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Analyst Monitoring and Earnings Management: The Roles of Corporate Disclosure and National Culture

Abstract

We examine country-level determinants of private information search incentives, and whether analysts' role in constraining managers' opportunistic earnings management varies across countries. In a sample of 31,312 firm-year observations originating from 30 countries, we document that: (1) analyst coverage is negatively (positively) related to the level of corporate disclosure (how secretive the national culture is); (2) the negative association between analyst coverage and earnings management is observed in stronger investor protection countries but not in weaker investor protection countries; and (3) analyst monitoring fails to mitigate culture-driven earnings manipulations in countries with more individualistic and uncertainty-tolerant cultures. Taken together, financial analysts' role in constraining opportunistic earnings management across countries appears to vary with corporate disclosure and cultural environments.

JEL Classification Codes: G34; M16; M40

Keywords: *Analyst Coverage; Earnings Management; Corporate Disclosure; National Culture; Investor Protection*

1. Introduction

In this study, we examine country-level determinants of investors' private information search incentives (proxied by analyst coverage) and ask whether financial analysts play a monitoring role to curb earnings management practice across countries. Prior literature suggests that country-level institutions and cultural factors have siginficant capital market consequences (e.g., Leuz, Nanda, and Wysocki 2003; Hope 2003; Guiso, Sapienza, and Zingales 2007; Han, Kang, Salter, and Yoo 2008). However, there is a paucity of evidence on country-level determinants of private information search incentives and how analysts' monitoring roles vary across countries with different investor protection and culture.

Corporate disclosure levels capture the amount of disclosed information, while the secretiveness of national culture reflects the likelihood of withholding releavnt information. In stronger disclosure environments and less secretive cultures, where corporate disclosure levels tend to be higher (hence there is more information to process), it is possible that the demand for information intermediaries is higher than that for information providers. In contrast, in weaker disclosure environments and more secretive cultures, the demand for information production is likely to be higher than that for information processing. As a result, financial analysts are more likely to play the role of information provider rather than information intermediary in order to complement the weaker corporate disclosure. Hence, we hypothesize and test whether financial analysts' information search levels vary across countries that have different disclosure and cultural environments, depending on whether their primary role in the capital market is information intermediary or information provider.

Our cross-country setting provides a greater power to reject the null hypothesis of analysts role as an information provider than in a single country setting (e.g., Lang and

Lundholm 1996), as the variation in disclosure levels and culture across countries is likely to be greater than the variations in one jurisdiction, e.g., the U.S. In this regard, our tests complements the single country evidence from Lang and Lundholm (1996), who did not provide support for the role of financial analysts as information provider.[1]

Next, we hypothesize and test whether the monitoring role of analysts vary across countries by focusing on their role in constraining managers' opportunistic earnings management behaviors. Using U.S. data, Yu (2008) finds that analysts play a governing role in corporations, resulting in a negative relation between analyst coverage and earnings management. However, given international variations in investor protection and culture that are known to influence managers' decision to manipulate earnings (Leuz et al. 2003; Han et al. 2008), it is not clear whether the association between analyst coverage and earnings management will generalize to countries other than the U.S. Hence we ask whether financial analysts mitigate both legal institution- and culture-driven earnings management incentives across countries.[2]

Our evidence shows the following. First, we find that analyst coverage is on average lower in stronger disclosure regimes and in less secretive cultures. These suggest, consistent with our prediction, that private information search incentives are greater in weaker disclosure environments and in more secretive cultures. These results supplement Lang and Lundholm's (1996) U.S. evidence on the information intermediary role of analysts by documenting information provider role of analysts in countries with weaker disclosure rules and more secretive culture. Second, our results show that analysts constrain earnings management in strong investor protection countries, consistent with the monitoring view of analysts, but earnings

[1] Their evidence supports the information intermediary role of analysts.
[2] For example, Leuz et al. (2003), firms manage earning less in stronger investor protection countries. Han et al. (2008) document that the magnitude of discretionary accruals is greater in countries with more individualistic and uncertainy-tolerant culture, suggesting that national culture matters in managers' decision to manipulate earnings.

magement increases with analyst coverage in weaker investor protection countries, in line with the idea that analysts can put pressure to report better firm performance when there isn't appropriate incentives to monitor. These results suggest that financial analysts' monitoring incentives vary with the strength of investor protection. Finally, our evidence shows that analysts induce more earnings management, instead of mitigating it, in more individualistic and uncertainty-tolerant cultures.

This study contributes to the literature on financial analysts' information search and monitoring incentives in the following ways. First, our evidence shows that the main role financial analysts play in a capital market (i.e., information intermediary or information provider) depends on the corporate disclosure level and the likelihood of managers' withholding information in the economy. This finding complements Lang and Lundholm's (1996) earlier U.S. evidence on financial analysts role as informatio intermediary (but not as information provider). Second, we find that national culture relates to analysts' information search and that analyst role in constraining earnings management is conditional on the cultural environment (i.e., how secretive the culture is). We document that analysts' information search incentives are higher in more "secretive" cultures, but that they fail to mitigate culture-driven earnings management in more individualistic and uncertainty-tolerant cultures. Finally, we provide evidence which suggests that analysts' monitoring incentives vary with the legal environment (i.e., investor protection mechanisms): analysts appear to monitor managers when investor protection is strong, but not in the absence of appropriate legal incentives, i.e., in weak investor protection environments.

The rest of this paper is organized as follows. In the next section, we briefly review relevant literature and develop hypotheses. In Section 3, we describe our methodology and sample. In Section 4, we discuss the results. In Section 5, we conclude.

2. Background and Hypotheses Development

Financial analysts collect and analyze information about the firms they follow, monitoring managers by reducing information asymmetry between managers and investors (e.g., Jensen and Meckling 1976; Healy and Palepu 2001; Frankel and Li 2004; Dyck 2006). Lang and Lundholm's (1996) U.S. evidence suggests that analysts respond to firms' disclosure practices, i.e., firms can attract analysts, reduce information asymmetries and limit market surprises by adopting more forthcoming disclosure practices. Prior literature identifies two possible roles of financial analysts in the capital market – the roles of information intermediary and information provider (e.g., Bhushan 1989). In the Bhushan's model (1989), the effect of increased disclosure on the demand for analyst services depends on the role that analyst play in the capital market.[3] If analysts are primarily information intermediaries – the principal flow of information goes from the firm to the analysts, who process the information and trasmit it to the capital market – then an increase disclosure means the analyst has a more valuable report to sell, increasing aggregate demand for analyst services. However, if analysts are primarily information providers who compete with firm-provided disclosures made directly to investors, then an increase in corporate disclosure will substitute for the analysts report, decreasing aggregate demand for analyst services. Lang and Lundholm's (1996) U.S. evidence shows that corporate disclosure and

[3] On the supply side, more disclosure will increase aggregate supply of analyst services if it is less costly to receive information from the firm than to acquire it independently from other sources.

number of analyst following are positively associated, consistent with the information intermediary role of analysts.

In fact, it is possible that analysts' role in the capital market might vary across countries. Even though analysts primarily act as information intermediaries in stronger disclosure environments, where firms disclose more and hence analysts have more information to process, in weak disclosure regimes, where firms do not provide sufficient information through public disclosure, analysts might engage in information production in order to supplement poor corporate disclosure. Taken together, we predict that analysts play more of an information provider (intermediary) role in weaker (stronger) disclosure environments. This leads us to the following hyopthesis:

H1: Analyst coverage is negatively associated with corporate disclosure levels

In general, research in comparative accounting has produced an awareness of important basic differences in accounting practices in different countries, which are related with the influence of various environmental factors such as national culture (e.g., Radebaugh 1975; Gray 1988; Radebaugh, Gray, and Black 2006). For our investigation, it is possible that cultural tendency to be secretive relate to analysts information search incentives. Gray (1988) describes the secrecy dimension of accounting subculture values as "a preference for confidentiality and the restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open, and publicly accountable approach." To the extent that managers have greater tendency to withhold information in more secretive cultures, ceteris paribus, corporate disclosure levels would be lower and hence private information search incentives would be higher.

Our investigation extends prior studies that document an association between national culture and corporate disclosure levels (e.g., Salter and Niswander 1995; Jaggi and Low 2000; Hope 2003) by examining how the cultural tendency to be secretive relates to financial analysts' private information search incentives. The secrecy hypothesis predicts that managers in more secretive culture have a greater tendency to withhold information, rather than disclose it, ceteris paribus. Thus, to the extent that the information environments are weaker in more secretive cultures, the demand for information production might be higher. If analysts, responding to such demand, assume the role of information provider in those countries, analyst coverage will relate positively to how secretive the culture is. This reasoning leads us to the following prediction:

H2: Analyst coverage is positively related to the cultural tendency to be secretive

In theory, the association between analyst coverage and earnings management can be either positive (the "pressuring" view) or negative (the "monitoring" view). The monitoring view suggests that financial analysts who have financial expertise track corporate financial statements on a regular basis are likely to act as external monitors of managers (e.g., Jensen and Meckling 1976, Healy and Palepu 2001).[4] The pressuring view suggests that analyst coverage is often held responsible for creating excessive pressure on managers to manage earnings. Firms that miss analyst forecasts usually suffer significant declines in their stock price. In practice, one of the primary earnings targets that managers try to achieve is to meet analysts' forecast consensus (e.g. DeGeorge et al. 1999).[5,6]

[4] As Yu (2008) notes, they tend to interact directly with management and raise questions on different aspects of earnings numbers through earnings release conferences. For example, it is known that financial analysts are directly involved in the discovery of corporate fraud in companies including Compaq, CVS, Electronic Data System, Gateway, Motorola, etc. (e.g., Dyck 2006).

[5] Yu's U.S. evidence (2008) supports the monitoring hypothesis, indicating less earnings management as analyst coverage increases. However, it is not clear if this finding generalizes to countries outside the U.S, as there is little

Prior literature shows that managers' earnings management behaviors vary internationally with legal institutions and culture (e.g., Leuz et al. 2003; Han et al. 2008). Leuz et al. (2003) argue that strong and well-enforced outsider rights limit insiders' acquisition of private control benefits, and consequently, mitigate insiders' incentives to manage accounting earnings because they have little to conceal from outsiders. Their evidence shows that earnings mangement is more pervasive in countries where the legal protection of outside investors is weak, because in these countries insiders enjoy greater private control benefits and hence have stronger incentives to obfuscate firm performance. Han et al. (2008) find that managers engage in opportunistic earnings management more in countries with more individualistic and uncertainy-tolerant culture.

A priori, it is not clear whether the monitoring role of analysts would vary with the strength of legal environments. On the one hand, it is possible that analysts play a greater monitoring role in stronger legal environments (i.e., stronger investor protection mechanisms including outsider rights) by constraining opportunistic earnings management as analysts in those environments, where financial markets tend to be more developed and competitive, are likely to be more competent and hence better equipped to monitor managers.[7,8] Thus, it is possible that financial analysts in stronger legal environments are more effective in constraining opportunistic earnings management given their superior ability (e.g., financial expertise) to

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evidence on whether analysts' monitoring roles vary across countries that have different disclosure and cultural environments.

[6] Prior studies document that external auditors play different governance role internationally (e.g., Fan and Wong 2005; Choi and Wong 2007; Francis and Wang 2008), suggesting that firm stakeholders' monitoring incentives relate to country-level factors. The evidence on the differing monitoring role of auditors across countries provides little guidance for analysts' case for the following reason: while auditors face litigation risk from their audit reports and the risk varies across countries, analysts do not have such concerns. Hence, there is little reason to expect that analyst coverage relate systematically to the difference in litigation risks across countries.

[7] Our maintained assumption is that financial analysts provide monitoring regardless of whether their main role is information intermediary or information provider.

[8] In line with this idea, Hope (2003) finds that financial analysts demonstrate better earnings forecasting performance in countries with more effective legal enforcement.

monitor managers. On the other, the demand for corporate monitoring in general might be greater in weak legal environments, where managers are more likely to accumulate private control benefits in weak legal environments and obfuscate the firm performance (e.g., Leuz et al. 2003).[9] Since the direction of association is not obvious ex-ante, we develop the next hypothesis as non-directional in the following manner:

H3: The association between analyst coverage and earnings management will vary with the legal environment (i.e., countries with stronger investor protection and outsider rights).

Next, we investigate whether the role financial analysts play in constraining earnings management varies with culture. On the one hand, it is possible that analysts in more secretive cultures, where the demand for monitoring to reduce information asymmetry is greater, provide closer monitoring. On the other, analysts in more secretive cultures might provide less effective monitoring if they cannot overcome managers' cultural tendency to be secretive, i.e., withhold relevant information and increase firm opacity. Taken together, how effective analysts will be in reducing earnings management in more secretive culture is an empirical question. As the direction of association is not clear ex-ante, we develop our next hypothesis as follows:

H4: The association between analyst coverage and earnings management will vary with national culture (i.e., how secretive the culture is).

3. Research Design and Sample Selection

3.1. Research Design

[9] In either case, analysts also have incentives to go along with earnings management behavior, driven by the need to pursue investment banking business, the need to maintain good relationship with management for access to private information, and the need to avoid downgrades in stocks in which major clients have significant holdings (e.g., Dechow et al. 2000, Lin and McNichols 1998, Michaely and Womack 1999). These incentives might override the monitoring incentives especially in weak legal environments where legal enforcement is weaker (e.g., Francis, Khurana and Pereira 2003, Francis and Wong 2007).

Prior studies show that the choice of analyst following depends on unobserved or partly observed characteristics such as firm size, risk, analysts' incentives (e.g., Yu 2008). We adopt two-stage least squares (2SLS) approach to avoid this endogeneity problem. We run the following regression models in the first stage (Eq.1) and run the second stage regression using the fitted values from the first stage regression (Eq.2).

$$Coverage = \beta_0 + \beta_1 DISREQ + \beta_2 SEC + \beta_3 LNSIZE + \beta_4 LOSS + \beta_5 ISSUE + \beta_6 ROA + \beta_7 RECORR + \beta_8 ROESTD + \varepsilon \quad (1)$$

$$EM = \alpha_0 + \alpha_1 Coverage + \alpha_2 INVPRO + \alpha_3 INVPRO \times Coverage + \alpha_4 OSRIGHTS + \alpha_5 OSRIGHT \times Coverage + \alpha_6 CUL + \alpha_7 CUL \times Coverage + \alpha_8 LNSIZE + \alpha_9 LNBM + \alpha_{10} LEV + \alpha_{11} ISSUE + \alpha_{12} ROA + \varepsilon \quad (2)$$

Where:

Coverage	=	Analyst coverage at fiscal year-end month
EM	=	Earnings discretion measured by absolute discretionary accruals (|*DACC*|)
DISREQ	=	Disclosure requirement index (La Porta et al. 2006)
SEC	=	Cultural secrecy measure, which is the sum of Hofstede's uncertainty avoidance and power distance less individualism score (Hope, Kang, Thomas and Yoo 2008)
LNSIZE	=	Natural logarithm of total assets
LOSS	=	Indicator variable for a loss
ISSUE	=	Indicator variable for equity issuance
ROA	=	Return on Assets
RECORR	=	Correlation between firm return and market return (Bhushan 1989)
ROESTD	=	Standard deviation of Return on Equity
INVPRO	=	Investor protection index, which is the sum of La Porta et al.'s (1998) rule of law, Judicial efficiency, and corruption scores (Leuz, Nanda, and Wysocki 2003)
OSRIGHT	=	Outside shareholder right index (La Porta et al. 1998)
CUL	=	Hofstede (1980) individualism scores less uncertainty avoidance scores (Han, Kang, Salter, and Yoo 2008)
LNBM	=	Natural logarithm of book-to-market ratio
LEV	=	Leverage ratio

Analyst coverage is measured by the number of analysts following at fiscal year-end month. Earnings discretion (*EM*) is the earnings quality measure derived by country-year cross-sectional regression of modified Jones model following Tucker and Zarowin (2006). *EM* is measured by the absolute value of the predictive error (residual). We differentiate the

discretionary accruals from total accruals by using the cross-sectional modified Jones model as follows:

$$TAcc_t = \gamma_1 + \gamma_2 GPPE_t + \gamma_3 \Delta \mathrm{Re}v_t + \gamma_4 ROA_t + \varepsilon_t$$

where $TAcc_t$ is the total accruals during year t; $GPPE_t$ is the gross property, plant, and equipment at the end of year t; ΔRev_t is the change of revenue during year t; ROA_t is the return on asset during year t; all of those, including the constant term, are scaled by total assets at the beginning of year t. ε is the error term. We estimate the cross-sectional modified Jones model year by year separately within each country. The residuals from the regressions are used as a proxy for the discretionary accruals.

Our measures for disclosure level, investor protection, and shareholder rights of a country are from La Porta et al. (1998, 2006). The level of disclosure variable (*DISREQ*) is from La Porta et al. (2006). They construct disclosure index using the five indexes measuring the level of required disclosure such as (1) prospectus; (2) compensations; (3) shareholders; (4) inside ownership; (5) contracts irregular. The range for this index is from 0 to 1. Investor protection variable (*INVPRO*) is measured as the sum of three legal enforcement variables from La Porta et al. (1998): (1) the efficiency of the judicial systems; (2) an assessment of the rule of law; (3) the corruption index. The first two variables pertain to proper law enforcement and the last deals with the government's stance toward business. Outside shareholder right variable (*OSRIGHT*) is constructed using anti-director right allowed in a country.[10] The range for the index is from zero to five. Those measures for investor protection have been used in many prior studies (e.g., Leuz

[10] This index is formed by adding one when: (1) the country allows shareholders to mail their proxy vote; (2) shareholders are not required to deposit their shares prior to the General Shareholders=Meeting; (3) cumulative voting or proportional representation of minorities on the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders= Meeting is less than or equal to ten percent (the sample median); or (6) when shareholders have preemptive rights that can only be waved by a shareholders meeting.

et al., 2003). Finally, we use two culture related measures, *SEC* and *CUL*. Following Hope et al. (2008), we construct secrecy variable (*SEC*) using the three operationalized dimensions of national culture developed by Hofstede (1980) such as uncertainty avoidance (*UA*), power distance (*PD*), and individualism (*IND*). Following Han et al. (2008), we construct culture (*CUL*) variable using the two main cultural dimensions, uncertainty avoidance (*UA*) and individualism (*IND*). The variables are measured as follows:

$$SEC = UA + PD - IND$$
$$CUL = UA - IND$$

The literature on analyst coverage and earnings management is large, which provide us with extensive guidance on what variables to include in the models as controls (e.g., Bhushan 1989; Dechow and Dichev 2002; Yu 2008). In Eq.1, we use control variables considered to be associated with analyst coverage. The natural logarithm of total assets (*LNSIZE*) is included because the aggregate demand for analysts' service is likely to increase as the firm size increases. A firm's profitability related measures such as Return on Assets (*ROA*), a loss dummy (*LOSS*), standard deviation of Return on Equity (*ROESTD*) and financing activity related measure (*ISSUE*) are included because analyst provided information is more valuable when their variability of its profitability and financing activities are increasing (Bhushan 1989). The correlation between firm return and market return is included since marginal information acquisition cost for a firm will be high if the firm's return is not associated with market returns and, thus, the demand for analyst' provided information will be higher (Bhushan 1989).

We use the following control variables in Eq.2. The natural logarithm of total assets (*LNSIZE*) is included because large firms tend to exercise less discretion as they are subject to continuous stock market monitoring. We control for the natural logarithm of book-to-market

ratio (*LNBM*) because it is one of the major risk factors identified in prior finance studies (e.g. Fama and French, 1993) and risky firms possess greater incentive to exercise discretion in reported earnings due to the high variability of earnings. The leverage ratio (*LEV*) and a dummy variable of stock issuance (*ISSUE*) are included because firms that are likely to raise capital more often have incentives to manage earnings opportunistically. Finally, we control the return on assets (*ROA*) since it is expected to be related to managers' incentive to exercise discretion.

3.2. Sample Selection

Our empirical analysis is based on a sample of firms from 30 countries from 1992 to 2006. We extract accounting data from COMPUSTAT North America (U.S. firms) and COMPUSTAT Global (non-U.S. firms); stock price, analysts' earnings forecasts, and industry identification code from I/B/E/S (all firms); and stock returns from CRSP (U.S. firms). We also use the exchange rate data from IMF International Financial Statistics. In September of each year,[11] we select firm-years that satisfy the following criteria: (1) analysts' earnings forecasts available in I/B/E/S, (2) non-financial firm, (3) financial statement data available from COMPUSTAT North America or COMPUSTAT Global, (4) stock price, industry identification code and number of shares data available from I/B/E/S, and (5) consistency of currency codes between COMPUSTAT Global and I/B/E/S, and between adjacent years. In addition, the country-level investor protection variable should be available from La Porta et al. (1998, 2006).

This process yields a final sample of 31,561 firm-year observations (6,087 distinct firms) from 30 countries.[12] Given some of our conditioning variables, i.e., legal environment and

[11] This criterion follows Frankel and Lee (1999).

[12] We adjust all per share numbers for stock splits and stock dividends using I/B/E/S adjustment factors. Also, when I/B/E/S indicates that the consensus forecast for that firm-year is on a fully diluted basis, we use I/B/E/S dilution factors to convert those numbers to a primary basis. Furthermore, in order to mitigate the effects of outliers, we

culture variables, are country-level variables, we collapse the sample into to 5,572 country-year-industry observations. Doing so alleviates the concern that the coefficients are biased towards observations from more heavily represented countries, as this appproach does not give undue weight to large countries with many firm-year observations.

4. Empirical Results and Discussions

4.1. Descriptive Statistics and Correlation

Firm level and Country level Descriptive statistics are reported in Table 1 and Table 2, respectively. Table 1 shows that the average (median) number of analysts is 7.9 (6.0) and *EM* has a mean (median) of 0.053 (0.039), which are comparable to those reported in prior studies (e.g., Han et al. 2008).

[Insert Table 1 about here]

Table 2 provides country-level averages of treatement variables. The mean of disclosure level (*DISREQ*) is 0.68. *DISREQ* is higher in the United States and Singapore and lower in Austria, Belgium, and Portugal. The mean of investor protection (*INVPRO*) and shareholder rights (*OSRIGHT*) are 23.54 and 2.72, repectively. *INVPRO* is higher in european countries such as Denmark, Finland, and Sweden and lower in asian countries such as Indonesia, Philippines, and Pakistan, while *OSRIGHT* is highest in the United States and lower in countries like Belgium and Italy. In addtion, the mean of secrecy (*SEC*) and culture (*CUL*) is 56.38 and -4.93, respectively. Countries like Portugal and South Korea are highly secretive and Denmark and U.K

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winsorize *LNSIZE*, *LNBM*, *EM* at the 1st and 99th percentiles. Other variables are categorical in nature and do not exhibit extreme observations.

are less secretive. The mean of another culture related variable, *CUL*, is -4.93 and higher in UK and Denmark, and lower in South Korea and Chile.

[Insert Table 2 about here]

Pearson correlations among selected variables are reported separately for the 1st stage and 2nd stage regression samples in Table 3. *Coverage* is negatively associated with disclosure level (*DISREQ*) but is positively related to *SEC* (0.1262, $p < 0.05$) in the first stage. Note that *DISREQ* is negatively associated with *SEC* (-0.1073, $p < 0.01$), which confirms that secretive countries disclose less, on average, and analyst supplement the corporate disclosure when disclosure practice is more secretive. In the second stage, earnings discretion (*DACC*) is negatively related to *INVPRO* (-0.0901, $p < 0.01$) but is not significantly associated with *OSRIGHT* and *CUL*. Considering the positive relations between *INVPRO* and *OSRIGHT* and *CUL*, however, these correlation results should be interpreted with caution because they do not control for differences in other firm characteristics in the cross-section. This will be dealt with in the multiple regression analysis below.

[Insert Table 3 about here]

4.2. Multiple Regression Analysis

Table 4 provides a test of the ability of disclosure level and analyst coverage to explain the magnitude of earnings discretion. More specifically, we test whether disclosure level affects analysts' coverage decisions and how the number of analyst following (*Coverage*) is associated with earnings management after controlling for the endogenous nature of analyst coverage decision.

[Insert Table 4 about here]

The results for the overall association between analyst following (*Coverage*) and disclosure level (*DISREQ*) and between *Coverage* and earnings discretion (*EM*) are presented in Table 4 and Table 5. First two columns show the results of 2-stage least square (2 SLS) regressions and the next two columns are estimation results from the 3-stage least square (3 SLS) regressions.[13] The first stage regression result shows that the coefficient on *DISREQ* is significantly negative in both 2 SLS (-2.5580, t-value = -7.11) and 3 SLS model (-3.7449, t-value = -10.67). This finding provides evidence that, consistent with substitution effect argument, analysts supplement the corporate disclosure when public information does not provide sufficient information. As for secrecy, we find the coefficient on *SEC* is significantly positive at the 1 percent level in both 2 SLS (0.0128, t-value = 9.34) and 3 SLS model (0.0139, t-value = 10.76). This suggest that more secretive firms are likely to have more analyst followings because analysts are likely to have more valuable reports to sell in that environment, which is consistent with H2. Overall, in the first stage – analyst coverage determinants model, we confirm our conjecture that disclosure and cultural environments are one of the significant determinants in analyst coverage decision.

Next, we examine whether institutional factors like investor production and culture affect analysts' ability to monitor managers. First, we test whether analyst play an important role in monitoring managers. As shown in Table 4, we find that, consistent with the monitoring view, the coefficient on *Coverage* is negative in the second stage regressions. In Table 5, we include the interaction terms between *Coverage* and *INVPRO, SORIGHT, and CUL* to test whether the association between *EM* and *Coverage* varies with investor protection and culture of the firm's

[13] Three-stage least squares regressions differ from two-stage least squares regressions as they make use of the covariance matrix computed from the two disturbance terms in the simultaneous equations framework. Three-stage least squares capture cross-equation effects as error terms of individual equations in the system of equations (i.e., Eq.1 and Eq.2) are assumed to be contemporaneously correlated. In this regard, three-stage least squares combine the features of both two-stage least squares and seemingly unrelated regression.

country of domicile. In both two-stage and three-stage models, the interaction terms *Coverage* × *INVPRO* (*Coverage* × *OSRIGHT*) is positive and significant (coef. = 0.0013 (0.0026) in the two-stage model and coef. = 0.0026 (0.0019) in the three-stage model), indicating that analysts' monitoring role is more effective in countries with high investor protection where disclosure levels tend to be higher than those with low investor protection. It suggests that analysts' role as a monitoring mechanism becomes more important when the country-level institution to ensure transparent corporate disclosure is stronger. This result is consistent with Francis and Wang (2008)'s finding that auditors play a bigger role in constraining earnings discretion in strong legal environments than in weak legal environments. As for the cultural factor, we find that the coefficients on the the interaction terms *Coverage* × *CUL* is significantly negative in both 2 SLS (coef. = -0.0002, t-value = -3.52) and 3 SLS models (coef. = -0.0001, t-value = -2.56) at the 1 percent level. This finding suggests that analysts' role as a monitoring mechanism constraining the usage of earnings discretion is more important when the national culture is more secretive. Taken together, these results suggest that the effect of analysts' monitoring on earnings discretion is conditional on national culture and institutional factors like the degree of investor protection, suggesting that future research that investigates the monitoring role of analysts in an international sample should control for effects of corporate disclosure and cultural factors in the research design.

4.4. Sensitivity Tests

Barth, Kaznik and McNichols (2001) and Song, Lobo and Stanford (2006) suggest that analyst coverage might be a function of disclosure quality. This suggests that the direction of causality might actually run from disclosure quality to analyst coverage rather than from analyst coverage to restraining earnings management. To address this issue, we model analyst coverage

as a function of also total accounting accruals (deflated by total asset) in the first stage regression, and estimate the two equations using the seemingly unrelated regression method as the error terms in the two regressions are likely to be correlated with each other. As predicted, the accrual variable is significant in the first stage model ($p<0.01$, two-tailed). However, untabulated results show that the second stage model (i.e., earnings management model) results are not affected by this control (i.e., the interaction term between analyst coverage and investor protection stays significant with a t-statistic of 3.02), suggesting that the potential reverse causality between analyst coverage and earnings management does not affect our inference.

5. Conclusion

This study addresses two important questions: whether financial analysts play the role of information provider and whether their role in constraing managers' opportunistic reporting behaviors is conditional on the legal environments. Regarding the first issue, we find that there is a negative association between analyst coverage and country-level disclosure environment, suggesting that the demand for analyst service is higher when the mandatory disclosure requirements are less stringent. This finding contrasts that of Lang and Lundholm's (1996) U.S. evidence, which suggests that financial analysts' primary role in a capital market is that of information intermediary.

Our evidence further suggests that analyst coverage associates negatively with earnings management in both strong and weak legal enviornments but that the association is stronger in strong legal environments. This suggests that while analysts play a governing role across countries, they play a greater role in stronger investor protection countries with strong legal infrastructures, where financial statement information is more relevant to users' decisions than in

countries with weak legal infrastructure (e.g., Ball 2001). This study contributes to the literature by documenting that analysts' governance role varies across countries with the strength of legal environment: we find that the extent to which Yu's (2008) finding generalizes to countries outside U.S. varies with how strong the legal environment is.

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TABLE 1
Descriptive Statistics

Variables	Mean	Q1	Median	Q3	Std Dev
COVERAGE	7.900	4.000	6.000	10.000	5.931
DACC	0.053	0.022	0.039	0.066	0.054
LNSIZE	5.673	4.778	5.656	6.544	1.389
LOSS	0.104	0.000	0.000	0.000	0.267
ISSUE	0.377	0.000	0.000	1.000	0.455
ROA	0.051	0.023	0.050	0.080	0.070
RECORR	0.037	-0.330	0.054	0.413	0.515
ROESTD	0.152	0.041	0.076	0.144	0.311
LNASSET	5.972	5.062	5.890	6.780	1.315
LNBM	0.690	0.326	0.517	0.815	0.660
LEVERAGE	0.237	0.130	0.229	0.328	0.146

TABLE 2
Country-Level Descriptive Statistics (Country Means)

Country	n	*Coverage*	*DACC*	*DISREQ*	*SEC*	*INVPRO*	*OSRIGHT*	*CUL*
Argentina	31	5.629	0.033	0.500	89.000	17.370	4.000	-40.000
Australia	409	7.224	0.055	0.750	-3.000	28.520	4.000	39.000
Austria	75	6.307	0.047	0.250	26.000	28.070	2.000	-15.000
Belgium	47	7.128	0.049	0.420	84.000	28.320	0.000	-19.000
Canada	317	6.508	0.057	0.920	7.000	29.250	4.000	32.000
Chile	71	4.000	0.043	0.580	126.000	19.570	3.000	-63.000
Denmark	205	7.805	0.050	0.580	-33.000	30.000	3.000	51.000
Finland	80	8.688	0.049	0.500	29.000	30.000	2.000	4.000
France	252	10.476	0.043	0.750	83.000	26.03	2.000	-15.000
India	136	8.471	0.063	0.920	69.000	16.750	2.000	8.000
Indonesia	143	8.430	0.080	0.500	112.000	8.630	2.000	-34.000
Italy	38	13.803	0.052	0.670	49.000	21.210	0.000	1.000
Japan	262	6.716	0.026	0.750	100.000	27.500	3.000	-46.000
Malaysia	325	11.285	0.062	0.920	114.000	23.160	3.000	-10.000
Netherland	162	14.333	0.048	0.500	11.000	30.000	2.000	27.000
New Zealand	96	4.823	0.056	0.670	-8.000	30.000	4.000	30.000
Norway	142	7.377	0.062	0.580	12.000	30.000	3.000	19.000
Pakistan	21	2.333	0.068	0.580	111.000	11.010	4.000	-56.000
Philippines	62	6.758	0.062	0.830	106.000	10.400	4.000	-12.000
Portugal	24	5.313	0.049	0.420	140.000	21.560	2.000	-77.000
Singapore	253	9.462	0.062	1.000	62.000	26.790	3.000	12.000
South Africa	169	5.382	0.056	0.830	33.000	19.340	4.000	16.000
South Korea	56	7.786	0.061	0.750	127.000	16.650	2.000	-67.000
Spain	122	12.066	0.052	0.500	92.000	21.430	2.000	-35.000
Switzerland	179	7.705	0.043	0.670	24.000	30.000	1.000	10.000
Sweden	185	6.319	0.053	0.580	-11.000	30.000	2.000	42.000
Thailand	96	6.833	0.073	0.920	108.000	14.680	3.000	-44.000
U.K.	560	6.219	0.050	0.830	-19.000	27.670	4.000	54.000
U.S.	868	6.900	0.050	1.000	-5.000	28.630	5.000	45.000
Average		7.658	0.054	0.678	56.379	23.536	2.724	-4.931

*Please refer to Panel A of Table 1 for variable definitions.

Table 3
Pearson Correlation Matrix – separately for the 1st stage (Panel A) and 2nd stage (Panel B) regressions

Panel A: The Coverage Regression

	DISREQ	*SEC*	*LNSIZE*	*LOSS*	*ISSUE*	*ROA*	*RECORR*	*ROESTD*
COVERAGE	-0.0892	0.1262	0.5229	-0.0940	0.0380	0.1093	-0.0283	*0.0054*
DISREQ		-0.1073	*0.0064*	-.0765	*-0.0106*	0.0700	0.0618	-0.1317
SEC			*0.0244*	0.0298	*-0.0062*	-0.0404	*-0.0016*	*0.0069*
LNSIZE				-0.2191	*-0.0114*	0.1869	-0.0586	*-0.0160*
LOSS					*0.0090*	-0.5807	-0.0603	0.0859
ISSUE						-0.0272	0.0300	*-0.0020*
ROA							0.0907	*0.0040*
RECORR								0.0295

Panel B: The Dacc Regression

	COVERAGE	*INVPRO*	*ANTIDIR*	*CUL*	*LNASSET*	*LNBM*	*LEVERAGE*	*ISSUE*
DACC	*-0.0162*	-0.0901	*-0.0111*	*0.0042*	-0.1415	-0.0731	-0.0759	0.0867
COVERAGE		*-0.0202*	-0.2029	-0.0886	0.4551	-0.2245	*0.0111*	0.0380
INVPRO			0.1917	0.6016	*0.0180*	-0.1240	-0.1121	-0.0392
ANTIDIR				0.5398	-0.1022	-0.1071	-0.0414	0.0216
CUL					-0.2097	-0.1921	-0.1672	*0.0112*
LNASSET						*0.0021*	0.3117	*0.0072*
LNBM							0.1787	-0.0343
LEVERAGE								0.1608

* Correlations are significant at p<0.05 or above (two-tailed) unless italicized.

Table 4
Regression Results (n = 5,572)

	2SLS Model		3SLS Model	
	1st Stage Model	2nd Stage Model	1st Stage Model	2nd Stage Model
DISREQ	-3.7133		-3.7619	
	(-10.54)***		(-10.72)***	
SEC	0.0139		0.0138	
	(10.73)***		(10.71)***	
LNSIZE	2.3497		2.3528	
	(49.55)***		(49.77)***	
LOSS	1.1685		1.0657	
	(4.34)***		(3.98)***	
ISSUE	0.2174		0.2169	
	(1.60)		(1.60)	
ROA	4.1334		3.8874	
	(3.74)***		(3.53)***	
RECORR	0.0611		0.0648	
	(0.50)		(0.54)	
ROESTD	0.3873		0.3018	
	(1.91)*		(1.50)	
COVERAGE		-0.0007		-0.0012
		(-1.51)		(-2.62)***
INVPRO		-0.0013		-0.0013
		(-6.68)***		(-6.35)***
OSRIGHT		-0.0033		-0.0029
		(-3.34)***		(-2.96)***
CUL		0.0001		0.0001
		(2.73)***		(2.73)***
LNASSET		-0.0028		-0.0019
		(-2.26)**		(-1.53)
LNBM		-.00064		-.00073
		(-5.27)***		(-6.09)***
LEVERAGE		-0.0196		-0.0207
		(-3.33)***		(-3.53)***
ISSUE		0.0103		0.0104
		(6.50)***		(6.60)***
ROA		0.0228		0.0260
		(1.99)**		(2.27)**
Intercept	-4.1285	0.0889	-4.0709	0.0829
	(-4.43)***	(7.84)***	(-4.38)***	(7.34)***
Adj. R-sq.	0.4062	0.0624	0.4062	0.0544

Table 5
Regression Results (n = 5,572)

	2SLS Model		3SLS Model	
	1st Stage Model	2nd Stage Model	1st Stage Model	2nd Stage Model
DISREQ	-2.5580		-3.7449	
	(-7.11)***		(-10.67)***	
SEC	0.0128		0.0139	
	(9.34)***		(10.76)***	
LNSIZE	2.2274		2.3501	
	(9.34)***		(49.71)***	
LOSS	0.7460		1.0670	
	(9.34)***		(3.99)***	
ISSUE	0.5794		0.2170	
	(3.95)***		(1.60)	
ROA	3.7020		3.8983	
	(3.12)***		(3.54)***	
RECORR	0.0632		0.0643	
	(0.48)		(0.53)	
ROESTD	-0.0215		0.3190	
	(-0.10)		(1.59)	
COVERAGE		-0.0399		-0.0292
		(-3.32)***		(-2.44)**
INVPRO		-0.0112		-0.0083
		(-3.72)***		(-2.77)***
OSRIGHT		-0.0245		-0.0182
		(-3.56)***		(-2.66)***
CUL		0.0015		0.0010
		(3.67)***		(2.66)***
COVERAGE		0.0013		0.0009
× INVPRO		(3.33)***		(2.38)**
COVERAGE		0.0026		0.0019
× OSRIGHT		(3.27)***		(2.33)**
COVERAGE		-0.0002		-0.0001
× CUL		(-3.52)***		(-2.56)***
LNASSET		-0.0012		-0.0002
		(-0.95)		(-0.19)
LNBM		-.00079		-.00087
		(-5.53)***		(-6.16)***
LEVERAGE		-0.0142		-0.0177
		(-2.21)**		(-2.78)***
ISSUE		0.0118		0.0115
		(6.30)***		(6.18)***
ROA		0.0458		0.0435
		(3.07)***		(2.92)***
Intercept	-3.6798	0.3884	-4.0764	0.2948
	(-8.74)***	(4.22)***	(-4.39)***	(3.22)***
Adj. R-sq.	0.4029	0.0644	0.4029	0.0644