Financial integration and the transparency of firms in emerging capital markets

Qiyu Zhang [a,*], Wendy Beekes [a], Philip Brown [b,c]

[a] *Department of Accounting and Finance, The Management School, Lancaster University, Lancaster, LA1 4YX, UK*

[b] *Business School, The University of Western Australia, 35 Stirling Highway, Crawley WA 6009, Australia*

[c] *The Australian School of Business, The University of New South Wales, Sydney NSW 2052, Australia*

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Abstract

We examine the association between financial integration and capital market transparency of emerging-market firms. We use four intra-year price timeliness measures derived from the Beekes and Brown (2006, 2007) methods as indicators of the firm's transparency. The sample comprises 57,465 firm-year observations on listed companies in 24 emerging economies over the period 1995-2010. As expected, we find that greater financial integration is associated with greater transparency, and that the effect is more pronounced when the news about the firm is bad. Using structural equation modelling (SEM), we find evidence of a mechanism through which financial integration enhances the information environment: improved corporate governance.

1. Introduction

There has been a dramatic increase in the degree of financial integration in emerging economies in the past few decades.[1] A growing body of literature has reported the beneficial effects of financial integration in lowering the cost of equity capital (Bekaert and Harvey, 2000), stimulating economic growth (Bekaert et al., 2001), expanding financing options (Schmukler and Vesperoni, 2006; Lucey

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* Corresponding author. Tel.: +44 1524593625; fax: +44 1524847321
 E-mail addresses: q.zhang7@lancaster.ac.uk (Q. Zhang), w.beekes@lancaster.ac.uk (W. Beekes), philip.brown@uwa.edu.au (P. Brown)

[1] In our context, financial integration refers to the free access of foreign households and firms to local capital markets, and of local households and firms to foreign capital markets. The emerging equity markets in this study are those defined by the MSCI Global Investable Market Indices 2007.

and Zhang, 2011), and improving firm performance (Mitton, 2006; Giannetti and Ongena, 2009). There is also evidence showing that financial integration can improve the information environment faced by firms (Bae et al., 2006). Our study contributes to this literature by examining the association between financial integration and four timeliness measures of equity market transparency derived from the Beekes and Brown (2006, 2007) approach. These innovative measures add to existing indicators of the firm's information environment (e.g., properties of security analysts' earnings forecasts) by examining the intra-year price discovery process. The method we use can be adapted to identify the timeliness of the recognition of different types of value-relevant information (e.g., good news versus bad news), thereby providing new insights into the relationship between financial integration and transparency to investors.

Our sample comprises 57,465 firm-year observations on 10,124 unique companies domiciled in 24 developing countries during the period 1995-2010. The dependent variables are four measures of the intra-year timeliness of price discovery, which proxy for the equity market transparency of a firm. Two of the four are raw price timeliness measures and the remaining two relate to the timeliness of good and of bad news. The independent variables of interest include two country-level measures of financial integration developed by Chinn and Ito (2006) and Lane and Milesi-Ferretti (2007). We also construct a cross-listing dummy variable to indicate the international exposure of a firm. Results from the univariate and multivariate tests generally indicate timelier price discovery when financial integration is higher. In addition, we find that greater financial integration is associated with more timely price discovery of bad news relative to good. Cross-listed firms have slower timeliness of good news, implying they adopt more conservative disclosure practices. Importantly, our work suggests that financial integration can help to resolve information and agency problems, and ultimately to influence the speed of price discovery in the longer term.

We explicitly test a potential mechanism, corporate governance, through which financial integration improves the information environment of a firm. To do so, we focus on Chinese listed firms and use both simple regression analysis and structural equation modelling (SEM). We find evidence that financial integration has both direct and indirect effects on the timeliness of bad news, with indirect effects arising through the mechanism of corporate governance. Specifically, financial integration is associated with better corporate governance such that better-governed firms are associated with more timely pricing of bad news.

The rest of the paper is organized as follows. In Section 2, we describe the most closely related literature and formulate our predictions. Section 3 describes the data and variables, and Section 4 presents the results. Concluding remarks are made in Section 5.

2. Related literature and predictions

2.1. Financial integration and the information environment in emerging markets

Our main prediction is that greater financial integration improves the quality of the information environment faced by local firms. Previous studies provide evidence to support the prediction. Li et al. (2004) find that greater capital market openness is associated with higher firm-specific variation in returns and lower comovement in emerging markets. They indicate their finding could be explained by several possibilities such as reduced tunnelling because of greater transparency, less investor herding, and the activities of informed arbitrageurs. Bae et al. (2006) focus on country-level market liberalization in a sample of emerging markets and find that increased openness to foreign equity investors is associated with increases in firm-specific information, analyst coverage, and analyst value-added, and decreases in earnings management. Bae et al.'s findings suggest that the transition

of an emerging stock market into one that is integrated with the global capital market alters the local environment for disclosure, information production, and the analysis and use of information, and attracts foreign capital to the home country.

Another strand of literature focuses on the effects of cross listing on foreign exchanges. Baker et al. (2002) and Lang et al. (2003) report increases in analyst coverage, forecast accuracy, and news stories after firms cross-list. Eun and Sabherwal (2003) examine the relationship between the prices in the home and host markets for a sample of Canadian firms that were cross-listed in the U.S., and find that their stock prices in the Canadian and U.S. markets are cointegrated and mutually adjusting. Korczak and Bohl (2005) and Liu (2007) find that when firms are cross-listed on more established overseas exchanges, their home-market pricing efficiency as indicated by stock return autocorrelation is enhanced. Su and Chong (2007) document that trading in both Hong Kong and the U.S. contributes to the price-discovery process for Chinese stocks cross-listed in the two markets. The results of these studies suggest that a better information environments in a home market, whereby more information about the fundamentals of cross-listed firms can be revealed, feed back into the home market prices, effectively improving the information environment and pricing efficiency of the home market.

In light of the studies described above, which suggest that financial integration is positively associated with other aspects of the information environment, we predict that financial integration increases the speed of intra-year price discovery; for example, information related to price-sensitive earnings announcements tends to be incorporated into share prices in a timelier fashion (Ball and Brown, 1968) in countries that are more closely integrated with the world's financial markets. (In the present context, price discovery, as described by Beekes and Brown 2006 and 2007, is the process whereby value-relevant, private information is incorporated into a stock's publicly observable market price.) Specifically, we test the following hypothesis:

H₁: The degree of financial integration is positively associated with the timeliness of price discovery in emerging markets.

Besides unconditional price timeliness, we are also interested in asymmetry in the recognition of good and bad news. Unconditional price timeliness is the net effect of corporate disclosures, combined with the actions of information intermediaries, traders, market agents, and investors. There are good reasons why disclosure can be valuable to a firm. For instance, low information asymmetry between corporate insiders and outside investors can improve a firm's ability to issue securities and reduce its cost of capital (Diamond and Verrecchia, 1991; Botosan, 1997; Leuz and Verrecchia, 2000). Delayed disclosure can be punished by stock price penalties imposed by investors (Cornell and Landsman, 1989; Beekes et al., 2014). Disclosure may also prevent claims resulting from legal action against inadequate disclosure to current and potential investors, especially when there is impending bad news (Skinner, 1994, 1997). Notwithstanding the benefits of timely disclosure, the imbalance in corporate disclosures of good and bad news is a familiar topic in the literature. On one hand, managers tend to withhold bad news due to their private incentives (Kothari et al., 2009). For instance, the disclosure of bad news will incur costs arising from career-related concerns, lower bonus payments and a loss in wealth as a result of the stock price decline. In our setting, agency problems are relatively severe because of features of emerging markets such as weak financial and legal institutions. As a result, emerging-market firms are more likely to withhold bad news relative to good news. We thus test the following hypothesis:

H₂: The positive effect of financial integration is more pronounced on the timeliness of bad news than on the timeliness of good news.

2.2. Corporate governance as a potential mechanism for financial integration

Previous works suggest that the scrutiny of foreign investors, foreign equity analysts, and foreign stock market listing standards can help improve the information environment by fostering higher quality disclosure and governance standards to emerging-market firms (e.g., Obstfeld, 1998; Stulz, 1999; Doidge et al., 2004). Stulz (1999) indicates that the different assessments of the value of a project made by management and investors act as another cause of expensive external capital. The "information asymmetry" problem and "agency cost" problem could be manifest in variation in assessments, and effective monitoring of management could mitigate these problems. As Stulz argues, financial globalization and integration will improve the monitoring of management through mechanisms such as the board of directors, the capital market, the legal system, active shareholders, the market for corporate control, and the public disclosure of information by firms. Doidge et al. (2004) model the trade-off whereby controlling shareholders either expropriate as much of the firm's resources as possible from minority shareholders or increase resources by committing to limit their expropriation activities so that firms can raise lower-cost capital from foreign exchanges. Their model predicts that the cost of raising external capital will fall with enhanced corporate governance. Aggarwal et al. (2011) provide empirical evidence supporting their prediction in that they find a positive relationship between international institutional investments and the strength ('quality') of the corporate governance of local firms. Another strand of literature has examined the effects of corporate governance on disclosure and the information environment of the firm. Aman et al. (2011) find that corporate governance in Japan is associated with increased disclosure and a greater analyst following, but not with more timely price discovery. Beekes et al. (2012a) find that better corporate governance leads to a higher analyst following, lower dispersion in analysts' forecasts, and greater forecast accuracy in Canada. Beekes and Brown (2006) and Beekes et al. (2014) find evidence of timelier price discovery for better-governed Australian firms. Hass et al. (2014) show that the positive

effect of corporate governance is more pronounced on the timeliness of bad news than on that of good news in China. Thus we predict:

H₃: Firms in more closely integrated economies have higher quality of governance which leads to greater transparency.

3. Data and variables

3.1. Sample selection

Our data set relates to 10,124 public companies domiciled in 24 emerging markets covering the period from 1995 to 2010. We obtain firms' price and financial data from Datastream and Worldscope, data on cross-listing from the Bank of New York Mellon, data on country-level financial integration from Lane and Milesi-Ferretti (2007) and Chinn and Ito (2006), data on country-level financial and macroeconomic variables from the World Development Indicators (World Bank, 2013), data on the information flow of a country from the KOF Index of Globalization (Dreher, 2006), and data on legal institutions from La Porta et al. (1998). To avoid survivorship bias, we include firms delisted during the sample period. We exclude firms with missing timeliness estimates and control variables (to be discussed later). We also exclude financial firms (SIC codes between 6000 and 6999) due to their unique accounting and financial characteristics. The selection process results in a final sample of 57,465 firm-year observations.

3.2. Measuring price timeliness

The measure of price timeliness is derived from Beekes and Brown's (2006) approach. The measure has its origins in the seminal work of Ball and Brown (1968), which showed that annual income reports are not a timely source of earnings-related information because most of the value-relevant component of earnings (85%-90%) has already been captured by more timely media. Because the Ball and Brown measure focuses on a single point in time, it seems more suitable to assess how accurately a firm's share price (P_t), observed at daily intervals throughout the year, approximates its terminal value (P_0), which in line with earlier literature we take to be the market's valuation two weeks (14 days) after the annual earnings release date. Specifically, we calculate the timeliness of price discovery (T) as

$$T = \left(\left(\sum_{t=-365}^{t=-1} |ln(P_0) - ln(P_t)| \right) - 0.5 \right) / 365 \qquad (1)$$

where P_t is the market-adjusted share price, which is observed at daily intervals from day -365 until day -1, and P_0 is the price 14 days after the release date.[2] -0.5/365 is an adjustment made to recognize the flow of information, which is reflected in returns during the course of the trading day. Because idiosyncratic volatility inflates the measure when it is calculated at the individual firm-year level, following Beekes and Brown (2006) we also generate a deflated timeliness metric (TD), which is the timeliness metric divided by one plus the absolute rate of return on the share over the 365-day period used to calculate the share's timeliness metric.

The idea behind the timeliness measures is straightforward. The longer it takes a firm's share price to capture information and converge to its "final" price P_0 (which reflects all value-relevant information discovered during the year), the larger is the value of T (TD). A high value for T (TD) thus indicates

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[2] Timeliness is measured in calendar time, to facilitate international comparisons since the number of trading days in a year differs by country. Prices are forward-filled on days when the market was closed (e.g., on weekends and holidays), or when there was no trading in the stock. We set the ending date to be fourteen days after the earnings release date, because the market may need time to absorb information (Beaver, 1968).

low intra-year timeliness. In contrast, if all the information that affects the final price was incorporated on day -365, T (TD) would be at its minimum, and the speed of adjustment at its maximum. We can interpret T (TD) as a measure of how much value-relevant information is, on the average day, already known from other sources before prices finally 'settle' following the release of the firm's annual earnings number. In this sense, the variable is inextricably linked to other value-relevant disclosures that are more timely than the announcement of earnings for the year.

We use the approach discussed in Beekes and Brown (2007) to calculate two additional measures of timeliness: timeliness of good news, and timeliness of bad news. For the timeliness of good news, we first construct a time series of good news returns, $r_t^G \geq 0$, which includes positive market-adjusted daily log returns. If the day's return is less than zero, we set the good news return on that day to zero. We then create a cumulative log return series, C_t^G, by setting $C_{-365}^G = 0$, and combining the good news return series as $C_t^G = C_{t-1}^G + r_t^G$ from day -364 to day 0:

$$TG = (\sum_{t=-365}^{t=-1} (C_0^G - C_t^G)/C_0^G - 0.5)/365 \qquad (2)$$

To suppress noise from bid-ask bounce, we chose the third quartile as the filter. The raw (unadjusted) returns are filtered at the third quartile to mitigate undue noise (e.g., from bid-ask bounce).[3] An equivalent procedure is adopted for bad news.

3.3. Measuring financial integration

We gauge the degree of financial integration using both de jure and de facto measures. De jure measures emphasize changes in policy and legal controls on cross-border capital flows. Capital

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[3] Our results are robust to unfiltered measures.

controls take many forms, including controls on inflows versus controls on outflows, quantity controls versus price controls, or restrictions on foreign equity holdings. The imposition/relaxation of these controls reflects the dynamics of a country's financial market openness. Despite the increasing sophistication of de jure measures, there are several potential drawbacks to relying on this approach. First, de jure measures may not accurately reflect the actual degree of openness of the capital market because they are partially based on various restrictions associated with foreign exchange transactions that may not necessarily impede capital flows (Kose et al., 2006). Second, even though governments officially pronounce the openness of their financial markets, it is likely that domestic and foreign investors and institutions show little interest in the announcements when they are made. Third, de jure measures do not capture the time-varying nature of financial integration. Unlike de jure indicators, de facto measures focus on the degree to which a country has made use of international financial markets, in practice, over time. Given the numerous candidate measures, we select financial integration measures based on their appropriateness in terms of relevance and data coverage. An added requirement is that the measure(s) are time-varying such that they reveal the dynamic nature of integration and achieve some predictive success in empirical studies.[4]

We adopt the de jure openness index developed by Chinn and Ito (2006). The index is aimed at measuring the extent of openness in capital controls based on information in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Chinn and Ito use a binary coding system to transform information about the liberty in cross-border financial transactions into a quantitative scale. Higher values of the restriction-based index indicate greater openness of a country to cross-border capital transactions. We label the index as *KAOPEN* in our study.

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[4] An incomplete reference list for our adopted measures includes Chinn and Ito (2008), Umutlu et al. (2010), and Lucey and Zhang (2011).

We also make use of a de facto measure, which draws upon the updated and extended version of a dataset constructed by Lane and Milesi-Ferretti (2007). Lane and Milesi-Ferretti calculate the gross levels of international financial transactions via the accumulation of the corresponding inflows and outflows, making relevant valuation adjustments. Their measure (*LMF* henceforth) is calculated as the sum of a country's foreign equity assets and liabilities and the foreign direct investment assets and liabilities as a fraction of GDP. Higher values indicate greater openness and integration of local financial markets.

Finally, we include a firm-level integration measure, namely an indicator variable *DR*, indicating whether the firm's shares are traded on a foreign stock exchange through Depository Receipts. The indicator variable is equal to one if a firm has a Depository Receipt on issue in a given year, and zero otherwise. Cross-listing could affect a firm's visibility and disclosure standards and therefore its price timeliness. Data on firms cross-listed on the U.S. and other exchanges is obtained from the Bank of New York Mellon's website. The dataset includes the name of the company issuing the DR, the DR's trading symbol, the country in which the DRs are registered, the DR type, the primary exchange, the DR listing exchange and the effective date of issue.

4. Empirical results

4.1. Estimation models

To examine the effects of financial integration on price timeliness, we use the following regression models, which include country, year and industry fixed-effects.

$$T = \beta_0 + \beta_1 FINITI + \beta_2 GINFOR + \beta_3 COMMON + \beta_4 INFL + \beta_5 GDPPC + \beta_6 STKTRD$$

$$+ \beta_7 SIZE + \beta_8 PROFIT + \beta_9 LEV + \beta_{10} MB + \beta_{11} RETVOL + \beta_{12} GNEWS + \varepsilon \qquad (3)$$

$$TG\ (TB) = \beta_0 + \beta_1 FINITI + \beta_2 GINFOR + \beta_3 COMMON + \beta_4 INFL + \beta_5 GDPPC + \beta_6 STKTRD$$

$$+ \beta_7 SIZE + \beta_8 PROFIT + \beta_9 LEV + \beta_{10} MB + \beta_{11} RETVOL + \varepsilon \qquad (4)$$

T, *TG* and *TB* stand for timeliness, timeliness of good news and timeliness of bad news. *FINITI* represents the financial integration variables. As suggested by prior literature (e.g., Beekes et al., 2012b; Holthausen, 2009; Leuz et al., 2003; Morck et al., 2000; Yu, 2011), it is likely that the variation in equity market transparency depends on macroeconomic and institutional differences between countries. We include five variables to control for the information, economic, and institutional environment of a country. These variables (explained in more detail in Table 1) include an information flow index (*GINFOR*), a dummy variable of legal origin (*COMMON*), the annual percentage change in the consumer price index (*INFL*), the natural logarithm of GDP per capita (*GDPPC*), and the ratio of total value of stock traded over GDP (*STKTRD*). At firm level, we control for firm size (*SIZE*) because larger firms are likely to disclose more frequently and be more transparent (Brennan and Hughes, 1991; Lang and Lundholm, 1993, 1996). *SIZE* is measured as the natural logarithm of market capitalization in U.S. dollars (Worldscope item 07210). We control for profitability (*PROFIT*) by including the ratio of earnings before interest, taxes and depreciation (Worldscope item 18198) to total assets (Worldscope item 02999). Firms that are more highly levered may release more information to shareholders (Taylor et al., 2012). Thus firms that are more highly levered may be the subject of more efficient price discovery. We control for financial leverage (*LEV*) by including the ratio of total debt (Worldscope item 03255) to total assets. We control for growth opportunities (*BM*) by including the ratio of total shareholder's equity (Worldscope item 03995) to market capitalization (Worldscope item 08001). Firms with greater volatility of performance may release additional information on a timely basis, but the timeliness of price discovery can be

detrimentally affected by their fluctuating performance (Beekes and Brown, 2006). Volatility (*RETVOL*) is measured as the standard deviation of daily stock returns over the 360 days prior to the end of the year. For the timeliness model shown in Eq. (3) we include a dummy variable, namely *GNEWS*, to denote a good news year. *GNEWS* is equal to one if the firm outperforms the market over the timeliness estimation period, and zero otherwise. The reason for its inclusion is that managers tend to reveal good news to investors immediately, while they withhold bad news.

[Insert Table 1 about here]

Table 2 presents the mean values of the timeliness estimates for each of the 24 emerging economies. The highest mean *T and TD* are observed in Korea (0.282 and 0.181), and the lowest are observed in Chile (0.155 and 0.114). The highest mean *TG* is observed in Turkey (0.510), and the lowest is observed in Indonesia (0.471). The highest mean *TB* is observed in Morocco (0.516), and the lowest is observed in Indonesia and Russia (0.469). The three highest mean *LMF* are observed in Chile (1.332), Jordan (1.120) and South Africa (0.963), and the three lowest are observed in Pakistan (0.161), Turkey (0.234) and Indonesia (0.267). The three highest mean *KAOPEN* are observed in Jordan (2.439), Peru (2.428) and Egypt (2.254), and the lowest in China, India, Morocco and Pakistan (-1.169). The statistics show some differences in the degrees of timeliness and financial integration between countries.

[Insert Table 2 about here]

4.2. Univariate analysis

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Table 3 provides the Pearson correlation coefficients between price timeliness, financial integration, and the control variables. The four measures of timeliness are negatively correlated with international investments (*LMF*). *TD* and *TG* are negatively correlated with the restriction-based openness measure (*KAOPEN*). *T* and *TD* are negatively correlated with the cross-listing dummy variable (*DR*). Turning to the control variables, all timeliness measures are positively correlated with GDP per capita (*GDPPC*), leverage (*LEV*) and return volatility (*RETVOL*), while negatively correlated with firm size (*SIZE*) and profitability (*PROFIT*). We also find that the two country-level integration variables (*LMF and KAOPEN*) are positively correlated with information flow (*GINFOR*) and GDP per capita (*GDPPC*), while negatively correlated with the inflation rate (*INFL*). In other words, countries with a greater information flow and lower inflation tend to have more liberal and open financial markets. The degree of financial integration is also high in wealthy countries. The correlation analyses provide prima facie evidence that greater financial integration is associated with an increase in the speed of price discovery, which is consistent with our main prediction. In the next section, we further explore the relationship using multivariate regressions.

[Insert Table 3 about here]

4.3. Multivariate analysis

Table 4 presents the results of estimating Eq. (3). The dependent variable in the first three columns, labeled (1), (2), and (3), is share price timeliness (*T*) shown in Eq. (1). The dependent variable in the last three columns, labeled (4), (5), and (6), is share price timeliness deflated (*TD*). We test the effects of the financial integration variables. Columns (1) and (4) present the results for the de facto measure, *LMF*, and columns (2) and (5) present the results for the de jure measure, *KAOPEN*. Both country-level integration variables are included in columns (3) and (6). For OLS analysis, we report

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standardized regression coefficients.[5] The coefficient on *LMF* is negative and significant whenever it is included, ranging between -0.043 and -0.068. The marginal effect of *LMF* is larger than that of *STKTRD* (coefficient=0.027) and *GINFOR* (coefficient=0.049). The cross-listing dummy (*DR*) is negatively related to *T* (coefficient=-0.111) and *TD* (coefficient=-0.098) at the 1% level. The marginal effect of *DR* ranks second among all firm-level independent variables. The results support H_1 which states that, other things being equal, greater financial integration is associated with an increase in the speed of price discovery, implying a better information environment for firms.

[Insert Table 4 about here]

Regarding the control variables, we find that countries with a higher GDP per capita (*GDPPC*) see a more timely reflection of firms' performance in their share prices. However, we do not find consistent and significant effects in the case of the other economic and institutional variables. At the firm level, *SIZE* is negatively associated with timeliness, confirming other evidence (e.g., Beekes and Brown, 2006; Beekes et al., 2012a, 2012b; Beekes et al., 2014) that larger firms have faster price discovery. *PROFIT* and *BM* are negatively related to timeliness. The two risk variables (*LEV* and *RETVOL*) have positive effects on timeliness. *GNEWS* is positively related to timeliness in all specifications, suggesting slower price discovery when investors receive, on balance, good news over the year.

Table 5 presents the results of estimating Eq. (4). The dependent variable in the first three columns, labeled (1), (2), and (3), is the timeliness of good news (*TG*) shown in Eq. (2). The dependent variable in the last three columns, labeled (4), (5), and (6), is the timeliness of bad news (*TB*). The coefficient on *LMF* is not significant for the timeliness of good news, indicating no relationship

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[5] The standardization procedure is as follows. Continuous variables are transformed by subtracting the mean and dividing by the standard deviation; and indicator variables are transformed by subtracting the mean. For interacted terms, we subtract the mean of the variable created by the interaction of the indicator variable and the standardized continuous variable. The transformations are based on the means and standard deviations of the cases used to fit the particular model.

between financial integration and the speed of recognition of good news. The negative and significant coefficient on *LMF* for the timeliness of bad news suggests that the price discovery of bad news is faster when cross-border investments reach higher levels. The coefficient on *KAOPEN* is negative and significant for the timeliness of both good and bad news, suggesting the presence of a beneficial effect of capital market openness on the speed of recognition of value-relevant news. The coefficient on *KAOPEN* is larger in value for the timeliness of bad news (-0.051 in column (5) and -0.048 in column (6)) than for the timeliness of good news (-0.034 in columns (2) and -0.035 in and (3)). In addition, cross-listed firms (*DR*) have slower timeliness of good news (coefficient=0.039 from columns (1) to (3)), but faster timeliness of bad news (-0.062 in columns (4) to (6)). Our results support H_2, which states that financial integration enhances the disclosure and recognition of bad news relative to good news. Note that the deterrents against withholding bad news are increased litigation risk and a greater stock price impact at the end of the year (Cornell and Landsman, 1989; Skinner, 1994, 1997; Baginski et al., 2002). In this regard, financial integration has important implications for emerging markets since the legal systems and capital markets are still less developed in these countries.

[Insert Table 5 about here]

4.4. A potential mechanism of financial integration

In this section, we examine a mechanism, namely corporate governance, potentially affected by financial integration, which in turn affects the information environment of emerging-market firms. To this end, we focus on Chinese capital markets and listed firms. China, an emerging market, has been undergoing governance reform since the early 2000s, such as the 2002 requirement relating to the appointment of independent directors, the introduction of Qualified Foreign Institutional Investors

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(QFII) also in 2002, and the reforms relating to non-tradable shares in 2005. The Chinese sample includes 12,613 observations on 2,134 listed firms covering the period from 2003 to 2011. We employ structural equation modelling (SEM), which indicates whether financial integration has both direct effects on the quality of the information environment and indirect effects via the mechanism.

4.4.1. Corporate governance of Chinese listed firms

We use the China Listed Firms Corporate Governance Research Database as the primary source of corporate governance data. Other datasets for the analysis include the China Stock Market Financial Statements Database, the China Stock Market Trading Database, and the China Stock Market Financial Database – Audit Opinion.

We construct a parsimonious firm-level score of corporate governance that captures a limited number of core governance attributes. Based on prior literature (e.g., Aggarwal et al., 2011; Bai et al., 2004; Brown and Caylor, 2006, 2009; Chen et al., 2006; Chung et al., 2010; Fan and Wong, 2005; Sami et al., 2011), we select the following seven attributes: independent outside directors as a percentage of the total number of board members (*INDIV*); total number of directors (including board chairman) on the company's board (*BOARDSIZE*); whether one person holds both the board chairman and the general manager positions (*DUAL*); whether there are any relationships among the top ten shareholders (*TOP10 RELATION*); shares held by directors, supervisors, and executives as a proportion of total number of shares on issue (*MANAGEMENT*); and whether the auditor is a member of one of the joint ventures between a Big Four international audit firm and a domestic audit firm (*BIG4*). We impose a criterion for each attribute and construct a dummy variable that is set equal to one if the governance attribute in question meets that criterion in a given year and zero otherwise.[6]

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[6] See Table 6 for more details.

We then sum the six dummy variables to create a single governance score, denoting the result as *CG*. A higher *CG* value is interpreted as indicating better corporate governance.

Panel A of Table 6 presents the criteria used for the governance attributes and the proportion of qualifying firm-year observations for each one. We observe some variations among the attributes. For *BOARDSIZE* and *DUAL*, more than 80% of the firm-year observations meet the criteria, while only about 1% do in the case of *INDIV*. An intermediate number of observations meet the criteria for *TOP10 RELATION*, *MANAGEMENT*, and *BIG4*. Panel B of Table 6 shows the Pearson correlations among the composite *CG* score and its seven components. Note that *CG* is significantly correlated with each component, but the components are not significantly correlated with each other. This latter result indicates that the seven components capture different aspects of the corporate governance mechanism.

[Insert Table 6 about here]

4.4.2. Path analysis

As shown in column (1) of Table 7, *CG* is positively related to *FINITI*, which is measured by the cross-listing dummy variable. This is in line with our prediction that exposure to international investors could contribute to the market transparency of a firm. Columns (2) to (5) of Table 7 present the relationship between financial integration and timeliness without including *CG*, while *CG* is included in columns (6) to (9). The mediating effects of *CG* can be identified to some extent. The coefficient of *FINITI* in column (5), without *CG*, is -0.226 and is significant at the 1% level; but it drops to -0.216 when *CG* is included.

[Insert Table 7 about here]

The results of structural equation modelling (SEM) are presented in Table 8. The equations in the SEM include a regression of one of the outcome variables, *T*, *TD*, *TG* or *TB*, on the mediating variable (*CG*), and a regression of the mediating variable, *CG*, on the source variable, *FINITI*. The regression coefficients are estimated using maximum likelihood estimation. As expected, the direct effect of *FINITI* on *TG* and *TB* is significant at the 10% and 1% level, respectively. Also, the path estimates of *FINITI* to *CG* are significant at the 1% level for all models. The indirect effect is the product of the direct path coefficients leading to and from the mediating variable. The indirect effect is the product of rows I and II. We test the significance of the indirect effects using the Sobel (1982) test statistic. As shown in column (4), financial integration (*FINITI*) improves the timeliness of bad news through corporate governance (*CG*). Specifically, the indirect or product coefficient for *TB* is -0.001 and statistically significant at the 5% level.

[Insert Table 8 about here]

5. Conclusions

We examine the effect of international financial integration on the timeliness of price discovery in emerging economies. For this purpose, we use a sample of 55,790 firm-year observations from 24 countries over the period 1995 to 2010. We measure raw price timeliness and the timeliness of good/bad news as proposed by Beekes and Brown (2006, 2007). We consider two country-level financial integration metrics, one looking at the intensity of capital controls, the other focusing on actual portfolio investment flows. We construct a cross-listing dummy variable as the firm-level integration measure. We also control for several possibly correlated factors that may affect price timeliness.

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Univariate and multivariate analysis suggests that financial integration is positively associated with price timeliness. In addition, we find that financial integration improves the timeliness of bad news relative to good news. Taken as a whole, the results are consistent with a firm having an improved information environment when financial integration is higher. Finally, we examine a mechanism through which financial integration increases timeliness. We find evidence of both direct and indirect effects, with indirect effects resulting from better corporate governance.

Our conclusions prompt some questions for future research. One potentially important question is, at what stage of the financial integration process is the timeliness of price discovery most affected? This question is important because it is well known that financial integration is a gradual and reversible process. The panel analysis in this paper can capture the implications of the overall integration process, but it does not allow us to address the question of when financial integration begins to take effect. Future work could look for effective integration dates and explore how the variables of interest responded to the change. Research could also explore other channels through which financial integration might affect the information transparency of firms in emerging markets. For example, has financial integration increased disclosure levels in terms of both the frequency and the amount of disclosure?

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Table 1. Variable definitions

Variable	Description	Source
Panel A: Timeliness variables		
T	Price timeliness, estimated as in Eq. (1).	Datastream & Worldscope
TD	Price timeliness deflated. This measure is calculated by deflating the raw timeliness measure in Eq. (1) by one plus the absolute rate of return on the share over the period used to calculate timeliness.	Datastream & Worldscope
TG	Price timeliness of good news, estimated as in Eq. (2).	Datastream & Worldscope
TB	Price timeliness of bad news, estimated as in Eq. (2).	Datastream & Worldscope
Panel B: Financial integration variables		
LMF	A country-level de facto measure of financial integration, estimated as the sum of a country's foreign equity assets and liabilities and foreign direct investment assets and liabilities as a share of GDP.	The External Wealth of Nations Mark II Database developed by Lane and Milesi-Ferretti (2007)
KAOPEN	A country-level de jure measure of openness in capital controls based on information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).	Chinn and Ito (2006)
DR	A firm-level dummy variable that is equal to one if the firm is cross-listed on a foreign exchange in that year and zero otherwise.	Bank of New York Mellon
Panel C: Country-level control variables		
STKTRD	The ratio of the total value of stocks traded on official stock exchanges in a country to that country's GDP.	World Development Indicators (World Bank, 2013)
GINFOR	Information flow of a country, measured using data such as internet users (per 1,000 people), television (per 1,000 people), and trade in newspapers (percentage of GDP).	KOF Index of Globalization (Dreher, 2006)
COMMON	A dummy variable that is equal to one if the country adopts the British common law system and zero otherwise.	La Porta et al. (1998)
INFL	The annual percentage change in the consumer price index.	World Development Indicators (World Bank, 2013)
GDPPC	The natural logarithm of GDP per capita in constant 2005 US dollars.	World Development Indicators (World Bank, 2013)
Panel D: Firm-level control variables		
SIZE	The natural logarithm of market capitalization in US dollars (Worldscope item 07210).	Worldscope
PROFIT	Earnings before interest, taxes and depreciation (Worldscope item 18198) divided by total assets (Worldscope item 02999).	Worldscope
LEV	Total debt (Worldscope item 03255) divided by total assets.	Worldscope
BM	Total shareholder's equity (Worldscope item 03995) divided by market capitalization (Worldscope item 08001).	Worldscope
RETVOL	The standard deviation of daily stock returns over the 360 days prior to the end of the year.	Datastream
GNEWS	A dummy variable that is equal to one when the company's share price outperforms the market over the year and zero otherwise.	Datastream

Table 2. Means of variables, by country (N=57,465)

Country	Number of firms	Firm-year Obs.	T	TD	TG	TB	LMF	KAOPEN	DR	STKTRD	GINFOR	COMMON	INFL	GDPPC	SIZE	PROFIT	LEV	BM	RETVOL	GNEWS
Argentina	71	481	0.218	0.151	0.498	0.493	0.403	0.365	0.104	0.043	65.682	0	6.209	8.406	18.537	0.120	0.260	1.417	0.023	0.412
Brazil	344	1,909	0.238	0.160	0.494	0.490	0.480	0.039	0.104	0.280	58.280	0	6.707	8.503	19.447	0.145	0.290	0.836	0.025	0.494
Chile	117	117	0.155	0.114	0.485	0.498	1.332	1.648	0.051	0.250	72.600	0	1.410	9.061	19.944	0.125	0.217	0.792	0.014	0.479
China	1,558	8,731	0.199	0.149	0.499	0.475	0.344	-1.169	0.0001	1.077	52.759	0	2.707	7.647	19.717	0.083	0.281	0.383	0.025	0.524
Colombia	40	226	0.194	0.136	0.495	0.500	0.305	-0.484	0.044	0.042	60.676	0	7.950	8.139	19.294	0.105	0.139	1.903	0.020	0.513
Czech	46	160	0.195	0.139	0.475	0.496	0.584	1.589	0.094	0.137	88.076	0	2.921	9.373	19.065	0.132	0.145	1.905	0.018	0.456
Egypt	78	336	0.234	0.156	0.486	0.471	0.374	2.254	0.122	0.304	57.888	0	10.956	7.247	19.315	0.179	0.185	0.675	0.025	0.458
Hungary	47	287	0.224	0.152	0.501	0.502	0.929	1.644	0.101	0.210	80.754	0	7.438	9.216	18.251	0.113	0.178	1.205	0.027	0.425
India	2,057	8,535	0.263	0.173	0.496	0.495	0.317	-1.169	0.058	0.710	40.280	1	8.444	6.741	17.586	0.131	0.304	1.044	0.030	0.426
Indonesia	319	2,213	0.274	0.178	0.471	0.469	0.267	1.159	0.017	0.152	41.971	0	8.673	7.179	17.593	0.120	0.304	1.116	0.033	0.409
Israel	341	1,682	0.219	0.150	0.507	0.500	0.930	2.228	0.032	0.516	57.559	1	2.679	9.922	17.789	0.073	0.309	0.827	0.024	0.479
Jordan	122	427	0.225	0.155	0.482	0.487	1.120	2.439	0.012	0.822	75.445	0	5.814	7.906	17.016	0.063	0.182	0.927	0.019	0.546
Malaysia	1,001	8,611	0.220	0.150	0.495	0.500	0.877	-0.032	0.006	0.474	69.786	1	2.350	8.612	17.528	0.072	0.242	1.245	0.030	0.364
Mexico	132	1,174	0.213	0.145	0.495	0.493	0.399	0.973	0.165	0.075	62.231	0	9.416	8.946	19.721	0.126	0.241	1.209	0.021	0.428
Morocco	50	136	0.167	0.122	0.497	0.516	0.533	0.000	0.216	0.216	66.820	0	1.729	7.709	19.152	0.168	0.169	0.454	0.016	0.551
Pakistan	141	710	0.230	0.160	0.505	0.503	0.161	-1.169	0.011	0.501	41.283	1	11.203	6.568	17.949	0.168	0.275	0.878	0.023	0.451
Peru	95	572	0.241	0.162	0.486	0.486	0.425	2.428	0.040	0.035	51.984	0	2.729	8.021	18.239	0.167	0.214	1.375	0.023	0.514
Philippines	159	979	0.254	0.169	0.500	0.495	0.276	-0.069	0.053	0.107	44.991	0	4.877	7.113	17.798	0.081	0.208	1.402	0.032	0.459
Poland	362	1,429	0.249	0.166	0.497	0.497	0.544	0.033	0.020	0.132	88.337	0	3.141	9.105	17.921	0.090	0.167	0.828	0.026	0.445
Russia	111	235	0.258	0.166	0.481	0.469	0.625	0.101	0.366	0.464	80.370	0	10.565	8.729	20.944	0.159	0.231	1.104	0.030	0.485
South Africa	503	2,895	0.251	0.164	0.506	0.499	0.963	-1.134	0.093	0.825	48.695	1	6.260	8.539	18.351	0.151	0.162	0.857	0.031	0.458
South Korea	1,683	9,497	0.282	0.181	0.503	0.497	0.438	-0.067	0.008	1.401	56.697	0	3.280	9.756	17.770	0.061	0.266	1.474	0.032	0.397
Thailand	495	4,164	0.233	0.156	0.496	0.500	0.539	-0.414	0.021	0.465	59.650	1	2.978	7.881	17.591	0.118	0.297	1.106	0.026	0.456
Turkey	252	1,959	0.224	0.160	0.510	0.499	0.234	-0.743	0.031	0.407	63.210	0	16.365	8.849	18.320	0.142	0.231	0.800	0.027	0.462
All countries	10,124	57,465	0.240	0.162	0.497	0.493	0.513	-0.293	0.033	0.717	56.226	0.463	5.089	8.258	18.180	0.101	0.262	1.031	0.028	0.439

Note: This table presents the means of variables by country over the period 1995 to 2011. See Table 1 for the definitions of the variables. All time-varying variables are winsorized at the 1% and 99% percentiles.

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Table 3. Simple correlation matrix (N=57,465).

		[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
T	[1]	0.920	0.152	0.198	-0.050	0.007	-0.047	0.051	-0.056	-0.003	0.043	0.022	-0.228	-0.230	0.143	0.004	0.462	-0.008
		(0.000)	(0.000)	(0.000)	(0.000)	(0.113)	(0.000)	(0.000)	(0.000)	(0.480)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.388)	(0.000)	(0.067)
TD	[2]		0.166	0.204	-0.068	-0.009	-0.052	0.071	-0.065	-0.021	0.052	0.011	-0.225	-0.207	0.136	0.013	0.446	0.022
			(0.000)	(0.000)	(0.000)	(0.025)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.000)	(0.003)	(0.000)	(0.000)
TG	[3]			0.587	-0.058	-0.033	-0.005	-0.049	-0.015	0.001	0.027	0.022	-0.056	-0.035	0.025	0.107	0.059	-0.035
				(0.000)	(0.000)	(0.000)	(0.213)	(0.000)	(0.000)	(0.830)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TB	[4]				-0.009	0.001	-0.002	-0.033	0.011	0.065	0.001	0.028	-0.021	-0.021	0.022	0.025	0.066	-0.033
					(0.029)	(0.893)	(0.642)	(0.000)	(0.009)	(0.000)	(0.767)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LMF	[5]					0.286	0.012	0.035	0.513	0.409	-0.319	0.405	-0.105	-0.076	-0.129	0.007	0.003	-0.020
						(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.111)	(0.551)	(0.000)
KAOPEN	[6]						0.022	-0.198	0.354	-0.160	-0.106	0.425	-0.084	-0.057	-0.038	0.087	-0.030	-0.012
							(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
DR	[7]							-0.068	-0.026	0.019	0.060	-0.031	0.231	0.065	0.013	-0.023	-0.069	0.008
								(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.049)
STKTRD	[8]								-0.128	-0.213	-0.189	0.282	0.094	-0.096	-0.019	-0.059	0.111	0.035
									(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GINFOR	[9]									-0.107	-0.305	0.600	-0.015	-0.120	-0.115	0.051	-0.058	-0.013
										(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
COMMON	[10]										-0.001	-0.305	-0.242	0.064	0.019	0.038	0.034	-0.039
											(0.912)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INFL	[11]											-0.243	-0.043	0.163	0.027	0.022	0.081	0.004
												(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.323)
GDPPC	[12]												-0.035	-0.148	-0.082	0.120	0.038	-0.021
													(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	[13]													0.308	-0.092	-0.336	-0.411	0.164
														(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PROFIT	[14]														-0.237	-0.040	-0.313	0.187
															(0.000)	(0.000)	(0.000)	(0.000)
LEV	[15]															-0.120	0.182	-0.069
																(0.000)	(0.000)	(0.000)
BM	[16]																0.086	-0.106
																	(0.000)	(0.000)
RETVOL	[17]																	-0.021
																		(0.000)
GNEWS	[18]																	

Note: This table reports the simple correlations between the timeliness and explanatory variables. See Table 1 for the definition of the variables. All time-varying variables are winsorized at the 1% and 99% percentiles. The *p*-values are reported in parentheses.

Table 4. Regression results for price timeliness and financial integration

Dependent variable	Timeliness (T)			Timeliness deflated (TD)		
	(1)	(2)	(3)	(4)	(5)	(6)
LMF	-0.067***		-0.068***	-0.045***		-0.043***
	(-4.17)		(-4.18)	(-2.79)		(-2.71)
KAOPEN		0.0003	0.003		-0.011	-0.009
		(0.03)	(0.32)		(-1.10)	(-0.90)
DR	-0.111***	-0.111***	-0.111***	-0.098***	-0.098***	-0.098***
	(-5.34)	(-5.35)	(-5.34)	(-4.63)	(-4.64)	(-4.63)
STKTRD	0.027***	0.021**	0.027***	0.052***	0.050***	0.054***
	(3.28)	(2.52)	(3.17)	(6.22)	(5.92)	(6.27)
GINFOR	0.049**	0.055**	0.049**	0.061***	0.065***	0.062***
	(2.13)	(2.36)	(2.12)	(2.64)	(2.81)	(2.65)
COMMON	-0.135	0.063	-0.132	-0.151	-0.032	-0.158
	(-0.89)	(0.44)	(-0.87)	(-0.96)	(-0.22)	(-1.01)
INFL	-0.005	-0.008	-0.005	0.00003	-0.003	-0.001
	(-0.82)	(-1.25)	(-0.78)	(0.00)	(-0.40)	(-0.11)
GDPPC	-0.182***	-0.111*	-0.182***	-0.178**	-0.134**	-0.180**
	(-2.69)	(-1.70)	(-2.68)	(-2.55)	(-1.99)	(-2.57)
SIZE	-0.027***	-0.026***	-0.027***	-0.057***	-0.057***	-0.057***
	(-4.49)	(-4.38)	(-4.48)	(-9.82)	(-9.77)	(-9.83)
PROFIT	-0.108***	-0.108***	-0.108***	-0.087***	-0.087***	-0.087***
	(-17.36)	(-17.37)	(-17.36)	(-16.14)	(-16.16)	(-16.15)
LEV	0.034***	0.034***	0.034***	0.036***	0.036***	0.036***
	(7.13)	(7.15)	(7.13)	(7.88)	(7.88)	(7.86)
BM	-0.053***	-0.053***	-0.053***	-0.039***	-0.038***	-0.039***
	(-9.01)	(-8.93)	(-9.01)	(-7.30)	(-7.26)	(-7.32)
RETVOL	0.408***	0.409***	0.408***	0.379***	0.379***	0.378***
	(56.82)	(56.82)	(56.79)	(61.71)	(61.69)	(61.67)
GNEWS	0.060***	0.060***	0.060***	0.116***	0.116***	0.116***
	(8.12)	(8.04)	(8.11)	(14.82)	(14.79)	(14.83)
N	57,465	57,465	57,465	57,465	57,465	57,465
Adjusted R-squared	0.25	0.25	0.25	0.23	0.23	0.23
F-test	149.18	149.27	146.64	189.08	189.28	186.02
Country dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the regression results for the timeliness measures. See Table 1 for the variable definitions. All time-varying variables are winsorized at the 1% and 99% levels. The estimation method is pooled ordinary least squares (OLS) with standard errors clustered by firm. Standardized regression coefficients are reported with t-statistics in parentheses. The values of the t-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

Table 5. Regression results for price timeliness (good news versus bad news) and financial integration

Dependent variable	Timeliness of good news (TG)			Timeliness of bad news(TB)		
	(1)	(2)	(3)	(4)	(5)	(6)
LMF	0.013		0.017	-0.079***		-0.073***
	(0.77)		(1.00)	(-4.70)		(-4.31)
KAOPEN		-0.034***	-0.035***		-0.051***	-0.048***
		(-3.18)	(-3.23)		(-5.01)	(-4.66)
DR	0.039*	0.039*	0.039*	-0.062***	-0.062***	-0.061***
	(1.87)	(1.89)	(1.89)	(-3.05)	(-3.04)	(-3.02)
STKTRD	-0.105***	-0.099***	-0.100***	0.042***	0.042***	0.049***
	(-11.93)	(-11.09)	(-11.17)	(4.94)	(4.96)	(5.68)
GINFOR	-0.173***	-0.173***	-0.172***	-0.111***	-0.103***	-0.109***
	(-7.06)	(-7.05)	(-7.01)	(-4.52)	(-4.22)	(-4.44)
COMMON	-0.205	-0.282*	-0.231	-2.192***	-2.017***	-2.228***
	(-1.28)	(-1.84)	(-1.44)	(-13.85)	(-13.31)	(-14.03)
INFL	-0.019***	-0.021***	-0.022***	-0.041***	-0.049***	-0.045***
	(-2.94)	(-3.25)	(-3.35)	(-6.52)	(-7.59)	(-7.06)
GDPPC	0.070	0.047	0.065	-0.893***	-0.824***	-0.900***
	(0.95)	(0.66)	(0.88)	(-12.43)	(-11.75)	(-12.50)
SIZE	-0.008	-0.008	-0.008	0.064***	0.065***	0.064***
	(-1.36)	(-1.43)	(-1.41)	(11.27)	(11.32)	(11.20)
PROFIT	-0.016***	-0.016***	-0.016***	-0.024***	-0.025***	-0.025***
	(-3.10)	(-3.18)	(-3.19)	(-4.73)	(-4.88)	(-4.86)
LEV	0.020***	0.019***	0.019***	0.011***	0.011**	0.011**
	(4.44)	(4.38)	(4.38)	(2.60)	(2.55)	(2.52)
BM	0.108***	0.107***	0.107***	0.022***	0.022***	0.022***
	(20.47)	(20.38)	(20.38)	(4.58)	(4.56)	(4.44)
RETVOL	0.036***	0.035***	0.035***	0.075***	0.074***	0.074***
	(5.90)	(5.82)	(5.83)	(12.39)	(12.32)	(12.29)
N	57,465	57,465	57,465	57,465	57,465	57,465
Adjusted R-squared	0.07	0.07	0.07	0.07	0.07	0.07
F-test	84.05	84.22	82.78	95.79	95.58	95.31
Country dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the regression results for the timeliness measures (good news versus bad news). See Table 1 for the variable definitions. All time-varying variables are winsorized at the 1% and 99% levels. The estimation method is pooled ordinary least squares (OLS) with standard errors clustered by firm. Standardized regression coefficients are reported with *t*-statistics in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

Table 6. Summary statistics and correlation of the corporate goverance attributes of Chinese listed firms

Panel A: Criteria used to construct the CG score

	The proportion of observations that meet the criterion
1. The board is controlled by more than 50% independent directors (*INDIV*).	1%
2. The board size is greater than 6 but fewer than 13 (*BOARDSIZE*).	88%
3. The chairman and general manager are not the same person (*DUAL*).	85%
4. There are no relationships among the top ten shareholders (*TOP10 RELATION*).	8%
5. Management ownership (directors, supervisors, and executives) is greater than 1% but less than 30% (*MANAGEMENT*).	7%
6. Foreign investor ownership is greater than zero (*FOREIGN*)	6%
7. The firm is audited by one of the joint ventures between a Big Four international audit firm and a domestic audit firm (*BIG4*).	6%

Panel B: Correlations of corporate governance attributes(N=12,613)

		[2]	[3]	[4]	[5]	[6]	[7]	[8]
CG	[1]	**0.155**	**0.447**	**0.493**	**0.352**	**0.307**	**0.326**	**0.364**
INDIV	[2]		-0.016	-0.007	-0.021	-0.011	-0.011	**0.042**
BOARDSIZE	[3]			-0.0002	**-0.028**	**0.033**	-0.016	**-0.056**
DUAL	[4]				-0.007	**-0.100**	**-0.044**	**0.052**
TOP10 RELATION	[5]					**-0.045**	-0.012	-0.014
MANAGEMENT	[6]						-0.009	**-0.045**
FOREIGN	[7]							**0.064**
BIG4	[8]							

Notes: This table provides the summary statistics and correlation coefficients of the corporate governance attributes of Chinese listed firms. Panel A presents the summary statistics, and panel B presents the Pearson correlation coefficients. The statistics in Panel A come from the sample of the price timeliness model because that sample has the most observations. Figures in boldface indicate significance at the 1% level.

Table 7. Regression results for corporate governance, price timeliness and financial integration

Dependent variable	CG	T	TD	TG	TB	T	TD	TG	TB
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FINITI	0.591***	0.018	0.078	-0.110	-0.226***	0.022	0.081	-0.106	-0.216***
	(4.48)	(0.28)	(1.05)	(-1.54)	(-3.24)	(0.34)	(1.09)	(-1.48)	(-3.07)
CG						-0.007	-0.006	-0.007	-0.017**
						(-0.85)	(-0.69)	(-0.85)	(-2.17)
STATE	-0.055***	-0.025**	-0.014	0.040***	0.001	-0.025**	-0.015	0.039***	0.00005
	(-2.68)	(-2.06)	(-1.21)	(3.87)	(0.10)	(-2.10)	(-1.24)	(3.83)	(0.00)
NONTRADE	0.101***	0.036***	0.039***	-0.037	-0.037***	0.037***	0.040	-0.037***	-0.035***
	(5.26)	(3.00)	(3.32)	(-3.21)	(-3.19)	(3.05)	(3.37)	(-3.13)	(-3.03)
TOP1	-0.029	-0.032***	-0.031***	-0.023	-0.039***	-0.033***	-0.031***	-0.023**	-0.040***
	(-1.45)	(-3.02)	(-3.01)	(-2.26)	(-3.76)	(-3.04)	(-3.02)	(-2.28)	(-4.27)
SIZE	0.177***	0.051**	-0.017	-0.026	0.241***	0.053**	-0.016	-0.025***	0.244***
	(5.57)	(2.41)	(-0.85)	(-1.41)	(12.21)	(2.48)	(-0.79)	(-3.13)	(12.35)
PROFIT	-0.004	-0.099***	-0.093***	-0.025***	-0.045***	-0.099***	-0.093***	0.019**	-0.046***
	(-0.41)	(-7.76)	(-7.94)	(-3.12)	(-4.72)	(-7.76)	(-7.94)	(2.12)	(-4.73)
LEV	0.009	0.104***	0.095***	0.019**	-0.008	0.104***	0.095***	0.019**	-0.008
	(0.57)	(10.44)	(10.00)	(2.11)	(-0.91)	(10.44)	(10.00)	(2.12)	(-0.89)
BM	0.072***	-0.117***	-0.104***	0.075***	-0.088***	-0.117***	-0.103***	0.075***	-0.087***
	(3.81)	(-9.98)	(-8.94)	(7.28)	(-8.83)	(-9.95)	(-8.90)	(7.32)	(-8.70)
RETVOL	-0.004	0.216***	0.149***	-0.356***	-0.148***	0.216***	0.149***	-0.356***	-0.148***
	(-0.16)	(9.31)	(7.13)	(-17.30)	(-6.23)	(9.31)	(7.13)	(-17.31)	(-6.23)
TRADE	-0.063*	-0.044*	0.015	-0.134***	-0.246***	-0.044*	0.015	-0.135***	-0.247***
	(-1.94)	(-1.78)	(0.65)	(-6.02)	(-10.45)	(-1.81)	(0.64)	(-6.04)	(-10.51)
GNEWS		0.366***	0.383***			0.365***	0.383***		
		(22.05)	(22.10)			(22.01)	(22.07)		
N	12,613	12,613	12,613	12,613	12,613	12,613	12,613	12,613	12,613
Adjusted R-squared	0.06	0.16	0.16	0.26	0.24	0.16	0.16	0.26	0.24
F-test	29.55	103.56	119.32	225.64	226.06	99.27	114.35	216.11	217.64
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports the regression results for corporate governance and the timeliness measures. The sample includes 2,134 Chinese listed firms from 2003 to 2011. See Table 1 for the variable definitions. We include three ownership variables to control for the governance characteristics that are not included in the aggregate CG score, but that will influence the information environment. These variables are state-owned shares as a proportion of the total number of shares (STATE), non-tradable shares as a proportion of the total number of shares (NONTRADE), and shares held by the largest shareholder as a proportion of the total number of shares (TOP1). We also include TRADE, which is defined as the natural logarithm of the value of stocks traded of the year, deflated by the natural logarithm of market index at the beginning of the year. All time-varying variables (except CG) are winsorized at the 1% and 99% levels. The estimation method is pooled ordinary least squares (OLS) with standard errors clustered by firm. Standardized regression coefficients are reported with t-statistics in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

Table 8. Structural equation modelling of direct and indirect effects of financial integration on the timeliness of price discovery

Outcome variable (*OV*)	*T*	*TD*	*TG*	*TB*
	(1)	(2)	(3)	(4)
Direct path				
p[*FINITI*, *OV*]	0.003	0.006	-0.009*	-0.015***
	(0.34)	(1.25)	(-1.74)	(-3.51)
Mediated path				
I. p[*FINITI*, *CG*]	0.392***	0.392***	0.402***	0.402***
	(8.41)	(8.41)	(8.63)	(8.63)
II. p[*CG*, *OV*]	-0.001	-0.001	-0.001	-0.002**
	(-0.87)	(-0.71)	(-0.85)	(-2.13)
Indirect effect (I×II)	-0.001	-0.0002	-0.0003	-0.001**
	(-0.87)	(-0.70)	(-0.85)	(-2.07)
N	12,613	12,613	12,613	12,613
Goodness of fit (LR test statistic)	0.00	0.00	0.00	0.00
Control variables	Yes	Yes	Yes	Yes

Note: This table presents the results of the path analysis of the relationships among financial integration, the mediating variable, and the measures of price timeliness. The sample includes 2,134 Chinese listed firms from 2003 to 2011. We estimate a structural equation model (SEM) of the direct effect of financial integration on the timeliness of price discovery as well the indirect effect of financial integration on price timeliness though improved corporate governance. The equations in the SEM include a regression of one of the outcome variables, *T*, *TD*, *TG* or *TB*, on the mediating variable (*CG*), and a regression of the mediating variable, *CG*, on the source variable, *FINITI*. We present the unstandardized path coefficients with *z*-statistics in parentheses. The significance of the indirect effect is assessed using the Sobel (1982) test. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).