

Macroeconomic Information and Information Transfer of Earnings Announcements: Evidence from U.S.-listed Non-U.S. Firms

Abstract

This study examines the roles of new macroeconomic information released by firms' earnings announcements on information transfers of earnings announcements. We predict that new macroeconomic information from earnings announcements may lead to stock price changes for the announcing firms' country peers, defined as firms from the same country but different industry with the announcing firm. We also predict that the interaction between new industry and macroeconomic information may generate additional new information, which results in more information transfers. Using a sample of U.S.-listed non-U.S. firms, we find empirical evidence that is consistent with our two predictions. The results from cross sectional tests also show that the roles of macroeconomic information in information transfer are affected by investors of responding firm's limited attention and belief heterogeneity, and by information transparency of the responding firm's home country.

Macroeconomic Information and Information Transfer of Earnings Announcements: Evidence from U.S.-listed Non-U.S. Firms

1. Introduction

Studies in the literature of information transfer show that firms' earnings announcements can significantly affect the stock prices of their domestic industry peers who have not announced their own earnings (e.g., Foster 1981, Han and Wild 1990, Ramnath 2002).¹ This phenomenon is often referred to as (domestic) intra-industry information transfer in the literature. According to these studies, intra-industry information transfers occur because a firm's earnings announcement provides new information about the industry, and investors of the announcing firm's domestic industry peers will react to the news by incorporating the new information into the stock prices of their invested firms. Recently, some studies also show that a firm's earnings announcement may contain new macroeconomic information which is not incorporated into the forecast of the macro indexes (e.g., Ball et al. 2009, Konchitchki and Pataoukas 2014), and that new macroeconomic information can help investors to predict firms' future cash flows and hence stock prices (e.g., Konchitchki 2011, Li et al. 2014).²

These findings together indicate that earnings announcements may convey new information about industry and country, and both can affect the stock prices of the firms that share the same economic commonality at industry and/or macro level with the announcing firms. This, in turn, suggests that macro information may affect information transfer of earnings announcement in the following two scenarios. First, new macroeconomic information, together

¹ Several studies also document evidence of intra-industry information transfer in the settings of announcements of management earnings forecasts (e.g., Baginski 1987, Han et al. 1989), stock split (e.g., Tawatnuntachai and D'Mello 2002), dividend (e.g., laux et al. 1998), and corporate security offerings (e.g., Szewczyk 1992).

² In this study, macro information and country information are used interchangeably.

with new industry information from the earnings announcement, may result in information transfers for the announcing firm's domestic industry peers. Second, new macroeconomic information from the earnings announcement may generate information transfers for the announcing firm's country peers, defined as firms that are from the same country but different industries with the announcing firm. However, to the best of our knowledge, the roles of macroeconomic information in information transfers have been largely unexplored in prior literature. Thus, the purpose of this study is to empirically examine the issue.

First, we examine whether new macroeconomic information released by earnings announcements will lead to stock price changes for the announcing firms' country peers. We argue that when a firm's earnings announcement provides new macroeconomic information, investors of the announcing firm's country peers will respond to the new information by adjusting the stock prices of their invested firms. We referred to this as intra-country information transfer, and predict that there are significant intra-country information transfers of earnings announcements.

Second, we examine the effect of the interaction between macro and industry information on information transfer. Kalay et al. (2016) argue that non-macro level uncertainty may be exacerbated when it is interacted with macro level uncertainty. They predict and show the empirical evidence that the effect of combined non-macro and macro uncertainties on equity investment are larger than the sum of the individual effect of non-macro and macro uncertainties, suggesting that the interaction between the macro and non-macro uncertainties creates new uncertainty. Applying their theory and findings to our setting, we argue that the interaction between macro and industry information may generate additional new information, which in turn will generate additional information transfers for the announcing firm's domestic

industry peers.³ As a result, we hypothesize that the effect of combined new macro and industry information on information transfer (proxied by domestic intra-industry information transfers) are greater than the sum of the effect of new industry information on information transfer (proxied by foreign intra-industry information transfers) and the effect of new macro information on information transfer (proxied by intra-country information transfer).

We use the setting of earnings announcements made by U.S.-listed non-U.S. firms to test the two hypotheses. Using data of 3821 earnings announcements of U.S.-listed non-U.S. firms from 34 countries in the period of 1992 to 2012, we find significant intra-country information transfers, and thus supporting evidence to the first hypothesis. Economically, for each unit of cumulative abnormal return (CAR) of the announcing firm in the 3-day earnings announcement window, the abnormal stock returns of the announcing firm's country peers are about 1.8% of the announcing firm's CAR in the same 3-day window.

To test the second hypothesis, we first estimate foreign and domestic intra-industry information transfers of earnings announcements. Similar to intra-country information transfer, we find significant foreign and domestic intra-industry information transfers with an economic magnitude of 2.0% and 6.1% of the announcing firm's CAR, respectively. We then compare the domestic intra-industry information transfers with the sum of the intra-country and foreign intra-industry information transfers, and find the former being significantly greater than the latter. This result is consistent with the prediction that macro and industry information together can generate additional new information and hence incremental information transfers. To summarize, we document the empirical evidence of the roles of macroeconomic information played in information transfer of earnings announcement. We

³ Although new information is likely to be generated when firm level information is interacted with industry or macroeconomic information, investors are unlikely to react significantly to such new information because it is specifically associated with the announcing firm.

show that macro information contained in firms' earnings announcements can generate intra-country information transfers, and the interaction between macro and industry information can generate additional new information which increases domestic intra-industry information transfers.

We identify several factors and perform cross-sectional tests to examine whether intra-country information transfers are significantly affected by these factors. The first one is investors' limited attention. Recent studies find that investors may neglect publicly available information due to limited attention (e.g., Hirshleifer et al. 2009, DellaVigna and Pollet 2007, 2009). We argue that investor limited attention may also influence information transfer. Due to investors' limited time and cognitive resources, their selective attention is likely to be paid to the major competitors of their invested firms, which are often the industry peers rather than the country peers of their invested firms. We use the indicator for earnings announcements made during the 3-month window of president election (one month before and one month after the election month), the indicator for firms with a name conveying information of its home country (i.e., British Airway), and the number of U.S.-listed country peers as the proxies for the degree of investors' limited attention. We find that the degree of investor limited attention is significantly and negatively associated with the intra-country information transfer in all of the three cases.

The second factor is the heterogeneity of belief across investors. Studies find that surprised macro news may not or less significantly affect stock prices during the rapid economic expansion and recession periods due to higher degrees of heterogeneity of belief among investors in these periods (e.g., Pericoli and Veronese 2015, Birz and Lott 2011). For example, some investors may view a negative surprise during a recession year as bad news,

whereas others may view it as good news because it increases the likelihood that the government will loosen monetary policy (e.g., Boyd et al. 2005, Andersen et al. 2007). We calculate the growth rate of real GDP for each sample country in each year, and use 1) the ranked variable of the absolute value of the growth rate of real GDP and 2) an indicator for the top and bottom 20% of the real GDP growth rate as the two proxies for the years of rapid economic expansion or recession. We find that intra-country information transfers are less pronounced in these years than in other years.

The third factor is the information environment of the responding firm's home country. Previous studies find that in countries with less available firm-specific information, investors will rely more on macro information to value firms (e.g., Morck et al. 2000, Wurgler 2000, Khandaker and Heaney 2011). These findings suggest that investors may rely less on macroeconomic information from other firm's earnings announcements to make investment decisions if their invested firms provide ample firm-specific information. We use World Bank's indexes of investor protection, disclosure requirement, and enforcement of regulations of the responding firm's home country, and the indicator for that firm's management earnings forecast as the four proxies for the information environment of the responding firm, and find that all of the factors are negatively associated with intra-country information transfers.

We then perform several additional and robustness tests. First, we examine whether the roles of macroeconomic information in information transfer differ in the cases of good news and bad news, defined as the announcing firm's CAR being positive or negative in its 3-day earnings announcement window, respectively. We classify the firm's earnings announcement and the responding firms into the good- or bad-news subsamples based on the sign of the announcing firm's CAR. We find that there are significant intra-country, foreign

intra-industry, and domestic intra-industry information transfers in both good- and bad-news subsamples. For the second hypothesis that the effect of combined new macro and industry information is greater than the sum of the individual effects, the result is significant in the bad-news subsamples but insignificant in the good-news subsample.

Second, we use the association between the absolute value of the announcing firm's earnings surprise and the absolute value of the abnormal stock return of its country, foreign industry, and domestic industry peers as the proxy of intra-country, foreign intra-industry, and domestic intra-industry information transfers, respectively. We retest the two hypotheses, and find significant intra-country information transfers. We also find that the domestic intra-industry information transfers are marginally greater than the sum of the intra-country and foreign intra-industry information transfers.

This paper makes several contributions. First, it contributes to the literature of information transfer. Prior studies have focused on domestic intra-industry information transfers, and attribute them to the economic commonality at industry level shared by announcing firms and their domestic industry peers. To the best of our knowledge, this is the first study that documents the role of macroeconomic information in information transfer. We show that there is a significant intra-country information transfer in the setting of earnings announcements of U.S.-listed non-U.S. firms. We also show that the interaction between industry and macroeconomic information creates incremental information transfer for the announcing firms' domestic industry peers.

Second, this paper extends the literatures of investor limited attention, belief heterogeneity among investors, and the importance of information environment on information transfer. For investor limited attention, prior studies primarily focus on the effect of limited attention on

announcing firms themselves. We provide evidence that investor limited attention also affects the investors of the announcing firms' country peers. For investor belief heterogeneity, all of the previous studies use the settings of macro news releases. We enrich the literature by documenting the empirical evidence in the setting of earnings announcement. Finally, we extend the literature of information transparency by showing its effects on information transfer.

Section 2 reviews the related literature and develops research questions. Section 3 describes the data and research designs. Section 4 presents the empirical results. Section 5 performs additional tests and section 6 concludes.

2. Literature review and Research questions

2.1 Literature Review

2.1.1 Literature of intra-industry and intra-country information transfer

Domestic intra-industry information transfer is documented as early as 1970s. Firth (1976) shows that investors use information contained in the firms' earnings announcements to evaluate the share prices of the announcing firms' industry peers. Information transfers are further evidenced by Foster (1981) and Freeman and Tse (1992) who use larger samples and more rigorous research designs. Several studies document domestic intra-industry information transfers in the other events such as announcements of management forecasts (Baginski 1987, Han et al. 1989) and bankruptcy announcements (Lang and Stutz 1992). Kim et al. (2008) differentiate the underlying economic links among industry peers of rivals and among industry peers of non-rivals, and find that different mechanisms will lead to opposite directions of market reactions in information transfer. More recent studies show that

information transfer is not only observed within industry but also within the supply-chain (Chen and Lai 2008).

A few later studies use information transfer as the proxy to examine various issues. Yip and Young (2012) and Wang (2014) use the cross-border intra-industry information transfer to examine the degree of accounting comparability among the industry peers. Ramnath (2002) and Thomas and Zhang (2008) use intra-industry information transfer to examine market efficiency. Ramnath (2002) finds that investors and analysts underreact to news released by the first announcer in the industry, and Thomas and Zhang (2008) find evidence of overreaction in information transfer. Stock price changes of announcing firms' peers to the announcing firms' news releases are also documented in the studies that examine contagion effect. Gleason et. al (2008) provide evidence that there are contagious effects in peer firms when financial restatements are announced. They show that contagion happens because the announcements change investors' perception toward peer firms' financial reporting quality. Recently, Jia and Zhao (2015) documents contagion among country peer firms in a setting of U.S.-listed non-U.S. firms.

2.1.2 Literature of micro-to-macro and macro-to-micro links between earnings and macro information

Studies of the micro-to-macro link examine whether earnings contain new macroeconomic information. Ball et al. (2009) find that the aggregate firm-level earnings surprises have substantial systematic components which cannot be fully diversified. Because firm-specific or sector-specific risks can be diversified away, the result suggests that earnings reflect market wide information. Konchitchki and Pataoukas (2014) find that the aggregate accounting earnings growth is informative about future GDP growth, but macro forecasts of

GDP growth do not fully incorporate the incremental predictive content of aggregate earnings growth. Their findings suggest that earnings announcements provide new macroeconomic information.

Studies of the macro-to-micro link focus on whether macro information affects firms' stock prices, and have extensively examined the relationship between macro variables and stock prices. The theoretical appealing for such a relationship is based on the asset pricing theory, which argues that variables that affect the level of consumption or investment should also affect asset prices (e.g., Merton 1973, Breeden 1979). Many empirical studies examine the effects of the unexpected components of the economic announcements on share prices. In general, these studies find consistent evidence on the stock price effects of the surprised news of monetary policies such as money supply and interest rates (e.g., Flannery and Protopapadakis 2002, Chen 1991, Pearce and Roley 1985, 1983). Some accounting studies examine whether macro news is useful in predicting firm level cash flows. For example, Konchitchki (2011) finds that macro level inflation helps predict firms' future cash flows and future stock returns. Li et al. (2014) show that forecasts of real GDP growth are useful in forecasting firms' future performance.

2.2 Research Question Development

Literature in intra-industry information transfer provides ample evidence that when news is announced, investors of the announcing firm's domestic industry peers will react significantly (e.g., Baginski 1987, Han et al. 1989; Han and Wild 1990; Kim et al. 2008). These studies also argue that information transfers occur because the news announced by the firm has implications for the profitability of the announcing firm's industry peers who share

the similar economic link with the announcing firm at industry level. We argue that these findings can be generalized to the country level. First, prior studies indicate that earnings announcements may convey new macroeconomic information (e.g., Konchitchki and Pataoukas 2014). Second, new macro news is likely to have implications for the profitability of firms within the same country. For example, when economic growth slows down, revenues and profit margins are likely to decrease for most firms. When inflation increases, product prices and operating costs are likely to increase, and together they affect earnings. Interest rates also have impacts on earnings as they affect interest expenses and demand for products. The link between macroeconomic policies and firms' profitability has been confirmed by empirical evidence. Konchitchki (2011) and Li et al. (2014) find that new macroeconomic news has predictive power to firms' cash flows forecasts and hence share prices. There is also substantial evidence that surprised news of monetary policies such as money supply and interest rates affect companies' share prices (e.g., Flannery and Protopapadakis 2002, Chen 1991, Pearce and Roley 1985, 1983). Based on all of these findings, we predict that investors of the announcing firm's country peers will react to the new macroeconomic information from the announcing firm's earnings release by incorporating the new information into the stock prices of their invested firms. Therefore, we hypothesize that there are significant intra-country information transfers of earnings announcements.

Investors of the announcing firm's domestic industry peers are likely to react to new information about both industry and country from the earnings announcement. Kalay et al. (2016) hypothesize that the effects of non-macro level uncertainty and macro level uncertainty are exacerbated in the presence of the other. When investors face only one type of uncertainty, they are able to reduce the uncertainty using their certainty about the other, but unable to do

so if they are uncertain about both. Thus, they predict that the effects of the combined uncertainties on investment would be larger than the sum of the individual effects of each uncertainty, and find supporting empirical evidence. Applying their theory and findings to our setting, we argue that the interaction between industry and macroeconomic information may generate additional new information which will cause incremental information transfers. For example, if new information of 2% industry growth rate and 3% country growth rate are available, then the incremental information that the industry growth rate is 1% lower than the country growth rate will be generated. This suggests that the announcing firm's domestic industry peers will react to 2% industry growth rate, 3% country growth rate, and the 1% difference between the two growth rates, but its country peers and foreign industry peers will react to 3% country growth rate and 2% industry growth rate only, respectively. This in turn suggests that the effects of combined industry and macro new information on information transfer are likely to be greater than the sum of the individual effects of each type of new information on information transfer. Therefore, we hypothesize that domestic intra-industry information transfer is greater than the sum of intra-country and foreign intra-industry information transfers.

3. Sample and research design

3.1 Sample

We use non-U.S. firms that cross-list their shares in the U.S. capital market as our empirical setting, and their annual earnings announcements as the events to examine our research questions. Table 1 summarizes the country distribution of the sample. It includes U.S.-listed non-U.S. firms from 34 countries from 1992 to 2012. If two firms from the same

country announce their earnings in the same 3-day window, then both earnings announcements are excluded from the sample. If a country peer announces its earnings within the five days after the announcing firm's earnings release, the firm-year observation of the country peer is excluded. As indicated by Table 1, for 34 countries with observations of earnings announcement, Canada, the U.K., and Ireland have the largest, and Indonesia, Belgium, and Norway have the smallest number of earnings announcements. Canada, the U.K., and China have the largest, and Indonesia, Belgium, and Peru have the smallest number of observations on country peers' market reactions to announcing firms' earnings releases. Canada also has the largest number of domestic industry peers, followed by China and Israel, and Belgium, Italy, and Norway have the same smallest number of domestic industry peers. For foreign industry peers, the three countries with the largest number of observations are China, Israel, and Canada, and the three countries with the smallest number of observations are British Virgin Island, Jordan, and Cyprus.

[Insert Table 1 about here]

3.2 Research design for the main tests

Following Foster (1981), we use the following equation to examine whether there is significant intra-country information transfer:

$$CP_CAR_{jt} = \beta_0 + \beta_1 AF_CAR_{it} + Controls + \varepsilon_{jt}, \quad (1)$$

where the dependent variable CP_CAR_{jt} is the cumulative beta-adjusted stock return of the announcing firm's country peer from 1 day before to 1 day after the earnings announcement. The variable of interest is AF_CAR_{it} , which is the cumulative beta-adjusted stock return of the announcing firm from 1 day before to 1 day after the earnings announcement. Beta is estimated using a market model from 200 days to 15 days before the earnings announcement. We include several variables for both announcing firms and their country peers in the model to control for various factors that may affect the cumulative stock returns. They are firm size calculated as the natural log of total assets, leverage ratio calculated as total debt divided by total assets, market to book value of equity, the number of analysts following the firm, the absolute value of total accruals scaled by total assets, and the indicator for using a Big 4 auditor. We also control for the natural log of the number of days between the announcing firm's fiscal year end and its earnings announcement day. In all of the tests, we control for the fixed effects of industry, country, and year, and the standard errors are adjusted for clustering by firm.

To examine the second hypothesis that domestic intra-industry information transfer is greater than the sum of foreign intra-industry and intra-country information transfers, we first estimate foreign intra-industry and domestic intra-industry information transfers using equation (1). In the case of the former, we replace the dependent variable CP_CAR_{jt} by FIP_CAR_{jt} , which is the cumulative beta-adjusted stock return of the announcing firm's foreign industry peers. Similarly, we replace CP_CAR_{jt} by DIP_CAR_{jt} , which is the cumulative beta-adjusted stock return of the announcing firm's domestic industry peers. We also adjust the control variables accordingly. We then perform F-test to examine whether the coefficient of AF_CAR_{it} from the domestic intra-industry regression is significantly greater than the coefficient from the foreign intra-industry regression plus that from the intra-country regression.

3.3 Research designs for cross-sectional tests of intra-country information transfer

In this section, we identify and examine some factors that may have significant impacts on intra-country information transfer. The first one is investor limited attention. Investors are subject to limited time and cognitive constraints, which make it impossible for them to pay close attention to all new information. There is extensive evidence on the effects of investor inattention. For example, Barber and Odean (2008) predict that investors' attention affects buying more than selling stocks because they face thousands of stocks in the buying scenario and only a few stocks in the selling scenarios, and find supporting evidence. Cohen and Frazzini (2008) find that investors do not promptly incorporate publically available information of their customers and suppliers into the stock prices due to attention constraints. DellaVigna and Pollet (2009) assume that investor inattention is more significant on Friday than on other weekdays, and find significantly lower responses to and lower trading volume around Friday earnings announcements. Hirshleifer et al. (2009) find the negative effect of the number of same-day earnings announcements on the immediate price and volume reaction to the announcements.

The second factor is investor belief heterogeneity. The argument that investor belief heterogeneity may affect intra-country information transfers originates primarily from studies that find business cycle matters to the relation between macroeconomic news and stock prices. For example, McQueen and Roley (1993) and Boyd et al. (2005) find that positive news increases stock prices during recession but decreases stock prices during expansion. Andersen et al. (2007) find that equity markets react differently to news dependent on the stage of the business cycle. Beber and Brandt (2010) show that macroeconomic news is important when it

contains bad news in expansions and good news in contractions. These studies argue that beliefs among investors are likely to be more heterogeneous during rapid expansions and severe recessions than other periods (e.g., Boyd et al. 2005, Andersen et al. 2007). For example, some investors may view a positive surprise during an expansion year as good news, whereas others may view it as bad news because it may lead the government to tight monetary policy.

The third factor is the country's information environment. Studies find that stock prices move together more in emerging than developed markets (e.g., Morck et al. 2000, Wurgler 2000, Khandaker and Heaney 2011). The interpretation is that due to less firm-specific information available in emerging markets than developed markets, investors use more market wide information to value firms in emerging markets. Applying these findings to the setting of intra-country information transfer, they suggest that intra-country information transfers are weaker in countries with more transparent information environment, because investors will rely less on macro information but more on firm-specific information of their invested firms to make investment decisions.

The regression model is as follows:

$$CP_CAR_{jt} = \beta_0 + \beta_1 AF_CAR_{it} + \beta_2 Proxy_{jt} + \beta_3 AF_CAR_{it} * Factor_{jt} + Controls + \varepsilon_{jt} \quad (2)$$

In the above equation, $Factor_{jt}$ represents the proxy for factors that may affect intra-country information transfers. For investor limited attention, we use the following three proxies. The first is an indicator for whether the earnings announcement is made during the window of presidential election of the announcing firm's home country (*Election*). Because different presidential

candidates are likely to have different future economic policies, investors will probably pay more attention to news of their invested firm's home country during the window of that country's presidential election than other time, leading to a lower degree of investor limited attention. The window of presidential election is defined as 1 before and 1 after the election month. The second proxy is an indicator for firms with a name that conveys the information of its home country (*Firm_name*). When these firms make earnings announcements, their names are more likely to remind investors of country peers about the shared economic commonalities than firms whose names do not convey the information of their home country, and thus trigger more intra-country information transfers. These two proxies are expected to be positively associated with intra-country information transfers. The third is the announcing firm's number of U.S.-listed country peers (*CP_number*). Because the larger number of country peers increases the degree of limited attention, this proxy is expected to be negatively associated with intra-country information transfers.

For investor belief heterogeneity, we use the following two proxies. The first is the absolute value of the ranked variable of a country's real GDP growth rate ($|GDP_growth_rate|$).⁴ A larger value indicates a rapid expansion or recession year, and thus a higher degree of investor belief heterogeneity. The second is an indicator for the top and bottom 20% of ranked variable of a country's real GDP growth rate (*Abnormal_year*). Similarly, these years are likely to have a higher degree of investor belief heterogeneity than other sample years. These two proxies are expected to be negatively associated with intra-country information.

For firms' information environment, prior studies identify several institutional factors that are important determinants of firms' information environment. First, studies find that strong

⁴ The ranking is made based on the sample. We also make the ranking based on country. Because we include the country fixed effect in the empirical model, the results are nearly identical for the two ranked variables.

investor protection increases firms' disclosure incentives (Gong et al. 2013), reduces the level of stock price synchronicity (Morck et al. 2000, Khandaker and Heaney 2008), and reduces earnings management and hence improves financial reporting quality (Leuz et al. 2003). Second, disclosure requirements are a mechanism which mandates firms to disclose certain information to the public. Thus, firms from countries with weak disclosure requirements may generate less firm-specific information than those from countries with strong disclosure requirements (e.g., Horton et al. 2013; Byard et al. 2010). Third, the degree of law enforcement is viewed as one of the important factors that affect the quantity and quality of financial information disclosure and hence information transparency. Leuz et al. (2003) and Burgstahler et al. (2006) show that firms in countries with strong enforcement of laws and regulations manipulate earnings less than firms in countries with weak enforcement. Daske et al. (2008) find that strong legal enforcement is one of the two critical factors necessary for the occurrence of the benefits of IFRS adoption. The values of the three country-specific indexes are obtained from the World Bank.

In addition to the above three institutional factors, firms' information environment is also affected by managers' voluntary disclosure practices. The link between the firm's voluntary disclosure and earnings quality has been established by theoretical studies (e.g., Dye 1985, Verrecchia 1990, Penno 1997) and supported by empirical studies (e.g., Lang and Lundholm 1993, Tasker 1998). Management forecasts are often used as the proxy for voluntary disclosure in prior studies, and found to be significantly associated with information quality (e.g., Waymire 1985, Cox 1985). The indicator for management earnings forecast is 1 if the firm issues the forecast of the annual earnings, and 0 otherwise. We predict β_3 to be less than zero.

4. Descriptive statistics and regression results

4. 1 Descriptive statistics

Figure 1 depicts the average cumulative stock returns of the four peer groups of the announcing firms during the 3-day earnings announcement windows. As indicated by the chart, when a firm announces its earnings, its domestic industry peers have the largest market reaction (0.90% for good news and -0.73% for bad news), followed by the country peers (0.20% for good news and -0.20% for bad news), and then by the foreign industry peers (0.10% for good news and -0.20% for bad news). All of them are significantly different from zero. These figures are consistent with our two predictions that there is significant intra-country information transfer and domestic intra-industry information transfer is greater than the sum of the foreign and domestic intra-industry information transfers. The market reactions of firms from different countries and industries are insignificant. It reflects the fact that these firms do not share any industry and country economic commonalities with the announcing firms.

Table 2 summarizes descriptive statistics of variables. As indicated, the mean of the cumulative stock returns in the 3-day earnings announcement window is -0.001 for the announcing firms, and -0.001, 0.000, and -0.002 for the announcing firms' country peers, foreign intra-industry peers, and domestic intra-industry peers, respectively. We also provide descriptive statistics of control variables for the four groups of firms.

[Insert about Table 2 about here]

4.2 Results for intra-country information transfer

Table 3 summarizes the results of the main tests. The first column reports the regression results for intra-country information transfers. The coefficient on the variable of interest is

0.018 which is significantly greater than zero, indicating that there are significant intra-country information transfers in the sample of U.S.-listed non-U.S. firms. The economic interpretation is that during the 3-day earnings announcement window, the average abnormal stock return of the announcing firm's country peers is 0.018 of the announcing firm's abnormal stock return. The results also show that country peers' firm sizes and ratios of market to book value of equity are negatively associated with their abnormal stock returns. Announcing firms' leverage ratios and ratios of market to book value of equity positively but firm sizes and using a Big 4 auditor negatively affect their country peers' market reaction to their earnings announcements.

[Insert Table 3 about here]

The regression result for foreign intra-industry information transfer is summarized in the second column. It is indicated that the announcing firm's foreign industry peers have a significant CAR during the 3-day earnings announcement window of the announcing firm, with the magnitude of 0.020 of the CAR of the announcing firm. The result from an F-test shows that the intra-country and foreign intra-industry information transfers are not statistically different.

The results for the domestic intra-industry information transfer are summarized in the third column. Similar to the other two information transfers, there is significant domestic intra-industry information transfer with the magnitude of 0.061 of the announcing firm's CAR. We perform an F-test to examine whether the coefficient of interest for domestic intra-industry is greater than the sum of that for intra-country and foreign intra-industry

information transfers. The result (F-value = 7.65 and p-value = 0.006) is consistent with the second hypothesis.

To summarize, we find that macroeconomic information contained in earnings announcements play an important role in information transfer of earnings announcement. We document the evidence of significant intra-country information transfers, and the evidence of the effect of the interaction of industry and macroeconomic information on domestic intra-industry information transfer. Thus, the results of the main tests are supportive to the two hypotheses.

4.2 Results for the cross-sectional tests

We summarize the results for the effect of investor limited attention on intra-country information transfer in Table 4. We find that the first two proxies for investor limited attention (*Election* and *Firm_name*) are positively and significantly associated with intra-country information transfer. Specifically, the coefficients are 0.088 (t-value = 2.16) and 0.027 (t-value = 1.96) for the interaction terms between *AF_CAR* and *Election* and between *AF_CAR* and *Firm_name*, respectively. The third proxy of investor limited attention (*CP_number*) is negatively associated with intra-country information transfer with a coefficient -0.003 (t-value = -2.59). Therefore, all the results are consistent with the view that investor limited attention decreases intra-country information transfer.

[Insert Table 4 about here]

The results for the effect of investor belief heterogeneity on intra-country information transfer are summarized in Table 5. The first proxy for investor belief heterogeneity (*/GDP_Growth_Rate/*) is negatively associated with intra-country information transfer with a coefficient -0.002 (t-value = -2.86). The second proxy (*Abnormal_year*) is marginally significant with a coefficient -0.011 (t-value = -1.72). Overall, these results support the argument that investor belief heterogeneity decreases intra-country information transfer.

[Insert Table 5 about here]

Table 6 presents the results of the effects of the information transparency of the announcing firm's country peers on the intra-country information transfer. As indicated, the first three proxies of information transparency are significantly and negatively associated with the intra-country information transfer. Specifically, the coefficient of interest is -0.037 (t-value = -2.81) for the index of investor protection, -0.086 (t-value = -3.78) for the index of disclosure requirement, and -0.045 (t-value = -2.55) for the index of law enforcement. The result is marginally significant for the indicator of management earnings forecast, with the coefficient -0.011 and t-value -1.79. These results thus are consistent with the argument that transparent information environment of country peers reduces their investors' reaction to announcing firms' earnings announcements.

[Insert Table 6 about here]

5. Additional tests

5.1 The role of macro information in information transfer in good and bad news scenarios

Findings from prior studies suggest that market reactions to good news may differ from that to bad news. For example, Mian and Sankaraguruswamy (2012) find that stock price sensitivity to good (bad) earnings news is higher if investors' sentiment is higher (lower). Thus, it is possible that intra-country information transfer differs between earnings announcements that deliver good news from those that deliver bad news. We examine whether this is the case by estimating equation (1) in the good- and bad-news subsamples separately. The good (bad) news is defined as AF_CAR being positive (negative). The regression results for intra-country information transfer are summarized in columns (1) and (2) of Table 7. The coefficients of AF_CAR are significant in both good and bad news subsamples, and they are not statistically different, suggesting that intra-country information transfer is not affected by whether announcing firms report good or bad news.

[Insert Table 7 about here]

We also examine whether foreign and domestic intra-industry information transfers are affected by good or bad news scenarios. Similarly, we split each sample into a good- and bad-news subsamples and estimate equation (1) in subsamples separately. The results of the foreign intra-industry information are summarized in columns (3) and (4), and those of the domestic intra-industry information transfer are summarized in columns (5) and (6). As indicated, the coefficients of AF_CAR are positive and significant in all of the four columns, indicating that both foreign and domestic intra-industry information transfers exist in good and bad news scenarios. While foreign intra-industry information transfer in the good news

subsample is marginally greater than that of the bad news subsample, domestic intra-industry information transfer is not statistically different between the good and bad news subsamples.

In addition, we examine whether the coefficient of interest for domestic intra-industry is greater than the sum of the coefficients for intra-country and foreign intra-industry information transfers in the good and bad news subsamples. For the good news subsamples, F value is 2.03, which is not significant (p value = 0.155). For the bad news subsample, F value is 7.89, which is significant (p-value = 0.005). Overall, our results suggest that the roles of macroeconomic information played in information transfer are similar to good and bad news scenarios.

5.2 The role of macroeconomic information in information transfer using a different model

Some studies use the association between the announcing firm's earnings surprises and the reacting firms' abnormal stock return in the earnings announcement window as the proxies for information transfer (e.g., Han and Wild 1990, Ramnath 2002). We perform robustness tests to examine whether our results for the main tests are sensitive to the choice of model. The new model is similar to equation (1) except that the dependent variable is the absolute value of the responding firm's CAR in the 3-day earnings announcing window ($|CP_CAR_{jt}|$, $|FIP_CAR_{jt}|$, or $|DIP_CAR_{jt}|$), and the variable of interest is the absolute value of earnings surprise of the announcing firm ($|AF_SUR_{it}|$). AF_SUR_{it} is calculated as the difference between reported earnings and the consensus of analysts' last earnings announcements, scaled by the stock price from 2 days before the earnings announcement. We take the absolute value to the dependent and independent variables because we are only interested in the magnitude of information transfer.

The results are summarized in Table 8. We find significant intra-country, foreign intra-industry, and domestic intra-industry information transfers. In addition, the coefficient of interest for domestic intra-industry information transfers is marginally greater than the sum of the coefficients of foreign intra-industry and intra-country information transfers (F value = 3.38, 2-tailed p-value = 0.066). Therefore, in general, our results are not affected by the choice of the model.

[Insert Table 8 about here]

6. Conclusion

This study examines the roles of macroeconomic information in earnings announcements played in information transfers of earnings announcements. Our first hypothesis is built on the prior findings that 1) when a firm makes an earnings announcement, there are abnormal stock returns for the announcing firm's industry peers (e.g., Foster 1981, Han and Wild 1990, Ramnath 2002); 2) earnings announcements contain new macroeconomic information (e.g., Ball et al. 2009, Konchitchki and Pataoukas 2014); and 3) new macroeconomic information is useful in predicting firms' future cash flows and hence affect their stock prices (e.g., Konchitchki 2011, Li et al. 2014). We argue that when a firm's earnings announcement provides new macroeconomic information which can be used to forecast firms' future cash flows, investors of the announcing firm's country peers are likely to respond to the new information by adjusting the stock prices of their invested firms, and thus hypothesize that there are significant intra-country information transfers.

Our second hypothesis deals with the issue of the interaction between industry and macroeconomic information. We argue that the interaction between industry and macroeconomic information may generate new information, and such new information may lead to additional information transfers. Therefore, we hypothesize that the effects of combined industry and macroeconomic information on information transfer as proxied by domestic intra-industry information are greater than the sum of the two individual effects as proxied by intra-country and foreign intra-industry information transfers.

We use U.S.-listed non-U.S. firms to test our research question. We find that when firms make earnings announcements, the stock prices of their country peers change significantly. We also find that domestic intra-industry information transfers are significantly greater than the sum of intra-country and foreign intra-industry information transfers. Thus, our empirical evidence supports both hypotheses. Using three proxies for investor limited attention (presidential election, country-identity name, and the number of country peers), two proxies for investor belief heterogeneity (ranked variable of the absolute value of the growth rate of the real GDP and indicator for the top and bottom 20 percent of the growth rate of the real GDP), and four proxies for responding firms' information environment (investor protection, disclosure requirement, enforcement of law and regulation, and management earnings forecast), we find that investor limited attention, belief heterogeneity, and responding firms' information environment are all negatively associated with intra-country information transfer.

We perform one additional test to examine whether our findings are primarily driven by the announcements of good earnings news, bad earnings news, or both. Good (bad) news is defined as a positive (negative) abnormal stock return in the 3-day earnings announcement window for the announcing firm. We find that intra-country information transfers exist in both

good and bad news samples, but the effect of the interaction between industry and country information on information transfer is only significant in the bad news sample. Finally, we perform a robustness test by using a different model to test the two hypotheses. Using the new model, we find significant results for intra-country information transfers, and marginally significant results for the prediction that the effects of combined industry and country information on information transfers are greater than the sum of the two individual effects on information transfers.

References

- Ammer, J., S. Holland, D. Smith, and F. Warnock. 2012. US international equity investment. *Journal of Accounting Research* 50(5): 1109-1139.
- Andersen, T., T. Bollerslev, F. Diebold, and C. Vega. 2007. Real-time price discovery in stock, bond, and foreign exchange markets. *Journal of International Economics* 73: 251-277.
- Baginski, S. 1987. Intra-industry Information Transfers Associated with Management Forecasts of Earnings. *Journal of Accounting Research*: 196-216.
- Bailey, W., G. Karolyi, and C. Salva. 2006. The economic consequences of increased disclosure: Evidence from international cross-listings. *Journal of Financial Economics* 81(1): 175-213.
- Ball, R., G. Sadka, and R. Sadka. 2009. Aggregate earnings and asset prices. *Journal of Accounting Research* 47 (5), 1097-1133.
- Barber and Odean. 2008. All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. *Review of Financial Studies* 21 (2): 785-818
- Barberis, N., A. Shleifer, and R. Vishny. 1998. A model of investor sentiment. *Journal of Financial Economics*, 49(3), 307-343.
- Beaver, W. 1968. The information content of annual earnings announcements. *Journal of Accounting Research*: 67-92.
- Beber, A. and M. Brandt. 2010. When it cannot get better or worse: The asymmetric impact of good and bad news on bond returns in expansions and recessions. *Review of Finance* 14 (1): 119-155.
- Bernard, V. and J. Thomas. 1990. Evidence that stock prices do not fully reflect the implications of current earnings for future earnings. *Journal of Accounting and Economics* 13: 305-340.
- Birz G. and J. Lott. 2011. The effect of macroeconomic news on stock returns: New evidence from newspaper coverage. *Journal of Banking & Finance* 35: 2791-2800.
- Boyd, J., J. Hu, and R. Jagannathan. 2005. The Stock market's reaction to unemployment news: why bad news is usually good for stocks. *Journal of Finance* 60: 649-670.
- Breeden, D. 1979. An intertemporal asset pricing model with stochastic consumption and investment opportunities. *Journal of Financial Economics* 7: 265-296.
- Byard, D., Li, Y., & Yu, Y. (2011). The effect of mandatory IFRS adoption on financial analysts' information environment. *Journal of Accounting Research*, 49(1): 69-96.

- Chan, W., R. Frankel, and S.P. Kothari. (2004). Testing behavioral finance theories using trends and consistency in financial performance. *Journal of Accounting and Economics* 38: 3-50.
- Chen, N. 1991. Financial investment opportunities and the macroeconomy. *The Journal of Finance* 46: 529-554.
- Chen, N., R. Roll, and S. Ross. 1986. Economic forces and the stock market. *Journal of Business* 46: 529-554.
- Chen, S., and S. Lai. 2008. The vertical information transfer effects of earnings restatements along the supply chain. *Working paper*. National Taiwan University.
- Cohen and Frazzini. 2008. Economic Links and Predictable Returns *The Journal of Finance* 63 (4): 1977-2011.
- Cox, C. 1985. Further evidence on the representativeness of management earnings forecasts. *The Accounting Review* 60: 692-701.
- Daske, H., L. Hail, C. Leuz, and R. Verdi. 2008. Mandatory IFRS reporting around the world: early evidence on the economic consequences. *Journal of Accounting Research* 46: 1085-1142.
- DellaVigna, S. and J. Pollet. 2007. Demographics and industry returns. *American Economic Review* 97: 1167-1702.
- DellaVigna, S. and J. Pollet. 2009. Investor inattention and Friday earnings announcements. *Journal of Finance* 64: 709-749.
- Dye, R. 1985. Disclosure of nonproprietary information. *Journal of Accounting Research* 23: 123-145.
- Edwards, W. 1968. Conservatism in human information processing. *Formal Representation of Human Judgement*, B. Kleinmütz (Ed), Wiley, New York, 17-52.
- Firth, M. 1976. The impact of earnings announcements on the share price behavior of similar type firms. *Economic Journal* 86(342): 296-306.
- Flannery, M. A. Protopapadakis. 2002. Macroeconomic factors do influence aggregate stock returns. *Review of Financial Studies* 15: 751-782.
- Foster, G. (1981). Intra-industry information transfers associated with earnings releases. *Journal of Accounting and Economics*, 3(3), 201-232.
- Freeman, R., & Tse, S. (1992). An earnings prediction approach to examining intercompany information transfers. *Journal of Accounting and Economics*, 15(4), 509-523.

- Ghent, A. 2010. Why do markets react badly to good news? Evidence from Fed Funds Futures. *Working paper*. University of Wisconsin.
- Gong, G., Ke, B., & Yu, Y. (2013). Home Country Investor Protection, Ownership Structure and Cross-Listed Firms' Compliance with SOX-Mandated Internal Control Deficiency Disclosures. *Contemporary Accounting Research*, 30(4), 1490-1523.
- Gleason, C. A., Jenkins, N. T., & Johnson, W. B. (2008). The contagion effects of accounting restatements. *The Accounting Review*, 83(1), 83-110.
- Goldberg, L. and C. Grisse. 2013. Time variation in asset price responses to macro announcements. *Federal Reserve Bank of New York Staff Reports*.
- Han, J. C., Wild, J. J., & Ramesh, K. (1989). Managers' earnings forecasts and intra-industry information transfers. *Journal of Accounting and Economics*, 11(1), 3-33.
- Hirshleifer, D., S. Lim, and S. Teoh. 2009. Driven to distraction: Extraneous events and underreaction to earnings news. *The Journal of Finance* 64(5), 2289-2325.
- Horton, J., Serafeim, G., & Serafeim, I. (2013). Does Mandatory IFRS Adoption Improve the Information Environment? *Contemporary Accounting Research*, 30(1), 388-423.
- Jegadeesh, N. and S. Titman. 1993. Returns to buying winners and selling losers: implications for stock market efficiency. *Journal of Finance* 48: 65-91.
- Jia, W., & Zhao, J. (2014). Does the Market Punish the Many for the Sins of the Few? The Contagion Effect of Accounting Restatement for Foreign Firms Listed in the US. *Working paper*.
- Kahneman, D. and A. Tversky. 1982. On the study of statistical intuitions. *Cognition* 11 (2):123-141.
- Kim, Y., M. Lacina and M. Park. 2008. Positive and negative information transfers from management forecasts. *Journal of Accounting Research* 46(4): 885-908.
- Khandaker, S., and R. Heaney. 2008. Do emerging markets have higher stock synchronicity? The international evidence. *Journal of Business and Policy Research* 8(1): 78-97.
- Kodres, L. and M. Pritsker. 2002. A rational expectations model of financial contagion. *Journal of Finance* 57 (2): 769-799.
- Konchitchki, Y. 2011. Inflation and nominal financial reporting: Implications for performance and stock prices. *The Accounting Review* 86 (3): 1045-1085.
- Konchitchki, Y., and P. Patatoukas. 2014. Accounting earnings and gross domestic product. *Journal of Accounting and Economics* 57: 76-88.

- La Porta, R., F. Lopez-de-Silanes, and A. Shleifer. 2006. What works in securities laws? *Journal of Finance*, 61(1), 1-32.
- Lang, L. and R. Stulz. 1992. Contagion and competitive intra-industry effects of bankruptcy announcements. *Journal of Financial Economics* 32 (1): 45-60.
- Lang, M. H., Lins, K. V., & Miller, D. P. (2002). ADRs, analysts, and accuracy: Does cross listing in the United States improve a firm's information environment and increase market value? *Journal of Accounting Research*, 41(2), 317-345.
- Lang, M., and K. Lundholm. 1993. Cross-sectional determinants of analyst ratings of corporate disclosures. *Journal of Accounting Research* 31: 246-271.
- Lang, M., J. Raedy, and W. Wilson. 2006. Earnings management and cross-listing: are reconciled earnings comparable to US earnings? *Journal of Accounting & Economics* 42: 255-283.
- Lang, M., Smith Raedy, J., & Wilson, W. (2006). Earnings management and cross listing: Are reconciled earnings comparable to US earnings? *Journal of Accounting and Economics*, 42(1), 255-283.
- Leuz C. 2006. Cross listing, bonding, and firms' reporting incentives: A discussion of Lang, Ready and Wilson. *Journal of Accounting & Economics* 42: 285-299.
- Leuz, C., D. Nanda, and P. Wysocki. 2003. Earnings management and investor protection: An international comparison. *Journal of Financial Economics* 69: 505-527.
- McQueen, G. and V. Roley. 1993. Stock prices, news, and business conditions. *Review of Financial studies* 6 (3): 683-707.
- Merton, R. 1973. An intertemporal capital asset pricing model. *Econometrica* 41, 867-887.
- Mian, G. M. and S. Sankaraguruswamy. 2012. Investor sentiment and stock market response to earnings news. *The Accounting Review* 87 (4): 1357-1384.
- Mitchell, M. and J. Mulherin. 1994. The impact of public information on the stock market. *Journal of Finance* 49 (3): 923-950.
- Morck, R., B. Yeung, and W. Yu. 2000. The information content of stock markets: why do emerging markets have synchronous stock price movements? *Journal of Financial Economics* 58: 215-260.
- Pearce, D. and V. Roley. 1983. The reaction of stock prices to unanticipated changes in money: A note. *The Journal of Finance* 38: 1323-1333.

Penno, M. C. 1997. Information quality and voluntary disclosure. *The Accounting Review* 72: 275-284.

Pericoli, M. and G. Veronese. 2015. Forecast heterogeneity, surprise and financial market. *Working Paper no. 1020*. Rome: Bank of Italy.

Ramnath, S. (2002). Investor and analyst reactions to earnings announcements of related firms: An empirical analysis. *Journal of Accounting Research*, 40(5), 1351-1376.

Sadka, R. 2006. Momentum and post-earnings-announcement drift anomalies: The role of liquidity risk. *Journal of Financial Economics* 80 (2): 309-349.

Szewczyk, S. H. 1992. The intra-industry transfer of information inferred from announcements of corporate security offerings. *Journal of Finance* 47(5): 1935-1945.

Tasker, S. 1998. Bridging the Information Gap: Quarterly Conference Calls as a Medium for Voluntary Disclosure. *Review of Accounting Studies* 3 (1): 137-167.

Tawatnuntachai, O., and R. D'Mello. 2002. Intra-industry reactions to stock split announcements. *Journal of Financial Research* 25(1): 39-57.

Thomas, J., & Zhang, F. (2008). Overreaction to Intra-industry Information Transfers? *Journal of Accounting Research*, 46(4), 909-940.

U.S. Senate Committee on Banking, Housing, and Urban Affairs. 2002. Sarbanes Announces Mark-Up of Accounting Reform and Investor Protection Legislation. <http://banking.senate.gov/pre102/0612mark.htm>.

Wang, C. (2014). Accounting standards harmonization and financial statement comparability: Evidence from transnational information transfer. *Journal of Accounting Research* 52 (4): 955-992.

Wurgler, J. 2000. Financial markets and the allocation of capital. *Journal of financial economics* 58(1): 187-214.

Verrecchia, R. 1990. Information quality and discretionary disclosure. *Journal of Accounting & Economics* 12: 365-380.

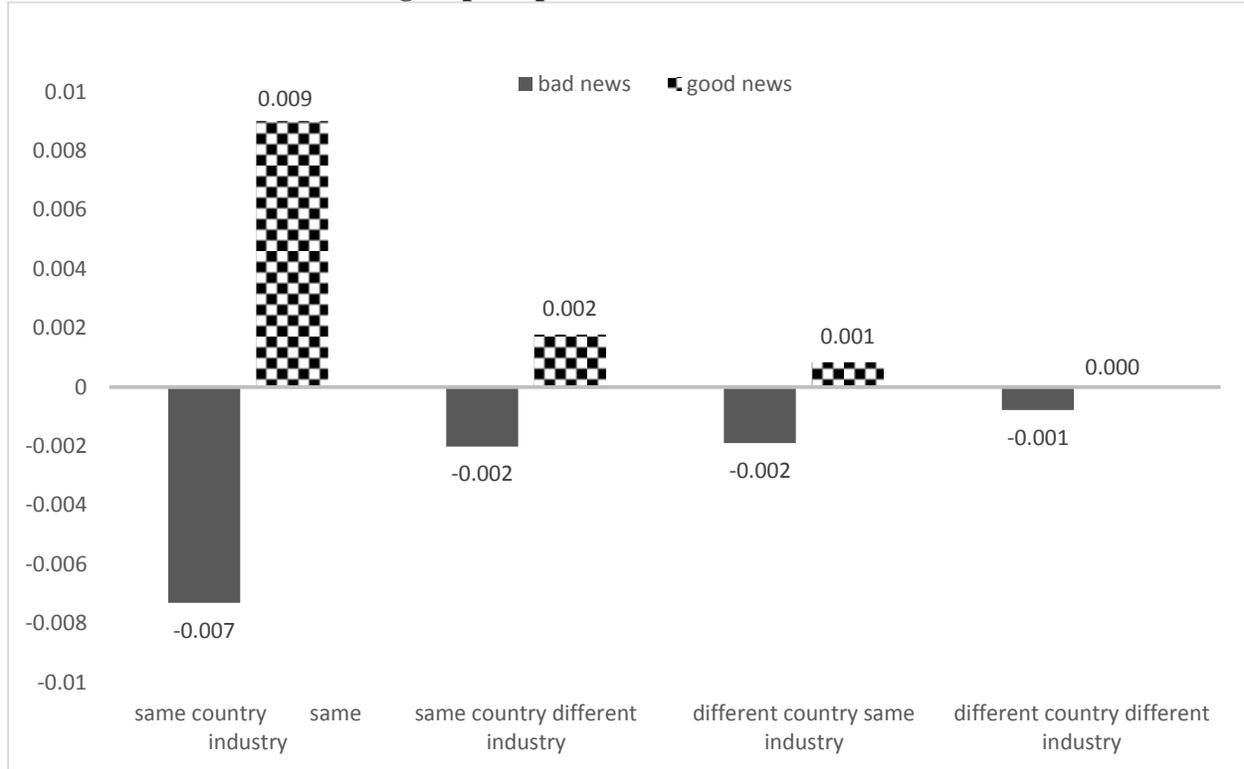
Waymire, G. 1985. Earnings volatility and voluntary management forecast disclosures. *Journal of Accounting Research* 23: 268-295.

Yip, R. W., & Young, D. (2012). Does mandatory IFRS adoption improve information comparability? *The Accounting Review*, 87(5), 1767-1789.

Appendix A Variable Definition

Variable Name	Descriptions	Data Source
<i>AF_CAR</i>	Cumulative abnormal stock return of the announcing firm in its 3-day (-1, +1) earnings announcement window	CRSP
<i>CP_CAR</i>	Cumulative abnormal stock return of the announcing firm's country peers in the announcing firm's 3-day (-1, +1) earnings announcement window	CRSP
<i>FIP_CAR</i>	Cumulative abnormal stock return of the announcing firm's foreign industry peers in the announcing firm's 3-day (-1, +1) earnings announcement window	CRSP
<i>DIP_CAR</i>	Cumulative abnormal stock return of the announcing firm's domestic industry peers in the announcing firm's 3-day (-1, +1) earnings announcement window	CRSP
<i>AF_Size/CP_Size</i>	Log of total assets of the announcing firm/the announcing firm's country peer	Compustat
<i>AF_Lev/CP_Lev</i>	Total debt to total assets of the announcing firm/the announcing firm's country peer	Compustat
<i>AF_MB/CP_MB</i>	Market to book value of equity of the announcing firm/the announcing firm's country peer	Compustat
<i>AF_Analyst/CP_Analyst</i>	Log of 1 plus the number of analysts following for the announcing firm/the announcing firm's country peer	IBES
<i>AF_Accrual/CP_Accrual</i>	Absolute value of accruals scaled by total assets of the announcing firm/the announcing firm's country peer	Compustat
<i>AF_Big4/CP_Big4</i>	Indicator for using a Big 4 auditor by the announcing firm/the announcing firm's country peer	Compustat
<i>Lag</i>	Log of the number of days between the announcing firm's fiscal year end and the earnings announcement date	Compustat
<i>Inv_Pro</i>	Country-level index of investor protection	World Bank
<i>Dis_Req</i>	Country-level index of disclosure requirement	World Bank
<i>Enforcement</i>	Country-level index of enforcement	World Bank
<i>CP_MF</i>	Indicator for at least one management's earnings forecast by the announcing firm's country peer	S&P Capital IQ
<i>Foreign</i>	Indicator for U.S.-listed non-U.S. firms	Compustat
<i>CP_OwnCAR</i>	Cumulative abnormal stock return of the announcing firm's country peer in its own 3-day (-1, +1) earnings announcement window	Compustat
<i>Country_Identity</i>	Indicator for announcing firms whose firm names contain the information of their home countries	Compustat

Figure 1
Market reaction to different groups of peer firms



The vertical axis represents the average market reaction which is calculated as the accumulative abnormal stock return in the 3-day earnings announcement window. The horizontal axis represents the 4 different groups of peer firms. Good news is defined as a positive accumulative abnormal stock return for announcing firm in its 3-day earnings announcement window, and bad news is defined as the announcing firm's stock return be positive in its 3-day earnings announcement window

Table 1
Sample Distribution

Country	No. of earnings announcements	Firm-years of announcing firms' country peers	Firm-years of announcing firms' foreign industry peers	Firm-years of announcing firms' domestic industry peers
Argentina	70	306	981	27
Australia	58	199	659	14
Austria			31	
Bahamas			90	
Belgium	17	22	258	2
Brazil	79	463	535	8
British Virgin Islands			2	
Canada	424	24670	9021	1662
Chile	111	910	1281	49
China	226	14090	9584	1557
Colombia			21	
Cyprus			7	
Denmark	40	72	747	3
Dominican Republic			24	
Finland	25	34	452	12
France	157	1685	3050	136
Germany	129	1111	1806	73
Ghana			18	
Greece	84	384	1127	838
Hong Kong	143	1156	2194	112
Hungary			114	
Iceland			15	
India	77	350	1849	165
Indonesia	12	18	556	14
Ireland	272	3909	4232	476
Israel	238	6225	9473	1272
Italy	74	266	606	2
Japan	81	693	2659	101
Jordan			4	
Liberia			156	
Luxembourg	69	173	874	56
Mexico	124	1262	1835	188
Netherlands	245	3697	3341	213
Norway	21	27	336	2
Panama	64	162	465	.
Papua New Guinea			93	
Peru	22	22	283	.
Portugal			259	

Russia	27	62	522	20
Singapore	56	137	999	56
South Africa	74	216	409	46
South Korea	59	269	1320	39
Spain	23	42	428	4
Sweden	47	112	731	25
Switzerland	192	2139	2660	224
Taiwan	63	206	1851	256
United Kingdom	418	14641	7106	894
Total	3821	79730	75064	8546

Table 2
Descriptive Statistics and Correlation Matrix

Variable	N	Mean	Median	Min	Max	Std. Dev.
<i>AF_CAR</i>	3821	-0.001	-0.001	-0.253	0.292	0.075
<i>CP_CAR</i>	79730	-0.001	-0.002	-0.121	0.130	0.047
<i>FIP_CAR</i>	75064	0.000	-0.002	-0.149	0.174	0.050
<i>DIP_CAR</i>	8546	-0.002	-0.003	-0.178	0.190	0.057
Control variable of the announcing firms						
<i>AF_Size</i>	3821	7.649	7.699	2.194	13.492	2.394
<i>AF_Lev</i>	3821	0.193	0.170	0.000	0.716	0.169
<i>AF_MB</i>	3821	3.003	2.036	-12.339	26.188	4.128
<i>AF_Analyst</i>	3821	1.748	1.609	0.693	3.611	0.796
<i>AF_Acc</i>	3821	0.079	0.053	0.001	0.649	0.095
<i>AF_Big4</i>	3821	0.804	1.000	0.000	1.000	0.397
<i>Lag</i>	3821	3.974	3.970	2.890	5.050	0.480
Control variable of the announcing firms' country peers						
<i>CP_Size</i>	79730	7.258	7.005	3.058	12.808	2.348
<i>CP_Lev</i>	79730	0.171	0.138	0.000	0.618	0.165
<i>CP_MB</i>	79730	3.061	2.035	-0.889	18.887	3.418
<i>CP-Analyst</i>	79730	1.745	1.609	0.693	3.434	0.782
<i>CP_Accrual</i>	79730	0.078	0.054	0.002	0.402	0.080
<i>CP_Big4</i>	79730	0.801	1.000	0.000	1.000	0.399
Control variable of the announcing firms' foreign industry peers						
<i>CP_Size</i>	75064	7.460	7.393	2.592	13.185	2.445
<i>CP_Lev</i>	75064	0.174	0.138	0.000	0.731	0.173
<i>CP_MB</i>	75064	3.247	2.175	-9.004	27.866	4.311
<i>CP-Analyst</i>	75064	1.748	1.609	0.693	3.638	0.796
<i>CP_Accrual</i>	75064	0.087	0.062	0.001	0.574	0.093
<i>CP_Big4</i>	75064	0.800	1.000	0.000	1.000	0.400
Control variable of the announcing firms' domestic industry peers						
<i>CP_Size</i>	8546	6.646	6.312	2.592	12.538	2.126
<i>CP_Lev</i>	8546	0.170	0.108	0.000	0.777	0.190
<i>CP_MB</i>	8546	3.034	1.987	-11.528	26.736	4.477
<i>CP-Analyst</i>	8546	1.787	1.792	0.693	3.638	0.768
<i>CP_Accrual</i>	8546	0.092	0.059	0.001	0.691	0.110
<i>CP_Big4</i>	8546	0.773	1.000	0.000	1.000	0.419

All the variables are defined in Appendix A.

Table 3
Results for intra-country information transfer

Variable	(1)	(2)	(3)
	Intra-country information transfer CAR(-1,+1)	Foreign intra-industry information transfer (CAR(-1,+1))	Domestic intra-industry information transfer CAR(-1,+1)
<i>AF_CAR</i>	0.018*** (7.50)	0.020*** (7.34)	0.061*** (7.89)
<i>CP_Size</i>	0.000* (1.74)	-0.000 (-0.84)	-0.001 (-1.10)
<i>CP_Lev</i>	-0.002 (-1.19)	0.001 (0.48)	0.001 (0.28)
<i>CP_MB</i>	-0.000*** (-3.62)	-0.000*** (-2.71)	0.000 (0.14)
<i>CP_Analyst</i>	0.000 (0.93)	-0.000 (-0.45)	0.001 (1.15)
<i>CP_Accrual</i>	-0.004 (-1.28)	-0.003 (-0.87)	0.010 (1.44)
<i>CP_Big4</i>	0.000 (0.31)	-0.000 (-0.56)	0.001 (0.74)
<i>AF_Size</i>	-0.000*** (-2.87)	0.000 (1.24)	0.001** (2.52)
<i>AF_Lev</i>	0.004*** (2.93)	0.001 (1.24)	0.003 (0.71)
<i>AF_MB</i>	0.000* (1.89)	0.000 (1.31)	0.000 (1.64)
<i>AF_Analyst</i>	-0.000 (-0.00)	0.000 (0.25)	-0.002** (-2.02)
<i>AF_Accruals</i>	-0.003 (-1.45)	-0.003 (-1.17)	-0.008 (-1.33)
<i>AF_Big4</i>	-0.001** (-2.08)	-0.000 (-0.85)	0.002 (1.31)
<i>Lag</i>	0.000 (0.26)	0.000 (0.97)	0.003* (1.83)
<i>Constant</i>	-0.007 (-1.25)	0.022 (1.25)	-0.018 (-0.88)
<i>Industry, Country, and year FEs</i>	YES	YES	YES
<i>Observations</i>	79730	75064	8546
<i>R-square</i>	0.01	0.00	0.03

Test: Coefficient of *AF_CAR* in column (3) > Coefficient of *AF_CAR* in column (1) + Coefficient of *AF_CAR* in column (2), F value = 7.65 (P = 0.006).

The standard errors are adjusted for clustering by firm. *, **, and *** denote a significant level of 0.10, 0.05, and 0.01, respectively. All the variables are defined in Appendix A.

Table 4
The effects of investor limited attention on intra-country information transfer

VARIABLES	Predicted sign	CAR(-1,+1)	CAR(-1,+1)	CAR(-1,+1)
<i>Election*AF_CAR</i>	+	0.088** (2.16)		
<i>Election</i>		-0.000 (-0.30)		
<i>Firm_name*AF_CAR</i>	+		0.027** (1.96)	
<i>Firm_name</i>			-0.002*** (-3.65)	
<i>CP_number*AF_CAR</i>	-			-0.003*** (-2.59)
<i>CP_number</i>				-0.001*** (-2.77)
<i>AF_CAR</i>		0.019*** (7.45)	0.018*** (7.26)	0.046*** (4.45)
<i>CP_Size</i>		0.000* (1.92)	0.000** (1.98)	0.000** (2.01)
<i>CP_Lev</i>		-0.001 (-0.90)	-0.001 (-0.91)	-0.001 (-0.93)
<i>CP_MB</i>		-0.000*** (-4.34)	-0.000** (-4.27)	-0.000*** (-4.30)
<i>CP_Analyst</i>		0.000 (1.58)	0.000 (1.46)	0.000 (1.53)
<i>CP_Accrual</i>		-0.005* (-1.67)	-0.005* (-1.79)	-0.005* (-1.75)
<i>CP_Big4</i>		0.000 (0.36)	0.000 (0.49)	0.000 (0.44)
<i>AF_Size</i>		-0.000*** (-2.93)	-0.000* (-1.91)	-0.000*** (-2.87)
<i>AF_Lev</i>		0.003*** (2.98)	0.004*** (3.24)	0.003*** (2.85)
<i>AF_MB</i>		0.000* (1.88)	0.000** (2.03)	0.000* (1.82)
<i>AF_Analyst</i>		-0.000 (-0.04)	-0.000 (-0.82)	-0.000 (-0.20)
<i>AF_Accruals</i>		-0.004* (-1.71)	-0.004* (-1.72)	-0.004* (-1.83)
<i>AF_Big4</i>		-0.001** (-2.20)	-0.002** (-2.21)	-0.001** (-2.30)
lag		0.000 (0.21)	0.000 (0.25)	0.000 (0.43)
Constant		-0.006 (-1.16)	-0.007 (-1.27)	-0.006 (-1.18)
<i>Industry, Country, and Year FEs</i>		YES	YES	YES
Observations		76902	79730	79730
R-squared		0.00	0.01	0.01

Table 5
The effect of heterogeneity of investor belief on intra-country information transfer

Variables	Predicted sign	CAR(-1,+1)	CAR(-1,+1)
<i> GDP_Growth_Rate *AF_CAR</i>	-	-0.002*** (-2.86)	
<i> GDP_Growth_Rate </i>		-0.000*** (-3.21)	
<i>Abnormal_year*AF_CAR</i>	-		-0.011* (-1.72)
<i>Abnormal_year</i>			-0.001 (-0.72)
<i>AF_CAR</i>		0.031*** (6.86)	0.023*** (8.08)
<i>CP_Size</i>		0.000* (1.95)	0.000** (1.97)
<i>CP_Lev</i>		-0.001 (-0.94)	-0.001 (-0.92)
<i>CP_MB</i>		-0.000*** (-4.15)	-0.000*** (-4.26)
<i>CP_Analyst</i>		0.000 (1.47)	0.000 (1.45)
<i>CP_Accrual</i>		-0.005* (-1.82)	-0.005* (-1.79)
<i>CP_Big4</i>		0.000 (0.69)	0.000 (0.51)
<i>AF_Size</i>		-0.000*** (-3.01)	-0.000*** (-2.90)
<i>AF_Lev</i>		0.003*** (2.88)	0.003*** (2.84)
<i>AF_MB</i>		0.000* (1.82)	0.000* (1.82)
<i>AF_Analyst</i>		-0.000 (-0.22)	-0.000 (-0.24)
<i>AF_Accrual</i>		-0.004* (-1.66)	-0.004* (-1.77)
<i>AF_Big4</i>		-0.001** (-1.98)	-0.001** (-2.14)
<i>Lag</i>		0.000 (0.06)	0.000 (0.17)
<i>Constant</i>		-0.003 (-0.61)	-0.006 (-1.05)
<i>Industry FE</i>		YES	YES
<i>Country FE</i>		YES	YES
<i>Year FE</i>		YES	YES
Observations		79730	79730
R-squared		0.00	0.00

The standard errors are adjusted for clustering by firm *, **, and *** denote a significant level of 0.10, 0.05, and 0.01, respectively. All the variables are defined in Appendix A.

Table 6
The effect of information environment on intra-country information transfer

Variable	Predicted sign	(1) CAR(-1,1)	(2) CAR(-1,1)	(3) CAR(-1,1)	(4) CAR(-1,1)
<i>Inv_Pro*AF_CAR</i>	-	-0.037*** (-2.81)			
<i>Inv_Pro</i>		-0.001 (-0.66)			
<i>Dis_Req*AF_CAR</i>	-		-0.086*** (-3.78)		
<i>Dis_Req</i>			0.000 (0.23)		
<i>Enforcement*AF_CAR</i>	-			-0.045** (-2.55)	
<i>Enforcement</i>				-0.000 (-0.30)	
<i>CP_MF*AF_CAR</i>	-				-0.011* (-1.79)
<i>CP_MF</i>					0.001** (2.25)
<i>AF_CAR</i>		0.048*** (4.74)	0.089*** (4.83)	0.050*** (4.24)	0.024*** (5.57)
<i>CP_Size</i>		0.000** (2.24)	0.000** (2.47)	0.000** (2.32)	0.000 (1.02)
<i>CP_Lev</i>		-0.001 (-0.58)	-0.001 (-0.57)	-0.001 (-0.59)	-0.001 (-0.63)
<i>CP_MB</i>		-0.000*** (-3.76)	-0.000*** (-3.75)	-0.000*** (-3.77)	-0.000*** (-3.55)
<i>CP_Analyst</i>		0.000 (0.98)	0.000 (0.99)	0.000 (0.99)	-0.000 (-0.30)
<i>CP_Accrual</i>		-0.005* (-1.68)	-0.005* (-1.69)	-0.005* (-1.69)	-0.005 (-1.20)
<i>CP_Big4</i>		-0.001 (-1.15)	-0.001 (-1.23)	-0.001 (-1.19)	0.002** (2.16)
<i>AF_Size</i>		-0.000** (-2.46)	-0.000** (-2.27)	-0.000** (-2.34)	-0.000 (-1.61)
<i>AF_Lev</i>		0.005*** (3.83)	0.005*** (3.80)	0.005*** (3.79)	0.005*** (3.89)
<i>AF_MB</i>		0.000** (2.18)	0.000** (2.24)	0.000** (2.20)	0.000* (1.87)
<i>AF_Analyst</i>		0.000 (0.22)	0.000 (0.23)	0.000 (0.27)	0.000 (0.70)
<i>AF_Accruals</i>		-0.002 (-0.66)	-0.002 (-0.65)	-0.002 (-0.65)	-0.004 (-1.12)

<i>AF_Big4</i>	-0.000 (-0.64)	-0.000 (-0.68)	-0.000 (-0.67)	-0.002*** (-3.33)
<i>Lag</i>	-0.000 (-0.14)	-0.000 (-0.14)	-0.000 (-0.11)	0.000 (0.35)
<i>Constant</i>	0.020*** (4.43)	0.019*** (4.10)	0.020*** (4.37)	-0.011** (-2.33)
<i>Industry FE</i>	YES	YES	YES	YES
<i>Country FE</i>	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES
<i>Observations</i>	65441	65441	65441	52932
<i>R-squared</i>	0.01	0.01	0.01	0.01

The standard errors are adjusted for clustering by firm *, **, and *** denote a significant level of 0.10, 0.05, and 0.01, respectively. All the variables are defined in Appendix A.

Table 7
Results for Good news and bad new scenarios

Variable	Intra-country information transfer		Foreign intra-industry information transfer		Domestic intra-industry information transfer	
	(1)	(2)	(3)	(4)	(5)	(6)
	Good news CAR(-1,+1)	Bad news CAR(-1,+1)	Good news CAR(-1,+1)	Bad news CAR(-1,+1)	Good news CAR(-1,+1)	Bad news CAR(-1,+1)
<i>AF_CAR</i>	0.010** (2.08)	0.009** (2.02)	0.024*** (6.60)	0.016*** (3.68)	0.054*** (5.90)	0.070*** (5.16)
<i>CP_Size</i>	0.000 (0.40)	0.000** (2.50)	-0.000 (-1.19)	-0.000 (-0.01)	-0.000 (-0.73)	-0.001 (-1.05)
<i>CP_Lev</i>	-0.001 (-0.54)	-0.001 (-0.78)	-0.000 (-0.06)	0.002 (0.76)	-0.001 (-0.17)	0.002 (0.39)
<i>CP_MB</i>	-0.000* (-1.79)	-0.000*** (-4.23)	-0.000** (-2.03)	-0.000* (-1.85)	0.000 (0.22)	-0.000 (-0.50)
<i>CP_Analyst</i>	0.000 (0.35)	0.001** (2.58)	-0.000 (-0.12)	-0.000 (-0.99)	0.001 (0.93)	0.001 (0.48)
<i>CP_Accrual</i>	-0.004 (-0.96)	-0.007* (-1.87)	0.002 (0.52)	-0.005 (-1.11)	0.004 (0.43)	0.013 (1.24)
<i>CP_Big4</i>	-0.000 (-0.16)	0.001 (1.47)	-0.001 (-0.66)	0.000 (0.19)	-0.000 (-0.16)	0.003 (1.01)
<i>AF_Size</i>	-0.001*** (-3.82)	0.000 (0.25)	0.000 (1.06)	0.000 (0.70)	0.001 (1.10)	0.002** (2.48)
<i>AF_Lev</i>	0.002 (1.15)	0.002 (1.32)	0.001 (0.65)	0.002 (1.09)	-0.004 (-0.65)	0.011 (1.64)
<i>AF_MB</i>	0.000** (2.36)	0.000 (1.28)	0.000* (1.74)	0.000 (0.17)	0.001*** (2.76)	-0.000 (-0.59)
<i>AF_Analyst</i>	-0.001** (-2.15)	-0.000 (-0.55)	0.000 (0.71)	-0.000 (-0.36)	-0.000 (-0.28)	-0.004** (-2.55)
<i>AF_Accruals</i>	-0.007** (-2.12)	0.001 (0.45)	-0.002 (-0.63)	-0.003 (-0.89)	-0.020*** (-2.89)	0.007 (0.70)
<i>AF_Big4</i>	-0.001 (-1.31)	-0.002*** (-2.64)	-0.001 (-1.21)	0.000 (0.13)	0.001 (0.70)	0.003 (1.15)
<i>Lag</i>	0.000 (0.66)	0.000 (0.20)	0.001* (1.85)	-0.000 (-0.54)	0.002 (0.98)	0.004 (1.55)
<i>Constant</i>	0.019* (1.83)	-0.018*** (-2.80)	0.007 (0.39)	0.020 (0.00)	0.052*** (3.11)	0.026 (0.58)
<i>Industry FE</i>	YES	YES	YES	YES	YES	YES
<i>Country FE</i>	YES	YES	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES	YES	YES
<i>Observations</i>	37127	42603	41081	33983	4652	3894
<i>R-square</i>	0.00	0.01	0.01	0.01	0.03	0.04

Test1: Coefficient of *AF_CAR* in column (1) = Coefficient of *AF_CAR* in column (2), $F = 0.42$, $p = 0.518$

Test 2: Coefficient of *AF_CAR* in column (3) = Coefficient of *AF_CAR* in column (4), $F = 3.14$ ($p = 0.070$)

Test 3: Coefficient of *AF_CAR* in column (5) = Coefficient of *AF_CAR* in column (6), $F = 0.87$ ($p = 0.351$)

Test 4: Coefficient of *AF_CAR* in column (5) > Coefficient of *AF_CAR* in column (1) + Coefficient of *AF_CAR* in column (3), $F = 2.03$ ($p = 0.155$).

Test 5: Coefficient of *AF_CAR* in column (6) > Coefficient of *AF_CAR* in column (2) + Coefficient of *AF_CAR* in column (4), $F = 7.89$ ($p = 0.005$).

The good (bad) news sample includes the observations of earnings announcements where the announcing firms have a positive (negative) abnormal stock return during the 3-day announcement window and their country peers. The standard errors are adjusted for clustering by firm *, **, and *** denote a significant level of 0.10, 0.05, and 0.01, respectively. All the variables are defined in Appendix A.

Table 8
Results for intra-country information transfer using a different model

Variable	Intra-country	Foreign intra-industry	Domestic intra-industry
	<u>Information transfer</u>	<u>Information transfer</u>	<u>Information transfer</u>
	(1)	(2)	(3)
	CAR(-1,+1)	CAR(-1,+1)	CAR(-1,+1)
<i>/AF_SUR/</i>	0.001*** (2.97)	0.001** (2.06)	0.007** (2.00)
<i>CP_Size</i>	-0.004*** (-18.35)	-0.005*** (-15.33)	-0.004*** (-8.49)
<i>CP_Lev</i>	0.008*** (3.00)	0.013*** (4.25)	0.018*** (3.42)
<i>CP_MB</i>	0.000 (0.51)	0.000 (0.57)	-0.000 (-0.57)
<i>CP_Analyst</i>	-0.001** (-2.08)	0.000 (0.23)	-0.001 (-0.62)
<i>CP_Accrual</i>	0.031*** (7.09)	0.044*** (8.67)	0.028*** (3.77)
<i>CP_Big4</i>	0.001 (0.66)	-0.001 (-0.97)	-0.002 (-0.70)
<i>AF_Size</i>	-0.000 (-1.38)	-0.000 (-0.64)	0.001** (2.08)
<i>AF_Lev</i>	-0.003*** (-3.38)	0.004*** (3.30)	0.001 (0.22)
<i>AF_MB</i>	-0.000* (-1.88)	0.000 (1.21)	0.000 (1.24)
<i>AF_Analyst</i>	-0.000 (-0.73)	0.001** (2.12)	-0.003*** (-4.34)
<i>AF_Accruals</i>	-0.002 (-1.42)	0.013*** (4.15)	0.020*** (3.84)
<i>AF_Big4</i>	-0.000 (-0.61)	-0.001 (-1.28)	0.000 (0.24)
<i>Lag</i>	-0.002*** (-3.69)	-0.000 (-0.48)	-0.003** (-2.02)
<i>Constant</i>	0.074*** (8.69)	0.069*** (9.40)	0.068*** (5.82)
<i>Industry FE</i>	YES	YES	YES
<i>Country FE</i>	YES	YES	YES
<i>Year FE</i>	YES	YES	YES
<i>Observations</i>	79401	74939	8504
<i>R-square</i>	0.11	0.08	0.06

Test: Coefficient of *AF_SUR* in column (3) > Coefficient of *AF_SUR* in column (1) + Coefficient of *AF_SUR* in column (2), F value = 3.38 (P = 0.066).