(2007) 12:377–419
DOI 10.1007/s11142-007-9030-7

Investor protection and analysts' cash flow forecasts around the world

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Published online: 22 March 2007

Abstract We find that analysts are more likely to provide cash flow forecasts in countries with weak investor protection. This finding is consistent with our hypothesis that market participants demand (and analysts supply) cash flow information when weak investor protection results in earnings that are less likely to reflect underlying economic performance. Our results suggest that information intermediaries respond to market-based incentives to attenuate the adverse effects of country-level institutional factors on earnings' usefulness. These findings contribute to the literature by shedding light on the institutional determinants of analysts' research activities, and on the nature of the financial information they generate.

Keywords International accounting · Investor protection · Analysts' forecasts · Cash flows

JEL Classifications M41 · G15

Recent research finds that country-level institutional factors are associated with the usefulness of accrual-based accounting information. One implication of this research is that poor investor protection laws and weak law enforcement result in environments in which earnings are less likely to capture underlying economic events. While this research suggests that weak investor protection institutions limit earnings' usefulness, it does not address how information markets respond to these limitations. We conjecture that investors are more likely to demand cash flow information in environments in

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which earnings are less likely to capture underlying economic events, because cash flows are useful in supplementing and interpreting the information in reported earnings and thus are likely to help attenuate the adverse effects of weak investor protection on earnings' usefulness (DeFond & Hung, 2003). We expect further that analysts respond to this demand by providing investors with additional cash flow information, because analysts are information intermediaries with incentives to meet investors' information demands (Bushman, Piotroski, & Smith, 2004; Lang, Lins, & Miller, 2004; Schipper, 1991). An important way in which analysts provide investors information is through their forecasts. Therefore, the purpose of our investigation is to test the association between analysts' propensity to forecast cash flows and the strength of investor protection institutions.

We hypothesize that analysts are more likely to issue cash flow forecasts in countries with weak investor protection institutions because earnings are less likely to reflect underlying economic performance in these countries. Following prior research, we use the anti-director rights and law enforcement measures in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) to capture the strength of countries' investor protection institutions (DeFond & Hung, 2004; Leuz, Nanda, & Wysocki, 2003). We acknowledge that there may exist countervailing forces in countries with weak investor protection institutions that potentially work against our hypothesis. For example, average demand for value-relevant information is likely to be lower in countries with weaker investor protection, thereby attenuating investor demand for analysts' cash flow forecasts. While such factors argue against our hypothesis, we note that we restrict our analysis to firms with earnings forecasts, which should ensure that investors demand value-relevant information about our sample firms. However, to the extent that there are factors in countries with weak investor protection institutions that work against our hypothesis, they bias against finding our hypothesized result.

Our sample consists of 70,837 firm-year observations across 36 countries over the 1994 through 2002 period, including 31,766 firm-years with cash flow forecasts. The sample comes from Compustat's Global Industrial/Commercial database and I/B/E/S' Detail History Files. Our hypothesis, that analysts are more likely to issue cash flow forecasts in countries with weak investor protection institutions, is based on the assumptions that (1) countries with poor investor protection institutions are associated with firms that report poor quality earnings and, in turn, (2) firms that report poor quality earnings are associated with a greater propensity for analysts to forecast cash flows. We begin our analysis by empirically testing these assumptions. Consistent with our first assumption, we find a positive correlation between countries that have weaker investor protection institutions and that have poorer earnings' value relevance and a greater tendency to manage earnings. Consistent with our second assumption, we find a positive correlation between firms that have poorer earnings' value relevance and a greater tendency to manage earnings and the propensity for analysts to forecast cash flows.

Next, we test our hypothesis using a firm-level multivariate regression model in which the dependent variable equals one if the firm has both earnings and cash flow forecasts and zero if it has only earnings forecasts. The independent variables include our investor protection variables of interest along with several control variables.[1] The results of this analysis support our hypothesis. In addition, in tests that include the subset of our sample with sufficient data, our results are robust to including control variables that capture the firm-level operating, financing, and investing characteristics found in DeFond and Hung (2003) to explain the propensity of analysts to forecast cash flows in the U.S.

Our study contributes to the literature in several ways. First, we complement the research that investigates the association between investor protection and the properties of accounting information. While prior studies are consistent with weak investor protection limiting accrual-based earnings' usefulness in capturing firms' underlying economic performance, we address how information intermediaries respond to this limitation. Second, our study adds to the growing body of research that examines the behavior of financial analysts worldwide (Basu, Hwang, & Jan, 1998; Bushman & Smith, 2001; Chang, Khanna, & Palepu, 2000; Lang et al., 2004). Third, we extend the recent literature that finds countries' institutional factors dominate formal accounting regimes in determining the nature of reported accounting information (e.g., Ball, Robin, & Wu, 2003). Consistent with this work we find evidence that country-level institutional factors also influence the nature of the information generated by financial intermediaries. Finally, we contribute to the substantial body of research that investigates cash flows' usefulness to investors by adding to the recent thread that finds that firm characteristics help explain analysts' propensity to forecast cash flows in the U.S. capital markets (DeFond & Hung, 2003). While focusing exclusively on the U.S. capital markets holds constant the effects of countries' institutional factors, we extend this research by allowing these factors to vary. Documenting the association between country-level institutional factors and the characteristics of information markets is important because of the growing interest in internationalizing worldwide capital markets (Ball, Kothari, & Robin, 2000).

The remainder of the paper is structured as follows. Section 1 develops our hypothesis and Section 2 presents the methodology for testing our hypothesis. Section 3 describes the sample and presents the empirical results. Section 4 describes the results of several robustness tests. Section 5 summarizes our investigation and discusses limitations to interpreting our findings.

[1] Specifically, our control variables consist of a country-level disclosure index, country-level foreign investment, whether the firm is audited by a Big Five auditor, the number of analysts following, firm size, whether the firm is cross-listed on U.S. stock exchanges, and industry and year dummies. In addition, we perform a test that includes the inverse Mills ratio to control for potential self-selection bias (Heckman, 1979), because our sample firms are followed by analysts and thus are not randomly chosen.

1 Hypothesis development

Recent studies find that legal institutions are useful in explaining cross-country variation in corporate ownership structure, the development of capital markets, dividend policy, reliance on external financing, and the quality of accounting information (Hung, 2000; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). These studies suggest that the legal protection of investors' rights is a key determinant of both the pattern of corporate finance and the role of accounting information worldwide (Bushman & Smith, 2001; La Porta et al., 2000). For example, Ball et al. (2000) show that institutional factors related to countries' legal systems affect the ability of earnings to capture economic income over time.

We expect weak investor protection to reduce earnings' usefulness for two related reasons. First, prior research suggests that weak investor protection institutions provide managers incentives to mask true firm performance by distorting reported earnings (Leuz et al., 2003). The incentives to distort earnings arise because managers in weak investor protection countries typically enjoy large ''private benefits of control,'' a term referring to the expropriation of shareholder wealth through mechanisms such as transfer pricing schemes (Dyck & Zingales, 2004). For example, Hung (2000) finds evidence consistent with managers being more likely to manipulate earnings in countries with weaker investor protection institutions, thereby causing earnings to be less value relevant in these countries. Furthermore, Leuz et al. (2003) find evidence consistent with managers in poor investor protection countries manipulating earnings in order to conceal their private benefits of control, thereby avoiding disciplinary actions against them.

Second, countries with weak investor protection tend to have civil law legal origins (Chang et al., 2000; Hung, 2000; La Porta et al., 2000), and Ball et al. (2000) document that earnings in civil law countries are less timely in incorporating economic income when compared to common law countries. This is consistent with civil law countries giving rise to institutional settings wherein earnings play a less important role in valuing securities and managers face fewer incentives to report earnings that faithfully portray economic performance.[2]

To the extent that weak investor protection institutions adversely impact earnings' usefulness, we expect market participants to demand additional information to help them assess earnings quality. We argue that cash flows are likely to satisfy this demand for two reasons. First, cash flows are less

[2] Following DeFond and Hung (2004) (and many others), we capture investor protection by the extent of the laws that protect investors' rights and the strength of the legal institutions that facilitate law enforcement. While our investor protection variables are correlated with legal origin, we do not use legal origin in our primary analyses because Ball et al. (2003) document that some ''common law origin'' countries have civil law-like institutions. Nonetheless, in robustness tests we repeat our hypothesis test after replacing our investor protection variables with legal origin variables and find results that are qualitatively the same as those that obtain using our investor protection variables.

subjective than accrual-based earnings (Levitt, 2002, p. 154; Penman, 2001, p. 611; Wild, Bernstein, & Subramanyam, 2001, p. 532).[3] Second, since the purpose of accrual accounting is to transform cash flows into earnings, by forecasting cash flows and earnings together analysts are essentially providing information on accounting accruals. While prior research generally finds that earnings are superior to cash flows in explaining stock returns, both in the U.S. and internationally, evidence also suggests that cash flows are *incrementally* useful to earnings in valuing securities (Bowen, Burgstahler, & Daley, 1987). Consistent with this view, using U.S. data DeFond and Hung (2003) find evidence suggesting that cash flows are useful in helping investors interpret earnings. The implication of this research is that market participants are more likely to demand cash flow information when valuing securities in countries in which institutional factors limit earnings' usefulness.[4]

In addition, prior research finds that sell-side analysts are important information intermediaries with incentives to provide market participants information that is useful in valuing securities (Harris, Lang, & Moller, 1994; Lang et al., 2004; Schipper, 1991). This suggests that subject to other supply and demand factors that may influence their information production decisions, analysts are likely to provide value-relevant information in response to market demand for same.[5]

Based upon the above discussion, our hypothesis is as follows (stated in alternative form):

Hypothesis Ceteris paribus, analysts are more likely to make cash flow forecasts for companies in countries with weaker investor protection institutions.

We note that there may exist factors in weak investor protection environments that work against our hypothesis. In particular, we expect investor demand for value-relevant information to be lower, on average, in countries with weaker investor protection institutions. This is because, in these countries, ownership tends to be more concentrated and firms tend to rely more heavily on debt financing from banks and the state (La Porta et al., 1998), both of which result in lower demand for high quality accounting information and

[3] We note that cash flows can still be influenced by management's discretion (Mulford & Comiskey, 2002). For example, managers can manipulate cash flows by timing payable and receivable decisions. However, because manipulating cash flows involves altering real business activities (such as deferring or accelerating expenditures), we expect them to be more costly than manipulating accounting accruals.

[4] This inference is consistent with a recent Special Report in *The Economist* that comments on problems of comparing accounting information across countries (The Economist, 2002):"Standard-setters admit that no country has adequate rules on the recognition of revenues. A solution in the meantime may be to look at cash, which is far harder to disguise or invent. Comroad duped its auditor about its revenues, but it could not conceal the fact that its cash flow was negative."

[5] This prediction is consistent with the views of a sell-side analyst specializing in Latin American companies. In our conversations, this analyst indicated that there is widespread lack of trust in the reported earnings of Latin American companies and hence that there is high demand for additional analyses, including analyses pertaining to cash flow information.

other ways to efficiently communicate to outsiders (Ball et al., 2000). However, lack of investor demand may be less of a concern for our analysis because our sample firms are covered in the I/B/E/S database. That is, since our sample companies are followed by analysts, we are reasonably assured that investors demand value-relevant information to help them assess firm value. Absent investor demand for information, it is unlikely that analysts would engage in the costly information acquisition and computational effort necessary to generate earnings forecasts.

In addition, we note that conditioning our sample on information demand (by restricting the sample to firms with earnings forecasts) may actually work against our hypothesis. Firms in weaker investor protection environments that are covered in I/B/E/S are likely to have greater financing needs and may be more likely to use earnings to communicate with outside investors. If these firms engage in less earnings management and have higher quality earnings, it is not clear that investors will demand cash flow forecasts for them. However, while this is possible, Degeorge, Ding, Jeanjean, and Stolowy (2005) find that firms with greater analyst coverage (the firms that we expect to rely more on outside financing) are no less likely to engage in earnings management than firms with lesser analyst coverage in countries with weaker investor protection institutions.

The above arguments together suggest that there may exist countervailing factors in weak investor protection economies that potentially act to attenuate the demand for analysts' cash flow forecasts. However, to the extent that these factors work against our hypothesis, they bias against finding our hypothesized result.[6]

2 Research design

2.1 Primary analysis

We test our hypothesis using a firm-level logistic regression model in which the dependent variable equals one for firms with both earnings and cash flow forecasts and zero for firms with only earnings forecasts. In addition to our hypothesized variables, our regression model includes the following control variables that are potentially correlated with our hypothesized variables:

(1) *Disclosure.* We predict that disclosure levels are positively related to the propensity of analysts to forecast cash flows. Greater firm disclosure reduces analysts' costs of acquiring information, thereby increasing the

[6] Since there are arguments both for and against analysts' propensity to forecast cash flows in countries with poorer investor protection institutions, an alternative approach would be to make our hypothesis two-sided. However, we believe that the most compelling arguments favor an increased propensity to forecast cash flows in countries with weak investor protection environments, and hence we make our hypothesis one-sided. We note, however, that our analyses use two-sided *p*-values throughout the paper.

quantity of cash flow forecasts analysts supply.[7] Moreover, increased disclosure is likely to lead to greater demand for analysts' cash flow forecasts because analysts are generally viewed as *information intermediaries* who process information provided by managers (Bushman et al., 2004; Healy, Hutton, & Palepu, 1999; Lang et al., 2004; Lang & Lundholm, 1996). Following prior studies (Bushman et al., 2004; Leuz et al., 2003), we capture the level of accounting disclosure in a country using the index developed by the *Center for International Financial Analysis and Research* (CIFAR, 1995). The index represents the average percentage of items included in annual reports for each country; higher scores indicate greater disclosure.

(2) *Foreign investment*. We expect greater foreign investment to increase analysts' propensity to provide cash flow forecasts. Prior studies suggest that foreign investors are likely to experience greater information asymmetry than domestic investors, and that this information asymmetry is an important determinant of U.S. investors' bias against foreign stocks (Ahearne, Griever, & Warnock, 2004; Chang et al., 2000; Young & Guenther, 2003). One explanation for this information asymmetry is lack of familiarity with local accounting standards, which is consistent with reported earnings being less useful to foreign investors.[8] We conjecture that one way for foreign investors to overcome this information disadvantage is to use cash flow information to help interpret foreign GAAP-based earnings, as cash flows are not subject to different accounting treatments and accrual estimates.[9] Accordingly, we include a variable in our analysis that controls for the extent of foreign investment. We capture the extent of foreign investment as in Bushman et al. (2004), using a measure of foreign equity investment compiled by the World Bank:[10] the

[7] This is consistent with our conversation with an analyst at Bunting Warburg. Specifically, the analyst indicates that it is more difficult to compute cash flow forecasts for companies in countries with inadequate disclosure. Since forecasting cash flows is a fairly costly and difficult process that involves predicting items such as working capital and deferred taxes, increased disclosure of financial statement data is likely to reduce the cost of compiling these forecasts.

[8] For example, Patrick O'Donnell, chief of global equity research at Putman Investments, states that the most difficult task in cross-border investments is to achieve "true comparability" between, for example, U.S. and Argentinean oil companies. Although Putman prides itself on having analysts who understand different accounting methods, O'Donnell notes "there will always be quirks and twists." (Meisler, 1997).

[9] For example, the global telecommunication team at Morgan Stanley Dean Witter states: "Wireless companies are most commonly valued on a discounted cash flow basis... Due to the different accounting treatment for goodwill,... amortization expense among operators can vary significantly. For this reason, it is difficult to compare wireless operators on an operating income basis" (Morgan Stanley Dean Witter, 1999).

[10] We note that the information asymmetry problem varies with the source of foreign investment. For example, if the foreign investment is mostly from countries with similar accounting standards and institutional background, the information asymmetry among foreign investors should not be severe. Since we are unable to find data on the sources of foreign investment across countries, we acknowledge that the foreign investment variable is measured with error. However, we do not expect the noise in this variable to bias in favor of supporting our hypothesis.

international equity investments made to establish a lasting management interest (10% or more of voting stock) in an enterprise in an economy other than that of the investor, scaled by GDP.[11]

(3) *Audit quality.* We predict a negative association between an analyst's propensity to forecast cash flows and audit quality, because earnings reported in countries with higher quality auditing are less likely to contain unintentional errors or reflect management opportunism. This argument is consistent with Bushman and Smith (2001), who observe that increased audit rigor is likely to enhance investors' reliance on reported accounting information. A proxy often used to capture high audit quality is whether the auditor is a member of one of the large international auditing firms known as the Big Five during the sample period. Indeed, a large body of research suggests that these large international auditors provide higher quality auditing services that lead to more credible financial reporting (DeFond & Jiambalvo, 1993; Palmrose, 1988).[12] Thus, we capture audit quality as a dummy variable equal to one if a firm-year is audited by a member of the Big Five.

(4) *Number of analysts following the firm*. We expect greater analyst coverage to be associated with an increase in analysts' propensity to forecast cash flows. This is because greater analyst activity may result in a more competitive environment that provides analysts incentives to generate additional information (such as cash flow forecasts).

(5) *Firm size*. We expect firm size to be positively related to analysts' propensity to forecast cash flows because larger firms are likely to gain more attention from analysts, increasing the probability that analysts will issue cash flow forecasts for these firms. We measure firm size as the log of the market value of shareholders' equity.

(6) *Cross-listed.* We predict that analysts' propensity to forecast cash flows is associated with whether the firm is cross-listed on U.S. stock exchanges, although we cannot sign the prediction. On the one hand, there may be less demand for cash flow information for cross-listed firms because the SEC requires reconciliation of local GAAP to U.S. GAAP, and the SEC's supervision may attenuate earnings management for these firms. On the other hand, there may be greater demand for cash flow information for cross-listed firms because U.S. investors may be relatively more suspicious of foreign-based investments and demand cash flow

[11] Another measure of foreign equity investment is foreign equity portfolio investment. We do not use foreign equity portfolio investment because these data are available for only 15 of our 36 sample countries. In addition, World Bank documents suggest that data on foreign equity portfolio investment often suffer from measurement error and inconsistency because periodic reporting in many developing economies lacks clarity, adequate disaggregation, and comprehensiveness (World Bank, 2001).

[12] We acknowledge, however, that while auditor size is traditionally used in cross-country studies to control for audit quality, it is possible that Big Five auditors do not necessarily represent the set of high quality auditors in a particular country. For example, in a study of German companies, Ashbaugh and Warfield (2003) find that the two largest audit firms in Germany have the greatest local market expertise.

information to help facilitate cross-border comparison. We measure cross-listed as a dummy variable indicating whether the securities belong to foreign firms cross-listed on U.S. stock exchanges.

(7) *Industry membership.* We include dummy variables capturing each firm's industry membership. This modeling choice follows DeFond and Hung (2003), who find that cash flow forecasts for U.S. firms differ systematically based on industry characteristics.

(8) *Year effects.* We include year dummies for 1994 through 2001 to control for year effects.

The formal regression model is as follows:

$$\begin{aligned} &\textit{Cash flow indicator} \\ &= \beta_0 + \beta_1(\textit{Anti} - \textit{director rights}) + \beta_2(\textit{Law enforcement}) \\ &\quad + \beta_3(\textit{Disclosure}) + \beta_4(\textit{Foreign investment}) + \beta_5(\textit{Audit quality}) \\ &\quad + \beta_6(\textit{Number of analysts}) + \beta_7\,(\textit{Firm size}) \\ &\quad + \beta_8\,(\textit{Cross} - \textit{listed}) + \beta_n(\Sigma DIndustry) + \beta_m(\Sigma DYear) + \varepsilon, \end{aligned} \tag{1}$$

where:

Cash flow indicator = A dummy variable equal to 1 if the firm has both earnings and cash flow forecasts and 0 if the firm has only earnings forecasts.
Anti-director rights = The anti-director rights index constructed by La Porta et al. (1998). The index, based on company laws or commercial codes, aggregates the following aspects of investor rights: (1) the ability to vote by mail, (2) the ability to gain control of shares during investors' meetings, (3) the possibility of cumulative voting for directors, (4) the ease of calling an extraordinary investors meeting, (5) the availability of mechanisms allowing minority investors to make legal claims against the directors, and (6) the presence of shareholders' preemptive rights that can be waived only by a shareholders' vote. The index ranges from 0 to 5, with higher scores indicating stronger shareholder rights.
Law enforcement = An index based on the mean score of three legal enforcement variables reported in La Porta et al. (1998) and used in Leuz et al. (2003). The three variables are: (1) efficiency of the judicial system, which assesses the efficiency and integrity of the legal environment and is based on the average of 1980–1983 data from Business International Corp; (2) rule of law, which assesses the rule and order tradition in a country and is based on the average of 1982–1995 data from International Country Risk; and (3) corruption, which assesses the degree of corruption in government and is based on the average of 1982–1995 data from International Country

Risk.[13] The index ranges from 0 to 10, with higher scores indicating greater law enforcement.
Disclosure = An index developed for each country by CIFAR. The index represents the average percentage of 85 items included in the 1993 annual reports of a sample of domestic companies for each country; higher scores indicate greater disclosure.
Foreign investment = Investments made to establish a lasting management interest (10% or more of voting stock) in an enterprise in an economy other than that of the investor, scaled by GDP. This variable is the average of the investment measured from 1993 to 2001 and is obtained from the World Bank World Development Indicators.[14]
Audit quality = A dummy variable equal to 1 if a firm-year is audited by a member of the Big Five audit firms.
Number of analysts = Number of analysts issuing earnings forecasts for the firm in each year.
Firm size = The natural logarithm of the market value of equity in millions of U.S. dollars at the beginning of year, where market value of equity equals the stock price multiplied by the number of shares outstanding.
Cross-listed = A dummy variable equal to 1 if the securities belong to foreign firms cross-listed on U.S. stock exchanges and equal to 0 otherwise. Foreign securities and home-country securities for cross-listed firms, as well as the effective dates, are identified based on the 2004 ADR list from J.P. Morgan.
DIndustry = Dummy variables indicating a firm's industry membership based on two-digit SIC codes.
DYear = Dummies for years 1994 through 2001.

Our hypothesis predicts that coefficients β_1 and β_2 are negative. Further, we predict that coefficients β_3, β_4, β_6, and β_7 are positive and coefficient β_5 is negative. To control for the dependence in the error terms in our pooled time-series cross-sectional regression, we use robust standard errors clustered by country and industry (Petersen, 2004; Wooldridge, 2002).[15] Although we measure our firm-level control variables in each of the nine years during the

[13] We note that the efficiency of the judicial system component of the law enforcement institutions variable is measured much earlier than our investigation period. We therefore rerun our analysis using the rule of law component of this variable (because it is measured over a period ending in 1995) as a proxy for law enforcement institutions (as in La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1997). The results show that the signs and significance levels of the coefficients on our hypothesized variables are consistent with the results currently reported in our primary analysis in Models 2 and 3 of Table 4.

[14] For Hong Kong, this measure is averaged over the 1998 to 2001 period because the World Bank World Development Indicators do not disclose pre-1998 foreign investment for Hong Kong. We repeat our analyses excluding Hong Kong and find that the signs and significance levels of the all hypothesized variables are consistent with the results reported in our primary analysis (Table 4).

[15] We also perform sensitivity tests that consider alternative methods of controlling for dependence among our error terms as reported in Section 4.7.

investigation period, we are not able to do so for our country-level independent variables due to data limitations. We note that this is a common limitation in cross-country studies (e.g., Ali & Hwang, 2000; Hung, 2000; Young & Guenther, 2003) and that changing a country's institutions is a slow process (North, 1990). To the extent our independent variables change over the investigation period, we introduce noise into our measures. However, we do not expect this noise to bias in favor of supporting our hypothesis.

2.2 Controlling for self-selection bias

Because our sample firms are covered in the I/B/E/S database and thus are followed by analysts, they do not represent a random selection of international firms. We therefore perform an analysis that controls for potential self-selection bias (Heckman, 1979) to help us assess whether our results are sensitive to conditioning our sample on information demand (by restricting the sample to firms with analyst coverage). Specifically, we use all firm-year observations included in Compustat's Global Industrial/Commercial database to estimate the inverse Mills ratio, *Lambda*, from a probit model of analyst coverage, where the dependent variable equals one for firm-year observations with earnings forecasts included in the I/B/E/S database. We then test our hypothesis using the firm-years in the I/B/E/S database in a second-stage model that includes *Lambda.* Following prior studies (Bhushan, 1989; Chang et al., 2000; Lang & Lundholm, 1996), we model analyst coverage in our first-stage regression using the following factors: (1) legal origin (English, French, German, or Scandinavian), (2) foreign investment, (3) disclosure, (4) per capita GDP, (5) firm size, (6) capital intensity, (7) sales growth, (8) market-to-book, (9) leverage, (10) a loss dummy, and (11) industry membership. Formally, our first-stage probit model is:

$$\begin{aligned} \text{Select} = {} & \Upsilon_0 + \Upsilon_1(\textit{French Origin}) + \Upsilon_2(\textit{German Origin}) \\ & + \Upsilon_3(\textit{Scandinavian Origin}) + \Upsilon_4(\textit{Foreign Investment}) \\ & + \Upsilon_5(\textit{Disclosure}) + \Upsilon_6(\textit{Per Capita GDP}) + \Upsilon_7(\textit{Firm Size}) \\ & + \Upsilon_8(\textit{Capital Intensity}) + \Upsilon_9(\textit{Sales Growth}) \\ & + \Upsilon_{10}(\textit{Market}-\textit{to}-\textit{Book}) + \Upsilon_{11}(\textit{Leverage}) \\ & + \Upsilon_{12}(\textit{Loss}) + \Upsilon_n(\Sigma \textit{DIndustry}) + \varepsilon, \end{aligned} \tag{2}$$

where:

Select = A dummy variable equal to 1 for firms with earnings forecasts and 0 otherwise.
French Origin = A dummy for countries with French legal origin (La Porta et al., 1998).
German Origin = A dummy for countries with German legal origin (La Porta et al., 1998).

Scandinavian Origin = A dummy for countries with Scandinavian legal origin (La Porta et al., 1998).
Per Capita GDP = Average GDP per capita from 1993 to 2001, obtained from the World Bank World Development Indicators.
Firm Size = The natural logarithm of the market value of equity in millions of U.S. dollars at the beginning of year, where market value of equity equals the stock price multiplied by the number of shares outstanding.
Capital Intensity = Fixed assets divided by total assets.
Sales Growth = Change in sales over one year scaled by the prior year's sales.
Market-to-Book = Ratio of market value to book value of equity.
Leverage = Total liabilities divided by total assets.
Loss = A dummy variable equal to 1 if in the prior year the firm observes negative earnings and 0 otherwise.
DIndustry = A dummy variable indicating industry group based on two-digit SIC codes.

The other variables are measured following equation (1).

3 Empirical results

3.1 Sample selection and descriptive statistics

Our initial sample consists of all firms in the Compustat Global Industrial/Commercial database that also have one-year-ahead annual earnings forecasts in the I/B/E/S Detail History Files from 1994 to 2002.[16] To be included in the sample, countries must have the data necessary to compute the country-specific variables required by our hypothesis test, and companies must have the data necessary to compute the firm-level control variables.

Our discussions with I/B/E/S personnel indicate that the I/B/E/S database includes all cash flow forecasts submitted to I/B/E/S by their subscribing analysts.[17] I/B/E/S also indicates that while their contributing international analysts use a variety of calculations to arrive at their forecasts, their intent is to compute a number that approximates *operating cash flows* as opposed to alternative metrics such as EBITDA. This is consistent with I/B/E/S having a

[16] While thousands of firm-year observations in the I/B/E/S database have earnings forecasts but no cash flow forecasts, only 18 firm-year observations have cash flow forecasts but no earnings forecasts. Thus, we restrict our analysis to firm-year observations that have earnings forecasts.

[17] We assume that analysts provide cash flow forecasts to I/B/E/S only when investors demand cash flow information; that is, we do not assume that all analysts who use cash flow forecasts for internal analysis necessarily submit these forecasts to I/B/E/S for use by equity investors. This is consistent with our correspondence with an analyst at Prudential Securities who states that "cash flow forecasting is important and we do it for all of the companies we cover. Our published estimates though are earnings, as that is what investors look at."

separate database for EBITDA forecasts as well as several other non-EPS performance metrics (I/B/E/S, 2002). For the purposes of our analysis, the important thing to note about the cash flow forecasts is that they are attempts to provide a cash-based measure that supplements the accrual-based earnings measure. Thus, we do not expect the cross-country variation in the calculations of cash flow forecasts to affect our predictions.

Panel A of Table 1 reports the number of firms with earnings forecasts and the proportion of firms with earnings forecasts that are accompanied by one-year-ahead cash flow forecasts, for each of the 36 countries we analyze. As can be seen from the panel, there is large variation across countries in the proportion of firms with cash flow forecasts. For example, across the entire sample period, the proportion of firms with cash flow forecasts is 98% in Portugal but only 14% in the U.S.[18] This variation is consistent with institutional differences across countries, and firm-level differences within countries, driving the demand for cash flow forecasts.

Panel B of Table 1 reports the total number of firms with earnings forecasts and both the number and proportion of firms with earnings forecasts that are accompanied by one-year-ahead cash flow forecasts, where the firms are classified by the industry categories reported in I/B/E/S. Consistent with DeFond and Hung (2003), the results in this panel show that cash flow forecasts are relatively more prevalent among firms in capital intensive industries, such as Energy, Public utilities, and Basic industries.[19]

Panel C of Table 1 reports the total number of firms with earnings forecasts and both the number and proportion of firms with earnings and cash flow forecasts during each of the nine years we analyze. This panel shows that 30% of the firms with earnings forecasts in 1994 also have cash flow forecasts, while 58% of the firms with earnings forecasts in 2002 also have cash flow forecasts, with a relatively steady increasing trend in the interim.[20] There are a number of potential explanations for the increasing trend in analysts' cash flow forecasts during our sample period, for

[18] While the low percentage of cash flow forecasts for U.S. firms is consistent with DeFond and Hung (2003) and Wasley and Wu (2006), we perform additional analysis aimed at assessing whether the I/B/E/S database underreports the frequency of cash flow forecasts for U.S. firms. Specifically, we randomly select a sample of 100 firm-analyst pairs that do not have cash flow forecasts and attempt to trace them back to the analysts' report as reported in the Investext database. Of the 100 firm-analyst pairs, we are able to identify 72 analyst reports, none of which includes operating cash flow forecasts on the cover or summary page of the report. While six of the 72 reports include operating cash flow forecasts in the body of the report, they are typically included toward the end of the report, consistent with the forecasts for these six companies being peripheral to the analysts' analysis. Thus, we conclude that the I/B/E/S database appears to include all cash flow forecasts that are likely to be demanded by investors.

[19] While Compustat's Global Industrial/Commercial database excludes financial service firms such as banks and insurance companies, we note that a significant portion of our sample firms still belong to the finance sector according to the I/B/E/S classification. Further investigation indicates that the majority of these companies are related to insurance/real estate agents and brokers.

[20] While not reported in Table 1, only 4% of the I/B/E/S firms with earnings forecasts also had cash flow forecasts during 1993, the first year for which I/B/E/S began reporting cash flow forecasts. Because the sample size is small in 1993, we begin our analysis with 1994 data.

Table 1 Descriptive analysis of international firms with one-year-ahead earnings forecasts in both the Compustat Global Database and the I/B/E/S Detail Files from 1994 through 2002

Panel A: Number and proportion of firms with earnings and cash flow forecasts, by country

Country	Number of firms with earnings forecasts	Proportion of firms with cash flow forecasts
Argentina	162	80%
Australia	1,682	95%
Austria	383	94%
Belgium	433	95%
Brazil	514	75%
Canada	3,088	75%
Chile	270	50%
Colombia	46	63%
Denmark	542	88%
Finland	505	83%
France	2,538	93%
Germany	2,635	75%
Greece	342	91%
Hong Kong	470	81%
India	775	90%
Ireland	240	85%
Italy	840	92%
Japan	16,645	14%
Korea	245	95%
Malaysia	1,318	71%
Mexico	260	93%
Netherlands	1,072	95%
New Zealand	296	97%
Norway	519	95%
Pakistan	129	90%
Philippines	292	76%
Portugal	233	98%
Singapore	1,002	75%
South Africa	623	59%
Spain	754	93%
Sweden	992	88%
Switzerland	821	86%
Thailand	1,032	81%
Turkey	240	90%
U.K.	7,171	72%
U.S.	21,728	14%
Total	70,837	45%

instance, an increasing awareness of cash flow forecasts among investors and analysts.

Panel D of Table 1 reports the average number of analysts per firm making earnings and cash flow forecasts during each of the nine years we analyze. This panel shows that the average number of analysts making earnings forecasts per firm ranges from 7.0 to 8.5 during our sample period. The number of analysts making cash flow forecasts per firm ranges from 2.8 to 7.0.

Panel A of Table 2 presents the values of the country-level independent variables used in our hypothesis test. The bottom three rows of the table present the mean, median, and standard deviation for each of the variables

Table 1 continued

Panel B: Number and proportion of firms with earnings and cash flow forecasts, by industry

Industry group	Total earnings forecasts	Number with cash flow forecasts	Proportion with cash flow forecasts
Energy	2,861	2,166	76%
Finance	1,734	945	54%
Public utilities	3,206	1,672	52%
Basic industries	8,866	4,369	49%
Consumer-non durable	7,337	3,606	49%
Transportation	2,377	1,123	47%
Consumer services	14,220	6,372	45%
Capital goods	13,277	5,859	44%
Consumer durables	3,107	1,134	36%
Technology	9,255	3,032	33%
Health care	4,597	1,488	32%
Total	70,837	31,766	45%

Panel C: Number and proportion of firms with earnings and cash flow forecasts, by year

Year	Total earnings forecasts	Number with cash flow forecasts	Proportion with cash flow forecasts
1994	5,103	1,542	30%
1995	6,149	2,096	34%
1996	7,521	2,707	36%
1997	8,438	3,445	41%
1998	8,671	3,738	43%
1999	8,770	4,082	47%
2000	8,885	4,712	53%
2001	8,780	4,501	51%
2002	8,520	4,943	58%
Total	70,837	31,766	45%

Panel D: Average number of analysts per firm making earnings and cash flow forecasts, by year

	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002
Average number of analysts per firm making:										
Earnings forecasts	70,837	7.0	8.5	8.1	8.1	8.1	8.0	7.8	7.7	8.1
Earnings and cash flow forecasts	31,766	2.8	3.8	5.2	5.7	7.0	6.7	5.9	5.8	5.2

presented. The panel suggests that there is a reasonable amount of variation in the independent variables.

Panel B of Table 2 presents descriptive statistics on each of our firm-level variables. This panel reports that 98% of our sample firms are audited by Big Five auditors and that only 5% are cross-listed in the U.S. Panel B also reports that the mean number of analysts following a firm is approximately eight per firm, with a standard deviation of 8.49, suggesting fairly high average analyst coverage but a great deal of variation across firms.

Panel C of Table 2 presents Pearson correlation coefficients for the variables used in our hypothesis test. The first row presents the correlations between the issuance of cash flow forecasts and each of our independent variables, and is consistent with our prediction that analysts are more likely to forecast cash flows in countries with weaker anti-director rights and poorer law enforcement. Panel C also reports that several correlations between our independent variables are relatively high. For example, the correlation

Table 2 Data and descriptive statistics

Panel A: Data and descriptive statistics for country-level variables (N=36 countries)

Country	Anti-director rights	Law enforcement	Disclosure	Foreign investment
Argentina	4	5.79	68	2.96
Australia	4	9.51	80	1.85
Austria	2	9.36	62	1.89
Belgium	0	9.44	68	23.81
Brazil	3	6.13	56	2.76
Canada	5	9.75	75	3.13
Chile	5	6.52	78	6.29
Colombia	3	4.78	58	2.57
Denmark	2	10.00	75	5.41
Finland	3	10.00	83	3.28
France	3	8.68	78	2.22
Germany	1	9.05	67	2.01
Greece	2	6.82	61	0.92
Hong Kong	5	8.91	73	19.20
India	5	5.58	61	0.55
Ireland	4	8.36	81	8.75
Italy	1	7.07	66	0.56
Japan	4	9.17	71	0.09
Korea	2	5.55	68	0.95
Malaysia	4	7.72	79	4.55
Mexico	1	5.37	71	2.76
Netherlands	2	10.00	74	6.98
New Zealand	4	10.00	80	4.26
Norway	4	10.00	75	2.48
Pakistan	5	3.67	73	0.91
Philippines	3	3.47	64	2.06
Portugal	3	7.19	56	2.57
Singapore	4	8.93	79	9.97
South Africa	5	6.45	79	1.61
Spain	4	7.14	72	2.44
Sweden	3	10.00	83	7.34
Switzerland	2	10.00	80	3.08
Thailand	2	4.89	66	2.80
Turkey	2	4.79	58	0.64
U.K.	5	9.22	85	3.78
U.S.	5	9.54	76	1.58
Mean	3.22	7.75	71.64	4.14
Median	3.00	8.52	73.00	2.67
Std. dev.	1.41	2.06	8.39	4.95

Panel B: Descriptive statistics for firm-level variables (N=70,837 firm-years)

Variable	Mean	Median	Std. dev.
Cash flow indicator	0.45	0.00	0.50
Audit quality	0.98	1.00	0.15
Number of analysts	7.96	5.00	8.49
Firm size	5.72	5.59	1.87
Cross-listed	0.05	0.00	0.23

Table 2 continued

Panel C: Pearson correlation coefficients among variables with two-tailed p-values in parentheses (N=70,837 firm-years)

Variable	*Country-level variable*				*Firm-level variable*			
	Anti-director rights	**Law enforcement**	**Disclosure**	**Foreign investment**	**Audit quality**	**Number of analysts**	**Firm size**	**Cross-listed**
Cash flow indicator	-0.34	-0.24	0.08	0.34	-0.03	0.31	0.12	0.17
	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
Country-level variable								
Anti-director rights		0.30	0.48	-0.19	0.00	-0.02	0.11	-0.07
		(<0.01)	(<0.01)	(<0.01)	(0.85)	(<0.01)	(<0.01)	(<0.01)
Law enforcement			0.47	0.03	0.01	0.02	0.04	-0.15
			(<0.01)	(<0.01)	(0.17)	(<0.01)	(<0.01)	(<0.01)
Disclosure				0.25	-0.06	0.06	-0.02	-0.04
				(<0.01)	(<0.01)	(<0.01)	(<0.01)	(<0.01)
Foreign investment					-0.04	0.13	-0.01	0.08
					(<0.01)	(<0.01)	(0.01)	(<0.01)
Firm-level variable								
Audit quality						0.02	0.05	0.01
						(<0.01)	(<0.01)	(<0.01)
Number of analysts							0.65	0.24
							(<0.01)	(<0.01)
Firm size								0.25
								(<0.01)

Variable definitions:

Cash flow indicator = A dummy variable equal to 1 if the firm has both earnings and cash flow forecasts and 0 if the firm has only earnings forecasts.

Anti-director rights = The anti-director right index constructed by La Porta et al. (1998). The index, based on company laws or commercial codes, aggregates the following aspects of investor rights: (1) the ability to vote by mail, (2) the ability to gain control of shares during investors' meetings, (3) the possibility of cumulative voting for directors, (4) the ease of calling an extraordinary investors meeting, (5) the availability of mechanisms allowing minority investors to make legal claims against the directors, and (6) the presence of shareholders' preemptive rights that can be waived only by a shareholders' vote. The index ranges from 0 to 5, with higher scores indicating stronger shareholder rights.

Law enforcement = An index based on the mean score of three legal enforcement variables reported in La Porta et al. (1998). The three variables are (1) efficiency of the judicial system, which assesses the efficiency and integrity of the legal environment and is based on the average of 1980–1983 data from Business International Corp., (2) rule of law, which assesses the rule and order tradition in a country and is based on the average of 1982–1995 data from International Country Risk, and (3) corruption, which assesses the corruption in government. The index ranges from 0 to 10, with higher scores indicating greater law enforcement, based on the average of 1982–1995 data from International Country Risk.

Disclosure = An index developed for each country by the *Center for International Financial Analysis and Research* (CIFAR, 1995). The index represents the average percentage of 85 items included in the 1993 annual reports of a sample of domestic companies for each country, where higher scores equal greater disclosure.

Foreign investment = Investments made to establish a lasting management interest (10% or more of voting stock) in an enterprise in an economy other than that of the investor, scaled by GDP. This variable is the average of the investment measured from 1993 to 2001 and obtained from the World Bank World Development Indicators.

Audit quality = A dummy variable equal to 1 if a firm-year is audited by a member of a Big Five audit firm.

Number of analysts = Number of analysts issuing earnings forecasts for the firm each year.

Table 2 continued

Firm size = The natural logarithm of the market value of equity in millions of U.S. dollars at the beginning of year, where market value of equity equals the stock price multiplied by the number of shares outstanding.

Cross-listed = Dummy variable equal to 1 if the securities belong to foreign firm cross-listed on the NYSE, AMEX, or NASDAQ and equal to 0 otherwise. The foreign securities and home-country securities for the cross-listed firms, as well as the effective dates, are identified based on the 2004 ADR list from J.P. Morgan.

between firm size and analyst following is 0.65, and the correlation between anti-director rights and disclosure is 0.48. Because high collinearity can inflate standard errors (Greene, 1993), potentially making it more difficult to achieve significance, we perform additional analyses (discussed in Footnote 24) to assess the impact of multi-collinearity on our results.

3.2 Analysis of assumptions underlying our hypothesis

Our hypothesis is based on the argument that countries with poor investor protection institutions create a setting in which earnings quality is poor, and poor quality earnings, in turn, create incentives for analysts to forecast cash flows. Thus, our hypothesis essentially rests on the assumptions that (1) counties with poor investor protection institutions are associated with firms that report low quality earnings, and (2) firms that report low quality earnings are associated with a greater propensity for analysts to forecast cash flows. Before testing our hypothesis, we perform a brief analysis that empirically tests whether these two assumptions appear to be valid. We investigate the first assumption by comparing earnings' usefulness across countries with strong versus weak investor protection institutions and examining the correlations between the strength of a country's investor protection institutions and two measures of earnings quality. We investigate the second assumption by examining the correlations between two measures of earnings quality and analysts' propensity to forecast cash flows.

We use the following model to compare earnings' usefulness across countries with strong versus weak investor protection institutions:

$$\begin{aligned} 15-month\ CAR = {} & \beta_0 + \beta_1(Strong\ IP) + \beta_2(\Delta Earnings) + \beta_3(\Delta Cash\ flows) \\ & + \beta_4(\Delta Earnings * Strong\ IP) + \beta_5(\Delta Cash\ flows * Strong\ IP) \\ & + \beta_m(\Sigma DYear) + \varepsilon, \end{aligned} \tag{3}$$

where:

15-month CAR = 15-month cumulative market-adjusted stock returns ending three months after the fiscal year-end. The monthly market-adjusted stock return is equal to the monthly return minus the return on an equal-weighted index for all within-country firms covered by Compustat Global.
Strong IP = A dummy variable equal to 1 if the country is a strong investor

protection country and 0 otherwise. A country is classified as a strong investor protection country if both its anti-director rights and law enforcement indexes are higher than or equal to the median of the sample countries and as a weak investor protection country otherwise.
$\Delta Earnings$ = Change in earnings, where earnings is measured as Compustat reported net income before extraordinary items deflated by beginning-of-year market value of equity.
$\Delta Cash\ flows$ = Change in cash flows, where cash flows is measured as Compustat reported net income before extraordinary items, plus depreciation and amortization, minus the change in non-cash current assets, plus the change in current liabilities other than the current portion of long-term debt, deflated by beginning-of-year market value of equity.
$DYear$ = Dummies for years 1994 through 2001. For ease of presentation, year dummy coefficients are suppressed.

Based upon our assumption that weak investor protection is associated with poor earnings quality, we expect the coefficient on β_4 to be positive.

Panel A of Table 3 reports descriptive information comparing variables used in this analysis.[21] The panel reports that while median earnings changes are significantly lower in countries with strong investor protection, there is no difference in mean earnings changes, and both the mean and median change in cash flows is insignificantly different between countries with strong and weak investor protection. Panel A also reports that the mean and median 15-month CAR is significantly more negative in countries with weak investor protection.

Panel B of Table 3 reports the results of estimating equation (3) and indicates that the coefficient on the interaction term between ΔEarnings and Strong IP is significantly positive at $p < 5\%$ (two-tailed). Thus, the results of this analysis show that the association between stock returns and accounting earnings is significantly higher in countries with strong investor protection, consistent with our assumption that weaker investor protection institutions are associated with poorer quality earnings that are less likely to reflect underlying economic performance.

We further assess the assumption that weak investor protection institutions are associated with poor earnings quality by examining the correlations between our two measures of investor protection (the anti-director rights and law enforcement measures from La Porta et al., 1998) and our two measures of earnings quality (the earnings management variable used in Leuz et al., 2003 and the earnings' value relevance variable used in Hung, 2000). If our first assumption is correct, we expect investor protection to be negatively correlated with earnings management and positively correlated with earnings' value relevance.

[21] To avoid the influence of outliers while conserving sample size, we winsorize these variables at the top and bottom 1% of their distributions. Our results are qualitatively the same when we truncate observations in the top and bottom 1%. We note that the sample size is smaller than our full sample as reported in Table 1 because of the additional data requirements.

Table 3 Relation between investor protection and earnings properties

Panel A: Relation between investor protection and properties of earnings and cash flows (N=43,461 firm-years)

Variable	Investor protection	N	Mean	Median	Std. dev	*p*-value for mean diff.[a] *p-value for median diff.*[b]
Δ Earnings	Weak IP	7,540	0.00	0.01	0.21	0.20
	Strong IP	35,921	0.00	0.00	0.20	*<0.01*
Δ Cash flow	Weak IP	7,540	0.02	0.01	0.41	0.16
	Strong IP	35,921	0.01	0.01	0.31	*0.17*
15-month CAR	Weak IP	7,540	-0.08	-0.06	0.56	<0.01
	Strong IP	35,921	-0.02	-0.04	0.55	*<0.01*

Panel B: Regression results for firm-years with earnings forecasts, robust z-statistics with country/industry cluster in parentheses (N=43,461 firm-years)

*Model: 15-month CAR=β_0+β_1 (Strong IP)+β_2(ΔEarnings)+ β_3(ΔCash flow) +β_4(ΔEarnings *Strong IP)+ β_5(ΔCash flow*Strong IP)+ β_m (ΣDYear) +ε*

	Intercept	Strong IP	Δ Earnings	Δ Cash flow	Δ Earnings * Strong IP	Δ Cash flow * Strong IP	Year dummy variables	Adj. R^2
Coeff.[c]	-0.04	0.06***	0.40***	-0.00	0.14**	0.02	Included	0.04
(Z-stat.)	(-1.72)	(4.07)	(7.78)	(-0.17)	(1.94)	(0.60)		

Panel C: Descriptive statistics for earnings management and value relevance scores

Country	Earning management	Value relevance	Country	Earning management	Value relevance	Country	Earning management	Value relevance
Argentina	.	.	Greece	28.3	.	Pakistan	17.8	.
Australia	4.8	33.9	Hong Kong	19.5	26.2	Philippines	8.8	.
Austria	28.3	.	India	19.1	.	Portugal	25.1	.
Belgium	19.5	4.7	Ireland	5.1	32.7	Singapore	21.6	36.2
Brazil	.	.	Italy	24.8	30.1	South Africa	5.6	30.4
Canada	5.3	30.7	Japan	20.5	22.6	Spain	18.6	21.4
Chile	.	.	Korea	26.8	.	Sweden	6.8	17.9
Colombia	.	.	Malaysia	14.8	.	Switzerland	22.0	48.6
Denmark	16.0	24.0	Mexico	.	.	Thailand	18.3	.
Finland	12.0	12.0	Netherlands	16.5	27.4	Turkey	.	.
France	13.5	33.6	New Zealand	.	55.7	U.K.	7.0	34.1
Germany	21.5	28.5	Norway	5.8	5.3	U.S.	2.0	38.0
Mean	15.7	28.3	Median	17.8	30.1	Std. dev.	7.9	12.3

Panel D: Correlation analysis between investor protection and measures of country-level earnings management or earnings' value relevance

Variables	N	Coefficients	*p*-value
Anti-director rights, earnings management	69,049	-0.68	<0.01
Law enforcement, earnings management	69,049	-0.35	<0.01
Anti-director rights, value relevance	64,596	0.42	<0.01
Law enforcement, value relevance	64,596	0.19	<0.01

Panel E: Correlation analysis between measures of country-level earnings management or earnings' value relevance and propensity of analysts' cash flow forecasts

Variables	N	Coefficients	*p*-value
Earnings management , cash flow indicator	69,049	0.14	<0.01
Value relevance, cash flow indicator	64,596	-0.05	<0.01

[a] The *p*-values for the differences in means are based on pairwise t-test tests (parametric tests).

[b] The *p*-values for the differences in medians are based on signed-rank tests (nonparametric tests).

[c] *** $p < 1\%$ (two-tailed); ** $p < 5\%$ (two-tailed); * $p < 10\%$ (two-tailed)

Variable definitions:

Δ*Earnings* = Change in earnings, where earnings is measured as Compustat reported net income before extraordinary items deflated by beginning-of-year market value of equity.

Table 3 continued

Δ*Cash flows* = Change in cash flows, where cash flows is measured as Compustat reported net income before extraordinary items, plus depreciation and amortization, minus the change in non-cash current assets, plus the change in current liabilities other than the current portion of long-term debt, deflated by beginning-of-year market value of equity.

15-month CAR = 15-month cumulative market-adjusted stock returns ending three months after the fiscal year-end. The monthly market-adjusted stock return is equal to the monthly return minus the return on an equal-weighted index for all within-country firms covered by Compustat Global.

Strong IP = A dummy variable equal to 1 if the country is a strong investor protection country and 0 otherwise. A country is classified as a strong investor protection country if both its anti-director rights and law enforcement indexes are higher than or equal to the median of the sample countries and classified as a weak investor protection country otherwise.

DYear (year dummy variables) = Dummies for years 1994 through 2001. For ease of presentation, year dummy coefficients are suppressed.

Earnings management = The aggregate earnings management score from Leuz et al. (2003). The score, based on data over the 1990 to 1999 period, equals the average rank of two earnings-smoothing measures and two earnings-discretion measures.

Value relevance of earnings = The earnings value relevance measure from Hung (2000). The measure, based on data over 1991 to 1997 period, equals the proportion of information in security returns captured by the accounting earnings.

Panel C of Table 3 reports descriptive information on the earnings management and earnings' value relevance variables. We note that earnings management and value relevance scores are not available for several of our sample countries, which reduces the sample size in these tests. Consistent with our first assumption, Panel D of Table 3 reports that both of our investor protection variables are negatively correlated with our earnings management variable and positively correlated with our earnings' value relevance variable.

We assess the validity of our second assumption, that firms with low quality earnings are associated with a greater propensity for analysts to forecast cash flows, by examining the correlations between our two measures of earnings quality described in Panel C of Table 3 and analysts' propensity to forecast cash flows. Panel E of Table 3 report the results of this analysis. Consistent with our second assumption, this analysis shows that analysts' propensity to forecast cash flows is positively correlated with our earnings management variable and negatively correlated with our earnings' value relevance measure. We note, however, that the correlation coefficients in Panel E of Table 3 are relatively small (for example, when compared to the correlation coefficients in Panel D of Table 3). This is consistent with analysts' decisions to forecast cash flows being based on multiple factors, only one of which is earnings quality. This is also consistent with our arguments that lead to the inclusion of several control variables in the model testing our hypothesis.

In summary, the analysis in Table 3 provides evidence in support of our assumptions that countries with weak investor protection institutions create a

setting in which earnings quality is poor, and in turn poor quality earnings create incentives for analysts to forecast cash flows.

3.3 Hypothesis tests

Table 4 reports the results of our multivariate hypothesis tests. Model 1 includes our two investor protection variables along with control variables for industry and year effects, Model 2 adds our other control variables, and Model 3 adds *Lambda* to control for potential self-selection bias.[22] The results show that the coefficients on both of our investor protection variables, as well as our control variables for foreign investment and number of analysts, are significant in the predicted direction at $p < 1\%$ (two-tailed), that the coefficients on disclosure and cross-listed are significantly positive at $p < 1\%$ (two-tailed), and that the coefficient on *Lambda* is significantly negative at $p < 1\%$ (two-tailed).[23] Finding that the coefficient on *Lambda* is significant is consistent with self-selection partially explaining the decision to forecast cash flows.[24] In addition, the pseudo-R^2s for Models 1, 2, and 3 in Table 4 are 18%, 39%, and

[22] The Heckman first-stage probit estimation used to compute *Lambda* has a pseudo R^2 of 27% with the following coefficients, where two-tailed *p*-values are in parentheses and coefficients on industry dummies are not reported:

$$\begin{aligned} Select \;=\; & 4.10 \;(1.00) + 0.01\; French\ Origin \;(0.69) - 0.43\; German\ Origin \;(<0.01) - 0.24\; Scandinavian\ Origin \;(<0.01) \\ & - 0.02\; Foreign\ Investment \;(<0.01) + 0.01\; Disclosure \;(<0.01) + 0.00\; Per\ Capita\ GDP \;(<0.01) + 0.34\; Firm\ Size \;(<0.01) \\ & - 0.01\; Capital\ Intensity \;(0.37) + 0.04\; Sales\ Growth \;(<0.01) - 0.03\; Market\text{-}to\text{-}Book \;(<0.01) + \\ & 0.19\; Leverage \;(<0.01) + 0.01\; Loss. \;(0.48) \end{aligned}$$

Thus, I/B/E/S analysts tend to cover firms in *countries* with English legal origin, less foreign investment, greater disclosure, and larger per capita GDP, and further, they tend to cover *firms* that are larger and that have higher sales growth, smaller market-to-book, and higher leverage. In addition, we note that the number of observation in Model 3 is smaller because of the additional data requirements for the first-stage probit regression.

[23] We also note that the coefficient on firm size is significantly negative in Model 3 but significantly positive in Model 2. This is probably because firm size is significantly correlated with the inverse Mills ratio (in untabulated tests, the Pearson correlation coefficient between these variables is –0.84). That is, since larger firms are more likely to be covered by analysts, the effect of firm size on analysts' propensity to issue cash flow forecasts becomes negative after correcting for the self-selection bias.

[24] Because Table 2 finds that several correlations among our independent variables are reasonably large, we follow Allison (1999) to assess whether multi-collinearity impacts the coefficients in Models 2 and 3 of Table 4. Specifically, we rerun these models using an OLS regression after adjusting the linear combinations of our independent variables with the weight matrix used in the maximum likelihood algorithm. We then use OLS regression diagnostics to detect potential multicollinearity (Belsley, Kuh, & Welsch, 1980). The results (not tabulated) indicate that the variance inflation statistics (the degree to which the standard error of a coefficient is increased because of the degree to which the independent variable is correlated with the other predictors) for our hypothesized variables are below the commonly used cutoff of 4.0.

Table 4 Logistic regression analysis. Coefficients from firm-level logistic regressions, where the dependent variable equals 1 if the firm has both earnings and cash flow forecasts and 0 if the firm has only earnings forecasts. Robust z-statistics with country/industry cluster in parentheses

Full Model: Cash flow indicator = $\beta_0+\beta_1$(*Anti-director rights*)$+\beta_2$(*Law enforcement*)$+\beta_3$(*Disclosure*)$+\beta_4$(*Foreign investment*)$+\beta_5$(*Audit quality*)$+$ β_6(*Number of analysts*)$+\beta_7$(*Firm size*)$+\beta_8$(*Cross-listed*)$+\beta_9$(*Lambda*)$+\beta_n(\Sigma DIndustry)+\beta_m(\Sigma DYear)+\varepsilon$

		Model 1			Model 2			Model 3		
Independent variable	**Pred. sign**	**Coeff.**[a]	**(Z-stat.)**	**Δodds**[b]	**Coeff.**[a]	**(Z-stat.)**	**Δodds**[b]	**Coeff.**[a]	**(Z-stat.)**	**Δodds**[b]
Intercept	n/a	6.45***	(8.90)	n/a	-2.24*	(-1.69)	n/a	2.75*	(1.69)	n/a
Investor protection variables										
Anti-director rights	-	-0.66***	(-9.85)	-54%	-1.05***	(-12.22)	-71%	-1.15***	(-11.75)	-74%
Law enforcement	-	-0.35***	(-6.78)	-32%	-0.72***	(-7.93)	-55%	-0.85***	(-8.07)	-61%
Control variables										
Disclosure	+				0.15***	(8.02)	139%	0.15***	(6.56)	129%
Foreign investment	+				0.31***	(7.09)	141%	0.37***	(6.20)	187%
Audit quality	-				-0.07	(-0.64)	-1%	-0.05	(-0.46)	-1%
Number of analysts	+				0.09***	(8.28)	118%	0.09***	(8.92)	119%
Firm size	+				0.07***	(2.60)	15%	-0.20***	(-4.92)	-31%
Cross-listed	?				0.80***	(4.92)	20%	0.91***	(5.64)	23%
Lambda	?							-2.45***	(-8.70)	-48%
Industry dummy variables		Included			Included			Included		
Year dummy variables		Included			Included			Included		
Number of observations		70,837			70,837			66,004		
Number with cash flow forecasts		31,766			31,766			29,211		
Pseudo-R^2		0.18			0.39			0.41		

Table 4 continued

[a] *** $p < 1\%$ (two-tailed); ** $p < 5\%$ (two-tailed); * $p < 10\%$ (two-tailed).

[b] The percentage change in odds equals $100 \cdot [\exp(s_j \beta_j) - 1]$, where s_j is the sample standard deviation of variable j and β_j is the estimated regression coefficient for variable j

Variable definitions:

Lambda = Inverse Mills ratio in the Heckman two-stage regression model (Heckman, 1979). The ratio, calculated from the first-stage probit model, equals the probability density function divided by the cumulative density function.

Dindustry (industry dummy variables) = Dummy variables indicating a firm's industry membership based on two-digit SIC codes.

DYear (year dummy variables) = Dummies for years 1994 through 2001.

See Table 2 for definitions of other variables

41%, respectively, suggesting that the models are reasonably powerful in explaining analysts' propensity to forecast cash flows.[25]

In summary, the results of our hypothesis tests presented in Table 4 are consistent with analysts forecasting cash flows for firms in countries with weaker investor protection.

3.4 Controlling for accounting, operating, and financing characteristics

DeFond and Hung (2003) identify several accounting, operating, and financing characteristics that explain analysts' propensity to forecast cash flows in the U.S. Our tests in Table 4 include industry dummy variables in an attempt to control for these characteristics. The Table 4 analysis does not use more direct measures of the explanatory variables identified in DeFond and Hung (2003) because the data requirements greatly reduce our sample size. However, to investigate whether these firm-level variables are likely to be omitted correlated variables, we gather financial statement data from Compustat Global and run the following logistic regression on a reduced set of our sample firms:

$$\begin{aligned} \textit{Cash flow indicator} = {} & \beta_0 + \beta_1(\textit{Anti}-\textit{director rights}) + \beta_2(\textit{Law enforcement}) \\ & + \beta_3(\textit{Disclosure}) + \beta_4(\textit{Foreign investment}) \\ & + \beta_5(\textit{Audit quality}) + \beta_6(\textit{Number of analysts}) \\ & + \beta_7(\textit{Firm size}) + \beta_8(\textit{Cross}-\textit{listed}) \\ & + \beta_9(\textit{Magnitude of accruals}) \\ & + \beta_{10}(\textit{Foreign accounting standards}) \\ & + \beta_{11}(\textit{Earnings volatility}) \\ & + \beta_{12}(\textit{Capital intensity}) + \beta_{13}(\textit{Altman Z}) \\ & + \beta_n(\Sigma DIndustry) + \beta_m(\Sigma DYear) + \varepsilon, \end{aligned} \tag{4}$$

where:

Magnitude of accruals = Total accruals/total assets for the firm-year observation, where total accrual equals depreciation, minus the change in non-cash current assets, plus the change in current liabilities other than short-term debt.
Foreign accounting standards = A dummy variable equal to 1 if the firm-year uses accounting standards other than domestic standards and 0 otherwise.
Earnings volatility = The coefficient of variation of earnings measured over the sample period, calculated as |standard deviation of earnings /mean

[25] We also rerun our analysis in Models 2 and 3 of Table 4 after replacing our investor protection variables with the proxies of earnings properties (the earnings management and earnings' value relevance scores reported in Table 3). This analysis (not tabulated) shows that the coefficients on earnings management scores (earnings' value relevance scores) are significantly positive (negative) at $p < 1\%$ (two-tailed). Thus, the analysis provides further evidence consistent with our assumption that the investor protection variables are reasonable surrogates for the ability of earnings to capture underlying economic performance.

earnings|, where earnings is earnings per share before extraordinary items scaled by the beginning stock price.

Capital intensity = The ratio of gross property, plant, and equipment divided by sales revenue in the year immediately prior to the forecasted year.

Altman Z = Altman's *Z*-score measured in the year immediately prior to the forecasted year. Following Altman (1968), the *Z* score equals 1.2*(Net working capital/Total assets) + 1.4*(Retained earnings/Total assets) + 3.3*(Earnings before interest and taxes/Total assets) + 0.6*(Market value of equity/Book value of liabilities) + 1.0*(Sales/Total assets). A lower Altman *Z*-score indicates poorer financial health.

All other variables are measured as given in Eq. (1).

Since direct information on firms' cash flows is not widely available in many countries (Leuz et al., 2003), we are unable to calculate the magnitude of accruals as the difference between net income and operating cash flows (as in DeFond & Hung, 2003). Instead, we estimate this measure as depreciation expense minus the change in non-cash current assets plus the change in current liabilities other than short-term debt. In addition, we are unable to include the accounting choice heterogeneity variable used in DeFond and Hung (2003) because detailed accounting choice data on international companies are not available. Instead, we include a measure indicating whether the firm uses accounting standards other than domestic GAAP.

Table 5 reports the results of this additional analysis. Panel A reports descriptive statistics for the additional control variables and Panel B reports the results for the multivariate analysis (with and without the inclusion of *Lambda*). The results in Panel B indicate that the coefficients on all of our investor protection variables remain significantly negative, consistent with the results reported in Table 4. Thus, our results do not appear to be sensitive to including control variables for our sample firms' accounting, operating, and financing characteristics.

We also note that, consistent with the results in Table 4, the coefficients on the control variables for disclosure, foreign investment, number of analysts following a firm, and cross-listed are significantly positive, and that the coefficient on *Lambda* is significantly negative, all at $p < 1\%$ (two-tailed). With respect to the newly introduced control variables for accounting, operating, and financing factors, only the coefficient on the capital intensity variable is significant in the predicted direction at $p < 1\%$ (two-tailed) in both Models 1 and 2. This is consistent with at least two (non-mutually exclusive) explanations. First, the country-level institutional factors may dominate many of the firm-level factors in explaining differences in analysts' propensity to forecast cash flows internationally. Second, in a cross-country setting many of the firm-level variables may not be good proxies for the constructs they attempt to capture.

Table 5 Logistic regression analysis after controlling for accounting, operating, and financing characteristics

Panel A: Descriptive statistics for additional control variables on accounting, operating, and financing characteristics (N=42,327)

	Magnitude of accrual	Foreign accounting standards	Earnings volatility	Capital intensity	Altman Z
Mean	0.07	0.03	3.25	0.59	4.68
Median	0.05	0.00	1.08	0.54	2.64
Standard deviation	0.07	0.18	7.44	0.37	9.14

Panel B: Coefficients from firm-level logistic regressions, where the dependent variable equals 1 if the firm has both earnings and cash flow forecasts and 0 if the firm has only earnings forecasts. Robust z-statistics with country/industry cluster are in parentheses

Full Model: Cash flow indicator = β_0 + β_1(Anti-director rights)+ β_2(Law enforcement)+β_3(Disclosure)+β_4(Foreign investment)+ β_5(Audit quality)+ β_6(Number of analysts)+β_7(Firm size)+β_8(Cross-listed)+β_9(Magnitude of Accruals)+ β_{10}(Foreign accounting standards)+ β_{11}(Earnings volatility)+ β_{12}(Capital intensity)+β_{13}(Altman Z)+β_{14}(Lambda)+ β_n(ΣDIndustry)+β_m(ΣDYear)+ε

		Model 1			Model 2		
Independent variable	Predicted Sign	Coeff.[a]	(Z-stat.)	Δodds[b]	Coeff.[a]	(Z-stat.)	Δodds[b]
Intercept	n/a	-8.84***	(-4.63)	n/a	-2.99**	(-2.04)	n/a
Investor protection variables							
Anti-director rights	-	-1.45***	(-9.62)	-75%	-1.61***	(-10.54)	-85%
Law enforcement	-	-0.58***	(-6.55)	-44%	-0.61***	(-7.10)	-56%
Control variables							
Disclosure	+	0.23***	(6.29)	234%	0.20***	(7.58)	248%
Foreign investment	+	0.34***	(3.21)	97%	0.29***	(4.00)	189%
Audit quality	-	0.20	(1.47)	3%	0.19*	(1.68)	3%
Number of analysts	+	0.06***	(6.07)	64%	0.07***	(8.06)	82%
Firm size	+	0.30***	(7.70)	75%	-0.08	(-1.53)	-20%
Cross-listed	?	0.50***	(3.72)	11%	0.67***	(5.49)	13%
Additional control variables							
Magnitude of accrual	+	-1.17***	(-3.08)	-8%	-0.49	(-1.46)	-8%
Foreign accounting standards	+	-0.14	(-0.52)	-2%	-0.18	(-0.67)	-1%
Earnings volatility	+	-0.01	(-1.46)	-4%	-0.01*	(-1.97)	-4%
Capital intensity	+	0.44***	(3.10)	18%	0.43***	(3.40)	22%
Altman Z	-	-0.01***	(-2.63)	-9%	-0.00	(-1.12)	-3%
Lambda	?				-2.56***	(-5.69)	-58%
Industry dummy variables		Included			Included		
Year dummy variables		Included			Included		
Number of observations		42,327			42,247		
Number with cash flow forecasts		15,140			15,117		
Pseudo-R^2		0.41			0.41		

Table 5 continued

[a] *** $p < 1\%$ (two-tailed); ** $p < 5\%$ (two-tailed); * $p < 10\%$ (two-tailed)

[b] The percentage change in odds equals $100 \cdot [\exp(s_j \beta_j) - 1]$, where s_j is the sample standard deviation of variable j and β_j is the estimated regression coefficient for variable j

Variable definitions:

Magnitude of accruals = Total accrual/total assets for the firm-year observation, where total accrual equals depreciation–(change in non-cash current assets)+(change in current liability other than short-term debt).

Foreign accounting standards = A dummy variable equals 1 if the firm-year uses accounting standards other than domestic standards and 0 otherwise.

Earnings volatility = The coefficient of variation of earnings measured over the sample period, calculated as |standard deviation of earnings/mean of earnings|, where earnings is earnings per share before extraordinary items scaled by beginning stock price.

Capital intensity = The ratio of gross property, plant and equipment divided by sales revenue in the year immediately prior to the forecasted year.

Altman Z = Altman's Z-score measured in the year immediately prior to the forecasted year. Following Altman (1968), the *Z* score equals 1.2*(Net working capital/Total assets) + 1.4*(Retained earnings/Total assets) + 3.3*(Earnings before interest and taxes/Total assets) + 0.6*(Market value of equity/Book value of liabilities) + 1.0*(Sales/Total assets). Lower Altman's *Z*-scores indicate poorer financial health.

Lambda = Inverse Mills ratio in the Heckman two-stage regression model (Heckman, 1979). The ratio, calculated from the first-stage probit model, equals the probability density function divided by the cumulative density function.

Dindustry (industry dummy variables) = Dummy variables indicating a firm's industry membership based on two-digit SIC codes.

DYear (year dummy variables) = Dummies for years 1994 through 2001.

See Table 2 for definitions on other variables

3.5 Extending the analysis on the returns-earnings association in DeFond and Hung (2003)

This section extends the returns-earnings analysis reported in DeFond and Hung (2003) (hereafter DH) into an international setting by (1) comparing the association between stock returns, earnings, and cash flows for firm-year observations with and without cash flow forecasts, and (2) examining the relation between stock returns and cash flow forecast errors for firms with cash flow forecasts. Panel A of Table 6 provides descriptive statistics for the variables used in this analysis.[26] Similar to DH, we find both mean and median cash flows to be significantly higher among firms with cash flow forecasts. However, while DH finds mean and median earnings to be significantly lower for firms with cash flow forecasts, we find them to be significantly higher for firms with cash flow forecasts.

Panel B of Table 6 compares the association between 15-month CARs and earnings and cash flows across the observations with and without cash flow forecasts. To capture the marginal difference between the two sets of observations, we include a dummy variable (D) that equals one for the observations with cash flow forecasts and we interact this dummy with the earnings and cash flow variables. In addition, we include four control variables that are found in our Table 4 analysis to be associated with the analysts' propensity to forecast cash flows for reasons unrelated to earnings quality: disclosure, foreign investment, number of analysts, and cross-listed. We include these variables as controls because they are not only positively associated with the propensity to forecast cash flows (and hence are correlated with our cash flow forecast dummy variable, D), but they are also expected to be positively associated with earnings quality. Thus, without these control variables, our cash flow dummy variable will be confounded by factors that bias the dummy towards spuriously capturing firms with higher quality earnings.[27] Our formal model is as follows:

$$\begin{aligned} 15-month\ CAR\ =\ & \beta_0+\beta_1(D)+\beta_2(Earnings)+\ \beta_3(Cash\ flows)\\ & +\beta_4(D*Earnings)+\ \beta_5(D*Cash\ flows)\\ & +\beta_r(Other\ control\ variables)\\ & +\beta_m(Other\ control\ variables*Earnings)\\ & +\beta_v(Other\ control\ variables*\ Cash\ flows)\\ & +\beta_n(\Sigma DYear)\ +\ \varepsilon, \end{aligned} \tag{5}$$

where:

15-month CAR = 15-month cumulative market-adjusted stock returns ending three months after the fiscal year-end. The monthly market-adjusted

[26] We winsorize each variable at the top and bottom 1% of its distribution.

[27] These control variables are not included in DH because, while our study includes 36 countries, DH focuses only on the U.S. and does not have these four variables in its analysis.

Table 6 Analysis of properties of earnings and cash flows, partitioned by availability of cash flows forecasts

Panel A: Descriptive statistics

	Observations	N	Mean	Median	Std. dev.	p-value for mean diff.[a] p-value for median diff.[a]
Firm-year observations used in Panel B						
Earnings	*Without* cash flow forecasts	27,042	0.00	0.04	0.20	<0.01
	With cash flow forecasts	23,790	0.04	0.05	0.17	*<0.01*
Cash flows	*Without* cash flow forecasts	27,042	0.09	0.07	0.26	<0.01
	With cash flow forecasts	23,790	0.12	0.09	0.25	*<0.01*
15-month CAR	*Without* cash flow forecasts	27,042	-0.01	-0.04	0.54	<0.01
	With cash flow forecasts	23,790	-0.05	-0.04	0.54	*<0.01*
Firm-year observations used in Panel C						
|Earnings FE|	*Without* cash flow forecasts	39,149	0.02	0.00	0.05	0.08
	With cash flow forecasts	16,510	0.02	0.01	0.05	*0.88*
|Cash flows FE|	*With* cash flow forecasts	16,510	0.06	0.02	0.09	
Two-month CAR	*Without* cash flow forecasts	39,149	-0.00	-0.01	0.19	<0.01
	With cash flow forecasts	16,510	0.00	0.00	0.17	*<0.01*

Panel B: Regression of 15-month cumulative market-adjusted returns on earnings and cash flows. Robust z-statistics with country/industry cluster are in parenthesis

Full Model: 15-month CAR $= \beta_0 + \beta_1(D) + \beta_2(Earnings) + \beta_3(Cash\ flow) + \beta_4(D * Earnings) + \beta_5(D * Cash\ flow) + \beta_r(Other\ control\ variables) + \beta_m(Other\ control\ variables * Earnings) + \beta_v(Other\ control\ variables * Cash\ flow) + \beta_n(\Sigma DYear) + \varepsilon$

	Intercept	D	Earnings	Cash flow	D*Earnings	D*Cash flow	Other variables	Year dummy variables	Adj. R^2	N
Coeff.[c]	0.04***	-0.07***	0.26***	0.14***	0.24***	0.07**	Not Included	Included	0.04	50,832
(Z-stat.)	(2.61)	(-4.50)	(4.94)	(5.13)	(3.65)	(1.98)				
Coeff.[c]	-0.18***	-0.06***	-0.73*	-0.24	0.10	0.08*	Included	Included	0.05	50,832
(Z-stat.)	(2.74)	(-3.51)	(-1.76)	(-1.09)	(1.33)	(1.83)				

Table 6 continued

Panel C: Regression of two-month CARs on earnings and cash flow forecast errors. Robust z-statistics with country/industry cluster are in parentheses

Full Model: Two-month CAR $= \beta_0 + \beta_1(\text{Earnings FE}) + \beta_2(\text{Cash flow FE}) + \beta_m(\Sigma DYear) + \varepsilon$

	Intercept	Earnings FE	Cash flow FE	Year dummy variables	Adj. R^2	N
Observations *WITHOUT* cash flows forecasts						
Coefficient	0.01	0.15***		Included	0.00	39,149
(Z-stat.)	(0.60)	(5.93)				
Observations *WITH* cash flow forecasts						
Coefficient	0.02***	0.16***		Included	0.01	16,510
(Z-stat.)	(4.98)	(4.50)				
Coefficient	0.02***		0.07***	Included	0.01	16,510
(Z-stat.)	(4.25)		(4.63)			
Coefficient	0.02***	0.14***	0.06***	Included	0.02	16,510
(Z-stat.)	(4.90)	(3.85)	(3.95)			

[a] The *p*-values for the differences in means are based on pairwise t-test tests (parametric tests).

[b] The *p*-values for the differences in medians are based on signed-rank tests (nonparametric tests).

[c] *** $p < 1\%$ (two-tailed); ** $p < 5\%$ (two-tailed); * $p < 10\%$ (two-tailed).

Variable definitions:

Earnings = Compustat reported net income before extraordinary items deflated by beginning of year market value of equity.

Cash flows = Compustat reported net income before extraordinary items, plus depreciation and amortization, minus the change in non-cash current assets, plus the change in current liabilities other than the current portion of long-term debt, deflated by beginning of year market value of equity.

D = A dummy variable equal to 1 if the firm-year has earnings and cash flow forecasts available and 0 if the firm-year only has earnings forecasts available.

Table 6 continued

15-month CAR = 15-month cumulative market-adjusted stock returns ending three months after fiscal yearend. Monthly market-adjusted stock return is equal to monthly return minus return on an equal-weighted index for all within-country firms covered by Compustat Global.

Earnings FE = I/B/E/S reported actual earnings, minus the most recent I/B/E/S mean consensus earnings forecast, scaled by beginning-of-year stock price.

Cash flow FE = I/B/E/S reported actual cash flows, minus the most recent I/B/E/S mean consensus cash flow forecast, scaled by beginning-of-year stock price.

Two-month CAR = Cumulative market-adjusted stock returns during the month prior to earnings announcement and earnings announcement month. Monthly market-adjusted stock return is equal to return minus that on an equal-weighted index for all within-country firms covered by Compustat Global.

Other control variables = Factors that increase cash flow forecasts but not related to earnings quality (disclosure, foreign investment, number of analysts and cross-listed).

DYear (year dummy variables) = Dummies for years 1994 through 2001. For ease of presentation, year dummy coefficients are suppressed.

stock return is equal to the monthly return minus the return on an equal-weighted index for all within-country firms covered by Compustat Global.
D = A dummy variable equal to 1 if the firm-year has earnings and cash flow forecasts available and 0 if the firm-year only has earnings forecasts available.
Earnings = Compustat reported net income before extraordinary items deflated by beginning-of-year market value of equity.
Cash flows = Compustat reported net income before extraordinary items, plus depreciation and amortization, minus the change in non-cash current assets, plus the change in current liabilities other than the current portion of long-term debt, deflated by beginning-of-year market value of equity.
Other control variables = Factors that increase cash flow forecasts for reasons unrelated to poor earnings quality (disclosure, foreign investment, number of analysts, and cross-listed, as defined in equation (1) above).
DYear = Dummies for years 1994 through 2001. For ease of presentation, year dummy coefficients are suppressed.

If the results in our setting, which uses data across 36 countries, are consistent with those found in DH, which uses U.S. data, then we expect to find a significantly negative coefficient on β_4. Panel B of Table 6 reports our estimation results for models with and without the four control variables. The first regression in Panel B shows that without the additional control variables, both cash flows and earnings are incrementally useful to each other (consistent with the findings in DH). In addition, (inconsistent with the findings in DH) we find that both cash flows and earnings are more useful for firms with cash flow forecasts. However, the second regression in Panel B shows that when we include the variables that control for factors we expect to increase cash flow forecasts for reasons unrelated to poor earnings quality, we find that the coefficient on the interaction term D*Earnings becomes insignificant and the coefficient on the interaction term D*Cash flows remains significantly positive. Thus, the analysis in Panel B of Table 6 finds that, after controlling for potentially confounding factors, cash flows are relatively more useful for firms with cash flow forecasts compared to firms without cash flow forecasts.

Panel C of Table 6 examines the association between two-month CARs and forecast errors during the month prior to and the month of the earnings announcement.[28] Following DH, the first row of Panel C presents the results from a regression of two-month CARs on earnings forecast errors for the observations without cash flow forecasts and reports an earnings response coefficient of 0.15 that is significant at $p < 1\%$ (two-tailed). The remaining three regressions in Panel C estimate the coefficients on the earnings and/or cash flow forecast errors for the observations with cash flows forecasts. Interestingly, while DH finds that the coefficient on the earnings forecast error

[28] We use two-month CARs instead of two-day CARs as in DeFond and Hung (2003) because Compustat Global only provides monthly data on stock prices and prices are likely to fully incorporate information before public release in some international markets.

is insignificant and the coefficient on the cash flow forecast error is significantly positive for firms with cash flow forecasts, we find that the coefficients on both earnings and cash flow forecast errors are significantly positive. Thus, our analysis suggests that both earnings and cash flow forecasts have significant information content for firms with cash flow forecasts in international markets.

In summary, the analysis in Panels B and C of Table 6 finds that the results differ when the returns-earnings analysis in DH is extended to an international setting. Specifically, the differences are: (1) while DH finds that *earnings* are relatively *less* useful for firms with cash flow forecasts compared to firms without cash flow forecasts, we find that *cash flows* are relatively *more* useful for firms with cash flow forecasts, and (2) while DH finds that among firms with cash flow forecasts, earnings forecasts *are not* incrementally useful and that cash flow forecasts *are* incrementally useful, we find that *both* earnings and cash flow forecasts are incrementally useful. We note that it is difficult, however, to make direct comparisons between U.S. and international returns-earnings studies due to numerous differences in sample composition and institutional environments (e.g., differences in information dissemination and price formation processes).

4 Robustness tests

4.1 Controlling for differences in research teams across countries

A potential alternative explanation for our results is that there exist conventions to forecast cash flows among local analysts in some countries and that these conventions are coincidentally correlated with differences in investor protection. Accordingly, we repeat our hypothesis tests restricting our analyses to earnings and cash flow forecasts issued by analyst research teams in the leading international research firms, where we define the leading international research firms as the top eight global research teams in the 2003 Institutional Investor survey: UBS, Merrill Lynch, Morgan Stanley, Deutsche Bank Securities, Smith Barney Citigroup, Credit Suisse First Boston, J.P. Morgan, and Goldman Sachs & Co. Since each of these research teams produces forecasts for an average of 33 of the 36 countries included in our sample, finding that our results hold in this restricted sample would suggest that our results are not driven by systematic differences in the conventions followed by local research analysts in different countries.[29] We use the I/B/E/S broker translation file to identify the brokerage firms associated with the leading international research

[29] While we would like to restrict our analysis to the same individual analysts, we find that international analysts are frequently identified only by their industry name in I/B/E/S. In addition, it is unlikely one would find many analysts covering a large number of our sample countries, since analysts typically specialize in regions or cover a small number of countries.

firms.[30] The results of this analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4.[31] Thus, our findings do not appear to be driven by systematic differences in the conventions followed by local research analysts in different countries.[32]

4.2 Ex-post availability of cash flow information

While local GAAP requires many of our sample firms to report cash (or funds) flow statements (e.g., Coopers & Lybrand, 1993), and many companies voluntarily make such disclosures even if they are not required to do so (CIFAR, 1995), it is unclear whether the ex-post realization of the cash flow number forecasted by analysts is always available to investors. We therefore repeat our hypothesis test on a reduced sample that excludes cash flow forecasts when ex-post cash flow realizations are not reported by I/B/E/S, and that recodes the dependent variable so that it equals one when ex-post cash flow realizations are reported by I/B/E/S and otherwise zero. The results of this analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4, and hence are consistent with our implicit assumption that market participants have access to actual ex-post, realizations of the forecasted cash flows.

4.3 Mandatory cash flow statement reporting

Because mandatory reporting of cash flow statements may influence analysts' propensity to forecast cash flows, we rerun our hypothesis test twice: once including a dummy variable indicating the years in which *either* a cash flow statement, a funds flow statement, *or* a statement of changes in financial position was required for each country in our sample, and once including a dummy variable indicating the years in which a cash flow statement was required. The results of both tests (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4. In addition, the coefficient on the dummy variable indicating mandatory reporting is significantly negative at

[30] The proportion of forecasts from global research firms by country has a mean of 18%, a median of 17%, and a standard deviation of 9%. The country with the highest proportion is Australia (36%) and that with the lowest proportion is Turkey (4%).

[31] Throughout the paper we define "consistent with the results reported in Models 2 and 3 of Table 4" to mean that the coefficients on our investor protection variables remain significantly negative at $p < 10\%$ (two-tailed).

[32] While not tabulated, we also repeat this analysis restricting the sample to the top three research teams (each covers an average of 35 of the 36 countries in our sample) and find results that are the same as those reported in Table 4. Thus, our results do not appear to be driven by differences in analyst research teams.

$p < 1\%$ (two-tailed) in both tests.[33] Thus, our results do not appear to be explained by mandatory reporting of cash flow statements, funds flow statements, or statements of changes in financial position.

4.4 Controlling for capital market development

An alternative explanation for finding an association between cash flow forecasts and investor institutions is the level of capital market development. For example, countries with less developed capital markets tend to demonstrate several characteristics that are likely to increase the demand for cash flow forecasts, such as poor corporate governance, prevalent earnings management, and a creditor-oriented economy. However, countries with less developed capital markets are also associated with characteristics that are likely to limit the ability of analysts to produce and disseminate cash flow forecasts, such as a weak communications infrastructure.[34] Limitations on analysts' activities in less developed capital markets are consistent with Chang et al. (2000), who find that less developed markets attract fewer analysts. Therefore, while its sign is unpredictable, we repeat our hypothesis test including a control variable for the degree of capital market development, where capital market development is measured as a country's market capitalization divided by its GNP (Chang et al., 2000; La Porta et al., 1997). The results of this analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4. In addition, the coefficient for capital market development is significantly negative at $p < 1\%$ (two-tailed). Thus, our results do not appear to be explained by the level of capital market development.

4.5 Controlling for tax-book conformity

Another factor that potentially affects analysts' propensity to issue cash flow forecasts is the degree of convergence between financial accounting and tax reporting, although the direction of this effect is hard to predict. On the one hand, high tax-book conformity may increase the issuance of cash flow forecasts because the reduced use of accruals should make cash flows easier to forecast. On the other hand, higher tax-book conformity may decrease the issuance of cash flow forecasts because the difference between earnings and cash flows is smaller. Thus, we replicate our hypothesis test including a control variable for the degree of tax-book conformity as measured in Hung (2000)

[33] The negative coefficient on the dummy variable indicating mandatory reporting is consistent with two related explanations. First, because mandatory cash (and funds) flow statement reporting is associated with strong investor protection laws and enforcement, the dummy may be picking up some factors in the legal environment not captured by our investor protection variables. Second, analysts may be more motivated to supply cash flow information when it is not mandated because earnings quality tends to be poorer in such environments and cash flows are useful in helping market participants interpret poor quality earnings.

[34] Bushman and Smith (2001) suggest that good communications infrastructure results in financial information being widely, quickly, and cheaply disseminated to economic agents through distribution channels such as the financial press, radio, television, and the Internet.

(which limits our analysis to 26 of our 36 sample countries). The results of this analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4. In addition, the coefficient on tax-book conformity is significantly negative at $p < 1\%$ (two-tailed). Thus, while analysts are less likely to forecast cash flows in countries with high tax-book conformity, our results do not appear to be explained by tax-book conformity.

4.6 Alternative proxy for investor protection

Because countries with common law legal origin tend to develop stronger investor protection institutions than countries with civil law legal origin, we repeat our hypothesis test (in Models 2 and 3 in Table 4) after replacing our investor protection variables with a dummy variable indicating whether the country has a common law legal origin (following the classifications in La Porta et al., 1998 and Hung, 2000). The results (not tabulated) show that the coefficient for legal origin is significantly negative at $p < 1\%$ (two-tailed), consistent with analysts being less likely to issue cash flow forecasts in countries with common law legal origin, and hence with stronger investor protection. In addition, the signs and significance levels of the coefficients on all other country-level variables in Table 4 remain qualitatively unchanged. Thus, our primary conclusions are not sensitive to using legal origin as a measure of investor protection.

4.7 Alternative approaches to correct for correlation among residuals

Our regression analysis adjusts for possible dependence among the residuals by using robust standard errors clustered by country and industry. While an alternative approach would be to use robust standard errors clustered by country alone, Wooldridge (2002, 2003) points out that the clustered standard errors approach is not appropriate when the number of clusters is small relative to the number of observations in each cluster. Since clustering by country would give us only 36 clusters (where each country is a cluster) and hundreds or thousands of observations in each cluster (where each firm is an observation), clustering by country is clearly inappropriate for our analysis.[35] Nonetheless, for the sake of completeness we perform a sensitivity test that clusters by country and find that our results (not tabulated) are consistent with those currently reported in Models 2 and 3 of Table 4 with the following exception: the coefficient on foreign investment (a control variable) becomes insignificant at conventional levels in Model 3. Thus, we continue to find

[35] We also expect the correlation among residuals to be better captured by country-industry clusters than by country clusters alone, because analysts are often country-industry experts, suggesting a higher correlation across country-industries than across countries. Consistent with this expectation, we find that the intra-cluster correlation among residuals is 0.08 among country-industry clusters versus 0.05 among country clusters, suggesting country-industry clusters better capture the correlation among the residuals in our analysis.

support for our hypothesis at conventional levels of significance when using this alternative clustering method.

We also repeat our analysis using Fama-MacBeth (1973) statistics, an approach commonly used in the literature to control for potential dependence among the residuals (Petersen, 2004). However, because Fama and MacBeth only control for *cross-sectional* dependence, we also include only one randomly selected annual observation for each firm included in our sample to control for potential *time-series* dependence among the residuals. The results of this analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4. Thus, our results do not appear to be affected by cross-sectional and time-series dependence among the residuals.

4.8 Using alternative measures of foreign investment

To explore the sensitivity of our results to an alternative proxy for foreign investment, we use the holdings of U.S. investors in foreign companies introduced by Ahearne et al. (2004). Specifically, we repeat our hypothesis test using the weight in the U.S. portfolio relative to market capitalization reported in Table 1 of Ahearne et al. (2004). Since our focus here is on foreign investment, we exclude U.S. firms in this test. The results of this additional analysis (not tabulated) are consistent with those reported in Models 2 and 3 of Table 4. Thus, our results do not appear to be sensitive to our measure of foreign investment.

4.9 Excluding Japan and the U.S.

Because Panel A of Table 1 reports that Japan and the U.S. have a disproportionately large number of observations compared to the other countries included in our analysis, we rerun our Model 2 and 3 analyses in Table 4 after simultaneously excluding companies in both of these countries. We find that our results remain qualitatively unchanged with one exception: the coefficient on the law enforcement variable becomes insignificant at conventional levels in Model 2 (but remains significantly negative at $p < 1\%$ in Model 3). This result is consistent with self-selection being a more important factor to control for when one excludes the U.S. and Japan. In any event, since our results remain unchanged after controlling for self-selection and one of our two-investor protection variables remains significant in the predicted direction even without controlling for self-selection, we conclude that our primary inferences are not sensitive to excluding Japan and the U.S.

4.10 Additional analyses partitioned by size

To test whether our results are driven by size differences in our sample composition, we rerun our hypothesis test after partitioning our sample into three different size groups: the largest 25%, the middle 50%, and the bottom 25%. The results of this additional analysis (not tabulated) are consistent with

those reported Model 2 of Table 4.[36] Thus, our conclusions are not sensitive to this alternative means of controlling for size.

4.11 Alternative regression specifications

We conduct our hypothesis tests and additional analyses above based on *firm-level* regressions as this allows us to control for firm-specific factors that we expect to be correlated with our country-level variables. We believe that a firm-level regression specification is superior to a country-level regression specification (which ignores firm-level variation by omitting firm-level variables) because several studies find that using aggregated data can lead to incorrect conclusions. For example, Garrett (2003, p. 61) states that ''The use of aggregated data to explain individual behavior implies the assumption that the hypothesized relationship between the economic variables in question is homogeneous across all individuals. When the behavior of economic agents is not the same, a regression analysis using aggregated data can provide conclusions regarding economic relationships that are different from conclusions using less aggregated data.'' Thus, a firm-level regression is likely to provide a better specified model for our analysis than a country-level specification.

While we believe our firm-level specification is best, we also perform a sensitivity test of our primary results using a country-level logistic regression with a dependent variable that equals the proportion of firms with cash flow forecasts in each country (Allison, 1999; Greene, 1993) and our country-level independent variables (the investor protection variables and the variables capturing disclosure and foreign investment). The results of this additional analysis (not tabulated) are consistent with those found in Model 2 of Table 4. Thus, our results are not sensitive to using country-level analysis.

4.12 Sub-period analysis

To explore whether our results are sensitive to different time periods, we repeat our analysis for the following sub-periods: 1994–1996, 1997–1999, and 2000–2002. This analysis (not tabulated) is consistent with Models 2 and 3 of Table 4. Thus, our results do not appear to be sensitive to the sub-period over which the hypothesis test is performed.

4.13 Alternative measure of disclosure

To explore the sensitivity of our results to an alternative proxy for disclosure, we rerun our analysis in Models 2 and 3 of Table 4 using the disclosure variable from Bushman et al. (2004), which is based on data from International Accounting and Auditing Trends by CIFAR. Specifically, this measure equals the average ranking of the answers to the following questions: A6g

[36] We do not rerun Model 3 of Table 4 because this test is an alternative way to control for potential self-selection bias.

(R&D), B3f (capital expenditure), Ca (subsidiaries), Cb (segment-product), Cc (segment-geographic), and D1 (accounting policy). The results of this analysis (not tabulated) are consistent with those reported in Table 4. Thus, our conclusions do not appear to be affected by this alternative measure of accounting disclosure.

4.14 Alternative measure of cash flow forecast intensity

In an attempt to control for the relative frequency of cash flow and earnings forecasts, we rerun our analysis in Models 2 and 3 of Table 4 measuring our dependent variable as the ratio of the number of cash flow forecasts divided by the number of earnings forecasts for each firm. The results of this analysis (not tabulated) are consistent with those reported in Table 4.

4.15 Analysis based on the change in investor protection

Because it is notoriously difficult for economists to explain the spread of innovations and new technologies over time (Schumpeter, 1934), and because prior empirical studies that attempt to explain such phenomena are generally inconclusive (Baptista, 1999; Karshenas & Stoneman, 1993), one potential limitation of the paper is that we do not explain the growing adoption of cash flow forecasts over time. Thus, we perform an exploratory analysis that examines how the propensity to forecast cash flows changes in response to changes in two events that are expected to improve investor protection, namely, a country's initial enforcement of insider trading laws (Bhattacharya & Daouk, 2002) and the voluntary adoption of International Financial Reporting Standards (IFRS). Specifically, using a firm fixed-effect conditional logit model, we regress the change in the decision to issue a cash flow forecast on variables capturing the change in investor protection (i.e., the change in the enforcement of insider trading laws and the adoption of IFRS) and our firm-level control variables. The results show that, contrary to our predictions, the coefficients on the variables capturing the changes in the enforcement of insider trading laws and the adoption of IFRS are significantly positive. However, these variables become insignificantly different from zero when the model further includes year dummies to control for year fixed effects. Thus, this analysis yields mixed evidence on whether changes in investor protection impact analysts' propensity to forecast cash flows, and is consistent with the analysis being confounded by correlated omitted variables that also change over time, such as I/B/E/S data coverage and foreign ownership.

5 Summary and limitations

We hypothesize that analysts are more likely to issue cash flow forecasts in countries with weak investor protection because earnings are less likely to reflect underlying economic performance in these countries. Consistent with

our hypothesis, we find that analysts are more likely to forecast cash flows for firms in countries with weaker investor protection. We also find that cash flow forecasts are more common in countries with higher accounting disclosure and larger foreign investment, and among companies that have greater analyst coverage and that are cross-listed. We note, however, that our investigation is subject to several limitations that are known to be associated with cross-country research designs (Bushman & Smith, 2001). Specifically, our proxies for broad concepts such as the extent of investor protection may capture a number of country-level characteristics, suggesting that our regression results may suffer from correlated omitted variables problems. In addition, because we analyze only 36 countries, our analysis necessarily has a small number of degrees of freedom. Given these limitations, we acknowledge that our paper is essentially exploratory in nature and our results should be interpreted as suggestive.

Acknowledgments We thank Maureen McNichols (the editor), Luzi Hail (the discussant), two anonymous referees, and workshop participants at University of Arizona, University of Colorado, Dartmouth College, Duke University, Massachusetts Institute of Technology, University of North Carolina, Northwestern University, University of Notre Dame, Ohio State University, University of Oregon, University of Southern California, Stanford University, the 2003 American Accounting Association annual meetings, and the 2006 Review of Accounting Studies conference for their helpful and constructive comments. We also gratefully acknowledge the contribution of I/B/E/S International Inc. for providing earnings and cash flow forecast data from their Institutional Brokers Estimate System, and in particular to Steven Sommers of I/B/E/S for his help. These data have been provided as part of a broad academic program to encourage earnings expectations research. In addition, the paper greatly benefited from the input we received during informal conversations and correspondence with Trevor Harris and several analysts, including Laurence Madsen of Warburg Dillon Read and Fadi Chamoon of Bunting Warburg. This project was completed while Mingyi Hung was visiting The Chinese University of Hong Kong. Previous versions of this paper were titled "International Institutional Factors and Analysts' Cash Flow Forecasts."

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