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ABSTRACT

While analyst bias is well documented, its relationship with corporate governance has been neglected. We claim that entrenched management of covered firms significantly increases analyst bias. By using governance index as a proxy for managerial entrenchment, we show that analyst bias increases as managerial entrenchment increases and affiliated analysts do not provide biased research for firms with the least and most entrenched managers due to their reputational capital concerns. Furthermore, our results show that as the channels managers use to pressure analysts get clogged after the regulations that took place between 2000 and 2003, entrenched managers' effect on analyst behavior disappeared.

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Studies have shown that reputation helps financial intermediaries earn higher fees. Like other financial intermediaries, financial analysts want to build their reputation, which generates favorable career outcomes like better pay (Stickel, 1992) and moving up to a high-status

brokerage house job (Hong & Kubik, 2003). Therefore it is puzzling to see analysts providing biased research that hurts their reputation.

Fang and Yasuda (2009) point out that two distinct facets of the analyst compensation structure produce two opposing incentives. While reputational compensation is an incentive to provide accurate research, other kinds of compensation (access to private information, and underwriting and M&A advising business steered to the analyst's employer) are related to conflict of interest and furnish incentives for analysts to bias their recommendations. Therefore, analysts strike a balance between their own reputation and revenues for themselves and their investment banking departments (Ljungqvist, Marston, Starks, Wei, & Yan, 2007). We propose that an external factor, corporate governance, affects analysts' compensation structure by changing that balance. More specifically, we ask a question that would improve our understanding of analysts' conflict of interest: Do entrenched managers of firms with weaker corporate governance demand more favorable recommendations from analysts?

We suggest that, as managers get more entrenched, they engage in more value-destroying actions and seek cooperation from analysts to cover their actions (Tirole, 2005). Entrenched managers may hire analysts' investment banks and may provide non-public company information to analysts and by using these as indirect channels to punish and reward analysts, managers can pressure analysts to bias their research. Managers can reward (punish) analysts by increasing (cutting) the disclosure of non-public information and investment banking business when analysts provide optimistic research (do not cooperate with entrenched managers). This reward and punishment system can force analysts cater to entrenched managers. Furthermore, in firms with dysfunctional governance lack of transparency shields analysts from reputational cost.

Therefore, analysts shift the balance toward revenue generation when they cover companies with more entrenched management.

In contrast, as the least entrenched managers do not need analysts' cooperation, they will not use nonpublic company information and investment banking businesses as indirect channels to push analysts to provide favorable recommendations. Furthermore, the transparent structure of their companies increases the probability of detection of biased recommendations, thereby creates reputational costs for analyst bias. Higher reputational costs without any revenue generation make analysts shift the balance toward reputation. Hence, we posit that there is a positive relationship between managerial entrenchment and analyst bias.[1]

However, this incentive structure vanished with Regulation Fair Disclosure, the Sarbanes-Oxley Act, and the Global Analyst Research Settlement, as they put Chinese walls between analysts and investment bankers and prohibit dissemination of nonpublic company information to favorite analysts. We posit that the effect of managerial entrenchment on analyst bias becomes insignificant after these regulations.

Using G-Index as a proxy for managerial entrenchment, we show that a one-unit increase (decrease) in a firm's G-Index increases (decreases) its probability of receiving optimistic (pessimistic) recommendations by .21% (.22%). This negative relationship between entrenched

[1] We use analyst recommendations rather than forecasts to measure analyst bias for two main reasons. First, as Chen and Matsumoto (2006) state, recommendations are issued far less frequently than forecasts, making recommendations more significant to capital markets. Second, entrenched managers' preference for forecasts might be twofold: optimistic forecasts make the firm look good, while pessimistic recommendations decrease the probability of the firm meeting/beating analysts' forecasts.

managers and analyst bias has two major contributions to our understanding of conflict of interest and managerial entrenchment. Our results show that even though analysts provide biased research, this bias is demanded by entrenched managers so that managerial entrenchment is the real source of analyst bias. Analysts cater to entrenched managers, who demand biased research, and they do not just provide favorable recommendations to any company. Secondly, our results emphasize the capability of entrenched managers by touching the agency problem. Entrenched managers can make analysts cooperate with them and conceal their actions by aligning their own interest with the interest of analysts, not shareholders.

Then, we examine how affiliated analyst behavior changes based on managerial entrenchment. As opposed to the previous literature, we show that affiliated bias exists only for the medium-level entrenchment companies. Furthermore, affiliation bias vanishes in the post-regulation period as well as the effect of corporate governance on analyst bias as the channels analysts use to incentivize analyst bias are clogged with regulations.

Our study emphasizes the importance of corporate governance. While corporate governance aims to alleviate managers' expropriation of residual control rights, it also improves the functioning of financial intermediaries. Good corporate governance ensures that managers do not divert resources from corporations, and choose underwriters on their merits. Our research therefore contributes to the literature on analysts' role of monitoring firms. Using mergers and broker closures as exogenous events to shed light on the effects of analyst coverage on managerial expropriation, Chen, Harford, and Lin (2015) show that analysts play an important role in disciplining managers. Similarly, Yu (2008) shows that firms that are followed by more analysts manage their earnings less. Our pre- and post-regulations analyses investigate whether

regulations stop up the indirect channels that managers use to appeal to analysts, and thus whether analysts become more effective in monitoring firms after the regulations.

1. Literature review and hypothesis

1.1. Conflict of interest

The literature points out that there are three main incentives for analysts to provide biased research. First, analysts' compensation is tied to the revenue from underwriting business. After an investment bank underwrites an IPO, SEO, or debt offering, analysts at that bank are expected to initiate or continue (presumably positive) coverage (James & Karceski, 2006; Krigman, Shaw, & Womack, 2001). Otherwise the firm will leave that bank out of future business deals. Since analysts' compensation is tied to generation of investment bank business, analysts are wary of anything that would upset company managers. Therefore, managers can use investment bank business as an indirect channel to convince analysts to positively bias their recommendations.

The second incentive is M&A advising business. Kolasinski and Kothari (2008) argue that M&A business presents a stronger incentive than underwriting business for analysts to bias their recommendations, because M&As are more frequent and generate higher fees.

The third incentive is access to nonpublic company information. Schipper (1991) argues that analysts provide two broad types of services to the investment community: assimilation and processing of publicly available information, and acquisition and dissemination of new information that is hard to gather. A major source of nonpublic information is company managers, who hold meetings, analyst briefings, and conference calls to inform their favorite investors and analysts. Such information helps analysts make timely and good calls, which in turn affect their job placements and probability of being selected as all-star analysts. In short, nonpublic company information is too crucial for analysts to ignore (Stickel, 1992).

While private information is beneficial for analysts, it is not easy to reach. Thus, analysts need to cater to managers to gather private information. Das, Levine, and Sivaramakrishnan (1998) find that analysts provide more optimistic recommendations for companies whose earnings are difficult to be accurately forecasted using only public information, because optimistic recommendations open the doors of management. Since company managers are well aware of the importance of private information to analyst calls, they use it as another indirect channel to allure analysts to provide optimistic research.

1.2. The reputation hypothesis

While managers influence analyst behavior via incentives, another factor, reputational capital disciplines analysts and limits analyst bias because the reputation hypothesis suggests that analysts earn returns on their reputation and bear costs of reputation loss. Using all-star ranking as a proxy for reputation, Stickel (1992) finds that reputable analysts receive better pay. As companies are more likely to hire underwriters that employ all-star analysts (Ljungqvist, Marston, & Wilhelm, 2006), and as analysts' compensation is tied to the investment banking business they generate, reputable analysts are compensated more than other analysts. Also, Hong and Kubik (2003) find that reputation affects analysts' career outcomes and helps them move up to high-status brokerage house jobs.

While reputation offers analysts direct and indirect benefits, it also disciplines analysts and penalizes them when they take actions that hurt reputation (Fang & Yasuda 2009). For instance, long-term all-star analyst Jack Grubman lost all of his reputation, was banned from the securities industry, and paid million-dollar fines when a bias was detected in his recommendations.

In sum, while analysts want to remain unbiased to build their reputation and reap returns on it, they are also tempted to bias their recommendations to get private information and generate underwriting and advising business for their investment banks. In this study, we examine how managerial entrenchment affects the balance between revenue generation and reputational capital.

1.3. Managerial entrenchment

Berger, Ofek, and Yermack (1997) define entrenchment as the extent to which managers fail to experience discipline from the full range of corporate governance and control mechanisms, and therefore can pursue private benefits instead of maximizing shareholders' wealth, without the threat of being replaced. Tirole (2005) states that entrenched managers manipulate performance measures so that their firms "look good" to investors in order to secure their positions. However, accounting manipulations lead to severe penalties when revealed. To prevent exposure, entrenched managers may take two actions: securing collaboration from analysts (Tirole, 2005), and decreasing information disclosure so that investors cannot reveal manipulations easily. These two actions form the basis of this study.

Yu (2008) argues that analysts have monitoring power over managers and finds that as the number of analysts covering a company increases, earnings management decreases. Given that analysts have this power to discipline managers, entrenched mangers who engage in accounting manipulations need analysts' cooperation, as Tirole (2005) suggests. Therefore, we claim that as managers get more entrenched, they put more pressure on analysts to cooperate with them.

Then the question is: "through which channels managers achieve making analysts cooperate with them?" We suggest that managers achieve this by using direct and indirect

channels. There is plenty of anecdotal evidence of such pressure, including CEOs directly telling the analyst's boss what they need. For instance, after AT&T CEO Michael Armstrong complained to CitiGroup's co-CEO about a neutral rating published by Jack Grubman, Weill asked Grubman to have a fresh look at AT&T, and Grubman increased his rating.[2] But the indirect channels discussed above may have an even stronger effect. As long as these incentives exist, entrenched managers have channels to persuade analysts to distort their research; indeed, managerial entrenchment stands out as the root of analyst bias.

Even though analysts yield to manager pressures to get compensation related to revenue generation, reputational cost, which we define as the product of probability of detection and costs at detection, limits analyst optimism. But the opaque structure of firms with entrenched managers increases information asymmetry and thereby decreases the probability of detection, and with it the reputational cost. It may be harder for investors to recognize the bias in analyst recommendations since investors have limited information about companies with entrenched managers.

Conversely, since the least entrenched managers do not pursue private benefits, they do not engage in actions that would harm shareholders' value. As a result, they do not need any

[2] To test for this direct channel, following Matthew and Yildirim (2015), we hand-collected director data on six investment banks for the sample period, 1994–2006. Our goal was to specify the executives of recommended firms who served as directors for recommending the analyst's investment bank, so that we could test whether these affiliations resulted in more optimistic recommendations. However, our sample size was too small: we had only 43 recommendations out of 26,328 recommendations made by these 6 investment banks. Thanks to the referee for pointing out this possible channel.

cooperation from analysts and they do not try to appeal to analysts to bias their recommendations. Furthermore, due to less information asymmetry between investors and less entrenched companies, analysts cannot deceive investors about the value of the firm by biasing their recommendations. Therefore, increased transparency limits analysts' bias due to their reputational concerns.

We suggest that interests of managers and analysts complement each other. As managerial entrenchment gets worse, managers appeal to analysts to cover their actions. Increased incentives related to conflict of interest and decreased reputational costs motivate analysts to cater to managers, and analysts shift the balance toward revenue generation. Similarly, as managers become less entrenched, they do not force analysts to bias their recommendations. Lack of incentives related to conflict of interest and increased reputational cost due to transparency make analysts shift the balance toward personal reputation. Therefore managerial entrenchment affects analyst bias through the balance between personal reputation and revenue generation.

Hypothesis 1. There is a positive relationship between level of managerial entrenchment and analyst bias.

The literature specifically examines bias among affiliated analysts (Cowen, Groysberg, & Healy, 2006). Entrenched managers assume that it is their right to put pressure on affiliated analysts, and they can do so through investment bankers or even CEOs. Any pressure from the CEO threatens the analyst's job security.

While affiliated analysts are more biased than unaffiliated analysts, we suggest, however, that at extreme levels of managerial entrenchment, affiliated analyst behavior may differ from what previous studies have found. At very high levels of managerial entrenchment, affiliated

analysts face great reputational risk because the cost at detection increases sharply. At the opposite extreme, as the least entrenched managers do not need any cooperation from affiliated analysts, they do not offer any incentives for biased recommendations, and the transparency of their companies increases the probability of detection. Therefore, contrary to the common finding of "affiliated analyst bias," we claim that there is no affiliated analyst bias when managerial entrenchment is at either extreme.

Hypothesis 2. Affiliated analysts are not more biased than unaffiliated analysts when managers are of the most and least entrenched companies.

1.4. Recent regulations

After the bubble-burst period, conflict of interest problems triggered a series of regulations that aim to prevent analyst bias. We suggest that these regulations clogged the channels managers had been using to affect analyst recommendations. Regulation Fair Disclosure, implemented in October 2000, mandated that all publicly traded companies disclose material information to all investors at the same time, decreasing the need for analysts to cater to company management and eliminating the importance of nonpublic company information for analysts. On July 30, 2002, the U.S. Congress enacted the Sarbanes-Oxley Act in response to major corporate and accounting scandals. On April 28, 2003, the SEC, the NASD, the NYSE, and the ten largest investment banks agreed on the Global Settlement, which forced investment banks to maintain a "Chinese wall" between analysts and investment bankers and forbade tying analyst compensation to underwriting or advising business. Given these clogged channels, managers cannot put pressure on analysts by alluring them with underwriting and advising business. Furthermore, these changes have made managers more responsible for financial statements and required them to disclose more information to the market, limiting accounting

manipulations and alleviating the managerial entrenchment problem. In sum, managers no longer need cooperation from analysts and can no longer pressure them to produce biased research.

At the same time, the regulations have increased reputational cost by increasing both the probability and the costs of being detected. First, Sarbox aims to increase the transparency of financial statements by enhancing corporate disclosure and governance practices. Less information asymmetry between companies and investors makes it easier to detect bias. Second, harsh punishments of analysts following investigations have warned the remaining analysts in the industry about the increased reputational costs at detection.

Increased reputational cost and clogged channels that were effectively used by managers to pressure analysts to bias their recommendations suggest that managers may no longer influence both affiliated and unaffiliated analyst recommendations after regulations period.

Hypothesis 3a. Managerial entrenchment does not affect analyst behavior after regulations.

Hypothesis 3b. Affiliated analyst recommendations are not systematically different from those of unaffiliated analysts after regulations.

2. Data and methods

The data set covers the period from 1994 to 2006 and consists of the intersection of two databases: IBES Recommendation Detail U.S. data and Risk Metrics governance data.

IBES recommendations range from 1 to 5; for easier interpretation, we reverse the IBES recommendation code so that the lowest and the highest recommendations refer to strong sell and strong buy, respectively. Following Ljungqvist et al. (2007), we measure the consensus recommendation and define analyst recommendation bias as the difference between a given recommendation and the median recommendation for the same stock in the previous quarter. To find the consensus recommendation, we use the most recent recommendation of each analyst

covering the stock within a one-year period. Analyst bias ranges from -4 to 4; positive numbers refer to optimistic bias and negative numbers refer to pessimism.

We use the G-index, created by Gompers, Metrick, and Ishii (2003), as a proxy for managerial entrenchment because this variable measures how much power managers and shareholders hold. The G-index is widely used, though recent studies cast doubt on the importance of some of its provisions. Bebchuk, Cohen, and Ferrell (2008) argue that only six out of 24 provisions play key roles in linking governance and firm value. We create an E-index following Bebchuk et at. (2008) and use it in robustness tests and in other tests where applicable. We also use the hostile takeover index of Cain, McKeon, and Solomon (2017) in the robustness tests.

To examine whether managerial entrenchment affects affiliated analyst behavior, following Malmendier and Shantikumar (2007) we define an analyst as affiliated if her investment bank is the lead underwriter or co-underwriter in an IPO in the past five years, or in an SEO in the past two years or the next two years, or if her bank is the lead underwriter of bonds in the past year. Underwriting data are from the Securities Data Corporation New Issues database.

Following Ljungqvist et al. (2006), Malmendier and Shanthikumar (2007), we use the all-star analyst ranking of *Institutional Investor* magazine to measure analyst reputation. All-star analyst names are retrieved from the October issues of the magazine over the sample period. For each industry *Institutional Investor* lists the top three analysts, together with runners-up who get at least 35% of the vote earned by the third-ranking analyst. The analyst dummy is equal to one if that analyst is ranked. Since rankings are announced in the October issue, an analyst is called

an all-star for the quarter ending in December of that year and the quarters ending in March, June, and September of the next year.

We control for analyst experience and workload. Career experience is defined as the log of number of days the analyst's forecasts have been appearing in the IBES database. IBES recommendation data start from 1993; therefore, we use IBES detailed forecast data, which start in 1983, to identify the first date an analyst enters the database. Similarly, firm-specific experience is measured as the log of the difference between recommendation date and the first date an analyst starts covering a specific firm. Workload is the log of the number of firms an analyst covers during a year.

We also control for institutional holding, because Ljungqvist et al. (2007) show that institutional investors moderate a sell-side analyst's incentives, presumably through the institutions' ability to evaluate the analyst in public surveys. Institutional data are from Thomson Financial 13F. We match the number of shares held by institutions with the market capitalization from CRPS data for each quarter-end to eliminate concerns about the accuracy of market capitalization information in 13f data. Where 13f does not specify any institutional holding, we assign zero percent for institutional holding. Where institutional holding is greater than market capitalization, we assume data are missing. Panel B of Table 1 shows that the mean of the institutional holding variable is 68%, slightly greater than the mean of institutional holdings found by Ljungqvist et al. (2007).

Size and book-to-market ratio are from CRSP and Compustat. Size is equal to shares outstanding times price, calculated at the end of each quarter. The average company size is $7,947 million, much bigger than company size in the study by Ljungqvist et al (2007).

Quarterly book-to-market ratio is calculated as common equity divided by the product of common shares outstanding and price.

Initiation is a dummy variable that is equal to 1 if the recommendation is the analyst's first recommendation for a given company.

Jobmove is a dummy variable that equals 1 if an analyst changes jobs. If an analyst's recommendation shows up with a broker ID that differs from the broker ID of his/her previous recommendation, all of the recommendations that he/she makes from that recommendation date until one quarter later are assigned a value of 1.[3]

We also control for the log of the number of analysts covering the stock within a year.[4]

There are 467,448 recommendations in the IBES data from 1994 to 2006. After we eliminate observations that do not have governance data and other control variables, and exclude companies in Standard Industrial Classification industries 4900–4999 (utilities), 6000–6999 (financials), and 9000–9999 (government agencies), there are 155,009 observations in the sample.

Panel A of Table 1 summarizes our recommendation sample. Mean recommendation level is 3.68. 16% of recommendations are made by all-star analysts, and 7% of recommendations are made by affiliated analysts. The G-index ranges from 1 to 18, and the E-

[3] We also create jobmove2 and jobmove3, which take the value of 1 for recommendations that take place until 2 and 3 quarters after the job change, and our results remain the same.

4 Our results remain the same if a forecast accuracy measure is added to the regression as a control variable, following Ljungqvist et al. (2007). We did not include it in our regressions because it decreases our number of observations by 13,438.

index ranges from 0 to 6. Mean G-index is 9.06, very close to the midpoint within the range of G-index, whereas mean E-index is 2.21, more skewed to least entrenchment.

[TABLE 1]

To examine the effect of managerial entrenchment on analyst bias in more detail, we create three subsamples based on G-index, following Gompers et al. (2003). The least-entrenchment sample includes firms that have G-index less than 6, whereas the most-entrenchment sample consists of companies that have G-index greater than 13. The remaining companies make up the medium-level-entrenchment sample. Panel B of Table1 presents differences among the three subsamples using firm-quarter-level observations. There are on average 8.18, 8.88, and 8.28 analysts covering firms with least, medium-level, and most entrenchment. The number of affiliated analysts is greatest for the least-entrenchment sample, whereas the number of all-star analysts is greatest for the most-entrenchment sample. The most-entrenchment sample consists of smaller companies and has the highest book-to-market ratio. Institutional holding does not vary much among the subsamples. Average G-index for the most-entrenchment sample is 14.49, very close to the threshold level used to define that subsample. Similarly, the average of G-index in the least-entrenchment sample is 4.51, which is close to 5. G-index and E-index are highly correlated, with a correlation coefficient of 74%. The average E-index is .52 for the least-entrenchment, 2.38 for the medium-level-entrenchment, and 3.94 for the most-entrenchment sample.

3. Empirical tests and results

3.1. Main results

For multivariate analysis, we use ordered probit regression because the dependent variable is based on a transformation of an ordinal scale. Analyst bias has three choice levels:

issuing a recommendation that is below, at, or above consensus (i.e., pessimistic, objective, or optimistic).

We use the following regression to investigate the effect of corporate governance on analyst bias and affiliated analyst bias:

$$Analyst\ Bias_{ij} = ??_{??} + ??_1 * Affiliation_{????} + ??_2 * Gindex_j + ??_3 * AllStar_{ij} + ??_4 * FirmExp_{ij} + ??_5 * CarExp_{ij} + \beta_6 * Workload_{ij} + \beta_7 * InsHold_j + \beta_8 * BM_j + \beta_9 * Logsize_j\ \beta_8 * Initiation_j + \beta_9 * NoAnalystsCovering_j + \beta_{10} * Jobmove_j, \quad (1)$$

where *i* refers to analyst and *j* refers to firm.[5]

Model 1 of Table 2 shows that the G-index coefficient is positive and statistically significant at the 1% level. Panel B of Table 2 shows marginal effects. A one-unit increase in G-index increases the probability of an optimistic recommendation by .21% and decreases the probability of a pessimistic recommendation by .22%. In other words, a firm from the most-entrenchment sample, which has an average G-index of 14.40, is 2.1% ((14.40-4.5)*.21%) more likely to have an optimistic recommendation than a firm from the least-entrenchment sample, which has an average G-index of 4.5. Our results do not change when we use a two-level dependent variable (optimistic vs. not optimistic) and run a simple probit regression. In model 3, our results show that a one-unit increase in G-index increases the probability of an optimistic recommendation by .2%.

[TABLE 2]

The positive relationship between managerial entrenchment and analyst bias tabulated in Table 2 suggests that the level of analyst bias is not the same for all firms. As managerial

[5] Our results are robust to industry and year fixed effects, which are not included in the main regressions.

entrenchment becomes worse, managers elicit more biased recommendations. In general, the results in the first column of Table 2 confirm our first hypothesis, that managerial entrenchment affects analyst behavior.

We claim that managerial entrenchment affects the balance analysts strike between revenue generation and personal reputation. The negative coefficient of the all-star dummy suggests that all-star analysts are more willing to protect their reputation by limiting optimistic bias, thereby giving up incentives related to revenue generation. Marginal effects shown in Panel B of Table 2 suggest that all-star analysts are 2.07% (2.17%) less (more) likely than unranked analysts to provide optimistic (pessimistic) recommendations.

As Ljungqvist et al. (2007) suggest, institutional investors alleviate analyst bias. A 1% increase (decrease) in institutional holding decreases (increases) the probability of analyst optimism (pessimism) by 8.1% (8.4%). The number of analysts covering the stock has a positive and significant effect, as Ljungqvist et al. (2007) also found. Irvine, Lipson, and Puckett (2006) show that almost 80% of the initiations in their sample are "strong buy" and "buy" recommendations, whereas only 1% are "sell" and 0% are "strong sell." Supporting this result, the coefficient of our initiation dummy is positive and significant. As analysts cover companies for longer periods, they become more optimistic. The number of companies analysts cover makes them less optimistic. Because bigger companies have less information asymmetry, analysts covering them refrain from optimistic research. Finally, the coefficient of job move is positive and significant, suggesting that as analysts start new jobs, they may want to build strong relationships with the companies they cover.

Gompers et al. (2003) find striking differences between dictatorship and democracy samples (which we rename as most-entrenchment and least-entrenchment samples). For the

reasons explained above, we ask whether extreme levels of managerial entrenchment have the same effect on analyst bias as does a medium level of entrenchment.

Our results appear in columns 6 to 8 of Table 2. For the medium-level-entrenchment sample, the coefficient of G-index is still positive and significant, but it becomes insignificant for the least- and most-entrenchment samples. While this result means that G-index does not affect analyst bias within the least- and most-entrenchment samples, it does not tell whether analyst bias changes from one subsample to another. Therefore, we create dummy variables for each subsample and run the regression with dummy variables for most and medium-level entrenchment, using least entrenchment as the base sample. The MLE dummy, which is set to 1 if G-index is between 5 and 14, has a positive and significant coefficient, suggesting that analyst bias in medium-level-entrenchment samples is significantly greater than analyst bias in the least-entrenchment sample. The ME dummy, which is set to 1 if G-index is greater than 13, has a positive and significant coefficient that is almost twice as big as the coefficient of the MLE dummy. Marginal effects suggest that analysts are 1.3% more likely to make optimistic recommendations for medium-level-entrenchment companies than for least-entrenchment companies. On the other hand, the probability of providing optimistic recommendation for most entrenchment companies compared to the probability of providing optimistic recommendation for least entrenchment companies is much higher. Analysts are 2.2% more likely to publish optimistic recommendations for most-entrenchment companies than for least-entrenchment ones. Our results in model 2 confirm our findings of negative impact of managerial entrenchment on analyst bias.

Our second hypothesis suggests that managerial entrenchment affects the behavior of affiliated analysts. To examine the effect of managerial entrenchment on analyst bias, we examine the significance of affiliation in three sub-samples.

The coefficient of the affiliation dummy is positive and significant at the 1% level for the whole sample, confirming the findings of previous studies. Affiliated analysts are 2.02% (2.04%) more (less) likely than unaffiliated analysts to provide optimistic (pessimistic) recommendations. But the subsample regressions show that affiliated analysts make optimistic recommendations only for the medium-level-entrenchment sample. For the most- and least-entrenchment samples the affiliation dummy becomes insignificant. Failing to differentiate companies based on managerial entrenchment leads to a widely accepted result: affiliated analysts provide optimistic recommendations for any company. We show that entrenchment is the source of analyst bias. Confirming our second hypothesis, insignificant coefficients of affiliated dummy for the least and most entrenchment samples confirm that affiliated analysts are wary of providing more optimistic research than unaffiliated analysts because the probability of losing their reputational capital is greater when managerial entrenchment is on the two edges of G-Index.

Our results on affiliated analyst bias confirm the finding of Clarke, Ferris, Jayaraman, and Lee (2006). Using a sample of 384 firms that file for bankruptcy, they find that affiliated analysts do not let potential conflicts affect their recommendations. This finding runs directly counter to mainstream results on conflict of interest. However, the insignificant affiliated analyst coefficient for most entrenchment sample sheds light on seemingly conflicting result of Clarke et al. (2006).

3.2. Endogeneity in analysts' selection of companies

Cross-sectional regression results show a positive relationship between analyst bias and managerial entrenchment. However, some analysts who are more interested in revenue generation may cover only firms with the most entrenched managers, while other analysts who are more reputation-oriented may cover only firms with the least entrenched managers. In other words, as Ljungqvist et al. (2007) suggests, our results may be present only because analysts are strategically selecting the companies they want to cover. Therefore, our argument that managerial entrenchment leads to analyst bias may not hold.[6] To deal with this endogeneity problem, we run three additional tests.

In the first test, we examine whether the same analyst behaves in the same way for companies with different entrenchment levels. If managerial entrenchment is the source of analyst bias, the same analyst who covers firms with different levels of managerial entrenchment may strike a different balance between revenue generation and personal reputation for different companies.

Specifically, we focus on analysts who cover firms from different subsamples. We compare recommendations of the same analysts in the same year, which assures the same level of career experience and workload and the same dummy for all-star ranking. We run this test for affiliated and unaffiliated analysts separately to make sure that affiliation status does not bias the test results.

[TABLE 3]

Table 3 presents the results of unpaired t-test statistics of affiliated and unaffiliated analysts' optimism for samples with differing entrenchment in Panel A and Panel B,

[6] We greatly appreciate the referee's pointing out this possibility.

respectively. (Again, analyst optimism is the difference between individual recommendation and median recommendation, and ranges from -4 to +4.[7])

Panel A shows that affiliated analysts provide 690 recommendations for least-entrenchment companies and the same analysts provide 1,071 recommendations for medium-level-entrenchment companies. The null hypothesis is that the mean difference in analyst optimism for the two groups is 0. The null hypothesis is rejected at the 1% level, suggesting that the same analyst exhibits different levels of optimism for companies with different levels of entrenchment. The numbers of recommendations by analysts who provide research on firms from the least and most entrenchment samples in the same year are unsurprisingly small; 25 and 26 since our matching criteria are very strict and the least and most entrenchment samples are small. In spite of the small sample sizes, the difference in optimism between the same analysts' recommendations for most- and least-entrenchment samples is significant. The difference between recommendations for medium-level-entrenchment and most-entrenchment firms is not statistically significant, though affiliated analysts' optimism is greater for most-entrenchment companies than for medium-level-entrenchment firms.

In Panel B, we run similar t-tests for unaffiliated analysts. Since we require an analyst to be unaffiliated only, the sample sizes for the tests in panel B are bigger. The difference in the means of optimism for least entrenchment and medium entrenchment is negative and significant, with a p-value of 0.015. Similarly, the difference in the means of analyst optimism for medium entrenchment and most entrenchment is negative and significant, with a p-value of 0.015. The

[7] Our t-test results remain the same if we use the three-level optimism variable that we use in the regression analysis.

null hypothesis—that a given analyst will make equally optimistic recommendations for firms from the most- and least-entrenchment samples—is rejected at the 1% level.[8]

In the second test, following Ljungqvist et al. (2007), we create a sample of large companies, as analysts have little discretion about covering the largest companies in their sectors. In our subsample there are recommendations made for the largest five companies within each three-digit SIC code, ranked by market capitalization, for each year. We end up with 88,625 observations.

[TABLE 4]

To preserve space, in Table 4 we present only the coefficients and z-statistics on the managerial entrenchment variable. Our results and significance levels remain the same as those in original tests that use the whole sample.

In the third test, we run a Heckman model following Ljungqvist et al. (2007). We create all possible combinations of broker-firm-quarter observations, resulting in 58,524,440 observations. After deleting the observation before a firm or a broker enters or after it leaves the sample, we are left with 6,835,441 observations. Of these, 155,009 observations have active analyst coverage. We use the fraction of the number of companies that a broker covers within company *k*'s Fama and French (FF) industry as our instrument variable. As Ljungqvist et al. (2007) suggests, the more companies a broker covers in company *k*'s industry, the less costly it is to cover company *k* and, therefore, the more likely that the broker covers company *k*.

[8] We create two subsamples using the E-index, a most-entrenchment sample where the E-index is equal to 5 or 6, and a least-entrenchment sample where the E-index is equal to 0–1. The null hypothesis—that the same analysts who cover firms from the most- and the least-entrenchment samples are equally optimistic—is rejected with a p-value of 0.016.

We include all the variables, except for analyst-specific variables, in the coverage regression. As we expected, the fraction of firms covered by the broker in the FF industry has a positive and significant coefficient. The second column of Table 5 presents our main regression results after we correct for endogenous selection. All of the variables carry the same sign as in Model 1 of Table 2, and the significance levels remain the same.

[TABLE 5]

3.3. Sub-period analyses

To test our third hypothesis, we partition the sample into two periods: sample period until Global Settlement of April 28, 2003 is called pre-regulation period and sample period after Global Settlement is called post-regulation period.

Panel A (Panel B) of Table 6 shows the regression results (marginal effects) for sub-periods. For the whole sample a one-unit increase in G-index leads to a .31% increase (.32% decrease) in the probability of an optimistic (pessimistic) recommendation in the pre-regulation period. These probabilities are 50% higher than the analogous probabilities for the entire sample period, presented in Model 1 of Table 2. In contrast, for the post-regulation period the effect of managerial entrenchment on analyst bias is not significant. Similar results appear for the medium-level-entrenchment sample, where the pre-regulation results are stronger than those for the entire sample period. We further test for the equality of the coefficients of G-index for the sub-period samples, and the null hypothesis (that the two coefficients are equal) is rejected with a p-value of 0.0034.

We also run the same regression used in model 2 of Table 2 for the pre-regulation period. Our untabulated results show that the probability of providing an optimistic recommendation for

firms in the most-entrenchment sample is 3.17% higher than that for firms in the least-entrenchment sample, whereas that probability is only 2.2% for the entire sample period.

Pre- and post-regulation period regression results for the least- and most-entrenchment samples confirm our third hypothesis. The G-index is insignificant for the sub-period analyses of the most- and least-entrenchment samples. Furthermore, a test of equality does not show any significant difference between the coefficients of the G-index for the sub-period analyses of the most- and least-entrenchment samples. Looking at sub-periods reveals that analysts' likelihood of being optimistic is driven by the pre-regulation period; after passage of the regulations, entrenched managers lose the channels for inducing analyst bias, and analysts are more interested in their reputational capital.

[TABLE 6]

Regulations also alleviate bias among affiliated analysts. For firms in the whole sample and the medium-level-entrenchment sample, affiliated analysts are 2.98% (3.2%) more likely than unaffiliated analysts to make optimistic recommendations before the regulations. After them, however, affiliated analysts' recommendations do not differ significantly from those of unaffiliated analysts. Our results remain robust to E-index.

Examining sub-periods reveals an important result related to analysts' reputational concerns. In Table 2, the coefficient of the all-star dummy is negative and significant for all subsamples and the whole sample, suggesting that all-star analysts make less biased recommendations than other analysts. However, Table 6 shows that this negative and significant coefficient derives mainly from the post-regulation period. For all subsamples and the whole sample, the all-star dummy is negative but insignificant for the pre-regulation period. We get the

same result when the E-index is used instead of the G-index. Therefore, our results support the view that before the regulations, the all-star ranking was merely a "beauty contest."

Since regulation, the all-star dummy for the whole sample shows that all-star analysts are 5.80% less (6.11% more) likely to issue optimistic (pessimistic) recommendations than unaffiliated analysts. Compared to the probabilities in Panel B of Table 2, the much higher probabilities in Panel B of Table 6 confirm that all results related to the all-star dummy derive from the post-regulation period. This finding has an important implication about the effectiveness of regulations. Regulations and penalties imposed on some analysts in the Global Settlement reminded analysts of how important reputation is for financial intermediaries and how severe reputational cost can be.

3.4. Other measures of managerial entrenchment

To test whether the relationship between the G-index and analyst bias is due to a spurious governance variable, we use the E-index and the hostile takeover index in the regression. Table 7 shows that for the whole sample the coefficient of the E-index is positive and significant, and a one-unit increase in it increases (decreases) the probability of an optimistic (pessimistic) recommendation by .25% (.26%). Sub-period regressions show that the coefficient of the E-index is positive and significant before the regulations—a one-unit increase in E-index increases (decreases) the probability of an optimistic (pessimistic) recommendation by .34% (.35%)—but becomes insignificant after the regulations. Furthermore, the test of equality of coefficients shows that the E-index coefficient differs significantly across sub-periods. Therefore, our result for the effect of managerial entrenchment on analyst bias is robust to E-index. The coefficient of the hostile takeover index remains significant for both periods, though the pre-regulation coefficient is bigger and more significant.

[TABLE 7]

4. Conclusion

Using G-Index, created by Gompers et al. (2003) as a proxy for managerial entrenchment, we show that analysts provide more optimistic research as managerial entrenchment worsens. Using indirect channels, non-public information and investment banking and M&A advising business, managers motivate analysts to shift their balance toward conflict of interest.

On the other hand, the commonly documented affiliated analyst bias is present for only the medium-level entrenchment sample. For the most and least entrenchment samples affiliated bias is not significant, suggesting that affiliated analysts do not behave differently from unaffiliated analysts when they cover companies with the least and most entrenched managers due to reputational concerns. Our pre-regulation and post-regulation analyses show that our results are mainly derived from pre-regulation period. As managers lost the channels to affect analyst behavior owing to regulations implemented between 2000 and 2003, the effect of managerial entrenchment on analyst bias disappears in the post-regulation period.

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Table 1

Descriptive statistics.

Panel A: Descriptive statistics by recommendations

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Recommendation level	155,009	3.68	0.95	1	5
Firm experience	155,009	5.47	2.81	0	9.07
Career experience	155,009	7.17	1.64	0	9.08
Workload	155,009	2.42	0.55	0.69	4.74
Size (log)	155,009	21.95	1.56	14.72	27.13
Book-to-market	155,009	0.41	0.43	-25.16	19.55
All-star analyst dummy	155,009	0.16			
Affiliation	155,009	0.07			
Initiation dummy	155,009	0.18			
No. analysts covering firm	155,009	2.25	0.72	0	4.03
Jobmove	155,009	0.09			
G-index	155,009	9.06	2.62	1	18
E-index	155,009	2.21	1.30	0	6

Table 1 (Continued)

Panel B: Descriptive statistics by firm-quarter observations

	Whole sample	Least entrenchment	Medium entrenchment	Most entrenchment
Recommendation level	3.71	3.76	3.70	3.71
Number of affiliated analysts covering stock	0.24	0.34	0.23	0.21
Number of all-star analysts covering stock	0.55	0.49	0.56	0.56
Number of analysts covering stock	8.78	8.18	8.88	8.28
Institutional holding	0.68	0.62	0.68	0.69
Size (in millions)	7,947	7,956	8,127	4,781
Book-to-market	0.44	0.44	0.44	0.48
E-index	2.28	0.52	2.38	3.94
G-index	9.08	4.51	9.27	14.49
Number of observations	155,009	13,983	133,950	7,076

Panel A presents descriptive statistics for 198,542 recommendations, representing the intersection of the Thomson 13f and Institutional Brokers' Estimates System (I/B/E/S). Panel B presents mean levels of variables at the firm level. Recommendation level ranges from 1 to 5, where 5 is the highest recommendation. Firm-specific experience is measured as the log of difference between recommendation date and the first date an analyst starts covering a specific firm. Career experience is defined as the log of the number of days the analyst's forecasts have been appearing in the IBES database. Workload is the log of the number of firms the analyst covers during a year. Size is equity market capitalization. Book-to-market is from the Compustat quarterly database (data59/(data14*data61). Institutional holding is taken from 13F. Three subsamples are created following Gompers et al. (2003). The all-star dummy is equal to one if an analyst is ranked by *Institutional Investor* magazine and 0 otherwise. The affiliated analyst variable is a dummy that takes a value of 1 if her investment bank has an underwriting relationship with a given company and 0 otherwise (Shanthikumar & Malmendier, 2007). Initiation is a dummy variable that is equal to one if the recommendation is the analyst's first recommendation for a specific company. Jobmove is a dummy variable that equals 1 if the analyst changes jobs. Governance index and entrenchment index data are from IRRC. The least entrenchment sample includes companies with G-index less than 6. Companies that have G-index greater than 13 constitute the most entrenchment sample. The remaining companies are in the medium-level-entrenchment sample. Number of analysts, affiliated analysts, and all-star analysts covering stock are the mean numbers of analysts covering a company per year.

Table 2

The effect of managerial entrenchment on analyst bias

Panel A: Regression results

	Whole sample			Subsamples		
	Model 1	Model 2	Model 3 (probit)	Least ent.	Medium ent.	Most ent.
Firm experience	0.023***	0.024***	0.023***	0.018*	0.025***	0.009
	(6.73)	(6.84)	(5.63)	(1.89)	(6.63)	(0.62)
Career experience	-0.000	-0.000	0.001	0.000	-0.000	-0.003
	(-0.13)	(-0.17)	(0.31)	(0.03)	(-0.03)	(-0.29)
Workload	-0.036***	-0.035***	-0.044***	-0.027	-0.037***	-0.018
	(-3.80)	(-3.76)	(-3.86)	(-1.30)	(-3.84)	(-0.66)
Size	-0.010***	-0.009***	-0.004	-0.007	-0.009***	-0.060***
	(-3.27)	(-3.02)	(-1.20)	(-0.86)	(-2.71)	(-3.71)
Book-to-market	-0.001	0.000	-0.016*	0.030	-0.004	0.006
	(-0.10)	(0.01)	(-1.77)	(1.23)	(-0.43)	(0.11)
Institutional holding	-0.226***	-0.224***	-0.193***	-0.162***	-0.232***	-0.374***
	(-10.64)	(-10.58)	(-7.91)	(-3.28)	(-10.10)	(-3.88)
All-star analyst dummy	-0.058***	-0.058***	-0.095***	-0.072**	-0.056***	-0.070*
	(-3.88)	(-3.82)	(-5.31)	(-2.19)	(-3.63)	(-1.65)
Affiliation	0.056***	0.055***	0.047***	-0.001	0.064***	0.074
	(4.21)	(4.12)	(3.10)	(-0.04)	(4.45)	(1.31)
Initiation dummy	0.200***	0.202***	0.131***	0.191***	0.203***	0.142
	(8.85)	(8.94)	(4.98)	(3.07)	(8.44)	(1.54)
No. analysts covering firm	0.041***	0.039***	-0.021***	0.014	0.039***	0.141***
	(6.45)	(6.20)	(-2.86)	(0.87)	(5.81)	(5.46)
Jobmove	0.071***	0.072***	0.031*	0.062*	0.077***	-0.007
	(5.16)	(5.17)	(1.93)	(1.78)	(5.35)	(-0.14)
G-index	0.006***		0.005***	0.001	0.006***	-0.029
	(4.56)		(3.60)	(0.05)	(3.26)	(-1.25)
MLE dummy		0.037***				
		(3.28)				
ME dummy		0.061***				
		(3.29)				
Observations	155,009	155,009	155,009	13,983	133,950	7,076

Constant cut1	-0.553***	-0.553***	-0.269***	-0.517***	-0.533***	-2.087***
Constant cut2	0.303***	0.302***		0.330*	0.325***	-1.255**

Table 2 (Continued)

Panel B: Marginal effects

	Whole sample			Subsamples		
	Model 1	Model 2	Model 3 (probit)	Least ent.	Medium ent.	Most ent.
Firm experience	0.0084	0.0086	0.0082	0.0065	0.0088	0.0031
	(-0.0087)	(-0.0088)		(-0.0068)	(-0.0091)	(-0.0031)
Career experience	-0.0001	-0.0002	0.0004	0.0001	0.0000	-0.0012
	(0.0001)	(0.0002)		(-0.0001)	(0.0000)	(0.0012)
Workload	-0.0128	-0.0126	-0.0159	-0.0098	-0.0134	-0.0067
	(0.0131)	(0.0130)		(0.0102)	(0.0138)	(0.0068)
Size	-0.0037	-0.0034	-0.0016	-0.0026	-0.0032	-0.0218
	(0.0038)	(0.0035)		(0.0027)	(0.0033)	(0.0220)
Book-to-market	-0.0003	0.0000	-0.0059	0.0106	-0.0014	0.0020
	(0.0003)	(0.0000)		(-0.0112)	(0.0014)	(-0.0021)
Institutional holding	-0.0811	-0.0805	-0.0691	-0.0575	-0.0832	-0.1360
	(0.0835)	(0.0829)		(0.0603)	(0.0856)	(0.1375)
All-star analyst dummy	-0.0207	-0.0205	-0.0335	-0.0254	-0.0199	-0.0251
	(0.0217)	(0.0214)		(0.0272)	(0.0208)	(0.0259)
Affiliation	0.0202	0.0198	0.0169	-0.0004	0.0231	0.0271
	(-0.0204)	(-0.0200)		(0.0005)	(-0.0232)	(-0.0267)
Initiation dummy	0.0736	0.0745	0.0479	0.0698	0.0747	0.0528
	(-0.0718)	(-0.0725)		(-0.0697)	(-0.0726)	(-0.0513)
No. analysts covering firm	0.0147	0.0141	-0.0075	0.0051	0.0139	0.0513
	(-0.0151)	(-0.0146)		(-0.0054)	(-0.0143)	(-0.0518)
Jobmove	0.0260	0.0260	0.0111	0.0223	0.0279	-0.0025
	(-0.0261)	(-0.0261)		(-0.0229)	(-0.0279)	(0.0025)
G-index	0.0021		0.0020	0.0002	0.0020	-0.0105

	(-0.0022)			(-0.0003)	(-0.0020)	(0.0106)
MLE dummy		0.0130				
		(-0.0136)				
ME dummy		0.0222				
		(-0.0223)				

Panel A of this table, except for model 3, presents the results of an ordered probit regression of analyst bias on G-index and control variables. Following Ljungqvist et al. (2007), we measure analyst bias for analyst i as the difference between recommendation of analyst i and consensus recommendation, which is the median recommendation for the previous quarter. To find consensus we use the most recent recommendation of each analyst covering the stock within a one-year period. The analyst bias variable ranges from -4 to 4, and we use a three-level choice variable where positive numbers refer to optimism, negative numbers refer to pessimism, and 0 is an objective recommendation. For model 3, we use a simple probit model where there is a two-level choice variable: issuing a recommendation above the consensus or otherwise. All other variables are defined in Table 1. The MLE dummy is equal to 1 if G-index is between 5 and 14 and zero otherwise. The ME dummy is equal to 1 if G-index is greater than 13 and zero otherwise. The least entrenchment sample includes companies with G-index less than 6. Companies that have G-index greater than 13 constitute the most entrenchment sample. The remaining companies are in the medium-level-entrenchment sample. In Panel A, z-stats are presented in parentheses. The standard errors are clustered by analyst, meaning that observations are assumed to be independent across analysts but not necessarily within them. ***, **, and * refer to one percent, five percent, and ten percent significance levels respectively. Panel B shows the marginal effects of coefficients in Panel A. The choice level is optimism for the first row of each coefficient, and pessimism for the second row of each coefficient, written in parentheses.

Table 3

T-tests between recommendations for firms with different levels of managerial entrenchment, made by the same analysts.

Panel A: Mean difference in recommendations of same affiliated analysts

Entrenchment	No. affiliated analyst recommendations	Mean	Difference in means (1-2)	
Least (1)	690	-0.147	-0.128	***
Medium (2)	1,071	-0.019	(0.003)	
Least (1)	25	-0.220	-0.470	**
Most (2)	26	0.250	(0.030)	
Medium (1)	481	-0.032	-0.046	
Most (2)	257	0.014	(0.270)	

Panel B: Mean difference in recommendations of same unaffiliated analysts

Entrenchment	No. affiliated analyst recommendations	Mean	Difference in means (1-2)	
Least (1)	11,558	-0.050	-0.024	**
Medium (2)	42,919	-0.026	(0.015)	
Least (1)	2,286	-0.060	-0.078	***
Most (2)	2,215	0.018	(0.006)	
Medium (1)	29,777	-0.027	-0.032	**
Most (2)	6,263	0.005	(0.015)	

This table compares the mean differences of recommendations made by the same analysts for companies with different entrenchment levels. Panel A examines recommendations made by affiliated analysts and Panel B examines recommendations made by unaffiliated analysts. Definitions of subsamples are given in Table 2. The last column shows the differences in mean level of same analysts' recommendation between subsamples. P-values are given in parentheses. ***, **, * refer to one percent, five percent, and ten percent significance levels respectively.

Table 4

Large sample tests.

	Table 1			Table 6	Table 2			Table 5	
	Model 1	Model 2	Model 3	E-index	Least ent.	Medium ent.	Most ent.	Prereg.	Postreg.
G-index	0.006***		0.004**		0.016	0.004**	-0.021	0.008***	-0.000
	(3.50)		(2.17)		(0.68)	(1.99)	(-0.78)	(4.25)	(-0.07)
MLE dummy		0.049***							
		(3.21)							
ME dummy		0.069***							
		(3.00)							
E-index				0.006*					
				(1.85)					
Observations	88,625	88,625	88,625	88,625	7,397	75,731	5,497	64,804	23,821

The regressions in this table replicate the regressions in other tables using a subsample of the largest companies. Following Ljungqvist et al. (2007), we create a sample of the largest five companies within each three-digit SIC code, ranked by market capitalization, for each year. There are 88,625 observations in this subsample. All the variables are defined in Tables 1 and 2. Z-stats are presented in parentheses. ***, **, * refer to one percent, five percent, and ten percent significance levels respectively.

Table 5

Heckman model.

	Equals one if analyst covers stock		Relative recommendation	
Firm experience			0.024	***
			(7.07)	
Career experience			-0.003	
			(-0.87)	
Workload			-0.015	*
			(-1.68)	
Size	0.007	***	-0.005	*
	(3.20)		(-1.71)	
Book-to-market	-0.025	***	0.003	
	(-3.91)		(0.40)	
Institutional holding	-0.106	***	-0.227	***
	(-7.84)		(-11.06)	
All-star analyst dummy			-0.033	**
			(-2.26)	
Affiliation			0.065	***
			(5.14)	
Initiation dummy			0.196	***
			(8.72)	
No. analysts covering firm	0.289	***	0.107	***
	(61.38)		(13.29)	
Jobmove			0.074	***
			(5.60)	
G-index	-0.003	***	0.005	***
	(-2.96)		(4.12)	
Fraction of firms in FF industry covered by broker	8.283	***		
	(19.99)			

This table presents the results of the Heckman model. The dependent variable is a three-level choice variable where positive numbers refer to optimism, negative numbers refer to pessimism, and 0 is an objective recommendation. All the variables are defined in Tables 1 and 2. To instrument the coverage decision, we use the fraction of firms in the Fama-French industry covered by the broker. Z-stats are presented in parentheses. The standard errors are clustered by analyst, meaning that observations are assumed to be independent across analysts but not necessarily within them. ***, **, * refer to one percent, five percent, and ten percent significance levels respectively.

Table 6

The effect of managerial entrenchment on analyst bias and marginal effects for sub-periods.

Panel A: Regression results

	Whole sample		Subsamples					
			Least entrenchment		Medium entrenchment		Most entrenchment	
	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period
Firm experience	0.028***	0.009	0.026***	-0.014	0.028***	0.012**	0.014	-0.015
	(6.92)	(1.27)	(2.67)	(-0.70)	(8.58)	(2.10)	(1.02)	(-0.57)
Career experience	-0.004	0.008	-0.011	0.031**	-0.003	0.006	-0.008	0.008
	(-1.18)	(1.54)	(-1.39)	(2.21)	(-0.90)	(1.42)	(-0.62)	(0.41)
Workload	-0.039***	-0.020	-0.038*	0.011	-0.040***	-0.022**	-0.012	-0.031
	(-3.59)	(-1.19)	(-1.80)	(0.28)	(-5.76)	(-2.10)	(-0.43)	(-0.54)
Size	-0.006	-0.024***	-0.005	-0.015	-0.004	-0.023***	-0.057***	-0.090***
	(-1.54)	(-4.78)	(-0.54)	(-0.90)	(-1.37)	(-5.07)	(-3.30)	(-2.65)
Book-to-market	-0.004	0.012	0.022	0.083	-0.007	0.009	0.003	0.029
	(-0.42)	(0.71)	(0.88)	(1.12)	(-0.79)	(0.58)	(0.05)	(0.24)
Institutional holding	-0.323***	-0.176***	-0.209***	-0.187*	-0.334***	-0.188***	-0.548***	0.127
	(-13.07)	(-4.78)	(-3.87)	(-1.77)	(-15.00)	(-5.15)	(-5.20)	(0.60)
All-star analyst dummy	-0.017	-0.165***	-0.034	-0.197***	-0.013	-0.161***	-0.033	-0.182**
	(-0.97)	(-6.49)	(-1.06)	(-2.99)	(-1.21)	(-9.32)	(-0.78)	(-2.27)
Affiliation	0.081***	-0.010	0.026	-0.107	0.088***	0.003	0.128**	-0.068
	(5.24)	(-0.41)	(0.71)	(-1.48)	(5.91)	(0.12)	(2.02)	(-0.57)
Initiation dummy	0.210***	0.124***	0.215***	0.037	0.209***	0.138***	0.175*	-0.003
	(8.12)	(2.79)	(3.27)	(0.28)	(9.34)	(3.66)	(1.83)	(-0.02)
No. analysts covering firm	0.027***	0.074***	-0.006	0.065*	0.025***	0.070***	0.137***	0.178***
	(3.67)	(7.04)	(-0.30)	(1.89)	(4.10)	(7.47)	(5.01)	(3.56)
Jobmove	0.032*	0.140***	0.042	0.096	0.034**	0.148***	-0.015	0.021
	(1.93)	(6.00)	(1.05)	(1.43)	(2.51)	(7.66)	(-0.28)	(0.21)
G-index	0.009***	0.001	0.003	0.009	0.009***	0.001	-0.031	-0.024
	(5.69)	(0.52)	(0.22)	(0.33)	(4.75)	(0.31)	(-1.17)	(-0.65)
Observations	109,098	45,911	10,612	3,371	93,047	40,903	5,439	1,637
Constant cut1	-0.507***	-0.842***	-0.557***	-0.492	-0.472***	-0.852***	-2.135***	-2.370**

Constant cut2	0.343***	0.032	0.289	0.364	0.380***	0.024	-1.312**	-1.501

Table 6 (Continued)

Panel B: Marginal effects

	Whole sample		Subsamples					
			Least entrenchment		Medium entrenchment		Most entrenchment	
	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period	Pre-regulation period	Post-regulation period
Firm experience	0.0099	0.0032	0.0092	-0.0050	0.0100	0.0043	0.0052	-0.0054
	(-0.0103)	(-0.0032)	(-0.0098)	(0.0050)	(-0.0104)	(-0.0043)	(-0.0052)	(0.0056)
Career experience	-0.0015	0.0029	-0.0039	0.0114	-0.0009	0.0021	-0.0027	0.0030
	(0.0015)	(-0.0029)	(0.0042)	(-0.0115)	(0.0010)	(-0.0021)	(0.0028)	(-0.0031)
Workload	-0.0138	-0.0073	-0.0135	0.0040	-0.0143	-0.0080	-0.0045	-0.0111
	(0.0144)	(0.0073)	(0.0143)	(-0.0040)	(0.0150)	(0.0080)	(0.0045)	(0.0115)
Size	-0.0021	-0.0087	-0.0016	-0.0053	-0.0014	-0.0085	-0.0208	-0.0321
	(0.0022)	(0.0087)	(0.0017)	(0.0053)	(0.0015)	(0.0085)	(0.0210)	(0.0331)
Book-to-market	-0.0014	0.0043	0.0078	0.0301	-0.0024	0.0032	0.0011	0.0104
	(0.0015)	(-0.0043)	(-0.0083)	(-0.0302)	(0.0025)	(-0.0032)	(-0.0011)	(-0.0107)
Institutional holding	-0.1152	-0.0637	-0.0737	-0.0680	-0.1192	-0.0681	-0.2002	0.0454
	(0.1201)	(0.0637)	(0.0783)	(0.0681)	(0.1242)	(0.0680)	(0.2015)	(-0.0467)
All-star analyst dummy	-0.0059	-0.0580	-0.0120	-0.0691	-0.0045	-0.0569	-0.0120	-0.0630
	(0.0062)	(0.0611)	(0.0129)	(0.0738)	(0.0047)	(0.0598)	(0.0122)	(0.0683)
Affiliation	0.0294	-0.0038	0.0092	-0.0381	0.0320	0.0011	0.0476	-0.0241
	(-0.0298)	(0.0038)	(-0.0097)	(0.0396)	(-0.0323)	(-0.0011)	(-0.0458)	(0.0254)
Initiation dummy	0.0773	0.0457	0.0781	0.0134	0.0768	0.0510	0.0656	-0.0011
	(-0.0759)	(-0.0443)	(-0.0784)	(-0.0133)	(-0.0753)	(-0.0492)	(-0.0627)	(0.0011)
No. analysts covering firm	0.0097	0.0267	-0.0020	0.0235	0.0091	0.0255	0.0500	0.0635
	(-0.0101)	(-0.0267)	(0.0021)	(-0.0235)	(-0.0094)	(-0.0255)	(-0.0503)	(-0.0653)

Jobmove	0.0115	0.0518	0.0148	0.0354	0.0122	0.0549	-0.0055	0.0074
	(-0.0119)	(-0.0493)	(-0.0155)	(-0.0343)	(-0.0125)	(-0.0520)	(0.0056)	(-0.0076)
G-index	0.0031	0.0004	0.0012	0.0033	0.0030	0.0003	-0.0112	-0.0085
	(-0.0032)	(-0.0004)	(-0.0012)	(-0.0033)	(-0.0032)	(-0.0003)	(0.0113)	(0.0088)

Panel A of this table presents the results of an ordered probit regression of analyst bias on G-index and control variables. All the variables are defined in Tables 1 and 2. The pre-regulation period includes observations until April 28, 2003, when the Global Settlement was agreed. The post-regulation period includes observations on and after April 28, 2003. The least-entrenchment sample includes companies with G-index less than 6. Companies that have G-index greater than 13 constitute the most-entrenchment sample. The remaining companies are in the medium-level-entrenchment sample. In Panel A, z-stats are presented in parentheses. The standard errors are clustered by analyst, meaning that observations are assumed to be independent across analysts but not necessarily within them. ***, **, * refer to one percent, five percent, and ten percent significance levels respectively. Panel B shows the marginal effects of coefficients in Panel A. The choice level is optimism for the first row of each coefficient and pessimism for the second row of each coefficient, written in parentheses.

Table 7

Robustness checks.

Panel A: Regression results

	E-index			Hostile takeover index		
	Whole sample	Pre-regulation period	Post-regulation period	Whole sample	Pre-egulation period	Post-regulation period
Firm experience	0.024***	0.029***	0.009	0.021***	0.023***	0.01
	(6.87)	(7.12)	(1.29)	(5.72)	(5.53)	(-1.40)
Career experience	-0.001	-0.004	0.008	-0.001	-0.004	0.006
	(-0.18)	(-1.27)	(1.54)	(-0.20)	(-1.02)	(-1.15)
Workload	-0.035***	-0.038***	-0.020	-0.041***	-0.045***	-0.024
	(-3.73)	(-3.48)	(-1.19)	(-4.43)	(-4.22)	(-1.43)
Size	-0.008***	-0.003	-0.024***	-0.021***	-0.018***	-0.032***
	(-2.70)	(-0.88)	(-4.72)	(-6.31)	(-4.49)	(-5.72)
Book-to-market	0.000	-0.002	0.012	-0.001	-0.002	0.006
	(0.04)	(-0.25)	(0.74)	(-0.11)	(-0.22)	(-0.34)
Institutional holding	-0.225***	-0.318***	-0.174***	-0.219***	-0.314***	-0.195***
	(-10.54)	(-12.80)	(-4.71)	(-10.13)	(-12.45)	(-5.21)
All-star analyst dummy	-0.058***	-0.016	-0.164***	-0.063***	-0.023	-0.165***
	(-3.83)	(-0.92)	(-6.48)	(-4.13)	(-1.33)	(-6.25)
Affiliation	0.054***	0.079***	-0.011	0.060***	0.088***	-0.011
	(4.09)	(5.06)	(-0.42)	(4.32)	(5.39)	(-0.41)
Initiation dummy	0.203***	0.215***	0.125***	0.184***	0.188***	0.124***
	(8.95)	(8.28)	(2.81)	(7.91)	(6.99)	(-2.73)
No. analysts covering firm	0.040***	0.026***	0.073***	0.053***	0.040***	0.084***
	(6.27)	(3.47)	(6.98)	(8.13)	(5.27)	(-7.60)
Jobmove	0.071***	0.032*	0.140***	0.073***	0.035**	0.139***
	(5.14)	(1.91)	(6.00)	(5.21)	(2.04)	(-5.87)
E-index	0.007***	0.009***	0.000			
	(2.70)	(3.06)	(0.05)			
Hostile takeover index				0.386***	0.475***	0.176**
				(10.10)	(10.58)	(-2.57)
Observations	155,009	109,098	45,911	142,629	100,156	42,473
Constant cut1	-0.548***	-0.503***	-0.844***	-0.784***	-0.775***	-1.008***

Constant cut2	0.307***	0.346***	0.030	0.073	0.076	-0.132

Table 7 (Continued)

Panel B: Marginal effects

	E-index			Hostile takeover index		
	Whole sample	Pre-regulation period	Post-regulation period	Whole sample	Pre-regulation period	Post-regulation period
Firm experience	0.0086	0.0102	0.0032	0.0074	0.0082	(0.0035)
	(-0.0089)	(-0.0106)	(-0.0032)	(-0.0076)	(-0.0085)	(-0.0035)
Career experience	-0.0002	-0.0016	0.0028	-0.0002	-0.0013	(0.0022)
	(0.0002)	(0.0016)	(-0.0028)	(0.0002)	(0.0013)	(-0.0022)
Workload	-0.0125	-0.0135	-0.0073	-0.0148	-0.0159	(-0.0089)
	(0.0129)	(0.0140)	(0.0073)	(0.0152)	(0.0166)	(0.0088)
Size	-0.0030	-0.0012	-0.0085	-0.0077	-0.0065	(-0.0115)
	(0.0031)	(0.0012)	(0.0085)	(0.0079)	(0.0068)	(0.0114)
Book-to-market	0.0001	-0.0008	0.0045	-0.0003	-0.0008	(0.0021)
	(-0.0001)	(0.0009)	(-0.0045)	(0.0003)	(0.0008)	(-0.0021)
Institutional holding	-0.0806	-0.1133	-0.0631	-0.0787	-0.1120	(-0.0710)
	(0.0830)	(0.1181)	(0.0631)	(0.0809)	(0.1167)	(0.0707)
All-star analyst dummy	-0.0205	-0.0057	-0.0579	-0.0225	-0.0082	(-0.0582)
	(0.0215)	(0.0059)	(0.0610)	(0.0236)	(0.0086)	(0.0611)
Affiliation	0.0196	0.0284	-0.0039	0.0219	0.0320	(-0.0039)
	(-0.0198)	(-0.0288)	(0.0039)	(-0.0220)	(-0.0323)	(0.0039)
Initiation dummy	0.0747	0.0790	0.0459	0.0678	0.0687	(0.0457)
	(-0.0727)	(-0.0775)	(-0.0445)	(-0.0662)	(-0.0679)	(-0.0441)
No. analysts covering firm	0.0143	0.0092	0.0265	0.0192	0.0144	(0.0306)
	(-0.0147)	(-0.0096)	(-0.0265)	(-0.0197)	(-0.0150)	(-0.0305)
Jobmove	0.0259	0.0114	0.0518	0.0267	0.0126	(0.0515)
	(-0.0260)	(-0.0118)	(-0.0493)	(-0.0267)	(-0.0129)	(-0.0488)
E-index	0.0025	0.0034	0.0001			
	(-0.0026)	(-0.0035)	(-0.0001)			

Hostile takeover index	0.1385	0.1694	(0.0640)
	(-0.1424)	(-0.1765)	(-0.0637)

Panel A of this table presents the results of an ordered probit regression of analyst bias on E-index, the hostile takeover index, and control variables. The pre-regulation period includes observations until April 28, 2003, when the Global Settlement was agreed. The post-regulation period includes observations on and after April, 28 2003. All variables are defined in Tables 1 and 2. The hostile takeover index is taken from Dr. McKeon's website, http://pages.uoregon.edu/smckeon/. The least-entrenchment sample includes companies with G-index less than 6. Companies that have G-index greater than 13 constitute the most-entrenchment sample. The remaining companies are in the medium-level-entrenchment sample. In Panel A, z-stats are presented in parentheses. The standard errors are clustered by analyst, meaning that observations are assumed to be independent across analysts but not necessarily within them. ***, **, * refer to one percent, five percent, and ten percent significance levels respectively. Panel B shows the marginal effects of the coefficients in Panel A. The choice level is optimism for the first row of each coefficient and pessimism for the second row of each coefficient, written in parenthesis.