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Corporate Governance and Analyst Behavior: Evidence from an Emerging Market

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Abstract

This study examines how analysts would recommend poorly governed firms to their clients in an emerging market where information asymmetry tends to be high and shareholder rights are not well protected by legal systems. Given that analysts have incentives to access managers and to help their brokerage houses win investment banking deals, we hypothesize that poor corporate governance reveals a firm's preference for upward-bias recommendations, while good corporate governance reveals its preference for more accurate information, and that analysts are inclined to give what the firm prefers. We examine 55 652 recommendations on firms listed on the Taiwan Stock Exchange and find evidence consistent with our hypothesis. Our study implies that analysts' buy recommendations on firms with poorer corporate governance are less reliable. Furthermore, improving corporate governance not only can reduce agency problems within firms, but can also enhance information quality produced by analysts and reduce information risk faced by investors.

Keywords Corporate governance; Analyst recommendations; Analyst bias

JEL Classification: G14, G24, G32

1. Introduction

Security analysts of brokerage houses frequently provide investors with buy, hold, or sell recommendations on the firms they cover. Their recommendations lead investors to reevaluate the firms, often resulting in significant changes in stock prices.[1] While their reputation of providing reliable information is important,

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[1]See, for example, Womack (1996), Barber *et al.* (2001), and Jegadeesh *et al.* (2004).

analysts have incentives to give favorable recommendations to help their brokerage firms generate more revenue.[2] In fact, many studies have shown that analysts issue far more buy than sell recommendations and that analysts affiliated with firms' Initial Public Offering (IPO) or Search Engine Optimization (SEO) underwriters tend to issue upward-bias recommendations, compared to those issued by unaffiliated analysts.[3]

The purpose of this study is to address a simple question: how would analysts recommend poorly governed firms to their clients in emerging markets where information asymmetry is high and shareholder rights are not well protected by legal systems? Tirole (2001) suggests that "a good governance structure is then one that selects the most able managers and makes them accountable to investors" (p. 3). La Porta *et al.* (2000) further note that "corporate governance is, to a large extent, a set of mechanisms through which outside investors protect themselves against expropriation by the insiders" (p. 4). Thus, intuitively, one expects that, *ceteris paribus*, analysts would give more favorable recommendations on firms with better corporate governance with which their clients could better assure themselves of a return on their investments (Shleifer and Vishny, 1997).

However, this naïve expectation does not properly take into account analysts' incentives. While the literature has recognized that analysts have incentives to issue positive recommendations on a firm that is an investment banking client or a potential client, we contend that analysts' incentives to bias also depend on the firm's corporate governance. Since poorly governed firms tend to be less transparent and more likely to manage earnings,[4] managers of such firms would prefer investment bankers whose analysts could issue favorable recommendations to help camouflage their actions. Conversely, as we argue below, managers of firms with good corporate governance would prefer investment bankers whose analysts could provide more accurate information to their investors.

As La Porta *et al.* (2000) point out, firms can generally obtain outside finance on better terms when insiders expropriate less and their private benefits of control diminish. Furthermore, La Porta *et al.* (2002) show that market valuation tends to be higher for firms with better protection of minority shareholders. And, Gompers *et al.* (2003) report that firms with stronger shareholder rights have higher firm value, higher profits, and higher sales growth. Thus, making managers accountable to investors and protecting minority shareholders is consistent with the principle of maximizing firm value.

[2]Under short-selling constraints, buy recommendations could generate more trading business than sell recommendations. Also, favorable recommendations may help brokerage firms win future underwriting deals. By helping their brokerage firms generate more revenue, analysts' compensations would increase.

[3]See, for example, Lin and McNichols (1998), Michaely and Womack (1999), and Malmendier and Shanthikumar (2007).

[4]See, for example, Francis *et al.* (2005), and Fan and Wong (2002).

Given that analysts have incentives to access managers and to help their brokerage houses win investment banking deals, we propose a simple hypothesis to link a firm's corporate governance to the behavior of analysts who cover the firm in an emerging market. Specifically, we posit that poor corporate governance reveals a firm's preference for upward-bias recommendations, while good corporate governance reveals its preference for more honest opinions, and that analysts, particularly underwriting-affiliated analysts, are inclined to provide what the firm prefers.

Both underwriting-affiliated and unaffiliated analysts have incentives to take into consideration what the firm prefers so that they can maintain or establish business relationships with the firm and hopefully win future underwriting deals (Bradshaw *et al.*, 2006; Malmendier and Shanthikumar, 2007). Furthermore, analysts are afraid of being "frozen out" and not able to access managers for information in the future if they do not take into consideration what managers prefer.[5]

Underwriting-affiliated analysts have stronger incentives than unaffiliated ones to catering to managers' needs since they have more to lose.[6] In particular, Hong and Kubik (2003) show that, "for analysts who cover stocks underwritten by their houses, job separations depend less on accuracy and more on optimism" (p. 313). Furthermore, business relationships allow affiliated analysts to know more about managers' preferences and their ways of doing business. Consequently, it is more difficult for underwriting-affiliated analysts to keep managers of (poorly governed) firms they cover at arm's length.

Thus, as previous studies have suggested, it is understandable that analysts have incentives to issue upward-bias recommendations. Our hypothesis further argues that, in emerging markets, poor corporate governance of recommended firms strengthens analysts' incentives by inducing them to shift their balance more toward optimism because the corporate culture that tolerates managerial behavior with adverse selection and moral hazard problems tends to reveal managers' preference for upward-bias recommendations; and, investment bankers would somehow pressure their analysts to deliver them. As Michaely and Womack (1999) point out, "there is implicit pressure on analysts to issue and maintain positive recommendations on a firm that is either an investment banking client or a potential client" (p. 654).

For firms with good corporate governance, the set of mechanisms that protect outside investors make the firm more transparent and cause managers to be more conscious about, and careful to avoid, agency problems that may violate corporate governance rules. Consequently, managers of well-governed firms would be less likely to influence or pressure investment bankers for biased recommendations. This

[5]Lim (2001) finds evidence consistent with his hypothesis that financial analysts trade off bias to improve management access and forecast accuracy.

[6]Ljungqvist *et al.* (2006) show that the main determinant of the lead-bank choice for a firm's future security offerings is "the strength of prior underwriting and lending relationships".

makes it easier for analysts to do their job of providing their clients with more timely reliable information on the firm, which in turn allows analysts to accumulate reputation capital.

To test our hypothesis, we use a sample of 55 652 recommendations issued by analysts affiliated with brokerage houses in Taiwan on firms listed on the Taiwan Stock Exchange (TWSE). Since existing studies that examine the affiliated analyst bias largely use data from the US market, our data from an emerging market could provide a further test on the bias. Furthermore, in emerging markets with high information asymmetry, corporate governance could play a more critical role in mitigating agency problems.[7] Thus, the effect of corporate governance on analyst behavior, if it exists, would be more profound and should be more easily detected using our data from an emerging market than it would be using data from the well-developed US market.[8] Additionally, as in many emerging markets, most investors in Taiwan are retail investors (by value and number of trades),[9] for whom analyst recommendations are important sources of information. Hence, given that retail investors are frequently misled by analysts,[10] it is important to clarify the role of corporate governance in mitigating analyst bias.

Indeed, we find that, holding other things constant: (i) analysts are more (less) likely to give buy (sell) recommendations on firms with poor corporate governance than on firms with good corporate governance; and that (ii) affiliated analysts give additional bias, which increases as recommended firms' corporate governance decreases. Analyzing stock price reactions to analyst recommendations, we further find that while the market reacts positively when buy recommendations are announced, it puts discounts on buy recommendations on firms with poor corporate governance, and discounting is larger on underwriting-affiliated firms than it is

[7]According to Yeh *et al.* (2001), companies listed on the TWSE are predominantly family-controlled, with a high degree of ownership in general (many small individual investors), and low institutional ownership. These ownership characteristics are similar to those of publicly traded companies in most countries around the world (see, e.g. La Porta *et al.*, 1999; Claessens *et al.*, 2000). Yeh *et al.* (2001) further point out that investors have approximately the same number of shareholder rights as the average reported for the 49 countries in La Porta *et al.* (1998).

[8]In the next section we review two studies that show how the global research analyst settlement reached in 2003 affects analyst behavior in the US market.

[9]The monthly trading statistics of the security market of the TWSE reports that the percentage of retail investors in trading volume ranges from 91.9 to 88.2% during the sample period (1995–1999). Even though the percentage of retail investors is decreasing, the percentage of retail investors in trading volume is still 61.9%, more than 50%, in 2011.

[10]Malmendier and Shanthikumar (2007) suggest that retail investors are more likely to be misguided by analyst recommendations and incur losses.

on unaffiliated firms.[11] Thus, consistent with our hypothesis, the data reveals that analyst recommendations on firms with poorer corporate governance contain more upward bias.

Our findings imply that when a firm improves its corporate governance, analysts who cover the firm would be less inclined to bias their recommendations. Thus, while improving corporate governance can reduce agency problems within the firm, it also has an externality in moderating analyst bias.

The remainder of our paper is organized as follows. Section 2 provides a review of the literature on analyst recommendations and on corporate governance, and then presents our hypothesis. Section 3 describes our data. Section 4 presents evidence of analyst bias and its relation with corporate governance. Section 5 investigates the discounts the market places on analyst bias. Section 6 addresses the question: which corporate governance mechanisms are effective in moderating analyst bias? Section 7 contains our concluding remarks.

2. Literature Review and Hypothesis

2.1. Analysts Recommendations

The literature on the behavior of financial analysts has noted significant differences between the recommendations issued by analysts with and without investment banking ties to the firms they cover. For example, Lin and McNichols (1998) show that lead and co-underwriter analysts' recommendations are significantly more favorable than those made by unaffiliated analysts. They also show that stock returns associated with lead underwriter hold recommendations are significantly more negative than those associated with unaffiliated hold recommendations, suggesting that "investors expect lead analysts are more likely to recommend 'Hold' when 'Sell' is warranted" (p. 101).

Similarly, Michaely and Womack (1999) report that underwriter analysts' recommendations contain significant bias and that the market does not recognize the full extent of this bias. In particular, they show that stocks affiliated analysts recommend to buy perform more poorly than those buys recommended by unaffiliated analysts prior to, at the time of, and subsequent to the recommendation date. Furthermore, Dechow *et al.* (2000) find that analysts employed by the lead managers of equity offerings make the most optimistic growth forecasts, and that post-

[11]Similar to Lin and McNichols (1998), Michaely and Womack (1999), and Malmendier and Shanthikumar (2007), we show that the market discounts upward-bias recommendations. The findings do not mean that investors can detect the implicit collusion by the poorly governed firms and the analysts. Rather, better informed investors, to some extent, are aware of analysts' upward bias and discount their recommendations. In other words, upward-bias buy recommendations still generate positive reactions, which, however, are smaller than the reactions to less biased buy recommendations.

offering underperformance is most pronounced for firms with the highest growth forecasts made by affiliated analysts.

According to O'Brien *et al.* (2005), affiliated analysts tend to be slower to downgrade, but faster to upgrade, their recommendations than unaffiliated analysts. Their study suggests that investment banking ties influence the speed with which analysts convey favorable and unfavorable news.

However, Bradshaw *et al.* (2006) argue that both affiliated and unaffiliated analysts issue overly optimistic forecasts and upward-bias recommendations on firms with external financial activities. They suggest that analyst over optimism is "primarily attributable to some combination of indirect investment banking pressures, incentives to generate brokerage business and analyst naiveté, rather than to direct investment banking conflicts" (p. 55).

More related to our Taiwan data, Shen and Chih (2009) examine whether conflicts of interest between the brokerage and proprietary trading divisions of investment banks exist in Taiwan. They find that investment banks buy (sell) the recommended stocks through their proprietary trading division before issuing recommendations. The evidence suggests that the conflicts of interest do exist in Taiwan and that investment banks could profit from their recommendations in the short run.

Recently, Malmendier and Shanthikumar (2009) show that, while large traders exert buy pressure following strong buy recommendations, they display no significant reaction to buy recommendations and exert selling pressure following hold recommendations. The discounting is particularly strong on affiliated recommendations. In contrast, small traders follow recommendations literally—they exert buy pressure following both buy and strong buy recommendations and zero pressure following hold recommendations. Their analyses suggest that small traders are more likely to be misguided by analyst recommendations and incur losses.

Thus, there is strong evidence to suggest that analysts bias their recommendations upwards. In fact, in 2003, 10 Wall Street brokerage houses reached a global research analyst settlement with the Securities and Exchange Commission (SEC), the New York Stock Exchange (NYSE), the National Association of Securities Dealers (NASD) and the New York Attorney General in the amount of US$1.4 billion for their failure to ensure that the research their analysts provided to customers was independent and unbiased. The case illustrates the seriousness of analyst bias.

Interestingly, Kadan *et al.* (2009)examine the effect of recent regulations—NASD Rule 2711, NYSE Rule 472, and the Global Analyst Research Settlement—on analyst recommendation performance, and find that "the overall informativeness of recommendations has declined" (p. 4189). They show that while affiliated analysts are still reluctant to issue pessimistic recommendations, issuing optimistic recommendations no longer depends on whether analysts are affiliated with the covered firm. Also, Clarke *et al.* (2011) report that "independent research firms set up after the Global Research Settlement are of inferior quality; they issue more optimistic and less innovative recommendations that generate lower announcement period

returns than independent firms existing prior to the Settlement" (p. 529). Thus, the regulations that aim to mitigate the conflicts of interest between research and investment banking departments of US brokerage houses have unintended consequences, and may not remove analyst bias.

Analyst bias should be even more severe in emerging markets than in the well-developed US market. As we postulate in this paper, in an emerging market where information asymmetry is high and shareholder rights are not well protected, poor corporate governance of covered firms may induce analysts to put more weight on their incentives to issue upward-bias recommendations and less weight on their reputation.

2.2. Corporate Governance

Shleifer and Vishny (1997) state that "corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment" (p. 737). In their view, the agency problem (Jensen and Meckling, 1976) is a key concern to corporate governance since the opportunities for managers to abscond with financiers' funds, to invest in bad projects, or to steal profits are plentiful. Thus, after reviewing research in the area, Shleifer and Vishny suggest that "a good corporate governance system should combine some type of large investors [who can monitor managers] with legal protection of both their rights and those of small investors" (p. 739). In other words, as Tirole (2001) says, "a good governance structure is then one that selects the most able managers and makes them accountable to investors" (p. 3).

With the same reasoning, La Porta *et al.* (2000) note that outside investors face a risk that the returns on their investments will never materialize because corporate insiders (controlling shareholders and managers) may expropriate them.[12] Thus, they suggest that "corporate governance is, to a large extent, a set of mechanisms through which outside investors protect themselves against expropriation by the insiders" (p. 4).

Protecting outside investors is beneficial to the firm. As La Porta *et al.* (2000) and Tirole (2001) point out, when insiders expropriate less and their private benefits of control diminish, the firm can generally obtain outside finance on a better term. Joh (2003) finds that, in terms of firm profitability, stronger corporate governance in Korean firms is associated with better operating (accounting) performance. Furthermore, La Porta *et al.* (2002) show higher valuation of firms in countries with better protection for minority shareholders and in firms with higher cash-flow ownership by the controlling shareholder.

[12]As Hart (1995) summarizes, investors get their returns largely because they have certain power—the power to sue managers and directors and get compensations, and the power to vote for changing directors, stopping a project that may benefit insiders at the expense of outside investors, or liquidating the firm and receiving the proceeds.

Barclay *et al.* (1993) show that closed-end fund discounts are larger in funds with a higher managerial stock ownership. They argue that the discounts reflect blockholders' private benefits, which do not accrue to other shareholders. Similarly, Claessens *et al.* (2002) find that when the largest shareholder's control rights exceed cash-flow rights, corporate governance tends to be weak and firm value declines (see also Lemmon and Lins, 2003).

Mitton (2002) finds that stock prices of firms with higher disclosure quality (ADRs and auditors from the Big 6 accounting firms) and higher outside ownership concentration tend to perform better during the Asian financial crisis of 1997–1998. His results suggest that corporate governance that reduces information asymmetry and increases monitoring activities has a positive effect on firm valuation (see also Baeka *et al.*, 2004). Also, Johnson *et al.* (2000) report that, during the Asian financial crisis, stock markets decline more in countries with weak corporate governance, particularly when measured by the effectiveness of protection for minority shareholders.

In sum, the literature has shown that firms' operating and stock price performances benefit from corporate governance mechanisms that reduce information asymmetry and mitigate agency problems. Thus, protecting outside investors and minority shareholders is consistent with the principle of maximizing firm value.

2.3. A Hypothesis Linking Corporate Governance to Analyst Behavior

Based on Shleifer and Vishny's (1997) and La Porta *et al.*'s (2000) notion of corporate governance, we propose a simple hypothesis to link a firm's corporate governance to the behavior of analysts who cover the firm in an emerging market. First, we argue that corporate governance mechanisms affect managerial behavior. For firms with good corporate governance, the set of mechanisms that protect outside investors make the firm more transparent and cause managers to be more conscious about, and careful to avoid, agency problems that may violate corporate governance rules.

Conversely, for firms with poor corporate governance, insiders (managers and controlling shareholders) are more interested in private benefits of control, and less interested in protecting outside investors. To make it easier for themselves to reap private benefits, insiders would make their firms less transparent, and their accounting earnings less informative (Fan and Wong, 2002; Francis *et al.*, 2005). They may manage earnings upward when their firms perform poorly (Peasnell *et al.*, 2005). As Klein (2002) shows, earnings management and poor corporate governance mechanisms are positively related. Under this corporate culture, managers would prefer investment bankers whose analysts could provide favorable recommendations on the firms to their customers. The external endorsements could disguise managers' interests in private benefits of control. Furthermore, as Holmstrom and Tirole (1993) suggest, financial markets provide firms with measures of managerial performance. Analysts' favorable recommendations could inflate stock prices, lead to more compensation to managers, and increase insiders' wealth.

Thus, we hypothesis that, in an emerging market, poor corporate governance reveals a firm's preference for favorable recommendations, while good corporate governance reveals its preference for more honest opinions from analysts, and that analysts, particularly underwriting-affiliated ones, have incentives to cater to the firm's preference.

Our hypothesis is closely related to that of Bradshaw *et al.* (2006) and Malmendier and Shanthikumar (2007), who show that while affiliated analysts issue upward-bias recommendations (Lin and McNichols, 1998; Michaely and Womack, 1999), unaffiliated analysts, to a lesser extent, also issue upward-bias recommendations. Also related are Lim (2001) and Ljungqvist *et al.* (2007), who show that financial analysts trade off forecast accuracy and bias for accessing management, investment banking deals, and brokerage businesses.

We extend this literature by postulating that corporate governance within the firms that analysts cover plays a role in their decision processes, which manifests in their behavior of issuing recommendations. Specifically, our hypothesis suggests that analysts are inclined to provide upward-bias recommendations on firms with poor corporate governance, but more accurate information on firms with good corporate governance. Thus, our hypothesis predicts that, *ceteris paribus*, analysts' recommendations on firms with poorer corporate governance contain more upward bias and that the market would put a larger discount on recommendations with more bias.

3. Data

3.1. Analyst Recommendations

Our sample consists of 55 652 recommendations on 447 firms listed on the Taiwan Stock Exchange.[13] We collected this sample through the brokerage houses' reports compiled by Central News Agency in Taiwan over the 1996–1999 period. The recommendations were issued by financial analysts affiliated with 46 brokerage houses. Among them, 38 brokerage firms have both brokerage and investment banking businesses, and the remaining eight are relatively small brokerage houses that have no investment banking business. We refer to the analysts affiliated with the latter group as "independent" analysts.

By searching key words in the brokerage houses' reports, we assigned a score, from 1 to 4, to each recommendation as follows:

4 — Buy (Add, Outperform, Overweight, Accumulate, Strong Buy)
3 — LBuy (Long-term Buy)
2 — Hold (Wait, Neutral, Range Trade)
1 — Sell (Under-perform, Reduce, Underweight, Strong Sell)

[13]There were 477 firms listed on the exchange during the sample period. The 30 firms not in our sample received no recommendations during the sample period.

Table 1 reports the score distribution of the 55 652 recommendations. Buy recommendations account for 67% of all recommendations in our sample. There are very few (<1%) Strong Buy recommendations so we put them in the same category as Buy recommendations with a score of 4. We find that 17% of our recommendations indicate "buying for long term", which we refer to "LBuy", and assign a score of 3 for this group. (As we will show, there are significant differences between buy and long-term buy recommendations, in terms of firm characteristics and market reactions.) In sum, the positive recommendations account for 84% of all recommendations. Around 10% are Hold recommendations (a score of 2). Strong Sell, which is also very rare (<1%), we put in the same group as Sell recommendations and assign them a score of 1. They account for the remaining 6%. The average score of our sample recommendations is 3.46. Thus, our sample is similar to those of previous studies in which there are far more buy than sell recommendations.

Following Lin and McNichols (1998) and Malmendier and Shanthikumar (2007), we classify a recommendation as "affiliated" if it is issued by an analyst affiliated with the recommended firm's IPO underwriters within five years after its IPO (IPO_5), or SEO underwriters within 2 years after an SEO (P_SEO), or within 2 years before an SEO (F_SEO).[14] Of the 55 652 recommendations in our sample, 15 433, or 27.7%, are affiliated. The remaining 40 219 recommendations are unaffiliated, of which 4975 are issued by "independent" analysts.

Table 1 also presents the distribution of analyst recommendations by affiliation and score. There are several notable differences. First, 73% of the affiliated recommendations have a score of 4, which is higher than 53% of the independent ones or 64% of the unaffiliated ones with the same score. Second, independent analysts issue many more Hold recommendations, 32% versus 8% by affiliated analysts. Third, about 19% of the unaffiliated (including independent) recommendations are for Long-Term Buy, compared to 12% of the affiliated recommendations. To summarize their differences, the mean score of the affiliated recommendations is 3.54, which is significantly higher than 3.42 for the unaffiliated ones, or 3.14 for the independent ones. We report the test results for the differences in mean scores in Panel B of Table 1. Thus, consistent with earlier studies, affiliated analysts in our sample also tend to bias their recommendations upward, relative to unaffiliated ones.

Among the affiliated subsamples, the mean score of the IPO_5 recommendations is 3.53, which is very close to 3.52 for the P_SEO and 3.55 for the F_SEO recommendations. However, the mean scores of the three affiliated subsamples are all significantly higher than those of the unaffiliated sample. Furthermore, on average,

[14]Among the 447 sample firms, 300 have recommendations issued by analysts affiliated with firms' IPO or SEO underwriters. Specifically, 191 firms have IPO underwriter-affiliated recommendations; and 215 firms have SEO underwriter-affiliated recommendations. One hundred and forty-seven firms have no IPO or SEO during the sample period.

Table 1 The distribution of recommendations by underwriting affiliation

Panel A presents the distribution of recommendations by underwriting affiliation. Buy (hold, sell) denotes buy (hold, sell) recommendations. LBuy denotes recommendations for "buy for long term". Panel B presents Satterthwaite *t*-tests for differences between various types of affiliations. Panel C presents paired *t*-test for sample firms recommended on the same day by both affiliated and unaffiliated analysts. We identify a recommendation as "affiliated" if it is issued by an analyst affiliated with the recommended firm's IPO underwriters within 5 years after its IPO, or SEO underwriters within 2 years after SEOs or within 2 years before SEOs. A recommendation is "independent" if it is issued by brokerage houses, which have no underwriting business. *** denotes significance at the 1% level.

Panel A: Distribution by affiliation

		Percentage by score (%)				Statistics		
Affiliation	Frequency	1 Sell	2 Hold	3 LBuy	4 Buy	Mean	SD	Skew
All	55 652	5.99	9.52	17.34	67.14	3.46	0.89	−1.53
Unaffiliated	40 219	5.77	9.81	18.97	63.61	3.42	0.90	−1.45
Independent	4975	3.86	31.74	11.26	53.15	3.14	0.99	−0.51
Affiliated	15 433	6.29	8.34	12.38	72.99	3.54	0.87	−1.81
IPO underwriting (past 5 years)	7240	6.23	00208.11	11.80	73.87	3.53	0.89	−1.49
Lead underwriting	434	4.38	9.91	11.98	73.73	3.55	0.84	−1.77
Co-underwriting	6806	6.34	8.00	11.78	73.88	3.53	0.89	−1.80
SEO underwriting (past 2 years)	6494	5.76	9.69	11.03	73.53	3.52	0.89	−1.72
Lead underwriting	728	4.80	4.94	5.08	85.17	3.71	0.77	−2.61
Co-underwriting	5766	5.88	10.28	11.78	72.06	3.50	0.90	−1.64
SEO underwriting (next 2 years)	3240	5.50	6.20	15.31	72.99	3.55	0.84	−1.91
Lead underwriting	535	2.80	5.98	12.52	78.69	3.67	0.71	−2.27
Co-underwriting	2705	6.03	6.24	15.86	71.86	3.54	0.86	−1.84

Panel B: Tests for differences in recommendations

	Difference in mean score	*t*-value
Independent versus unaffiliated (excluding independent)	−0.33	−22.13***
IPO affiliated versus unaffiliated	0.11	9.58***
Lead underwriter versus unaffiliated	0.13	3.10***
Co-underwriter versus unaffiliated	0.11	9.13***
Lead underwriter versus co-underwriter	0.02	0.43
SEO affiliated versus unaffiliated	0.11	11.16***
SEO past 2 years versus unaffiliated	0.10	8.23***
SEO next 2 years versus unaffiliated	0.13	8.69***

Table 1 (*Continued*)

Panel B: Tests for differences in recommendations

	Difference in mean score	*t*-value
Lead underwriter versus unaffiliated	0.27	12.36***
Co-underwriter versus unaffiliated	0.09	8.23***
Lead underwriter versus co-underwriter	0.18	7.72***

Panel C: Paired *t*-tests

	Number of pairs	Mean of differences	*t*-value
Affiliation versus unaffiliation	3895	0.15	9.14***
IPO past 5 years versus unaffiliation	2003	0.17	7.07***
SEO past 2 years versus unaffiliation	1736	0.11	4.54***
SEO next 2 years versus unaffiliation	633	0.14	3.56***

analysts affiliated with SEO lead underwriters are most inclined to issue upward-bias recommendations.

To further illustrate the affiliated analyst bias, we select a "paired" subsample, which contains recommendations on the same firm issued by both affiliated and unaffiliated analysts on the same day. For this paired subsample, if there are more than one affiliated (unaffiliated) recommendations on the same firm on the same day, we average their recommendation scores and do a paired *t*-test. As shown in Panel C of Table 1, the mean of the paired differences is 0.15, with a *t*-value of 9.14. The paired differences are significant for all three affiliated subsamples. These paired comparisons provide us with clean evidence that the underwriting-affiliated analyst bias indeed exists in the Taiwanese market.

3.2. Corporate Governance

We obtained data on corporate governance from the *Taiwan Economic Journal* (*TEJ*), the biggest financial data provider in Taiwan. Our data include eight corporate governance variables. We put them into three subgroups: ownership structure, board characteristics, and corporate transparency.

The ownership structure subgroup has three variables. First, *MNG_Share*, a dummy variable for management shareholdings,[15] which is equal to 1 if the percentage of management shareholdings is above the median across the sample

[15]It includes the holdings of chief executive officer (CEO), vice CEO, president, vice president, general manager, vice general manager, managers, and divisional managers.

firms. According to Jensen and Meckling (1976), as management ownership rises, managers are less likely to squander corporate wealth because they pay a larger share of the costs of agency problems.[16] Second, *UCF/UCO*, which attempts to capture the adverse effect on firm value of the divergence in the ultimate control rights (*UCO*) and the ultimate cash flow rights (*UCF*) of the largest shareholder (in terms of direct and indirect voting rights).[17] Following La Porta *et al.* (1999) and Claessens *et al.* (2000), we expect high divergence between *UCO* and *UCF* to weaken corporate governance. Hughes (2005) suggests that firm value falls only when the largest controlling shareholder has at least twice as many voting rights as cash flow rights. Thus, we set the dummy variable *UCF/UCO* to equal 0 if the largest controlling shareholder's $\frac{UCF}{UCO} < 0.5$, and 1 otherwise.[18] Third, *Outside_Share*, a dummy variable on outside board members' shareholdings,[19] which is equal to 1 if the percentage of outside board members' shareholdings is above the median. According to Jensen and Meckling (1976), Ruland *et al.* (1990), and Beasley (1996), we expect that outside board members with high shareholdings have more incentives to monitor managers.

The board characteristics subgroup also has three dummy variables. The first concerns board size. According to Jensen (1993), Yermack (1996), and Eisenberg *et al.* (1998), a small board tends to be more cohesive and effective in monitoring managers. However, recently, Coles *et al.* (**2008**) re-examine the relationship between firm value and board size and find a U-shaped relation, "which, at face value, suggests that either very small or very large boards are optimal" (p. 329). They argue that this relationship arises from differences between complex and simple firms, that is, firm value tends to increase (decrease) in board size for complex (simple) firms. Thus, we set *Board_Size* equal to 1 if the total number of directors

[16]However, Morck *et al.* (1988) argue that the relationship between management ownership and market valuation of the firm's assets could be non-linear because "while the convergence-of-interests hypothesis suggests a uniformly positive relationship, the entrenchment hypothesis suggests that market valuation can be adversely affected for some range of high ownership stakes".

[17]*TEJ* follows La Porta *et al.* (1999) to measure the largest shareholder's *UCO* and *UCF*, which include direct and indirect voting rights and cash flow rights, respectively. La Porta *et al.* (1999) define that a corporation has a controlling shareholder (ultimate owner) if this shareholder's direct and indirect voting rights in the firm exceed 10% (p. 477).

[18]That is, we set *UCF/UCO* to equal 1 if a firm is widely held (i.e. no controlling shareholder) or if its largest controlling shareholder's. $\frac{UCF}{UCO} \geq 0.5$

[19]*TEJ* defines a board member as an outsider if he or she: (1) has no blood relationship with the controlling shareholders; (2) is not affiliated with the controlling shareholders; and (3) has no business relationship with the firm.

and supervisors on the board is less than the first quartile or greater than the third quartile, and 0 otherwise.[20]

The second variable, *Board_Ind*, measures board independence, which is equal to 1 if the board is independent, and 0 otherwise. We follow Yeh *et al.* (2001) to define that a board is not independent if over half of the board members are affiliated with controlling shareholders.[21] The third variable, *Supervisor_Ind*, is equal to 1 if none of the supervisors on the board are affiliated with controlling shareholders, and 0 otherwise. Supervisors provide important monitoring on corporate insiders (directors and managers). Their monitoring would be more effective if they were independent.

The corporate transparency subgroup has two measures. *Forecast* is a dummy variable equal to 1 if the number of earnings forecasts released by management in the previous year is higher than the median across the sample firms, and 0 otherwise. Releasing earnings forecasts could reduce information asymmetry, and lower adverse selection and moral hazard problems. *Auditor* is also a dummy variable equal to 1 if the firm did not change its auditor in the previous 3 years, and 0 otherwise. Several studies have found that market reactions to auditor change announcements tend to be either negative or insignificant (see, e.g. Nichols and Smith, 1983; Johnson and Lys, 1990). As Davidson *et al.* (2006) point out, the negative market reactions to auditor changes could reflect that management may be searching for a lower quality audit, which could reduce the quality of information reaching financial markets, and that management may hope to use the resulting increase in asymmetric information for its own benefit.

We sum up the eight dummy variables to form a corporate governance (CG) index. Hence, in our sample, if a firm has a CG index equal to eight, it means that outside investors have the full set of mechanisms to protect themselves from expropriation by insiders. Table 2 reports summary statistics of the eight variables and the CG index. The range of the CG index in our sample is from one to eight, with a mean of 4.60 and a standard deviation of 1.50.

[20]As Yeh and Woidtke (2005) describe, as in Germany, firms in Taiwan have two corporate boards—a board of directors and a board of supervisors. While directors are responsible for overseeing the firm's management and making ultimate corporate decisions, supervisors do not participate in decision-making or voting processes; instead, they are designated to monitor directors (e.g. scrutinizing decisions made by directors, reviewing and auditing the reports provided by directors, and resolving any disputes between shareholders and directors). During our sample period, Taiwan's Corporate Laws stipulate that both directors and supervisors are to be elected by shareholders and only current shareholders are qualified candidates. Also, the Laws require that a company needs to have at least three directors and one supervisor. The restriction that directors and supervisors shall be firm shareholders is relaxed in 2001. In the same year, the minimum requirements are raised to five directors and three supervisors for newly listed companies.

[21]The TWSE requires a corporation to disclose relationships between its directors (and supervisors) and controlling shareholders.

3.3. The Correlation Matrix

We use *CG*, the (demeaned) CG index, in our analysis of the relationship between corporate governance and analyst bias. Table 3 shows that *Buy* (a dummy variable for Buy and Strong Buy) is negatively correlated with the interaction of *CG* and *Buy*, suggesting that Buy-recommended firms tend to have a lower CG index. Conversely, *Sell* (a dummy variable for Sell and Strong Sell) is positively correlated to the interaction of *CG* and *Sell*, indicating that Sell-recommended firms tend to have a higher CG index. These correlations provide a first hint consistent with the notion that analysts are less (more) likely to issue sell (buy) recommendations on low CG firms than high CG firms.

Table 2 Summary statistics of corporate governance variables

MNG_Share dummy is equal to 1 if the total of management shareholdings is greater than the median across the sample firms, and 0 otherwise. *UCF/UCO* is the ultimate cash flow rights divided by the ultimate control share rights of the largest shareholder. If the *UCF/UCO* > 0.5, then *UCF/UCO dummy* is 1, and 0 otherwise. *Outside_Share* is the percentage of outside board members' shareholdings to total outstanding shares. If the *Outside Share* (%) is larger than the median, then *Outside Share dummy* is 1, and 0 otherwise. *Board size* is the total number of the board directors and supervisors. If the *Board size* is smaller than the first quartile or greater than the third quartile, then *Board Size dummy* is 1, and 0 otherwise. If the board is not controlled by controlling shareholders, then *Board_Ind* is 1, and 0 otherwise. *Supervisor_Ind* is equal to 1 if none of the supervisors on the board are affiliated with controlling shareholders, and 0 otherwise. *Forecast* is the number of management earnings forecasts in the previous year before recommendation year. If *Forecast* is greater than the median, then *Forecast dummy* is 1, and 0 otherwise. If a firm did not change its auditor in the previous 2 years before the recommendation year, then *Audit* is 1, 0 otherwise. All variables, except for *Audit* and *Forecast*, are measured at the end of the previous quarter before the recommendation date. We construct a corporate governance (*CG*) index by summing up the eight (bold) dummy variables.

Variable	*N*	Mean	SD	Max	Median	Min
MNG_Share (%)	55 652	1.01	2.05	23.01	0.15	0.00
MNG_Share dummy	55 652	0.49	0.50	1.00	0.00	0.00
UCO (%)	55 652	24.53	15.67	88.83	23.88	0.02
UCF (%)	55 652	19.03	15.27	88.83	15.61	0.00
UCF/UCO (%)	55 652	77.03	26.53	100.00	88.55	0.00
UCF/UCO dummy	55 652	0.82	0.38	1.00	1.00	0.00
Outside_Share (%)	55 652	10.30	11.54	71.00	7.09	0.00
Outside Share dummy	55 652	0.50	0.50	1.00	0.00	0.00
Board size	55 652	11.90	5.61	41.00	10.00	3.00
Board_Size dummy	55 652	0.58	0.49	1.00	1.00	0.00
Board_Ind	55 652	0.54	0.50	1.00	0.00	0.00
Supervisor_Ind	55 652	0.29	0.45	1.00	1.00	0.00
Forecast	55 652	1.23	0.91	5.00	1.00	0.00
Forecast dummy	55 652	0.42	0.49	1.00	0.00	0.00
Audit	55 652	0.96	0.19	1.00	1.00	0.00
CG Index	**55 652**	**4.60**	**1.50**	**8.00**	**5.00**	**1.00**

Table 3 The correlation matrix

Buy is a dummy variable for recommendations with a score of 4. *LBuy* is a dummy variable for recommendations with a score of 3. *Hold* is a dummy variable for recommendations with a score of 2. *Sell* is a dummy variable for recommendations with a score of 1. *CG* is demeaned corporate governance index. *Aff* is a dummy variable equal to 1 if the recommendation is issued by an affiliated analyst. *Size_Firm* is the demeaned natural logarithm of market capitalization of the covered firm. M/B_Firm is the demeaned natural logarithm of the market-to-book equity ratio of the covered firm. *Size_Broker* is the demeaned natural logarithm of the brokerage house total assets. *N_Brokers* is the demanded number of recommending brokerage houses on the same stock on the same day. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

	Buy	*LBuy*	*Hold*	*Sell*	*Buy*CG*	*Lbuy*CG*	*Hold*CG*	*Sell*CG*	*Buy*Aff*	*LBuy*Aff*	*Hold*Aff*	*Sell*Aff*	*Size_Firm*	*M/B_Firm*	*Size_Broker*
*Buy*CG*	−0.02***	0.01**	0.01	0.01*	1.00										
*Lbuy*CG*	−0.05***	0.08***	−0.01***	−0.01**	0.00	1.00									
*Hold*CG*	−0.03***	−0.01***	0.07***	−0.01	0.00	0.00	1.00								
*Sell*CG*	−0.06***	−0.02***	−0.01***	0.15***	0.00	0.00	0.00	1.00							
*Buy*Aff*	0.35***	−0.23***	−0.16***	−0.13***	0.04***	−0.02***	−0.01***	−0.02***	1.00						
*LBuy*Aff*	−0.27***	0.41***	−0.06***	−0.05***	0.00	0.05***	0.00	−0.01*	−0.10***	1.00					
*Hold*Aff*	−0.22***	−0.07***	0.47***	−0.04***	0.01	−0.01	0.12***	−0.01	−0.08***	−0.03***	1.00				
*Sell*Aff*	−0.18***	−0.06***	−0.04***	0.51***	0.00	−0.00	0.00	0.15***	−0.07***	−0.02***	−0.02***	1.00			
Size_Firm	−0.02***	0.04***	0.04***	−0.06***	0.03***	0.02***	0.02***	−0.00	0.07***	0.04***	0.01***	0.02***	1.00		
M/B_Firm	−0.02***	0.08***	−0.01	−0.07***	0.13***	0.09***	0.04***	0.02***	−0.02***	0.03***	−0.02***	−0.02***	0.32***	1.00	
Size_Broker	0.20***	−0.15***	−0.15***	0.02***	0.02***	0.00	0.03***	0.02***	0.25***	0.07***	0.09***	0.09***	−0.02***	0.03***	1.00
N_Brokers	0.02***	−0.00	0.04***	−0.08***	−0.01*	0.04***	−0.01***	−0.02***	−0.01***	−0.03***	−0.01**	−0.03***	0.38***	0.10***	−0.14***

The correlation matrix also shows that the interaction of *CG* and *Buy* is positively correlated with firm size (the demeaned market capitalization), and M/B (the demeaned market-to-book equity ratio), suggesting that Buy-recommended firms with better corporate governance tend to be larger and have higher growth opportunities. Furthermore, *Buy* is positively correlated with *Size_Broker*, the (demeaned) total asset value of the brokerage house that issues the recommendation. This suggests that Buy recommendations tend to be issued by larger brokerage houses.

Interestingly, unlike *Buy*, *LBuy* (a dummy variable for recommendations of buying for long term), is positively related to the interaction of *CG* and *LBuy*. Also, *LBuy* is positively correlated with firm size and M/B, but negatively correlated with *Size_Broker*. These correlations suggest that Long-Term Buy recommendations tend to be issued on firms with better corporate governance, larger firms, and firms with more growth opportunities; and they tend to be issued by smaller brokerage houses. Thus, there are differences between Buy and Long-Term Buy recommendations, in terms of the firm and brokerage house characteristics. We control for these characteristics in our analysis of the relationship between corporate governance and analyst bias to which we turn next.

4. Evidence of the Effects of Corporate Governance on Analyst Bias

4.1. The Ordered Probit Model

Our hypothesis predicts that, holding other things constant, analyst recommendations, particularly those issued by underwriting-affiliated analysts, on firms with poor corporate governance contain upward bias, relative to those on firms with good corporate governance. Since we use ordinal scores to classify analysts' recommendations, the ordered probit model first introduced by McKelvey and Zavoina (1975) seems appropriate for testing our hypothesis.

To set up the ordered probit model, we assume that there is a latent continuous variable S_i^* whose value determines the score of recommendation i as follows:

$$Score_i = \begin{cases} 4 & \text{if} \quad \gamma_3 \le S_i^* \\ 3 & \text{if} \quad \gamma_2 \le S_i^* < \gamma_3 \\ 2 & \text{if} \quad \gamma_1 \le S_i^* < \gamma_2 \\ 1 & \text{if} \quad S_i^* < \gamma_1 \end{cases} \tag{1}$$

where γ_1, γ_2, and γ_3 are the cutoff points. The latent variable depends linearly on the explanatory variables x as follows:

$$\begin{aligned} S_i^* &= X_i B + \varepsilon_i \\ &= \beta_1 \cdot CG_i + (\beta_2 + \beta_3 \cdot CG_i) \cdot Affiliated_i + \sum_{k=1}^{K} \beta_{3+k} C_{k,i} + \varepsilon_i \end{aligned} \tag{2}$$

where $\varepsilon_i \sim N(0,1)$ and the explanatory variables are $CG_i = CGI_i - \overline{CGI}$, the demeaned corporate governance index of the recommended firm; $Affiliated_i$ a

dummy variable equal to 1 if the recommendation is issued by an affiliated analyst; and $C_{k,i}$ the kth (demeaned) control variable. The control variables include the log size and the log M/B of the covered firm, and the log size of the brokerage house that issues the recommendation.

The setup suggests that the probability of i being a buy recommendation is

$$\Pr(Score_i = 4) = \Pr(S_i^* \geq \gamma_3) = \Pr(X_iB + \varepsilon_i \geq \gamma_3) = \Pr(\varepsilon_i \geq \gamma_3 - X_iB) = \Phi(X_iB - \gamma_3) \tag{3}$$

and being a sell recommendation is

$$\Pr(Score_i = 1) = \Pr(S_i^* < \gamma_1) = \Pr(X_iB + \varepsilon_i < \gamma_1) = \Pr(\varepsilon_i < \gamma_1 - X_iB) = \Phi(\gamma_1 - X_iB) \tag{4}$$

where $\Phi(\cdot)$ denotes the cumulative distribution function. Similarly, the probability of i being a long-term buy recommendation and hold recommendation, respectively, are

$$\Pr(Score_i = 3) = \Pr(\gamma_3 > S_i^* \geq \gamma_2) = \Phi(\gamma_3 - X_iB) - \Phi(\gamma_2 - X_iB) \tag{5}$$

and

$$\Pr(Score_i = 2) = \Pr(\gamma_2 > S_i^* \geq \gamma_1) = \Phi(\gamma_2 - X_iB) - \Phi(\gamma_1 - X_iB). \tag{6}$$

Given the recommendation scores in our sample and the probability structure, the ordered probit model allows us to use the Maximum Likelihood Explanation (MLE) method to estimate the cutoff points and the regression coefficients associated with the explanatory variables in equation (2). We report their *maximum likelihood* estimates in Table 4 and discuss them in the next subsection.

4.2. Unaffiliated Analysts

We focus first on the effects of firms' corporate governance on their probabilities of receiving buy and sell recommendations from *unaffiliated* analysts. Our hypothesis predicts $\beta_1 < 0$, meaning that, holding other things constant, unaffiliated analysts are more (less) likely to issue buy (sell) recommendations on firms with low CG than on firms with high CG.

Consistent with our hypothesis, the estimate of β_1 is -0.0542, with a heteroskedasdicity-consistent t-value of -13.42, in the full sample regression. The result shows that, *ceteris paribus*, firms with fewer corporate governance mechanisms are indeed more (less) likely to receive buy (sell) recommendations from unaffiliated analysts than firms with more corporate governance mechanisms. The evidence implies that the behavior of unaffiliated analysts is affected by corporate governance of the firms they cover.

Table 4 Ordered probit regressions of recommendation scores

This table presents the results of ordered probit regressions of recommendation scores on corporate governance and affiliation. *CG* is the demeaned corporate governance index. *Affiliated* is a dummy variable equal to 1 if the recommendation is issued by an affiliated analyst. *Size_Firm* is the demeaned natural logarithm of market capitalization of the covered firm. *M/B_Firm* is the demeaned natural logarithm of the market-to-book equity ratio of the covered firm. *Size_Broker* is the demeaned natural logarithm of the brokerage house total assets. The parameter *intercept* is the negative of the first cutoff point, γ_1, for the recommendation scores in equation (1). The parameter *_Limit2* is the difference between the second and the first cutoff points for the recommendation scores in equation (1). The parameter *_Limit3* is the difference between the third and the first cutoff points for the recommendation scores in equation (1). The values in parentheses are heteroskedasdicity-consistent *t*-values. *** and ** denote significance at the 1, and 5% levels respectively.

	Dependent variable: recommendation scores					
	Full sample		Subsample excluding independent		Subsample excluding all unaffiliated but independent	
Parameters	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
intercept	1.5075***	1.5704***	1.4968***	1.5374***	1.2811***	1.2728***
	(167.85)	(170.40)	(158.45)	(160.38)	(65.62)	(39.56)
Limit2	0.5422***	0.5449***	0.4379***	0.4354***	0.7547***	0.7575***
	(77.44)	(77.52)	(64.37)	(64.21)	(57.37)	(57.38)
Limit3	1.1167***	1.1316***	1.0597***	1.0621***	1.1571***	1.1609***
	(134.74)	(135.38)	(124.55)	(124.68)	(80.40)	(80.39)
CG	−0.0487***	−0.0542***	−0.0508***	−0.0543***	−0.0465***	−0.0429***
	(−12.32)	(−13.42)	(−11.85)	(−12.41)	(−4.45)	(−4.06)
Affiliated	0.2125***	0.076***	0.1647***	0.076***	0.4981***	0.5132***
	(17.65)	(5.88)	(13.451)	(5.86)	(25.70)	(13.18)
*CG *Affiliated*	−0.0293***	−0.0328***	−0.0267***	−0.0324***	−0.0310**	−0.0381***
	(−3.63)	(−4.01)	(−3.24)	(−3.89)	(−2.46)	(−3.00)
Size_Firm		0.0002		0.0046		−0.0792***
		(0.04)		(0.90)		(−6.32)
*Size_Firm** Affiliated		−0.0150		−0.0203**		0.0630***
		(−1.58)		(−2.10)		(4.25)
M/B_Firm		0.0398***		0.0457***		0.0304**
		(4.58)		(4.97)		(2.06)
Size_Broker		0.1396***		0.1425***		−0.0032
		(35.06)		(27.60)		(−0.31)
Log likelihood	−53 369	−52 727	−46 997	−46 587	−18 907	−18 880.2
LR statistics	550.63***	1819	416.05	1224.95	755.54	799.29
Pseudo R^2 (%)	1.4880***	4.8083	1.2514	3.6273	5.4590	5.7640
Number of Observations	55 652	55 652	50 677	50 677	20 408	20 408

To see how big the effects of corporate governance are, we turn to the marginal effects of a firm's CG_i on its likelihood of receiving a buy recommendation from unaffiliated analysts, which is

$$\frac{\partial \Pr(Score_i = 4)}{\partial CG_i} = \phi(X_i B - \gamma_3)\beta_1, \tag{7}$$

where $\phi(.)$ denotes the standard normal density function. Since the marginal effects depend on the level of all variables, we compute the marginal effect at

$Affiliated_i = 0$, $CG_i = CGI_i - \overline{CGI} = 0$, and $C_{k,i} = 0$ (the kth demeaned control variable, for $k = 1,\ldots,K$). According to Table 4, for the full sample, $\gamma_3 = -0.4388$, $\gamma_2 = -1.0256$, and $\gamma_1 = -1.5704$. Thus,

$$\frac{\partial \Pr(Score_i = 4)}{\partial CG_i} = \phi(0.4388) \times (-0.0542) = -0.0191 \tag{8}$$

This suggests that, for an average firm (in terms of the control variables), reducing one CG mechanism increases its probability by 1.91% points of receiving a buy recommendation from unaffiliated analysts.

For the average firm, the marginal effect (evaluated at $Affiliated_i = 0$, $CG_i = CGI_i - \overline{CGI} = 0$, and $C_{k,i} = 0$) of CG_i on its likelihood of receiving a sell recommendation from unaffiliated analysts is

$$\frac{\partial \Pr(Score_i = 1)}{\partial CG_i} = [-\phi(-1.5704)] \times (-0.0542) = 0.0063 \tag{9}$$

This suggests that a decrease of one CG mechanism lowers the probability by 0.63 of a percentage point of receiving a sell recommendation from unaffiliated analysts.

While unaffiliated analysts are less inclined to issue sell recommendations on firms with poor CG, they are more inclined to issue hold recommendations to them than to comparable firms with good CG. The inference is based on the negative marginal effect of CG on the firm's likelihood of receiving a hold recommendation, as shown below:

$$\begin{aligned} \frac{\partial \Pr(Score_i = 2)}{\partial CG_i} &= [\phi(X_iB - \gamma_2) - \phi(\gamma_1 - X_iB)]\beta_1 \\ &= [\phi(1.0256) - \phi(-1.5704)] \times (-0.0542) = -0.0062 \end{aligned} \tag{10}$$

The effect of CG on the firm's likelihood of receiving a long-term buy recommendation is

$$\begin{aligned} \frac{\partial \Pr(Score_i = 3)}{\partial CG_i} &= [\phi(X_iB - \gamma_3) - \phi(X_iB - \gamma_2)]\beta_1 \\ &= [\phi(0.4388) - \phi(1.0256)] \times (-0.0542) = 0.0066 \end{aligned} \tag{11}$$

This suggests that an increase of one CG mechanism heightens the probability by 0.66 of a percentage point of receiving a long-term buy recommendation from unaffiliated analysts.

From equations (8) through (11), one can see that corporate governance has the strongest marginal effect on the likelihood of receiving a buy recommenda-

tion. According to Table 2, on average, our sample firms have 4.6 CG mechanisms. If the average firm has all the eight CG mechanisms, its (demeaned) CG_i would be 3.4; conversely, if it has none of the mechanisms, its CG_i would be −4.6. Thus, by equation (3) and the parameter estimates in Table 4, we have

$$\Pr(Score_i = 4 | CG_i = -4.6, Affiliated_i = 0, C_{ik} = 0) = 0.7543$$

and

$$\Pr(Score_i = 4 | CG_i = 3.4, Affiliated_i = 0, C_{ik} = 0) = 0.6005.$$

These numbers indicate that the average firm with none of the eight corporate governance mechanisms ($CG_i = -4.6$) would have a probability of 0.75 of receiving a buy recommendation from unaffiliated analysts, compared to a probability of 0.60 for an average firm with all the eight mechanisms ($CG_i = 3.4$), a difference of 15% points.

Thus, in contrast to the naïve expectation that poorly governed firms would receive less favorable recommendations, our findings (based on buy, hold, and sell recommendations) suggest that unaffiliated analysts are more likely to issue upward-bias recommendations to them than to firms with good corporate governance. *In* Section 5, we will show that, consistent with this assessment of upward-bias recommendations, the market significantly discounts unaffiliated analysts' buy and hold recommendations on firms with poor corporate governance.

4.3. Underwriting-Affiliated Analysts

We now assess the extent of upward bias in recommendations issued by underwriting-affiliated analysts. Following Lin and McNichols (1998) and Michaely and Womack (1999), we expect $\beta_2 > 0$ in equation (2), that is, a firm, regardless of its CG_i, is more likely to receive buy recommendations from underwriting-affiliated analysts than from unaffiliated analysts. Furthermore, our hypothesis predicts $\beta_3 < 0$, that is, as the firm's CG_i declines, the difference in its likelihood of receiving buy recommendations from affiliated analysts and from unaffiliated analysts increases.

Indeed, Table 4 shows that the estimate of β_2 is 0.0760 (t-value = 5.88) and β_3 is −0.0328 (t-value = −4.01). The findings confirm that underwriting-affiliated analysts have stronger incentives than unaffiliated analysts to give upward-bias recommendations, and that their upward bias increases as the covered firm's CG decreases.

The marginal effect of the covered firm's CG_i on its likelihood of receiving a buy recommendation from affiliated analysts (evaluated at $Affiliated_i = 1$, $CG_i = 0$, and $C_{k,i} = 0$) is

$$\frac{\partial \Pr(Score_i = 4)}{\partial CG_i} = \phi(X_i B - \gamma_3) \times (\beta_1 + \beta_3) = -0.0315 \quad (12)$$

This estimate suggests that reducing one CG mechanism leads affiliated analysts to increase (decrease) their likelihood by 3.15% points to issue buy recommendations. This marginal effect is larger in magnitude than the one derived from unaffiliated analysts in equation (8), implying that a firm's corporate governance has a stronger effect on the behavior of its underwriting-affiliated analysts than on that of unaffiliated analysts in issuing buy recommendations.

In contrast, the marginal effect of the covered firm's CG_i on its likelihood of receiving a sell recommendation from underwriting-affiliated *analysts* (evaluated at $Affiliated_i = 1$, $CG_i = 0$, and $C_{k,i} = 0$) is

$$\frac{\partial \Pr(Score_i = 1)}{\partial CG_i} = [-\phi(\gamma_1 - X_i B)] \times (\beta_1 + \beta_3) = 0.0101 \quad (13)$$

which is almost double the one derived from unaffiliated analysts in equation (9). Thus, it seems that a firm's corporate governance has much more effect on the behavior of its underwriting-affiliated analysts than on its unaffiliated analysts in issuing sell recommendations.

In sum, our results show that corporate governance of covered firms displays varying degrees of influences on the behavior of underwriting-affiliated and unaffiliated analysts in issuing buy and sell recommendations. The evidence is consistent with our hypothesis, which posits that firms with poor corporate governance reveal their preferences for upward-bias recommendations, and that analysts, particularly underwriting-affiliated ones, are inclined to give what the firms prefer.

Interestingly, Table 4 also shows that firms with higher M/B are more (less) likely to receive buy (sell) recommendations, implying that analysts tend to issue more favorable recommendations on firms with more growth opportunities. Furthermore, the results also show that larger brokerage houses are more likely to issue favorable recommendations.

For a robustness check, Table 4 also includes the ordered probit regression results for two subsamples. One subsample excludes "independent" recommendations (those issued by brokerage houses that have no investment banking business); and the other subsample excludes all unaffiliated recommendations except "independent" ones. The results from both subsamples show that the inferences on corporate governance and on its interaction with affiliation are essentially the same as those from the full sample.

Because the sample period of this study is from 1996 to 1999, to examine whether our results are not a special phenomenon during financial crisis, we separate the sample into Financial Crisis period (from July 1997 to June 1998) and Non-Financial Crisis period (from January 1996 to June 1997 and from July

1998 to the end of 1999), and re-run ordered probit regressions analyses. The results show the coefficient of *Affiliated* keeps positive both in the financial crisis and non-financial crisis periods. Interestingly, the effect is more significant in the non-financial crisis period, which shows the robustness of our results, and also shows that analyst upward bias in recommendations on firms with poor corporate governance are more likely to happen in a boom market where investors tend to be more optimistic and firms have good timing for issuing stocks.

Further, to confirm the robustness of the results, we use the eight dummy variables to generate an alternative corporate governance index from the factor analysis, and re-run the analyses. Note that the correlation coefficient between the equal-weighted CG index and this alternative CG measurement from factor analysis is 0.7815, suggesting that the two CG indexes are highly correlated. The direction and significance of the coefficients of *Affiliated* and the interaction of this Factor CG measurement and *Affiliated* are similar as those in Table 4. Additionally, we use a measure of optimism which properly compares the current score with a benchmark,[22] and find that the results are virtually the same as before.

If more favorable recommendations on firms with poor corporate governance represent upward bias, as our hypothesis suggests, one expects that the market would discount the recommendations on poorly governed firms and that the discount would be larger on underwriting-affiliated recommendations.

5. Evidence of Market Discount on Analyst Bias

Lin and McNichols (1998) show that stock returns to lead underwriter hold recommendations are more negative than those to unaffiliated hold recommendations, and suggest that lead analysts tend to recommend "hold" when "sell" is warranted. Their results imply that, to some extent, investors know affiliated analysts' upward bias and discount their recommendations. Similarly, Michaely and Womack (1999) report that stocks affiliated analysts recommend to buy perform more poorly than those buys recommended by unaffiliated analysts. However, they note that the market does not recognize the full extent of the affiliated analyst bias. Malmendier and Shanthikumar (2007) further show that while small traders follow analyst recommendations literally, large traders display no reaction to buy recommendations and exert selling pressure following hold recommendations, and that the discounting is stronger for recommendations issued by affiliated analysts.

[22]We use an adjusted recommendation score, which is the recommendation minus the consensus recommendation in the same month (or year) as an alternative measure of the level of recommendation bias.

Following Lin and McNichols (1998), Michaely and Womack (1999), and Malmendier and Shanthikumar (2007), this section investigates whether investors discount upward-bias recommendations on firms with poor corporate governance, and whether they distinguish affiliated recommendations from unaffiliated ones. To do the investigations, we first run the following regression for the subsample of buy recommendations:

$$CAR(-1,+3)_i = b_0 + b_1 \cdot CG_i + (b_2 + b_3 \cdot CG_i) \cdot Affiliated_i + \sum_{k=1}^{K} b_{3+k} C_{k,i} + u_i \quad (14)$$

where $CAR(-1, +3)_i$ is the 5-day size-adjusted return on the recommended firm from days -1 through $+3$, relative to the date of public release of the ith recommendation (day 0)[23]; CG_i the demeaned corporate governance index of the recommended firm; $Affiliated_i$ a dummy variable for affiliated recommendations; $C_{k,i}$ the kth (demeaned) control variable; and u_i the error term.

We also run the regression for long-term buy, hold, and sell recommendations, separately, and report the regression results in Table 5. The reason for running the analyses separately is tractability. If we put all four types of recommendations together in a regression analysis, the interactions between each recommendation type (*Buy*, *LBuy*, *Hold*, and *Sell*) and the explanatory variables (CG_i, $Affiliated_i$, $Size\_Firm_i$, M/B_Firm_i, and $Size\_Broker_i$) would complicate the model and obscure our focus.

Our focus is on whether market reactions to analyst recommendations are related to corporate governance. For buy recommendations, our regression results show that the expected abnormal return of an unaffiliated buy recommendation on the average firm can be summarized as:

$$b_0 + b_1 \cdot CG_i = 1.959 + 0.111 \cdot CG_i$$

The t-values for b_0 and b_1 are 50.42 and 4.13, respectively, suggesting that both estimates are significantly different from zero. Since $CG_i < 0$ when $CGI_i < \overline{CGI}$, the abnormal return is lower when the recommended firm has poorer corporate governance. Thus, the estimates provide evidence that investors indeed discount buy recommendations issued by unaffiliated analysts on firms with poor corporate governance.

Since there is more upward bias in affiliated recommendations than in unaffiliated ones, we expect more discounting on the former. Indeed, for the average firm,

[23]We follow Lin and McNichols (1998) and Michaely and Womack (1999) to use size-adjusted returns in the regression analysis. For each recommended stock, we measure its 5-day size-adjusted return as the buy-and-hold return over the 5 days less the same-period buy-and-hold return for the portfolio of TWSE firms in the same size decile as the recommended firm.

Table 5 Regressions of *CAR*

This table presents the results of regressing 5-day cumulative abnormal returns (*CAR*) from day −1 through +3 relative to the recommendation date on affiliation and corporate governance for Buy, Long-term Buy, Hold, and Sell recommendations, separately. *CG* is the demeaned corporate governance index. *Affiliated* is a dummy variable equal to 1 if the recommendation is issued by an affiliated analyst. *Size_Firm* is the demeaned natural logarithm of market capitalization of the covered firm. *M/B_Firm* is the demeaned natural logarithm of the market-to-book equity ratio of the covered firm. *Size_Broker* is the demeaned natural logarithm of the brokerage house total assets. *N_Brokers* is the demanded number of recommending brokerage houses on the same stock on the same day. The values in parentheses are *t*-values, based on White's heteroskedasticity consistent standard errors. ***, and ** denote significance at the 1, and 5% levels, respectively.

	Dependent variables: *CAR*[−1,+3]			
	Buy	Long-term Buy	Hold	Sell
Parameters	Estimate	Estimate	Estimate	Estimate
Intercept	1.9586*** (50.42)	0.8299*** (11.99)	1.0921*** (11.02)	−1.3177*** (−8.84)
CG	0.1113*** (4.13)	0.0289 (−0.57)	0.1805*** (3.07)	−0.0164 (−0.18)
Affiliated	0.0784 (1.04)	0.7029*** (4.24)	−0.2058 (−0.90)	0.2594 (0.79)
*Affiliated*CG*	0.1142** (2.28)	−0.0876 (−0.78)	0.0176 (0.13)	0.2608 (1.43)
Size_Firm	−0.9300*** (−29.11)	−0.9035*** (−15.02)	−0.6895*** (−8.69)	0.0050 (0.04)
*Affiliated*Size_Firm*	0.0848 (1.52)	0.2881** (2.47)	0.2481 (1.51)	−0.3237 (−1.55)
M/B_Firm	−0.3089*** (−5.49)	−0.2269** (−2.13)	−0.1531 (−1.01)	0.1353 (0.64)
Size_Broker	0.0943*** (3.31)	−0.0520 (−0.99)	0.1967*** (3.98)	0.8827*** (7.90)
N_Brokers	0.5565*** (37.52)	0.5951*** (19.24)	0.4996*** (13.95)	1.0224*** (13.60)
Adj. R^2 (%)	5.39	5.35	4.04	8.21
Number of Observations	37 367	9648	5299	3938

the expected abnormal return on an affiliated buy recommendation can be written as:

$$(b_0 + b_2) + (b_1 + b_3) \cdot CG_i = (1.959 + 0.078) + (0.111 + 0.114) \cdot CG_i$$
$$= 2.037 + 0.225 \cdot CG_i$$

While the b_2 estimate has a t-value of 1.04, indicating that it is insignificantly different from zero, the b_3 estimate (with a t-value of 2.28) is significant at the 5% level. The results suggest that the discounting on buy recommendations on firms with poor corporate governance issued by affiliated analysts is larger than that issued by unaffiliated analysts.

For unaffiliated hold recommendations, the regression results show that the expected abnormal return on the average firm can be expressed as $b_0 + b_1 \cdot CG_i = 1.092 + 0.181 \cdot CG_i$; both the b_0 and b_1 estimates are significantly different from zero. This suggests that the market also discounts hold recommendations issued by analysts on firms with poor corporate governance.

For other types of recommendations, corporate governance of the recommended firms does not seem to affect investor reactions. Nevertheless, there are several interesting findings that are worth mentioning. First, we find that the market reactions to long-term buy recommendations are more positive when they are issued by affiliated than when they are issued by unaffiliated analysts. Second, there is a size effect, that is, holding other things constant, the market reactions to buy, long-term buy, and hold recommendations on smaller firms tend to be more positive. Third, there is also a M/B effect, that is, holding other things constant, for firms with higher M/B, investors put a larger discount on buy and long-term buy recommendations. We obtain virtually the same results when we use the Fama-French three-factor model, the market model, or the market-adjusted return method to compute the *CARs*.

Finally, we find that *N_Brokers*, the number of brokerage houses issuing recommendations (regardless of the types of recommendations issued) on the same firm on the same day, also has significantly positive effects on investor reactions to the recommendations.[24]

In addition, we conduct several experiments of adding to the model other variables, including a dummy for SEO lead underwriters and the interactions between explanatory variables, and find them to have insignificant effects on the *CARs*. In sum, the results of investor reactions to buy recommendations are largely consistent with our hypothesis that analysts give upward-bias recommendations on firms with

[24]On average, 2.86 recommendations are issued on the same firm and on the same day. The median is 2.0, and the standard deviation is 2.51. Since there are far more buy recommendations than other types of recommendations, it is likely buy recommendations are included when multiple recommendations are involved.

poor corporate governance, and that the bias in affiliated recommendations is larger than that in unaffiliated recommendations.

6. Which CG Mechanisms are Effective?

Our corporate governance index contains eight variables. This raises an interesting question: which corporate governance mechanisms are effective in moderating analyst upward bias? To answer this question, we re-run the ordered probit regression in equation (2) using the eight CG dummy variables to replace the CG index, and report the results in Table 6.

The results show that the dummy variables for management ownership, board size, board independence, independence of supervisors, no change in auditor, and the frequency of management earnings forecasts have significant effects in reducing analyst upward bias. Furthermore, the interactions between affiliated analysts and the following variables—the divergence between the largest shareholder's cash flow rights and control rights, outside board members' ownership, independence of supervisors—also show significant effects. Thus, the results suggest that most of the individual corporate governance mechanisms show some effects in moderating analyst upward bias.

We run a similar exercise for equation (14), and report the results in Table 7. The results show that the abnormal returns associated with buy recommendations are positively related to the dummy variables for the divergence between the largest shareholder's cash flow rights and control rights, board size, independence of supervisors, the frequency of management earnings forecasts, the interactions between affiliated analysts and the dummy variables for management ownership, outside board members' shareholdings, no change in auditor, and the frequency of management earnings forecasts. Again, most of the individual CG mechanisms show positive effects on market reactions to analyst buy recommendations. The results suggest that the market indeed puts more discounts on analysts' buy recommendations on firms with fewer CG mechanisms.

Nevertheless, Table 7 shows that the individual CG mechanisms of recommended firms seem to have mixed or no effects on the market reactions to other types of analyst recommendations. The evidence seems to suggest that analyst upward bias is more severe in buy recommendations than in other type of recommendations, and that the severeness of the upward bias in buy recommendations is significantly and inversely related to corporate governance of recommended firms.

In sum, our results imply that as a firm increases its CG mechanisms, analyst bias toward the firm decreases. This implication is consistent with the notion that most of the CG mechanisms that the literature has suggested and we include in our CG index are effective in moderating the upward bias in analyst recommendations.

Table 6 Ordered probit regressions of recommendation scores on eight CG dummies

This table presents the results of ordered probit regressions of recommendation scores on eight corporate governance dummy variables and affiliation. *MNG_Share* is a dummy variable for management shareholdings. *UCF/UCO* is the divergence between the ultimate cash flow rights and the ultimate control share rights of the largest shareholder. *Outside_Share* is the outside board members' shareholdings. *Board size* is the total number of directors and supervisors. *Board_Ind* is board independence. *Supervisor_Ind* is independence of supervisors. *Forecast* is the number of management earnings forecasts in the previous year before recommendation year. Audit is no change in auditor during the previous 3 years. For detailed definitions of the eight CG dummy variables, please see Table 2. *Affiliated* is a dummy variable for affiliated recommendations. *Size_Firm* is the demeaned natural logarithm of market capitalization of the covered firm. *M/B_Firm* is the demeaned natural logarithm of the market-to-book equity ratio of the covered firm. *Size_Broker* is the demeaned natural logarithm of the brokerage house total assets. The cut-off points, γ_3, γ_2, *and* γ_1, are not reported to save space. The values in parentheses are *t*-values, based on White's heteroskedasticity consistent standard errors. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

	Dependent variable: recommendation scores		
	Full sample	Subsample excluding independent	Subsample excluding all unaffiliated but independent
Parameters	Estimate	Estimate	Estimate
Mng_Share	−0.0638*** (−4.80)	−0.0590*** (−4.11)	−0.0835** (−2.33)
UCF/UCO	0.0215 (1.29)	0.0260 (1.44)	0.0318 (0.72)
Outside_Share	0.0182 (1.37)	0.0186 (1.31)	0.0230 (0.63)
Board_Size	−0.0274** (−2.20)	−0.0172 (−1.28)	−0.0874*** (−2.59)
Board_Ind	−0.0984*** (−7.18)	−0.1194*** (−8.08)	0.0379 (1.01)
Supervisor_Ind	−0.0853*** (−6.08)	−0.0600*** (−3.96)	−0.2348*** (−6.10)
Auditor	−0.0968*** (−2.86)	−0.1163*** (−3.13)	−0.0285 (−0.34)
Forecast	−0.1021*** (−8.05)	−0.1110*** (−8.13)	−0.0386 (−1.08)
Affiliated	0.1601** (2.31)	0.1432** (2.01)	0.6629*** (5.77)
*Affiliated*Mng_Share*	−0.0119 (−0.44)	−0.0176 (−0.63)	0.0273 (0.63)
*Affiliated*UCF/UCO*	−0.1549*** (−4.78)	−0.1570*** (−4.74)	−0.1839*** (−3.51)
*Affiliated*Outside_Share*	−0.1137*** (−4.10)	−0.1137*** (−4.03)	−0.1255*** (−2.86)
*Affiliated*Board_Size*	0.0226 (0.86)	0.0123 (0.46)	0.0884** (2.17)
*Affiliated*Board_Ind*	0.1509*** (5.36)	0.1719*** (5.99)	0.0089 (0.20)
Affiliated Supervisor_Ind*	−0.1029*** (−3.49)	−0.1279*** (−4.26)	0.0733 (1.58)
*Affiliated*Auditor*	0.0493 (0.79)	0.0689 (1.08)	0.0155 (0.16)
*Affiliated*Forecast*	−0.0185 (−0.74)	−0.0083 (−0.33)	−0.0792* (−1.90)
Size_Firm	−0.0012 (−0.25)	0.0053 (1.00)	−0.0887*** (−6.81)
*Affiliated*Size_Firm*	−0.0300*** (−3.06)	−0.0370*** (−3.69)	0.0574*** (3.72)
M/B_Firm	0.0509*** (5.71)	0.0541*** (5.73)	0.0387** (2.56)
Size_Broker	0.1421*** (35.43)	0.1452*** (27.89)	−0.0041 (−0.40)
Log likelihood	−52 650	−46 508	−18 826
LR statistics	1974	1382	908
Pseudo R^2 (%)	5.2039	4.0810	6.5179
Number of observations	55 652	50 677	20 408

Table 7 Regressions of *CAR* on eight CG dummy variables

This table presents the results by recommendation type of regressing 5-day cumulative abnormal returns on eight corporate governance dummy variables and affiliation. *MNG_Share* is a dummy variable for management shareholdings. *UCF/UCO* is the divergence between the ultimate cash flow rights and the ultimate control share rights of the largest shareholder. *Outside_Share* is the outside board members' shareholdings. *Board size* is the total number of directors and supervisors. *Board_Ind* is board independence. *Supervisor_Ind* is independence of supervisors. *Forecast* is the number of management earnings forecasts in the previous year before recommendation year. Audit is no change in auditor during the previous 3 years. For detailed definitions of the eight CG dummy variables, please see Table 2. *Affiliated* is a dummy variable for affiliated recommendations. *Size_Firm* is the demeaned natural logarithm of market capitalization of the covered firm. *M/B_Firm* is the demeaned natural logarithm of the market-to-book equity ratio of the covered firm. *Size_Broker* is the demeaned natural logarithm of the brokerage house total assets. The values in parentheses are *t*-values based on White's heteroskedasticity consistent *standard* errors. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

	Dependent variables: *CAR*[−1,+3]			
	Buy	Long-term buy	Hold	Sell
Parameters	Estimate	Estimate	Estimate	Estimate
Intercept	1.7359*** (7.29)	1.8615*** (4.68)	0.3627 (0.56)	−1.7155* (−1.72)
Mng_Share	−0.0014 (−0.02)	−0.2859* (−1.87)	0.2647 (1.23)	−0.8840** (−2.34)
UCF/UCO	0.2697** (2.32)	0.1932 (1.00)	0.3582 (1.41)	0.0551 (0.14)
Outside_Share	−0.1659* (−1.86)	0.2521 (1.57)	0.4079* (1.81)	0.5915* (1.77)
Board_Size	0.2780*** (3.39)	−0.0232 (−0.16)	−0.0847 (−0.42)	0.1667 (0.56)
Board_Ind	0.0782 (0.88)	−0.3888** (−2.39)	−0.2673 (−1.13)	0.2671 (0.70)
Supervisor_Ind	0.5470*** (5.84)	0.5614*** (3.47)	0.3958 (1.65)	0.4428 (1.31)
Auditor	−0.3437 (−1.56)	−1.0871*** (−2.86)	0.0931 (0.15)	0.5425 (0.59)
Forecast	0.1502* (1.80)	−0.1260 (−0.88)	0.2067 (0.97)	−0.8031*** (−2.66)
Affiliated	−0.7513* (−1.87)	0.5085 (0.55)	0.1358 (0.11)	0.4465 (0.27)
*Affiliated*Mng_Share*	0.3223*** (2.00)	0.3422 (0.99)	0.1988 (0.39)	−0.6905 (−1.04)
*Affiliated*UCF/UCO*	−0.0475 (−0.25)	−0.8340** (−2.14)	−0.6816 (−1.13)	−0.8366 (−1.13)
*Affiliated*Outside_Share*	0.4737*** (2.83)	−0.1957 (−0.53)	0.3440 (0.68)	−1.2134* (−1.74)
*Affiliated*Board_Size*	−0.2583 (−1.61)	−0.2711 (−0.80)	−0.1075 (−0.23)	−0.0870 (−0.13)

Table 7 (*Continued*)

	Dependent variables: *CAR*[−1,+3]			
	Buy	Long-term buy	Hold	Sell
Parameters	Estimate	Estimate	Estimate	Estimate
*Affiliated*Board_Ind*	−0.2140 (−1.29)	−0.0555 (−0.15)	−0.5128 (−1.01)	0.3231 (0.43)
Affiliated Supervisor_Ind*	−0.3234* (−1.82)	−0.7606** (−2.05)	0.4294 (0.77)	1.94713*** (2.73)
*Affiliated*Auditor*	0.7531** (2.14)	1.0342 (1.25)	0.3210 (0.26)	−0.0089 (−0.01)
*Affiliated*Forecast*	0.3046** (2.04)	0.4395 (1.37)	−0.5184 (−1.18)	1.2338** (2.22)
Size_Firm	−0.9179*** (−28.33)	−0.8767*** (−14.13)	−0.6545*** (−8.03)	0.0650 (0.52)
*Affiliated*Size_Firm*	0.1053* (1.80)	0.3073** (2.56)	0.2235 (1.30)	−0.4159* (−1.96)
M/B_Firm	−0.3289*** (−5.69)	−0.2565*** (−2.32)	−0.1513 (−0.96)	0.0859 (0.40)
Size_Broker	0.0899*** (3.14)	−0.0440 (−0.83)	0.2065*** (4.07)	0.8773*** (7.90)
N_Brokers	0.5711*** (37.90)	0.6113*** (19.54)	0.4968*** (13.70)	1.0224*** (13.34)
Adj. R^2 (%)	5.50	5.58	4.18	8.79
Number of Observations	37 367	9648	5299	3938

7. Conclusion

In this study, we propose and test a simple hypothesis that links corporate culture and analyst behavior in an emerging market. As Jackson (2005) points out, analysts strike a balance between their reputation and optimism. We argue that, in an emerging market, the balance could be influenced by corporate governance of covered firms. Specifically, we posit that firms with poor corporate governance reveal their preferences for upward-bias recommendations, while firms with good corporate governance prefer more honest opinions, and that analysts are inclined to give firms what they prefer.

To test our hypothesis, we analyze a large sample of analyst recommendations on firms listed on the Taiwan Stock Exchange. Consistent with our hypothesis, we find more upward bias in analyst recommendations on lower CG firms. Furthermore, we find that the market put more discounts on analyst buy recommendations on lower CG firms.

Our findings imply that analyst buy recommendations on poorly governed firms are less reliable, and that firms can enhance the reliability of analyst recommendations when they improve their corporate governance. While we obtain the results from Taiwan data, the implication is useful to other emerging markets as well. In emerging markets where information quality is lower and shareholder rights are less protected by legal systems, adverse selection and moral hazard problems tend to be more severe. Thus, it is important for firms in emerging markets to have good corporate governance, which can not only mitigate agency problems within firms, but also enhance information quality produced by analysts and lower the information risk faced by investors.

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