Available online at www.sciencedirect.com
ScienceDirect
Journal of Accounting and Economics 43 (2007) 37–67
JOURNAL OF Accounting & Economics
www.elsevier.com/locate/jae

Investor protection and the information content of annual earnings announcements: International evidence ☆

Mark DeFond[a,*], Mingyi Hung[a,b], Robert Trezevant[a]

[a]*Leventhal School of Accounting, University of Southern California, Los Angeles, CA 90089-0441, USA*
[b]*School of Accountancy, Chinese University of Hong Kong, Shatin, N.T., Hong Kong*

Available online 17 November 2006

Abstract

We draw on the investor protection literature to identify structural factors in the financial reporting environment that are likely to explain cross-country differences in the information content of annual earnings announcements. Using data from over 50,000 annual earnings announcements in 26 countries, we find that annual earnings announcements are *more* informative in countries with higher quality earnings or better enforced insider trading laws, and that annual earnings announcements are *less* informative in countries with more frequent interim financial reporting. We also find that, on average, earnings announcements are more informative in countries with strong investor protection institutions.

JEL classification: G14; G15; K0

Keywords: Cross-country event study; Earnings announcement; Price reaction

☆The authors wish to thank S.P. Kothari (the editor), Per Olsson, Danqing Young, and the referee for helpful suggestions, as well as seminar participants at the University of California at Los Angeles, the University of Southern California, the University of Tennessee, the AAA FARS Mid-Year Meeting, and the International Conference on Corporate Governance in China and Asia. We also gratefully acknowledge the contribution of I/B/E/S International Inc. for providing earnings forecast data from their Institutional Brokers Estimate System. The data have been provided as part of a broad academic program to encourage earnings expectations research. All errors are ours.

*Corresponding author. Tel.: +1 213 740 5016; fax: +1 213 747 2815.
E-mail address: defond@marshall.usc.edu (M. DeFond).

0165-4101/$ - see front matter © 2006 Elsevier B.V. All rights reserved.
doi:10.1016/j.jacceco.2006.09.001

1. Introduction

A large body of research examines cross-country differences in long-window associations between stock returns and accounting earnings, and finds that earnings' value relevance varies substantially across countries. But because this research examines long-window returns–earnings associations, it does not inform us whether investors actually use the information contained in periodic earnings announcements, or what factors influence the usefulness of such information. The purpose of this study is (1) to examine cross-country differences in investors' reactions to annual earnings announcements using event study methodology that allows us to infer the information content of the announcements, and (2) to identify country-level differences in the financial reporting environment that influence the announcements' informativeness.

We draw upon the literature that examines investor protection institutions to identify structural factors in countries' financial reporting environments that are likely to impact how investors respond to earnings announcements across countries.[1] Specifically, we hypothesize that the market reaction to annual earnings announcements is *stronger* when (1) earnings are higher quality, which imparts greater credibility to earnings, and (2) there is stronger enforcement of insider trading laws, which makes earnings information less likely to already be impounded into price. We also hypothesize that the market reaction to annual earnings announcements is *weaker* when (3) there is more frequent interim financial reporting, because earnings information is more likely to already be impounded into price. Finally, while we are unable to sign the prediction, we hypothesize that the market reaction to annual earnings announcements is likely to be affected by (4) greater financial disclosure, because it impacts the financial reporting environment in ways that both *strengthen* and *weaken* the reaction to annual earnings announcements.

To test our hypotheses, we regress measures of the information content of annual earnings announcements on four country-level structural factors. While we perform both country-level (with each country representing a single observation) and firm-level (with each earnings announcement representing a single observation) analysis, we rely on firm-level regressions to draw conclusions because they include firm-specific controls for several potentially omitted correlated variables.[2] We estimate each regression annually and evaluate the significance of the coefficients using Fama–MacBeth statistics (Fama and MacBeth, 1973).

Our sample consists of 53,197 annual earnings announcements from companies in 26 countries during the period 1995 through 2002 that are obtained from the I/B/E/S database. We measure the information content of earnings announcements as the 2-day abnormal return variance around the earnings announcement date, where higher variance is consistent with greater information content of the announcement (Beaver, 1968; Warner et al., 1988; Bamber et al., 2000; Landsman and Maydew, 2002). We measure four financial

[1]We refer to these factors as "structural" because they are relatively stable over time and characterize countries' financial reporting environments. Note that we use the terms "information content of annual earnings announcements," "annual earnings announcement informativeness," and "market reaction to annual earnings announcements" interchangeably throughout the paper.

[2]Moreover, Garrett (2003) suggests that a firm-level regression, in which the dependent variable and control variables are measured for each firm (i.e., disaggregated), is likely to provide a better specified model for our analysis than a country-level regression, in which the dependent variable and independent variables are measured using the average within each country (i.e., aggregated).

reporting structural factors as follows: (1) earnings quality is measured using a variation of the earnings management metric computed in Leuz et al. (2003), where less earnings management indicates higher quality earnings; (2) strong enforcement of insider trading laws is captured as a dummy variable using data from Bhattacharya and Daouk (2002); (3) interim financial reporting frequency is measured as the number of times during the year that earnings are reported in a country (e.g., quarterly or semi-annually), and (4) financial disclosure is captured by the CIFAR accounting disclosure index (Center for International Financial Analysis & Research, 1995) as in Bushman et al. (2004).[3]

The results of both our country-level and firm-level hypothesis tests support all three of our signed hypotheses. Specifically, high quality earnings and strong enforcement of insider trading laws *strengthen* the market reaction to annual earnings announcements, while more frequent interim financial reporting *weakens* the market reaction to annual earnings announcements. Regarding our unsigned hypothesis we find no evidence of an association between financial disclosure and annual earnings announcement informativeness. In additional analysis we also find some evidence consistent with the hypothesized structural factors serving as mechanisms through which investor protection institutions impact the information content of earnings announcements, and we document that on average the information content of earnings is higher and is impounded into prices more quickly in countries with stronger investor protection institutions.

To our knowledge this is the first study in the accounting literature to use international earnings announcement dates from the I/B/E/S database. Accordingly, we perform tests to assess the accuracy of the I/B/E/S-reported announcement dates. As we discuss in detail in Section 5.2, we find that the I/B/E/S-reported announcement dates often differ from those reported in the financial press. While we do not expect this noise to bias in support of our hypotheses, we acknowledge that this is a limitation of our study. Importantly, however, we also find that the differences between the I/B/E/S-reported announcement dates and the announcement dates reported in the financial press are larger for announcements with longer reporting lags (where the reporting lag equals the number of days between the fiscal year-end and the announcement date reported by I/B/E/S). We therefore repeat our analysis on a sample restricted to firm-year observations with shorter reporting lags. Our results continue to hold, providing reasonable comfort that our findings are not driven by observations with noisy I/B/E/S announcement dates.

Our paper contributes to the literature in several ways. First, we add to the literature that examines cross-country differences in earnings' value relevance. A large body of research examines the long-window association between stock returns and accounting earnings, and finds that earnings' value relevance varies substantially across countries (Alford et al., 1993; Ali and Hwang, 2000; Hung, 2000). However, because these studies examine the correlation between prices and earnings over periods of a year or more, they are unable to assess whether investors actually use accounting information (Pownall and Schipper, 1999). We extend this research by using an event study methodology that allows us to infer whether market participants use the earnings information provided in annual

[3]Our firm-level regression also includes the following firm-specific control variables: firm size, whether a firm is among the largest 20 firms in its economy, whether a firm is cross-listed in the US, the earnings reporting lag, the absolute value of the earnings surprise, the dispersion of analysts' earnings forecasts, the number of earnings forecasts, whether a firm reports a loss, and a firm's industry membership.

earnings announcements, and to identify factors in countries' financial reporting environments that influence how investors respond to earnings announcements.

Second, our study adds to the recent stream of research that examines the impact of institutional factors on capital market development (La Porta et al., 2000; Bushman et al., 2004) and, in particular, on cross-country differences in the extent to which information is impounded into stock prices (Ball et al., 2000, 2003; Morck et al., 2000). This research suggests that legal institutions that protect investors' rights are associated with numerous structural factors in the financial reporting environment that are likely to affect the price discovery process and in turn accounting information usefulness. This is an important issue because prior research suggests that more informative stock prices lead to better resource allocation, which has implications for economic growth (Wurgler, 2000). We contribute to this literature by finding evidence consistent with the information content of earnings announcements being a function of factors in the financial reporting environment that have been shown in prior research to be associated with a country's investor protection institutions.

Third, our findings contribute to the extensive literature that examines the market response to earnings announcements. Prior research finds that earnings announcements are significant information events that play an important role in the stock price formation process (Ball and Brown, 1968; Beaver, 1968; Kothari, 2001; Landsman and Maydew, 2002). However, prior literature typically examines the market reaction to earnings announcements in the US and/or another single country; see, e.g., Brown (1970) for Australian firms, Firth (1981) for UK firms, Frost and Pownall (1994) for firms listed in the US and UK, and Haw et al. (2000) for Chinese firms.[4] We extend this research by comparing the market reaction to earnings announcements across a large number of countries. Cross-country comparisons are potentially useful because they allow us to identify factors associated with earnings announcement informativeness that are relatively constant within countries, but that vary greatly across countries. Identifying these factors not only increases our understanding of the US capital markets, but is also important due to the growing interest in worldwide capital market development (Ball et al., 2000). Our findings suggest that factors in the financial reporting environment impact the usefulness of periodic earnings announcements in international capital markets.

The remainder of the study proceeds as follows: Section 2 develops our hypotheses and Section 3 presents the research design. Section 4 describes the sample and reports the empirical results. Section 5 presents additional analysis and Section 6 describes the results of several robustness tests. Section 7 summarizes our findings.

2. Hypothesis development

Recent research on investor protection institutions has several implications for the structural factors in countries' financial reporting environments that are likely to influence how investors respond to earnings announcements. In this section we appeal to this literature to identify those factors in countries' financial reporting environments that are

[4]The only study we are aware of that compares earnings announcements across a large number of countries is that of Bailey et al. (2006), who examine the market reaction to earnings announcements of firms that are cross-listed in the US. While our findings are generally consistent with the conclusions in Bailey et al., direct comparisons are difficult since Bailey et al. do not examine the hypothesized variables of interest that we examine here.

likely to influence earnings announcement informativeness. In addition, we develop formal hypotheses that predict how each factor is likely to increase or decrease the information content of annual earnings announcements.

2.1. Earnings quality

Leuz et al. (2003) examine the association between investor protection institutions and several country-level measures of earnings management. Following Healy and Wahlen (1999), Leuz et al. define earnings management as the alteration of reported economic performance by insiders to either "mislead some stakeholders" or to "influence contractual outcomes." They argue that managers in strong investor protection countries are less likely to manage earnings because they have limited ability to accumulate private benefits of control, and hence have fewer incentives to mask firm performance. As predicted, they find less earnings management in countries with stronger investor protection institutions. We expect earnings in countries with less earnings management to be of "higher quality" in the sense that earnings are less likely to distort firms' underlying economic performance. Since higher quality earnings better capture a firm's underlying economic performance, they should be more useful in helping investors assess firm value. Therefore, we expect higher earnings quality to be a structural factor in countries' financial reporting environments that is likely to make earnings announcements more informative. We formalize this hypothesis as follows, stated in alternative form:

Hypothesis 1. Countries with higher earnings quality have more informative annual earnings announcements.

We measure country-level earnings quality using the aggregate earnings management score from Leuz et al. (2003) multiplied by −1. The score, based on data from 1990 to 1999, equals the average rank of two earnings-smoothing measures and two earnings-discretion measures. We multiply the Leuz et al. measure by −1 so that higher values indicate higher earnings quality.

2.2. Insider trading law enforcement

Beny (2005) finds that common law countries have tougher insider trading laws that are more likely to be enforced. Since common law legal origin is a characteristic associated with strong investor protection institutions (La Porta et al., 1998), Beny's finding suggests that more extensive insider trading laws and their enforcement are structural factors associated with the reporting environments of strong investor protection countries. In a related study, Bhattacharya and Daouk (2002) find that the enforcement of insider trading laws is associated with a lower average cost of equity capital, and conclude that it is the *enforcement* of insider trading laws, and not merely their *existence,* that causes managers to refrain from engaging in insider trading.

When managers engage in less insider trading, the information in earnings announcements is less likely to already be impounded in stock prices, resulting in earnings announcements that are likely to be more useful in valuing securities. Thus, we expect strong insider trading law enforcement to be a structural factor in countries' financial reporting environments that is associated with increased annual earnings announcement

informativeness. Our second hypothesis is therefore as follows, stated again in alternative form:

Hypothesis 2. Countries with stronger enforcement of insider trading laws have more informative annual earnings announcements.

Following Bhattacharya and Daouk (2002), we capture the likelihood of insider trading law enforcement using an indicator variable that changes from zero to one in the years after the first insider trading case is brought to court.

2.3. Interim reporting frequency

Because more timely financial information is more useful in investment decision making (Financial Accounting Standards Board, 1980), we expect investors to demand more frequent financial reporting. Further, since managers in countries with strong investor protection institutions have greater incentives to meet investor demand for disclosures that are "useful" in valuing securities (Hung, 2000), frequent interim financial reporting is likely to be a structural factor associated with the financial reporting environments of strong investor protection countries.

Because stock prices impound annual earnings information at an earlier point in time when interim reporting is more frequent, annual earnings announcements are likely to be less informative in countries with more frequent interim financial reporting (Butler et al., 2003). For example, McNichols and Manegold (1983) document that the information content of annual earnings announcements decreases after firms listed on the American Stock Exchange switch from annual to quarterly financial reporting. Thus, we expect the frequency of interim financial reporting to be a structural factor in countries' financial reporting environments that is associated with decreased annual earnings announcement informativeness. Formally, our third hypothesis, stated in alternative form, is:

Hypothesis 3. Countries with more frequent interim earnings reporting have less informative annual earnings announcements.

2.4. Financial disclosure

The CIFAR (Center for International Financial Analysis & Research, 1995) index measures the proportion of 85 financial disclosures included in a representative sample of companies' annual reports, and is commonly used by researchers to capture a variety of country-level financial reporting characteristics. For example, La Porta et al. (1998) use the CIFAR index to measure financial reporting quality and Bushman et al. (2004) use it to capture financial reporting intensity, under the assumption that countries with higher CIFAR indexes are characterized by relatively greater (i.e., more transparent, more intensive, and higher quality) financial disclosures. In addition, La Porta et al. (1998) find that common law countries, which tend to have strong investor protection institutions, have significantly higher CIFAR scores. Taken together, these papers suggest that greater financial disclosure is a structural factor associated with the reporting environments of stronger investor protection countries.

We expect financial disclosure to impact earnings announcement informativeness in two opposing ways. On the one hand, earnings announcements in countries with greater

financial disclosure may be more informative to investors because managers are likely to disclose more information in the announcements. This conjecture is consistent with Francis et al. (2002), who find that US earnings announcements have greater information content when they contain relatively greater disclosure. On the other hand, earnings announcements in countries with greater financial disclosure may be less informative because managers are likely to publicly disclose more information to shareholders between earnings announcement dates. This view is consistent with greater financial transparency in these countries and with management responding to investor demand for value-relevant information.

In summary, financial disclosure is a structural factor in countries' financial reporting environments that is likely to impact earnings announcement informativeness. However, because we expect greater disclosure to have opposing effects, we are unable to predict whether it will increase, decrease, or have no overall net effect on the information content of earnings announcements. Thus, our fourth hypothesis, stated in alternative form, is:

Hypothesis 4. Greater financial disclosure in a country affects the informativeness of annual earnings announcements.

3. Research design

We measure the information content of earnings announcements as the 2-day abnormal return variance around the earnings announcement date, where higher variance is consistent with greater information content (Beaver, 1968; Warner et al., 1988; Landsman and Maydew, 2002). We perform the analysis using both country-level and firm-level regression models. In addition, we run the regression models annually and analyze the significance of the means of the coefficients using Fama–MacBeth statistics (Fama and MacBeth, 1973). The models are specified as follows.

Country-level model:

$$\begin{aligned}&\text{Average abnormal return variance}\\&\quad=\beta_0+\beta_1(\text{Earnings quality})\\&\qquad+\beta_2(\text{Insider trading enforcement})\\&\qquad+\beta_3(\text{Interim reporting frequency})\\&\qquad+\beta_4(\text{Financial disclosure})+\varepsilon;\end{aligned}\tag{1}$$

Firm-level model:

$$\begin{aligned}&\text{Abnormal return variance}\\&\quad=\beta_0+\beta_1(\text{Earnings quality})\\&\qquad+\beta_2(\text{Insider trading enforcement})\\&\qquad+\beta_3(\text{Interim reporting frequency})\\&\qquad+\beta_4(\text{Financial disclosure})+\beta_5(\text{Firm size})\\&\qquad+\beta_6(\text{Largest 20})+\beta_7(\text{Cross}-\text{listed})\\&\qquad+\beta_8(\text{Earnings reporting lag})+\beta_9(|\text{UE}|)\end{aligned}$$

$$+ \beta_{10}(\text{Forecast dispersion}) + \beta_{11}(\text{Number of forecasts}) + \beta_{12}(\text{Loss dummy}) + \beta_n(\text{DIndustry}) + \varepsilon; \quad (2)$$

where

Abnormal return variance: The stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the market model during the firm's earnings announcement window [0, 1], with day 0 being the earnings announcement date reported in I/B/E/S. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated over day −120 through day −21 (relative to the announcement date). We use a 2-day window [0, 1] because annual earnings are generally reported on newswires on day 0, and then newswire information is typically disseminated via sources such as the *Wall Street Journal* on day 1.

Earnings quality: The aggregate earnings management score from Leuz et al. (2003) multiplied by −1 (so that higher scores indicate higher earnings quality). 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.[5]

Insider trading enforcement: A dummy variable that is equal to one in the years after the first legal case is brought against insider trading, and zero otherwise (Bhattacharya and Daouk, 2002).[6]

Interim reporting frequency: The reporting frequency index comes from Center for International Financial Analysis & Research (1995). The index measures the frequency of a country's financial reporting, with a score of 4 for quarterly reporting, 2 for semi-annual reporting, and so forth.

Financial disclosure: The accounting disclosure index is reported in Center for International Financial Analysis & Research (1995). The index is constructed by determining the mean percentage of items, from a pre-specified list of 85 accounting items, that are included in a sample of fiscal year 1993 annual reports of domestic companies (Center for International Financial Analysis & Research, 1995, pp. 357–358).

Firm size: The natural logarithm of the market value of equity in millions of US dollars at the beginning of the year, where market value of equity equals the stock price multiplied by the number of shares outstanding according to the I/B/E/S database.

[5]We note that while our sample period is from 1995 to 2002, the earnings quality measure compiled by Leuz et al. (2003) is based on the 1990–999 period. Thus, as a sensitivity test, we update the earnings quality scores by using data from the Compustat Global database during our sample period. We find that the updated measure is highly correlated with the measure we currently use, with a correlation coefficient of 0.96. In addition, the analysis after using the updated earnings quality measure finds results consistent with those reported in Model 2 of Table 4, Panel B. Thus, our overall conclusions are not sensitive to this alternative measure of earnings quality scores during our sample period.

[6]We note that the insider trading enforcement data in Bhattacharya and Daouk (2002) end in 1999, and that five countries (Austria, Pakistan, the Philippines, Portugal, and South Africa) have not enforced insider trading laws by the end of 1999. It is possible that one or more of these five countries enforce insider trading laws after 1999. Thus, as a sensitivity test, we repeat our primary analysis in Model 2 of Table 4, Panel B after restricting the sample period to 1995 through 1999, and find results consistent with those reported in Model 2 of Table 4, Panel B. Thus, our overall conclusions are not sensitive to the alternative sample period.

Largest 20: A dummy variable equal to one if the firm is one of the largest 20 firms in its country, where size is measured by market value at the beginning of the year according to the I/B/E/S database.

Cross-listed: A dummy variable equal to one if the securities belong to foreign firms cross-listed in the US. The foreign securities and home-country securities for the cross-listed firms, as well as the effective dates of cross-listing, are identified based on the 2004 ADR list from J.P. Morgan.

Earnings reporting lag: The number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S.

$|UE|$: Magnitude of unexpected earnings. Unexpected earnings equal actual annual earnings minus the most recent mean forecasted annual earnings, scaled by the most recent closing price on or before the date that annual earnings are announced. All data come from I/B/E/S.

Forecast dispersion: Standard deviation of the analysts' earnings forecasts, scaled by the most recent closing price on or before the annual earnings announcement date. All data come from I/B/E/S.

Number of forecasts: The most recent number of the I/B/E/S-reported annual earnings forecasts prior to the annual earnings announcement date.

Loss dummy: A dummy variable equal to one if the I/B/E/S-reported actual earnings are less than zero.

Dindustry: A dummy variable indicating a firm's industry membership based on industry group classifications from the I/B/E/S sector data. I/B/E/S classifies firms into 11 sectors: Finance, Health care, Consumer non-durables, Consumer services, Consumer durables, Energy, Transportation, Technology, Basic industries, Capital goods, and Public utilities.

Our hypotheses predict β_1 and β_2 to be positive, β_3 to be negative, and we have no prediction for the sign of the coefficient β_4. The firm-level model includes several variables to control for firm-specific factors that may be correlated with our variables of interest. We include firm size because the information environment depends on firm size (Atiase, 1985), and we include a dummy capturing the largest 20 firms in each country because such firms are likely to be the "pillars of the economy" and thus to disclose more extensive information and have more alternative information sources (DeFond and Hung, 2003). Similarly, we include a dummy capturing whether the firm is cross-listed in the US because such firms are likely to have a richer information environment (Lang et al., 2003). We control for the earnings reporting lag because a longer reporting lag increases the likelihood that investors are able to obtain earnings information prior to the earnings announcement date (Chambers and Penman, 1984). For example, longer lags provide greater opportunities for managers to provide earnings guidance, and for analysts to increase their forecasting activities, both of which are expected to reduce the information content of earnings announcements. In addition, we control for the magnitude of unexpected earnings because market reactions to earnings announcements depend on the magnitude of the earnings surprise (Francis et al., 2002).

To control for the precision of pre-announcement information and earnings signals, we include (1) forecast dispersion as a proxy for the noise in the accounting system,[7] and

[7]Following prior studies such as Imhoff and Lobo (1992), we use forecast dispersion to proxy for the noise in the accounting numbers. Although forecast dispersion could also reflect the uncertainty about firms' future cash flows, we argue that it is more likely to proxy for the noise in the accounting numbers in an international setting. This argument is consistent with prior international studies that find strong investor protection (1) results in

(2) the number of forecasts as a proxy for the precision of earnings forecasts (Kim and Verrecchia, 1991). We also include a dummy variable capturing whether the firm reports a loss because prior studies find that negative earnings are less informative (Hayn, 1995). Finally, since industry concentration varies by country and earnings informativeness is likely a function of industry, we include dummy variables for each firm's industry membership.

While we measure the firm-level control variables in each of the 8 years during our investigation period, we do not remeasure the country-level independent variables each year due to data limitations. We note that this is a common limitation in cross-country studies (Hung, 2000; Leuz et al., 2003), and that changes in country-level institutions are a slow process (North, 1990). To the extent that our independent variables change over the investigation period, we introduce noise into our measures. However, we do not expect this noise to bias towards supporting our hypotheses.

4. Sample and empirical results

4.1. Sample selection and descriptive statistics

Our sample period covers 1995 through 2002, with reported earnings and earnings announcement dates obtained from the I/B/E/S database. We restrict our analysis to annual earnings announcements because few international companies report quarterly earnings data on I/B/E/S. We obtain daily stock return data from Datastream and measure market return as the return on an equal-weighted index for all within-country firms covered by both I/B/E/S and Datastream. To mitigate the influence of outliers, we winsorize all scaled variables (abnormal return variance, magnitude of unexpected earnings, and forecast dispersion) at the top and bottom 1% of each distribution.

Our sample consists of 53,197 annual earnings announcements in 26 countries. Table 1 reports the number of earnings announcements by year and by country. The bottom row of Table 1 indicates that the total number of announcements per year range from 5184 in 1995 to 7608 in 1999, and the far-right column reports that the total number of announcements per country range from 153 for Pakistan to 21,573 for the US, with the US and Japan having unusually large numbers of announcements compared to the rest of the countries. Because the large number of earnings announcements in the US and Japan potentially influences our firm-level tests (given each announcement is equally weighted), below we perform sensitivity tests that exclude the US and Japan from the analysis.

Panel A of Table 2 presents the value of our country-level independent variables for each country in our sample, with the bottom three rows reporting the sample-wide means, medians, and standard deviations. The second column reports that the US has the highest earnings quality measure and Austria has the lowest. The third column reports the first year of insider trading enforcement for each country, with this variable coded one in our regressions for the years subsequent to the first year of enforcement. We note that many countries first prosecuted insider trading cases during the 1990s, and that five countries (Austria, Pakistan, the Philippines, Portugal, and South Africa) have not prosecuted an

(*footnote continued*)
earnings that are more likely to reflect underlying firm performance, and (2) reduces analyst forecast dispersion (e.g., Chang et al., 2000).

Table 1
Distribution of firm-year observations by country and fiscal year

Country	1995	1996	1997	1998	1999	2000	2001	2002	Total
Australia	131	149	182	209	232	263	272	265	1703
Austria	56	51	37	17	32	29	26	23	271
Belgium	44	44	56	30	70	68	68	56	436
Canada	138	171	196	218	210	230	234	260	1657
Denmark	69	71	78	74	78	59	44	45	518
Finland	56	56	57	53	89	72	82	81	546
France	181	191	229	140	271	279	271	257	1819
Germany	206	186	216	115	293	380	382	315	2093
Hong Kong	147	161	157	155	135	182	198	207	1342
India	57	108	97	74	75	113	124	71	719
Italy	88	82	94	23	129	123	137	122	798
Japan	604	633	1022	1140	1191	1109	902	968	7569
Malaysia	155	171	170	166	140	124	131	134	1191
Netherlands	112	118	122	81	137	116	93	94	873
Norway	44	45	58	65	74	66	70	78	500
Pakistan	28	34	35	21	21	11	2	1	153
Philippines	69	73	74	63	55	50	39	35	458
Portugal	22	16	26	11	32	26	25	22	180
Singapore	114	118	106	116	112	108	107	117	898
South Africa	77	99	116	156	189	149	126	106	1018
Spain	69	64	81	40	99	92	95	93	633
Sweden	62	74	103	131	148	126	122	120	886
Switzerland	75	68	80	87	112	126	133	132	813
Thailand	39	43	30	26	27	53	66	103	387
UK	481	517	530	652	685	564	345	389	4163
US	2060	2463	2672	2810	2972	3016	2809	2771	21573
Total	5184	5806	6624	6673	7608	7534	6903	6865	53197

insider trading case. The fourth column reports the interim financial reporting period and indicates that the majority of countries have semi-annual earnings announcements. The fifth column reports our measure of financial disclosure, captured by the CIFAR accounting disclosure index.

Panel B of Table 2 presents descriptive statistics for each of our firm-level variables by country, with columns two through four reporting characteristics of the abnormal return variance. Panel B indicates that the mean abnormal return variance is greater than one for each sample country, suggesting that, on average, return variance is relatively greater during the 2 days surrounding earnings announcements. From the panel it can be seen that the mean abnormal return variance varies widely across countries, with a low of 1.21 in Italy and a high of 5.00 in the UK. Interestingly, we report a mean abnormal return variance of 2.75 for the US, which is similar to the magnitude reported in Landsman and Maydew (2002).

Panel B also reports that the median of the median abnormal return variance for our sample countries is less than one, indicating that earnings announcement dates are not an unusual event for the majority of our sample firms, including almost half of the firms in the US. This finding is consistent with Bamber et al. (2000), who find that the median abnormal return variance during earnings announcement weeks is less than one for both a

Table 2
Descriptive statistics

Country	Panel A: Country-level variables (N = 26 countries)			
	Earnings quality	First insider trading enforcement year	Interim reporting frequency	Financial disclosure
Australia	−4.80	1996	4	80
Austria	−28.30	no	2	62
Belgium	−19.50	1994	2	68
Canada	−5.30	1976	4	75
Denmark	−16.00	1996	2	75
Finland	−12.00	1993	3	83
France	−13.50	1975	2	78
Germany	−21.50	1995	2	67
Hong Kong	−19.50	1994	2	73
India	−19.10	1998	2	61
Italy	−24.80	1996	2	66
Japan	−20.50	1990	2	71
Malaysia	−14.80	1996	2	79
Netherlands	−16.50	1994	2	74
Norway	−5.80	1990	4	75
Pakistan	−17.80	no	2	73
Philippines	−8.80	no	4	64
Portugal	−25.10	no	2	56
Singapore	−21.60	1978	2	79
South Africa	−5.60	no	2	79
Spain	−18.60	1998	2	72
Sweden	−6.80	1990	3	83
Switzerland	−22.00	1995	2	80
Thailand	−18.30	1993	4	66
UK	−7.00	1981	2	85
US	−2.00	1961	4	76
Mean	−15.21	n/a	2.54	73.08
Median	−17.15	n/a	2.00	74.50
Std. Dev.	7.35	n/a	0.86	7.47

	Panel B: Firm-level variables ($N = 53{,}197$ firm-years)											
	Abnormal return variance			Firm size			Cross-listed			Earnings reporting lag		
Country	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.
Australia	2.28	0.84	4.24	5.65	5.56	1.67	0.15	0.00	0.36	69.48	62.00	49.86
Austria	1.66	0.36	4.41	5.33	5.40	1.55	0.25	0.00	0.43	166.40	139.00	80.03
Belgium	2.03	0.61	4.12	6.12	6.11	1.69	0.05	0.00	0.21	127.15	92.00	85.03
Canada	2.13	0.75	4.30	5.37	5.17	1.67	0.00	0.00	0.00	61.12	57.00	31.49
Denmark	2.08	0.44	5.00	5.44	5.26	1.53	0.05	0.00	0.22	110.26	91.00	60.33
Finland	2.02	0.61	4.46	5.25	5.24	1.75	0.06	0.00	0.25	71.04	59.00	43.22
France	2.45	0.75	4.91	6.09	5.92	1.97	0.13	0.00	0.33	117.21	98.00	71.27
Germany	1.47	0.48	3.41	5.43	5.23	2.14	0.06	0.00	0.24	144.38	130.00	69.56
Hong Kong	2.63	0.92	5.14	5.96	5.74	1.68	0.31	0.00	0.46	102.83	99.00	47.65
India	1.77	0.55	3.83	5.60	5.59	1.47	0.25	0.00	0.43	109.59	83.00	112.75
Italy	1.21	0.46	2.50	6.53	6.33	1.67	0.10	0.00	0.30	118.55	106.00	53.43

Table 2 (*continued*)

	Panel B: Firm-level variables ($N = 53{,}197$ firm-years)											
	Abnormal return variance			Firm size			Cross-listed			Earnings reporting lag		
Country	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.
Japan	1.50	0.54	3.17	6.46	6.38	1.60	0.11	0.00	0.31	61.16	58.00	20.42
Malaysia	1.60	0.43	3.76	5.70	5.64	1.28	0.04	0.00	0.20	95.14	83.00	74.35
Netherlands	2.68	0.75	5.62	5.87	5.62	2.12	0.17	0.00	0.37	92.35	73.00	65.32
Norway	1.69	0.55	4.03	5.32	5.19	1.44	0.11	0.00	0.31	92.05	64.00	135.94
Pakistan	1.55	0.28	4.58	4.24	4.12	1.41	0.07	0.00	0.25	193.43	177.00	86.70
Philippines	1.63	0.39	4.48	5.06	5.04	1.57	0.12	0.00	0.33	147.75	128.00	73.18
Portugal	1.65	0.53	4.10	6.29	6.18	1.52	0.16	0.00	0.36	103.81	89.00	51.78
Singapore	2.16	0.61	4.96	5.48	5.25	1.45	0.10	0.00	0.30	90.02	83.50	42.98
South Africa	1.22	0.37	3.10	5.61	5.60	1.74	0.17	0.00	0.38	102.43	89.00	61.06
Spain	1.39	0.43	3.61	6.53	6.45	1.72	0.09	0.00	0.28	88.84	69.00	55.51
Sweden	1.80	0.62	3.74	5.66	5.61	1.80	0.08	0.00	0.27	76.46	55.00	91.42
Switzerland	1.67	0.54	3.56	6.20	6.10	1.74	0.08	0.00	0.27	117.87	108.00	57.76
Thailand	2.27	0.50	5.79	4.84	4.71	1.45	0.06	0.00	0.24	75.74	65.00	49.74
UK	5.00	1.26	8.79	6.05	5.84	1.84	0.12	0.00	0.33	78.55	74.00	27.16
US	2.75	1.02	5.20	6.49	6.33	1.83	0.07	0.00	0.26	44.55	37.00	35.62
Mean	2.01	0.60	4.41	5.71	5.60	1.67	0.11	0.00	0.30	102.24	87.25	62.83
Median	1.78	0.55	4.27	5.65	5.60	1.67	0.10	0.00	0.30	98.78	83.25	59.05
Std. dev.	0.75	0.22	1.19	0.56	0.55	0.21	0.07	0.00	0.09	34.07	30.90	25.94
	UE (%)			Forecast dispersion			Number of forecasts			Loss dummy		
Australia	−2.35	0.00	10.16	0.02	0.00	0.04	13.32	7.00	4.24	0.12	0.00	0.33
Austria	−1.04	−0.06	5.98	0.02	0.01	0.03	6.06	5.00	3.83	0.09	0.00	0.28
Belgium	−1.55	−0.10	6.78	0.01	0.01	0.02	8.17	7.00	6.36	0.10	0.00	0.30
Canada	−1.44	0.00	7.43	0.02	0.01	0.04	6.03	5.00	4.30	0.19	0.00	0.39
Denmark	−1.36	−0.04	7.60	0.02	0.01	0.04	6.83	6.00	5.79	0.13	0.00	0.33
Finland	−0.82	0.00	7.26	0.02	0.01	0.04	6.92	7.00	6.91	0.14	0.00	0.34
France	−2.01	−0.05	9.26	0.02	0.01	0.04	10.91	7.00	7.58	0.14	0.00	0.35
Germany	−4.95	−0.18	14.57	0.04	0.01	0.07	11.15	6.00	10.90	0.28	0.00	0.45
Hong Kong	−3.99	−0.40	11.41	0.03	0.01	0.05	12.46	11.00	9.93	0.10	0.00	0.29
India	−2.21	−0.19	8.54	0.02	0.01	0.04	5.12	7.00	4.80	0.04	0.00	0.20
Italy	−2.08	−0.17	8.70	0.02	0.01	0.04	9.44	8.00	9.35	0.14	0.00	0.34
Japan	−1.24	−0.13	5.73	0.01	0.00	0.03	4.25	4.00	4.23	0.17	0.00	0.38
Malaysia	−2.81	−0.12	10.24	0.02	0.01	0.04	10.67	9.00	8.55	0.12	0.00	0.32
Netherlands	−2.06	0.01	9.10	0.02	0.01	0.04	10.62	12.00	10.86	0.10	0.00	0.30
Norway	−2.97	−0.19	12.29	0.03	0.01	0.06	6.92	6.00	5.51	0.22	0.00	0.41
Pakistan	−1.58	0.15	9.64	0.05	0.02	0.07	3.24	4.00	1.45	0.09	0.00	0.29
Philippines	−7.46	−0.49	17.98	0.05	0.01	0.08	9.23	10.00	6.33	0.17	0.00	0.38
Portugal	−0.95	0.00	5.60	0.02	0.01	0.02	8.21	8.00	5.46	0.11	0.00	0.31
Singapore	−2.39	−0.16	9.04	0.02	0.01	0.05	10.58	9.00	8.36	0.11	0.00	0.31
South Africa	−1.96	−0.07	8.83	0.02	0.01	0.04	6.78	5.00	2.85	0.05	0.00	0.21
Spain	−1.66	−0.04	8.12	0.01	0.01	0.03	11.29	14.00	9.55	0.07	0.00	0.25
Sweden	−2.20	−0.12	10.02	0.02	0.01	0.05	7.04	5.00	7.22	0.20	0.00	0.40
Switzerland	−1.29	0.01	8.00	0.02	0.01	0.05	6.97	7.00	7.56	0.12	0.00	0.33
Thailand	−6.34	−0.48	16.55	0.06	0.02	0.08	8.42	6.00	5.99	0.23	0.00	0.42
UK	−0.83	0.09	6.15	0.01	0.00	0.03	7.15	5.00	5.41	0.09	0.00	0.28
US	−0.67	0.03	5.47	0.01	0.00	0.03	5.98	5.00	6.49	0.18	0.00	0.38

Table 2 (*continued*)

	Panel B: Firm-level variables ($N = 53{,}197$ firm-years)											
	UE (%)			Forecast dispersion			Number of forecasts			Loss dummy		
Country	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.	Mean	Median	Std. dev.
Mean	−2.31	−0.10	9.25	0.02	0.01	0.04	8.22	7.12	6.53	0.13	0.00	0.33
Median	−1.99	−0.06	8.77	0.02	0.01	0.04	7.66	7.00	6.35	0.12	0.00	0.33
Std. dev.	1.67	0.16	3.19	0.01	0.00	0.02	2.57	2.49	2.42	0.06	0.00	0.06

Variable definitions:
Earnings quality: The aggregate earnings management score from Leuz et al. (2003) multiplied by −1. 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.
First insider trading enforcement year: The year during which the first legal case is brought against insider trading (Bhattacharya and Daouk, 2002).
Interim reporting frequency: The reporting frequency index comes from Center for International Financial Analysis & Research (1995). The index measures the frequency of a country's financial reporting, with a score of 4 for quarterly reporting, 2 for semi-annual reporting, and so forth.
Financial disclosure: The accounting disclosure index is reported in Center for International Financial Analysis & Research (1995). The index is constructed by determining the mean percentage of items, from a pre-specified list of 85 accounting items, that are included in a sample of fiscal year 1993 annual reports of domestic companies (Center of International Financial Analysis & Research, 1995, pp. 357–358).
Abnormal return variance: The stock return variance over the event window, scaled by the stock return variance over the estimation window. Stock return variance over the event window equals the average of the squared prediction errors from the market model during the firm's earnings announcement window [0, 1] with day 0 being the earnings announcement date reported in I/B/E/S. The stock return variance over the estimation window equals the variance of the residual returns from the firm's market model estimated over day -120 through day -21 (relative to the announcement date).
Firm size: The natural logarithm of the market value of equity in millions of US dollar at the beginning of the year, where market value of equity equals the stock price multiplied by the number of shares outstanding according to the I/B/E/S database.
Cross-listed: A dummy variable equal to one if the securities belong to foreign firms cross-listed in the US. The foreign securities and home-country securities for the cross-listed firms, as well as the effective dates of cross-listing, are identified based on the 2004 ADR list from J.P. Morgan.
Earnings reporting lag: The number of days from the fiscal year-end to the earnings announcement date reported by I/B/E/S.
UE: Actual annual earnings minus the most recent mean forecasted annual earnings, scaled by the most recent closing price on or before the date that annual earnings are announced. All data come from I/B/E/S.
Forecast dispersion: Standard deviation of the analysts' earnings forecasts, scaled by the most recent closing price on or before the annual earnings announcement date. All data come from I/B/E/S.
Number of forecasts: The most recent number of the I/B/E/S-reported annual earnings forecasts prior to the annual earnings announcement date.
Loss dummy: A dummy variable equal to one if the I/B/E/S-reported actual earnings are less than zero.

sample that replicates the sample used in Beaver's (1968) classic study, and a sample consisting of the largest US Fortune 200 firms. In fact, Bamber et al. (2000) find that only about 30% of the sample observations in their Beaver (1968) sample have an abnormal return variance greater than one and conclude that "most individual earnings announcements are not associated with unusual price reactions" (p. 105). While Bamber et al. examine US firms, we believe that there is evidence suggesting that this phenomenon

is likely to be even more pronounced in non-US settings. Specifically, Morck et al. (2000) find that stock prices in less developed economies tend to move together, and Jin and Myers (2006) find that such markets are more prone to crashes. These studies conclude that their findings are consistent with stock prices reflecting little firm-specific information in less developed economies, due to opacity and poor investor protection. Thus, finding median abnormal return variances that are less than one is consistent with prior evidence in the US, and with inferences drawn from prior research on the behavior of many non-US markets.

The remaining columns in Panel B report statistics for our firm-level control variables. These statistics indicate a relatively low variation in mean company size and the frequency of cross-listings, but a relatively high variation in mean reporting lags, which range from a low of 44.55 days in the US to a high of 193.43 days in Pakistan. Panel B of Table 2 also indicates that all countries report negative mean unexpected earnings, consistent with analysts' earnings forecasts being optimistic on average (O'Brien, 1988). However, we also note that *median* unexpected earnings tend to be quite low (with the median of the median values equaling −0.06% across all countries), suggesting that analysts' predictions tend to be reasonably accurate around the world. Panel B also reports that forecast dispersion is fairly low across the sample, and that the mean number of forecasts per firm varies from a low of 3.24 in Pakistan to a high of 13.32 in Australia. Finally, the last three columns in Panel B report that the mean number of firms reporting losses varies fairly widely across countries.

Table 3 presents Pearson and Spearman correlation coefficients among the variables used in our analysis. While the univariate correlations in Table 3 find a significantly positive association between the abnormal return variance and each of our structural variables, we rely on the multivariate analysis described in the next section to test our hypotheses since it jointly controls for all hypothesized variables and for potentially omitted correlated variables.

4.2. Multivariate results

Table 4 reports the results of our hypotheses tests, with Panel A presenting our country-level regression and Panel B presenting two firm-level regressions (where Model 1 includes the four hypothesized variables, and Model 2 adds the firm-level control variables). Panel A shows that the coefficients on Earnings quality, Insider trading enforcement, and Interim reporting frequency are significant in the predicted directions at $p \leqslant 10\%$ (two-tailed), and that the coefficient on Financial disclosure is not significant at conventional levels. Similarly, both models in Panel B find that the coefficients on Earnings quality, Insider trading enforcement, and Interim reporting frequency are significant in the predicted directions at $p \leqslant 5\%$ (two-tailed), and that the coefficient on Financial disclosure is not significant at conventional levels.[8] Thus, both our country-level and firm-level tests support all three of our signed hypotheses.

[8]Note that because we predict the direction of our first three hypotheses, but report two-tailed p-values, the significance levels on our signed hypotheses are conservatively stated. In addition, for ease of exposition, we use the term "coefficient" when referring to the "mean of the estimated coefficients over the eight-year sample period" in Tables 4–6.

Table 3
Correlation coefficients among variables; Pearson (Spearman) coefficients in the upper (lower) triangle[a] ($N = 53{,}197$ firm-years)

Variable	Country-level financial reporting factors					Firm-level control variables						
	Abnormal return variance	Earnings quality	Insider trading enforcement	Interim reporting frequency	Financial disclosure	Firm size	Cross-listed	Earnings reporting lag	|UE|	Forecast dispersion	Number of forecasts	Loss dummy
Abnormal return variance		0.10	0.05	0.03	0.12	−0.01	−0.03	−0.06	−0.01	−0.03	0.00	−0.03
Country-level financial reporting factors												
Earnings quality	0.16		0.15	0.85	0.53	0.07	−0.06	−0.36	−0.10	−0.14	−0.08	0.02
Insider trading enforcement	0.10	0.17		0.18	0.22	0.08	−0.03	−0.27	−0.03	−0.05	−0.04	0.06
Interim reporting frequency	0.12	0.89	0.18		0.14	0.07	−0.08	−0.36	−0.07	−0.10	−0.07	0.05
Financial disclosure	0.10	0.41	0.09	0.17		0.01	−0.02	−0.15	−0.07	−0.09	−0.04	−0.04
Firm-level control variables												
Firm size	0.08	0.09	0.07	0.06	−0.01		0.31	−0.23	−0.30	−0.31	0.61	−0.23
Cross-listed	−0.01	−0.06	−0.03	−0.08	−0.01	0.29		0.06	−0.00	0.01	0.20	−0.03
Earnings reporting lag	−0.17	−0.58	−0.29	−0.56	−0.09	−0.28	0.10		0.19	0.20	−0.11	0.05
|UE|	−0.09	−0.28	−0.06	−0.24	−0.09	−0.40	0.03	0.34		0.68	−0.13	0.42
Forecast dispersion	−0.12	−0.37	−0.12	−0.32	−0.10	−0.35	0.10	0.43	0.67		−0.12	0.40
Number of forecasts	0.08	−0.03	−0.05	−0.03	0.02	0.62	0.17	−0.15	−0.27	−0.10		−0.16
Loss dummy	−0.05	0.02	0.06	0.06	−0.05	−0.22	−0.03	0.05	0.35	0.31	−0.18	

Variable definitions:
Insider trading enforcement: A dummy variable that is equal to one in the years after the first legal case is brought against insider trading, and zero otherwise (Bhattacharya and Daouk, 2002).
$|UE|$: Magnitude of unexpected earnings.
See Table 2 for definitions of other variables.
[a]Two-tailed p-values $\leqslant 1\%$ for coefficients with magnitude greater than 0.01.

Table 4
Mean coefficients from eight annual regressions with abnormal return variance regressed on structural variables, investor protection and control variables

Panel A: Country-level analysis ($N = 208$ country-years)
Model: Average abnormal return variance = $\beta_0 + \beta_1$(Earnings quality) + β_2(Insider trading enforcement) + β_3(Interim reporting frequency) + β_4(Financial disclosure)) + ε

Independent variable	Pred. sign	Mean coeff.	*N* of positive coeff.	Two-tailed p-values for *t-statistics*[a]
Intercept	n/a	3.50	n/a	*0.12*
Country-level financial reporting factors				
Earnings quality	+	0.05	7	*0.05*
Insider trading enforcement	+	0.61	8	*<0.01*
Interim reporting frequency	−	−0.33	1	*0.10*
Financial disclosure	?	0.00	3	*0.84*
Average adj. R^2 *(%)*		*12*		

Panel B: Firm-level analysis ($N = 53{,}197$ firm-years)
Model 1: Abnormal return variance = $\beta_0 + \beta_1$(Earnings quality) + β_2(Insider trading enforcement) + β_3(Interim reporting frequency) + β_4(Financial disclosure) + ε
Model 2: Abnormal return variance = $\beta_0 + \beta_1$(Earnings quality) + β_2(Insider trading enforcement) + β_3(Interim reporting frequency) + β_4(Financial disclosure) + β_5(Firm size) + β_6(Largest 20) + β_7(Cross-listed) + β_8(Earnings reporting lag) + β_9(|UE|) + β_{10}(Forecast dispersion) + β_{11}(Number of forecasts) + β_{12}(Loss dummy) + β_n(DIndustry) + ε

		Model 1			Model 2		
Independent variable	Pred. sign	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]
Intercept	n/a	4.58	n/a	*0.05*	5.37	n/a	*0.05*
Country-level financial reporting factors							
Earnings quality	+	0.14	8	*<0.01*	0.14	8	*<0.01*
Insider trading enforcement	+	1.10	8	*<0.01*	1.15	8	*<0.01*
Interim reporting frequency	−	−0.86	1	*0.02*	−0.87	1	*0.02*
Financial disclosure	?	0.01	5	*0.57*	0.00	4	*0.87*
Firm-level control variables							
Firm size					−0.12	1	*0.01*
Largest 20					0.24	6	*0.03*

Table 4 (*continued*)

Panel B: Firm-level analysis ($N = 53{,}197$ firm-years)
Model 1: Abnormal return variance $= \beta_0 + \beta_1$(Earnings quality) $+ \beta_2$(Insider trading enforcement) $+ \beta_3$(Interim reporting frequency) $+ \beta_4$(Financial disclosure) $+ \varepsilon$
Model 2: Abnormal return variance $= \beta_0 + \beta_1$(Earnings quality) $+ \beta_2$(Insider trading enforcement) $+ \beta_3$(Interim reporting frequency) $+ \beta_4$(Financial disclosure) $+ \beta_5$(Firm size) $+ \beta_6$(Largest 20) $+ \beta_7$(Cross-listed) $+ \beta_8$(Earnings reporting lag) $+ \beta_9$(|UE|) $+ \beta_{10}$(Forecast dispersion) $+ \beta_{11}$(Number of forecasts) $+ \beta_{12}$(Loss dummy) $+ \beta_n$(DIndustry) $+ \varepsilon$

		Model 1			Model 2		
Independent variable	Pred. sign	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]
Cross-listed					−0.23	2	*0.12*
Earnings reporting lag					−0.00	0	*0.01*
|UE|					1.43	7	*0.04*
Forecast dispersion					−1.78	4	*0.28*
Number of forecasts					0.03	8	*<0.01*
Loss dummy					−0.54	0	*<0.01*
Industry dummies					*Included*		
Average adj. R^2 *(%)*		*2*			*3*		

Variable definitions:
Insider trading enforcement: A dummy variable that is equal to one in the years after the first legal case is brought against insider trading, and zero otherwise (Bhattacharya and Daouk, 2002).
Largest 20: A dummy variable equal to one if the firm is one of the largest 20 firms in its country, where size is measured by market value at the beginning of the year according to the I/B/E/S database.
|*UE*|: Magnitude of unexpected earnings.
Dindustry: A dummy variable indicating a firm's industry membership based on industry group classifications from the I/B/E/S sector data. I/B/E/S classifies firms into eleven sectors: Finance, Health care, Consumer non-durables, Consumer services, Consumer durables, Energy, Transportation, Technology, Basic industries, Capital goods and Public utilities. For ease of presentation, industry dummy coefficients are not reported.
See Table 2 for definitions of other variables.
[a]*t*-statistics: mean of the coefficients/standard error of the coefficients over the eight sample years (Fama and MacBeth, 1973).

Model 2 in Panel B also finds that six of our firm-level control variables (Firm size, Largest 20, Earnings reporting lag, Magnitude of earnings surprise, Number of forecasts, and Loss dummy) are significant at $p \leqslant 5\%$ (two-tailed). These results suggest that firms with larger earnings surprises, firms that are "pillars of the economy", or firms with more analysts' forecasts realize stronger market reactions to annual earnings announcements, while firms that are larger, firms with longer reporting lags, or firms with reported losses realize weaker market reactions to annual earnings announcements.

We also note that our findings are generally consistent with Bailey et al. (2006), a concurrent study that addresses whether cross-listing in the US impacts the market reaction to foreign firms' earnings announcements. While Bailey et al. conclude that cross-listing in the US increases the market reaction to earnings announcements (due to greater disclosure), direct comparisons with our study are difficult because Bailey et al. address a different research question, and do not examine the country-level structural variables that we examine.

In summary, our analysis in Table 4 finds evidence that three financial reporting factors (Earnings quality, Insider trading enforcement, and Interim reporting frequency) in countries' financial reporting environments are associated with cross-country differences in the information content of annual earnings announcements. The next section reports additional analysis that attempts to corroborate the conclusions drawn in our primary analysis.

5. Additional analysis

5.1. Additional analysis of the influence of investor protection institutions

5.1.1. Hypothesized variables and investor protection institutions

By drawing on the investor protection literature to identify our structural factors, our findings indirectly suggest that the four structural factors we examine serve as mechanisms through which countries' investor protection institutions influence the information content of earnings announcements. To explore this conjecture further, we repeat our hypothesis tests in Model 2 of Table 4, Panel B after (1) replacing our hypothesized structural variables with two variables capturing investor protection, and (2) including these two investor protection variables along with our hypothesized structural variables.[9] Following DeFond and Hung (2003, 2004) and Leuz et al. (2003), we capture investor protection institutions using the antidirector rights and law enforcement measures of La Porta et al. (1998).[10]

[9]The additional analysis in Section 5 and the sensitivity tests in Section 6 focus on Model 2 of Table 4, Panel B because the firm-level regression model includes several firm-level control variables.

[10]Specifically, the antidirector rights measure is an index that aggregates the following components of investor rights: (1) the ability to vote by mail, (2) the ability to gain control of shares during the investors' meeting, (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 antidirector rights measure ranges from 0 to 5, with higher scores for stronger shareholder rights. The law enforcement measure is based on the mean score of the following three legal enforcement variables: (1) a measure of the efficiency of the judicial system that assesses the efficiency and integrity of the legal environment, based on the average of data from 1980 to 1983 from Business International Corp., (2) a rule of law variable that assesses the law and order tradition in a country, based on the average of data from 1982 to 1995 from International Country

The results from this analysis (not tabulated) indicate that (1) in the model that replaces our hypothesized structural variables with the two investor protection variables, both investor protection variables are significantly positive at $p \leqslant 1\%$ (two-tailed), and (2) in the model that includes the two investor protection variables along with our hypothesized structural variables, the coefficient on antidirector rights is significantly positive at $p \leqslant 10\%$ (two-tailed), the coefficient on law enforcement is insignificant at conventional levels, and the coefficients on the hypothesized structural variables that are significant in Model 2 of Table 4, Panel B remain significant at $p \leqslant 10\%$ (two-tailed). The finding that the investor protection variables are significant when included alone, but that they become less significant when our structural variables are added (while our structural variables remain statistically significant), is consistent with the hypothesized variables capturing the mechanisms through which the investor protection variables influence the usefulness of earnings announcements.[11]

5.1.2. *Investor protection and the timing of earnings information flowing into prices*

The analysis in the previous section shows that *earnings announcements are more informative* in stronger investor protection countries. Recall that the long-window association tests used in prior research demonstrate that *annual earnings are more value relevant* over periods of a year or more in stronger investor protection countries (Ali and Hwang, 2000; Hung, 2000; Young and Guenther, 2003). Taken together, this evidence implies that investor protection institutions affect both the timing and the amount of earnings information that is impounded in prices.

To further explore this implication we follow the approach in Freeman (1987) and Alford et al. (1993), and calculate cumulative market-adjusted returns (CMAR) on portfolios formed based on perfect foreknowledge of annual earnings changes (as defined in Fig. 1). Fig. 1 plots the CMAR during months [−11, 0] for companies in strong and weak investor protection countries (as defined in Fig. 1), where month 0 is the month in which earnings are announced. Consistent with prior studies, Fig. 1 finds that both the total information impounded in earnings and the information content of earnings announcements are higher in countries with stronger investor protection. Specifically, CMAR at the end of the accumulation period (month 0) is 31.7% for strong investor protection countries versus 21.2% for weak investor protection countries. In addition, the increase in CMAR during month 0 is 3.6% for strong investor protection countries versus 2.5% for weak investor protection countries. Overall, this analysis suggests that in countries with stronger investor protection institutions, earnings are more highly correlated with prices, earnings information is more rapidly impounded into prices, and earnings announcements have a stronger impact on prices.

5.2. *I/B/E/S announcement dates*

Our study assumes that the I/B/E/S earnings announcement dates are reasonably accurate in capturing the dates on which annual earnings become available to investors.

(*footnote continued*)
Risk, and (3) a corruption variable that assesses the degree of corruption in a government, based on the average of data from 1982 to 1995 from International Country Risk. The law enforcement measure ranges from 0 to 10, with higher scores denoting greater law enforcement.

[11]For further discussion and application of this method of statistical inference, see Morck et al. (2000) and Francis et al. (2002).

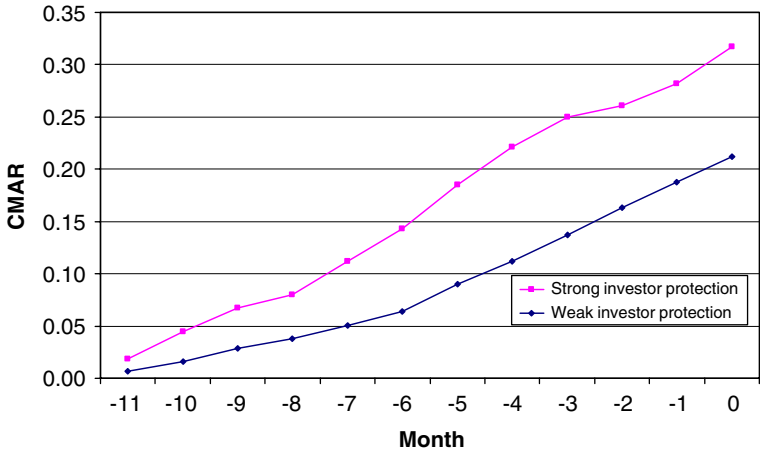

Fig. 1. CMAR is cumulative market-adjusted returns on portfolios formed based on perfect foreknowledge of annual earnings changes for companies in strong (weak) investor protection countries. Following the approach in Freeman (1987) and Alford et al. (1993), CMAR is calculated using portfolios based on perfect foreknowledge of annual earnings changes (ΔNI), by taking long positions in stocks with the highest 25% ΔNI each year and short positions in stocks with the lowest 25% ΔNI each year. Countries are classified as having strong investor protection if both values of their investor protection variables are higher than the medians reported in Table 2. Based on this approach, Australia, Canada, Japan, Norway, the UK and the US are classified as strong investor protection countries, while all other countries are classified as weak investor protection countries. Fig. 1 plots the CMAR for the hedge portfolio during month [−11, 0] for companies in strong and weak investor protection countries, where month 0 is the month in which earnings are announced.

A potential problem with this assumption is that the I/B/E/S earnings announcement dates may contain noise because, for example, the I/B/E/S earnings announcement sources may differ across countries.[12] While prior cross-country studies also rely on the I/B/E/S-reported earnings announcement dates (e.g., Jegadeesh and Kim, 2005; Bailey et al., 2006), we are not aware of previous studies that assess the extent of the noise in the I/B/E/S database. Accordingly, we now turn to an examination of whether our findings are influenced by noise in the I/B/E/S-reported earnings announcement dates.

We perform this analysis by first choosing a random sample of five company-year earnings announcements from each of our 26 sample countries and then comparing the announcement dates reported in the I/B/E/S database with the earliest earnings announcement dates we identify in the Lexis/Nexis database. For company-years not included in Lexis/Nexis, we randomly choose another company-year in the same country until we were able to identify five announcements per country with dates available in both the I/B/E/S and Lexis/Nexis databases. This procedure results in a search of 274 company-years and yields 130 announcement date comparisons across the two databases ($130 = 5$ firms $\times$ 26 countries; we analyze the 144 company-years that do not have a Lexis/Nexis date later in this subsection).

Panel A of Table 5 presents the descriptive statistics of the announcement date differences between I/B/E/S and Lexis/Nexis. We find that the I/B/E/S dates follow the

[12]For instance, I/B/E/S reports that its US and Canadian sources consist of newswires, and that its non-North American sources, while *primarily* newswires and newspapers, may also come from contributing brokers (I/B/E/S Glossary, 2000).

Table 5
Analysis restricting samples to shorter reporting lags

Panel A: Descriptive statistics on differences between I/B/E/S and Lexis/Nexis earnings announcement dates, with negative numbers indicating that I/B/E/S dates are later than Lexis/Nexis dates

Differences between I/B/E/S announcement dates and Lexis/Nexis announcement dates	*N*	Mean	Median	% within |1 day|	% within |2 day|	% within |3 day|
Company-years from hand-gathered data (five randomly selected firms*26 countries)	130	−12.67	−1.00	44%	46%	57%
Restrict company-years to those with reporting lags						
⩽99 calendar days	98	−0.93	0.00	57%	58%	72%
⩽62 calendar days	52	−0.06	0.00	73%	76%	88%

Panel B: Mean coefficients from eight annual regressions with abnormal return variance regressed on financial reporting factors and control variables, after restricting the sample based on various reporting lags

Model: Abnormal return variance $= \beta_0 + \beta_1$(Earnings quality) $+ \beta_2$(Insider trading enforcement) $+ \beta_3$(Interim reporting frequency) $+ \beta_4$(Financial disclosure) $+ \beta_5$(Firm size) $+ \beta_6$(Largest 20) $+ \beta_7$(Cross-listed) $+ \beta_8$ (Earnings reporting lag) $+ \beta_9$(|UE|) $+ \beta_{10}$(Forecast dispersion) $+ \beta_{11}$(Number of forecasts) $+ \beta_{12}$(Loss dummy) $+ \beta_n$(DIndustry) $+ \varepsilon$

		Restricting the sample to reporting lags ⩽ 99 calendar days ($N = 43{,}788$)			Restricting the sample to reporting lags ⩽ 62 calendar days ($N = 29{,}823$)		
Independent variable	Pred. sign	Mean coeff.	N of positive coeff.	*Two-tailed p-values for t-statistics*[a]	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]
Intercept	n/a	5.15	n/a	*0.08*	5.60	n/a	*0.09*
Country-level financial reporting factors							
Earnings quality	+	0.17	8	*<0.01*	0.16	8	*0.01*
Insider trading enforcement	+	1.79	8	*<0.01*	1.03	8	*0.07*
Interim reporting frequency	−	−1.15	1	*0.02*	−1.10	1	*0.03*
Financial disclosure	?	0.01	5	*0.55*	0.01	4	*0.74*

Firm-level control variables						
Firm size	−0.13	1	*0.02*	−0.12	1	*0.01*
Largest 20	0.19	6	*0.16*	0.04	5	*0.73*
Cross-listed	−0.37	2	*0.02*	−0.43	1	*0.03*
Earnings reporting lag	0.00	4	*0.92*	0.00	4	*0.46*
|UE|	1.73	6	*0.12*	2.52	7	*0.01*
Forecast dispersion	−2.13	3	*0.38*	−2.50	4	*0.40*
Number of forecasts	0.03	8	*<0.01*	0.04	8	*<0.01*
Loss dummy	−0.58	0	*<0.01*	−0.75	0	*<0.01*
Industry dummies	*Included*			*Included*		
Average adj. R^2 (%)	*4*			*3*		

Variable definitions:
See Tables 2 and 4 for definitions of variables.
[a] *t*-statistics: mean of the coefficients/standard error of the coefficients over the eight sample years (Fama and MacBeth, 1973).

Lexis/Nexis dates by an average of 12.7 days, with a median of 1 day, and that 44% of the I/B/E/S dates are within 1 day of the Lexis/Nexis dates. Importantly, while not tabulated, we also find that the differences between the I/B/E/S and Lexis/Nexis dates are highly positively correlated with the length of the reporting lag, with a correlation coefficient of 0.76. Further, Panel A of Table 5 shows that if we restrict our hand-gathered sample to observations with reporting lags of less than or equal to 99 calendar days (because 98.78 days is the median of the mean reporting lag in our sample countries reported in Table 2, Panel B), the announcement date noise is reduced. Specifically, the differences between the I/B/E/S dates and the earliest-reported Lexis/Nexis dates have a mean of 1 day and a median of 0 days, and 57% of the I/B/E/S dates are within 1 day of the Lexis/Nexis dates. Finally, Panel A also shows that if we restrict the hand-gathered sample to reporting lags of less than or equal to 62 calendar days (which is the average of the mean reporting lags in the US and the UK), the announcement date noise is further reduced, with the difference between the I/B/E/S and Lexis/Nexis dates having a mean and median of 0 days, and with 73% of the I/B/E/S dates falling within 1 day of the Lexis/Nexis dates.[13]

Based on the preceding findings, we perform several tests to assess the likelihood that noise in the I/B/E/S database is influencing our results. First, we repeat our hypothesis tests after restricting our analysis to sample firms that report earnings announcement lags of less than or equal to 99 calendar days (equal to approximately 71 trading days) or less than or equal to 62 calendar days (equal to approximately 44 trading days), as these restrictions are expected to reduce the announcement date noise as shown in Panel A of Table 5. The results of this analysis, reported in Table 5, Panel B are consistent with those reported in Model 2 of Table 4, Panel B.[14]

Second, we repeat our hypothesis tests after excluding the countries that have the greatest amount of noise in their announcement dates as found in the hand-gathered sample. Specifically, we drop Austria, Germany, Italy, the Netherlands, Pakistan, the Philippines, and Portugal, all of which have mean differences between the announcement dates reported in the I/B/E/S and Lexis/Nexis databases greater than the overall mean difference of 12.7 days. This analysis (not tabulated) generates results consistent with those reported in Model 2 of Table 4, Panel B. Thus, our first two tests suggest that our findings are not driven by either observations or countries with noisy announcement dates.[15]

[13]We take the average of the mean reporting lags in the US and the UK because these countries have the largest reported abnormal return variance in Table 2, Panel B. These large abnormal return variances are consistent with I/B/E/S accurately capturing the earnings announcement dates in these countries.

[14]We define "consistent with the results reported in Table 4, Panel B" to mean that the average coefficients on Earnings quality, Insider trading enforcement, and Interim reporting frequency continue to be significant at $p \leqslant 10\%$ (two-tailed) in the predicted direction, and that the average coefficient on Financial disclosure is insignificant at conventional levels.

[15]Because the announcement date noise is also potentially a function of poor investor protection, we calculate the correlation between the difference in the I/B/E/S and Lexis/Nexis announcement dates in our hand-gathered sample, and the two variables we use to capture investor protection (the antidirector rights index and law enforcement index). This analysis finds correlations of -0.14 ($p = 0.10$) and -0.16 ($p = 0.07$), respectively. When we restrict the hand-gathered sample to observations with lags of less than or equal to 99 days, these correlations fall to -0.10 ($p = 0.31$) and 0.05 ($p = 0.64$), respectively. When we further restrict the hand-gathered sample to observations with lags of less than or equal to 62 days, these correlations become 0.02 ($p = 0.87$) and 0.01 ($p = 0.94$), respectively. Thus, the noise in the I/B/E/S database does not appear to be highly correlated with poor investor protection.

Third, in order to increase the probability that more event dates fall within our event window, we repeat our hypothesis tests after expanding the event window to three [−1,1], five [−2,2], and 11 [−5,5] days. While increasing the event window reduces the power of our tests by including more non-announcement days, we continue to find results (not tabulated) consistent with the findings in Model 2 of Table 4, Panel B. Thus, expanding our event window provides additional assurance that our findings are not driven by noisy announcement dates.

Finally, since cross-country differences in the I/B/E/S earnings announcement sources may introduce noise, we attempt to restrict our sample to the announcements that are most likely to come from similar sources. Specifically, since Lexis/Nexis reports announcements that are released primarily via news sources, the 144 earnings announcements that we are unable to find in the Lexis/Nexis database (when compiling our hand-gathered sample) are more likely to be those that are announced via non-news channels. Analysis of the reporting lags in our hand-gathered sample finds that the 144 announcements we are unable to find in Lexis/Nexis have mean and median reporting lags of 108 and 88 days, respectively, while the 130 announcements that we are able to find in Lexis/Nexis have mean and median reporting lags of 85.5 and 67.5 days, respectively. Thus, because the earnings announcements we are unable to find in Lexis/Nexis tend to have longer reporting lags, our test (reported above) that restricts the sample to company-years with reporting lags of less than or equal to 99 or 62 days also reduces the probability that we are using I/B/E/S dates in these tests that are from non-news sources. Therefore, the test that restricts the reporting lags also provides some assurance that our results are not driven by cross-country differences in the earnings announcement sources used by I/B/E/S (e.g., news versus non-news sources). In summary, the above analysis provides us with reasonable assurance that our findings are unlikely to be driven by noise in the I/B/E/S earnings announcement dates.

5.3. Analysis of abnormal trading volume

Another commonly used measure to assess the information content of earnings announcements is abnormal trading volume (Beaver, 1968). Thus, we repeat our analysis in Table 4, Panel B after replacing abnormal return variance with abnormal trading volume, which is defined as the average trading volume during the firm's earnings announcement window [0, 1], scaled by the average trading volume over the 100-day trading window [−120, −21]. Models 1 and 2 in Table 6 find that the results of this analysis (without and with control variables, respectively) are consistent with those reported in Table 4, Panel B.[16] Thus, our hypothesis tests that use trading volume corroborate the results of our primary analysis.

5.4. Analysis of market efficiency

Our tests implicitly assume that stock markets in our sample countries are reasonably efficient, in the sense that prices are capable of responding to news announcements that impact firm value. This assumption is consistent with the fact that our sample firms are relatively large and actively followed by analysts, suggesting a reasonably large investor

[16]The sample sizes are smaller than those in Table 4, Panel B due to missing trading volume data.

Table 6
Mean coefficients from eight annual regressions with abnormal trading volume regressed on financial reporting factors and control variables ($N = 44{,}954$ firm-years)

Model 1: Abnormal trading volume $= \beta_0 + \beta_1$(Earnings quality) $+ \beta_2$(Insider trading enforcement) $+ \beta_3$(Interim reporting frequency) $+ \beta_4$(Financial disclosure) $+ \varepsilon$
Model 2: Abnormal trading volume $= \beta_0 + \beta_1$(Earnings quality) $+ \beta_2$(Insider trading enforcement) $+ \beta_3$(Interim reporting frequency) $+ \beta_4$(Financial disclosure) $+ \beta_5$(Firm size) $+ \beta_6$(Largest 20) $+ \beta_7$(Cross-listed) $+ \beta_8$(Earnings reporting lag) $+ \beta_9$(|UE|) $+ \beta_{10}$(Forecast dispersion) $+ \beta_{11}$(Number of forecasts) $+ \beta_{12}$(Loss dummy) $+ \beta_n$(DIndustry) $+ \varepsilon$

		Model 1			Model 2		
Independent variable	Pred. sign	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]	Mean coeff.	*N* of positive coeff.	*Two-tailed p-values for t-statistics*[a]
Intercept	n/a	1.60	n/a	*0.17*	2.18	n/a	*0.07*
Country-level financial reporting factors							
Earnings quality	+	0.03	7	*0.02*	0.03	7	*0.02*
Insider trading enforcement	+	0.40	8	*<0.01*	0.33	8	*<0.01*
Interim reporting frequency	−	−0.17	2	*0.07*	−0.20	1	*0.03*
Financial disclosure	?	0.01	5	*0.47*	0.00	5	*0.63*
Firm-level control variables							
Firm size					−0.07	0	*<0.01*
Largest 20					0.08	7	*0.10*
Cross-listed					−0.09	1	*0.01*
Earnings reporting lag					−0.00	0	*<0.01*
|UE|					0.61	6	*0.11*
Forecast dispersion					−0.87	2	*0.17*
Number of forecasts					0.01	7	*0.03*
Loss dummy					−0.23	0	*<0.01*
Industry dummies					*Included*		
Average adj. R^2 (%)		*2*			3		

Variable definitions:
Abnormal trading volume: The average trading volume during the firm's earnings announcement window [0, 1] with day 0 being the earnings announcement date reported in I/B/E/S, scaled by the average trading volume over the 100-day trading window [−120, −21].
See Tables 2 and 4 for definitions of other variables.
[a]*t*-statistics: mean of the coefficients/standard error of the coefficients over the eight sample years (Fama and MacBeth, 1973).

base. It is also consistent with a large body of prior research that finds evidence of stock market efficiency in a variety of countries; see, e.g., Brown (1970) for Australian firms, Hawawini (1984) for 14 European countries, Bhattacharya et al. (2000) for Mexican firms, and Haw et al. (2000) for Chinese firms.[17] Importantly, this research includes evidence that

[17]In addition, Cumby and Glen (1990) show that institutional investors specializing in foreign equities are unable to outperform international stock indexes.

stock markets are informationally efficient in developing economies, where investor protection institutions are typically quite weak.

Despite this prior research, a potential alternative explanation for our findings is that stock markets are *not* informationally efficient in countries with weak investor protection institutions. That is, if countries with weak investor protection institutions have informationally inefficient stock markets, this may explain the association we find between abnormal stock return variation and our structural factors. We address this issue by performing two additional tests that are designed to provide evidence on whether stock markets in weak investor protection countries in our sample are informationally efficient.

Our first test consists of controlling for the effects of liquidity on the market reaction to earnings announcements. While a necessary condition for market efficiency is that investors are willing to trade on new information as it enters the market, an additional necessary condition is that markets are sufficiently liquid to allow investors to trade. Bhattacharya and Daouk (2002) find that market liquidity is lower in developing economies. Since developing countries generally have weak investor protection, we rerun the regression in Model 2 of Table 4, Panel B (i.e., the full-model firm-level regression in Table 4) after including the country-level turnover measure reported in Bhattacharya and Daouk (2002) to proxy for market liquidity. This measure equals the natural logarithm of annual trading volume during 1997 divided by market capitalization at the end of 1997. The analysis (not tabulated) reports results consistent with the results in Model 2 of Table 4, Panel B. Thus, our results are robust to controlling for market liquidity.

Our second test examines the significance of the average abnormal return variance in our sample countries. If stock prices respond to the information in earnings announcements, then we expect to observe an average abnormal return variance that is statistically significantly greater than one (Watts and Zimmerman, 1986). Despite the low power of this test (because it does not control for other factors that influence the price reaction to annual earnings announcements), we find that all but one country in our sample (Pakistan) have average abnormal return variances that are *significantly* greater than one at $p \leqslant 10\%$. While the insignificant average abnormal return variance in Pakistan may be driven by poorer than average earnings quality, or worse than average enforcement of insider trading laws (as shown in Table 2, Panel A), it is also possible that the country has informationally inefficient stock markets. Thus, we rerun Model 2 of Table 4, Panel B after excluding firms in Pakistan. The analysis yields results (not tabulated) consistent with those reported in Table 4. Thus, our results are robust to excluding countries in our sample with potentially inefficient stock markets.

Overall, our analysis and discussion in this section suggest that our results are unlikely to be driven by lack of informational efficiency among the firms in countries with weak investor protection institutions. The next section reports some robustness tests related to our analysis.

6. Robustness tests

6.1. Excluding US and Japanese firms

Table 1 reports that the US and Japan have a much larger number of earnings announcements than other countries. Because the large weight on the US or Japan might drive the results in our firm-level hypothesis tests, we repeat our full-model regression

(Model 2) in Table 4, Panel B after excluding US and Japanese firms sequentially from our sample. The analysis (not tabulated) yields results consistent with the results in Model 2 of Table 4, Panel B. Thus, our overall results are not sensitive to excluding US or Japanese firms.

6.2. Controlling for capital market development

A factor that may influence our findings is capital market development. For example, less developed capital markets may have characteristics, such as a weak communications infrastructure or a poor trading environment, that dampen a market's reaction to earnings announcements. However, less developed capital markets may also have characteristics, such as fewer alternative information sources, that increase a market's reaction to earnings announcements. We therefore repeat our full-model regression (Model 2) in Table 4, Panel B after adding a variable that captures capital market development. As in La Porta et al. (1997), we measure capital market development as the country's market capitalization divided by its gross national product for 1994.

The analysis (not tabulated) yields results consistent with the results in Model 2 of Table 4, Panel B. In addition, the coefficient on the capital market development variable is insignificant at conventional levels. Thus, our overall conclusions are not sensitive to controlling for capital market development.

6.3. Controlling for time-series correlation

Panel B of Table 4 reports Fama-MacBeth (1973) statistics, which control for potential *cross-sectional* correlation among the error terms in our regressions. To control for potential *time-series* correlation among our regression error terms, we repeat our full-model regression (Model 2) in Table 4, Panel B after including only one randomly selected annual observation for each firm in our analysis. The analysis (not tabulated) yields results consistent with the results in Model 2 of Table 4, Panel B. Thus, our results do not appear to be affected by time-series correlation among the regression error terms.

6.4. Deleting influential observations

To examine the potential effects of influential observations, we rerun our full-model regression (Model 2) in Table 4, Panel B after dropping observations with absolute values of R-student statistics exceeding three. The analysis (not tabulated) yields results consistent with the results in Model 2 of Table 4, Panel B. Thus, our results do not appear to be affected by influential observations.

6.5. Using an alternative regression specification

Our descriptive statistics in Table 2 indicate that the means of the abnormal return variance tend to be higher than the medians, suggesting that our measure of abnormal return variance is skewed. Thus, we rerun our full-model regression (Model 2) in Table 4, Panel B after replacing all variables other than the dummies with the ranked values of the corresponding variables. The analysis (not tabulated) yields results consistent with the results in Model 2 of Table 4, Panel B, with one exception: the average coefficient on

Financial disclosure becomes significantly positive at $p \leqslant 10\%$ (two-tailed). Thus, our overall conclusions are not sensitive to this alternative regression specification.

6.6. Including country averages of firm-specific control variables

To test whether our country-level analysis is sensitive to cross-country differences in the firm-level controls, we rerun our analysis after including country averages of firm-specific control variables in our country-level regressions in Table 4, Panel A.[18] The analysis (not tabulated) yields results consistent with the results in Table 4, Panel A.

7. Summary

The purpose of this study is to examine cross-country differences in the information content of annual earnings announcements using short-window methodology that allows us (1) to infer whether market participants actually use the reported earnings information, and (2) to identify factors in countries' financial reporting environments that explain these differences. We appeal to the literature on investor protection institutions and identify four structural factors in countries' financial reporting environments that we hypothesize are associated with the information content of annual earnings announcements. Consistent with our hypotheses, we find that annual earnings announcements are *more* informative in countries with higher quality earnings or better enforced insider trading laws, and that annual earnings announcements are *less* informative in countries with more frequent interim financial reporting.

References

Alford, A., Jones, J., Leftwich, R., Zmijewski, M., 1993. The relative informativeness of accounting disclosures in different countries. Journal of Accounting Research 31, 183–223.

Ali, A., Hwang, L., 2000. Country-specific factors related to financial reporting and the value relevance of accounting data. Journal of Accounting Research 38, 1–22.

Atiase, R., 1985. Predisclosure information, firm capitalization and security price behavior around earnings announcements. Journal of Accounting Research 23, 21–36.

Bailey, W., Karolyi, G.A., Salva, C., 2006. The economic consequences of increased disclosure: evidence from international cross-listings. Journal of Financial Economics 81, 175–213.

Ball, R., Brown, P., 1968. An empirical evaluation of accounting income numbers. Journal of Accounting Research 6, 159–178.

Ball, R., Kothari, S.P., Robin, A., 2000. The effect of international institutional factors on properties of accounting earnings. Journal of Accounting and Economics 29, 1–51.

Ball, R., Robin, A., Wu, J.S., 2003. Incentives versus standards: properties of accounting income in four East Asian countries. Journal of Accounting and Economics 36, 235–270.

Bamber, L., Christensen, T., Gaver, K., 2000. Do we really 'know' what we think we know? A case study of seminal research and its subsequent overgeneralization. Accounting, Organizations and Society 25, 103–129.

Beaver, W., 1968. The information content of annual earnings announcements. Journal of Accounting Research 6, 67–92.

Beny, L.N., 2005. Do insider trading laws matter? Some preliminary comparative evidence. American Law and Economics Review 7, 144–183.

Bhattacharya, U., Daouk, H., 2002. The world price of insider trading. The Journal of Finance 57, 75–108.

[18]We do not include this test as part of our analysis in Panel A of Table 4 because a disaggregated (firm-level) model is likely to be better specified than an aggregated (country-level) model (Garrett, 2003).

Bhattacharya, U., Daouk, H., Jorgenson, B., Kehr, C., 2000. When an event is not an event: the curious case of an emerging market. Journal of Financial Economics 55, 69–101.

Brown, P., 1970. The impact of the annual net profit report on the stock market. The Australian Accountant, 277–283.

Bushman, R.M., Piotroski, J.D., Smith, A.J., 2004. What determines corporate transparency? Journal of Accounting Research 42, 207–252.

Butler, M., Kraft, A., Weiss, I., 2003. The effect of reporting frequency on the timeliness of earnings: the case of voluntary and mandatory interim reports. Working paper, University of Rochester, London Business School and Columbia Business School.

Center for International Financial Analysis & Research, 1995. International Accounting and Auditing Trends. CIFAR Publications, Inc., Princeton, NJ.

Chambers, A., Penman, S., 1984. Timeliness of reporting and the stock price reaction to earnings announcements. Journal of Accounting Research 22, 21–47.

Chang, J.J., Khanna, T., Palepu, K.G., 2000. Analyst activity around the world. Working paper, Harvard Business School and the Wharton School.

Cumby, R., Glen, J., 1990. Evaluating the performance of international mutual funds. The Journal of Finance 45, 497–521.

DeFond, M.L., Hung, M., 2003. Investor protection and analysts' cash flow forecasts around the world. Working paper. University of Southern California.

DeFond, M.L., Hung, M., 2004. Investor protection and corporate governance: evidence from worldwide CEO turnover. Journal of Accounting Research 42, 269–312.

Fama, E.F., MacBeth, J.D., 1973. Risk, return, and equilibrium: empirical tests. The Journal of Political Economy 81, 607–636.

Financial Accounting Standards Board, 1980. Statement of Financial Accounting Concepts No. 2: Qualitative Characteristics of Accounting Information, Financial Accounting Standards Board, Norwalk, Connecticut.

Firth, M., 1981. The relative information content of the release of financial results data by firms. Journal of Accounting Research 19, 521–529.

Francis, J., Schipper, K., Vincent, L., 2002. Expanded disclosures and the increased usefulness of earnings announcements. The Accounting Review 77, 515–546.

Freeman, R., 1987. The association between accounting earnings and security returns for large and small firms. Journal of Accounting and Economics 9, 195–228.

Frost, C., Pownall, G., 1994. A comparison of the stock price response to earnings disclosures in the United States and the United Kingdom. Contemporary Accounting Research 11, 59–83.

Garrett, T., 2003. Aggregated versus disaggregated data in regression analysis: implications for inference. Economic Letters 81, 61–65.

Haw, I., Qaqing, D., Wu, W., 2000. Timeliness of annual report releases and market reaction to earnings announcements in an emerging capital market: the case of China. Journal of International Financial Management and Accounting 11, 108–131.

Hawawini, G., 1984. European equity markets: price behavior and efficiency. Salomon Brothers Center Monograph Series. New York University, New York.

Hayn, C., 1995. The information content of losses. Journal of Accounting and Economics 20, 125–153.

Healy, P., Wahlen, J., 1999. A review of the earnings management literature and its implications for standard setting. Accounting Horizons 13, 365–383.

Hung, M., 2000. Accounting standards and value relevance of earnings: an international analysis. Journal of Accounting and Economics 30, 401–420.

I/B/E/S., 2000. I/B/E/S Glossary. I/B/E/S International, New York, NY.

Imhoff, E., Lobo, L., 1992. The effect of ex-ante earnings uncertainty on earnings response coefficient. The Accounting Review 67, 427–439.

Jegadeesh, N., Kim, W., 2005. Value of analyst recommendations: International evidence. Working paper, Emory University.

Jin, Li., Myers, S., 2006. R-squared around the world: New theory and new tests. Journal of Financial Economics 79, 257–292.

Kim, O., Verrecchia, R.E., 1991. Market reaction to anticipated announcements. Journal of Financial Economics 30, 273–309.

Kothari, S.P., 2001. Capital markets research in accounting. Journal of Accounting and Economics 31, 105–231.

Landsman, W., Maydew, E., 2002. Has the information content of quarterly earnings announcements declined in the past three decades? Journal of Accounting Research 40, 797–808.
Lang, M.H., Lins, K.V., Miller, D.P., 2003. ADRs, analysts, and accuracy: does cross listing in the US improve a firm's information environment and increase market value? Journal of Accounting Research 41, 317–345.
La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., 1997. Legal determinants of external finance. The Journal of Finance 52, 1131–1150.
La Porta, R., Lopez-de-Silanes, R., Shleifer, A., Vishny, R.W., 1998. Law and finance. Journal of Political Economy 106, 1113–1155.
La Porta, R., Lopez-de-Silanes, R., Shleifer, A., Vishny, R.W., 2000. Investor protection and corporate governance. Journal of Financial Economics 58, 3–27.
Leuz, C., Nanda, D., Wysocki, P.D., 2003. Earnings management and investor protection: an international comparison. Journal of Financial Economics 69, 505–527.
McNichols, M., Manegold, J., 1983. The effect of the information environment on the relationship between financial disclosure and security price variability. Journal of Accounting and Economics 5, 49–74.
Morck, R., Yeung, B., Yu, W., 2000. The information content of stock markets: why do emerging markets have synchronous stock price movement? Journal of Financial Economics 58, 215–260.
North, D., 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge.
O'Brien, P., 1988. Analysts' forecasts as earnings expectations. Journal of Accounting and Economics 10, 53–83.
Pownall, G., Schipper, K., 1999. Implications of accounting research for the SEC's consideration of international accounting standards for US securities offerings. Accounting Horizons 13, 259–280.
Warner, J., Watts, R., Wruck, K., 1988. Stock prices and top management changes. Journal of Financial Economics 20, 461–492.
Watts, R.L., Zimmerman, J.L., 1986. Positive Accounting Theory. Prentice Hall, Englewood Cliffs, NJ.
Wurgler, J., 2000. Financial markets and the allocation of capital. Journal of financial Economics 58, 187–214.
Young, D., Guenther, D.A., 2003. Financial reporting environments and international capital mobility. Journal of Accounting Research 41, 553–579.