 provides the hypotheses of this study, including the relative relations between various types of earnings, and analyst forecast errors. Chapter 4 lays out the empirical models used in this study in. Chapter 5 discusses the methodology of this investigation in. Chapter 6 provides the data analyses. Finally, Chapter 7 concludes this study.

# CHAPTER 2

# LITERATURE REVIEW

This chapter includes an introduction of prior literature on management managing earnings and guiding forecasts, and analysts following management's guidance. Section A provides a review of the types of earnings that management manipulate or guide, management's incentives to do so, and the consequences of being caught. Section B reviews the literature on analysts' incentives to follow management's guidance. Section C reports the results of the interaction between management and analysts. Section D summarizes the literature discussed in the above sections and raises unanswered research questions that this paper answers.

## A. Managers' Earnings Management

GAAP Earnings

Accounting Principles Board (APB) Statement No. 20 (1971) states that financial statement errors are items resulting from "mathematical mistakes, mistakes in the application of accounting principles, or oversight or misuse of facts that existed at the time the financial statements were prepared" (APB 20, par. 13). Managers may intentionally misrepresent earnings for bonus compensation incentives (DeFond and Jiambalvo, 1991), external financing incentives (Dechow, Sloan, Sweetney, 1999; Richardson, Tuna, Wu, 2000), meeting or deviating from analysts' expectations (Abarbanell and Lehavy), maintaining a succession of uninterrupted positive earnings growth and uninterrupted positive quarterly earnings surprises (Richardson, Tuna, Wu, 2000). Dechow, Sloan, Sweetney (1999) argue that firms, by employing aggressive

accounting policies, temporarily blow up their market values and temporarily decrease their costs of capital. Therefore, managers of firms with high demands for external financing have incentives to increase earnings.

The United States General Accounting Office (GAO) states other reasons for the use of the increased number of questionable accounting practices in recent years as follows. "1) Corporate pressure to meet quarterly earnings projections and thus maintain stock prices during and after the market expansion of the 1990s, 2) perverse executive compensation, 3) outdated accounting and rule-based standards, 4) complex corporate financing arrangements, 5) globalization and rapidly evolving technology." (GAO-03-138) The GAO report also contends that industry officials state the compromise of public accounting firms' independence as a reason questionable accounting practices were not disclosed. The final reason for accounting problems is unintentional mistakes.

Street Earnings

Managers not only manipulate GAAP earnings, but also street earnings. This is due to street earnings, especially I/B/E/S actuals, are often compared with forecasts, which are also provided on a continuing operating basis. Although on December 4, 2001, SEC issued a document that warns companies that antifraud provision of the federal securities laws applies to firms that provide street earnings (Ciccone, 2002), there have been few firms punished under this provision.

Some studies show that firms manipulate I/B/E/S (First Call) earnings to beat benchmarks. Abarbanell and Lehavy (2002) find that management increasingly use negative special items, and decreasingly use non-operating items to manage earnings

after 1990, when I/B/E/S aligned the definition of earnings with their forecasts and academics started using I/B/E/S actuals to calculate forecast accuracy. They show that Compustat earnings (basic earnings per share excluding extraordinary items) are negatively distributed, and are overall lower than I/B/E/S earnings. This, they say, may be due to management taking a big bath using items included in Compustat earnings, but excluded from I/B/E/S actuals. They claim that the earnings definition of I/B/E/S actuals is stable, but that management's use of items to manipulate earnings has changed over time. Ciccone (2002) find that firms manipulate First Call street earnings. They show that firms with profits do not manipulate street earnings, and therefore GAAP and street earnings are not significantly different. However, they provide evidence that firms that have incentive to manipulate earnings, i.e. those that have losses and those that have volatile earnings. As a result, these firms have street earnings that are higher than GAAP earnings (basic EPS before extraordinary items and discontinued operations). Doyle and Soliman (2002) use I/B/E/S earnings as a proxy for street earnings, and define exclusions as the difference between IBES actuals and GAAP earnings. They show that managers exclude small amounts of recurring expenses to meet or beat analyst forecasts. They demonstrate that the likelihood of meet or beat analyst forecasts increases when firms exclude small expenses from GAAP (EPS before extraordinary items and discontinued operations) and report pro forma earnings. They also find that the probability of just meeting or beating analyst forecasts is positively associated with firms excluding small expenses from their pro forma earnings.

Others find that street earnings are value relevant. Brown and Sivakumar (2003) compare the ability of three earnings measures in predicting themselves. They find that

using seasonal random walk models, street (I/B/E/S) earnings are better at predicting actual earnings than both Compustat EPS from operations and EPS before extraordinary items and discontinued operations. Bradshaw and Sloan (2002) also show that street earnings are more value relevant than GAAP operating earnings or net income.

Management's Incentives

The main incentive for the management to meet or beat analyst forecasts is the reward from investors. Kasznik and McNichols (2002) show that meeting or beating analysts' estimates is positively related to firm value. Chan et al. (2003) find that the estimate slope of a regression of announcement window returns on earnings surprise for 1999-2000 is more than 10 folds of that for 1984-87. Investors especially reward those with high runs of non-negative earnings surprises. The resulting price-to-book of those with eight consecutive quarters of non-negative surprises is 1.7 time of those without the runs, versus only 1.2 times before these companies start to have the runs. Dopuch, Seethamraju, Xu (2003) find that the market reward firms that meet or exceed both, but not either, analysts' and time-series forecasts. They explain that analyst forecasts may be subject to management guidance. On the other hand, time-series forecasts, which are based on earnings over a long period of time, are less subject to management manipulation. Therefore, investors can rely on time-series models as a benchmark. However, they find, the reward is positively related to forecast error of analysts, not time-series models. In addition, they show that firms that meet or beat both benchmarks are more likely to perform well in the future. However, Vickers (1999) provides anecdotal evidence that investors do not find positive earnings surprise that unexpected and look for

companies that consistently beat profit estimates. Dopuch, Seethamraju, Xu (2003) find that abnormal trading volume is positively related to whether companies meet or beat both analysts' and time-series forecasts. However, it is highly associated with the level of analysts' forecast errors, but not time-series models' forecast errors.

The penalty for missing analyst forecasts is severe. Skinner (1994) and Kasnick and Lev (1995) find that managers guide forecasts down for fear that they will get sued in the face of negative valuation consequences (Brown, 1998). Chang (1991), Ip (1998) find that managers report earnings that beat forecasts to avoid negative valuation consequence, which then influences their stock options (Brown, 1998). Myers and Skinner (1999) show that firms that report earnings that miss forecasts endure large declines in their stock prices. Brown (2003) find that the negative valuation consequence for reporting small negative earnings surprises has increased over the years. Bartov, Givoly, and Hayn (2000), Payne and Robb (2000), and Lopez and Rees (2001) show that the negative valuation consequences of having negative earnings surprise is greater than the positive valuation consequences of beating forecasts [Brown (2003)]. In addition, the penalty for missing the target is increasing in the level of beating the target previously (Barth, Elliot, Finn 1999). Skinner and Sloan (2002) and Brown (2003) find that the negative valuation consequence for reporting small negative earnings surprises is more severe for growth firms, versus value firms. Brown (2003) show that such difference in penalty has increased over the years. However, Gu and Wu (2003) find that trading volume is insignificantly positively associated with negative forecast errors, i.e. earnings that beat forecasts.

GAAP Earnings Restatements

There is a price to pay when managers manipulate GAAP earnings. Statement of Financial Accounting Standards No. 16 (1977) requires companies to disclose errors affecting earnings reported in prior periods as prior period adjustments. Retrospective restatements are required if the incorrect financial statements are presented (APB 9 1966). In the case of restatements, companies are also required to disclose in footnotes the nature of the error, its effect on earnings, earnings before extraordinary items, earnings per share. DeFond and Jiambalvo (1991) comment that since the APB20 definition includes both intentional and unintentional misrepresentations by management, restatements may be driven by the same economic incentive for managers choosing accounting methods regardless of whether financial statements indicate that restatements are intentional or not. (see p. 643 footnote for summary of this research).

GAO (2002) finds that there has been an increase in the number of restatements in recent years. The number of financial statement restatement announcements has increased significantly each year, rising from 92 in 1997 to 225 in 2001. In total, the number of restating companies is expected to represent about 10 percent of the average number of listed companies from 1997 to 2002. The average size of companies restating their financial grew over 300 percent from 1997 to 2002, which is 5 times the growth of the average size of listed companies over the same period.

Several studies look at the frequency of various types of restatements. Of the 919 announced restatements from 1997 to 2002 identified by the GAO, revenue recognition was the most frequent reason of restatement and account for 38 percent of the 919 restatements. Cost or expense-related issues were the next most frequent reason for

restatement and account for almost 16 percent of all restatement. Other reasons for restatements in descending order of frequency are 1) others, 2) restructuring, assets, or inventory, 3) acquisitions and mergers, 4) security related, 5) reclassification, 6) in-process research and development (3.6%), 7) related party transaction. Of these categories of reasons, security related restatements increased significantly from 4.6 percent of restatements in 2001 to 12.4 percent of restatements in the first half of 2002. Palmrose, Richardson, Scholz (2001) categorize restatements that involve adjustments to revenue, cost of goods sold and continuing operating expenses as the core matters. They find that sixty percent of the restatements involve at least one core matter. Similar to the GAO's finding, they reveal that the most frequent single matter is revenue recognition. Merger related issues are most common non-core matters. Only 42 percent of non-core restatements decrease net income. This is because most of these restatements are IPR&D restatements[16], most of which are income-increasing. Similarly, of the 44 restatement firms investigated by Defond and Jiambalvo (1991), 41 are overstatements and only 3 are understatements.

Kinney and McDaniel (1989) is one of the earliest studies on earnings restatements. They investigate firms that misstate their quarterly earnings and correct them in subsequent annual reports. They find that most of the misstated earnings are overstated, and that the level of misstatements is somewhat greater than 5% of earnings, the usual measure of materiality. However, IPRD restatements are usually correction of prior understatements. Companies that face high expectations for future earnings but are

[16] In-process research and development costs (IPR&D) are allocations to research and development projects in acquisitions accounted for by the purchase method. There has been an increase in the write-offs of IPR&D in both frequency and dollar magnitude from 1990 to 1996 (Deng and Lev, 1998). IPR&D restatements reverse the write-offs.

not in the position to take a bath or smooth income, write off IPRD as expense at the time of acquisition. (Press and Dowdell, 2001) Press and Dowdell (2001) find that, after SEC's scrutiny, companies with large acquisitions and large IPRD charges are pressed to reduce their write-offs, which increase their earnings at the time of restatements or acquisitions. The result is higher goodwill along with future amortization, which makes it harder for these companies to meet earnings expectations. After the guidance of SEC, IPRD as a percentage of assets acquired reduces more than half. (Press and Dowdell, 2001) Press and Dowdell (2001) state that this affects both restaters and in-process acquisitions.

Prior studies examine firm characteristics that are associated with earnings restatements. Kinney and McDaniel (1989) find that restatement firms are smaller, less profitable, have higher debt, slower growth, and are more likely to received qualified opinion due to material uncertainties. They speculate that the reason these firms are smaller is that they have poorer internal controls. DeFond and Jiambalvo (1991) compare firms with earnings restatements with those without to examine firm characteristics of those that incur accounting errors. They find that companies that overstate their earnings have diffuse ownership, lower growth in earnings, and relatively fewer income-increasing GAAP alternatives available. The overstatements are negatively correlated with the growth in earnings before manipulation. Richardson, Tuna, Wu (2000) show that restatement firms were trying to maintain consecutive positive earnings growth and quarterly earnings surprises. They also provide a model that employs factors to predict the occurrence of earnings restatements. They find that the predictive factors are high market expectations for future earnings growth, high levels of outstanding debt, and large

total accruals. They also discover that information in operating and investing accruals are crucial signals of earnings management that result in restatements. This is consistent with Dechow et al. (1996) and Bradshaw, Richardson and Sloan (2001) that accrual information is a key determinant of earnings manipulation that ultimately lead to SEC enforcement actions.

Most of the prior literature finds that firms that restate their earnings have poor governance structure. DeFond and Jiambalvo (1991) find that firms with earnings restatements are less likely to have audit committees. Abbott, Parker, and Peters (2002) explore the impact of audit committee characteristics on the possibility of financial misstatements. They find that the independence of the audit committee and whether the committee meets at least four times per year are negatively related to the incident of accounting restatements. They also uncover that audit committee that lacks a member with financial expertise is positively related to the occurrence of accounting restatements. However, only audit committee independence and the lack of financial expertise exhibit a negative (positive) association with accounting fraud. Consistent with prior research, Agrawal and Chadha's (2003) show that having independent directors with accounting or finance expertise on board of directors or audit committees is negatively related to occurrences of restatements. However, they report that the independence of boards of directors and audit committees, and the employment of outside auditors for non-audit services is not related to the probability of earnings restatements.

The independence and quality of independent audit also affect whether companies report manipulated earnings. Schneider and Wilner (1990) examine whether auditing discourages the potential perpetration of accounting irregularities. They find that both

internal and external audit discourage the occurrence of financial reporting irregularities when all four conditions are present, namely, 1) material dollar amounts, 2) irregularities regarding asset overstatements, 3) unambiguous GAAP violations, 4) less incentive for misstating income. In addition, Palmrose et al. (2001) argue that the risk-based and directional nature of the auditing procedure makes it more possible for auditor-initiated restatements to be income decreasing. The effect of internal auditing is similar to that of external auditing.

Accounting misstatements which lead to earnings restatements may be caused by compromised independence of audit quality due to the expanded scope of professional services provided by the accounting firms, e.g. using audit fees for consulting services (GAO 2002). However, Raghunandan et al. (2003) report that non-audit fees or the total of audit and non-audit fees received by auditors during periods of material misstatements that later led to earnings restatements, do not influence audits and hence later restatements.

Other possible auditor related causes of earnings misstatement which led to earnings restatements are as follows. 1) Auditors have reduced the scope of their audits and the level of testing below what is necessary to have reliable financial statements (GAO 2002). 2) Other close relationships between accounting firms and their clients, e.g. investment (GAO 2002).

One study examines whether investors use information regarding initiator of restatements as indicators of the severity of restatements. Palmrose et al. (2001) show that investors use whether restatements are initiated by auditors as an indication of the level of negative net income impact. They state that this is reasonable since auditors are

responsible for detecting material errors.

Consequences of Restatements

Companies suffer consequences when they restate their earnings. Erickson, Hanlon, Mayhew (2002) look at the tax consequences of firms that overstate their earnings. They conclude that firms pay substantial taxes on overstated earnings. That is, restatement firms paid eleven cents per dollar of overstated pre-tax earnings and 1.3 percent of market value. They also find that firms that paid taxes on overstated earnings are more likely to have positive pre-tax income and positive taxable income than firms that did not pay taxes. A substantial number of restatement firms deferred at least some taxes on overstated earnings, while some recorded the amount of overstatement as a book-tax difference, which enables them not to pay taxes in the year of allegedly fraudulent earnings. (Erickson et al., 2002)

Restatement firms face risks of being sued. SEC's Division of Enforcement focused more on accounting related violations in the late 1990s. From Oct. 1998 to Sep. 2001, almost one in five enforcement cases brought by the SEC involved accounting violations. Accounting related issues comprise of about 20 percent of SEC's total enforcement effort in 2001, and increase from 8 percent in 1990 (GAO). Jones and Weingram (1997) study the effects of certain events, which lead to major stock price decline, on the possibility of firms being sued. They find that firms that restate their financial statements and those that are subject to SEC enforcement actions are much more likely to be subject to a 10b-5 action than firms that incur insider trading, seasoned equity offerings, and fall-triggering announcements.

Several studies investigate the market effects of earnings restatements. Many examine how investors' impression of firm value changes due to the anticipation and occurrence of earnings restatements. GAO (2002) and Richardson, Tuna, Wu (2002) show that there is significant market reaction at the announcement of earnings restatements. GAO (2002) find that the stock prices of most of the restating companies fell by almost 10 percent from 3 days prior to 3 days after the restatement announcement. The restating companies lost below 0.2 percent per year of total market capitalization of publicly traded companies. The stock prices of companies announcing earnings restatements fell by 18%, from 60 trading days before through 60 trading days after the announcement. The market capitalization losses of these companies total almost $190 billion. Richardson et al. (2002) document that firms with the highest accruals experience the largest stock price decline at the time of earnings restatement announcements.

Palmrose, Richardson, Scholz (2001) find that cumulative abnormal returns (CARs) are negative throughout the period before the announcement of restatements, with the most severe decline immediately surrounding the announcement day. The mean CARs of income-decreasing restatements is significantly more negative than those of income-increasing restatements. They also provide evidence that more serious reactions are related to management fraud, and auditor-initiated restatements, bigger dollar effects. They hypothesize that the former two factors imply an increase in investors' expected monitoring cost, while the last factor is associated with greater revision in the expectation of future performance. Anderson and Yohn (2002) also show significant negative abnormal stock returns surrounding the announcement of an accounting irregularity and a

forthcoming correction filing. They also find significant negative abnormal returns for the period beginning prior to the irregularity announcement and ending after the filing of the corrected financial statements. In both situations, they document a larger negative reaction to revenue recognition related corrections than to other types of restatements.

The level of investor reaction to earnings (measured by earnings response coefficients) announced post earnings restatements have also changed. Anderson and Yohn (2002) find smaller earnings response coefficients for earnings reported after relative to before the restatement. The decrease in the earnings response coefficient is not more pronounced for revenue recognition related corrections. Wu (2002) also shows that prior to the restatements, there is a significant relation between earnings and prices. However, after the restatements, the relation between earnings and prices is insignificant. This means that investors rely less on earnings releases after a restatement than before a restatement, and investors have lost their confidence in the quality of accounting information of the firms with earnings restatements.

Anderson and Yohn (2002) investigate how information asymmetry changes due to the anticipation and occurrence of earnings restatements. They find an increase in spreads around the announcement of an accounting trouble only for corrections related to revenue recognition issues. Surprisingly, they show no increase in spreads from before the announcement of the trouble to after the release of corrected financial statements. The results suggest that the increase in information asymmetry around the announcement of a trouble is transitory.

The restatement firms incur cost not only due to restatements, but also due to litigations following the restatements. Griffin, Grundfest, Perino (2000) examines the

price response to securities fraud litigations which are most likely lead by corrective disclosures. They find that the initial stock price response to class action filing events is significantly negative. The response is stronger for small firms, firms with low analyst coverage, and firms with filings in the filed after the passage of the Private Securities Litigation Reform Act of 1995[17]. The findings on firm size and analyst coverage support the conclusion that information cost is the reason for the observed pattern of stock price reaction. The initial stock price response to a rapid filing[18], therefore, appears to be incrementally more negative than the response to a delayed filing. This may be due to the lingering effects of the restatement disclosure, which for some rapid filings could happen only a few days before the class action filing date. Smaller firms and firms with smaller analyst coverage have greater post-announcement drift. The passage of the Reform Act increased the speed of the market's price response to a class action. Beyond the first few weeks, however, they did not detect a significant change in the post-announcement drift as a result of the passage of the Act.

The increase in the restatement incidents has a negative impact on the overall market, too. The UBS/Gallup Index of Investor Optimism suggests that overall investor confidence has declined significantly since September 2000. Surveys show that the main reason for the drop in confidence since February 2002 is the negative impact of questionable accounting practices on the market. In July 2002, 91 percent of all investors surveyed felt that accounting issues were negatively impacting the market. 40 percent of those interviewed said that they were less likely to invest in equity due to the questionable accounting practices. Using mutual funds flow as a proxy for investor

[17] The Reform Act requires the first plaintiff of a class action to make prompt public notices of the fact of filing.

confidence, GAO finds that annual equity mutual fund net flows declined significantly from 2000 to 2001, and from $310 billion to $32 billion. The outflow in July 2002 was the largest outflow on record.

Auditors are also sued as a result of restatements. Palmrose and Scholz (2000) provide evidence on the effect of accounting restatements on auditor litigation. They categorize accounting restatements as economic or technical. Economic restatements are those that involve core (recurring) earnings, and all other restatements are technical. They discover that auditors have a higher possibility of being sued over economic restatements than technical ones. Revenue restatements, which occur most frequently, cause this result. They also find that economic restatements are related with more severe consequences such as fraud, materiality, bankruptcy/delisting, and security price reaction. As to the whether Arthur Andersen is really a worse public accounting firm than the others, Eisenberg and Macey (2003) compared the frequency of earnings restatements of clients of large accounting firms. Controlling for client size, region, time, and industry, they find that Arthur Andersen do not perform worse than other big accounting firms.

In terms of preventing restatements, Myers et al. (2003) investigate the possibility of mandatory auditor rotation reducing the occurrence of restatements. They find that older companies have auditors with longer tenure and are less likely to restate their earnings. On average, their sample shows that auditor tenure is not significantly related to restatements. However, in their subsample, restatements of quarterly core earnings are more likely as the length of auditor tenure increases. Myers et al. (2003) indicate that auditor tenure is not significantly related to the inclination towards annual earnings restatements. Changing auditors do not increase the likelihood of auditors recognizing

[18] A rapid filing is a filing filed within 10 days of a corrective disclosure.

the necessity of restatements. Neither do they find relation between auditor tenure and the seriousness and type of restatements. That is, their results do not indicate any need for mandatory auditor rotation.

Most analysts react to earnings restatement announcements rather than inform investors of the possibility of the events. Griffin (2003) finds that although some analysts may revise their earnings forecasts downward before the announcements of earnings restatements, their forecasts are generally positive. Their biggest revision occurs in the month of a restatement. As a result, he shows that analyst forecast error decreases significantly in the month of and one month after the earnings restatement. The change in forecast error in the months before and after the above mentioned period is insignificant, although the downward revision can last up to 6 months after restatements. Analyst forecasts right before restatements are most pessimistic for firms with higher *pre-*restatement net insider selling, institutional holdings, and larger post-announcement decline in stock prices. In other words, average analysts continue to issue optimistic forecasts until the restatement and/or the price change apparently triggered by a correction. Therefore analysts' inability to warn investors of accounting irregularities has caused investors to be shocked at the news of restatements. As a result of the restatements, finds Griffin (2003), the number of analysts following these firms decrease significantly in the months after restatements. However, he documents that most informed investors such as insiders, short sellers, and managers of institutional investment firms act earlier to the possibility of restatements than analysts, by being unexpectedly active in the few months prior to the restatements.

**B. Managers' Forecast Guidance**

Why are analysts optimistic before restatements? This is because managers also guide market expectations directly or analyst forecasts indirectly. Bagnoli, Beneish, and Watts (1999) find that management uses analyst forecast to guide investor expectations. Skinner (1997), Kasznick and Lev (1995), Francis et al. (1994), Soffer et al. (2000) show that managers have increasing tendency to warn investors about upcoming unfavorable earnings [Dopuch et al. (2003)]. Soffer et al. (2000) also provide evidence that firms use earnings pre-announcements to manage market expectations.

Matsumoto (2002) shows that firms guide analyst forecasts down so earnings would meet or beat these forecasts. Richardson, Teoh, Wysocki (1999) find that after 1992, forecasts are optimistic at the beginning of the year, and gradually become pessimistic by the year end. They assert that analysts place more emphasis on pleasing managers with optimistic forecast at the beginning of the year. Richardson et al. (1999) claim that currying the favor of management enable access to management information. As time goes by, analyst forecasts are guided down by management. And as the year end approaches, analysts shift their focus on providing more accurate forecasts, still relying on management for guidance. Management eventually guides forecasts so as to be slightly beat by earnings at the year end. The slightly positive earnings surprises not only satisfy management, but also investors who use forecast accuracy at the fiscal year end to evaluate analysts. They find that for profit firms in 1997, earnings are equal to forecasts at the beginning of the year, and slightly beat forecasts at the year end. For loss firms, on the other hand, earnings are way below forecasts at the beginning of the year, and slightly miss forecasts at the year end. Chan et al. (2003) also show that the

direction of forecast revision is predictive of non-negative earnings surprises, which indicates that analyst forecasts are being guided down by management.

Analysts' Incentive

Why do analysts follow managers' guidance? This is because analysts gain by following management's lead. Regulators in the U.S. blamed analysts' optimist research reports for the burst of the technology bubble, and investors' losses on companies that manipulated their earnings that occurred in the early 2000s'. They argue that although analysts are supposed to provide their clients (investors) with the most accurate research results, analysts are biased because they are funded by the companies they cover. Such potential conflict is an application of the Jensen and Meckling (1976) model when they show how an agent have problem serving the interest of more than one principal at the same time, and how agency problems arise when agents don't act in the best interest of their principals.[19] Such conflicting situations are also called conflict of interest issues. In this case, the agent is analyst(s), and the principals are investors and companies that analysts cover. Both principals pay analysts for their services.

Cowen, Groysberg, Healy (2003) explain how analysts are funded. Both investment banks and brokerage firms fund their analysts using funds from these businesses. Cowen et al. (2003) state that investment banks fund their analysts with underwriting fees and commissions from institutional and/or retail investors. They describe that brokerage firms, on the other hand, fund their analysts with trading commission from their institutional or retail clients. However, they add, research firms

[19] The application of the agency theory, by Jensen and Meckling (1976), to the issue of analyst research is described in Hodgkinson (2001).

not providing either investment banking services or brokerage services fund their analysts based on analysts' performance.

The funding process explained above provides analysts with incentives to bias their reports. By biasing their reports in favor of the companies they receive funding from, they get higher commissions and fees. Therefore, regulators point to the analysts' investment banking relations as the major cause for the market's losses. As a result, NYSE Rule 472 and NASD Rule 2210 were set to assure the independence of research analysts. In addition, in April of 2003, ten of the biggest investment banks in the U.S. agreed to execute several restructures regarding the analyst industry, and to pay fines for past recklessness.

This study employs the hypothesis of above described conflict of interest issues as the reason for analyst forecast bias[20] Therefore, the following is an introduction of prior literature in this area. These studies are inconclusive as to whether affiliated analysts are more optimistic than unaffiliated analysts. Some studies find no significant difference between forecasts produced by affiliated analysts and those by unaffiliated analysts. Hansen and Sarin (1996) also show no significant difference between forecast errors of affiliated analysts and unaffiliated analysts. Lin and McNichols (1998b) compare the forecasts of lead underwriter analysts, co-underwriter analysts, and unaffiliated analysts. They find that the earnings forecasts of the first two groups of analysts are not significantly different from that of the unaffiliated analysts. Using the last forecast that investment banking analysts issued for a fiscal year, and compare with the forecasts made

[20] Other incentives for providing optimistic forecasts as mentioned in prior studies include access to management information [Francis and Philbrick (1993), Das, Levine, and Sivaramakrishnan (1998), Kim and Lustgarten (1998), Lim (1998)], cognitive bias [Elton et al. (1984), Easterwood and Nutt (1999), Affeck-Graves et al. (1990)]. Performance [Mikhail, Walther, and Willis (1999), Clement (1999)] and

by noninvestment banker analyst at the date closest to the corresponding investment banker analysts, Dugar and Nathan (1995) also find that investment banking analysts' forecasts are as accurate as non-investment banking analysts. In addition, they find that both types of analysts issue forecasts that are greater than actual earnings. They explain that this is due to investment banking analysts use proprietary information which makes their forecasts more accurate at times. However, at other times, when these analysts do not have superior private information, they issue optimistic forecasts to please managers. These forecasts are less accurate than non-investment banker analysts. Hodgkinson (2001) shows that broker analysts are not more accurate than non-broker firms in terms of forecasts issued within two weeks prior to earnings announcement. Teoh and Wong (2002) find that after equity issuers announce high issue-year accruals, especially discretionary accruals, analysts are optimistic in their median forecasts for the next four years. This is occurs regardless of the existence of affiliation.

Other studies find that there is significant difference among forecasts of analysts who are affiliated versus those who are not. These studies show that affiliated analysts are more optimistic. In addition, trading incentives arising from brokerage services are more attractive to analysts than the underwriting incentive from underwriting services. Cowen et al. (2003) uses the mean of an analyst's forecast error relative to the average forecast error of all analysts and find that analysts at firms with underwriting business provide less optimistic forecasts than those at syndicate firms (firms with both underwriting and trading businesses). They also find that analysts at syndicate firms are less optimistic than analysts at pure brokerage firms (those that do not provide

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reputation [Stickel (1992), Leone and Wu (2002), Hong and Kubik (2003)] are the incentives to provide accurate forecasts as evidenced in prior studies. See Kothari (2001) and Jung (2003) for descriptions.

underwriting businesses). After finding insignificant affects of bank reputation and client types, they claim that brokerage analysts issue the most optimistic forecasts due to the sales and trading incentives. Their result on pure research analysts is inconclusive. The relative optimism (the level of forecast optimism relative to that of all analysts) of pure research analysts, they document, are low for within 90-day horizon, but are high for 91-180 day horizon. Dugar and Nathan (1995) use mean and median forecast errors and show that both investment banker analysts and noninvestment banker analysts have negative forecast errors (earnings minus forecasts scaled by price). That is, both types of analysts are optimistic in their earnings forecasts. They also find that analysts whose employers have investment banking relationships with the covered companies have a tendency to issue more optimistic forecasts than analysts whose firms do not have such relationships. Irvine, Nathan, and Simko (1998) indicate that analysts are optimistic towards new investments of their new mutual fund families at the brokerage houses, and are pessimistic for the investments they divested.

Jackson (2003) investigates the conflicting trade-generating and reputation-building incentives that sell-side analysts face. He claims that, as indicated by Spitzer (2002), this is the next important issue after the separation of investment banking and research functions in recent exchange rules and regulatory actions. He uses Australian data to document increased trading for both optimistic and high reputation analysts. In addition, he shows that analysts who provide more accurate forecasts have higher reputation. That is, analysts are short sighted if they attempt to mislead investors by issuing optimistic forecasts because investors eventually find out whether they are

misled.[21] However, Jackson (2003) analytically demonstrates that the equilibrium forecast is optimistic when investors are unsure whether analysts put more focus on reputation or trade, and when short sales constraint exists. The equilibrium exists even when investment banking Affiliated is removed. This is because more trade is generated from being optimistic.

Jackson's (2003) finding that the equilibrium analysts disregard reputation or performance contrasts with Degeorge and Derrien's (2001) result. The latter find that although analysts affiliated with underwriters are more optimistic in their forecasts of French IPOs than unaffiliated analysts, analyst forecasts for IPO firms are not more biased than for non-IPO firms. This implies that analysts are somewhat concerned with the accuracy of their forecasts.

Hayes (1998) shows analytically that analysts are more likely to put more effort in gathering information regarding stocks that are expected to perform well. Therefore, forecasts for these stocks are more likely to be accurate. This is because analysts are putting their effort on stocks that can generate trade, and hence indirectly increase their commission. More precise information regarding potential "buy" stocks will reduce investors' risk and hence increase trading, whereas more precise information regarding potential "sell" stocks may decrease the number of shares sold. The focus on potentially well performing stocks increases in the face of restrictions on short sales due to these sales being limited to investors who already hold these stocks. Cowen et al. (2003) explain that all investors in the market can act on an optimistic report, while only

[21] DeChow, Hutton, and Sloan (2000) provide evidence that optimistic long-term analyst forecasts boost stock prices at the issue date only temporarily.

investors who own stocks before the relating reports or who are willing to incur high costs of short selling[22] will act on a pessimistic report.

Hong and Kubik (2003) provide more evidence regarding how optimism is rewarded for analysts at brokerage houses. They find that analysts who are optimistic relative to consensus forecasts are more likely to be given better projects, and less prone to being fired from a top brokerage house, and have a higher possibility of being promoted or hired by a better firm. This model is especially pertinent for analysts who follow stocks underwritten by their brokerage houses, and during the mid to late nineties.

Other studies find that underwriter analysts provide more pessimistic forecasts. Liu and Song (2001) find that analysts whose employers are lead underwriters for internet companies they follow provide pessimistic median forecasts both before and after the burst of internet bubble in 2000. However, unaffiliated analysts were optimistic before the bubble burst, but pessimistic afterwards. They reject the analyst rationality hypothesis. In addition, Zhang (2004) find that analyst forecast optimism hurts analyst career outcome rather than helps it.

Other studies provide evidence on how underwriting/brokerage analysts provide overly optimistic recommendations, changes in earnings forecasts, long-term earnings forecasts. Hussain (1996) uses forecasts issued by a single brokerage house to show that the broker status has little impact on analysts' over-reaction to prior earnings changes, however, broker analysts are more optimistic regarding changes in earnings. Hodgkinson (2001) uses data from a large firm of analysts and also document more optimistic earnings change forecasts when analysts are also brokers for the firm. DeChow, Hutton, and Sloan (2000), Lin and McNichols (1998a) find that analysts' long-term earnings

[22] Asquith and Meulbroek (1998) show that the cost of short selling stocks is significantly high.

forecasts are more optimistic for stocks their employers underwrite. DeChow et al. (2000) document analysts' long-term growth forecasts are consistently excessively optimistic around equity offerings and that analysts employed by lead underwriters of the offerings are the most optimistic. In addition, the optimism is positively related to the amount of fee the stock offerings generate. Lin and McNichols (1998b) document that the earnings growth forecasts and recommendations for the both lead and co-underwriting analysts are significantly more optimistic than the unaffiliated analysts. Carleton et al. (1998) find that brokerage firm analysts show greater level of forecast optimism relative to non-brokerage analysts in terms of their recommendations. Irvine (2002) uses Canadian brokerage trading data and show that "buy" recommendations, but not optimistic forecasts, generate more trades. Lin, McNichols and O'Brien (2003) show that after new issues, analysts with investment banking Affiliation are slower at revising recommendations down for stocks with bad news than analysts at unaffiliated firms.

Analysts also have incentive to bias forecasts in order to be ranked highly on the Institutional Investor's annual rankings. These rankings are results of surveys of money managers, who vote for their favorite stock pickers (Vickers, France, Thornton, Henry, Timmons, 2002). Although these money managers may be corrupted as revealed by the hurricanes of mutual fund scandals in late 2002, Vickers et al. (2002) state that these are clients that analysts also need to please.

Prior investigations have different results as to whether the performances of stocks that affiliated analysts cover are different from those that unaffiliated analysts follow. Michaely and Womack (1999) find that the "buy" stocks recommended by underwriter analysts perform worse than those recommended by unaffiliated analysts

before, at the time of, and after the date of recommendation. Dugar and Nathan (1995) show that returns from following the recommendations of analysts who work for investment banker of stocks they cover, is not significantly different from the that of non investment banking analysts.

Prior research differs in its conclusions as to whether investors incorporate the fact that analysts may have conflict of interest issues. Dugar and Nathan (1995) find that the market reacts less to investment banker analysts than non investment banker analysts. However, they find the difference to be insignificant. Michaely and Womack (1999) show that underwriter analysts are overly optimistic in their recommendations, and the market do not recognize the full magnitude of such bias. Hirst, Koonce and Sinko (1995) find that investors in their experimental study find that investors expect favorable research reports to come from analysts with investment-banking relations.

### C. Results of Earnings Management and Forecast Guidance

This study uses forecast minus reported earnings as a proxy for forecast error. Forecasts are optimistic if forecast is greater than earnings (positive forecast errors), and are pessimistic if smaller (negative forecast errors). Forecasts are biased when they are not equal to earnings. This study also uses reported earnings minus forecasts to measure earnings surprises. Earnings that are greater than forecasts are termed "beating the forecasts," those that are equal to forecasts "meet the forecasts," and those that are smaller "do not meet forecasts," or "miss forecasts."

Early research on analysts such as Fried and Givoly (1982), O'Brien (1988), Biddle and Ricks (1988) finds that analysts issue optimistic forecasts. Clayman and

Schwartz (1994) find that analysts systematically overestimate earnings over years. McNichols, O'Brien, and Francis (1997) find that analysts follow firms they view favorably, and drop those they unfavor. They claim that this explains the optimism in analyst forecasts. Chopra (1998) find that analysts are optimistic about the earnings growth of companies they cover.

The recent trend in forecast accuracy has changed. Studies show that analysts are pessimistic. Brown (1997, 1998) shows that the median earnings surprise is zero, however, the mean forecast error is positive (i.e forecasts are optimistic). Brown (1997) shows that although analysts are optimistic, their forecasts have been less optimistic over time. Moreover, the optimistic bias for S&P 500 firms is insignificant from 1993-96. Brown (1998) shows that forecasts from 1984-96 are optimistic for the whole sample, and the loss subsample. Both Brown (1997, 1998) report forecast pessimism for 1996 and 1997 using quarter I/B/E/S data. Bagnoli, Beneish and Watts (1999) also find that quarterly earnings forecasts are pessimistic using First Call data. Richardson, Teoh, and Wysocki (1999) also find that for the period 1983-1997, although the mean forecasts errors indicate optimistic forecasts, the median forecast errors within 4 months before year ends is negative (i.e. pessimistic forecasts). Brown (2001) show that the median earnings surprise has changed from small negative in 1984 to small positive in 1999[23] Brown (2003) finds that this is due to a decrease in managers' reporting quarterly earnings that fall slightly short of analyst estimates. Liu and Song (2001) find that analysts are overly optimistic before the internet crash of April 2000, but are pessimistic

[23] He finds that his result is robust to Abarbanell and Lehavy's (2002) claim that the difference in I/B/E/S and Compustat definition of earnings contribute to the increased frequency of positive earnings surprises. However, the subset replicated by Brown (2001), where I/B/E/S actuals equals Compustat earnings, is where Abarbanell and Lehavy (2002) contend that the problem is least serious.

afterwards. Richardson et al. (1999) find that forecast pessimism is most frequent in recent years especially at the shortest forecast horizon. The pessimism is more obvious using consensus forecasts from I/B/E/S Detail data than from Summary data which includes stale forecasts. Degeorge et al. (1999) find that although mean forecast error is positive (i.e. forecasts are optimistic), the median forecast error is zero. This is caused by management meeting or slightly exceeding analysts' quarterly forecasts for the majority of the time, but they sometimes fall extremely short of these forecasts. Chopra (1998) report decline in earnings growth forecast optimism over the years.

Other studies show that analysts are rational. Gu and Wu (2000), Abarbanell and Lehavy (2003) find that it is the extreme observations that influence the observed optimistic forecast bias. Gu and Wu (2003), using data from 1983 to 1998, claim that analysts are rational and truthful in that the median forecast error is zero. They show that analysts try to forecast median earnings so as to minimize mean earnings forecasts errors. Therefore, analysts provide mean optimistic forecasts since the distribution of earnings is negatively skewed. Such forecasts minimize mean absolute forecast errors when earnings are negatively skewed. Abarbanell and Lehavy (2003) also find that the mean forecast is optimistic, while median forecast error is zero. They state that it is firms that use extreme negative abnormal accruals that make earnings negatively skewed, and therefore analyst forecasts optimistic. These firms are trying to take a big bath, and that analysts do not have incentives to provide optimistic forecasts. However, Cohen and Lys (2003) find that the frequency of the positive skewness of forecast errors (where forecasts are optimistic) is double the frequency of the negative skewness of actual earnings. They conclude that there may be unexplained factors for the cause of the asymmetry.

Studies show that the probability of earnings meeting or beating forecasts is higher than random. Brown (1997) provides evidence that the frequency of small positive earnings surprises is higher than that of negative surprises. In addition, Degeorge et al. (1999) and Burgstahler and Dichev (1999) find unusually high frequency of marginally positive earnings surprises (Richardson et al. 1999). Both Burgstahler and Eames (1999) and Degeorge et al. (1999) find that the frequency of small negative earnings surprises is too low to be occurring randomly (Brown, 2003). Matsumoto (2003) also show firms meet or exceed analyst estimates 65% of the time. Chan, Karceski, and Lakonishok (2003) find that, consistent with recent studies, there is an increase in the percentage of non-negative earnings surprises. The proportion of such earnings surprises is 75.59% in 1999-2000, compared to 48.88% in the late 1980s.

Studies provide evidence as to the firm characteristics that are associated with forecast pessimism. The first set of firm characteristics are firm size, profit/loss firm, and analysts following. Brown (1997) shows that forecasts have been less optimistic especially for larger firms and firms followed by many analysts. Lim (1998) shows that the optimistic bias for small firms is 2.5% of price per share, whereas the optimistic bias is 0.53% of price per share for large firms. Brown (1998) shows that 85.5% of the profit firms have pessimistic forecasts. They show that large firms are more likely to report profits that slightly beat analyst forecasts. Therefore, these companies are more likely to have pessimistic forecasts. Dowen (1996) shows that analysts are more optimistic regarding firms that report losses. Hwang, Jan, Basu (1996) show that analysts are 10 times more optimistic when firms report losses. Degeorge et a. (1999) show the optimistic bias is significantly greater for the loss sub-group. Although, Gu and Wu

(2003) hypothesize that analysts are rational and honest and claim that their results support their conjecture. They find that loss firms are more likely to have optimistic forecast. In addition, large firms' earnings are less negatively skewed, and are more likely to have pessimistic forecasts. Earnings are negatively associated with forecast errors, i.e. higher earnings are associated with pessimistic forecasts. Richardson et al. (1999) also find that large firms, profit firms are more likely to have pessimistic forecasts.

In addition, studies find that firm growth, real GDP growth, and past performance are determinants of pessimistic forecasts. Richardson et al. (1999) find firms with high growth, and when real GDP is growing are positively related to pessimistic forecasts. They explain that high growth firms that need new capital are more sensitive to investor reactions. Therefore, helping companies meet or beat earnings helps management raise capital, and therefore enhances the underwriting business of analysts' employers. Analysts are not good at forecasting the general economy, and therefore are pessimistic when the real GDP is growing (Richardson et al.,1999). Chan, Karceski, and Lakonishok (2003) provide evidence that growth firms and firms with several consecutive quarters of non-negative earnings surprises are more likely to meet or beat earnings forecasts. They explain that the bull market in the 1990s lead to a surge in capital raising activities. In addition, growth stocks and stocks that have been doing well in the past have the more pressure than other in performing well [Chan et al.'s (2003)]. Lastly, Chan et al. assert that growth stocks are more likely to be involved in capital raising activity, and are more likely to incur intense trading activities due to investors' attention. They state, this causes analysts whose employers are underwriters or brokers of these companies to bias their

forecasts. Managers of these high pressured companies therefore guide their earnings so as to meet or beat earnings forecasts [Chan et al.'s (2003)]. Brown (2003) also finds that growth firms are more likely than value firms to experience decrease in earnings that slightly miss forecasts over time.

By categorizing earnings into profits and losses, prior research finds the following. Brown (2001) finds that, for both profit and loss firms, there is an increasing trend in both meeting and beating analyst forecasts. That is, there is an increasing trend in managers who report profits that are "a bit of good news," and a decreasing trend in managers who report losses that are "extremely bad news." The median surprise for profits exceeds that for losses. In addition, managers of growth firms are more likely than those of value firms to report profits that are "a bit of good news." Brown (1998) provides evidence that when managers report profits, they seek to meet or slightly beat analyst estimates. Management wants to beat forecasts only slightly so they can "save for a better tomorrow" [Degeorge et al. (1999)]. Brown (1998) also shows that when managers report losses, they do not care about meeting or beating forecasts. Managers in this circumstance try to increase future earnings and hence future bonus by taking big baths and do not forewarn analysts of them [Brown (1998)]. Therefore, forecasts are likely to be optimistic for loss firms, and forecast errors are more likely to be small for profit firms but large for loss firms [Brown (1998)]. This is consistent with Brown's (1997) finding that the number of large negative errors is higher than positive errors. These indicate that firms manage their earnings so as to achieve small positive earnings surprises. However, they do not care to beat forecasts when they report losses and hence have large negative surprises (via big baths).

Richardson et al. (1999) provides another reason why managers of loss firms do not care about meeting or beating forecasts. They cite Degeorge et al.'s (1999) finding that managers are trying to exceed three benchmarks: positive profit, earnings equal or greater than in the last period, meet analyst earnings forecasts. In addition, investors are more concerned about whether firms make a profit than whether firms meet analysts' forecasts [Degeorge et al.'s (1999)]. Therefore, if management knows that it will miss the earnings target, then it will not care about meeting or beating forecasts (Richardson et al., 1999). Consistent with their speculation, analysts are more pessimistic regarding profit firms than loss firms (Richardson et al., 1999). In addition, Richardson et al. (1999) find that forecasts for profit firms are pessimistic by the end of the year, whereas those for loss firms remain optimistic.

Matsumoto (2002) further provides evidence that firms with highly transient institutional ownership, high reliance on implicit claims with their stakeholders, and high value relevance earnings have a higher possibility of meeting or beating earnings estimates. A big portion of these firms are owned by institutional investors that base their trading strategies on momentum performance and have high portfolio turnover. He also finds that high growth and high litigation risk firms have highly transient institutional ownership. However, the last factor is significant in predicting non-negative earnings surprises, while the first two factors are not when all three factors are in the model [Matsumoto (2002)]. He explains that companies with firm values highly tied to earnings have higher pressure to meet or exceed forecasts.

Studies examine the resulting forecast optimism vs. pessimism when managers manage earnings. Managers manipulate earnings in order to meet or beat forecasts.

Burgstahler and Eames (2003) find firms manage earnings before extraordinary, nonrecurring, and special items and that analysts are not good at detecting such schemes. Therefore, analysts are pessimistic with regards to earnings that are equal to zero, and are optimistic when they forecast that earnings are equal to zero. Richardson et al. (1999) find that pessimistic forecast are more frequent when firms report positive special items, high cash flows from operations, and high working capital accruals. Matsumoto (2002) also shows that firms use both managing earnings upward using abnormal accruals, and guiding forecasts downward to an unexpected level, to avoid negative earnings surprises. Liu (2003) shows that analysts' earnings forecasts are systematically below the median earnings for firms with high accounting reserves, negative forecasted earnings, and negatively skewed unmanaged earnings. She explains that analysts do so in order to help companies meet or beat earnings in the face of downward management of earnings. Gu and Wu (2003) find that earnings are lower in the fourth quarters than other quarters, however have been less lower over the years.

**International Evidence**

Various studies compare the level of earnings management in the U.S. relative to that in other countries. Brown and Higgins (2001) find that managers in the U.S. manage earnings surprises (both profits and losses) and analysts' estimates more than managers in twelve other countries. This is due to U.S. managers have more incentives including higher equity ownership by top executive, more surveillance by institutional and large shareholders, more outside directors on their board of directions, more external takeovers threats, higher risk of litigation [Brown and Higgins (2001)]. However, they show that

managers in the U.S. are more likely to manage earnings surprises, profit surprises and analyst estimates, but not loss surprises, than Japan. Japan is the only country in Brown and Higgins' (2001) sample that requires managers to forecast earnings. Brown and Higgin (2001) also find that U.S. managers are more likely to manage analyst forecasts because of their widespread public relations departments and more incentives to manage earnings surprises. However, Leuz et al. (2002) find that U.S. firms manage earnings less than other countries.

Additional studies investigate the worldwide trend of managing earnings surprises over time. Brown and Higgins' (2001) show that there is an increasingly worldwide trend of managing earnings surprise over the years, whereas Bhattacharya et al. (2001), Fulkerson et al. (2002), and Land and Lang (2002) find that the trend is decreasing over time throughout the world [Brown and Higgins (2002)]. Brown and Higgins (2002) show that this is caused by firms worldwide guide analysts downward more than manage earnings upward. Such downward guidance of forecasts has increased over time [Brown and Higgins (2002)]. In addition, they provide support that the guidance is positively related to the strength of investor protection, the fruitfulness of the companies' information environment, managers' ability and incentives to guide analysts.

**D. Summary and Conclusion**

Prior studies find that managers increasingly manipulate both reported earnings [Matsumoto (2002), GAO (2002)] and street earnings [Ciccone (2002), Doyle and Soliman (2002)] upward, and guide analyst forecasts [Matsumoto (2002)] downward in order to achieve positive earnings surprises in recent years. Although managers'

incentive to manipulate reported earnings is to reap reward [Kasznik and McNichols (2002), Chan et al. (2003), Dopuch et al. (2003)] and to avoid punishment from investors [Skinner (1994), Kasnick and Lev (1995), Chang (1991), Ip (1998), Myers and Skinner (1999)], the end result of such manipulation may be earnings restatements which lead to class action lawsuits. The market prices for restatement firms drop at the announcement of both earnings restatements [GAO (2002), Richardson et al. (2002)] and the following class action lawsuits [Griffin et al. (2000)]. In addition, analysts willingly follow managers' guidance due to incentive to gain from the investment banking [Cowen et al. (2003), Dugar and Nathan (1995)] and brokerage [Carleton et al. (1998), Hodgkinson (2001)] functions of their employer firms. Hence, analysts are optimistic regarding restatement firms until the date of corrective disclosure (Griffin, 2002). Although IBES earnings may be manipulated, Brown and Sivakumar (2001) provide evidence that IBES earnings are better at predicting actual earnings than Compustat EPS from operations and EPS before extraordinary items and discontinued operations.

The literature motivates me to examine the issue of analyst forecast errors by looking at the following research questions. For firms that restate their earnings (restatement firms), what are the forecast errors when using restated earnings? How does analyst forecast errors differ between restatement firms and non-restatement firms? How do analysts' being affiliated with restatement versus non-restatement firms affect the above questions? The following sections provide answers to these questions.

# CHAPTER 3

# HYPOTHESES DEVELOPMENT

This chapter develops hypotheses regarding analyst forecast errors under the influence of analyst affiliation and earnings management. This chapter first presents the legal and economic background for the time period that this study covers. Second, the chapter discusses managements' and analysts' incentives and behavior. Third, the chapter develops the models of the setting and implications of it based on the discussions.

The chapter also offers expectations regarding affiliated and unaffiliated analyst forecasts regarding restatement and non-restatement firms. The description of the conceptual framework of hypotheses 1 to 3 then follows, providing the rationale for each hypothesis, along with the hypotheses themselves.

## Economic & Legal Environment

For the restatement sample, I examine earnings that were restated between 1997 and mid-2002. The legal and economic environment surrounding the time frame that the data in this study cover affects the need for earnings restatements. Reported earnings associated with these restatements were announced before regulations regarding analyst conflict of interest became effective in July 2002, and before the Sarbanes-Oxley Act of 2002 requiring complete reconciliation of pro forma earnings and GAAP earnings became effective. Although the requirement of reconciliation between pro forma earnings and GAAP earnings is new, the antifraud provision of the federal securities laws already existed. In addition, most of the misstatement dates are prior to the effective date of Regulation FD in October 2000, which prohibits managers' private communication

with analysts without also providing the information to investors within 24 hours. Therefore, the hypotheses are developed reflecting these market characteristics.

Management Incentives and Behavior

Managers, in recent years, have reaped rewards from meeting or beating analyst forecasts [Kasznik and McNichols (2002), Chan et al. (2003), Dopuch et al. (2003)] and suffer severe consequences otherwise [Skinner (1994), Kasnick and Lev (1995), Chang (1991), Ip (1998), Myers and Skinner (1999)]. Therefore, they may manipulate reported earnings [GAO (2002)] and street earnings [Abarbanell and Lehavy (2002), Ciccone (2002), Doyle and Soliman (2002)] upwards and guide forecasts downwards [Matsumoto (2002), Richardson et al. (1999), Chan et al. (2003)] in order to appear to meet or slightly beat analyst forecasts. Managers can influence street earnings by 1) providing pro forma earnings along with earnings announcements, 2) issuing management forecasts, 3) holding conference calls with investors and analysts, and 4) having private communication with analysts.[24] The above scenarios are especially significant for restatement firms since the incentives to significantly manipulate GAAP earnings as documented by Kinney and McDaniel (1989), DeFond and Jiambalvo (1991), Richardson, Tuna, Wu (2000), are similar to those to meeting or beating analyst forecasts as found by Brown (1997, 1998, 2003), Lim (1998), Richardson et al. (1999) and those to manipulate street earnings as shown by Ciccone (2002), Abarbanell and Lehavy (2002), Doyle and Soliman (2002).

[24] These are the same methodologies that managements use to influence analyst forecasts as documented in prior research. For example, Williams (1996) and Baginski and Hassell (1990) find that analysts revise their forecasts after management forecasts, Ruland (1978) finds that analyst forecasts are inferior to time-series forecasts forecast errors before management forecasts, but are superior to time-series forecasts after

Analysts Information Sources, Incentives, and Behavior

For the purpose of this paper, analysts' sources of information are roughly characterized as private information gathering efforts and guidance from firm management[25] However, when analysts are affiliated with covered firms,[26]i.e. analysts whose employers are also investment bankers of these firms, analysts have more incentives to follow management's guidance in terms of both street earnings and forecasts.[27] This is because the employing firms of the analysts receive compensation for the investment banking functions if they satisfy their clients with the analytical coverage.[28] Rewards from such incentives may be greater than rewards from providing accurate forecasts.

In summary, managers issue financial reports. Sometimes, the SEC discovers substantial misstatement in the reports and companies are required to restate them. Managers have strong incentives to meet the earnings forecasted by analysts. They can issue guidance to analysts about their beliefs with respect to company earnings. Analysts issue forecasts. They use both private information and management guidance in forming their forecasts. While there are incentives both to use their private and management guidance information, there are investment banking and other incentives for following management guidance.

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management forecasts.

[25] Matsumoto (2002), Richardson et al. (1999), and Chan et al. (2003) provide evidence of analysts following management guidance.

[26] As discussed in the literature review, analysts have various incentives such as investment banking [Cowen et al. (2003), Dugar and Nathan (1995)] and brokerage [Carleton et al. (1998), Hodgkinson (2001), Hong and Kubik (2003)], or access to management information [Das et al. (1998), Lim (2001)]. However, this paper focuses on the investment banking incentive.

[27] First Call calculates Street earnings based on information from earnings announcements, which may include pro forma earnings, and information from analysts. (Conversation with First Call)

[28] Cowen et al. (2003) explain the funding process.

Implications

In terms of focusing on analyst forecasts, based on the above discussion, the important factors pertaining to this study that determine analyst forecast errors are management guidance, private information, and analysts' incentives to satisfy management. Therefore, I formalize the inquiry for this paper as:

Analyst forecast = $\alpha$*management guidance + (1-$\alpha$)*private information (a)

$\alpha = f$(analysts' company related incentives).

There are several general implications of the inquiry:

1. All analysts presumably have some motivation to rely on both management guidance and private information. Management's guidance points to street earnings (using IBES actuals as the proxy), while analysts' private information points to final earnings (i.e. reported earnings for non-restatement firms and restated earnings for restatement firms).
2. Analysts having investment banking or other financial relationships with companies have greater incentives to follow management guidance. That is, $\alpha$ is greater for affiliated analysts.
3. For non-restatement firms, there is less conflict between analysts' private information and management guidance, so affiliated (having investment banking relationships) and unaffiliated analysts should have similar sized alphas forecasts, as compared with restatement firms.
4. For restatement firms, the conflict between private information and management guidance will lead unaffiliated analysts to have lower

earnings forecasts, and to have earnings forecasts with larger errors with respect to street earnings, than affiliated analysts.

5. The same conflict mentioned in item 4 should lead to lower forecast errors for unaffiliated analysts with respect to restated earnings for restatement firms.

6. There is some level of earnings management for all firms. The difference between restatement firms and non-restatement firms is the level rather than the existence of earnings management. That is, restatement firms have the highest level of earnings manipulation.

7. The difference between IBES actuals and GAAP earnings is due to two sources. One is the difference between accounting principles' and analysts' definition of earnings from continuing operations, and the other is management's guidance of IBES actuals.

The above discussion implies the following. Affiliated analysts (analysts who work for investment banks of covered firms) of non-restatement firms issue forecasts that are slightly below street earnings. Street earnings are the bases for calculating forecast errors and earnings surprises in academia. This is because both street earnings and analyst forecasts are provided on continuing operating bases.[29] In addition, investors rely more on such earnings than on GAAP reported earnings (Abarbanell and Lehavy, 2002). Therefore, consistent with Doyle and Soliman (2002), management has incentives to meet or beat analyst forecasts with street earnings; and consistent with Cowen et al.

[29] I/B/E/S actuals, the bases for I/B/E/S analyst forecasts, are calculated on continuing operating bases. (I/B/E/S Glossary, 2001)

(2003), Dugar and Nathan (1995), affiliated analysts of these firms, due to their own incentives, follow management's guidance.

However, affiliated analysts of restatement firms provide forecasts that are relatively lower than street earnings, compared with non-restatement firms. This is because for restatement firms, there is a greater inconsistency of analysts' private information with managers' guidance which is the manipulated street earnings. This effect will be stronger as the manipulation of street earnings increases. A numerical example may help to clarify this argument and is provided in Figure A. In the example, the relative weight that affiliated analysts place on management's guidance is 0.75, while unaffiliated analysts place significantly less weight on management's guidance, i.e. 0.25. In addition, the difference between street earnings and final earnings is $1 (i.e. $2-$1) for restatement firms, and $0.25 ($2-$1.75) for non-restatement firms. Using the formula presented earlier, when street earnings are $2, affiliated analyst forecast of a restatement firm earnings is $1.75, and $1.94 for a non-restatement firm.

Unaffiliated analysts provide forecasts that are slightly above final earnings (i.e. restated earnings for restatement firms, reported earnings for non-restatement firms) because they have insight regarding final earnings, and weigh their private information more than management's guidance, which has a higher level of manipulation for restatement firms than for non-restatement firms. However, these analysts are also influenced somewhat by management's guidance, which is upward from final earnings. For restatement firms, there is a greater inconsistency between analysts' private information and management's guidance, which is manipulated. This causes unaffiliated analysts to issue forecasts for restatement firms that are further away from final earnings,

compared with unaffiliated analysts of non-restatement firms. In the numerical example (Figure A) the difference between unaffiliated analyst forecasts and final earnings is $0.25 for restatement firms and $0.06 for non-restatement firms.

<Insert Figure A Here>

The difference between affiliated analysts' forecasts and unaffiliated analysts' forecasts should be greater for restatement firms than for non-restatement firms. This is due to affiliated analysts placing more weight on managements' guidance on street earnings, while unaffiliated analysts place more weight on their own private information. In addition, the difference between street earnings and final earnings is greater for restatement firms than for non-restatement firms, due to restatement firms having more incentives to manipulate street earnings. Also, for restatement firms, management's guidance and analysts' private information point in different direction; whereas they point in the same direction for non-restatement firms.

Based on the above discussion and implications, I hypothesize that analyst forecast superiority in recent years is influenced by analysts having incentives to follow managers' guidance and therefore issue forecasts that are equal to or slightly below earnings[30] The relative positions of reported earnings, restated earnings, street earnings, and analyst forecasts influence the issue of analyst forecast errors. Therefore I develop the following in the next section: 1) The relative relationships between street earnings and GAAP earnings. 2) Hypotheses regarding analyst forecast errors using street earnings as the benchmark. 3) Hypotheses regarding analyst forecast errors using final earnings as the benchmark.

[30] Chan, Karceski, Lakonishok (2003) argue that it is analyst conflict of interest issues that lead to earnings that meet or beat forecasts.

*Hypotheses*

Figure B provides the conceptual framework of hypotheses 1 to E3. I test the difference between forecast error of affiliated analysts vs. unaffiliated analysts for restatement firms in sub-hypotheses HE2a and HE3a. I examine the difference between the performances of unaffiliated and affiliated analysts of non-restatement firms in sub-hypotheses HE2b and HE3b. I also investigate the difference in forecast error of affiliated analysts for restatement firm versus non-restatement firms in sub-hypotheses HE2c and HE3c. In addition, I examine the difference in forecast error of unaffiliated analysts for restatement firms versus non-restatement firms in sub-hypotheses HE2d and HE3d. I provide a graph regarding the relative relations between forecasts and actual earnings in Figure C. Table 1 contains a summary of hypotheses 2 and 3.

**H1: Management's Guidance of IBES Actuals**

The hypotheses in this section make conjectures about the level of street earnings manipulation. Since street earnings may be guided by managers, it is interesting to examine the relative positions of IBES actuals and GAAP reported and restated earnings.

*A. Hypothesis 1a*

Consistent with Abarbanell and Lehavy (2002), Ciccone (2002), and Doyle and Soliman, management may manipulate street earnings. In addition, Abarbanell and Lehavy (2002) find that firms manage street earnings upwards from GAAP reported earnings. Ciccone (2002) disaggregates this finding to show that, for profit firms, street

earnings are not significantly different from GAAP earnings. However, for loss firms, street earnings are greater than reported earnings. Therefore:

**H1a:** Street earnings are on average greater than reported earnings.

*B. Hypothesis 1b*

The incentives to manipulate street earnings as shown by Ciccone (2002) are similar to those to manipulate GAAP earnings [Kinney and McDaniel (1989)]. Therefore, companies that restate their earnings also have incentives to manipulate street earnings. The majority of firms that manipulate their reported and/or street earnings manipulate them upward.[31] This is consistent with Doyle and Soliman (2002), who find that quarterly street earnings is 4 cents, 17%, higher than GAAP EPS before extraordinary items. Therefore, although restatement firms comprise less than 3% of all firms, this hypothesis posits that H1a holds for restatement firms, and hence:

**H1b:** Street earnings are greater than reported earnings on average for restatement firms.

*C. Hypothesis 1c*

Restatement firms' manipulation of reported earnings is greater than that of non-restatement firms. In addition, street earnings are more easily manipulated than reported earnings. Therefore, the guidance level of street earnings is greater than the manipulation level of reported earnings for restatement firms. Hence:

[31] See Kinney and McDaniel (1989) for the direction of earnings misstatements. See Abarbanell and Lehavy (2002), Ciccone (2002) for the direction of street IBES earnings manipulation.

**H1c:** The difference between street earnings and reported earnings is on average greater for restatement firms than for non-restatement firms.

*D. Hypothesis 1d*

H1a hypothesizes that street earnings are greater than reported earnings. Furthermore, for restatement firms, final (restated) earnings are less than reported earnings.

**H1d:** The difference between street earnings and restated earnings is greater than the difference between reported earnings and restated earnings for restatement firms.

**HE2: Forecast Error based on Street Earnings**

The following hypotheses make conjectures about forecast errors based on the last forecast before each earnings announcement, and street earnings forecast error. In categorizing forecast errors by whether analysts are affiliated with covered firms, and by whether these firms are restatement or non-restatement firms, I form HE2a-HE3d as follows:

*A. Hypothesis E2a*

Affiliated analysts of restatement firms issue their forecasts below street earnings due to their putting more weight on management's information than on their own private information. However, unaffiliated analysts of these firms rely more on their private

information and issue forecasts that are closer to final earnings, which are significantly below street earnings.

**HE2a:** For restatement firms, street earnings forecast error is smaller for affiliated analysts than for unaffiliated analysts.

*B. Hypothesis E2b*

For non-restatement firms, affiliated analysts place more weight on managers' guidance regarding street earnings, whereas unaffiliated analysts place more weight on their own private information. Therefore, compared with unaffiliated analysts of non-restatement firms, affiliated analysts of these firms issue forecasts that are closer to street earnings.

**HE2b:** For non-restatement firms, street earnings forecast error is smaller for affiliated analysts than for unaffiliated analysts.

*C. Hypothesis E2c*

Since the private information of non-restatement firms' affiliated analysts is more consistent with managers' guidance, compared with those of restatement firms, affiliated analysts of non-restatement firms issue forecasts that are closer to street earnings.

**HE2c:** Street earnings forecast error of affiliated analysts for non-restatement firms is smaller than that for restatement firms.

*D. Hypothesis E2d*

Unaffiliated analysts issue forecasts that are slightly above final earnings, which are significantly lower than street earnings for restatement firms. In addition, I hypothesize the difference between street earnings and final earnings to be greater for restatement firms than non-restatement firms. This is because managers of restatement firms, compared to those of non-restatement firms, have more incentives to manipulate street earnings, and do so because it is less likely to be caught than manipulating reported earnings. Therefore, compared with forecasts of restatement firms' unaffiliated analysts, those of non-restatement firms are closer to street earnings.

**HE2d:** Street earnings forecast error of unaffiliated analysts for non-restatement firms is smaller than for that for restatement firms.

**HE3: Forecast Error Based on Final Earnings**

HE3 are hypotheses regarding forecast errors based on final earnings (i.e. restated earnings for restatement firms and reported earnings for non-restatement firms). I refer to this as final earnings forecast error in what follows. By using restated earnings (i.e. reported earnings adjusted for restatements), these hypotheses test the effect of earnings restatements on analyst forecast errors.

*A. Hypothesis E3a*

Unaffiliated analysts of restatement firms rely more on their own private information and therefore issue forecasts that are slightly above (in the direction of

management's guidance) final earnings. Whereas affiliated analysts of these firms provide forecasts that are below street earnings, which are significantly above final earnings.

**HE3a:** For restatement firms, final earnings forecast error is smaller for unaffiliated analysts than for affiliated analysts.

*B. Hypothesis E3b*

Affiliated analysts make forecasts that are slightly below street earnings, which are greater than final earnings. However, compared with affiliated analysts, unaffiliated analysts issue forecasts that are closer to final earnings. This is because unaffiliated analysts rely more on their research results (private information) while affiliated analysts rely more on managers' guidance.

**HE3b:** For non-restatement firms, final earnings forecast error is smaller for unaffiliated analysts than for affiliated analysts.

*C. Hypothesis E3c*

Affiliated analysts issue forecasts that are slightly below street earnings, which are greater than final earnings. Since the difference between street earnings and final earnings is greater for restatement firms than for non-restatement firms:

**HE3c:** Final earnings forecast error of affiliated analysts for non-restatement firms is smaller than that of affiliated analysts for restatement firms.

*D. Hypothesis E3d*

Unaffiliated analysts issue forecasts that are slightly above final earnings. Since analysts' private information is more inconsistent with management's guidance for unaffiliated analysts of restatement firms, these analysts issue forecasts that are further away from final earnings.

**HE3d:** Final earnings forecast error of unaffiliated analysts for non-restatement firms is smaller than that for restatement firms.

Table 1 provides a summary of hypotheses E2 and E3. In summary, this chapter hypothesizes that the magnitude of management's guidance of street earnings for restatement firms is greater than that of non-restatement firms. In addition, forecast error based on final earnings of unaffiliated analysts is smaller than that of affiliated analysts for restatement firms. However, forecast error based on street earnings of affiliated analysts is smaller than that of unaffiliated analysts for restatement firms. The difference between the forecast error of affiliated analysts and that of unaffiliated analysts is insignificant for non-restatement firms.

<Insert Figures B, C, Table 1 Here>

# CHAPTER 4

# EMPIRICAL MODELS

This chapter contains the empirical models used in this study. Where applicable, each section provides the measurements for dependent and independent variables, rationale for independent variables, and the expected signs of independent variables. Section A presents models for management's guidance of IBES actuals. Section B displays forecast error models. Section C discusses forecast bias models.

## A. Management's Guidance of Street Earnings

I provide the empirical models for management's guidance of street earnings in this section. Restatement firms have more incentives to guide street earnings upward. This is due to the poor actual performance of these companies. Since financial statements are still one of the important sources of information for investors, restatement firms misstate their earnings upwards. However, since companies are less likely to be caught when they misstate street earnings than when they misstate GAAP earnings, and street earnings are the recent benchmarks for earnings surprises, they guide street earnings even more upward so they have a better chance of beating analyst forecasts. Therefore, restatement firms should have a larger magnitude and (upward) direction for street earnings relative to both GAAP reported earning or final earnings.

The general model for management's guidance is as follows:

$$\text{Guidance Metric}_i = b_0 + b_1\text{Rsmt\_Firm}_i + b_2\,\text{Leverage}_i + b_3\text{Book\_to\_Market}_i + b_4\text{Consec\_Postv\_Earnings}_i + b_5\text{Consec\_Earngs\_Suprises}_i + b_6\text{Loss\_Firm}_i + e_i \quad (1)$$

The dependent variables for examining guidance magnitude are guidance magnitude relative to reported or final earnings. These measures are defined as follows.

$$\text{Guidance Magnitude}_i \equiv \left| \frac{I_i - G_i}{G_i} \right| \quad (2)$$

where

$I_i$ = IBES actuals for firm i,
$G_i$ = GAAP earnings for firm i. GAAP earnings can be either *final* or *reported* earnings.

To address the effect on magnitude of guidance relative to *reported earnings*, equation (1) is estimated using Guidance Magnitude, computed with GAAP earnings equals *reported earnings*, as the dependent variable. The independent variables are as specified in equation (1).

To address the effect on magnitude of guidance relative to *final earnings*, equation (1) is estimated using Guidance Magnitude, computed with GAAP earnings equals *final earnings*, as the dependent variable. The independent variables are as specified in equation (1). Final earnings are restated earnings for restatement firms and reported earnings for non-restatement firms.

The dependent variables for examining guidance direction are guidance direction relative to reported and final earnings. These are measured as follows.

$$\text{Guidance Direction}_i \equiv \frac{I_i - G_i}{|G_i|} \quad (3)$$

where

$I_i$ = IBES actuals for firm i,
$G_i$ = GAAP earnings for firm i. Again, GAAP earnings can be either *final* or *reported* earnings.

To address the effect on magnitude of guidance relative to *reported earnings*, equation (1) is estimated using Guidance Direction, computed with GAAP earnings equals *reported earnings*, as the dependent variable. The independent variables are as specified in equation (1).

To address the effect on magnitude of guidance relative to *final earnings*, equation (1) is estimated using Guidance Direction, computed with GAAP earnings equals *final earnings*, as the dependent variable. The independent variables are as specified in equation (1).

**Independent Variables**

Hypothesized Variable

Rsmt_Firm= dummy variable, 1 for restatement firm, 0 for non-restatement firm.

Control Variables

Leverage= short term debt plus long term debt divided by end of year assets.

Book_to_Market= book value of equity divided by the market capitalization at the end of the fiscal year.

Consec_Postv_Earnings= the number of consecutive positive quarterly earnings before extraordinary items. This includes the current quarter. For example, if the current quarter is the 4th quarter of year 2001, and this quarter and the 3rd and 2nd quarters of the same year have positive quarterly earnings, then Consec_Postv_Earnings =3.

Consec_Earngs_Suprises= the number of consecutive positive quarterly earnings surprises. This includes the current quarter. For example, if the current quarter is the 4th quarter of year 2001, and this quarter and the 3rd and 2nd quarters of the same year have positive earnings surprises, then Consec_Earngs_Suprises =3. Earnings surprise is calculated as earnings minus forecasts divided by the absolute value of forecasts.

Loss_Firm= dummy variable, 1 for firm-year with negative earnings before extraordinary items, and 0 for positive earnings before extraordinary items.

This paper includes the above indicated control variables to control for incentives to guide street earnings: leverage, book to market, and the number of consecutive positive earnings surprises. These variables are incentives to manage GAAP earnings and have been used in prior literature. I hypothesize that these GAAP earnings management incentives are also incentives to guide IBES actuals.

Leverage

Defond and Jiambalvo (1994) argue that managers manage earnings to avoid the high cost of violating debt covenant. Beneish (1997) finds that among firms that have aggressive accrues[32] with increasing sales, leverage is an indicator of firms that violate GAAP. Richardson et al. (2002) find that restatement firms have significantly higher leverage than non-restatement firms. However, DeFond and Jiambalvo (1991) find this to be an insignificant factor in differentiating restatement firms from non-restatement firms. Since firms with higher leverage have greater incentive to manipulate GAAP earnings, and even greater motivation to manipulate street earnings, and creditors may rely on street earnings in making decisions, I hypothesize that leverage is positively associated with the magnitude of and upward guidance of street earnings relative to both reported earnings and final earnings.

Book to Market

Following Richardson et al. (2002), this study uses book to market instead of market to book ratio to retain negative earnings observations and to reduce the level of earnings skewness. Skinner and Sloan (2002) show that growth stocks are especially responsive to stock price, particularly around earnings announcements. Richardson et al. (2002) hypothesize that firms trading at substantial multiples of book value will be under the greatest pressure to manipulate earnings in order to satisfy market participants' anticipation for high growth in earnings. Their results are consistent with their hypotheses in that market to book is a significant factor in distinguishing between restatement and non-restatement firms. Contrary to Hagin (1991) and LaPorta (1996) which investigates companies in earlier years, Brown (2001) documents a greater frequency of positive earnings surprises for growth firms (using the top quintile of market to book ratio as a proxy) vs. value firms from 1987 to 1999. This may be due to greater earnings manipulation to beat earnings forecast for growth firms in recent years. Since firms with more incentive to manipulate GAAP earnings have even greater incentive to guide street earnings because they are less likely to be caught in these manipulations street earnings, I anticipate book to market to be negatively related to the magnitude of and upward guidance of IBES actuals relative to both reported or final earnings.

[32] Accounts that recognize revenues or expenses before actual cash inflow or outflow.

Consecutive Positive Earnings

Both Burgstahler and Dichev (1997) and Degeorge et al. (1999) find that companies manage their earnings to above zero. The former analyze annual earnings while the latter analyze quarterly earnings. Firms that have (GAAP) consecutive positive earnings before extraordinary items may have 1) manipulated their GAAP earnings and are therefore are even more likely to manipulate street earnings, or 2) not manipulated GAAP earnings and have less incentive to manipulate street earnings upward for the current period. Therefore, I do not have an expectation regarding the direction for relations between the magnitude of and upward guidance of street earnings relative to both reported earnings and final earnings and the number of consecutive positive earnings.

Consecutive Positive Earnings Surprises

Firms have incentives to beat forecasts, i.e. report earnings that are greater than forecasts (Burgstahler and Eames, 2003; DeGeorge, Patel and Zeckhauser, 1999). In addition, Matsumoto (2002) finds that firms guide street earnings upward in order to beat analyst forecasts. Firms that have consecutive positive earnings surprises may or may not have misguided street earnings to achieve such goal. Therefore, I do not have an expectation regarding the direction for the relation between the number of consecutive earnings surprises and the magnitude and direction of management guidance of street earnings above restated and reported earnings.

Loss Firm

Firms that report losses are more likely to guide IBES actuals upward so their earnings would not look so bad, and their chances of beating forecasts would increase.[33] Since the guidance of street earnings is rarely punished, there is no need for companies to take big baths with street earnings. Therefore, I anticipate the existence of a loss to be positively related to the magnitude of and upward guidance of street earnings guidance relative to both reported earnings and restated earnings.

## B. Forecast Error

This section provides the empirical models regarding forecast error. The general model for forecast error is as follows. Following Duru and Reeb (2002), this study uses analysts following, forecast dispersion, firm size, loss firm, and earnings variability as the control variables for both forecast error and bias models. However, some variable specifications and constructs for which the variables proxy are different.

$$\text{Forecast Error}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Affiliated*Rsmt\_Firm}_i + b_3\text{Rsmt\_Firm}_i + b_4\text{Analysts\_Following}_i + b_5\text{Forecast\_Dispersion}_i + b_6\text{Firm\_Size}_i + b_7\text{Loss\_Firm}_i + b_8\text{Earnings\_Variability}_i + b_9\text{Prior\_Misstate}_i + e_i \quad (4)$$

The dependent variables for the forecast error regression models are as follows:

[33] The specification for the "loss firm" variable in this study is different from Matsumoto (2002), since Matsumoto (2002) focuses on the value relevance of earnings.

$$\text{Forecast Error}_i \equiv \left| \frac{F_i - A_i}{F_i} \right| \quad (5)$$

where

$F_i$ = earnings forecast for firm i,
$A_i$ = actual earnings for firm i. Actual earnings can be either *IBES actuals* or *final earnings*.

To address the effect on forecast error based on *IBES actuals*, equation (4) is estimated using Forecast Error, computed with actual earnings equals *IBES actuals*, as the dependent variable. The independent variables are as specified in equation (4).

To address the effect on forecast error based on *final earnings*, equation (4) is estimated using Forecast Error, computed with actual earnings equals *final earnings* as the dependent variable. The independent variables are as specified in equation (4).

*Independent variables*

The hypothesized variables for forecast error are as follows.

Affiliated= 1 for forecast made by an affiliated analyst, 0 for forecast made by an unaffiliated analyst. Affiliated analysts are analysts whose employers are underwriters of covered firms within a 6 year window around earnings announcements.

Rsmt_Firm= 1 for restatement firm, 0 for non-restatement firm.

Affiliated* Rsmt_Firm= the interaction variable created by multiplying Affiliated by Rsmt_Firm.

**Expected signs of hypothesized variables**

In this section, I provide a discussion of the expected signs of the regression coefficients in the forecast error models. The general model is as the follows.

$$\text{Forecast Error}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Affiliated*Rsmt\_Firm}_i + b_3\text{Rsmt\_Firm}_i + b_4\text{Analysts\_Following}_i + b_5\text{Forecast\_Dispersion}_i + b_6\text{Firm\_Size}_i + b_7\text{Loss\_Firm}_i + b_8\text{Earnings\_Variability}_i + b_9\text{Prior\_Misstate}_i + e_i \quad (6)$$

Since the predicted coefficients for the control variables as a result of estimating equation (4) are the same regardless of analyst affiliation or firm type, in this discussion I focus on the coefficients of the independent variables of primary interest (Affiliated, Affiliated*Rsmt_Firm, Rsmt_Firm) and the intercept when determining the expected sign of these variables and when interpreting the results. For affiliated analysts of restatement firms, Affiliated=1 and Rsmt_Firm=1. When these values are substituted into equation (6), these values cause the coefficients of these variables in equation (6) to reduce to $b_0+b_1+b_2+b_3$. For unaffiliated analysts of restatement firms, Affiliated=0 and Rsmt_Firm=1. When these values are substituted into equation (6), these values cause the coefficients to reduce to $b_0+b_3$. For affiliated analysts of non-restatement firms, Affiliated=1 and Rsmt_Firm=0. When these values are substituted into equation (6), these values cause equation (6) to reduce to $b_0+ b_1$. For unaffiliated analysts of non-restatement firms, Affiliated=0 and Rsmt_Firm=0. When these values are substituted into equation (6), these values cause equation (6) to reduce to $b_0$. Table 2 is a summary of the coefficients determining the relative forecast error/bias of different groups based on the above discussion.

<Insert Table 2 Here>

Table 3 provides a summary of hypotheses E2 and E3 along with the expected signs of coefficients for hypothesized variables for testing these hypotheses. The expected signs, as shown in Panel C, are based on Panel B, which shows comparison of cells in Table 2 that are relevant to each sub-hypothesis. As Table 3 shows, for the

regression estimates for forecast error based on street earnings, $b_1$ is expected to be negative, and $b_3$ is expected to be positive, and the sign of $b_2$ is not predicted. With regards to the regression estimates for forecast error based on final earnings, both $b_1$ and $b_3$ are expected to be positive, and the sign of $b_2$ is not predicted.

<Insert Table 3 Here>

*Control Variables*

Analysts_Following= the number of analysts providing forecasts for the annual earnings.

Forecast_Dispersion= the standard deviation of the last 5 forecasts, excluding the last forecast, made since the beginning of the fiscal year for each annual earnings announcement.[34]

Firm_Size= the natural log of market value of common equity

Loss_Firm= 1 for firm-year with loss in earnings before extraordinary items, 0 otherwise.

Earnings_Variability= the standard deviation of earnings before extraordinary items for the previous five years.

Prior_Misstate= 1 for earnings misstatement in the prior year.

*Rationale*

Lys and Soo (1995) and Duru and Reeb (2002) find that forecast error decreases with the number of analysts following. This is because the larger the number of analysts following a firm, the greater the amount of information is provided by analysts regarding the firm to the public. This in turn helps analysts provide less erroneous forecasts regarding the firm. Therefore, I expect the number of analysts following to be negatively related to forecast error.

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[34] This study does not use a deflator for forecast dispersion for the following reasons. The purpose of using a deflator for forecast dispersion is to control for differences in forecasts across firms. Since the standard deviation of forecasts already controls for the mean of forecasts, therefore, a deflator is not needed. In addition, since this study only uses 5 forecasts to calculate forecast dispersion, the mean and median for 5

Lang and Lundholm (1996), Alford and Berger (1999), and Bird (2000) find a positive relation between forecast dispersion and forecast error. This occurs because disagreement among analysts (forecast dispersion) implies uncertainty regarding covered firms, which increases analysts' forecast difficulty (forecast error). I expect forecast dispersion to be positively associated with forecast error.

Larger firms are more likely to have more predisclosure information and therefore smaller forecast errors. (Duru and Reeb, 2002) Lang and Lundholm (1996), Bird (2000) finds that analysts are more accurate in forecasting the earnings of large firms. However, Duru and Reeb (2002) find insignificant association between firm size and forecast accuracy. This study expects firm size to be negatively related to forecast error. Natural log of the variable is used because the distribution of observations for this variable is skewed, as shown in Figure D.

Hwang et al. (1996) find that forecast errors of loss firms are greater than those of profit firms. This is because firms that incur losses are unwilling to disclose negative information to the public, and therefore analysts either receive incorrect or relatively less information about the company. I expect loss firms to be positively associated with forecast error.

It is difficult for analyst to forecast earnings when the variability of earnings is large. Duru and Reeb (2002), Kross et al. (1990), and Lim (2001) find that longer term earnings volatility is negatively associated with forecast accuracy. Hence, this paper expects earnings variability to be positively related to forecast error.

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observations should not be significantly different. Hence, using the median forecast as the deflator is not necessary.

Analysts have difficulty forecasting earnings of firms that have misstated earnings in the prior period. These firms that misstated earnings in the prior period have greater incentives to misstate earnings and/or mislead analysts for the current period. Therefore, I expect forecast error to be positively related to prior misstatements.

## C. Forecast Bias

This section provides the specifications and expectations for the forecast bias models. This study examines both forecast error and forecast bias. This is because when forecasts are optimistic relative to benchmarks, the results of tests of forecast error and bias should be similar in terms of the direction of hypothesized variables' coefficients. That is, greater optimism implies possibly greater forecast error. However, when forecasts are hypothesized to be pessimistic relative to benchmark(s), as in this study, tests of both forecast error and bias are needed for a full understanding of the relative positions. For example, when forecasts are pessimistic relative to benchmark(s), greater optimism means smaller forecast error.

Following the logic for HE2 and HE3, the hypotheses relating to forecast bias are as follows.

HB2a: For restatement firms, street earnings forecast bias is greater for affiliated analysts than for unaffiliated analysts.

HB2b: For non-restatement firms, street earnings forecast bias is greater for affiliated analysts than for unaffiliated analysts.

HB2c: Street earnings forecast bias of affiliated analysts for restatement firms is smaller than that for non-restatement firms.

HB2d: Street earnings forecast bias of unaffiliated analysts for restatement firms is smaller than for that for non-restatement firms.

HB3a: For restatement firms, final earnings forecast bias is smaller for unaffiliated analysts than for affiliated analysts.

HB3b: For non-restatement firms, final earnings forecast bias is smaller for unaffiliated analysts than for affiliated analysts.

HB3c: Final earnings forecast bias of affiliated analysts for non-restatement firms is smaller than that of affiliated analysts for restatement firms.

HB3d: Final earnings forecast bias of unaffiliated analysts for non-restatement firms is smaller than that for restatement firms.

Table 4 contains a summary of expectations for forecast bias as hypotheses B2a-B3d in. Based on the implications for the hypotheses development section and figure B, hypotheses B2a, B2b, B3a, B3b expect affiliated analysts to be more optimistic than unaffiliated analysts for both restatement firms and non-restatement firms when using either IBES actuals or final earnings as the benchmark. Based on the hypotheses development section and figure B, affiliated analysts of restatement firms rely somewhat on their private information and issue forecasts that are further away from (below) IBES actuals than those of non-restatement firms. In addition, unaffiliated analysts of restatement firms rely somewhat on management's guidance and provide forecasts that are further away from (above) final earnings than those of non-restatement firms.

Hence, as hypothesis B2c states, affiliated analysts of restatement firms are more pessimistic relative to IBES actuals than those of non-restatement firms. As hypothesis B2d states, unaffiliated analysts of restatement firms are less optimistic relative to than

non-restatement firms. As hypothesis B3c states, affiliated analysts of restatement firms are more optimistic relative to final earnings compared to those of non-restatement firms. As hypothesis B3d states, unaffiliated analyst of restatement firms are more optimistic relative to final earnings than those of non-restatement firms.

<Insert Table 4 Here>

The general forecast bias models are as follows.

$$\text{Forecast Bias}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Affiliated}_i\text{*Rsmt\_Firm}_i + b_3\text{Rsmt\_Firm}_i + b_4\text{Analysts\_Following}_i + b_5\text{Forecast\_Dispersion}_i + b_6\text{Firm\_Size}_i + b_7\text{Loss\_Firm}_i + b_8\text{Earnings\_Variability}_i + b_9\text{Prior\_Misstate}_i + e_i \quad (7)$$

The dependent variables for the forecast bias regression models are as follows:

$$\text{Forecast Bias}_i \equiv \frac{F_i - A_i}{|F_i|} \quad (8)$$

where

$F_i$ = earnings forecast for firm i,
$A_i$ = actual earnings for firm i. Again, Actual earnings can be either *IBES actuals* or *final earnings*.

To address the effect on forecast bias based on *IBES actuals*, equation (7) is estimated using Forecast Bias, computed with actual earnings equals *IBES actuals*, as the dependent variable. The independent variables are as specified in equation (7).

To address the effect on forecast bias based on *final earnings*, equation (7) is estimated using Forecast Bias, computed with actual earnings equals *final earnings* as the dependent variable. The independent variables are as specified in equation (7). Final earnings are restated earnings for restatement firms and reported earnings for non-restatement firms.

*Hypothesized Variables*

Table 5 is a summary of hypotheses B2 and B3 along with the expected signs of coefficients for hypothesized variables for testing these hypotheses. The expected signs, as shown in Panel C, are based on Panel B, which shows comparison of cells in Table 2 that are relevant to each sub-hypothesis. As Table 5 shows, for the regression estimates for forecast bias based on street earnings, $b_1$ is expected to be positive, and $b_3$ is expected to be negative, and the sign of $b_2$ is not predicted. With regards to the regression estimates for forecast bias based on final earnings, both $b_1$ and $b_3$ are expected to be positive, and the sign of $b_2$ is not predicted.

<Insert Table 5 Here>

*Rationale for Control variables*

Brown (1997, 2001) shows that analyst forecasts' optimistic bias is negatively associated with analysts following and firm size. Brown (1998) finds that larger firms are more likely to report profits that beat analyst forecasts, i.e. pessimistic forecasts. In addition, Das et al. (1998) argue that greater analysts following is negatively associated optimistic bias forecasts. They argue that firms with fewer following analysts provide optimistic forecasts in order to gain access to management information. However, they find weak results for the hypothesis. Hence, I expect analysts following and firm size to be negatively associated with forecast bias.

Das et al. (1998) and Gu and Wu (2003) find that forecast dispersion, a proxy for uncertainty and disagreement among analysts, is associated with optimistic forecasts.

They argue that this is due to analysts providing optimistic forecasts in order to gain access to management information. In addition, optimistic forecasts help generate trading volume (Cowen et al., 2003), enhance underwriting business (DeChow et al., 2000; Lin and McNichols, 1998a). Therefore, in order to be consistent with prior studies, this variable is included in the models. However, in my theoretical model, analysts have access to both management guidance and private information. Unaffiliated analysts have management's guidance but prefer not to follow it. Hence, there does not seem to be any need for analysts to following management's guidance in order to gain management guidance.

Dowen (1996), Hwang, Jan, and Basu (1996), Degeorge, Patel, and Zeckhauser (1999), Brown (2001) show that firms that report losses are more likely to miss analyst forecasts (i.e. more optimistic forecasts), using street earnings as the benchmark. Therefore, I expect forecast bias to be positively related to loss firm.

Lim (2001) posits that analysts provide more optimistic forecasts for firms with greater earnings uncertainty, using earnings variability as the proxy, in order to curry favor with the management and therefore gain access to private information so as to increase forecast accuracy. Therefore, this study anticipates earnings variability to be positively related to forecast bias.

Analysts are less likely to know the true earnings of companies that misstated their earnings in previous period(s). Since these firms are also more likely to misstate their earnings in the current period, and most misstatements are upwards, when analysts are unaware of the existence of earnings misstatements, analyst forecasts are more likely

to be greater than true earnings as well for firms that . Therefore, this paper expects prior misstatement and forecast optimism to be positively related.

# CHAPTER 5

# METHODOLOGY

This chapter describes the terminology, data sources, sample collection methods, and variable specifications for data used in this study.

**Terminologies**

This study defines restatement firms as firms that restated their earnings during the period 1997-mid 2002. On the other hand, non-restatement firms are defined as firms that did not restate their earnings in the period 1997-mid 2002. Street earnings are earnings that are not calculated based on GAAP. This study uses street earnings provided by the majority of Thomson Financial analysts, which are called IBES actuals. Reported earnings are annual earnings that companies file with the SEC. Restated earnings are annual earnings that companies file with the SEC to correct for prior mistakes due to earnings manipulation. Final earnings are reported earnings for non-restatement firms (because these firms never had to restate), and restated earnings for restatement firms. GAAP earnings are earnings that are calculated based on GAAP and are filed with the SEC, and include reported earnings, restated earnings, and final earnings. Actual earnings are street earnings (IBES actuals), reported earnings, restated earnings, or final earnings. Affiliated analysts are analysts whose employers are underwriters of covered firms within a 6-year window around earnings announcements. Unaffiliated analysts are analysts whose employers are not underwriters of covered firms within a 6-year window around earnings announcements. Covered firms are firms that analysts follow. The Glossary provides a listed summary of this paragraph.

***Data Sources***

I employ data for 314 restatement firms from the I/B/E/S, Compustat, and CRSP databases, which are available via the Wharton Research Data Services (WRDS) website. I/B/E/S Actual earnings and I/B/E/S earnings forecasts are obtained from the I/B/E/S Detail File. I/B/E/S Primary/Diluted Flag and I/B/E/S Dilution Factor are from the I/B/E/S Detail Identifier file. Company reported earnings and control variables, except forecasts used to calculate the number of positive forecast errors, are obtained from Compustat. Adjustment factors for stock splits and stock dividend are available via CRSP. In addition, restated earnings are taken from the EDGAR databases, with restatement dates and restatement initiator attained from the GAO-03-395R Financial Statement Restatement Database. Lexis-Nexis Newswire is used to screen for data fit for this study. The criteria used to screen the data are included in the "Sample Selection" section of this chapter. Forecast errors from various models are computed from 1992-2001, while earnings used in time-series models are from 1986-2001. The definition of earnings per share is basic earnings before extraordinary items adjusted for stock splits and stock dividends. I provide more details about the sample in the following sections.

***Forecasts and Actuals***

In this study, I use forecasts from the I/B/E/S detail file, which improves upon data used in most prior studies on analyst forecast superiority. Most of the studies on analyst forecast superiority are done prior to the early 1990s and use forecasts from the IBES Summary file which are not as precise as those from I/B/E/S Detail file. The reasons are as follows. First, aggregate forecasts from the Summary file are provided on

a monthly basis and are a composite of forecasts made at different time periods. The last months that annual forecasts are provided are generally before the fiscal year end date, which are months before these earnings are announced. These forecasts, therefore, do not incorporate a lot of information that is available within less than three months prior to the announcement of annual earnings. Forecasts in the detail file are made up to one month before earnings announcements, and therefore incorporate more information than forecasts in the Summary File.

Second, earnings and forecasts provided in the Summary file are rounded to the nearest cent, which are a lot less accurate than those currently available in the Detail file, which are rounded to the nearest four digits after the decimal point. Third, the Detail file provides the dates that individual forecasts are made. These forecasts incorporate information before these dates, and therefore provide better control of the amount of information incorporated when comparing with time-series forecasts.

***Sample Selection***

I compare the forecasts of annual earnings per share in this study. Richardson et al. (2002) argue that restatements of annual earnings is preferred as the sample since quarterly earnings restatements may reverse in subsequent periods and thus do not have an effect on annual earnings per share.

The main sample of 183 restatement firms (314 restatement firm-years) for periods 1992 to 2001 is selected from the GAO-03-395R Financial Statement Restatement Database. I provide a detail account of the process of obtaining the restatement sample from the GAO database in Table E. The GAO database provides

restatement dates for 940 restatement announcements that occurred between 1997 and mid 2002. GAO (2002), which uses the GAO-03-395R database, defines accounting irregularities are those that are not fairly presented according to GAAP (Generally Accepted Accounting Principles), and would include material errors and fraud. The database does not include restatements due to stock split, general accounting changes under GAAP, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, litigation settlements, arithmetic and general bookkeeping errors, restatements due to accounting policy changes, restatements that are not made to correct mistakes in application of accounting principles (GAO, 2002). Examples of restatements made to correct mistakes in application of accounting principles include correction based on SEC's guidance on IPRD and SEC's Staff Accounting Bulletin No. 101. SEC's guidance on IPRD is consistent with APB 16, FASB Statement 2, and FASB interpretation 4. SEC's Staff Accounting Bulletin No. 101 is an interpretation of disclosure requirements of the Federal securities laws. Hence, restatements based on SEC's guidance on IPRD and SEC's Staff Accounting Bulletin No. 101 are due to prior earnings management instead of new accounting principles, and are therefore included in the sample.

I perform the following steps for each company restatement announcement date in the GAO database to extract data that fit the criteria for this study: First, I go to Lexis-Nexis newswire, for the news report for the restatement date reported by GAO. Using "restate" as the keyword, I scan the articles for whether restatements are on a quarterly or annual basis. Only annual restatements are used in this study because quarterly

restatements may be reversed in subsequent quarters and hence may have no effect on annual earnings. For companies that restate both quarterly and annual earnings, I use only the data regarding annual earnings restatement.

Second, EDGAR is used to collect earnings per share before extraordinary items. Firms with the following characteristics are not included in the study: Companies 1) without EDGAR filings on either the SEC website or Thomson Research database, e.g. because they are foreign companies; 2) that are not in both I/B/E/S and Compustat databases; 3) only have quarterly restatements; 4) restate their annual earnings before issuance of 10-K; 5) whose restatements do not impact earnings; 6) whose restatement results have not been announced; 7) without forecasts; 8) without I/B/E/S actuals; 9) others. Furthermore, for firms that restate their earnings more than once, the result for the last restatement is used, i.e. they are included only once in the study.

In addition, restatement observations where spin-offs, partial liquidating payments, mergers, total liquidations, exchanges involving all shares, announcements of final liquidation payment, disappearance of security, for example, due to closing of companies, that occurred between misstatement date (the fiscal year end in which restated EPS was filed) and EDGAR conformed period (the date that reported EPS was announced) are deleted. For example, if the 1999/12 EPS was restated in the filing of 2001/12 10-k, the fiscal year end for which restated EPS was filed is 2001 even though SEC received the filing in 2002/4. Using CRSP's cumulative factor to adjust shares outstanding, 6 firm-years are deleted as a result. Furthermore, restatement firms that are in I/B/E/S, but are missing forecasts for misstatement dates are deleted as well.

<Insert Table 6 Here>

***The Last Forecast before Each Earnings Announcement***

For hypotheses HE2, HE3, HB2, and HB3 annual earnings (final earnings and I/B/E/S actuals) are compared with the last analyst forecast made within half a year before each earnings announcement. This is because investors' evaluation of whether companies beat forecasts is based on the last analyst forecast.[35] Kutsoati and Bernhardt (2004) find that the last forecast before each earnings announcement is on average more pessimistic than the consensus forecast (the mean of the latest forecasts). This is consistent with Bernhardt and Campello's (2002) argument that analysts use the last forecast to create positive earning surprises. In addition, they find that investors do not adjust for the bias at their reaction to earnings announcements. This is consistent with Brown and Kim's (1991) finding that earnings surprises based on the last forecast prior to each earnings announcement is more highly associated with stock prices.

O'Brien (1988) states that the use of the most recent forecast eliminates outdated forecasts. Collins and Hopwood (1980) and Elton, Gruber, and Gultekin (1982), Lobo (1992) find that analysts incorporate new information relevant to earnings as the year progresses. Consistent with these studies, O'Brien (1988) finds that the most recent forecast is more accurate than mean or median forecast. Crichfield, et al. (1978), O'Brien (1988), Brown (1991) find that forecast recency is positively related to forecast accuracy. O'Brien (1988), Brown, Foster, and Noreen (1985), Brous (1922), Brous and Kini (1933) find that analyst forecasts are more pessimistic as the fiscal year end approaches.[Dugar and Nathan, 1955]

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[35] For example, Kasznik and McNichols (2002) use the forecast closest to but within 90 days prior to the earnings announcement to examine whether earnings surprises are related to firm value. Brown (2001), Dugar and Nathan (1995) use the last forecast before each earnings announcement. Brown and Kim (1991) find that earnings surprises based on the last forecast prior to each earnings announcement is more highly

***Definition of Earnings***

Following Philbrick and Ricks (1991), actual earnings used in this study, which include Compustat reported earnings, EDGAR restated earnings, and IBES actuals, are defined as earnings before extraordinary items. Compustat earnings per share excluding extraordinary items are earnings per share before extraordinary items and discontinued operations adjusted for preferred dividends. This item includes equity in earnings of nonconsolidated subsidiaries. The use of such earnings is due to the basis on which forecasts are provided. I/B/E/S earnings and forecasts do not include the effect of extraordinary charges, discontinued operations, and other non-operating items (I/B/E/S Glossary 1994-2003). In addition, preliminary analyses show the following.

1) For restatement firms, the correlations between Compustat EPS excluding extraordinary items, Compustat EPS from operations, IBES Actual and EDGAR EPS from continuing operations are 99.78%, 83.12%, and 58.44%, respectively.

2) For non-restatement firms, the correlations between Compustat EPS excluding extraordinary items, Compustat EPS from operations, IBES Actual and EDGAR EPS from continuing operations are 99.869%, 99.96%, and 88.02%, respectively.

Since Compustat EPS excluding extraordinary items is the type of Compustat earnings that is most highly correlated with EDGAR EPS from continuing operations for both restatement firms and non-restatement firms, it is a good proxy for EDGAR EPS from continuing operations. Therefore, (Compustat) reported earnings is proxied by Compustat EPS excluding extraordinary items.

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associated with stock prices.

The following explains some of the details regarding the process involved in the calculation of earnings and estimates as provided by I/B/E/S. Recent studies use IBES actual earnings in calculating forecast errors because it is explained by Thomson Financial[36] to be consistent with IBES estimates in terms of the accounting methodology employed. That is, although earnings and forecasts in I/B/E/S are based on earnings from continuing operations, the analysts that provide estimates to Thomson Financial may calculate such earnings differently from company reported earnings. In addition, the accounting method for calculating earnings may differ from one analyst to another.

The data in the I/B/E/S Summary file includes earnings and their estimates based on the methodology of the majority of analysts, which may differ from company to company. The Consensus file does not include estimates that are based on accounting methods that are different from the majority of analysts, and estimates of analysts that stop making forecasts. When forecasts in the Consensus file are made in two different quarters, they may be calculated on different accounting bases. This is because analysts may exclude or calculate certain items on one basis in one quarter and on another in the other. Sometimes, this is due to changes in accounting principles or regulations, and sometimes this is because of the analysts' own decisions. The Detail file includes all estimates in the IBES database and the estimates for any company may be based on different accounting methodologies.

Table 7 presents an example of the calculation of I/B/E/S Actuals versus EDGAR reported earnings. The first row shows the quarterly IBES actuals of JNI Corporation for fiscal year ending in 2001. These earnings are based on continuing operating bases. The numbers in the second row are items First Call discloses that are used to exclude from

[36] Thomson Financial is the company that compiles the IBES database.

GAAP earnings to come up with IBES actuals. The last row documents reported net income based on JNI Corporation's EDGAR filing, i.e. these are GAAP net income per share. It would seem that by adding IBES actuals (first row) and exclusions First Call made to GAAP earnings (second row), which results in numbers in the third row, the results should be the same as GAAP earnings (last row). However, the table shows that numbers in the last two rows are different. Therefore, the exclusions that First Call provided are insufficient to explain the difference between IBES actuals and GAAP earnings.

<Insert Table 7 Here>

***Basic Earnings Per Share***

All forecasts and earnings used in this study are computed on a basic level. This is because most companies are followed on basic earnings per share level. The Identifier file in the Detail ancillary file provides information as to whether companies are followed on a basic/diluted basis. For companies with a diluted indicator, both forecasts and actuals are multiplied by the dilution factor. I/B/E/S actuals are collected from the Detail file since these actuals has a precision of 4 decimal places, while the ones in the summary file has a precision of only 2 decimal places. Similarly reported earnings and restated earnings obtained from Compustat and EDGAR respectively are calculated on a basic level.

***Stock Splits and Stock Dividends***

In addition to the above concerns and adjustments, the forecasts and earnings used in this study are adjusted for stock splits and stock dividends. Payne and Thomas (2002) provide the following rationale. I/B/E/S provides per share data on a split-adjusted basis.

This information helps institutional investors make better decisions since both current and forecast information are adjusted for stock split. In order for data to be comparable over the years, I/B/E/S also adjusts past per share data for stock splits.

Payne and Thomas (2002) provide examples showing how, when using summary I/B/E/S data, forecast errors calculated from data adjusted for stock splits are much smaller than that unadjusted for splits. This causes prior studies to give the impression that forecasts have been more accurate over the years, when in fact the number of forecasts that follow this trend is less than evidenced in these studies. This problem is especially significant for larger firms, for firms with numerous stock splits, and for studies that use annual instead of quarterly data.

Payne and Thomas (2002) find that the split adjustment done by I/B/E/S is very inaccurate. And the unwinding using the adjusted data provided by the summary I/B/E/S data is not accurate either due to the rounding to the done by I/B/E/S. Since unadjusted data provides a more accurate comparison of forecast errors, they recommend that future researchers use the adjusted data from detail I/B/E/S data, and use split factor to unadjust it.

This study uses stock split and stock dividend adjustment factors from CRSP. The adjustment is needed because actual earnings and forecasts from I/B/E/S is calculated on an adjusted basis, while data from Compustat (reported earnings) and 10-K (restated earnings) is calculated on an unadjusted basis. That is, I/B/E/S data are adjusted for stock dividends and stock splits that occur between the fiscal year end date and the most recent date, while Compustat and 10-K do not adjust for these future events. I/B/E/S only provides factors to unadjust forecasts and actuals from the future, while

CRSP provides data to adjust for these future events. Since the dates corresponding adjustment factors in CRSP are on a daily basis, while those in Compustat are provided on either annual or quarterly basis, CRSP is used as the source of the factors. This enables effective comparison to forecasts from I/B/E/S, whose corresponding dates are provided in terms of days. Although CRSP also adjusts for factors besides stock splits and stock dividends, the easiness of identifying these factors, because they are coded as 0 or less than 0, do not create a problems for using CRSP adjustment factors in this study. In addition, since the SAS coding to obtain the factor from I/B/E/S data is far more complicated than that from CRSP, CRSP is used as the source of the factors. Therefore, all forecasts and earnings used in this study are adjusted for future stock splits and dividends.

***Affiliated***

This study defines Affiliated as analysts' employers being one of the IPO, SEO (IPO and or SEO) offering underwriters of covered firms; and these offerings dates of the covered firms are within a 6 year window of, i.e. three years before to three years after, earnings announcements. Furthermore, analysts who work for the same parent company as underwriters of covered firms are also deemed as affiliate. If there are more than 1 offerings in the 6-year window, those affiliated with at least one offering are categorized as affiliated.

In this study I use a 3-year window both before and after primary offerings. It is important to look at the time both before and after these offerings for the following reasons. 1) Analysts have incentives to following management's guidance before these offerings. Lin and McNichols (1998) argue that offering issuers are more likely to

choose underwriters whose analyst employees provide favorable expectations. Dechow, Hutton, and Sloan (2000) show that optimistic long-term forecasts help to boost stock prices temporarily at the issue date. 2) Analysts also have incentives to following management's guidance after these offerings. Lin and McNichols (1998) state that one of the factors that companies consider when making decisions as to the underwriters to employ for companies' primary offerings is the ability of underwriters to provide research support after offerings. Zhang (2004) state that analysts are important to firms after underwriting deals because analysts reduce information uncertainty. Lin, McNichols, and O'Brien (2003) show that analysts are slow to downgrade stocks after new issues. Although there seems to be no benefit for analysts after primary offerings of covered firms since the deals have been completed, covered offering firms can always make deals under the table with analysts to provide forecasts after offerings. 3) Lin and McNichols (1998) also find that once an underwriting relationship has started, there is a high likelihood that the relationship will continue.

# CHAPTER 6

# DATA ANALYSES

This chapter is divided into three parts. 1. Descriptive Statistics. 2. Management's Guidance of IBES Actuals. 3. Forecast Error/Bias. The purpose of the basic statistics section is to present the relative positions of forecasts and actuals based on means and medians. The management's guidance of IBES actuals section presents regression results for testing hypotheses 1 and supplemental analyses relating to the topic. The forecast error/bias section presents regression results regarding hypotheses 2 and 3. In addition, results of tests on forecast bias are presented as supplemental analyses to the section. Lastly, the forecast error/bias models are tested for all firms so as to compare with the results of prior studies.

Table 8 Panel A presents the sample sizes for different sets of tests. The total number of observations before limiting sample size based on forecast horizon is 634. The sample size for the basic statistics section is 591. This is due to selecting observations with forecasts that are made within 3 months before earnings announcements. The sample size for the IBES Actuals guidance models is 618 because observations with missing values for at least one variable for the regression models are not used in the calculation. In addition, 3 outliers are deleted for the IBES Actuals guidance models. The magnitude and direction of IBES actuals guidance for the 2 of the outliers are 69.39, 120.02, while the range of these variables are 0 to 57 without these two outliers. In addition, the magnitude and direction of IBES actuals guidance relative to final earnings for the third outlier is 129, while the range of these measures without the outlier is 0-56. Therefore, these 3 outliers are deleted.

The sample size for the forecast error/bias models is 517 due to limiting forecasts to those made within 3 months before earnings announcements, to eliminating observations with missing values for at least one variable used in the regression models, and to deleting one outlier. The one outlier is deleted because, without the outlier, the minimum and maximum for forecast bias based on street earnings are -9 and 52.3, respectively. However, the same forecast bias measure for the outlier is -87, this is because analyst forecast for the observation is -0.01, and street earnings for the measure is -0.88. These clearly indicate that the observation is an outlier and therefore is deleted. Deleting observations is generally not a good statistical practice since this takes out the effect of some observations. Therefore, I attempt to delete as few observations as possible for the main regressions, and perform sensitivity tests based on trimming potential outliers.

Note that the number of observations within each set of tests is the same. This ensures comparability between results using different benchmarks, i.e. IBES actuals, reported earnings, final earnings. Although this dissertation displays results using different number of observations for the basic statistics (means/medians) of forecasts and actuals (n=591), and the regression models for guidance of IBES actuals (n=618), the regression models for forecast error and bias (n=517), the results of the hypothesized variables are not sensitive to using the same observations across different sets of models.

Table 8 Panel B lists the sample sizes for different groups of samples for the basic statistics section. The number of observations for non-restatement firms (297) is close to the number of observations for restatement firms (294). However, the proportion of affiliated analysts within the non-restatement firm sample (83/214) is greater than that

within the restatement firm sample (43/251). This may be due to analysts' employers considering the healthiness of company operations before they decide whether to underwrite for these companies.

<Insert Table 8 Here>

Table 9 is the frequency statistics table for restatement firms in the basic statistics sample. Panel A of the table lists the frequency distribution of restatement firms by year. The panel shows that the number of restatements that occur in the late 1990s is much greater than that in the early 1990s. Since the sample only includes companies that restated their earnings between 1997 and mid 2002,[37] the number of restatement firms in the early 2000s won't reflect companies that require restatements of earnings but have not been detected. Panel B of the table lists the frequency distribution of initiators of earnings restatements as provided by the GAO database. The panel shows that the order of initiators of earnings restatements in the order of frequency are 1) restatement firms themselves, 2) the SEC, and 3) auditors. The initiators for 27.21% of the restatements are unknown.

<Insert Table 9 Here>

## A. Descriptive Statistics

This section compares the means and medians of various types of earnings and forecasts. The purpose is to investigate crude relative relations between forecasts and actual earnings. Table 10 presents the basic statistics of earnings and forecasts for all firms. Panel A of Table 10 shows the means and medians of analyst forecasts in general

[37] Panel A shows that the restatement sample goes back to 1992. This is due to firms restated their earnings during 1997-mid 2002 had misstated their earnings during the period 1992-2001.

and various types of actuals, while panel B of Table 10 documents the basic statistics of earnings and forecasts broken down by analyst affiliation.

<Insert Table 10 Here>

Table 11 presents the basic statistics of earnings and forecasts for restatement and non-restatement firms. For restatement firms and non-restatement firms, the relative comparisons are broken down by firm type and affiliation, and are valid only for comparison within each category.[38]

<Insert Table 11 Here>

Figure E presents the relative size of forecasts and actuals based on information from Tables 10 and Panel B of 11. Panel A of figure E shows that restatement firms beat unaffiliated analyst forecasts with IBES actuals but miss affiliated analyst forecasts. On the contrary, non-restatement firms beat affiliated analyst forecasts with IBES actuals but miss unaffiliated analyst forecasts. This is inconsistent with the hypothesized relations as shown in Figure B, which shows that both restatement firms and non-restatement firms beat both types of analysts. For all firms, companies beat unaffiliated analyst forecasts with IBES actuals but miss the forecasts of affiliated analysts and analysts in general. This suggests that unaffiliated analysts help companies beat forecasts while affiliated analysts don't.

[38] For example, affiliated analyst forecasts of restatement firms can only be compared with reported earnings, final earnings, and IBES Actuals of firms these analysts cover, i.e. under the category of restatement firms and affiliated. Since there seems to be a difference between the earnings of firms that affiliated analysts and unaffiliated analysts follow, as shown by Panel B of Table 10, the numbers for affiliated analysts of restatement firms are not to be compared with those of unaffiliated analysts for restatement firms. In addition, since the earnings of non-restatement firms are different from that of restatement firms, the numbers of affiliated analysts of restatement firms are also incomparable to those of affiliated analysts for non-restatement firms.

Consistent with the expectation, IBES actuals are on average greater than reported earnings, which are in turn greater than final earnings. In addition, firms miss all three types of analyst forecasts with reported earnings and final earnings.

Panel B of figure E shows the relative positions of earnings and forecasts based on medians. Since Table 12 shows that earnings and forecasts are not normally distributed, and the difference between the means and medians of these numbers seems to be greater than 1-2%, medians may be more representative of the average values without being affected by extremely large or small values.[39] The medians for all firms show that consistent with recent studies such as Richardson, Teoh, and Wysocki (1999), Bagnoli, Beneish and Watts (1999), Brown (2001) that look at medians, companies beat analyst forecasts in general with IBES actuals. However, the panel also shows that for all firms, companies beat all three types of analyst forecasts. With regards to restatement firms, these firms beat unaffiliated analyst forecasts while missing affiliated analyst forecasts. Pertaining to non-restatement firms, these companies beat both affiliated and unaffiliated analyst forecasts. For both restatement and non-restatement firms, affiliated analysts seem to be more optimistic. For restatement firms, non-restatement firms, and all firms, IBES actuals are equal or greater than reported earnings and final earnings.

<Insert Figure E, Table 12 Here>

## B. Management's Guidance of IBES Actuals

This section investigates whether management guides IBES actuals upward in order to beat analyst forecasts. Table 13 shows the results for testing hypotheses 1a, 1b,

[39] http://www.geocities.com/thesciencefiles/class/average.html

and 1d. These tests use the number of observations that meet the hypotheses relative to the total number of observations for that category of firms. If the percentages of observations that are consistent with the hypotheses are substantially greater than 50%, which represents random occurrence, then the data on average is consistent with the hypotheses.

Hypothesis 1a hypothesizes that IBES actuals are greater than reported earnings for all firms. Since 55.99% (355 out of 634 observations), which is slightly greater than 50%, of the data shows that IBES actuals are greater than reported earnings, the data weakly supports H1a. Hypothesis 1b states that for restatement firms, IBES actuals are greater than reported earnings. Since 63.69% of the data indicates that IBES actuals are greater than reported earnings for restatement firms, then the data is consistent with H1b. Hypothesis 1d hypothesizes that for restatement firms, the difference between IBES actuals and final earnings is greater than the difference between reported earnings and final earnings. Since 69.75% of the data is consistent with the hypothesis, then, on average, the difference between IBES actuals and final earnings is greater than the difference between reported earnings and final earnings for restatement firms.

<Insert Table 13 Here>

Table 14 shows that all variables used this section are non-normally distributed because every Kolmogorov-Smirnov D statistic is significant at 1%. Table 15 provides evidence that the direction of IBES actuals guidance relative to both reported earnings and final earnings is upward, and the magnitude is greater than 0 for all firms, restatement firms, and non-restatement firms. This holds when investigating means or medians, although the mean guidance is greater than the median guidance for all firms,

restatement firms, and non-restatement firms. In addition, the median guidance magnitude and direction relative to both reported and final earnings for non-restatement firms are close to 0. Furthermore, from the significance of every Wilcoxon statistic, the direction for guidance of IBES actuals with regards to both reported earnings and final earnings is more upward for restatement firms than for non-restatement firms. Moreover, the magnitude of guidance relative to the two benchmarks is also greater for restatement firms than for non-restatement firms. In summary, Tables 13 and 15 show that restatement firms are more likely to guide IBES actuals than non-restatement firms.

<Insert Table 14, 15 Here>

Table 16 lists the means and medians of control variables. The average leverage ratio is around 0.2 for all firms, the average book to market ratio is around 0.5. The mean number of consecutive positive earnings is 7, however, the median is 2. The mean number of consecutive positive earnings surprises is 18.5, while the median is only 8.5. This means the number of positive earnings and positive earning surprises for the sample is right skewed. That is, the majority of the firms don't have many consecutive positive earnings or positive earnings surprises. The mean percentage of firms with negative earnings before extraordinary items is 26.7%. Since table 14 shows that all variables for the management guidance of IBES actuals models are non-normally distributed, the Wilcoxon's test is used to compare the difference in control variables between restatement firms and non-restatement firms. The Wilcoxon statistics show that restatement firms have significantly fewer of consecutive positive earnings, and are more likely to be loss firms, than non-restatement firms.

<Insert Table 16 Here>

Table 17 is the results of correlation analyses between independent variables. Since Table 14 shows that all independent variables are non-normally distributed, spearman correlation is used. Table 17 shows that firms with consecutive positive earnings are more likely to be firms with consecutive earnings surprises, and less likely to be loss firms. Firms with consecutive earnings surprises are less likely to be loss firms.

<Insert Table 17 Here>

Table 18 panel A provides the results for testing hypothesis 1c, magnitude of management's forecast guidance of IBES actuals relative to reported earnings. The model adjusted $R^2$ is 0.03, and the model F value is significant at 0.0002. The result for the restatement firm variable is consistent with H1c, that the magnitude of management's guidance of IBES actuals is greater for restatement firms than for non-restatement firms. In addition, the magnitude of management's guidance is negatively associated with the number of consecutive positive GAAP earnings and positively associated with firms' reporting losses for the current period. The coefficients for other control variables in the regression are insignificant, indicating no detectable association between leverage, book to market, the number of consecutive positive earnings surprises and the magnitude of management's guidance of IBES actuals relative to reported earnings.

Panel A of Table 19 documents the diagnostic statistics for the magnitude of IBES actuals guidance relative to reported earnings estimates. With regards to the tests for multicollinearity, all tolerance statistics are above 0.75, which are closer to 1 (the yardstick) than to 0. All variance inflation factors are a bit above 1, which are significantly below ten, the point of reference. The intercept adjusted condition index is 1.73, which is significantly lower than the benchmark of 30. These indicate that there is

no multicollinearity problem.

Table 20 panel A presents the results of sensitivity tests for the magnitude of IBES actuals guidance relative to reported earnings estimates by trimming observations with Rstudent>2.5, Cook's D statistic>4/n (n is the number of observations)[40], and with values of dependent variables that are among top 1% of the sample, respectively. All three robustness tests have consistent results with the main regression with regards to almost all variables. That is, coefficients of restatement firms, number of consecutive positive earnings, and loss firms remain significant, and the others are insignificant. The only exception is the robustness check based on Rstudent, which finds that the number of positive earnings surprises is positively related to the magnitude of IBES actuals guidance with respect to reported earnings. The model F values for the robustness regressions are all significant at < 0.0001. Hence, the results of the above analyses are consistent with H1c that the magnitude of IBES actuals guidance relative to reported earnings is greater for restatement firms than for non-restatement firms.

The following tests are supplemental to H1c in that these models use a different benchmark and/or test for the difference in existence of upward guidance of IBES actuals. Panel B of Table 18 shows the regression results for the magnitude of management's forecast guidance of IBES actuals relative to final earnings. The model adjusted $R^2$ is 0.0415, and the significance of the model F value is <0.0001. The coefficient for the restatement firm variable is positively significant, which is consistent with the prediction that the magnitude of management's forecast guidance of IBES actuals relative to final earnings is greater for restatement firms than for non-restatement

[40] Rstudent is the studentized residual. Cook's D measures the change in the parameter estimates due to deleting each observation.

firms. In addition, the coefficients for the control variables show that, the magnitude of management's guidance is negatively associated with firms having consecutive positive earnings and positively associated with firms' incentive to maintain consecutive positive earnings surprises. Inconsistent with the prediction, the coefficients on other control variables are insignificant.

Panels B of Table 19 contains diagnostic statistics for testing the magnitude of IBES actuals guidance relative to final earnings. Panel B is exactly the same as panel A, which indicates no multicollinearity problems.

Panel B of Table 20 shows the results of sensitivity tests of testing the magnitude of IBES actuals guidance relative to final earnings via trimming observations based on the values of Rstudent, Cook's d, and the dependent variable. Except for the loss firm variable, the results of other variables are consistent with the main result. That is, restatement firm and the number of consecutive positive earning surprises are positively related to the magnitude of guidance, while the number of consecutive positive earnings is negatively associated with guidance magnitude. In addition, the coefficient for the loss firm variable is positively significant for all three robustness tests. This indicates that loss firms are more likely to have greater magnitude of guidance of IBES actuals. The model significance for all three tests are <0.0001.

<Insert Tables 18, 19, 20 Here>

Table 21 presents results of regressions for testing the direction of IBES actuals guidance, which investigate whether restatement firms are more likely than non-restatement firms to guide IBES actuals upward from reported earnings and final earnings, respectively. Panel A of the table shows results using reported earnings as the

benchmark. The adjusted R2 for the model is 0.0354, and the model F value is 4.77 (significant at <0.0001). The coefficient for the restatement firm variable is positive and significant, indicating that as expected, that restatement firms tend to guide IBES actuals upward. Firms with consecutive positive earnings guide IBES actuals down,whereas loss firms have more incentive to guide IBES actuals upward. The coefficients for other control variables are insignificant, indicating no detectable relation between these factors and management's guidance of IBES actuals.

Panel A of Table 22 reports the results of diagnostic tests for testing the direction of IBES actuals guidance relative to reported earnings. The tolerance statistics are significantly closer to 1 than to 0, the variance inflation factor are all lower than 3, and the intercept adjusted condition index is way under 30. These show no multicollinearity problem.

Table 23 Panel A provides results of robustness checks on regression for testing the direction of IBES actuals guidance relative to reported earnings. All three robustness models are significant at <0.0001. The results for all variables except for "the number of consecutive positive earnings surprises" variable is consistent with the main regression results. The coefficient for the number of consecutive positive earnings surprises variable is positively significant for all three robustness models but not for the main regression. Therefore, we can infer that the number of consecutive positive earnings surprises is positively related to the upward guidance of IBES actuals, although the result is sensitive to the observations used.

Panel B of Table 21 is the regression result for the upward guidance of IBES actuals relative to final earnings. The model adjusted R2 is 0.0377 and the model F value

is 5.02, which is significant at <0.0001. As predicted, the coefficient for the restatement firm variable is positively significant, indicating that the upward guidance is greater for restatement firms than for non-restatement firms. The coefficient on the number of consecutive positive earnings is negative and significant, providing evidence that firms with consecutive positive earnings guide IBES actuals down from final earnings. Also, the coefficient on the number of consecutive positive earnings surprises is positive and significant, showing that firms with consecutive positive earnings surprises are more likely to guide IBES actuals upward.

Panel B of Table 22 reports the diagnostics for testing the upward guidance of IBES actuals relative to final earnings. Panel B is exactly the same as Panel A of the same table, and indicates no multicollinearity problem.

Panel B of Table 23 reports the results of sensitivity tests by trimming observations. All regressions are significant at <0.0001. The results for all variables except for the loss firm variable are consistent with the results in Panel B of Table 21. The coefficient for the loss firm variable is positively significant at 5% level for all three robustness tests. This indicates that the loss firms are more likely to guide IBES actuals upward relative to final earnings. However, the result is not robust.

<Insert Tables 21, 22, 23 Here>

Table 24 provides a summary of results for testing management's guidance of IBES actuals. Panel A of the table presents the expectation for the models. Panel B states the results of tests. Panel C reports the conclusion of the tests. The table shows that consistent with H1c and expectations for supplemental tests, the magnitude of and upward guidance of management's guidance of IBES actuals relative to both reported

earnings and final earnings are greater for restatement firms than for non-restatement firms. Although all tests of management's guidance of IBES actuals exclude 3 outliers, the results for the hypothesized variables are robust when excluding only 2 outliers, the results of which is not shown in this study.

<Insert Table 24 Here>

## C. Forecast Error and Bias

### a. Forecast Error

This section provides the results for testing hypotheses E2 and E3. In addition, expectations regarding forecast bias are tested. At the end, regression results regarding forecast error and bias for all firms are presented. Table 25 reports the basic statistics for forecast error. Panel A of the table shows that the mean forecast error based on IBES actuals is 52.7% of the forecast, while mean forecast error based on final earnings is 233%. The difference between the medians of the two types of forecast error is smaller than the difference between the means, however, the forecast error based on IBES actuals is still smaller than forecast error based on final earnings. The spread around forecast error based on final earnings is significantly greater than the spread around forecast error based on IBES actuals.

Panel B of Table 25 presents the descriptive statistics of forecast error based on IBES actuals and final earnings broken down by analyst affiliation and firm type. Both the mean and median forecast error for restatement firms based on IBES actuals and final earnings are greater for affiliated analysts than for unaffiliated analysts. Both the mean and median forecast error for non-restatement firms based on both IBES actuals and final

earnings of affiliated analysts are smaller than that of unaffiliated analysts. These show that for non-restatement firms affiliated analysts are better at predicting company earnings than unaffiliated analysts. However, the opposite occurs for restatement firms.

<Insert Table 25 Here>

Table 26 reports the descriptive statistics of independent variables for the forecast error and forecast bias models. The average percentage of forecasts that are made by affiliated analyst is 21.3% (0% for median). Only an average of 7.29 % the forecasts are made by affiliated analysts of restatement firms. On average, 10 analysts follow per firm within a given year. In addition, the average firm size is 5.2 billion dollars. The average percent of firms that misstated earnings in prior years is 12.9%. Table 27 provides evidence that every independent variable in the model is non-normally distributed (significant at 1%).

<Insert Tables 26, 27 Here>

Table 28 lists the basic statistics of control variables by groups of firms. Wilcoxon tests are used to compare differences between control variables by type of firm or analyst affiliation status because Table 27 shows that all these control variables are non-normally distributed. Table 28 shows that the number of analysts following, firm size, the percentage of loss firms, and prior misstate are significantly different between restatement firms and non-restatement firms. These indicate that compared with restatement firms, non-restatement firms are larger in firm size, have more analysts following, and have a lower percentage of firm-years with losses.

Table 28 also compares differences between control variables by analyst affiliation. This is done because Panel B's of Tables 5 and 6 show that the earnings and

forecasts for firms followed by unaffiliated analysts are larger than those followed by affiliated analysts. Table 28 shows that firms followed by unaffiliated analysts are larger, are more likely to misstate earnings in the prior period than those followed by affiliated analysts, especially for restatement firms. In addition, unaffiliated analysts are less likely to follow loss firms, especially for non-restatement firms. however These indicate that unaffiliated analysts seem to select large firms that seem to perform well but are actually manipulating earnings. This seems consistent with Table 8 Panel B, which shows that affiliated analysts are more likely to follow non-restatement firms.

<Insert Table 28 Here>

Table 29 reports the correlations among independent variables. Since Table 27 shows that all independent variables are non-normally distributed, spearman correlation is used. Table 29 shows that earnings variability is positively correlated with analysts following and firm size. In addition, larger firms are more likely to have more analysts following.

<Insert Table 29 Here>

Table 30 Panel A reports the results of the regression which tests hypothesis 2. The model adjusted R2 is 0.277, and the model F value is 22.96 (significant at <0.0001). Table 31 Panel A provides a summary of the significant coefficients for the hypothesized variables in Panel A of Table 30. The coefficients in Table 2 are reduced to Table 31 Panel A because I can not reject the hypotheses that the insignificant coefficients are equal to 0. Hence, when comparing between cells, Table 31 shows that contrary to the HE2a, affiliated analysts have larger forecast error than unaffiliated analysts for restatement firms. Consistent with hypothesis E2c, affiliated analysts of restatement

firms have larger forecast error than those of non-restatement firms. However, the data do not support HE2b because the difference between the forecast error of affiliated analysts and that of unaffiliated analysts for non-restatement firm is insignificant. HE2d is also unsupported by the data because the forecast error of unaffiliated analysts for restatement firms is insignificantly different from that for non-restatement firms. Among the control variables, forecast dispersion and loss firm are positively associated with forecast error. That is, the more disagreement among analysts and the higher likelihood that firms report losses, the more difficult it is to forecast IBES actuals. However, analysts following, firm size, earnings variability, and prior misstate are not associated with forecast error.

Panel A of Table 32 provides results for diagnostic checks of regression for forecast error based on street earnings. Panel A shows that except for analysts following and firm size, the tolerance statistics are all above 0.5. The variance inflation factor are all lower than 10. In addition, the intercept adjusted condition index is way under thirty. Therefore, there is no multicollinearity problem.

Table 33 Panels A-1 and A-2 reports results of robustness checks based on trimming of potential outliers. The significance of F values for all three robustness regressions are <0.0001. Panel A-2 of Table 33 shows that the conclusions for comparisons of forecast error between groups are consistent with those for the main regression, although $b_0$ is not significant for trimming based on Cook's d and top 2% of the dependent variable. The coefficients for forecast dispersion and loss firms are positive and significant, consistent with those for the main regression. In addition, prior

misstate is positive and significant for trimming based on Cook's d and top 2% of the dependent variable.

Panel B of Table 30 provides regression results for testing hypotheses E3a-E3d. The model R2 is 0.0819, and the model F value is 6.11, which is significant at <0.0001. Table 31 Panel B is a summary of significant coefficients that are relevant to comparisons of forecast error based on final earnings between groups. The coefficients in Table 2 are reduced to Table 31 Panel B because I can not reject the hypotheses that the insignificant coefficients are equal to 0. All of these coefficients are insignificant. Therefore, inconsistent with the hypothesized relations in HE3a-HE3d, the results show the following. 1) There is no significant difference between the forecast error of affiliated analysts and that of unaffiliated analysts for restatement firms. 2) There is no significant difference between the forecast error of affiliated analysts and that of unaffiliated analysts for non-restatement firms. 3) The forecast error of affiliated analysts for restatement firms is not significantly different from that for non-restatement firms. 4) The forecast error of unaffiliated analysts for restatement firms is not significantly different from that for non-restatement firms. The control variables show that forecast error based on final earnings increases with forecast dispersion, loss firm, and earnings variability. That is, disagreement among analysts regarding covered firms, firms reporting losses, and firms with greater earnings variability increases the difficulty in forecasting earnings for these firms. However, the number of analysts following, firm size, and prior misstate are not associated with forecast error.

Panel B of Table 32 report the diagnostic statistics for forecast error based on final earnings. Panel B is the same as Panel A of the same table, which indicates no multicollinearity problem.

Panels B-1 and B-2 of Table 33 presents the results of sensitivity tests by trimming potential outliers. All three models have F values that are significant at <0.0001. The regression based on trimming top 2% of forecast error has insignificant hypothesized variables, which is consistent with Panel B of Table 30. However, trimming based on Rstudent and Cook's d results in a significant coefficient for the restatement firm variable, $b_3$. Panel B-2 is a summary of significant coefficients relevant to HE3a-HE3d for regression results using trimming based on Rstudent and Cook's d. The table shows that, consistent with HE3c, the forecast error of affiliated analysts for restatement firms is greater than that for non-restatement firms. In addition, as hypothesized by HE3d, the forecast error of unaffiliated analysts for restatement firms is significantly greater than that for non-restatement firms. These results are inconsistent with the result in Panel B of Table 30 and are therefore not robust. The reason for the inconsistent results between the main regression (n=517) and robustness tests based on Rstudent and Cook's d (n=507) may be that some other factors may be causing the large forecast error in outliers. The results for the difference between the forecast error of affiliated and unaffiliated analysts for both restatement firms and non-restatement firms are insignificant, consistent with Panel B of Table 30. The results of all control variables, except forecast dispersion, for all three sensitivity tests in terms of significance are consistent with the results as shown in Panel B of Table 30. A summary of HE2a-HE3d and their test results, as discussed above, are included in Table 34.

<Insert Tables 30, 31, 32, 33, 34 Here>

**b. Forecast Bias**

Table 35 reports the descriptive statistics of forecast bias. Panel A of Table 35 presents the basic statistics for all firms. The mean forecast bias based on IBES actuals and final earnings are positive, indicating that companies on average do not beat forecasts based on IBES actuals and final earnings. The median forecast bias based on final earnings is positive while the forecast bias based on IBES actuals is negative. The latter shows that companies do beat forecasts with IBES actuals. In addition, the median forecast error based on IBES actuals is close to zero, providing evidence that half of the firms beat while another half miss analyst forecasts.

Panel B of Table 35 provides descriptive statistics of forecast bias based on IBES actuals and final earnings by groups. For restatement firms, the forecast bias based on both IBES actuals and final earnings is greater for affiliated analysts than for unaffiliated analysts. This indicates that affiliated analysts are more optimistic than unaffiliated analysts for restatement firms. In addition, the forecast bias of affiliated analysts for restatement firms is greater that for non-restatement firms, showing that affiliated analysts for restatement firms are more optimistic than those for non-restatement firms. For non-restatement firms, the mean forecast bias of affiliated analysts is smaller than that of unaffiliated analysts. This provides evidence that unaffiliated analysts are more optimistic than affiliated analysts for non-restatement firms. The standard deviation of forecast bias based on final earnings is greater than the standard deviation of forecast bias based on IBES actuals in both Panels A and B, indicating possible guidance of IBES actuals relative to final earnings.

Table 36 Panel A displays regression results for forecast bias based on IBES actuals. The model adjusted R2 is 0.2110, and the model F value is 16.33, which is significant at <0.0001. Table 37 provides a summary of significant coefficients of relevant variables for comparing forecast bias between groups. The coefficients in Table 2 are reduced to Table 37 Panel A because I can not reject the hypotheses that the insignificant coefficients are equal to 0. The table shows that both $b_0$ and $b_2$ are significant. Therefore, consistent with hypothesis B1a, the forecast bias of affiliated analysts is greater than that of unaffiliated analysts for restatement firms. Contrary to hypothesis B1c, forecasts of affiliated analysts for restatement firms are more optimistic than those for non-restatement firms. The data rejects hypothesis B1b, since the forecast bias of affiliated analysts is insignificantly different from that of unaffiliated analysts for non-restatement firms. The data also do not support hypothesis B1d since the forecast bias of unaffiliated analysts for restatement firms is insignificantly different from that of non-restatement firms. As to the control variables, the only significant control variable is forecast dispersion. This shows that forecast bias increases with forecast dispersion, which means analysts provide optimistic forecasts in the case of uncertainty in order to gain access to management information or to help the investment banking business of their employers. However, the number of analysts following, firm size, loss firm, earnings variability, prior misstate are not associated with forecast bias based on IBES actuals.

Panel A of Table 38 reports the regression diagnostic statistics for forecast bias based on IBES actuals. Panel A of Table 38 presents the same result as Panel A of Table 32, which indicates no multicollinearity problems.

Panels A-1, A-2, and A-3 of Table 39 show the results of robustness tests via trimming of potential outliers. The model F value is insignificant for regression using trimming based on Rstudent. The model F values are significant at less then 1% for sensitivity tests via trimming based on Cook's d and top and bottom 1% of forecast bias. For trimming based on Rstudent and Cook's d, $b_0$ and $b_2$ are significant, consistent with Panel A of Table 36. Although $b_0$ is not significant for trimming based on top and bottom 1% of the dependent variable, the conclusions for comparisons of forecast bias between groups is the same as the main regression. As for the control variables, the results are not robust across different tests. In addition, non of the control variables are significant for the regression using trimming the top/bottom 1% of forecast bias.

Table 36 Panel B reports results of regression for forecast bias based on final earnings. The adjusted R2 for the model is 0.0774, and the model F value is 5.81 (significant at 0.0001). Table 37 Panel B provides a summary of significant coefficients of relevant variables for comparisons between groups. The table indicates that $b_3$ is the only significant coefficient. This indicates that consistent with hypothesis B2c, the forecasts of affiliated analysts for restatement firms are more optimistic than those for non-restatement firms. As conjectured by hypothesis B2d, forecasts of unaffiliated analysts for restatement firms are more optimistic than those for non-restatement firms. However, the data does not support hypotheses B2a and B2b. That is, the forecast bias for affiliated analysts of restatement firms is insignificantly different that for non-restatement firms. In addition, the forecast bias of unaffiliated analysts for restatement firms and that for non-restatement firms are insignificantly different.

Panel B of Table 38 provides diagnostic statistics for forecast bias based on final earnings. Panel B shows the same results as Panel A of the same table, indicating no multicollinearity problem.

Panels B-1 and B-2 of Table 39 provide evidence from results of sensitivity tests for forecast bias based on final earnings. The results show that the model significance for all three tests are <0.0001. In addition, consistent with Table 36 Panel B, the restatement firm and loss firm variables are significant. However, forecast dispersion is not significant in any of these robustness tests. The earnings variability variable is significant for the first robustness test in Panel B-1, showing that forecasts are more optimistic when there is high earnings variability. The other control variables are insignificant in these tests. In conclusion, the restatement firm variable is robust across all tests for forecast bias based on final earnings. The results of the above discussion are summarized in Table 40.

<Insert Tables 36, 37, 38, 39, 40 Here>

**c. Forecast Error and Forecast Bias for All Firms**

This section presents results of comparing between affiliated and unaffiliated analysts for all firms, forecast error and bias based on IBES actuals and final earnings. The purpose of this section, with regards to using IBES actuals as the benchmark, is to validate the data used in this study.

The regression models for this section are:

$$\text{Forecast Metric}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Analysts\_Following}_i + b_3\text{Forecast\_Dispersion}_i + b_4\text{Firm\_Size}_i + b_5\text{Loss\_Firm}_i + b_6\text{Earnings\_Variability}_i + b_7\text{Prior\_Misstate}_i + e_i \quad (9)$$

To address the effect on forecast error based on street earnings, equation (9) is estimated using Forecast Error, computed with actual earnings equals IBES actuals, as the dependent variable. The independent variables are as specified in equation (9).

To address the effect on forecast error based on final earnings, equation (9) is estimated using Forecast Error, computed with actual earnings equals final earnings, as the dependent variable. The independent variables are as specified in equation (9).

To address the effect on forecast bias based on street earnings, equation (9) is estimated using Forecast Bias, computed with actual earnings equals IBES actuals, as the dependent variable. The independent variables are as specified in equation (9).

To address the effect on forecast bias based on final earnings, equation (9) is estimated using Forecast Bias, computed with actual earnings equals final earnings, as the dependent variable. The independent variables are as specified in equation (9).

For all firms, I expect that, consistent with figure B, IBES actuals>affiliated analyst forecasts>unaffiliated analyst forecasts>final earnings. Therefore, the street earnings forecast error of affiliated analysts is smaller than that of unaffiliated analysts. However, the final earnings forecast error of affiliated analysts is greater than that of unaffiliated analysts. This is inconsistent with the finding of Hansen and Sarin (1996), who show that there is insignificant difference between the forecast error of affiliated analysts and unaffiliated analysts. In addition, I expect the forecast bias of affiliated analysts to be greater than that of unaffiliated analysts, using either IBES actuals or final earnings as the benchmark. See Table 41 for a summary of the hypotheses.

Table 42 presents the results for testing H4E and H5E. As Panel A of Table 42 shows, the regression results for forecast error based on IBES actuals has an adjusted R2

of 0.2718, and F value of 28.52 (significant at <0.0001). Inconsistent with the conjecture, the coefficient for the Affiliated variable is insignificant. That is, there is no difference between the forecast error of affiliated analysts and that of unaffiliated analysts, using either IBES actuals or final earnings as the benchmark. With regards to the control variables, forecast dispersion and loss firm are positively related to forecast error based on IBES actuals. There is no association between analysts following, firm size, earnings variability, prior misstate and forecast error.

Panel B of Table 42 reports the regression results for forecast error based on final earnings. The model has an adjusted R2 of 0.0780, and F value of 7.23 (significant at <0.0001). Also inconsistent with the anticipation, the affiliated variable is not significant. Regarding the control variables, consistent with the expectation, the coefficients for forecast dispersion, loss firm, and earnings variability are significant. However, the coefficients for analysts following, firm size, and prior misstate are insignificant.

Panel A of Table 43 exhibits the regression results for forecast bias based on IBES actuals. The results show that, as expected, affiliated analysts are more optimistic than unaffiliated analysts. In addition, forecast dispersion is positively associated with forecast bias. However, the coefficients for other control variables are insignificant, indicating no detectable association between these variables and forecast optimism.

Table 43 Panel B shows the regression results for forecast bias based on final earnings. Inconsistent with the prediction, there is no difference between the forecast bias of affiliated analysts and that of unaffiliated analysts. However, as conjectured, forecast dispersion and loss firm are increasing in forecast bias. The coefficients of other

control variables are insignificant. In conclusion, the results of data used in this study are consistent with those of prior study and the data for this study are therefore valid. The results of the above discussions are summarized in Table 44. In addition, Figure F summarizes the conclusions of various tests.

<Insert Tables 41, 42, 43, 44, Figure F Here>

With regards to further robustness tests, the results of the hypothesized variables for the forecast error and forecast bias models are robust when dropping analysts following or adding "the number of consecutive earnings surprises." In addition, the results for all hypothesized variables are robust when using the same observations (n=510) across all 12 models in this study.

# CHAPTER 7

# CONCLUSION

In this study, I examine the issue of analyst forecast errors to help people rethink the appropriateness of using forecast errors as the benchmark for analyst performance. If forecast errors and earnings surprises are the results of games played by analysts and management, then the use of such benchmarks is subject to doubt. This section concludes the study by discussing important results, their implications and related policy issues, and limitations of this research.

## A. Important Results

The results of this dissertation show that, contrary to the expectation, there is no evidence of conflict of interest issue for non-restatement firms. If there was a conflict of interest issue for non-restatement firms, I would find affiliated analysts having smaller street earnings forecast error, larger final earnings forecast error, and greater street earnings and final earnings forecast bias than those of unaffiliated analysts for non-restatement firms. Instead, I find insignificant differences between the forecast error and forecast bias of affiliated analysts and of unaffiliated analysts for non-restatement firms. This holds when using either street earnings or final earnings as the benchmark. This result is consistent with that of Bajaji and Krainer (2004). They find that analysts are influenced more by market performance and peer pressure than by investment banking incentives.

This study shows that restatement firms guide street earnings upward. However, there is no evidence that this is true for non-restatement firms. This is due to the significant results for IBES guidance magnitude and direction models relative to both reported earning and final earnings. In addition, the results for testing H1b, H1d, and the mean and medians of the magnitude and direction of IBES actuals guidance show similar results (see Tables 13 and 15). The results imply that Thomson Financial, regulators, and investors have to watch out for situations where IBES actuals have been manipulated. Investors should avoid relying on these earnings as a source of street earnings and as a basis for calculating earnings surprises and forecast error. This study shows that these firms also are manipulators of GAAP earnings.

The results also show that affiliated analysts of restatement firms provide forecasts that are greater than IBES actuals. This is contradictory to the expectation that affiliated analysts help companies beat forecasts. If these analysts help companies beat forecasts, I would find that affiliated analysts have smaller forecast error than that of unaffiliated analysts for restatement firms. Instead, I find the opposite.

Some possible reasons for affiliated analysts of restatement firms to issue forecasts that are greater than IBES actuals are discussed below.

1) Affiliated analysts may have overreacted out of desperation in order to help restatement firms due to conflict of interest issues. Studies such as De Bondt and Thaler (1990) proposed the analyst overreaction theory and argue that analysts have tendency to overreact to information in general and issue extreme forecasts. Therefore, affiliated analysts may move their forecasts upward in response to their knowledge that covered firms are manipulating earnings upwards. However, perhaps to help these firms obtain

financing, affiliated analysts overshoot their forecasts. That is, these analysts move their forecasts far more upward than is necessary to appear healthy. Richardson et al. (2002) find that restatement firms have more ex ante need for financing than non-restatement firms. One of the methods to fulfill this need is to issue IPOs or SEOs, which is how the underwriting relationships are indicated in this study.

2) Conflict of interest may not be the explanation for affiliated analysts of restatement firms to issue forecasts that are above IBES actuals. The evidence is that the underwriting relationship does not cause affiliated analyst forecasts to be significantly different from unaffiliated analysts for non-restatement firms. In addition, since the reason for restatement firms to guide IBES actuals upward is to beat analyst forecasts (Richardson et al., 2002), if affiliated analysts were following management guidance, they would issue forecasts that restatement firms could beat. On the other hand, if affiliated analysts were relying on their private information because they know there is earnings manipulation going on, they would be issuing forecasts that are the same as those issued by unaffiliated analysts. Instead, we see that restatement firms miss affiliated analyst forecasts.

The contradiction between the above two possibilities as to whether optimistic affiliated analyst forecasts for restatement firms are due to conflict of interest issues may be caused by my use of the last forecast before each earnings announcement. This is discussed in the limitation section of this chapter.

I also find that both affiliated and unaffiliated analysts of restatement firms do not explicitly warn investors about the existence of earnings manipulation. This is due to the evidence that for restatement firms, the forecast error and forecast bias of affiliated

analysts are significantly greater than those of unaffiliated analysts when using IBES actuals as the benchmark. However, there is no significant difference between affiliated and unaffiliated analyst forecasts when using final earnings as the benchmark. In addition, IBES actuals for restatement firms have been manipulated upward from final earnings. These imply that analyst forecasts are closer to IBES actuals, which have been manipulated, than to final earnings. Hence, analyst forecasts are also significantly misguided for restatement firms.

In addition, the distribution of analysts by groups and correlations among independent variables for forecast error/bias models show that affiliated analysts seem to pick quality firms to cover; that is, firms that are not manipulating earnings.

**B. Implications and Regulatory Issues**

The above results show that for the majority of firms, there is no need for concern regarding the behavior of analysts who are affiliated with covered firms due to underwriting relationships. That is, investors can rely on forecasts and street earnings provided for these firms. However, it is important to predict which firms are manipulating earnings. This is because firms that are manipulating GAAP earnings are also more likely to manipulate IBES actuals and analyst forecasts. In addition, the affiliated analyst forecasts for restatement firms are overly optimistic and therefore unreliable.

Most of the recent rules and regulations may not change the analyst forecasts for most firms. These rules and regulations include: 1) Regulation FD, 2) the Sarbanes-Oxley Act of 2002 requiring complete reconciliation of pro forma earnings and GAAP

earnings, 3) the NYSE and Nasdaq rules regarding analyst conflict of interest issues. Since only about 3% of all firms[41] are restatement firms and thus have optimistic affiliated analyst forecasts and manipulated IBES actuals, these rules and regulations will affect these firms more strongly. In the future, regulators and academics can make more efficient use of funding and tax payers' money by focusing on these firms rather than on all firms. This can be done by creating prediction models to identify potential restatement firms. One example of such a model is provided by Richardson et al. (2002).

This study provides the following indicators of possible GAAP earnings and street earnings manipulation. 1) Firms with IBES actuals that are significantly different from GAAP earnings. Restatement firms manipulate their IBES actuals, while non-restatement firms don't. 2) Firms that have consecutive positive earnings surprises. These firms are apt to manipulate IBES actuals upward. This is shown by the significant coefficient for this variable in IBES guidance models. 3) Companies whose analysts provide overly optimistic forecasts. These firms may be restatement firms, since affiliated analysts of these firms provide forecasts that are significantly greater than IBES actuals and final earnings. 4) Companies that have misstated their earnings in prior period(s). Firms that misstated their earnings in the current period are more likely to have manipulated their earnings in the prior period. Of course these indicators are developed as ex post measures. Further research is needed to test their ex ante prediction ability.

[41] Restatement firms comprise only 3% of all firms (Defond and Jiambalvo, 1995).

**C. Limitations**

The limitations of this study are as follows.

1) In this study, I define affiliated analysts as analysts whose employers are underwriters of IPOs and SEOs for covered firms. The data source for the "affiliated" variable is the SDC database. The results of this study depend on my definition and data source. I also considered other definitions of affiliated analysts as follows.

a) Affiliated analysts are defined as analysts whose employers are investment banks of covered firms. One data source for the variable is Corporate Finance Bluebook (or America's Corporate Finance Directory). Dugar and Nathan (1995) argue that the names of investment banks in Corporate Finance Bluebook are not the same as those in the SDC database. Corporate Finance Bluebook provides names of companies' long term investment banks while the SDC database provides companies' shorter term investment bankers based on individual deals. (Dugar and Nathan, 1995) The data source was not used for this study because only a small percentage of all forecasts are categorized as affiliated analyst forecasts. Another data source based on this definition is:

http://www.business.com/directory/financial_services/investment_banking_and_brokerage/investment_banks/north_america/. The affiliated variable based on this definition was not used because only a small percentage of all forecasts are categorized as unaffiliated analyst forecasts. However, the use of the SDC database instead of the above two data sources may bias towards finding optimistic affiliated analyst forecasts. This is so since it may be better for the companies to beat analyst forecast in the long run, although it may be beneficial to be optimistic in the shorter run.

b) Affiliated analysts are defined as analysts whose employers are lead underwriters of covered firms. The data source for this definition is the SDC database. The affiliated variable based on this definition was not used because only a small percentage of all forecasts are categorized as affiliated analyst forecasts.

2) This study uses the single last forecast before each earnings announcement. This results in using only one forecast per firm for this paper. This does not enable comparisons among forecasts of affiliated and unaffiliated analysts of the same company. In addition, the last forecast may not necessarily follow the general trend of forecasts being guided downward throughout the year. Furthermore, the use of the final forecast per earnings announcement may have caused this study's non-clear finding of conflict of interest issues. Future study may be done by using the last forecast for each covering analyst made within 30 days before each earnings announcement. My examination of the single last forecast found no systematic differences between the forecast error and bias of affiliated and unaffiliated analysts for non-restatement firms.

3) The street earnings used in this study is IBES actuals, which is the basis on which the majority of analysts provide their forecasts. However, this may not be the basis on which analysts, who issue the last forecasts, provide their forecasts.

The investigation provides reconciliation of the contradictory findings in the literature on firms' missing or beating of forecasts, and the forecast bias of affiliated vs. unaffiliated analysts. Although helping covered firms beat forecasts does create positive abnormal returns (Kasznik and McNichols, 2002; Chan et al., 2003; Dopuch et al., 2003), promote underwriting performance (Zhang, 2004), and hence increase analysts'

compensation (Hong and Kubik, 2003), affiliated analysts of restatement firms are certainly not doing so.

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**Table 1. Hypotheses E2 and E3**

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HE2a** | $ERROR_{AR}<ERROR_{UR}$ | **HE3a** | $ERROR_{AR}>ERROR_{UR}$ |
| **HE2b** | $ERROR_{AN}<ERROR_{UN}$ | **HE3b** | $ERROR_{AN}>ERROR_{UN}$ |
| **HE2c** | $ERROR_{AR}>ERROR_{AN}$ | **HE3c** | $ERROR_{AR}>ERROR_{AN}$ |
| **HE2d** | $ERROR_{UR}>ERROR_{UN}$ | **HE3d** | $ERROR_{UR}>ERROR_{UN}$ |

**Table 2. Summary of Coefficients for Comparisons**

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_0+b_1+b_2+b_3$ | $b_0+b_1$ |
| **Unaffiliated** | $b_0+ b_3$ | $b_0$ |

**Table 3. Hypotheses E2 and E3 and Their Coefficients**

**HE2: Forecast Error based on Street Earnings**

| | **Panel A** | **Panel B** | **Panel C** |
|---|---|---|---|
| **HE2a** | $ERROR_{AR}<ERROR_{UR}$ | $b_0+b_1+b_2+b_3< b_0+ b_3$ | $=> b_1+b_2<0$ |
| **HE2b** | $ERROR_{AN}<ERROR_{UN}$ | $b_0+b_1< b_0$ | $=> b_1<0$ |
| **HE2c** | $ERROR_{AN}<ERROR_{AR}$ | $b_0+b_1< b_0+b_1+b_2+b_3$ | $=> b_2+b_3>0$ |
| **HE2d** | $ERROR_{UN}<ERROR_{UR}$ | $b_0< b_0+ b_3$ | $=> b_3>0$ |

$b_1+b_2<0, b_2+b_3>0$ $\quad => -b_3<b_2<-b_1$

**HE3: Forecast Error based on Final Earnings**

| | **Panel A** | **Panel B** | **Panel C** |
|---|---|---|---|
| **HE3a** | $ERROR_{UR}<ERROR_{AR}$ | $b_0+ b_3< b_0+b_1+b_2+b_3$ | $=> b_1+b_2>0$ |
| **HE3b** | $ERROR_{UN}<ERROR_{AN}$ | $b_0< b_0+b_1$ | $=> b_1>0$ |
| **HE3c** | $ERROR_{AN}<ERROR_{AR}$ | $b_0+b_1< b_0+b_1+b_2+b_3$ | $=> b_2+b_3>0$ |
| **HE3d** | $ERROR_{UN}<ERROR_{UR}$ | $b_0< b_0+ b_3$ | $=> b_3>0$ |

$b_1+b_2>0, b_2+b_3>0$ $\quad => b_2>\max(-b_1,-b_3)$

**Table 4. Hypotheses B2 and B3**

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HB2a** | $BIAS_{AR}>BIAS_{UR}$ | **HB3a** | $BIAS_{AR}>BIAS_{UR}$ |
| **HB2b** | $BIAS_{AN}>BIAS_{UN}$ | **HB3b** | $BIAS_{AN}>BIAS_{UN}$ |
| **HB2c** | $BIAS_{AR}<BIAS_{AN}$ | **HB3c** | $BIAS_{AR}>BIAS_{AN}$ |
| **HB2d** | $BIAS_{UR}<BIAS_{UN}$ | **HB3d** | $BIAS_{UR}>BIAS_{UN}$ |

**Table 5. Hypotheses B2 and B3 and Their Coefficients**

**HB2: Forecast Error based on Street Earnings**

| | **Panel A** | **Panel B** | **Panel C** |
|---|---|---|---|
| **HB2a** | $BIAS_{AR}>BIAS_{UR}$ | $b_0+b_1+b_2+b_3> b_0+ b_3$ | $=> b_1+b_2>0$ |
| **HB2b** | $BIAS_{AN}>BIAS_{UN}$ | $b_0+b_1> b_0$ | $=> b_1>0$ |
| **HB2c** | $BIAS_{AR}<BIAS_{AN}$ | $b_0+b_1< b_0+b_1+b_2+b_3$ | $=> b_2+b_3<0$ |
| **HB2d** | $BIAS_{UR}<BIAS_{UN}$ | $b_0>b_0+ b_3$ | $=> b_3<0$ |
| $b_1+b_2>0, b_2+b_3<0$ | | | $=> -b_3>b_2>-b_1$ |

**HB3: Forecast Error based on Final Earnings**

| | **Panel A** | **Panel B** | **Panel C** |
|---|---|---|---|
| **HB3a** | $BIAS_{AR}>BIAS_{UR}$ | $b_0+ b_3< b_0+b_1+b_2+b_3$ | $=> b_1+b_2>0$ |
| **HB3b** | $BIAS_{AN}>BIAS_{UN}$ | $b_0< b_0+b_1$ | $=> b_1>0$ |
| **HB3c** | $BIAS_{AR}>BIAS_{AN}$ | $b_0+b_1< b_0+b_1+b_2+b_3$ | $=> b_2+b_3>0$ |
| **HB3d** | $BIAS_{UR}>BIAS_{UN}$ | $b_0< b_0+ b_3$ | $=> b_3>0$ |
| $b_1+b_2>0, b_2+b_3>0$ | | | $=> b_2>\max(-b_1, -b_3)$ |

## Table 6. The Process of Obtaining the Restatement Sample from the GAO Database

| | | | |
|---|---|---|---|
| **Total number of firms in the GAO database** | | | **921** |
| Minus: | Correction of quarterly earnings/correction before 10-K | 344 | |
| | Foreign companies | 17 | |
| | Companies not in IBES | 71 | |
| | Companies not in Compustat | 6 | |
| | Companies not in EDGAR | 13 | |
| | Restate before filing 10-K | 50 | |
| | No results for restatements yet | 32 | |
| | No effect on EPS | 13 | |
| | No sign of restatement | 15 | |
| | M&A | 4 | |
| | Redundant observations | 15 | |
| | Further restatements afterwards | 3 | |
| | M&A between misstatement date an restatement date | 6 | |
| | Companies not in either IBES or Compustat or no data for earnings or forecasts | 121 | |
| | Others | 28 | |
| **Restatement firms** | | | **183** |

## Table 7. Comparison between Various Earnings Measures Provided by I/B/E/S and Companies Themselves

Example of JNI Corporation for the Fiscal Year Ending 2001

| | Q1 | Q2 | Q3 | Q4 | Annual |
|---|---|---|---|---|---|
| I/B/E/S Actual EPS | 0.05 | 0.03 | -0.01 | -0.08 | -0.01 |
| I/B/E/S Exclusions from Reported Earnings* | 0 | 0 | 0.07 | 0.06 | 0.13 |
| I/B/E/S Actual EPS before Exclusions | 0.05 | 0.03 | -0.08 | -0.14 | ***-0.14*** |
| EDGAR Net Income | 0.01 | -0.29 | -0.07 | -0.15 | ***-0.5*** |

*I/B/E/S Exclusions from Reported Earnings are based on footnotes in the First Call database. The items excluded from IBES actual earnings are amortization of intangible assets & stock-based Compensation. Exclusions of these items are not made in the first two quarters, but are made in the last quarters due to changes in accounting principles.

**Table 8. Observations Count**

Panel A. Observations Used in This Study

| | Cause of Eliminating Observations | Number |
|---|---|---|
| Total | | 634 |
| Basic Statistics | limiting forecast horizon | 591 |
| IBES Actuals Guidance Models | eliminating missing values and three outliers | 618 |
| Forecast Error/Bias Models | limiting forecast horizon & eliminating missing values and one outlier | 517 |

Panel B. Distribution of Analysts by Groups for the Basic Statistics Sample

| | | Count | |
|---|---|---|---|
| Non-Restatement Firm | Affiliated Analysts | 83 | |
| | Unaffiliated Analysts | 214 | 297 |
| Restatement Firm | Affiliated Analysts | 43 | |
| | Unaffiliated Analysts | 251 | 294 |
| | | | 591 |

**Table 9. Restatements by Year and Initiator**

Panel A.

| Year | COUNT | PERCENT |
|---|---|---|
| 1992 | 1 | 0.34 |
| 1993 | 2 | 0.68 |
| 1994 | 5 | 1.70 |
| 1995 | 6 | 2.04 |
| 1996 | 29 | 9.86 |
| 1997 | 51 | 17.35 |
| 1998 | 74 | 25.17 |
| 1999 | 53 | 18.03 |
| 2000 | 56 | 19.05 |
| 2001 | 17 | 5.78 |
| Total | 294 | 100.00 |

Panel B.

| Initiator | COUNT | PERCENT |
|---|---|---|
| Auditor | 22 | 7.48 |
| Company | 113 | 38.44 |
| Company/Auditor | 6 | 2.04 |
| Company/FASB | 3 | 1.02 |
| Company/SEC | 3 | 1.02 |
| External | 3 | 1.02 |
| NA | 80 | 27.21 |
| Nasdaq | 1 | 0.34 |
| OCC | 1 | 0.34 |
| SEC | 62 | 21.09 |
| Total | 294 | 100.00 |

# A. Basic Statistics

## Table 10. Earnings and Forecasts for All Firms*

### Panel A.

| | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Final Earnings | 0.3504 | 0.5200 | 2.2317 | -28.3000 | 7.7900 |
| Reported Earnings | 0.4150 | 0.6000 | 2.2020 | -27.6000 | 7.7900 |
| IBES Actuals | 0.7808 | 0.7182 | 1.5453 | -9.9400 | 16.4934 |
| Analyst Forecasts | 0.7885 | 0.7095 | 1.5305 | -10.0300 | 16.4934 |

### Panel B.

| | Affiliated | | | | |
|---|---|---|---|---|---|
| | Mean | Median | Standard Deviation | Minimum | Maximum |
| Final Earnings | -0.0376 | 0.2604 | 3.1162 | -28.3 | 4.8857 |
| Reported Earnings | -0.0062 | 0.3028 | 3.0793 | -27.6 | 4.8857 |
| IBES Actuals | 0.3847 | 0.5525 | 1.7535 | -9.94 | 4.7996 |
| Analyst Forecasts | 0.4449 | 0.5302 | 1.6973 | -10.03 | 5.0604 |

| | Unaffiliated | | | | |
|---|---|---|---|---|---|
| | Mean | Median | Standard Deviation | Minimum | Maximum |
| Final Earnings | 0.4555 | 0.585 | 1.9144 | -11.61 | 7.79 |
| Reported Earnings | 0.5291 | 0.6675 | 1.8841 | -11.61 | 7.79 |
| IBES Actuals | 0.8881 | 0.78 | 1.4676 | -6.5 | 16.4934 |
| Analyst Forecasts | 0.8816 | 0.77 | 1.4703 | -8.49 | 16.4934 |

## Table 11. Comparison of Earnings and Forecasts for Restatement Firms and Non-Restatement Firms

### Panel A.

| | Final Earnings | | Reported Earnings | |
|---|---|---|---|---|
| | Restatement | Non-Restatement | Restatement | Non-Restatement |
| Mean | 0.0532 | 0.6446 | 0.1831 | 0.6446 |
| Median | 0.3446 | 0.6800 | 0.4550 | 0.6800 |
| Standard Deviation | 2.4292 | 1.9777 | 2.3886 | 1.9777 |
| Minimum | -28.3000 | -11.6100 | -27.6000 | -11.6100 |
| Maximum | 4.7900 | 7.7900 | 4.3300 | 7.7900 |

| | IBES Actuals | | Analyst Forecasts | |
|---|---|---|---|---|
| | Restatement | Non-Restatement | Restatement | Non-Restatement |
| Mean | 0.8175 | 0.7445 | 0.8326 | 0.7448 |
| Median | 0.7167 | 0.7182 | 0.7117 | 0.7079 |
| Standard Deviation | 1.4693 | 1.6186 | 1.4031 | 1.6482 |
| Minimum | -6.1000 | -9.9400 | -4.2000 | -10.0300 |
| Maximum | 16.4934 | 5.7700 | 16.4934 | 5.5500 |

**Panel B.**

| | Final Earnings | | | | Reported Earnings | | | |
|---|---|---|---|---|---|---|---|---|
| | Restatement Firm | | Non-Restatement Firm | | Restatement Firm | | Non-Restatement Firm | |
| | Affiliated | Unaffiliated | Affiliated | Unaffiliated | Affiliated | Unaffiliated | Affiliated | Unaffiliated |
| Mean | -0.6583 | 0.1750 | 0.2839 | 0.7844 | -0.5663 | 0.3115 | 0.2839 | 0.7844 |
| Median | 0.0200 | 0.3900 | 0.5200 | 0.7800 | 0.2000 | 0.5500 | 0.5200 | 0.7800 |
| Minimum | -28.3000 | -9.1800 | -9.9500 | -11.6100 | -27.6000 | -9.1800 | -9.9500 | -11.6100 |
| Maximum | 2.3800 | 4.7900 | 4.8857 | 7.7900 | 2.7300 | 4.3300 | 4.8857 | 7.7900 |
| Standard Deviation | 4.4185 | 1.8800 | 2.1205 | 1.9063 | 4.3536 | 1.8410 | 2.1205 | 1.9063 |

| | IBES Actuals | | | | Analyst Forecasts | | | |
|---|---|---|---|---|---|---|---|---|
| | Restatement Firm | | Non-Restatement Firm | | Restatement Firm | | Non-Restatement Firm | |
| | Affiliated | Unaffiliated | Affiliated | Unaffiliated | Affiliated | Unaffiliated | Affiliated | Unaffiliated |
| Mean | 0.3237 | 0.9021 | 0.4163 | 0.8717 | 0.5157 | 0.8869 | 0.4083 | 0.8753 |
| Median | 0.3500 | 0.7772 | 0.5900 | 0.7800 | 0.4114 | 0.7700 | 0.5549 | 0.7656 |
| Minimum | -6.1000 | -3.9900 | -9.9400 | -6.5000 | -1.3600 | -4.2000 | -10.0300 | -8.4900 |
| Maximum | 2.5700 | 16.4934 | 4.7996 | 5.7700 | 2.5600 | 16.4934 | 5.0604 | 5.5500 |
| Standard Deviation | 1.2709 | 1.4865 | 1.9639 | 1.4484 | 0.7158 | 1.4835 | 2.0311 | 1.4580 |

*all numbers are on per share bases

**Table 12. Normality Tests for Earnings and Forecasts**

| Variable | Kolmogorov-Smirnov D Statistic |
|---|---|
| Final Earnings | 0.193003*** |
| Reported Earnings | 0.185435*** |
| IBES Actuals | 0.145707*** |
| Analyst Forecasts | 0.146964*** |

***:p-value significant at 1%

## Management's Guidance of IBES Actuals

### Table 13. Results for Testing Hypotheses H1a, H1b, H1d

| | Number of Observations | Total Number of Observations | Percentage of Total Number of Observations |
|---|---|---|---|
| H1a: IBES Actuals >Reported Earnings | 355 | 634 | 55.99 |
| H1b: Restatement firms: IBES Actuals >Reported Earnings | 200 | 314 | 63.69 |
| H1d: Restatement firms: \|IBES Actuals-Final Earnings\|>\|Reported Earnings-Final Earnings\| | 219 | 314 | 69.75 |

**Table 14. Normality Tests for IBES Actuals Guidance Models**

| Variable | Kolmogorov-Smirnov D statistic |
|---|---|
| Magnitude_IBES_Reported | 0.398907*** |
| Magnitude_IBES_Final | 0.384649*** |
| Direction_IBES_Reported | 0.342344*** |
| Direction_IBES_Final | 0.326073*** |
| Rsmt_Firm | 0.341984*** |
| Leverage | 0.130409*** |
| Book_to_Market | 0.134545*** |
| Consec_Postv_Earnings | 0.245985*** |
| Consec_Earngs_Suprises | 0.230532*** |
| Loss_Firm | 0.459766*** |

***:p-value significant at 1%

**Table 15. Basic Comparisons of IBES Actuals Guidance**

| | Magnitude_IBES_Reported | | | Magnitude_IBES_Final | | |
|---|---|---|---|---|---|---|
| | All Firms | Restatement Firm | Non-Restatement Firm | All Firms | Restatement Firm | Non-Restatement Firm |
| Mean | 1.3968 | 1.9711 | 0.835 | 1.7855 | 2.7573 | 0.835 |
| Median | 0.0893 | 0.1544 | 0.0615 | 0.2258 | 0.7064 | 0.0615 |
| Standard Deviation | 6.9078 | 8.7039 | 4.4499 | 8.6071 | 11.3112 | 4.4499 |
| Wilcoxon Statistic | | 109278.5 | | | 123208.5 | |
| 2 tail p-value | | 0.0000*** | | | 0.0000*** | |

| | Direction_IBES_Reported | | | Direction_IBES_Final | | |
|---|---|---|---|---|---|---|
| | All Firms | Restatement Firm | Non-Restatement Firm | All Firms | Restatement Firm | Non-Restatement Firm |
| Mean | 1.2355 | 1.8422 | 0.6421 | 1.583 | 2.545 | 0.6421 |
| Median | 0.0138 | 0.0553 | 0 | 0.0947 | 0.5131 | 0 |
| Standard Deviation | 6.9385 | 8.7322 | 4.4819 | 8.6467 | 11.361 | 4.4819 |
| Wilcoxon Statistic | | 110161 | | | 122206 | |
| 2 tail p-value | | 0.0000*** | | | 0.0000*** | |

**Table 16. Comparison of Control Variables for IBES Guidance Models**

| | Means | | | Medians | | | Wilcoxon Statistic |
|---|---|---|---|---|---|---|---|
| | Total | Restatement Firm | Non-Restatement Firm | Total | Restatement Firm | Non-Restatement Firm | |
| Leverage | 0.2264 | 0.231 | 0.222 | 0.1928 | 0.2077 | 0.1812 | 96753 |
| Book_to_Market | 0.5462 | 0.5605 | 0.5321 | 0.4493 | 0.4365 | 0.4773 | 93988 |
| Consec_Postv_Earnings | 7.3851 | 5.9968 | 8.7645 | 2 | 0 | 3 | 87539.5*** |
| Consec_Earngs_Suprises | 18.5356 | 18.4318 | 18.6387 | 8.5 | 7 | 9 | 93535.5 |
| Loss_Firm | 0.267 | 0.3149 | 0.2194 | 0 | 0 | 0 | 99889*** |

**Table 17. Correlations Among Independent Variables for IBES Guidance Models**

| | Leverage | Book to Market | Consec Postv Earnings | Consec Earngs Suprises | Loss Firm |
|---|---|---|---|---|---|
| Rsmt_Firm | 0.0259 | -0.0243 | -0.1483*** | -0.0327 | 0.1080*** |
| Leverage | 1 | 0.1356*** | -0.0684* | 0.0077 | 0.0004 |
| Book_to_Market | | 1 | -0.0001 | -0.0663* | -0.0417 |
| Consec_Postv_Earnings | | | 1 | 0.5026*** | -0.5578*** |
| Consec_Earngs_Suprises | | | | 1 | -0.4923*** |
| Loss_Firm | | | | | 1 |

*, **, ***:significant at 0.10, 0.05, 0.01

## Table 18. Regression Results for Magnitude of IBES Actuals Guidance

$$\text{Guidance Metric}_i = b_0 + b_1\text{Rsmt\_Firm}_i + b_2\,\text{Leverage}_i + b_3\text{Book\_to\_Market}_i + b_4\text{Consec\_Postv\_Earnings}_i + b_5\text{Consec\_Earngs\_Suprises}_i + b_6\text{Loss\_Firm}_i + e_i \quad (1)$$

| | Panel A. | | Panel B. | |
|---|---|---|---|---|
| | **IBES Gd Mag-Reported Earnings** | | **IBES Gd Mag-Final Earnings** | |
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept | | 0.7965 | | 1.1893 |
| | | (1.87)* | | (2.75)*** |
| Rsmt_Firm | + | 0.7649 | + | 1.1734 |
| | | (2.23)** | | (3.36)*** |
| Leverage | + | 0.1386 | + | -0.7029 |
| | | (0.16) | | (-0.82) |
| Book_to_Market | - | -0.2650 | - | -0.3292 |
| | | (-0.79) | | (-0.97) |
| Consec_Postv_Earnings | ? | -0.0489 | ? | -0.0652 |
| | | (-2.73)*** | | (-3.58)*** |
| Consec_Earngs_Suprises | ? | 0.0079 | ? | 0.0147 |
| | | (1.07) | | (1.96)** |
| Loss_Firm | + | 0.9322 | + | 0.2223 |
| | | (2.16)** | | (0.51) |
| Adjusted $R^2$ | | 0.0330 | | 0.0415 |
| Model F Value | | 4.51 | | 5.46 |
| Model p-value | | 0.0002 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Guidance Magnitude}_i \equiv \left| \frac{I_i - G_i}{G_i} \right| \quad (2)$$

where

$I_{it}$ = IBES actuals for firm i in year t,
$G_{it}$ = GAAP earnings for firm i in year t.

Rsmt_Firm= 1 for restatement firm, 0 for non-restatement firm. Leverage= short term debt plus long term debt divided by end of year assets. Book_to_Market= book value of equity divided by the market capitalization at the end of the fiscal year. Consec_Postv_Earnings= the number of consecutive positive quarterly earnings before extraordinary items. Consec_Earngs_Suprises= the number of consecutive positive quarterly earnings surprises. Loss_Firm= 1 for firm-year with negative earnings before extraordinary items, and 0 for positive earnings before extraordinary items.

## Table 19. Diagnostic Checks for Magnitude of IBES Actuals Guidance Regressions

Panel A. IBES Gd Mag-Reported Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Rsmt_Firm | 0.97615 | 1.02444 | |
| Leverage | 0.98893 | 1.01119 | |
| Earnings_Growth | 0.98910 | 1.01102 | |
| Consec_Postv_Earnings | 0.77784 | 1.28561 | |
| Consec_Earngs_Suprises | 0.83842 | 1.19272 | |
| Loss_Firm | 0.78925 | 1.26702 | |
| | | | 1.72667 |

Panel B. IBES Gd Mag-Final Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Rsmt_Firm | 0.97615 | 1.02444 | |
| Leverage | 0.98893 | 1.01119 | |
| Earnings_Growth | 0.98910 | 1.01102 | |
| Consec_Postv_Earnings | 0.77784 | 1.28561 | |
| Consec_Earngs_Suprises | 0.83842 | 1.19272 | |
| Loss_Firm | 0.78925 | 1.26702 | |
| | | | 1.72667 |

## Table 20. Robustness Tests using Trimming of Observations

Panel A. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **IBES Actuals Guidance Relative to** | | | |
| **Reported Earnings (Magnitude)** | | | |
| | >2.5 | >4/n | top 1% |
| Intercept | 0.4951*** | 0.6097*** | 0.6097*** |
| Rsmt_Firm | 0.3088** | 0.2748** | 0.2748** |
| Leverage | | | |
| Book_to_Market | | | |
| Consec_Postv_Earnings | -0.0333*** | -0.0319*** | -0.0319*** |
| Consec_Earngs_Suprises | 0.0075** | | |
| Loss_Firm | 0.6300*** | 0.4930*** | 0.4930*** |
| | | | |
| Adjusted R2 | 0.0723 | 0.0635 | 0.0635 |
| | | | |
| p-value of Model F value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 613 | 612 | 612 |

Panel B. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **IBES Actuals Guidance Relative to** | | | |
| **Final Earnings (Magnitude)** | | | |
| | >2.5 | >4/n | top 1% |
| Intercept | 0.5103** | 0.5103** | 0.4643*** |
| Rsmt_Firm | 0.7291*** | 0.7291*** | 0.6277*** |
| Leverage | | | |
| Book_to_Market | | | |
| Consec_Postv_Earnings | -0.0443*** | -0.0443*** | -0.0401*** |
| Consec_Earngs_Suprises | 0.0170*** | 0.0170*** | 0.0147*** |
| Loss_Firm | 0.4332** | 0.4332** | 0.3785** |
| | | | |
| Adjusted R2 | 0.1037 | 0.1037 | 0.1068 |
| | | | |
| p-value of Model F value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 613 | 613 | 611 |

## Table 21. Regression Results for Direction of IBES Actuals Guidance

Guidance Metric$_i$= $b_0$ + $b_1$Rsmt_Firm$_i$+ $b_2$ Leverage$_i$ + $b_3$Book_to_Market$_i$ + $b_4$Consec_Postv_Earnings$_i$ + $b_5$Consec_Earngs_Suprises$_i$ + $b_6$Loss_Firm$_i$ + $e_i$ (1)

| | Panel A. **IBES Gd Dir-Reported Earnings** | | Panel B. **IBES Gd Dir-Final Earnings** | |
|---|---|---|---|---|
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept | | 0.3913 | | 0.8550 |
| | | (0.91) | | (1.95)** |
| Rsmt_Firm | + | 0.8307 | + | 1.1719 |
| | | (2.40)** | | (3.31)*** |
| Leverage | + | 0.2380 | + | -0.6312 |
| | | (0.28) | | (-0.72) |
| Book_to_Market | - | -0.2585 | - | -0.3644 |
| | | (-0.77) | | (-1.06) |
| Consec_Postv_Earnings | ? | -0.0411 | ? | -0.0581 |
| | | (-2.28)** | | (-3.14)*** |
| Consec_Earngs_Suprises | ? | 0.0110 | ? | 0.0181 |
| | | (1.48) | | (2.38)** |
| Loss_Firm | + | 1.1835 | + | 0.2784 |
| | | (2.72)*** | | (0.62) |
| Adjusted $R^2$ | | 0.0354 | | 0.0377 |
| Model F Value | | 4.77 | | 5.02 |
| Model p-value | | <0.0001 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Guidance Direction}_i \equiv \frac{I_i - G_i}{|G_i|} \quad (3)$$

where

$I_{it}$ = IBES actuals for firm i in year t,
$G_{it}$ = GAAP earnings for firm i in year t.

Rsmt_Firm= 1 for restatement firm, 0 for non-restatement firm. Leverage= short term debt plus long term debt divided by end of year assets. Book_to_Market= book value of equity divided by the market capitalization at the end of the fiscal year. Consec_Postv_Earnings= the number of consecutive positive quarterly earnings before extraordinary items. Consec_Earngs_Suprises= the number of consecutive positive quarterly earnings surprises. Loss_Firm= 1 for firm-year with negative earnings before extraordinary items, and 0 for positive earnings before extraordinary items.

## Table 22. Diagnostic Checks for Direction of IBES Actuals Guidance Regressions

Panel A. IBES Gd Dir-Reported Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Rsmt_Firm | 0.97615 | 1.02444 | |
| Leverage | 0.98893 | 1.01119 | |
| Earnings_Growth | 0.98910 | 1.01102 | |
| Consec_Postv_Earnings | 0.77784 | 1.28561 | |
| Consec_Earngs_Suprises | 0.83842 | 1.19272 | |
| Loss_Firm | 0.78925 | 1.26702 | |
| | | | 1.72667 |

Panel B. IBES Gd Dir-Final Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Rsmt_Firm | 0.97615 | 1.02444 | |
| Leverage | 0.98893 | 1.01119 | |
| Earnings_Growth | 0.98910 | 1.01102 | |
| Consec_Postv_Earnings | 0.77784 | 1.28561 | |
| Consec_Earngs_Suprises | 0.83842 | 1.19272 | |
| Loss_Firm | 0.78925 | 1.26702 | |
| | | | 1.72667 |

## Table 23. Robustness Tests using Trimming of Observations

Panel A. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **IBES Actuals Guidance Relative to** | | | |
| **Reported Earnings (Directional)** | | | |
| | >2.5 | >4/n | top/bottom 1% |
| Intercept | | | 0.3189* |
| Rsmt_Firm | 0.3724** | 0.3388** | 0.3327** |
| Leverage | | | |
| Book_to_Market | | | |
| Consec_Postv_Earnings | -0.0254*** | -0.0240*** | -0.0270*** |
| Consec_Earngs_Suprises | 0.0106*** | 0.0074** | 0.0067** |
| Loss_Firm | 0.8833*** | 0.7482*** | 0.6847*** |
| | | | |
| Adjusted R2 | 0.0799 | 0.0671 | 0.0707 |
| | | | |
| Model p-value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 613 | 612 | 606 |

Panel B. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **IBES Actuals Guidance Relative to** | | | |
| **Final Earnings (Directional)** | | | |
| | >2.5 | >4/n | top/bottom 1% |
| Intercept | | | |
| Rsmt_Firm | 0.7244*** | 0.7244*** | 0.6454*** |
| Leverage | | | |
| Book_to_Market | | | |
| Consec_Postv_Earnings | -0.0371*** | -0.0371*** | -0.0356*** |
| Consec_Earngs_Suprises | 0.0204*** | 0.0204*** | 0.0171*** |
| Loss_Firm | 0.4906** | 0.4906** | 0.4208** |
| | | | |
| Adjusted R2 | 0.0959 | 0.0959 | 0.1067 |
| | | | |
| Model p-value | 0.0001 | 0.0001 | 0.0001 |
| Resulting n | 613 | 613 | 603 |

## Table 24. Guidance of I/B/E/S Actuals Relative to GAAP Earnings

Panel A. Expectations

| | *I/B/E/S Actuals-Reported Earnings* | *I/B/E/S Actuals-Final Earnings* |
|---|---|---|
| **Magnitude** | Restatement Firms>Non-restatement Firms (H1c) | Restatement Firms> Non-restatement Firms |
| **Upward Bias** | Restatement Firms> Non-restatement Firms | Restatement Firms> Non-restatement Firms |

Panel B. Results

| | *I/B/E/S Actuals-Reported Earnings* | *I/B/E/S Actuals-Final Earnings* |
|---|---|---|
| **Magnitude** | Consistent | Consistent |
| **Upward Bias** | Consistent | Consistent |

Panel C. Conclusions

| | *I/B/E/S Actuals-Reported Earnings* | *I/B/E/S Actuals-Final Earnings* |
|---|---|---|
| **Magnitude** | Restatement Firms> Non-restatement Firms | Restatement Firms> Non-restatement Firms |
| **Upward Bias** | Restatement Firms> Non-restatement Firms | Restatement Firms> Non-restatement Firms |

## Forecast Error and Bias*

### Table 25. Descriptive Statistics of Forecast Error

Panel A.

| | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Forecast Error-IBES Actuals | 0.5271 | 0.0407 | 4.2741 | 0 | 87 |
| Forecast Error-Final Earnings | 2.3253 | 0.2647 | 11.0843 | 0 | 208 |

Panel B.

| | Restatement Firm | | Non-Restatement Firm | |
|---|---|---|---|---|
| | Affiliated | Unaffiliated | Affiliated | Unaffiliated |
| **Forecast Error-IBES Actuals** | | | | |
| Mean | 0.8631 | 0.6169 | 0.1481 | 0.5007 |
| Median | 0.1034 | 0.0417 | 0.0341 | 0.0389 |
| Standard Deviation | 2.0870 | 5.5734 | 0.3170 | 3.6402 |
| Minimum | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 11.1667 | 87.0000 | 2.2857 | 52.3043 |
| **Forecast Error-Final Earnings** | | | | |
| Mean | 4.8365 | 2.9352 | 0.5870 | 1.7800 |
| Median | 0.6488 | 0.4853 | 0.0890 | 0.0977 |
| Standard Deviation | 12.0785 | 14.9119 | 1.8376 | 6.8511 |
| Minimum | 0.0184 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 50.0000 | 208.0000 | 15.8210 | 58.8261 |

*: all forecast error and bias measures are expressed as a fraction of forecasts.

**Table 26. Descriptive Statistics of Independent Variables**

| | Mean | Median | Standard Deviation |
|---|---|---|---|
| Affiliated | 0.2136 | 0.0000 | 0.4102 |
| Affiliated*Rsmt_Firm | 0.0729 | 0.0000 | 0.2602 |
| Rsmt_Firm | 0.4966 | 0.0000 | 0.5004 |
| Analysts_Following | 10.7823 | 8.0000 | 9.3099 |
| Forecast_Dispersion | 0.0796 | 0.0318 | 0.2712 |
| Firm_Size (log) | 6.4477 | 6.2907 | 1.8901 |
| Firm_Size* | 5243.065 | 539.556 | 23150 |
| Loss_Firm | 0.2627 | 0.0000 | 0.4405 |
| Earnings_Variability | 2.2634 | 0.6121 | 29.3857 |
| Prior_Misstate | 0.1288 | 0.0000 | 0.3353 |

*: Descriptive statistics for the variable Firm_Size before taking the natural log for use in tests for this study.

**Table 27. Normality Tests for Forecast Error/Bias Models**

| Variable | Kolmogorov-Smirnov D Statistic |
|---|---|
| Affiliated | 0.481908*** |
| Rsmt_Firm | 0.346601*** |
| Analysts_Following | 0.065375*** |
| Forecast_Dispersion | 0.386132*** |
| Firm_Size | 0.058912*** |
| Loss_Firm | 0.468192*** |
| Earnings_Variability | 0.312253*** |
| Prior_Misstate | 0.519035*** |
| | |
| ***:p-value significant at 1% | |

**Table 28. Comparisons of Control Variables Across Groups**

| | Analysts_Following | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 9.1905 | 7.0465 | 9.5578 | 12.3492 | 11.4699 | 12.6934 |
| Median | 7.0000 | 5.0000 | 8.0000 | 10.0000 | 9.0000 | 10.0000 |
| Standard Deviation | 7.5458 | 5.9360 | 7.7387 | 10.5558 | 9.4770 | 10.9512 |
| Minimum | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Maximum | 52.0000 | 25.0000 | 52.0000 | 49.0000 | 44.0000 | 49.0000 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 80269 | 35402 |
| 2 tail p-value | 0.0017 | 0.2958 |
| 2 tail t-value | 0.0018 | 0.2962 |

| | Forecast_Dispersion | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 0.0933 | 0.2084 | 0.0736 | 0.0663 | 0.0648 | 0.0669 |
| Median | 0.0279 | 0.0267 | 0.0285 | 0.0368 | 0.0381 | 0.0361 |
| Standard Deviation | 0.3747 | 0.8727 | 0.1853 | 0.0964 | 0.0757 | 0.1036 |
| Minimum | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 5.4196 | 5.4196 | 2.2555 | 1.0253 | 0.3578 | 1.0253 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 67478 | 31345 |
| 2 tail p-value | 0.3067 | 0.6329 |
| 2 tail t-value | 0.3072 | 0.6331 |

**Table 28**-Continued

| | Firm_Size (log) | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 6.1198 | 5.4938 | 6.2274 | 6.7652 | 6.4024 | 6.9086 |
| Median | 6.0344 | 5.4464 | 6.2109 | 6.5016 | 6.2816 | 6.568 |
| Standard Deviation | 1.6637 | 1.4583 | 1.6756 | 2.0494 | 1.6325 | 2.1794 |
| Minimum | 2.3642 | 2.5673 | 2.3642 | 1.1697 | 1.9685 | 1.1697 |
| Maximum | 10.5649 | 8.6596 | 10.5649 | 12.6157 | 10.3645 | 12.6157 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 78446 | 33696 |
| 2 tail p-value | 0.0002 | 0.0511 |
| 2 tail t-value | 0.0003 | 0.0516 |

| | Firm_Size | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 1841.332 | 658.4962 | 2044.78 | 8627.003 | 1981.389 | 11253.6 |
| Median | 417.544 | 231.922 | 498.3049 | 666.1875 | 534.625 | 711.9698 |
| Standard Deviation | 4422.759 | 1104.598 | 4738.121 | 32081.79 | 4114.931 | 37508.25 |
| Minimum | 10.6358 | 13.0301 | 10.6358 | 3.2212 | 7.1601 | 3.2212 |
| Maximum | 38750.49 | 5765.138 | 38750.49 | 301238.4 | 31713.5 | 301238.4 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 78446 | 33696 |
| 2 tail p-value | 0.0002 | 0.0511 |
| 2 tail t-value | 0.0003 | 0.0516 |

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**Table 28**-Continued

| | Loss_Firm | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 0.3129 | 0.4651 | 0.2869 | 0.2155 | 0.3253 | 0.1729 |
| Median | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Standard Deviation | 0.4645 | 0.5047 | 0.4532 | 0.4119 | 0.4713 | 0.3790 |
| Minimum | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 91278 | 41357 |
| 2 tail p-value | 0.0073 | 0.0018 |
| 2 tail t-value | 0.0075 | 0.0018 |

| | Earnings_Variability | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 3.4233 | 0.9790 | 3.8389 | 1.1129 | 0.9780 | 1.1662 |
| Median | 0.6153 | 0.5105 | 0.6331 | 0.5930 | 0.6743 | 0.5856 |
| Standard Deviation | 41.5864 | 2.2275 | 44.9742 | 2.6133 | 1.0471 | 3.0168 |
| Minimum | 0.0587 | 0.0587 | 0.0594 | 0.0071 | 0.0141 | 0.0071 |
| Maximum | 707.5876 | 14.5672 | 707.5876 | 41.4850 | 5.4045 | 41.4850 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 84319 | 35334 |
| 2 tail p-value | 0.9705 | 0.5079 |
| 2 tail t-value | 0.9705 | 0.5082 |

**Table 28**-Continued

| | Prior_Misstate | | | | | |
|---|---|---|---|---|---|---|
| | Restatement Firm | | | Non-Restatement Firm | | |
| | Total | Affiliated | Unaffiliated | Total | Affiliated | Unaffiliated |
| Mean | 0.2585 | 0.0233 | 0.2988 | 0.0000 | 0.0000 | 0.0000 |
| Median | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Standard Deviation | 0.4386 | 0.1525 | 0.4586 | 0.0000 | 0.0000 | 0.0000 |
| Minimum | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Maximum | 1.0000 | 1.0000 | 1.0000 | 0.0000 | 0.0000 | 0.0000 |

| | By Firm Type | By Affiliation |
|---|---|---|
| Wilcoxon Statistic | 98310 | 32804 |
| 2 tail p-value | 0.0000 | 0.0000 |
| 2 tail t-value | 0.0000 | 0.0000 |

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**Table 29. Correlations Among Independent Variables for Forecast Error/Bias Models**

| Variable | Analysts_Following | Forecast_Dispersion | Firm_Size | Loss_Firm | Earnings_Variability | Prior_Misstate |
|---|---|---|---|---|---|---|
| Affiliated | -0.0511 | 0.0226 | -0.0679 | 0.1138*** | -0.0369 | -0.1950*** |
| Affiliated*Rsmt_Firm | -0.1237*** | 0.0201 | -0.1419*** | 0.1459*** | -0.0595 | -0.0887** |
| Rsmt_Firm | -0.1416*** | -0.0442 | -0.1474*** | 0.1240*** | 0.0235 | 0.4009*** |
| Analysts_Following | 1.0000 | -0.1614*** | 0.7461*** | -0.1228*** | 0.3155*** | 0.0310 |
| Forecast_Dispersion | | 1.0000 | -0.1926*** | 0.2618*** | 0.1605*** | -0.0110 |
| Firm_Size | | | 1.0000 | -0.2151*** | 0.3205*** | 0.0254 |
| Loss_Firm | | | | 1.0000 | 0.2026*** | 0.0234 |
| Earnings_Variability | | | | | 1.0000 | 0.0629 |
| Prior_Misstate | | | | | | 1.0000 |

*, **, ***:significant at 0.10, 0.05, 0.01

## Table 30. Regression Results for Comparison of Forecast Error Across Groups

$$\text{Forecast Error}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Affiliated*Rsmt\_Firm}_i + b_3\text{Rsmt\_Firm}_i + b_4\text{Analysts\_Following}_i + b_5\text{Forecast\_Dispersion}_i + b_6\text{Firm\_Size}_i + b_7\text{Loss\_Firm}_i + b_8\text{Earnings\_Variability}_i + b_9\text{Prior\_Misstate}_i + e_i \quad (4)$$

| | Panel A. Forecast Error based on IBES Actuals | | Panel B. Forecast Error based on Final Earnings | |
|---|---|---|---|---|
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept ($b_0$) | | 0.3680 | | -0.6956 |
| | | (2.07)** | | (-0.32) |
| Affiliated ($b_1$) | - | -0.1724 | + | -1.100 |
| | | (-1.52) | | (-0.78) |
| Affiliated*Rsmt_Firm | ? | 0.4342 | ? | 1.3397 |
| ($b_2$) | | (2.31)** | | (0.57) |
| Rsmt_Firm ($b_3$) | + | -0.0591 | + | 1.7532 |
| | | (-0.64) | | (1.53) |
| Analysts_Following | - | 0.0037 | - | 0.0808 |
| | | (0.64) | | (1.13) |
| Forecast_Dispersion | + | 1.5988 | + | 5.0497 |
| | | (11.74)*** | | (2.99)*** |
| Firm_Size | - | -0.0450 | - | -0.1127 |
| | | (-1.48) | | (-0.30) |
| Loss_Firm | + | 0.3676 | + | 5.0751 |
| | | (4.08)*** | | (4.55)*** |
| Earnings_Variability | + | -0.0054 | + | 0.4188 |
| | | (-0.31) | | (1.97)** |
| Prior_Misstate | + | 0.0034 | + | -2.0593 |
| | | (0.03) | | (-1.38) |
| Adjusted $R^2$ | | 0.2766 | | 0.0821 |
| Model F Value | | 22.92 | | 6.12 |
| Model p-value | | <0.0001 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Forecast Error}_i \equiv \left| \frac{F_i - A_i}{F_i} \right| \quad (5)$$

where $F_{it}$ = earnings forecast for firm i in year t. $A_{it}$ = actual earnings for firm i in year t.
Affiliated= 1 for forecast made by an affiliated analyst, 0 for forecast made by an unaffiliated analyst. Rsmt_Firm= 1 for restatement firm, 0 for non-restatement firm. Affiliated* Rsmt_Firm= the interaction variable by multiplying Affiliated by Rsmt_Firm. Analysts_Following= the number of analysts providing forecasts for the annual earnings. Forecast_Dispersion= the standard deviation of the last 5 forecasts, excluding the last forecast, made since the beginning of the fiscal year for each annual earnings announcement.[42] Firm_Size= The log of market value of common equity. Loss_Firm= 1 for firm-year with loss in earnings before extraordinary items, 0 otherwise. Earnings_Variability= the standard deviation of earnings before extraordinary items for the previous five years. Prior_Misstate= 1 for earnings misstatement in the prior year.

[42] This study does not use a deflator for forecast dispersion for the following reasons. The purpose of using a deflator for forecast dispersion is to control for differences in forecasts across firms. Since the standard deviation of forecasts already controls for the mean of forecasts, therefore, a deflator is not needed. In addition, since this study only uses 5 forecasts to calculate forecast dispersion, the mean and median for 5 observations should not be significantly different. Hence, using the median forecast as the deflator is not necessary.

## Table 31. Coefficients of Hypothesized Variables for Forecast Error Regressions

Panel A. Forecast Error based on Street Earnings

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_0+b_2$ | $b_0$ |
| **Unaffiliated** | $b_0$ | $b_0$ |

Panel B. Forecast Error based on Final Earnings

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | 0 | 0 |
| **Unaffiliated** | 0 | 0 |

## Table 32. Diagnostic Checks for Forecast Error Regressions

Panel A. Forecast Error based on IBES Actuals

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Affiliated | 0.60129 | 1.66310 | |
| Affiliated*Rsmt_Firm | 0.54926 | 1.82064 | |
| Rsmt_Firm | 0.62013 | 1.61258 | |
| Analysts_Following | 0.46500 | 2.15056 | |
| Forecast_Dispersion | 0.94987 | 1.05278 | |
| Firm_Size | 0.44214 | 2.26172 | |
| Loss_Firm | 0.87959 | 1.13689 | |
| Earnings_Variability | 0.95815 | 1.04367 | |
| Prior_Misstate | 0.78885 | 1.26767 | |
| | | | 2.82760 |

Panel B. Forecast Error based on Final Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Affiliated | 0.60129 | 1.66310 | |
| Affiliated*Rsmt_Firm | 0.54926 | 1.82064 | |
| Rsmt_Firm | 0.62013 | 1.61258 | |
| Analysts_Following | 0.46500 | 2.15056 | |
| Forecast_Dispersion | 0.94987 | 1.05278 | |
| Firm_Size | 0.44214 | 2.26172 | |
| Loss_Firm | 0.87959 | 1.13689 | |
| Earnings_Variability | 0.95815 | 1.04367 | |
| Prior_Misstate | 0.78885 | 1.26767 | |
| | | | 2.82760 |

## Table 33. Robustness Tests using Trimming of Observations

Panel A-1. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **Forecast Error based on IBES Actuals** | >2.5 | >4/n | top 2% |
| | | | |
| Intercept ($b_0$) | 0.1117* | | |
| Affiliated ($b_1$) | | | |
| Affiliated*Rsmt_Firm ($b_2$) | 0.1390** | 0.1843*** | 0.2672*** |
| Rsmt_Firm ($b_3$) | | | |
| Analysts_Following | | | |
| Forecast_Dispersion | 0.4137*** | 1.3028*** | 0.4536*** |
| Firm_Size | | | |
| Loss_Firm | 0.1839*** | 0.1111*** | 0.1894*** |
| Earnings_Variability | | | |
| Prior_Misstate | 0.1226*** | | 0.1205** |
| | | | |
| Adjusted R2 | 0.1244 | 0.1784 | 0.0975 |
| | | | |
| Model p-value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 504 | 498 | 507 |

Panel A-2. Significant Coefficients for Trimming based on Cook's d and Top 2% of the Dependent Variable

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_2$ | 0 |
| **Unaffiliated** | 0 | 0 |

Panel B-1. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **Forecast Error based on Final Earnings** | | | |
| | >2.5 | >4/n | top 2% |
| Intercept ($b_0$) | | | |
| Affiliated ($b_1$) | | | |
| Affiliated*Rsmt_Firm ($b_2$) | | | |
| Rsmt_Firm ($b_3$) | 0.5496** | 0.6012** | |
| Analysts_Following | | | |
| Forecast_Dispersion | | | |
| Firm_Size | | | |
| Loss_Firm | 2.4902*** | 2.4739*** | 2.2350*** |
| Earnings_Variability | 0.4381*** | 0.4298*** | 0.1786** |
| Prior_Misstate | | | |
| | | | |
| Adjusted R2 | 0.2758 | 0.2100 | 0.1894 |
| | | | |
| Model p-value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 510 | 507 | 507 |

Panel B-2. Significant Coefficients for Trimming based on Rstudent and Cook's d

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_3$ | 0 |
| **Unaffiliated** | $b_3$ | 0 |

**Table 34. Summary for Tests of Hypotheses E2 and E3**

Panel A. Hypotheses

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HE2a** | $ERROR_{AR}<ERROR_{UR}$ | **HE3a** | $ERROR_{AR}>ERROR_{UR}$ |
| **HE2b** | $ERROR_{AN}<ERROR_{UN}$ | **HE3b** | $ERROR_{AN}>ERROR_{UN}$ |
| **HE2c** | $ERROR_{AR}>ERROR_{AN}$ | **HE3c** | $ERROR_{AR}>ERROR_{AN}$ |
| **HE2d** | $ERROR_{UR}>ERROR_{UN}$ | **HE3d** | $ERROR_{UR}>ERROR_{UN}$ |

Panel B. Results

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HE2a** | Contrary | **HE3a** | Insignificant |
| **HE2b** | Insignficant | **HE3b** | Insignificant |
| **HE2c** | Consistent | **HE3c** | Ambiguous (Insignificant*/Consistent**) |
| **HE2d** | Insignficant | **HE3d** | Ambiguous (Insignificant*/Consistent**) |

*: result of the main regression
**: results of some of the robustness regressions

Panel C. Conclusions

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HE2a** | $ERROR_{AR}>ERROR_{UR}$ | **HE3a** | $ERROR_{UR}=ERROR_{AR}$ |
| **HE2b** | $ERROR_{AN}=ERROR_{UN}$ | **HE3b** | $ERROR_{UN}=ERROR_{AN}$ |
| **HE2c** | $ERROR_{AR}>ERROR_{AN}$ | **HE3c** | $ERROR_{AR}$ ? $ERROR_{AN}$ |
| **HE2d** | $ERROR_{UR}=ERROR_{UN}$ | **HE3d** | $ERROR_{UR}$ ? $ERROR_{UN}$ |

**Table 35. Descriptive Statistics of Forecast Bias***

Panel A.

| | Mean | Median | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Forecast Bias-IBES Actuals | 0.2562 | -0.006 | 4.2989 | -9 | 87 |
| Forecast Bias-Final Earnings | 1.5883 | 0.1039 | 11.2139 | -37 | 208 |

Panel B.

| | Restatement Firm | | Non-Restatement Firm | |
|---|---|---|---|---|
| | Affiliated | Unaffiliated | Affiliated | Unaffiliated |
| **Forecast Bias-IBES Actuals** | | | | |
| Mean | 0.7140 | 0.2873 | -0.0484 | 0.2448 |
| Median | 0.0000 | -0.0080 | 0.0000 | -0.0068 |
| Standard Deviation | 2.1439 | 5.6002 | 0.3469 | 3.6665 |
| Minimum | -0.7059 | -9.0000 | -2.2857 | -6.5000 |
| Maximum | 11.1667 | 87.0000 | 0.8108 | 52.3043 |
| **Forecast Bias-Final Earnings** | | | | |
| Mean | 4.5716 | 2.5510 | 0.3217 | 0.3585 |
| Median | 0.5500 | 0.3720 | 0.0000 | 0.0069 |
| Standard Deviation | 12.1836 | 14.9827 | 1.9028 | 7.0705 |
| Minimum | -3.6897 | -11.8710 | -3.5000 | -37.0000 |
| Maximum | 50.0000 | 208.0000 | 15.8210 | 58.8261 |

*: All numbers in this table are expressed as a fraction of forecasts.



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## Table 36. Regression Results for Comparison of Forecast Bias Across Groups

$$\text{Forecast Bias}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Affiliated}_i\text{*Rsmt\_Firm}_i + b_3\text{Rsmt\_Firm}_i + b_4\text{Analysts\_Following}_i + b_5\text{Forecast\_Dispersion}_i + b_6\text{Firm\_Size}_i + b_7\text{Loss\_Firm}_i + b_8\text{Earnings\_Variability}_i + b_9\text{Prior\_Misstate}_i + e_i \quad (7)$$

| | Panel A. Forecast Bias based on IBES Actuals | | Panel B. Forecast Bias based on Final Earnings | |
|---|---|---|---|---|
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept ($b_0$) | | -0.3391 | | -2.1543 |
| | | (-1.75)* | | (-0.96) |
| Affiliated ($b_1$) | + | -0.0291 | + | -0.4288 |
| | | (-0.24) | | (-0.30) |
| Affiliated*Rsmt_Firm | ? | 0.6858 | ? | 0.8762 |
| ($b_2$) | | (3.34)*** | | (0.37) |
| Rsmt_Firm ($b_3$) | - | -0.1187 | + | 2.2525 |
| | | (-1.18) | | (1.94)** |
| Analysts_Following | - | -0.0073 | - | 0.0552 |
| | | (-1.16) | | (0.77) |
| Forecast_Dispersion | + | 1.5749 | + | 4.6709 |
| | | (10.60)*** | | (2.73)*** |
| Firm_Size | - | 0.0504 | - | 0.0229 |
| | | (1.52) | | (0.06) |
| Loss_Firm | + | 0.0301 | + | 5.2680 |
| | | (0.31) | | (4.66)*** |
| Earnings_Variability | + | -0.0256 | + | 0.3224 |
| | | (-1.37) | | (1.50) |
| Prior_Misstate | + | 0.0413 | + | -2.0889 |
| | | (0.31) | | (-1.38) |
| Adjusted $R^2$ | | 0.2105 | | 0.0777 |
| Model F Value | | 16.29 | | 5.83 |
| Model p-value | | <0.0001 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Forecast Bias}_i \equiv \frac{F_i - A_i}{|F_i|} \quad (8)$$

Where: $F_{it}$ = earnings forecast for firm i in year t. $A_{it}$ = actual earnings for firm i in year t.

Affiliated= 1 for forecast made by an affiliated analyst, 0 for forecast made by an unaffiliated analyst. Rsmt_Firm= 1 for restatement firm, 0 for non-restatement firm. Affiliated* Rsmt_Firm= the interaction variable by multiplying Affiliated by Rsmt_Firm. Analysts_Following= the number of analysts providing forecasts for the annual earnings. Forecast_Dispersion= the standard deviation of the last 5 forecasts, excluding the last forecast, made since the beginning of the fiscal year for each annual earnings announcement.[43] Firm_Size= The log of market value of common equity. Loss_Firm= 1 for firm-year with loss in earnings before extraordinary items, 0 otherwise. Earnings_Variability= the standard deviation of earnings before extraordinary items for the previous five years. Prior_Misstate= 1 for earnings misstatement in the prior year.

[43] This study does not use a deflator for forecast dispersion for the following reasons. The purpose of using a deflator for forecast dispersion is to control for differences in forecasts across firms. Since the standard deviation of forecasts already controls for the mean of forecasts, therefore, a deflator is not needed. In addition, since this study only uses 5 forecasts to calculate forecast dispersion, the mean and median for 5 observations should not be significantly different. Hence, using the median forecast as the deflator is not necessary.

## Table 37. Coefficients of Hypothesized Variables for Forecast Bias Regressions

Panel A. Forecast Bias based on IBES actuals

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_0+b_2$ | $b_0$ |
| **Unaffiliated** | $b_0$ | $b_0$ |

Panel B. Forecast Bias based on Final Earnings

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_3$ | 0 |
| **Unaffiliated** | $b_3$ | 0 |

## Table 38. Diagnostic Checks for Forecast Bias Regressions

Panel A. Forecast Bias based on IBES Actuals

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Affiliated | 0.60129 | 1.66310 | |
| Affiliated*Rsmt_Firm | 0.54926 | 1.82064 | |
| Rsmt_Firm | 0.62013 | 1.61258 | |
| Analysts_Following | 0.46500 | 2.15056 | |
| Forecast_Dispersion | 0.94987 | 1.05278 | |
| Firm_Size | 0.44214 | 2.26172 | |
| Loss_Firm | 0.87959 | 1.13689 | |
| Earnings_Variability | 0.95815 | 1.04367 | |
| Prior_Misstate | 0.78885 | 1.26767 | |
| | | | 2.82760 |

Panel B. Forecast Bias based on Final Earnings

| **Multicollinearity** | Tolerance | Variance Inflation Factor | Condition Index (Intercept Adjusted) |
|---|---|---|---|
| Intercept | | 0 | |
| Affiliated | 0.60129 | 1.66310 | |
| Affiliated*Rsmt_Firm | 0.54926 | 1.82064 | |
| Rsmt_Firm | 0.62013 | 1.61258 | |
| Analysts_Following | 0.46500 | 2.15056 | |
| Forecast_Dispersion | 0.94987 | 1.05278 | |
| Firm_Size | 0.44214 | 2.26172 | |
| Loss_Firm | 0.87959 | 1.13689 | |
| Earnings_Variability | 0.95815 | 1.04367 | |
| Prior_Misstate | 0.78885 | 1.26767 | |
| | | | 2.82760 |

## Table 39. Robustness Tests via Trimming of Possible Outliers

Panel A-1. Results of Robustness Tests

| | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| **Forecast Bias based on IBES Actuals** | | | |
| | >2.5 | >4/n | top/bottom 1% |
| Intercept ($b_0$) | 0.3339** | -0.1408** | |
| Affiliated ($b_1$) | | | |
| Affiliated*Rsmt_Firm ($b_2$) | 0.2937* | 0.1897*** | 0.3357*** |
| Rsmt_Firm ($b_3$) | | | |
| Analysts_Following | -0.0083* | -0.0052* | |
| Forecast_Dispersion | | 0.3324* | |
| Firm_Size | 0.0567** | 0.0286** | |
| Loss_Firm | | 0.0815** | |
| Earnings_Variability | | -0.0228* | |
| Prior_Misstate | | | |
| | | | |
| Adjusted R2 | 0.0076 | 0.0423 | 0.0262 |
| | | | |
| Model p-value | 0.1698 | 0.0004 | 0.0081 |
| Resulting n | 510 | 495 | 507 |

Panel A-2. Significant Coefficients for Trimming based on Rstudent and Cook's d

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_0+b_2$ | $b_0$ |
| **Unaffiliated** | $b_0$ | $b_0$ |

Panel A-3. Significant Coefficients for Trimming based on top/bottom 1% of the dependent variable

| | **Restatement** | **Non-restatement** |
|---|---|---|
| **Affiliate** | $b_2$ | 0 |
| **Unaffiliated** | 0 | 0 |

Panel B-1. Results of Robustness Tests

| Forecast Bias based on Final Earnings | Rstudent | Cook's D | Dependent Variable |
|---|---|---|---|
| | >2.5 | >4/n | top/bottom 1% |
| | | | |
| Intercept ($b_0$) | | | |
| Affiliated ($b_1$) | | | |
| Affiliated*Rsmt_Firm ($b_2$) | | | |
| Rsmt_Firm ($b_3$) | 0.9000*** | 0.8219*** | 0.5756** |
| Analysts_Following | | | |
| Forecast_Dispersion | | | |
| Firm_Size | | | |
| Loss_Firm | 2.6440*** | 2.6725*** | 2.3461*** |
| Earnings_Variability | 0.3623*** | | |
| Prior_Misstate | | | |
| | | | |
| Adjusted R2 | 0.1705 | 0.1531 | 0.1459 |
| | | | |
| Model p-value | <0.0001 | <0.0001 | <0.0001 |
| Resulting n | 511 | 507 | 507 |

Panel B-2. Significant Coefficients for Robustness Tests

| | Restatement | Non-restatement |
|---|---|---|
| **Affiliate** | $b_3$ | 0 |
| **Unaffiliated** | $b_3$ | 0 |

**Table 40. Summary for Tests of Hypotheses B2 and B3**

Panel A. Hypotheses

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HB2a** | $BIAS_{AR}>BIAS_{UR}$ | **HB3a** | $BIAS_{AR}>BIAS_{UR}$ |
| **HB2b** | $BIAS_{AN}>BIAS_{UN}$ | **HB3b** | $BIAS_{AN}>BIAS_{UN}$ |
| **HB2c** | $BIAS_{AR}<BIAS_{AN}$ | **HB3c** | $BIAS_{AR}>BIAS_{AN}$ |
| **HB2d** | $BIAS_{UR}<BIAS_{UN}$ | **HB3d** | $BIAS_{UR}>BIAS_{UN}$ |

Panel B. Results

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HB2a** | Consistent | **HB3a** | Insignificant |
| **HB2b** | Insignificant | **HB3b** | Insignificant |
| **HB2c** | Contrary | **HB3c** | Consistent |
| **HB2d** | Insignificant | **HB3d** | Consistent |

Panel C. Conclusions

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **HB2a** | $BIAS_{AR}>BIAS_{UR}$ | **HB3a** | $BIAS_{AR}=BIAS_{UR}$ |
| **HB2b** | $BIAS_{AN}=BIAS_{UN}$ | **HB3b** | $BIAS_{AN}=BIAS_{UN}$ |
| **HB2c** | $BIAS_{AR}>BIAS_{AN}$ | **HB3c** | $BIAS_{AR} > BIAS_{AN}$ |
| **HB2d** | $BIAS_{UR}=BIAS_{UN}$ | **HB3d** | $BIAS_{UR} > BIAS_{UN}$ |

**Table 41. Hypotheses 4 and 5**

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **H4E** | $ERROR_A < ERROR_U$ | **H5E** | $ERROR_A > ERROR_U$ |
| **H4B** | $BIAS_A > BIAS_U$ | **H5B** | $BIAS_A > BIAS_U$ |

## Table 42. Regression Results for Comparisons of Forecast Error between Affiliated

Forecast Metric$_i$= $b_0$ + $b_1$Affiliated$_i$ + $b_2$Analysts_Following$_i$ + $b_3$Forecast_Dispersion$_i$ + $b_4$Firm_Size$_i$ + $b_5$Loss_Firm$_i$ + $b_6$Earnings_Variability$_i$ + $b_7$Prior_Misstate$_i$ + $e_i$ (9)

| | Panel A. Forecast Error based on IBES Actuals | | Panel B. Forecast Error based on Final Earnings | |
|---|---|---|---|---|
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept | | 0.3484 | | 0.4156 |
| | | (2.04)** | | (0.20) |
| Affiliated | - | -0.0234 | + | -0.9167 |
| | | (-0.26) | | (-0.82) |
| Analysts_Following | - | 0.0034 | - | 0.0671 |
| | | (0.60) | | (0.94) |
| Forecast_Dispersion | + | 1.6285 | + | 5.2663 |
| | | (11.97)*** | | (3.12)*** |
| Firm_Size | - | -0.0463 | - | -0.1487 |
| | | (-1.52) | | (-0.39) |
| Loss_Firm | + | 0.3765 | + | 5.3282 |
| | | (4.19)*** | | (4.79)*** |
| Earnings_Variability | + | -0.0052 | + | 0.4101 |
| | | (-0.30) | | (1.92)** |
| Prior_Misstate | + | -0.0249 | + | -1.0737 |
| | | (-0.23) | | (-0.79) |
| Adjusted $R^2$ | | 0.2715 | | 0.0777 |
| Model F Value | | 28.47 | | 7.21 |
| Model p-value | | <0.0001 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Forecast Error}_i \equiv \left| \frac{F_i - A_i}{F_i} \right| \quad (5)$$

where $F_{it}$ = earnings forecast for firm i in year t. $A_{it}$ = actual earnings for firm i in year t.
Affiliated= 1 for forecast made by an affiliated analyst, 0 for forecast made by an unaffiliated analyst. Analysts_Following= the number of analysts providing forecasts for the annual earnings. Forecast_Dispersion= the standard deviation of the last 5 forecasts, excluding the last forecast, made since the beginning of the fiscal year for each annual earnings announcement.[44] Firm_Size= The log of market value of common equity. Loss_Firm= 1 for firm-year with loss in earnings before extraordinary items, 0 otherwise. Earnings_Variability= the standard deviation of earnings before extraordinary items for the previous five years. Prior_Misstate= 1 for earnings misstatement in the prior year.

[44] This study does not use a deflator for forecast dispersion for the following reasons. The purpose of using a deflator for forecast dispersion is to control for differences in forecasts across firms. Since the standard deviation of forecasts already controls for the mean of forecasts, therefore, a deflator is not needed. In addition, since this study only uses 5 forecasts to calculate forecast dispersion, the mean and median for 5 observations should not be significantly different. Hence, using the median forecast as the deflator is not necessary.

## Table 43. Regression Results for Comparisons of Forecast Bias between Affiliated

$$\text{Forecast Metric}_i = b_0 + b_1\text{Affiliated}_i + b_2\text{Analysts\_Following}_i + b_3\text{Forecast\_Dispersion}_i + b_4\text{Firm\_Size}_i + b_5\text{Loss\_Firm}_i + b_6\text{Earnings\_Variability}_i + b_7\text{Prior\_Misstate}_i + e_i \quad (9)$$

| | Panel A. Model 11 Forecast Bias based on IBES Actuals | | Panel B. Model 12 Forecast Bias based on Final Earnings | |
|---|---|---|---|---|
| **Variable** | *Predicted Sign* | *Coefficients* | *Predicted Sign* | *Coefficients* |
| Intercept | | -0.3854 | | -0.7582 |
| | | (-2.06)** | | (-0.35) |
| Affiliated | + | 0.2098 | + | -0.4668 |
| | | (2.11)** | | (-0.41) |
| Analysts_Following | - | -0.0075 | - | 0.0389 |
| | | (-1.19) | | (0.54) |
| Forecast_Dispersion | + | 1.6201 | + | 4.8841 |
| | | (10.85)*** | | (2.86)*** |
| Firm_Size | - | 0.0488 | - | -0.0190 |
| | | (1.46) | | (-0.05) |
| Loss_Firm | + | 0.0411 | + | 5.5625 |
| | | (0.42) | | (4.94)*** |
| Earnings_Variability | + | -0.0253 | + | 0.3114 |
| | | (-1.34) | | (1.44) |
| Prior_Misstate | + | -0.0176 | + | -0.8311 |
| | | (-0.15) | | (-0.60) |
| Adjusted $R^2$ | | 0.1960 | | 0.0708 |
| Model F Value | | 18.97 | | 6.62 |
| Model p-value | | <0.0001 | | <0.0001 |

*, **, ***: significant at 10, 5, 1%

$$\text{Forecast Bias}_i \equiv \frac{F_i - A_i}{|F_i|} \quad (8)$$

Where: $F_{it}$ = earnings forecast for firm i in year t. $A_{it}$ = actual earnings for firm i in year t.

Affiliated= 1 for forecast made by an affiliated analyst, 0 for forecast made by an unaffiliated analyst. Analysts_Following= the number of analysts providing forecasts for the annual earnings. Forecast_Dispersion= the standard deviation of the last 5 forecasts, excluding the last forecast, made since the beginning of the fiscal year for each annual earnings announcement.[45] Firm_Size= The log of market value of common equity. Loss_Firm= 1 for firm-year with loss in earnings before extraordinary items, 0 otherwise. Earnings_Variability= the standard deviation of earnings before extraordinary items for the previous five years. Prior_Misstate= 1 for earnings misstatement in the prior year.

[45] This study does not use a deflator for forecast dispersion for the following reasons. The purpose of using a deflator for forecast dispersion is to control for differences in forecasts across firms. Since the standard eviation of forecasts already controls for the mean of forecasts, therefore, a deflator is not needed. In addition, since this study only uses 5 forecasts to calculate forecast dispersion, the mean and median for 5 observations should not be significantly different. Hence, using the median forecast as the deflator is not necessary.

**Table 44. Summary of Comparisons of Forecast Error and Bias between Affiliated**

Panel A. Hypotheses

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **H4E** | $ERROR_A < ERROR_U$ | **H5E** | $ERROR_A > ERROR_U$ |
| **H4B** | $BIAS_A > BIAS_U$ | **H5B** | $BIAS_A > BIAS_U$ |

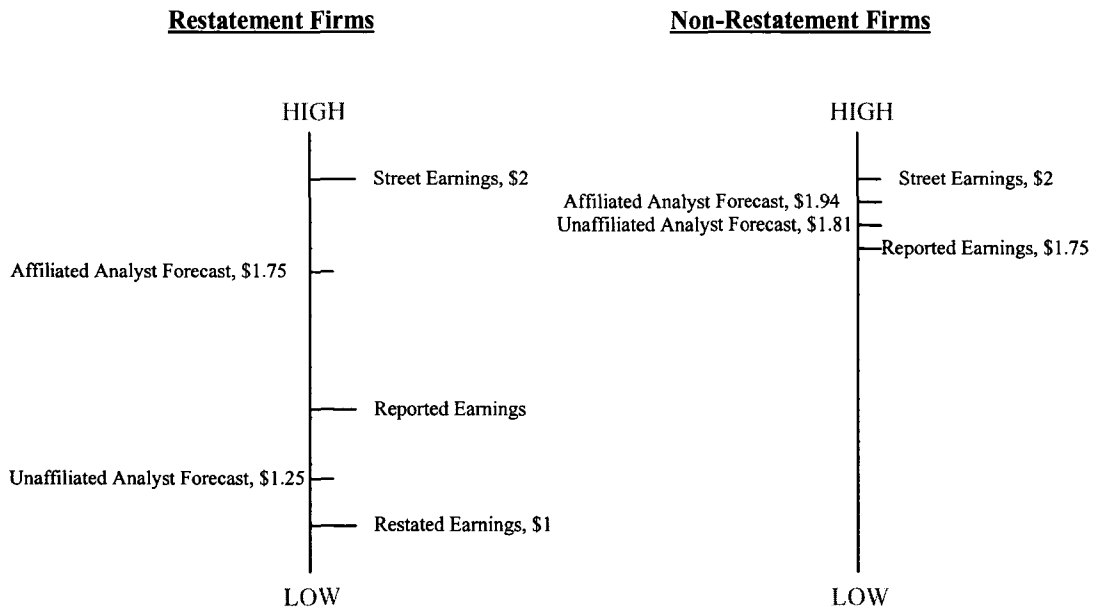
Panel B. Results

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **H4E** | Insignificant | **H5E** | Insignificant |
| **H4B** | Consistent | **H5B** | Insignificant |

Panel C. Conclusions

| | *I/B/E/S Actuals* | | *Final Earnings* |
|---|---|---|---|
| **H4E** | $ERROR_A = ERROR_U$ | **H5E** | $ERROR_A = ERROR_U$ |
| **H4B** | $BIAS_A > BIAS_U$ | **H5B** | $BIAS_A = BIAS_U$ |

**Figure A. Numerical Example of Forecasts and Earnings**




Based on equation (a):

Analyst forecast = $\alpha$*management guidance + (1-$\alpha$)*private information

For example, $\alpha$ =0.75 for affiliated analysts, and $\alpha$ =0.25 for unaffiliated analysts.

Hence:

Affiliated analyst forecasts for restatement firms=0.75*$2+0.25*$1=$1.75
Unaffiliated analyst forecasts for restatement firms=0.25*$2+0.75*$1=$1.25

Affiliated analyst forecasts for non-restatement firms=0.75*$2+0.25*$1.75=$1.94
Unaffiliated analyst forecasts for non-restatement firms=0.25*$2+0.75*$1.75=$1.81

**Figure B. Framework for Hypotheses Developments of Hypotheses 1 to 3**

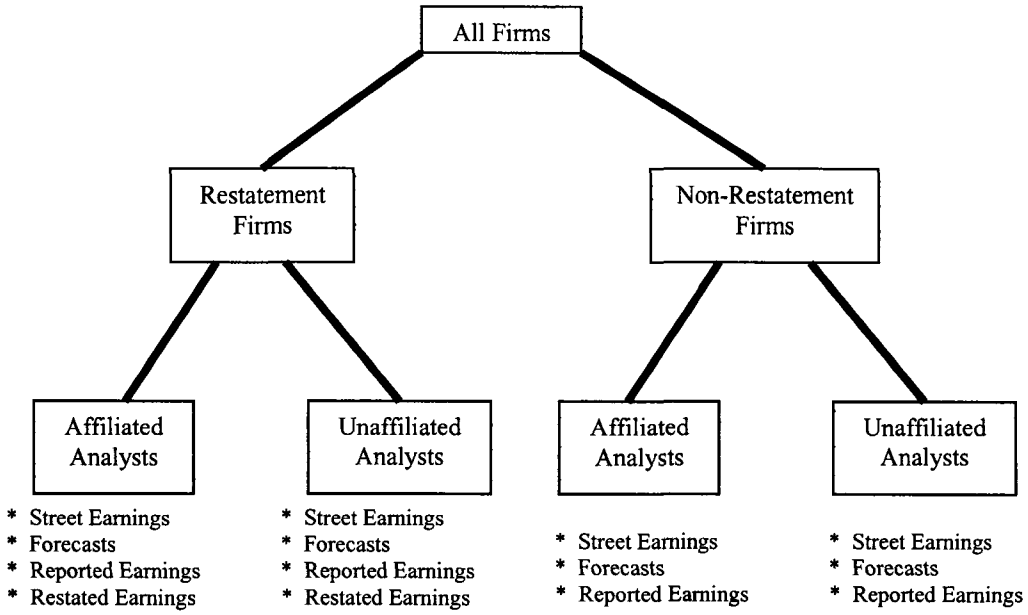



**Figure C. Hypothesized Relations between Forecasts and Earnings**

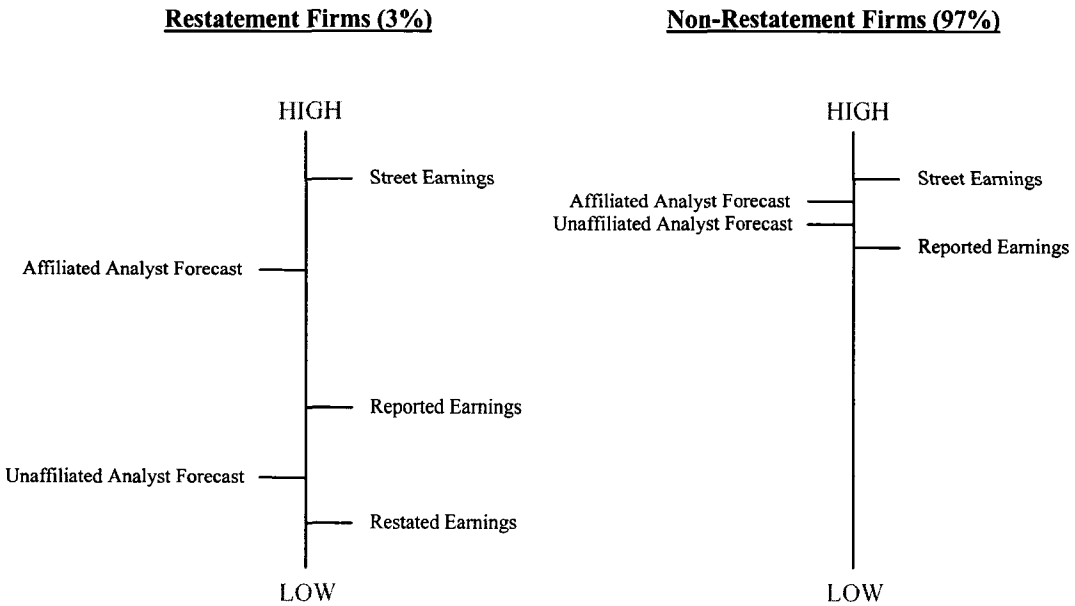


**Figure D. Histogram for Firm_Size**

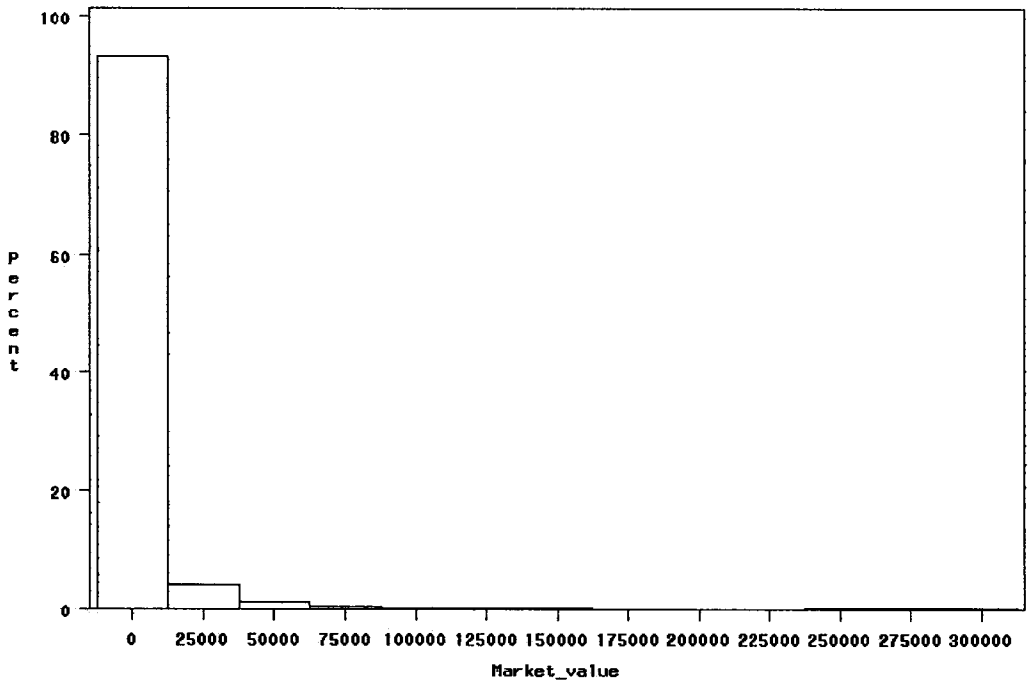
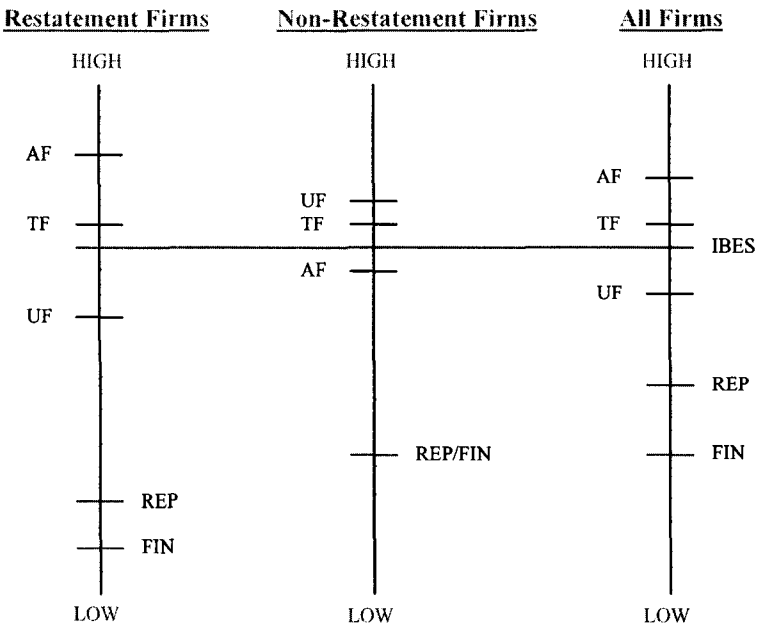
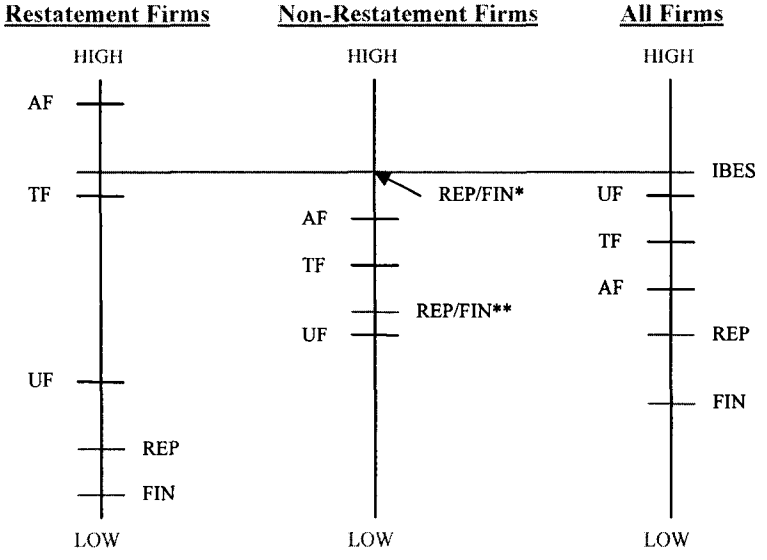


**Figure E. Figure based on Means and Medians**

Panel A. **Mean**

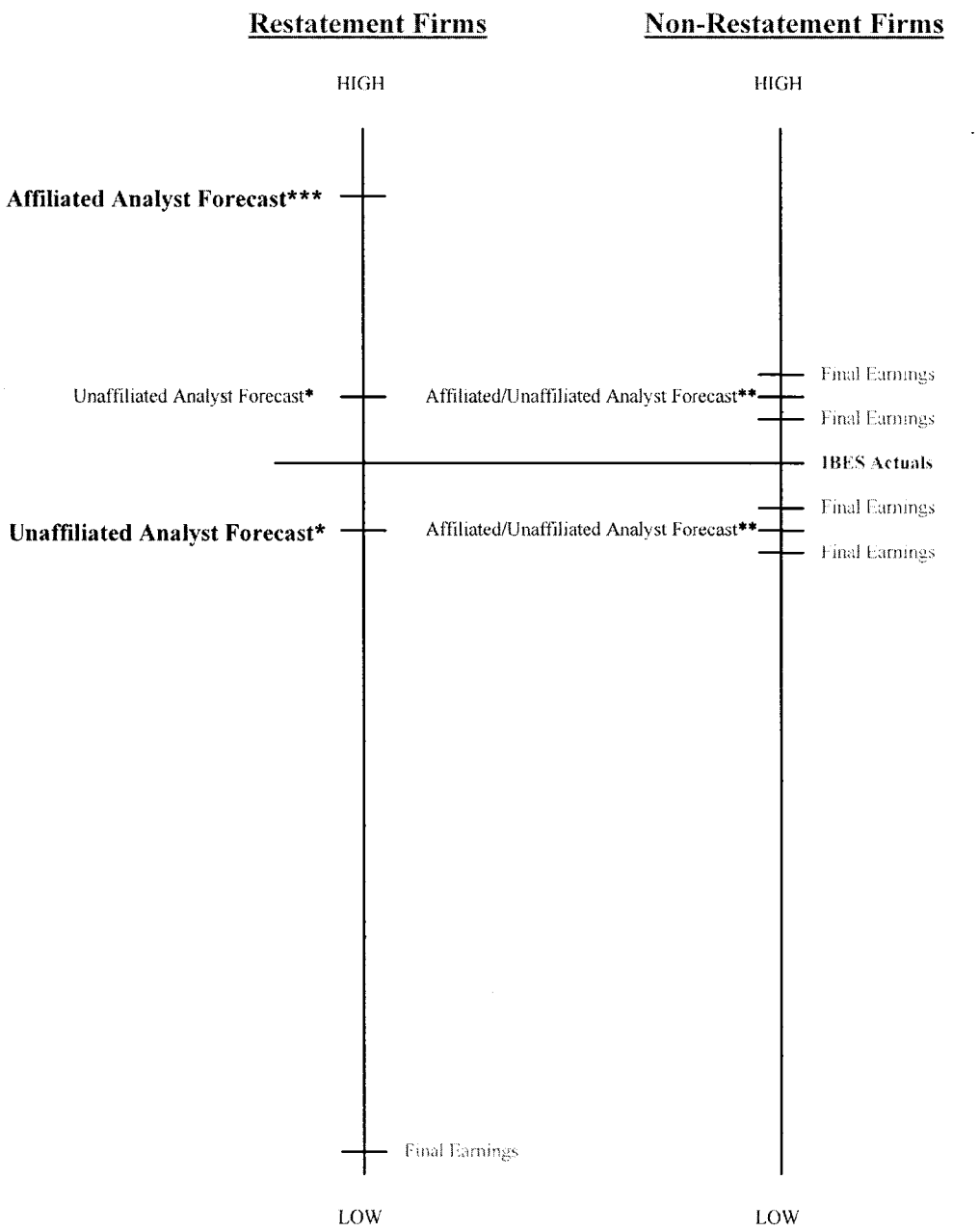



Panel B. **Median**




Note: the differences between the relative relations are not scaled.
TF: Total Analyst Forecasts
AF: Affiliated Analyst Forecasts
UF: Unaffiliated Analyst Forecasts
IBES: IBES Actuals
REP: Reported Earnings; reported earnings=final earnings for nonrestatement firms, but not for restatement firms.
FIN: Final Earnings
*: relative to unaffiliated analyst forecasts
**: relative to affiliated analyst forecasts and all analyst forecasts

**Figure F. Figure for Conclusion of the Study**




1. The difference between * and *** is significant relative to IBES actuals, but insignificant relative to final earnings.
2. The difference between * and ** is insignificant relative to both IBES actuals and final earnings.
3. Duplicate non-bold lettered items mean multiple possibilities for the exact location.