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Governance Role of Analyst Coverage and Investor Protection

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1. Introduction

International research on analysts suggests that investor protection affects analyst coverage and forecast accuracy across countries. Chang, Khanna, and Palepu (2000) find that analyst coverage is lower for common law countries than for civil law countries, implying that analyst coverage would play a more important role in countries with weak investor protection than in countries with strong investor protection. However, they also find that analyst forecasts are less accurate for civil law countries although more analysts follow firms in those countries. Similarly, Hope (2003) documents that analyst forecasts are more accurate for countries with high quality accounting disclosure quality and enforcement of accounting standards, suggesting that analysts perform better for countries with strong investor protection.

Recently, Yu (2008) and Knyazeva (2007) add to the literature by investigating the association between analyst coverage and earnings management. They find that high analyst coverage is associated with less earnings management in U.S., suggesting that analyst coverage can play a governance role in capital markets. However, the research on analysts' governance role is limited, especially in the international context. An exception is a study by Lang, Lins, and Miller (2004) who find that the association between firm valuation and the interaction of analyst coverage and concentrated family / management control is more positive for countries with weak investor protection. Their findings suggest that the governance role of analyst coverage could be magnified while investor protection is weak. Since extant research on the governance role of international analysts is limited, it is warranted to conduct more research on it.

Analyst coverage could be a substitute to other corporate governance mechanisms (Knyazeva 2007). In countries with weak investor protection, firms have more agency problems and weak corporate governance. As a substitute, analyst coverage may play a more important governance role in those countries. On the other hand, the governance role of analyst coverage could be attenuated by weak investor protection, resulting in less effectiveness of analyst coverage for weak investor protection countries. Thus, whether the governance role of analyst coverage is more important in weak investor protection countries than in strong investor protection countries is an empirical question.

This study examines whether analyst coverage is more effective in constraining earnings management for countries with weak investor protection than for countries with strong investor protection. Using a sample of 47,999 firm-year observations over the period 1990 to 2007 from 23 countries, I find that earnings management is more negatively associated with analyst coverage when countries' investor protection is weak. The results are robust to several additional analyses. My findings suggest that analyst coverage plays a more important role in countries with weak investor protection, i.e., there is a substitution relation between analyst coverage and investor protection.

This study contributes to the literature in the following two ways. First, I extend the limited research on the governance role of analysts. Unlike Yu (2008) and Knyazeva (2007), my study focuses on international data and the effect of investor protection on analysts' governance role. By examining the association between analyst coverage and earnings management in the international context, this study provides more explicit evidence on the substitution relation between analyst coverage and investor protection to

expand the study by Lang et al. (2004). Second, this study adds to a growing literature on international analysts. Prior research (e.g., Chang, et al. 2000; Hope 2003) focuses on investigating the effect of country-level institutions on analyst coverage and forecast accuracy. This study extends those studies by examining the effect of investor protection on the effectiveness of analyst coverage in constraining earnings management.

The rest of this paper is organized as follows. Section 2 introduces background and develops the hypothesis. Second 3 discusses research design. Section 4 presents empirical results. Section 5 concludes.

2. Background and Hypothesis

2.1 International analyst research

There is a growing literature that investigates the role of analysts in international capital markets. Chang et al. (2000) investigate analyst activity and performance in 47 countries around the world. They first examines whether country-level variables including average firm size, capital market development, legal origin, ownership concentration, foreign investment, and accounting disclosure quality are associated with analyst coverage. They find that analyst coverage is higher for countries with high average firm size, well developed stock market, or high accounting disclosure quality, and is lower for common law countries. They also examine whether the country-level variables affect forecast error and forecast dispersion. They find that analyst forecasts are more accurate for common law countries or countries with high accounting disclosure

quality or low stock return variability. Moreover, they find that forecast dispersion is lower for common law countries or countries with low stock return variability.

Ang and Ciccone (2001) also examine the international differences in analyst forecast properties among 42 countries. They investigate the effect of country-level variables including legal environment, banking system, family system, and accounting disclosure quality on forecast error and forecast dispersion.[1] Using multivariate regression analysis, they only find that accounting disclosure quality is negatively associated with forecast error, and family system dummy is positively associated with forecast dispersion. Again, Hope (2003) examines the association between analyst forecast accuracy and country-level variables including accounting disclosure quality and enforcement of accounting standards in 22 countries. He documents evidence that analyst forecast accuracy is positively associated with both accounting disclosure quality and the level of enforcement of accounting standards.

Lang et al. (2004) investigate the relation among ownership structure, analyst following, investor protection, and valuation in 27 countries. They first examine whether analyst coverage is associated with the presence of concentrated family / management control. They find that analysts are less likely to follow firms when the family / management group is the largest control rights blockholder. Moreover, they find that the negative association between analyst coverage and the presence of concentrated family / management control is stronger in countries with weak investor protection. This suggests

[1] Legal environment is measured as a scale from 0-6 based on the ability of the legal system to resolve disputes. Bank system is coded "1" if a country has a bank-dominated system and "0" otherwise. Family system is coded "1" if a country has a family dominated system and "0" otherwise.

that analysts are less likely to follow firms with more corporate governance issues when countries' investor protection is weak. On the other hand, they examine the interaction effects of concentrated family / management control and analyst coverage on firm valuation. They find that the interaction of concentrated family / management control and analyst coverage is more positively associated with firm valuation for firms in countries with low investor protection, suggesting that analysts play a more important governance role in those countries.

Barniv, Myring, and Thomas (2005) examine whether legal origin affects the ability of analyst characteristics to explain relative forecast accuracy. They argue that market forces provide incentives to analysts for performing better in common law countries than in civil law countries. Using a sample of firms in 12 common-law countries and 21 civil-law countries, they find that analysts with superior ability in common-law countries outperform their peers, whereas analysts with superior ability in civil-law countries less consistently outperform their peers. Bushman, Piotroski, and Smith (2005) investigate the relation between insider trading restrictions and analyst following. Using data for 100 countries, they find that analyst following increases after initial enforcement of insider trading laws more greatly for countries emerging market countries and countries without a preexisting portfolio of strong investor protections. More recently, Bae, Tan, and Welker (2008) investigate the effect of GAAP differences on foreign analyst following and forecast accuracy. Based on the data from 49 countries, they document that GAAP difference between two countries is negatively associated with foreign analyst following and forecast accuracy.

In summary, prior research focuses on examining the effect of country-level variables on analyst following and forecast performance. There is limited research on investigating the governance role of analyst coverage across countries.

2.2 Governance role of analysts

Prior research suggests that analysts play an information intermediary role in the capital market (e.g., Healy and Palepu 2001). For example, Barth, Kasznik, and, McNichols (2001) find that more analysts follow high intangible firms than low intangible firms, suggesting that analysts augment the financial reporting systems for intangibles. Barron, Byard, Kile, Riedl, and Demers (2002) document a negative association between a firm's level of intangible assets and the consensus in analysts' earnings forecasts. Their findings suggest that analysts rely more on their own private information search when issuing earnings forecasts for high intangible firms and thereafter supplement those firms' financial information. Gu and Chen (2004) find that analysts selectively include more persistent nonrecurring items and nonrecurring items with high valuation multiples in street earnings. This suggests that analysts can interpret financial information and enhance its usefulness.

Analysts also serve the monitoring role through interpreting public information and searching for private information. Analysts' great experience on tracking corporate financial statements and substantial industry-wide knowledge facilitate them to effectively monitor firms' financial reporting. Managers are less likely to issue fraudulent financial reports when analysts can see through them. Since analysts'

performance affects their reputations and compensation, they have incentives to search for private information and scrutinize firms' public disclosure in order to achieve their better performance. Dyck, Morse, and Zingales (2006) find that analysts are more effective in detecting corporate frauds than the Securities and Exchange Commission and auditors. Thus, analyst coverage is an important and alternative governance mechanism.

Recently, the governance role of analyst coverage has been emphasized by two studies. Yu (2008) examines whether analyst coverage can constrain earnings management. He finds that a high level of analyst coverage is associated with a low level of discretionary accruals. He also finds that high analyst coverage leads to less earnings management measured by the discontinuity of earnings distribution around earnings benchmarks. Knyazeva (2007) investigates the effect of analyst coverage on firm behavior. She argues that analyst coverage acts as a magnifying lens of managerial opportunism, allowing less informed shareholders to impose discipline on value destroying managers. She also finds that the level of earnings management is lower for firms with high analyst coverage than for firms with low analyst coverage. Their results suggest that analyst coverage plays an important governance role in constraining earnings management.

2.3 Hypothesis

As investors face a risk of expropriating their wealth by controlling shareholders or managers, they need to be protected by law and its enforcement. Countries with weak investor protection have low anti-director rights and legal enforcement (La Porta, Lopez-

de-Silanes, Shleifer, and Vishny 1998). Anti-director rights reflect the extent to which the legal system favors minority shareholders against managers or dominant shareholders in the corporate decision-making process, including the voting process. Thus, low anti-director rights will lead to more agency problems related to managerial opportunism and the expropriation of minority shareholders. Durnev and Kim (2005) note that countries with strong investor protection laws may be ineffective if they are not enforced. Anti-director rights are a de jure measure of investor protection that cannot measure the de facto strength of investor protection. As a de facto measure of investor protection, legal enforcement reflects how strongly the legal system is enforced to protect investors against the expropriation by managers and controlling shareholders. Thus, weak legal enforcement will lead to more managers' and controlling shareholders' opportunistic behavior.

While there are more agency problems for firms in countries with weak investor protection, corporate governance is also weak for those firms. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) find that strong investor protection is associated with valuable capital markets, and then argue that strong investor protection creates an environment that fosters good corporate governance. DeFond and Hung (2004) examine whether investor protection affects the association between CEO turnover and poor performance, which reflects the quality of corporate governance because good corporate governance will terminate poorly performing CEOs. They document that strong legal enforcement significantly improves the association between CEO turnover and poor

performance. Their results suggest that weak investor protection could lead to a low quality of corporate governance.

Recent studies by Yu (2008) and Knyazeva (2007) suggest that analyst coverage plays a corporate governance role. Knyazeva (2007) also examines whether analyst coverage is a substitute or complement to other corporate governance mechanisms. She finds that the earnings management is more negatively associated with analyst coverage for firms with low institutional ownership than for firms with high institutional ownership. As institutional shareholding is a kind of corporate governance mechanism (Bushee 1998), Knyazeva's (2007) findings suggest that analyst coverage could be a substitute to other corporate governance mechanisms. Since firms in countries with weak investor protection have more agency problems and lower corporate governance quality, it is likely that analyst coverage will play a more important role in mitigating agency problems and substituting other low quality governance mechanisms in those countries. However, as analyst coverage itself is a kind of governance mechanism, the effectiveness of its governance role could be lower in weak investor protection countries. Thus, whether analyst coverage plays a more important governance role in weak investor protection countries than in strong investor protection countries is an empirical question. We develop the hypothesis as follows:

H1 *The association between analyst coverage and earnings management is moderated by investor protection.*

3. Research Design

3.1 Data and variables

I first collect the data of analyst coverage for both U.S. and international firms from the I/B/E/S Detail History database. Analyst coverage is computed as the total number of analysts who issue forecasts of the next fiscal year's earnings per share for a firm during the current fiscal year. Next, I collect the data from COMPUSTAT Global to calculate other firm-level variables used in the analysis. Since I/B/E/S provides CUSIPs only for U.S. and Canadian companies, I have to manually match non-U.S. and non-Canadian companies between I/B/E/S and COMPUSTAT Global based on company names in the two databases.[2] This procedure identifies non-U.S. and non-Canadian firms that have both I/B/E/S TICKER and COMPUSTAT GVKEY. Then, I merge the I/B/E/S dataset with the COMPUSTAT Global dataset using CUSIPs for U.S. and Canadian firms, and TICKERs matched with GVKEYs for other countries' firms.

Following Leuz, Nanda, Wysocki (2003), I measure earnings management by the ratio of the absolute value of accruals and the absolute value of cash flow from operations.[3] Leuz et al. (2003) assert that the magnitude of accruals reflects the extent to which insiders exercise discretion in reporting earnings. In addition, I do not use the Jones model to determine discretionary accruals because of general concerns about the Jones model's ability to separate discretionary and nondiscretionary accruals (e.g.,

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[2] For non-U.S. and non-Canadian companies, CUSIPs in I/B/E/S are SEDOL codes, which are not provided in COMPUSTAT Global.

[3] Leuz, Nanda, Wysocki (2003) also use other three measures of earnings management including: the ratio of the standard deviation of operating income and operating cash flow, the Spearman correlation between the change in accruals and the change in cash flow from operations, and the number of "small profits" divided by the number of "small losses". However, these three variables are not measured for each firm-year observation and thus cannot be used in this study's cross-section analysis.

Dechow, Sloan, and Sweeney 1995) and because I am not aware of any evidence that indicates that the Jones model performs equally well across countries. Since it is still likely that accruals are a noisy proxy for earnings management, I also use an earnings benchmark variable as an alternative proxy for earnings management in robustness tests (discussed later).

Like Leuz et al. (2003) and Francis, LaFond, Olsson, and Schipper (2004), total accruals are measured as: change in current assets – change in current liabilities – change in cash + change in short-term debt – depreciation. Cash flow from operations is net income less total accruals. I also use four firm-level variables in the analysis. They include the market-to-book ratio (*MB*), firm size (*SIZE*), financial leverage (*LEV*), and loss-making dummy (*LOSS*). The market-to-book ratio is the ratio of the market value of common equity to the book value of common equity. Firm size is measured as the logarithm value of total assets. Financial leverage is long-term debt divided by total assets. Loss-making dummy is 1 if a firm is making loss and 0 otherwise.

Following DeFond and Hung (2004), I use the country-level measure of legal enforcement as a main proxy for investor protection. I use legal enforcement because Durnev and Kim (2005) note that a country can have strong investor protection laws in place, but these can be ineffective if they are not enforced. For example, India and Pakistan have strong investor protection laws but the de facto strength of investor protection is weak in these two countries (Durnev and Kim 2005). Like Leuz et al. (2003), legal enforcement scores are computed as the average of three measures from La Porta et al. (1998): (1) the efficiency of the judicial system, (2) the rule of law, and (3)

level of corruption in a country. In robustness tests, I also use anti-director rights, legal origin, and institutional cluster as other proxies for investor protection.

Similar to Tucker and Zarowin (2006), I use the fractional ranking of the firm-level continuous variables within each country-industry-year (two-digit SIC) in order to control for the fixed country, industry and year effects. To mitigate the effect of few observations within a country-industry-year on the fractional ranking, firm-year observations in the sample are required to be within a country-industry-year from which there are at least five observations.

I use the version of COMPUSTAT Global database updated on April 30, 2008 to collect the data for years 1989 to 2007.[4] Financial statement data is collected from the COMPUSTAT Global Industrial /Commercial file and stock market data is collected from COMPUSTAT Global Issue file. Since the lagged data is used in computing some variables, the test period becomes years 1990 to 2007. After excluding observations without the data of the firm-level variables and country-level investor protection, the final sample consists of 47,999 firm-year observations for years 1990 to 2007.

Table 1 presents the sample breakdown by country. 47,999 firm-year observations in the sample come from 23 countries. The numbers of observations from the U.S. (24,942 observations or 51.96% of the sample), Japan (9,995 observations or 20.82% of the sample), the U.K. (5,155 observations or 10.74% of the sample), and Canada (4,482 observations or 9.34% of the sample) are dominated in the sample. Because of the

[4] 1989 is the first year in this version of COMPUSTAT Global.

dominance of these countries' observations, in robustness tests, I test the hypothesis with observations from these countries are omitted, respectively.

Insert Table 1

Table 2 summarizes the scores of investor protection across the 23 countries in the sample. A high score for investor protection indicates a high investor protection in a country. Four countries including Switzerland, Denmark, Netherlands, and Sweden have the maximum score of legal enforcement among the sample countries, while Indonesia has the minimum score.

Insert Table 2

3.2 Model

To test the hypothesis, I estimate the following model:

$$EM = b_0 + b_1 INVP + b_2 ANALYST + b_3 INVP * ANALYST + b_4 MB + b_5 SIZE + b_6 LEV + b_7 LOSS + \varepsilon \quad (1)$$

where

EM = *Earnings management*, measured as the fractional ranking of the ratio of the absolute value of accruals to the absolute value of cash flow from operations within a country-industry-year,

INVP = *Investor protection*, measured as the score of legal enforcement for a country,

ANALYST = *Analyst coverage*, measured as the fractional ranking of the total number of analysts who issue forecasts of the next fiscal year's earnings per share within a country-industry-year,

MB = *Market-to-book ratio*, measured as the fractional ranking of the ratio of the market value of common equity to the book value of common equity within a country-industry-year,

SIZE = *Firm size*, measured as the fractional ranking of the logarithm value of total assets within a country-industry-year,

LEV = *Financial leverage*, measured as the fractional ranking of the ratio of long-term debt to total assets within a country-industry-year,

LOSS = *Loss-making dummy*, coded "1" if a firm is making loss and "0" otherwise.

In eq. (1), the coefficient on investor protection (b1) is expected to be negative because Leuz et al. (2003) find that the level of earnings management is lower for firms in countries with strong investor protection than for firms in countries with weak investor protection. Since Knyazeva (2007) and Yu (2008) document that analyst coverage is negatively associated with the level of earnings management in the U.S. context, I also predict a negative coefficient on analyst coverage (b2). If the hypothesis is supported, we expect that b3 is significant. If analyst coverage plays a more important role in constraining earnings management for firms in countries with weak investor protection than for firms in countries with strong investor protection, then the coefficient on the interaction term between investor protection and analyst coverage (b3) will be positive and significant. On the other hand, b3 will be negative if analyst coverage plays a less important role in constraining earnings management for firms in countries with weak investor protection than for firms in countries with strong investor protection,

I include the market-to-book ratio, firm size, financial leverage, and loss-making dummy in eq. (1) as control variables for three reasons. First, these four firm characteristics are likely to affect the level of earnings management. Using the U.S. data, Klein (2002a) finds that the market-to-book ratio and financial leverage are significantly positively associated with the absolute value of discretionary accruals. She also

documents an insignificantly positive and negative association of loss-making dummy and firm size with the absolute value of discretionary accruals.

Second, these four firm characteristics are likely to affect the demand for internal governance mechanisms. In her another U.S. study, Klein (2002b) document that the market-to-book ratio, firm size, and loss-making dummy is significantly negatively associated with audit committee independence, while financial leverage is insignificantly negatively associated with audit committee independence. Durnev and Kim (2005) find that it is more likely that firms with good investment opportunities have great incentives to practice good corporate governance in countries with weak legal enforcement than in countries with strong legal enforcement, suggesting that the market-to-book ratio could be negatively associated with earnings management in the international context.

Third, some of these control variables may also affect analyst coverage. Yu (2008) documents a significant and positive association of analyst coverage with growth rate of assets, firm size, and earnings performance. Based on the above discussions, in eq. (1), the coefficients on both the market-to-book ratio and firm size are expected to either positive or negative, while the coefficients on both financial leverage and loss-making dummy are expected to be positive. I estimate eq. (1) on pooled cross-sectional, time series data. In robustness tests, I separately estimate eq. (1) on yearly cross-sectional data for the Fama-MacBeth test.

4. Empirical Results

Table 3, panel A presents the descriptive statistics of variables. The mean and median of earnings management measure (*EM*) are 1.190 and 0.578, respectively. The

median *EM* (i.e., 0.578) of all observations in the sample is close to the mean and median (i.e., 0.558 and 0.552, respectively) of 31 countries' median *EM*s in Leuz et al. (2003). The mean and median of analyst coverage (*ANALYST*) for the sample are 8.71 and 6.00, respectively, compared to the mean and median of analyst coverage (i.e., 9.66 and 6.00, respectively) for the U.S. sample in Yu (2008).

Table 3, panel B provides the Pearson correlations between independent variables. The maximum absolute value among the correlation coefficients is 0.66 between analyst coverage and firm size. Since the correlations between the independent variables are not excessive, multicollinearity is unlikely to be a substantive issue.

Insert Table 3

Table 4 provides the results for testing the hypothesis. I find that the coefficient on the interaction term of investor protection and analyst coverage is positive and significant (*t*-statistic = 4.47), consistent with the hypothesis. This shows that analyst coverage is more negatively associated with the level of earnings management for firms in countries with weak investor protection than for firms in countries with strong investor protection. These findings suggest the substitution relation between analyst coverage and investor protection that analyst coverage plays a more important monitoring role in countries with weak investor protection.

Consistent with Leuz et al. (2003), I find that the level of earnings management is lower for firms in countries with strong investor protection than for firms with weak investor protection (*t*-statistic = -6.89). Also, I find that the level of earning management is lower for firms with high analyst coverage than for firms with low analyst coverage (*t*-

statistic = -5.25), consistent with the U.S. evidence in Knyazeva (2007) and Yu (2008). In addition, the level of earnings management is negatively associated with the market-to-book ratio (*t*-statistic = -29.54), suggesting that firms with good investment opportunities may have great incentives to practice good corporate governance in the international context (Durnev and Kim 2005). Firm size is positively associated with the level of earnings management (*t*-statistic = 7.42), consistent with the notion that large firms have more agency problems (Boone, Field, Karpoff, and Raheja 2007). Like Klein (2002a), I find that financial leverage is positively associated with the level of earnings management (*t*-statistic = 30.77). Finally, I find that the absolute value of accruals is higher for loss-making firms than for profit-making firms (*t*-statistic = 50.18).

Insert Table 4

To examine the robustness of the results, I conduct several additional analyses. First, I control for the endogenous relationship between earnings management and analyst coverage. The endogenous relationship may exist because analysts are more likely to self-select firms with high earnings quality than firms with low earnings quality. To address this concern, I run the two-stage regression. Similar to Yu (2008), I use local market index dummy as an instrumental variable because it can capture the variations in analyst coverage that are exogenous to earnings quality. I estimate the first stage model as follows:

$$ANALYST = a_0 + a_1 LMIND + a_2\, MB + a_3 SIZE + a_4 LEV + a_5 LOSS + \varepsilon \qquad (2)$$

where *LMIND* is local market index dummy, coded "1" for a firm included in a local market index and "0" otherwise. Then, I estimate the second stage regression model, i.e.,

eq. (1), using the fractional ranking of the fitted value from eq. (2) within each country-industry-year (*ANALYST^*) to replace *ANALYST*.

Insert Table 5

Table 5 reports the results on examining the substitution relation between analyst coverage and investor protection after allowing for the endogeneity of analyst coverage. I also find that the coefficient on the interaction of investor protection and analyst coverage is positive and significant (*t*-statistic = 2.86). Thus, the results after considering the endogeneity still support the notion that the level of earnings management is more negatively associated with analyst coverage for firms in countries with weak investor protection than for firms in countries with strong investor protection.

Second, I examine the sensitivity of the results to alternative proxies for investor protection including: anti-director rights, legal origin, and institutional clusters. We use anti-director rights because it measures the voting rights of minority shareholders (Leuz et al. 2003). Legal origin is a dummy coded "1" for a common law country and "0" for a civil law country as prior research suggests that investor protection is higher in common law countries than civil law countries (La Porta et al. 1998). Leuz et al. (2003) classify countries into three institutional clusters in terms of investor protection based on nine institutional variables from La Prota et al. (1997; 1998).[5] We code "2", "1", and "0" for a country in Clusters 1, 2, and 3, respectively.

[5] Nine institutional variables include stock market capitalization, listed firms, IPOs, ownership concentration, anti-director rights, disclosure index, efficiency of judicial system, rule of law, and corruption index.

Table 6 presents the results for the alternative measures of investor protection. Columns 3 and 4 of Table 6 report that the level of earnings management is more negatively associated with analyst coverage in countries with weak anti-director rights (*t*-statistic = 3.92). In columns 5 and 6 of Table 6, we provide the results that analyst coverage constrains earnings management more greatly in civil law countries (*t*-statistic = 4.87). Columns 7 and 8 of Table 6 also present that the negative association between earnings management and analyst coverage is stronger for countries with weak investor protection measured by institutional clusters (*t*-statistic = 5.60). Thus, the results are robust to those alternative measures of investor protection.

Insert Table 6

Third, I use the Fama-MacBeth test to control for the autocorrelations of time-series data. I estimate eq. (1) using yearly data. The mean coefficient on the interaction term of analyst coverage and investor protection for years 1991 to 2007 is 0.054.[6] Based on the seventeen years' annual coefficients, I document that the non-tabulated Fama-MacBeth *t*-statistic is 5.04, which is strongly significant (two-tailed p-value <0.001). These results are consistent with the results of the pooled regression.

Fourth, I examine whether the results are driven by the dominance of the number of some countries' observations in the sample. I am concerned with this issue because an extremely high proportion of the observations in the sample are from the U.S., Japan, the U.K., and Canada. To deal with this issue, I estimate eq. (1) by excluding (1) U.S. observations, (2) U.S. and Japanese observations, (3) U.S., Japanese, and U.K.

[6] Since all observations for 1990 (i.e., 20 observations) are from the U. K., eq. (1) cannot be estimated for that year.

observations, and (4) U.S., Japanese, U.K., and Canadian observations, respectively. I find that the coefficients on the interaction term of analyst coverage and investors are all positive and significant (non-tabulated *t*-statistic = 4.15 when U.S. observations are omitted, 4.65 when U.S. and Japanese observations are omitted, 5.27 when U.S., Japanese, and U.K. observations are omitted, and 3.39 when U.S., Japanese, U.K., and Canadian observations are omitted). Thus, the results are not driven by the dominance of those countries' observations in the sample.

Fifth, I examine whether the results are robust to an alternative measure of earnings management. Similar to Yu (2008), I use earnings benchmark dummy that takes the value of "1" if the change in earnings scaled by the beginning total assets lies in the interval of [0, 002) and "0" otherwise to measure earnings management because it is found that firms with a smaller increase in earnings are more likely to engage in earnings management (Burgstahler and Dichev 1997). I run the logistical regression of eq. (1) where the dependent variable is replaced with the earnings benchmark dummy.[7]

Insert Table 7

Table 7 reports the results on earning benchmark measure. I document that the negative association between the likelihood of firms' just meeting or beating prior year's earnings and analyst coverage is stronger for firms in countries with weak investor protection (chi-square statistic = 2.92), suggesting the substitution relation between analysts coverage and investor protection. Thus, the results still hold when I measure earnings management in an alternative way.

[7] Based on prior research (e.g., Ashbaugh, LaFond, and Mayhew 2003), the sign of the coefficient on *LOSS* is expected to be negative.

5. Conclusion

This study examines whether investor protection affects the ability of analyst coverage in constraining earnings management. I find that analyst coverage is more negatively associated with earnings management for countries with weak investor protection than for countries with strong investor protection. This suggests that the governance role of analyst coverage is magnified by weak investor protection. This study makes two contributions to the literature. First, this study adds to the limited research on the governance role of analysts by focusing on international data and the effect of investor protection on analysts' governance role. Second, this study extends a growing literature on international analysts by examining the effectiveness of analyst coverage in constraining earnings management.

This study also has certain limitations as follows. First, many countries are omitted from our final sample because sample firms need to be included by both Compustat Global and I/B/E/S. Second, it is unclear whether the approach to control for endogeneity of analyst coverage in this study is most appropriate although I follow Yu (2008)'s approach. Third, it is also unclear which method to measure earnings management is more appropriate in the international context.

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Table 1
Sample Breakdown by Country

Country Name	Country Code	Frequency	Percent (%)
Australia	AUS	632	1.32
Brazil	BRA	123	0.26
Canada	CAN	4,484	9.34
Switzerland	CHE	124	0.26
Chile	CHL	46	0.10
Germany	DEU	252	0.53
Denmark	DNK	30	0.06
France	FRA	21	0.04
United Kingdom	GBR	5,155	10.74
Hong Kong	HKG	292	0.61
Indonesia	IDN	15	0.03
Japan	JPN	9,995	20.82
Korea	KOR	114	0.24
Mexico	MEX	41	0.09
Malaysia	MYS	470	0.98
Netherlands	NLD	58	0.12
Philippines	PHL	31	0.06
Singapore	SGP	248	0.52
Sweden	SWE	115	0.24
Thailand	THA	442	0.92
Taiwan	TWN	280	0.58
United States	USA	24,942	51.96
South Africa	ZAF	89	0.19
Total		47,999	100.00

Table 2
Scores of Investor Protection across Countries

Country Name	Country Code	Investor Protection
Australia	AUS	9.51
Brazil	BRA	6.13
Canada	CAN	9.75
Switzerland	CHE	10.00
Chile	CHL	6.52
Germany	DEU	9.05
Denmark	DNK	10.00
France	FRA	8.68
United Kingdom	GBR	9.22
Hong Kong	HKG	8.91
Indonesia	IDN	2.88
Japan	JPN	9.17
Korea	KOR	5.55
Mexico	MEX	5.37
Malaysia	MYS	7.72
Netherlands	NLD	10.00
Philippines	PHL	3.47
Singapore	SGP	8.93
Sweden	SWE	10.00
Thailand	THA	4.89
Taiwan	TWN	7.37
United States	USA	9.54
South Africa	ZAF	6.45

Investor protection is measured by legal enforcement scores, i.e., the average of three measures from La Porta et al. (1998): (1) the efficiency of the judicial system, (2) the rule of law, and (3) level of corruption in a country (Leuz et al. 2003).

Table 3
Descriptive Statistics and Pearson Correlations

Panel A. Descriptive statistics

Variable	N	Mean	Median	Std	Q1	Q3
EM	47,999	1.190	0.578	2.563	0.317	0.939
ANALYST	47,999	8.714	6.000	8.360	2.000	12.000
MB	47,999	2.489	1.673	3.194	1.049	2.727
SIZE	47,999	6.445	6.319	1.693	5.248	7.538
LEV	47,999	0.161	0.128	0.160	0.017	0.255
LOSS	47,999	0.203	0.000	0.403	0.000	0.000

Panel B. Pearson correlations (N = 47,999)

Variable	*ANALYST*	*MB*	*SIZE*	*LEV*	*LOSS*
INVP	-0.059***	-0.023***	-0.023***	-0.021***	0.022***
ANALYST		0.304***	0.663***	0.092***	-0.136***
MB			0.136***	-0.014***	-0.029***
SIZE				0.266***	-0.147***
LEV					0.072***

EM = *Earnings management*, measured as the ratio of the absolute value of accruals to the absolute value of cash flow from operations,
ANALYST = *Analyst coverage*, measured as the total number of analysts who issue forecasts of the next fiscal year's earnings per share,
MB = *Market-to-book ratio*, measured as the ratio of the market value of common equity to the book value of common equity,
SIZE = *Firm size*, measured as the logarithm value of total assets,
LEV = *Financial leverage*, measured as the ratio of long-term debt to total assets,
LOSS = *Loss-making dummy*, coded "1" if a firm is making loss and "0" otherwise.
In panel B, *EM*, *ANALYST*, *MB*, *SIZE*, and *LEV* are the fractional ranking of its continuous values within a country-industry-year.
*** indicates a significance at the 1% level (two-tailed tests).

Table 4
Effect of Investor Protection on Governance Role of Analyst Coverage

Variable	Predicted sign	Coefficient	*t*-statistic
Intercept	+/-	0.812	17.51***
INVP	-	-0.034	-6.89***
ANALYST	-	-0.363	-5.25***
*INVP*ANALYST*	+/-	0.033	4.47***
MB	+/-	-0.135	-29.54***
SIZE	+/-	0.045	7.42***
LEV	+	0.149	30.77***
LOSS	+	0.162	51.18***
N			47,999
F-statistic			783.41***
Adj. R^2			10.24%

The regression model is as follows:

$$EM = b_0 + b_1 INVP + b_2 ANALYST + b_3 INVP * ANALYST + b_4 MB + b_5 SIZE + b_6 LEV + b_7 LOSS + \varepsilon \quad (1)$$

*** indicates a significance at the 1% level (two-tailed tests).

Table 5
Results after Allowing for Endogeneity

Variable	Predicted sign	Coefficient	*t*-statistic
Intercept	+/-	0.705	17.24***
INVP	-	-0.024	-5.49***
*ANALYST^*	-	-0.150	-2.30**
*INVP*ANALYST^*	+/-	0.020	2.86***
MB	+/-	-0.146	-33.28***
SIZE	+/-	-0.020	-1.14
LEV	+	0.158	29.03***
LOSS	+	0.162	51.09***
N			47,999
F-statistic			771.14***
Adj. R^2			10.10%

The first stage model is as follows:

$$ANALYST = a_0 + a_1 LMIND + a_2 MB + a_3 SIZE + a_4 LEV + a_5 LOSS + \varepsilon \quad (2)$$

where LMIND is local market index dummy, coded "1" for a firm included in a local market index and "0" otherwise.

The second stage model is as follows:

$$EM = b_0 + b_1 INVP + b_2 ANALYST^{\wedge} + b_3 INVP * ANALYST^{\wedge} + b_4 MB + b_5 SIZE + b_6 LEV + b_7 LOSS + \varepsilon \quad (1')$$

where *ANALYST^* is the fractional ranking of the fitted value from eq. (2) within each country-industry-year.

*** indicates a significance at the 1% level (two-tailed tests).

** indicates a significance at the 5% level (two-tailed tests).

Table 6
Results on Alternative Proxies for Investor Protection

		Anti-director rights		Legal origin		Institutional cluster	
Variable	Predicted sign	Coefficient	*t*-statistic	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Intercept	+/-	0.648	27.62***	0.530	65.46***	0.627	30.59***
INVP	-	-0.032	-6.68***	-0.044	-5.29***	-0.048	-6.68***
ANALYST	-	-0.195	-5.47***	-0.107	-8.44***	-0.227	-7.28***
*INVP*ANALYST*	+/-	0.029	3.92***	0.062	4.87***	0.061	5.60***
MB	+/-	-0.134	-29.42***	-0.133	-29.16***	-0.133	-29.18***
SIZE	+/-	0.047	7.75***	0.047	7.69***	0.048	7.82***
LEV	+	0.149	30.83***	0.149	30.88***	0.149	30.84***
LOSS	+	0.162	51.25***	0.162	51.10***	0.162	51.13***
N			47,999		47,999		47,999
F-statistic			784.23***		776.82***		779.86***
Adj. R^2			10.25%		10.16%		10.20%

The regression model is as follows:

$$EM = b_0 + b_1 INVP + b_2 ANALYST + b_3 INVP * ANALYST + b_4 MB + b_5 SIZE + b_6 LEV + b_7 LOSS + \varepsilon \quad (1'')$$

where *INVP* is replaced with anti-director rights, legal origin, and institutional cluster, respectively.
*** indicates a significance at the 1% level (two-tailed tests).

Table 7
Results on Earnings Benchmark

Variable	Predicted sign	Coefficient	Chi-square
Intercept	+/-	-0.274	0.53
INVP	-	-0.066	2.72*
ANALYST	-	-1.022	3.38*
*INVP*ANALYST*	+/-	0.101	2.92*
MB	+/-	-0.248	42.67***
SIZE	+/-	0.642	165.42***
LEV	+	0.123	9.61***
LOSS	-	-1.906	2,200.82***
N			50,023
LR statistic			3,965.11***
-2 Log L			56,148.91

The logistical regression model is as follows:
$EM = b_0 + b_1 INVP + b_2 ANALYST + b_3 INVP * ANALYST + b_4 MB + b_5 SIZE + b_6 LEV + b_7 LOSS + \varepsilon$ (1''')
where *EM* is measured by earnings benchmark dummy that takes the value of "1" if the change in earnings scaled by the beginning total assets lies in the interval of [0, 002) and "0" otherwise.
*** indicates a significance at the 1% level (two-tailed tests).
* indicates a significance at the 10% level (two-tailed tests).