Country Origins and Types of Institutional Investors, and Firm-specific Information Flows: Evidence from Worldwide Institutional Ownerships

Li Jiang, Jeong-Bon Kim,* and Lei Pang

Abstract

Using quarterly firm-level data on worldwide institutional ownership from 40 countries during the period of 1998–2006, this study investigates whether and how shareholdings by institutional investors affect the information environment, particularly the relative flow of firm-specific versus common information in the market. We find that shareholdings by foreign (especially U.S.), high-stake, and short-term institutions contribute more to the incorporation of firm-specific information into stock return, thereby reducing stock return comovement, compared with domestic, low-stake, and long-term institutions, respectively. Our change analyses show that an increase in foreign (particularly U.S.), high-stake, and short-term institutional ownership leads to a subsequent decrease in stock return comovement, but not vice versa. Overall, our results are robust to a variety of sensitivity checks.

Keywords: Institutional investors; firm-specific information; common information; stock return comovement

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Country Origins and Types of Institutional Investors, and Firm-specific Information Flows: Evidence from Worldwide Institutional Ownerships

1. Introduction

This study investigates a hitherto unexplored question of whether and how shareholdings by different institutional investors with differing characteristics (i.e., foreign versus domestic, short-term versus long-term, and high-stake versus low-stake institutions) influence a key aspect of the information environment, namely, the flow of firm-specific information in the market. Morck, Yeung, and Yu (2000), Fernandes and Ferreira (2008), and Kim and Shi (2012), among others, provide evidence that stock return comovement or synchronicity across different countries is inversely related to the extent to which firm-specific information is incorporated into stock price via trading activities of well informed investors or information risk arbitrageurs in a country.[1] It is therefore natural to inquire about the *identity* of well-informed investors and their information choices to better understand causes for the relative flow of firm-specific versus common (industry- and market-wide) information.

Given that institutional investors (or simply institutions)[2] are widely considered as well-informed investors, we address the above question by analyzing worldwide institutional ownership of international (non-U.S.) firms from 40 countries. Establishing a causal link from institutional shareholdings to the relative flow of firm-specific versus common information in the market is a daunting task, in particular, because it requires us to understand, and obtain

[1] Alternatively, Jin and Myers (2006) link insiders' incentives for private control benefits to a firm's opaqueness and stock return comovement. These authors argue that insiders absorb a portion of firm-specific risk so as to capture the firm's cash flow beyond the level expected by outsiders. Barberis, Shleifer, and Wurgler (2005) provide evidence supporting a friction- or sentiment-based comovement theory, which focuses on frictions due to limits to arbitrage and correlated sentiments among irrational investors.

[2] In this paper, we use terms, institutional investors and institutions, interchangeably.

information about, institutional investors' information acquisition choices with respect to firm-specific versus common information. An interesting, but hitherto unexplored, question is: Under what condition do institutional investors prefer to acquire firm-specific information than common information? Stated another way, under what circumstance do institutional investors rely more on firm-specific information than common information, when making their decision to invest in a firm's stock? To address the above question, we need to observe an institutional investor's information acquisition choice. However, this information choice is not directly observable, and thus, difficult to capture empirically. To circumvent such a difficulty, our analysis focuses on *firm-level* shareholdings by different institutions with potentially differing demands for firm-specific versus common information.

Specifically, using a comprehensive set of quarterly, firm-level data on institutional shareholdings of non-U.S. firms by both U.S. and non-U.S. institutions, we examine whether different country origins and types of institutions play differing roles in facilitating the incorporation of firm-specific information into stock price. In so doing, our analysis points to the fact that the cost of producing firm-specific versus common information differs systematically across different types of institutions: Specifically, the extent to which one type of institutions have an information advantage over the other type depends largely on their relative ability to cope with the fixed cost associated with the acquisition of firm-specific information (Veldkamp, 2006). We therefore focus on the following characteristics of institutions that are likely to influence information acquisition costs to an institutional investor: (1) country origins (foreign versus domestic and U.S. versus non-U.S. institutions); (2) the size of institutional holdings (high-stake versus low-stake institutions); and (3) investment horizon (short-term versus long-term institutions).

First, institutional investors of different country origins (e.g., U.S. versus non-U.S. institutions) are likely to differ in their private information endowment. Prior studies show that equity investment by foreign institutions improves firm-level corporate governance, thereby enhancing firm valuation (Aggarwal, Erel, Ferrira, and Matos, 2011; Ferreira and Matos, 2008). Foreign institutions from countries with well-developed markets are likely to be better endowed with value-relevant information, compared with domestic institutions in countries with less developed markets. In particular, U.S. institutions have better access to global private information and more expertise in processing public information, which gives them an advantage in generating valuation-relevant private information in conjunction with public information (Albuquerque, Bauer, and Schneider, 2009). Moreover, considering the relatively large size of their investment resources and client bases, U.S. institutions are better able to cope with high fixed costs associated with firm-specific information acquisition, and are more likely to have relatively low marginal costs of acquiring and processing firm-specific private information, compared with non-U.S. institutions.

Second, the size of an institution's stakeholdings can serve as a proxy for its ability to acquire firm-specific information, since the fixed cost of information production can be spread over their shareholdings. The fixed cost of information acquisition per unit of holding should thus be lower for high-stake institutions than for low-stake institutions. Third, an institution's trading intensity can also be a similar proxy, since the fixed cost of acquiring firm-specific (private) information can be spread over the number of units traded. The fixed cost of information acquisition per unit traded should thus be lower for short-term institutions with active trading strategies than for long-term institutions with passive trading strategies.

Drawing upon the above discussions, our study proposes the following three predictions

on the impact of institutional holdings on firm-specific information flow in the market. First, we predict that foreign institutions facilitate the incorporation of firm-specific information into stock price, and thus reduce stock price comovement, to a greater degree, than domestic institutions. We further predict that, among foreign institutions, U.S. institutions play a more significant role in enhancing firm-specific information flow in the market or mitigating stock return comovement than do non-U.S. institutions. Second, we predict that high-stake institutions (that hold at least 5% of a firm's shares outstanding) have greater incentives to produce firm-specific information, and are better able to facilitate firm-specific information flow, than low-stake institutions (that own less than 1% of a firm's shares outstanding). Finally, we predict that short-term institutions with active trading strategies are better able to improve firm-specific information flow than long-term institutions with passive strategies.

For our empirical analysis, we use quarterly, firm-level data on institutional holdings of international (non-U.S.) stocks by both U.S. and non-U.S. institutions for the 10-year period of 1997–2006. The data are extracted from the 2007 version of *Thomson Financial Equity Ownership*. Our sample consists of 11,041 non-U.S. firms from 40 countries: our sample firms are owned in part by either foreign (U.S. and/or non-U.S.) or domestic institutions and both. Briefly, our results can be summarized as follows.

First, consistent with our predictions, we find that stock return is less synchronous for firms with higher shareholdings by foreign (particularly U.S.) institutions. However, this finding does not hold for firms with higher shareholdings by domestic institutions. The above results suggest that foreign institutional holdings facilitate firm-specific information flow, while domestic institutional holdings do not. We further find that, among foreign institutional investors, those from common law countries facilitate firm-specific information flow, thereby reducing

stock price comovement, to a greater extent, compared with those from civil law countries.

Second, we find that stock return comovement or synchronicity decreases with the level of shareholdings by high-stake institutions, while it increases with the level of shareholdings by low-stake institutions except for U.S. institutions. This is consistent with the view that the per-unit fixed cost of information acquisition is lower for high-stake institutions than for low-stake institutions, and thus, the former institutions rely more on firm-specific information than the latter institutions, when making their trading decisions. Moreover, our results show that the negative relation observed between stock return comovement and high-stake shareholdings is more pronounced when high-stake shareholders (of non-U.S. firms) are foreign institutions in general and U.S.-based institutions in particular than when they are domestic institutions.

Finally, we find that stock return comovement decreases with shareholdings by short-term foreign institutions in general, and decreases more significantly with shareholdings by short-term U.S. institutions in particular. This finding suggests that the fixed cost of firm-specific information production per unit of trade is lower for short-term institutions than for long-term institutions, and thus, the former institution rely more on firm-specific information than the latter institutions, when making their trading decisions.

Overall, our results suggest that foreign (especially U.S.), high-stake, and short-term institutions are more likely to produce firm-specific information, and facilitate its incorporation into stock price, relative to domestic, low-stake, and long-term institutions, respectively. These results are robust to a variety of sensitivity checks, including changes analyses, reverse causality, and alternative clustering methods.

Our study contributes to the literature in the following ways. First, to our knowledge, our study is the first to provide systematic evidence that different country origins and types of

institutions play differing roles in facilitating firm-specific information flow in the market. Our detailed data on firm-level shareholdings of non-U.S. firms from 40 countries by both U.S. and non-U.S. institutions allow us to identify institutional characteristics that influence an institution's information choices. Second, we find that foreign (especially U.S.) institutions are superior to domestic institutions in facilitating firm-specific information flow in the market. Given the scarcity of evidence on the issue, this finding is important and interesting in its own right, and provides useful insights into the informational role of foreign investors in the global financial markets. Finally, our study complements the U.S. study by Boehmer and Kelley (2009), which shows that institutional investors improve the informational efficiency of prices through not only trading but also their holdings. Specifically, their results suggest that institutional trading eliminates existing mispricings whereas institutional holdings prevent mispricing from arising.[3] Our results on both the level and change of international institutional holdings of non-U.S. firms provide additional insights into both holding and trading effects.

The paper proceeds as follows. Section 2 reviews the literature and develops our predictions on the impact of different country origins and types of institutions on firm-specific information flow in the market. Section 3 describes the data and variable measurement, specifies empirical models, and presents descriptive statistics. Section 4 reports results of our main empirical tests. Section 5 conducts change analyses and other robustness tests. The final section concludes.

2. Literature review and empirical implications

[3] Boehmer and Kelley (2009) argue that "trading is necessary to eliminate mispricings; the trading effect is greater in stocks that are priced less efficiently during the previous quarter. But for stocks that are already priced efficiently during the previous quarter, institutions' holding matter more than their trading. (p. 3565).

2.1. Foreign versus domestic institutions

Prior research documents mixed evidence on whether foreign institutional investors have an informational advantage over domestic institutional investors. On the one hand, Brennan and Cao (1997), Dvorak (2005), and Choe, Kho, and Stulz (2005) find that domestic investors outperform foreign investors, suggesting that foreign institutions are at an informational disadvantage. On the other hand, Grinblatt and Keloharju (2000) and Seasholes (2000) find that foreign institutions perform better than domestic institutions, indicating that the former are better informed than the latter. This raises an interesting question of whether foreign (especially U.S.) institutions contribute more to the incorporation of firm-specific information into stock price, thereby reducing stock return comovement, to a greater extent, than domestic institutions. [4]

Domestic and foreign institutions differ in their influences on the flow of firm-specific versus common information because the composition of their portfolio can differs significantly between the two institutions, and this difference is likely to affect their information choices. Covrig, Lau, and Ng (2006) show that domestic institutions tend to hold a wide array of local stocks, whereas foreign institutions hold only selected local stocks. Thus, domestic institutions may prefer aggregate information that applies commonly to many firms within the country or the industry, which allows them to economize on the cost of producing common information. This suggests that shareholdings by domestic institutions contribute more to the incorporation of common (rather than firm-specific) information into stock price, thereby increasing stock price comovement.

[4] The return-chasing phenomenon is often used to justify the conventional belief that foreign investors are at an informational disadvantage (Brennan and Cao, 1997). However, Albuquerque, Bauer, and Schneider (2009) argue that the return chasing can be consistent with the fact that U.S. institutional investors have global private information and superior information processing capability.

In contrast, foreign institutional investors tend to hold smaller subsets of local stocks; they prefer stocks that are relatively larger and more transparent (Kang and Stulz, 1997) and stocks with greater global exposure, such as high export sales and cross-listed in the U.S. (Covrig et al., 2006; Ferreira and Matos, 2008), but dislike stocks with opaque accounting disclosure or weak corporate governance (Leuz, Lins, and Warnock, 2009). Bradshaw et al. (2004) find that U.S. investors underweight foreign stocks from countries with a higher level of divergence between U.S. and foreign (local) GAAP. Moreover, foreign (especially U.S.) institutions are endowed with so-called global private information, which Albuquerque et al. (2009) use to account for the fact that U.S. institutional investors have superior knowledge about U.S. industrial production and monetary policies, as well as global trends in market demands and technological advances. Such knowledge of global factors can give U.S. institutions an advantage in processing public information of local stocks into valuation-relevant private information.

In a related vein, foreign institutions in general have superior information processing capacity in generating private information in conjunction with public information (Bailey, Mao, and Sirodom, 2007). In particular, U.S. institutions have larger investor bases and more investment resources, and thus are more likely to enjoy economies of scale in information production, particularly private information gathering, compared with domestic institutions or non-U.S.-based foreign institutions. As a result, foreign institutions, particularly U.S. institutions, are likely to face the lower per unit fixed cost associated with private information gathering: they have relatively lower marginal costs of information acquisition and gathering, compared with domestic (local) institutions or non-U.S.-based foreign institutions.

An important implication from the above discussions is that, when making trading decisions, foreign institutions are likely to rely more on firm-specific information than domestic

institutions, while domestic institutions are likely to rely more on common information. As a result, shareholdings by foreign institutions are more (less) likely to facilitate the flow of firm-specific (common) information in the market than shareholdings by domestic institutions. This leads to our first prediction that the amount of firm-specific information incorporated into stock price is greater for firms with higher foreign shareholdings, or equivalently, stock return comovement is lower for such firms, all else being equal.

2.2. High- versus low-stake institutions

Prior studies argue that low-stake institutions cannot cover the fixed costs of producing firm-specific information (Ali, Klasa, and Li, 2008). Bushee and Goodman (2007) find that informed trading is concentrated mainly in situations where institutional investors take a large stake of a firm and have an information processing advantage. Given that information acquisition costs have a large fixed component (Boehmer and Kelley, 2009; Veldkamp, 2006), we expect that the per-unit fixed cost is lower for high-stake institutions than for low-stake institutions, and thus, high-stake institutions are more likely to acquire firm-specific information than low-stake institutions.

Investors' information choices depend on both the costs and benefits of information acquisition. In a competitive information market, information cost depends critically on the demand for information; an increase in its demand leads to a lower information cost per unit of holding.[5] On the one hand, the gains from acquiring firm-specific private information are greater

[5] Veldkamp (2006) shows that complementarities in information demand make common information affordable and investors' information choices cause excess stock return comovement. When investors choose to rely on high-demand common information, they behave similarly and stock returns comove excessively beyond the level suggested by fundamental factors. To ensure a high demand (and thus a low cost), investors and analysts tend to produce information useful for evaluating multiple assets. For example, they cluster their information production on bellwether (i.e., industry leaders) stocks to gauge industry-wide information and use this information to evaluate other related stocks in the same industry. Even though common information is less valuable than firm-specific

for institutional investors with higher stakes, because information has an increasing return to scale. Further, per unit cost of acquiring firm-specific information decreases with the size of the stakes, because high-stake institutions can effectively spread the associated fixed cost over their relatively large holdings. Therefore, high-stake institutions are more capable of producing firm-specific information than low-stake institutions, and thus facilitating the incorporation of firm-specific information into stock price. This implies that stock return comovement decreases with the size of institutional stakeholdings. In addition, a high-stake institutional holdings may allow institutional investors to trade as a monopolistic trader, and thus, to fully extract their trading profits from firm-specific information.[6] Drawing upon the above discussions, we make our second prediction that the amount of firm-specific information incorporated into stock price is greater for firms with high-stake institutional holdings than for those with low-stake institutional holdings or equivalently stock return comovement is lower for the former firms than for the latter firms.

2.3. Short- versus long-term institutions

Using U.S. data, Bushee (1998, 2001) provide evidence that the economic impact of shareholdings by institutional investors differs significantly, according to whether they are dedicated or transient institutions (Bushee, 1998; 2001). Moreover, the trading intensity of institutional investors is likely to be associated with their incentives to acquire firm-specific private information. Yan and Zhang (2009) show that short-term institutions trade more actively

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information, investors will still acquire it because its high demand reduces its acquisition cost. The clustered demand for common information adds common shocks to related stocks and contributes to excess stock return comovement.

[6] Admati and Pfleiderer (1988) examine whether an information owner sells information directly to investors or trades on the information by creating a mutual fund. The latter can control the effects of competition among these indirectly informed traders.

than long-term institutions to exploit their private information advantages.[7] Institutions that engage actively in short-term trading strategies can effectively reduce the per unit of trading cost of acquiring firm-specific information, since the associated fixed cost is spread over the relatively large units traded over time. Short-term institutions with active trading strategies can therefore afford the high fixed cost of gathering firm-specific private information. We therefore expect that short-term institutions with active trading strategies have stronger incentives and greater abilities to acquire firm-specific information than long-term institutions with passive strategies. This leads to our third prediction that, all else being equal, the amount of firm-specific information incorporated into stock price increases, or equivalently, stock return comovement decreases, as shareholdings by short-term institutions increase.

3. Data, variable measurement and research design

3.1. Data

The institutional holdings data are drawn from the *Thomson Financial Equity Ownership* database. This database contains global shareholding information, including data on ownership of equities from over 90 countries and institutional portfolios from over 35 countries. The institutions covered in the database are professional money managers such as mutual funds, hedge funds, pension funds, bank trusts, and insurance companies. *Thomson Financial* compiles data on shareholdings identified at the institution level that are available from such sources as 13F filings or 13D/G filings among others. In other cases, where explicit institutional level holdings are not available, *Thomson Financial* computes fund holdings up to the institution level.

[7] Yan and Zhang (2009) partition institutional investors into short- and long-term investors and examine the relation between institutional ownership and future stock returns. They find that short-term institutional investors are better informed and trade actively to exploit their information advantage.

This is often the case for non-U.S. holdings.

We use institutional ownership data for the period from 1997 to 2006[8] and extract financial statements data from *Worldscope.* We collect the following data items from *Datastream*: the weekly return index (*RI*), the market return index (*MI*), the exchange rate, the share price (*P*), the number of shares outstanding (*NOSH*), and the trading volume (*VO*). These data are necessary to compute firm-specific return comovement, trading turnover, and future returns for individual stocks.

We combine the *Worldscope*/*Datastream* sample with the institutional ownership data from *Thomson Financial Equity Ownership* at the end of each year using SEDOL codes. We first exclude financial firms (Standard Industrial Classification, or SIC, codes 6000–6999). Similar to Morck et al. (2000) and Jin and Myers (2006), we require all financial data to be available from *Worldscope* and weekly stock return data from *Datastream* to be available for at least 26 weeks. We require the total assets for each firm to be greater than $100 million. We obtain a final sample of 11,041 non-U.S. firms which comprise a total of 55,749 firm–year observations from 40 countries over the sample period of 1998–2006. Table 1 provides the distribution of our sample firms by country.

3.2. Measuring institutional ownership

We define total institutional ownership (*IO_TOTAL*) for each stock as the number of shares held by all institutions divided by the total number of shares outstanding at the end of each calendar year. Following Gompers and Metrick (2001), we set *IO_TOTAL* to zero if a stock is not held by any institution as recorded in the *Thomson Financial Equity Ownership* database.

[8] We extracted data from the 2007 version of the *Thomson Financial Equity Ownership* database. This version of the database provides us with relevant ownership date only up to the first quarter of 2007.

We also exclude observations with *IO_TOTAL* greater than 100%. We then classify total institutional ownership into three categories according to country origins, size of shareholdings, and trading intensity.

First, we classify institutions into foreign and domestic institutions based on their headquarters locations, and then further partition foreign institutions into U.S. and non-U.S. institutions. Specifically, for each stock, domestic institutional ownership (*IO_DOM*) is the sum of the shareholdings of all institutions headquartered in the same country where the stock is listed divided by the firm's total number of shares outstanding. Foreign institutional ownership (*IO_FOR*) is the sum of shareholdings of all institutions headquartered in foreign countries, i.e., countries different from the country in which the stock is listed, divided by the firm's total number of shares outstanding. Similarly, foreign institutional ownership is further divided into the percentages of shares held by U.S. institutions (*IO_FOR_US*) and non-U.S. institutions (*IO_FOR_NUS*).

We further divide domestic and foreign (U.S. and non-U.S.) institutions based on their size of stakeholdings. Following Ali et al. (2008), we use the 5% cutoff point to identify high-level institutional stakes. Bushee (1998) also classifies institutions with stakeholdings above 5% as dedicated investors. Specifically, we define high-stake institutional ownership as the sum of the shareholdings by institutions with more than 5% shareholdings in a stock divided by the total number of shares outstanding. Similarly, we use the 1% cutoff point and define low-stake institutional ownership as the sum of the shareholdings by institutions with less than 1% shareholdings in a stock divided by the total number of shares outstanding. We leave out medium-level institutional ownership ranging from 1% to 5%.

Third, we divide domestic and foreign (U.S. and non-U.S.) institutional investors based

on their trading intensity. We classify institutional investors into two categories, that is: short-term institutions with active trading strategies; and long-term institutions with passive strategies. Following Yan and Zhang's (2009) classification procedure, we sort all institutional investors into three tertile portfolios based on the average portfolio turnover rate over the past four quarters, which is called the churn rate. Those ranked in the top tertile with the highest average churn rate are classified as short-term institutional investors, and those ranked in the bottom tertile with the lowest average churn rate are classified as long-term institutional investors. We then define short-term institutional ownership as the sum of shareholdings of short-term institutions in a stock divided by the total number of shares outstanding, and long-term institutional ownership as the sum of shareholdings of long-term institutions in a stock divided by the total number of shares outstanding. Appendix B explains the classification procedure in detail.

3.3. Measuring stock return comovement

To measure stock return comovement, we estimate the following augmented market model using weekly return data for each stock in each year:

$$r_{i,t} = \alpha_i + \beta_{1,t} r_{m,i,t-1} + \beta_{2,t}(r_{us,t-1} + e_{i,t-1}) + \beta_{3,t} r_{m,i,t} + \beta_{4,t}(r_{us,t} + e_{i,t}) + \beta_{5,t} r_{m,i,t+1} + \beta_{6,t}(r_{us,t+1} + e_{i,t+1}) + \varepsilon_{i,t} \quad (1)$$

where, for stock i and year t, $r_{i,t}$ refers to weekly return; $r_{m,i,t}$ represents the value-weighted domestic weekly market index return in country j; $r_{us,t}$ is the value-weighted U.S. weekly market index return (a proxy for the global market factor); $e_{i,t}$ denotes the weekly change in country i's exchange rate per U.S. dollar; and $\varepsilon_{i,t}$ represents unspecified factors. The expression $r_{us,t} + e_{i,t}$ translates U.S. stock market returns into local currency units. We include lead and lag terms for the market index returns to alleviate potential bias associated with nonsynchronous trading

(Dimson, 1979).[9] In estimating Eq. (1), we exclude stocks that trade for fewer than 26 weeks during a year.

Let σ_i^2 and σ_{ie}^2 denote the total return variation and the firm-specific return variation, respectively, of Eq. (1). Then the common return variation is measured by $\sigma_i^2 - \sigma_{ie}^2$. For each firm in the sample, we compute the *relative* common return variation for each stock using the ratio of the common return variation to the total return variation, that is $(\sigma_i^2 - \sigma_{ie}^2)/\sigma_i^2$. Note here that R_i^2 of Eq. (1) is equal to this ratio, while $1 - R_i^2$ of Eq. (1) is equal to σ_{ie}^2/σ_i^2. Similar to other R^2-based studies (Piotroski and Roulstone 2004; Jin and Myers 2006; Kim and Shi 2012), we then obtain our measure of stock return comovement for firm *i*, denoted by $Comovement_i$ in each year, as

$$Comovement_i = ln[R_i^2/(1 - R_i^2)] = ln[(\sigma_i^2 - \sigma_{ie}^2)/\sigma_{ie}^2] \quad (2)$$

The logarithmic transformation is applied to circumvent the bounded nature of R_i^2 within [0, 1]. By construction, high values of *Comovement* mean a higher level of common return variation relative to firm-specific return variation.

3.4. Empirical specification

To test our three predictions on the impact of different country origins and types of institutions on stock price comovement or synchronicity, we specify the following baseline regression model:

[9] The inclusion of U.S. stock market returns in the model is important for the following reasons: U.S. market index returns reflect global factors, liquidity changes, or informational shocks that may affect U.S. investors' trading abroad (Wongswan, 2006). The inclusion of U.S. market returns accounts for the possibility that U.S. investors transmit liquidity or informational shocks from the U.S. market to foreign markets, thus causing excess return comovement among foreign stocks.

$$Comovement_{i,t} = \alpha_0 + \alpha_1 IO_{i,t-1} + \alpha_2 SIZE_{i,t-1} + \alpha_3 Comovment_{i,t-1} + \alpha_4 MB_{i,t-1} + \alpha_5 LEV_{i,t-1} + \alpha_6 ACCR_{i,t} + \alpha_7 ROA_{i,t} + \alpha_8 DIVERS_{i,t} + \alpha_9 HERF_{i,t} + \alpha_{10} NIND_{i,t} + \alpha_{11} NAF_{i,t} + \alpha_{12} TURN_{i,t} + (Year, Industry, Country\ Dummies) + \varepsilon \quad (3)$$

where, for firm *i* and year *t* (or *t-1*), *Comovement* denotes stock return comovement or synchronicity as defined in Eq. (2); and our test variable, *IO*, represents different classifications of institutional ownership.

To isolate the effect of institutional ownership on *Comovement* from the effect of other firm- and industry-level factors, we include in Eq. (3) a total of eleven firm- and industry-level control variables that are known to influence *Comovement*, that is: (i) firm size measured by the natural log of market capitalization (*SIZE*); (ii) the lagged comovement as a control for past comovement; (iii) the ratio of market value of equity to the book value of equity at the end of the fiscal year (*MB*); (iv) financial leverage measured by the book value of long-term debt scaled by the sum of market value of equity and book value of long-term debt at the end of the fiscal year (*LEV*); (v) the ratio of absolute total accruals to beginning-of-year operating cash flows (*ACCR*); (vi) the income before extraordinary items divided by the beginning-of-fiscal year total asset (*ROA*), (vii) firm-level diversification measured by the number of business segments (*DIVERS*); (viii) the revenue-based Herfindahl index that captures industry-level concentration (*HERF*); (ix) the natural log of the number of firms in each industry (*NIND*); (x) the natural log of number of analysts following a firm per year (*NAF*); and (xi) trading volume measured by the average monthly trading turnover (*TURN*). We include *Year, Industry,* and *Country* dummies to control for year, industry, and country fixed effects, respectively. Appendix A provides detailed definitions of all the variables included in Eq. (3).

3.5. Descriptive statistics

Table 1 reports the number of observations, the average of return comovement, total

institutional ownership (*IO_TOTAL*), domestic institutional ownership (*IO_DOM*), foreign institutional ownership (*IO_FOR*), and the country-level variables of legal infrastructure for non-U.S. countries. The table shows that the total number of firm-year observations for *non-U.S.* firms varies from a minimum of 110 in Hungary to a maximum of 15,601 in Japan. We find that the countries, other than the U.S., that have the highest average institutional ownership are Netherlands, Sweden, China, and Canada, while countries with the lowest average institutional ownership are Pakistan and Philippines. To distinguish between firms located in countries with strong or weak legal institutional infrastructure, we use two country-level measures of legal infrastructure: the legal regime of the country from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), and enforcement index constructed using the rule of law index from La Porta et al. (1997) and the anti-director rights index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008).

Table 2 presents descriptive statistics for the variables used in our regression analysis. We winsorize continuous financial variables and test variables at the 1% and 99% levels to mitigate the potential effects of outliers on our results. Panel A of Table 2 presents descriptive statistics for the institutional ownership variables. The mean value of total institutional ownership is 9.9% for non-U.S. stocks. When we classify total institutional ownership by an institution's country origin, we find that, on average, domestic institutional ownership (5.70%) exceed foreign institutional ownership (4.20%) and non-U.S. institutional ownership (2.70%) exceed U.S. institutional ownership (1.50%). Given that ownership is highly concentrated in non-U.S. markets and the free float for (non-U.S.) international stocks is lower (55.53%, untabulated), 1.50% of U.S. institutional ownership may still allow U.S. institutions to exert a significant influence on domestic stocks in non-U.S. markets.

When we classify domestic and foreign (both U.S. and non-U.S.) institutional ownerships by each institution's stakeholding size, we find that the ownership by low-stake institutions is greater, on average, than by high-stake institutions for both domestic and foreign (U.S. and non-U.S.) institutions. Thus, low-stake institutions still exhibit nontrivial level of institutional ownership. When we classify domestic and foreign (both U.S. and non-U.S.) institutional ownerships by an institution's trading intensity, we find that, on average, domestic short-term institutions with active trading strategies hold 1.20% of all shares, and domestic long-term institutions with passive strategies hold 1.40% of all shares, while foreign short- and long-term institutions equally hold 1.00% of all shares.

As shown in Panel B of Table 2, the mean and median of *Comovement* are -1.228 and -1.219, respectively. Note here that the mean *Comovement* of -1.228 for our international sample is larger than the mean of -2.7310 for the U.S. sample of Ferreira and Laux (2007), suggesting that stock prices comove more with common factors for non-U.S. firms than for U.S. firms. The standard deviation of *Comovement* is relatively large at 0.885, suggesting a wide variation of our *Comovement* measure across firms. With respect to the distributional properties of the control variables, the following is noteworthy. Our sample firms have, on average, about four different business segments. The mean and median of *ACCR* are 0.931 and 0.576, respectively, with a standard deviation of 1.731, suggesting that the *ACCR* distribution is highly skewed.

(INSERT TABLES 1 & 2 HERE)

4. Main empirical tests

In this section, we test our three predictions on the impact of country origins and different types of institutions (foreign versus domestics, high-stake versus low-stake, and short-term versus long-term) on the relative flow of firm-specific versus common information, captured by

stock return comovement or synchronicity.

4.1. Foreign versus domestic institutions and comovment

In section 2.1, we predict that shareholdings by foreign (particularly U.S.) institutions facilitate the incorporation of firm-specific information into stock price, and thus reduce stock price comovement, to a greater extent, than shareholdings by domestic institutions. To test this prediction, we start with our baseline regression in Eq. (3), using total institutional ownership (*IO_TOTAL*) as the test variable, so that our results can be compared with the results of previous research using U.S. data (e.g., Piotroski and Roulstone, 2004). Table 3 reports the results of various regressions in Eq. (3). Throughout the paper, all reported *t*-values are on an adjusted basis using robust standard errors corrected for firm-level clustering (Peterson, 2009).

As shown in column 1 of Table 3, we find that the coefficient on total institutional ownership, *IO_TOTAL*, is insignificant. This is consistent with the U.S. finding of Piotroski and Roulstone (2004) that the association between total institutional ownership and stock return comovement is ambiguous. In Table 3, we include a number of control variables that are used in previous research. Consistent with the U.S. evidence of Piotroski and Roulstone (2004) and Ferreira and Laux (2007) and the non-U.S. international evidence of Fernandes and Ferreira (2008) and Kim and Shi (2012), we find that the coefficients on *SIZE*，*LEV*, *DIVERS*, *NAF* and *TURN* are all significant and positive at the 1% level, and the coefficients on *ROA* and *NIND* are significant and negative at the 1% level. The coefficients on *NAF* are positive and significant at the 1% level, confirming that analysts play a role in facilitating the incorporation of common information into stock price via inter-industry information transmission (Piotroski and Roulstone, 2004; Kim and Shi, 2012). The coefficients of *MB*, *ACCR*, and *HERF* are insignificant across all columns in Table 3. Note that the coefficients on $Comovement_{t-1}$ are positive and significant at

the 1% level, suggesting that stock return comovement persists over time.

To examine our predictions on the differential effects of foreign and domestic institutional ownership on stock return comovement, we re-estimate Eq. (3) after partitioning total institutional ownership into domestic and foreign institutional ownerships (i.e., by including *IO_DOM* and *IO_FOR* in lieu of *IO_TOTAL*). As shown in column 2 of Table 3, we find that the coefficient of *IO_DOM* is positive but insignificant (0.017 with t = 0.430), while the coefficient of *IO_FOR* is significant and negative (-0.044 with t = -1.932). This supports our first prediction and suggests that foreign institutions contribute more to the incorporation of firm-specific information into stock price than domestic institutions, thereby mitigating stock return comovement. This evidence is consistent with the view that domestic institutions rely more on common information than foreign institutions, when making their investment decisions, compared with foreign institutions.

To examine whether U.S. institutions contribute more to firm-specific information flow than non-U.S. institutions, we further partition foreign institutional ownership (*IO_FOR*) into those of U.S. and non-U.S. institutions (*IO_FOR_US* and *IO_FOR_NUS*, respectively) and re-estimate the regression model in Eq. (3). Column 3 of Table 3 reports the results. We find that the coefficient of *IO_DOM* remains positive and insignificant. However, the coefficient on *IO_FOR_US* is highly significant, with an expected negative sign (-0.331 with t = -3.504), whereas the coefficient of *IO_FOR_NUS* is significant, with a positive sign (0.135 with t = 2.273). This indicates that U.S. institutions contribute significantly to the incorporation of firm-specific information into stock price, while non-U.S. institutions do not. The finding is consistent with the view that, relative to non-U.S. institutions, U.S. institutions possess global private information and have an informational advantage in processing firm-specific public information

into value-relevant private information, thereby reducing stock return comovement to a greater degree.

Next, we investigate whether the legal origin of a foreign institution's home country does matter. In so doing, similar to Aggarwal et al. (2011), we classify a foreign institution based on whether their headquarters is domiciled in a common-law or civil-law country, and then create two additional variables of interest: First, *IO_FOR_COMMON* is the sum of the shareholdings of all institutions headquartered in common law countries divided by the total number of shares outstanding. Second, *IO_FOR_CIVIL* is the sum of the shareholdings of all institutions headquartered in civil law countries divided by the total number of shares outstanding. As shown in column 4 of Table 3, the coefficient on *IO_FOR_COMMON* is negative and significant at the 1% level, while the coefficient on *IO_FOR_CIVIL*, is positive and significant at the 1% level. This finding suggests that when making investment decision, foreign institutions from common-law countries rely more on *firm-specific* information, and thus, contribute more to the incorporation of firm-specific information into stock price, while foreign institutions from civil-law countries rely more on *common* information, and thus, contribute more to the incorporation of common information into stock rice.

We evaluate the economic impact of institutional ownership on R^2 using coefficient estimates reported in column 3 of Table 3. The regression estimates the impact on *Comovement*, which is the transformed R^2. We calculate the impact on R^2 for our augmented market model in Eq. (1) by inverting Eq. (2). The coefficients on *IO_DOM*, *IO_FOR_US* and *IO_FOR_NUS* indicate that a ten-percent increase in ownership is associated with an increase of R^2 by 0.03%, -0.60% and 0.24%, respectively. The economic impact of *IO_FOR_US* on decreasing R^2 is nontrivial (roughly 1% of average R^2).

Overall, our results in Table 3 strongly support our first prediction, suggesting that foreign institutions differ from domestic institutions in their quest for and capability of producing firm-specific information. In particular, our results are consistent with the view that U.S. institutional investors are more effective in facilitating the flow of firm-specific information in the market, thereby lowering stock return comovement than non-U.S. institutions.

(INSERT TABLE 3 HERE)

4.2. High- versus low-stake institutions and comovement

In section 2.2., we predict that the size of institutional stakeholdings is inversely associated with stock return comovement or synchronicity. To test this prediction, we further partition domestic and foreign institutional ownerships (i.e., *IO_DOM* and *IO_FOR*) according to the size of an institution's stakeholding, that is: *IO_DOM_HIGH* versus *IO_DOM_LOW* and *IO_FOR_HIGH* versus *IO_FOR_LOW*, respectively. We then estimate our base line regression in Eq. (3) using these refined variables, that is: *IO_DOM_HIGH* and *IO_DOM_LOW* in lieu of *IO_DOM*; and *IO_FOR_HIGH* and *IO_FOR_LOW* in replacement of *IO_FOR*. Table 4 presents the results of regressions.

As shown in column 1 of Table 4, we find that the coefficients on *IO_DOM_LOW* and *IO_FOR_LOW* are all significant and positive (1.319 with t = 8.095 and 0.785 with t = 6.160, respectively). This finding suggests that shareholdings by low-stake institutions, whether domestic or foreign, are positively related to future return comovement. Stated another way, foreign institutions with low-stake holdings rely more on common information than firm-specific information, and thus, contribute more to the incorporation of common information into stock price, thereby increasing stock price comovement.

In contrast, we find that the coefficients on *IO_DOM_HIGH* and *IO_FOR_HIGH* are all

significant and negative (-0.270 with t = -4.322 and -0.428 with t = -5.217). This implies that shareholdings by high-stake institutions, whether domestic or foreign, are negatively related to future return comovement. The above results, taken together, are consistent with our second prediction, suggesting that high-stake (low-stake) institutions facilitate the incorporation of firm-specific (common) information into stock price.

Our results corroborate the finding of previous research that high-stake institutional investors are more likely to engage in informed trading (Bushee and Goodman, 2007) and that low-stake institutional investors cannot afford high fixed costs of acquiring firm-specific information (Ali et al., 2008), and thus are more likely to rely on common information, when making their investment decisions, thereby increasing stock return comovement. To the extent that the size of institutional stakeholdings reflects the ability to bear the fixed costs of acquiring firm-specific information, our results are in line with Veldkamp's (2006) information-driven comovement theory.

To further examine whether the impact of stakeholding size on comovement differs systematically between U.S. and non-U.S. institutions, we first partition foreign institutional ownership into U.S. and non-U.S. institutional holdings (*IO_FOR_US* and *IO_FOR_NUS*), and then, further partition *IO_FOR_US* into high- and low-stake holdings (*IO_FOR_US_HIGH* and *IO_FOR_US_LOW*, respectively). Similarly, we also decompose non-U.S. institutional ownership into those of high- and low-stake institutions (*IO_FOR_NUS_HIGH* and *IO_FOR_NUS_LOW*, respectively). Column 2 of Table 4 reports the results of regression using these finer partitions.

As shown in column 2 of Table 4, we find that the coefficient of high-stake U.S. institutions (*IO_FOR_US_HIGH*) is significantly negative (-0.423 with t = -2.879), while that of

high-stake non-U.S. institutions (*IO _FOR_NUS_HIGH*) is weakly significant (-0.387 with t = -1.823). This finding suggests that high-stake, U.S. institutions outperform high-stake, non-U.S. institutions in facilitating firm-specific information flow. Interestingly, we find that low-stake U.S. and non-U.S. institutions have opposing effects on stock return comovement: The coefficient of *IO_FOR_US_LOW* is significantly negative (-0.678 with t = -1.865), while that of *IO_FOR_NUS_LOW* is significantly positive (1.435 with t = 8.037). This can be viewed as an indication that even low-stake U.S. institutions contribute to a reduction in stock return comovement.

We evaluate the economic impacts of various institutional ownership using coefficient estimates reported in column 2 of Table 4. The coefficients on *IO_DOM_HIGH*, *IO_FOR_US_HIGH* and *IO_FOR_NUS_HIGH* indicate that a ten-percent increase in ownership is associated with a change of R^2 for the market model in Eq. (1) by -0.48%, -0.75% and -0.69%, respectively. The coefficients on *IO_DOM_LOW*, *IO_FOR_US_LOW* and *IO_FOR_NUS_LOW* indicate that a ten-percent increase in ownership is associated with a change of R^2 by 2.26%, -1.21% and 2.41%, respectively.

Overall, our results show that high-stake institutions are more likely to engage in the acquisition of firm-specific information than low-stake institutions, and thus facilitate firm-specific information flow, thereby reducing stock return comovement. On the other hand, our findings also reveal that low-stake institutions (except U.S. institutions) are more likely to rely on common information, and thus, increase stock return comovement.

(INSERT TABLE 4 HERE)

4.3. Short- versus long-term institutions and comovement

In section 2.3, we predict that the intensity of an institution's trading pattern is reversely

associated with stock return comovement. To test this prediction, we further partition domestic and foreign institutional ownership according to an institution's investment horizon, and obtain four ownership measures with finer partitions, that is, *IO_DOM_SHORT* versus *IO_DOM_LONG*; and *IO_FOR_SHORT* versus *IO_FOR_LONG*. We then estimate our baseline regression in Eq. (3) after including *IO_DOM_SHORT* and *IO_DOM_LONG* in lieu of *IO_DOM*, and *IO_FOR_SHORT* and *IO_FOR_LONG* in replacement of *IO_FOR*. Table 5 presents the results of these new augmented regressions.

As shown in column 1 of Table 5, we find that the coefficients of *IO_DOM_SHORT* and *IO_FOR_SHORT* are insignificant (0.029 with t = 0.280 and 0.134 with t = 0.999). The insignificant coefficients for short-term institutions, whether domestic or foreign, are in sharp contrast to the U.S. finding of Yan and Zhang (2009) that short-term institutions trade more frequently on firm-specific information to exploit their information advantage. The coefficient of *IO_DOM_LONG* is significantly positive (0.031 with t = 1.993), suggesting that long-term institutions with passive investment strategies rely more on common information, thereby increasing stock return comovement.

To further investigate whether U.S. institutions play a more important role than non-U.S. institutions in facilitating firm-specific information flow, we partition foreign institutional holdings into U.S. and non-U.S. ones, that is: *IO_FOR_US* and *IO_FOR_NUS*. Then we further partition *IO_FOR_US* into short-term and long institutional holdings (*IO_FOR_US_SHORT* and *IO_FOR_US_LONG*, respectively). Similarly, we also decompose *IO_FOR_NUS* into *IO_FOR_NUS_SHORT* and *IO_FOR_NUS_LONG*.

As shown in column 2 of Table 5, we find that the coefficient of *IO_FOR_US_SHORT* is significantly negative (-1.081 with t = -2.768), while that of *IO_FOR_US_LONG* is insignificant.

This finding suggests that, among U.S. institutional investors, short-term institutions play a more important role than long-term institutions in facilitating the incorporation of firm-specific information into stock price. We also find that the coefficient of *IO_FOR_NUS_SHORT* is insignificant. The results suggest that among short-term foreign institutions, U.S. institutions play a significant role in facilitating firm-specific information flow, while non-U.S. institutions do not. It should be noted here that the results for short- versus long-term institutions (Table 5) appear to be weaker, overall, than the results for high- versus low-stake institutions reported (Table 4). This is consistent with the view that high-stake institutional investors can control the competition among indirectly informed investors (i.e., fund investors) more effectively than short-term institutional investors (Admati and Pfleiderer, 1988).

The magnitudes of the coefficients on our variables of interest also indicate that the effects are economically significant. Based on the results reported in column 2 of Table 5, the coefficients on *IO_DOM_SHORT*, *IO_FOR_US_SHORT* and *IO_FOR_NUS_SHORT* implies that a ten-percentage point increase in ownership is associated with a change of R^2 for the market model in Eq. (1) by 0.05%, -1.95% and -0.58%, respectively. The economic impact of *IO_FOR_US_SHORT* is nontrivial (nearly 2% decrease in average R^2).

The significantly negative coefficient on *IO_FOR_US_SHORT* can be interpreted in the following way: Short-term U.S. institutions with active investment strategies effectively reduce per unit cost of acquiring firm-specific information by spreading the associated fixed cost over the units traded, and are therefore better able to invest in the production of firm-specific information than long-term domestic institutions. As a result, U.S. institutions with short-term investment horizons are likely to rely more on firm-specific information when making their investment decisions, thereby reducing stock return comovement. In contrast, long-term

domestic institutions with passive investment strategies are likely to rely more on common information, thereby increasing comovement, because the fixed cost of acquiring firm-specific information is prohibitively high for this type of domestic investors.

(INSERT TABLE 5 HERE)

5. Further analyses

5.1. Change regressions

Thus far, our regression analysis has used the *level* of institutional ownership as the test variable and the results shed lights on the *holding effect* of institutional investors. Boehmer and Kelley (2009) show that "the level of institutional holdings has a direct effect on efficiency that is orthogonal to the effect of trading" (p. 3565). To address the potential *trading effect*, we now examine the relation between the change in institutional ownership and the change in stock return comovement. Veldkamp (2006) shows that investors can economize on the cost of information production by relying on common information (with wider demand, larger user base, and thus low unit production cost). However, such reliance on common information leads to potential mispricings for individual stocks. If institutional investors, who are capable of producing firm-specific information, engage aggressively in information-based trading, and thus, mitigate mispricings, one can observe an increase in the amount of firm-specific information incorporated into stock price or a decrease in comovement.

Previous research uses changes in institutional ownership to capture institutional trading (e.g., Piotroski and Roulstone, 2004; Boehmer and Kelley, 2009; Yan and Zhang, 2009). Admittedly, however, the change in institutional ownership is a noisy measure of actual trades over a quarter (Chen, 2007). Specifically, the change in institutional ownership as a measure of trading does not capture actual trades among institutional investors. Therefore, there are potential

limitations for using the change in institutional ownership to infer institutions' trading effect. With the above caveats, we perform the change analysis to obtain additional insight into the effects of institutional trading on stock return comovement.[10] If institutional investors have a significant influence on comovement as our results imply, then as institutional ownership increases over time, we would expect to observe a subsequent decrease in comovement.

Table 6 presents the results for regressions with changes in return comovement as the dependent variable and changes in institutional ownership as the main explanatory variable. The dependent variable $\Delta Comovement_t$ is changes in the return comovement from year *t-1* to year *t*. The main explanatory variables are changes in institutional ownership ΔIO_{t-1} from year *t-2* to year *t-1*. We express all other independent variables in terms of changes.

As shown in Table 6, we find that the coefficients on the changes in domestic institutional ownership and its interaction with low-stake holdings (ΔIO_DOM and ΔIO_DOM_LOW, respectively) are positive and significant. In contrast, we find that the coefficients on the changes in U.S.-based institutional ownership and its interactions with high-stake holdings and short-term horizon (ΔIO_FOR_US, $\Delta IO\_FOR\_US\_HIGH$ and $\Delta IO\_FOR\_US\_SHORT$, respectively) are negative and significant at the 5% level. The coefficient on changes in shareholdings of foreign institutions from common-law countries (ΔIO_FOR_COMMON) is significantly negative, while the coefficient on changes in shareholdings of foreign institutions from civil-law countries (ΔIO_FOR_CIVIL) is significantly positive.

Overall, our results in Table 6 are in line with our results reported in Tables 3 to 5.

[10] Further, the similarity in statistical inferences, if observed, between results of level and change regressions would alleviate a concern about potential problems of correlated variables.

Specifically, we find that an increase in domestic institutional ownership contributes to the incorporation of common information into stock price, thereby leading us to observe an increase in comovement. We further find that an increase in U.S. institutional ownership facilitates the incorporation of firm-specific information into stock prices, while an increase in non-U.S. foreign institutional ownership leads to an increase in comovement. Finally, an increase in shareholdings of foreign institutions from common law countries facilitates the flow of firm-specific information in the market, and thus, mitigates stock return comovement, while the same increase in institutional holding by foreign institutions from civil law countries facilitates the flow of common information in the market, thereby increasing stock return comovement.

(INSERT TABLE 6 HERE)

5.2. Endogeneity

An important remaining concern is whether institutional ownership is endogenously determined. For example, long-term institutions may prefer to invest in stocks of more transparent firms (Bushee, 1998). As such, the observed impact of institutional shareholdings on stock return comovement from a single-equation ordinary least squares (OLS) regression may suffer from simultaneous equation bias. To address the issue of endogeneity, we use the residual institutional ownership for various types of institutions (instead of raw institutional ownership) in our main regression Eq. (3). Specifically, we estimate the residual institutional ownership using a separate regression of institutional ownership on various firm-specific characteristics as specified below:

$$IO_{i,t} = \alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 MB_{i,t-1} + \alpha_3 Q_{i,t-1} + \alpha_4 LEV_{i,t-1} + \alpha_5 CASH_{i,t-1} + \alpha_6 TURN_{i,t} + \alpha_7 VOLA_{i,t} + \alpha_8 AGE_{i,t} + \alpha_9 DP_{i,t-1} + \alpha_{10} RET_{i,t-12,t-3} + \alpha_{11} RET_{i,t-2,t} + (\textit{Industry and Country dummies}) + \varepsilon_{i,t} \quad (4)$$

where all the variables are defined Appendix A. We select the above determinants of institutional ownership based on prior studies. Gompers and Metrick (2001) find that U.S. institutions invest in larger and more liquid stocks with relatively low past returns. We therefore include leverage (*LEV*) and lagged return ($RET_{t-12, t-3}$, $RET_{t-2, t}$) in Eq. (4). Kang and Stulz (1997) examine foreign ownership in Japanese firms and find that foreign investors tend to invest in larger and more established firms with better accounting performance and lower leverage. To control for investment opportunity and age, we include in Eq. (3) Tobin's *Q* and *AGE*, respectively. We also include cash dividend yield (*DP*) and cash holding (*CASH*) because Dahlquist and Robertsson (2001) find that foreign investors in Sweden prefer larger firms with low dividends and large cash holdings. Ferreira and Matos (2008) find that U.S. institutions have a preference for value stocks (low *MB*), and thus *MB* is included. Covrig et al. (2006) show that both domestic and foreign institutional investors prefer stocks with a high turnover, and low volatility. We therefore include annual share turnover (*TURN*), and return volatility (*VOLA*) in Eq. (4).

Table 8 presents the estimates of regression analysis of return comovement and residual institutional ownership (*RIO*). For brevity, we do not report the results of regression in Eq. (5).[11] Note here that the results reported in Table 8 correspond to the main results reported in Tables 3 to 5. First, we find the coefficients on *RIO_DOM* are insignificant in both columns 1 and 5. Moreover, we find the coefficient on *RIO_FOR_US* is significantly negative (-0.523 with t = -4.630) while the coefficient on *RIO_FOR_NUS* is significantly positive (0.272 with t = 3.331). The above findings suggest that it is foreign institutions, particularly U.S.-based institutions, but not domestic institutions, that facilitate the incorporation of firm-specific information into stock price and thus reduce stock return comovement, consistent with our first prediction (in section

[11] The full results are available from us upon request.

2.1).

Second, as shown in column 2, we find that the coefficients on *RIO_FOR_US_HIGH* is significantly negative (-0.686 with t = -3.593) while the coefficient on *RIO_FOR_US_LOW* is only weakly significant, though negative (-0.629 with t = -1.671). In contrast, we find that the coefficients on both *RIO_DOM_LOW* and *RIO_FOR_NUS_LOW* are significantly positive (1.955 with t = 9.813 and 1.655 with t = 7.823). Overall, the above findings strongly supports our second prediction (in section 2.2) that high-stake foreign (particularly U.S.-based) institutions facilitate firm-specific information flow, and thus reduce stock return comovement, while low-stake institutions, whether domestic and non-U.S.-based, facilitate the flow of common information to the market, thereby increasing comovement.

Finally, as shown in column 3, we find that the coefficient on *RIO_FOR_US_SHORT* is significantly negative (-1.446 with t = -3.435) while the coefficient on *RIO_FOR_NUS_SHORT* is positive and marginally significant (0.516 with t = 1.864). The coefficients on other variables of interest are insignificant. The above finding is in line with our third prediction (in section 2.3) that short-term U.S. institutions with active investment strategies contribute more to the impounding of firm-specific information into stock price than long-term institutions with passive strategies. However, short-term non-U.S. institutions appear to rely more heavily on common information than firm-specific information when making their trading decisions, thereby leading to a positive relation between comovement and *RIO_FOR_NUS_SHORT*.

In short, all specifications using residual institutional ownership reported in Table 8 generate results similar to those in Tables 3 to 5. The results are in support of a causal link from institutional ownership to stock return comovement, not vice versa, and suggest that endogeneity is unlikely to be a factor explaining the observed relations between stock return

comovement and country origins and different types of institutional ownership.

(INSERT TABLE 7 HERE)

As a further check for endogeneity, we now perform a variety of reverse changes regression analyses: We regress each of various measures of $\Delta IO_{i,t}$ in Eq. (4) on $\Delta Comovement_{i,t-1}$ and *changes* in the same set of control variables used in Eq. (4). Our objective here is to determine whether changes in institutional ownership drive changes in comovement as predicted earlier, but not vice versa.

Table 8 reports the results of the reverse change regressions using each of various institutional ownership measures as the dependent variable. For brevity, we report the estimated coefficients only for the variable of interest, i.e., $\Delta Comovement_{t-1}$. We find that the coefficients on $\Delta Comovement_{t-1}$ are insignificant in most cases. In particular, the coefficient on the $\Delta Comovement_{t-1}$ is insignificant when the dependent variables are U.S.-based high-stake and short-term institutions ($\Delta IO\_FOR\_US_t$, $\Delta IO\_FOR\_US\_HIGH_t$ and $\Delta IO\_FOR\_US\_SHORT_t$, respectively), suggesting that the negative relation between comovement and U.S.-based high-stake and short-term institutional ownership is unlikely to be driven by institutions' sale of a stock before its return comovement increases. Overall, the evidence in Table 8 is consistent with the view that U.S.-based high-stake and short-term institutions reduce stock return comovement, but it is not consistent with changes in comovement driving changes in institutional ownership. In short, the results of reverse change regressions in Table 8 suggest that it is an increase in ownership by U.S. institutions with high stakeholdings and with short-term investment horizons that contributes much to the improved firm-specific information flow or the reduced stock return comovement for non-U.S. stocks.

(INSERT TABLE 8 HERE)

5.3 The effect of institutional infrastructure

The strength of institutional infrastructure in the country where the firm is located can also influence the role that institutional investors play in shaping a firm's information environment. We expect that firms located in countries with weak legal regimes benefit more from equity investments by international institutional investors than firms located in countries with strong legal environments. This is because international equity investment by foreign institutions is likely to improve the information environment and the governance efficacy, to a greater extent, for the former firms than for the latter firms. In an attempt to differentiate the effect of the strength of legal regime or shareholder protection on firm-specific information flow between firms located in countries with strong legal regimes and those with weak legal regimes, we repeat our regression analyses, separately, for each of subsamples that are constructed based on the following proxies of country-level institutional infrastructure: (1) the legal origin of a country based on La Porta et al. (1998); (2) the enforcement index constructed with the rule of law index from La Porta et al. (1997) and the anti-director rights index from Djankov, et al. (2008). Though not tabulated for brevity, our results show, overall, that, consistent with our expectation, the impact of shareholdings by foreign (particularly, U.S.), high-stake, and short-term institutions on improving firm-specific information flow is more pronounced in countries with weak institution infrastructures than in countries with strong institutional infrastructures.[12]

5.4 Controlling for country-level effect

Thus far, reported *t*-values for regression coefficients are on an adjusted basis using standard errors corrected for firm-level clustering. Given that our sample firms are from 40

[12] The full results are available from the authors upon request.

countries with differing levels of economic developments and institutional infrastructures, we repeat our regression analysis, and make inferences on estimated coefficients, using standard errors corrected for country-level clustering. Untabulated results show that the use of country-level clustering does not alter our results, suggesting that our regression results are robust to the use of different clustering approaches.

6. Conclusion

This study examines whether differing groups or types of institutional investors play different roles in facilitating firm-specific information flow in the market or in mitigating stock return comovement. By focusing on different colors of institutional investors, our study provides an explanation on whether, how, and why shareholdings by different country origins and types of institutions are linked to firm-specific information in the market. We find that foreign institutions, particularly, U.S.-based institutions, play a more significant role than domestic institutions in facilitating the incorporation of firm-specific information into stock price, because U.S. institutions tend to have greater access to global private information, possesses superior information processing skills, and are likely to have relatively lower marginal costs of acquiring and processing firm-specific information, compared with non-U.S. institutions. We next find that institutions with higher stakeholdings and/or more intense trading contribute more to firm-specific information flow in the market, suggesting that these institutions can effectively cope with the high fixed costs for producing firm-specific information.

We further find that changes in foreign (particularly U.S.), high-stake, and short-term institutional ownerships lead to subsequent changes in firm-level return comovement, but not vice versa. In the subsample analysis, we also find foreign (particularly U.S.), high-stake, and short-term institutional ownership play a significant role in facilitating firm-specific information

flows especially in countries with weak legal regimes. To the extent that institutions are rational in their information choices with respect to firm-specific versus common information, we establish a link between institution-specific characteristics and their information choices.

Our results provide an important policy implication: Given that informative stock prices facilitate efficient financing and investment decisions, stock market regulators in emerging markets should take into account the informational role of well-informed institutional investors in general and the superior role of foreign (particularly U.S.), high-stake, and short-term institutional investors in particular in facilitating the relative flow of firm-specific versus common information in the market.

(INSERT APPENDICES A AND B HERE)

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Appendix A: Variable definitions

Dependent Variable: comovement

Comovement is a measure of market-wide information arriving to the securities market based on R^2 from the expanded market model regression,

$$r_{i,t} = \alpha_j + \beta_{1,t} r_{m,j,t-1} + \beta_{2,t}(r_{us,t-1} + e_{j,t-1}) + \beta_{3,t} r_{m,j,t} + \beta_{4,t}(r_{us,t} + e_{j,t}) + \beta_{5,t} r_{m,j,t+1} + \beta_{6,t}(r_{us,t+1} + e_{j,t+1}) + \varepsilon_{j,t}$$

Specifically, $Comovement = ln(R^2/(1 - R^2))$.

Control Variables

SIZE is the natural log of market capitalization at the end of the fiscal year (in millions of U.S. dollars).

MB is the ratio of market value of equity to the book value of equity at the end of the fiscal year.

LEV is the book value of long-term debt scaled by the sum of market value of equity and book value of long-term debt at the end of the fiscal year.

ACCR is the absolute value of total accounting accruals scaled by total operating cash flows.

ROA is the income before extraordinary items divided by the beginning-of-fiscal year total asset.

DIVERS is the number of business segments.

HERF is the revenue-based Herfindahl index of industry-level concentration, calculated with the revenues of all firms within each country.

NIND is the natural log of the number of firms in each industry used to calculate *HERF*.

NAF is the natural log of number of analysts issuing forecasts for the firm during the fiscal year.

TURN is annual share turnover over the current year, where share turnover is calculated as the average monthly trading volume divided by the total number of shares outstanding during the month.

IndustryDummies are industry indicators based on two-digit SIC codes.

Institutional Ownership Determinants:

Q is calculated as the market value of equity plus the book value of assets minus the book value of equity scaled by the book value of assets at the end of the fiscal year.

LEV is the book value of long-term debt scaled by the sum of the market value of equity and the book value of long-term debt at the end of the fiscal year.

CASH is cash and equivalents, scaled by beginning-of-fiscal year assets.

VOLA is the volatility estimated as the standard deviation of monthly returns over the previous two fiscal years.

AGE is firm age, calculated as the log of the number of months since the first return appears in *Datastream*.

DP is dividend yield, calculated as cash dividend divided by share price.

$REL_{t-2, t-1}$ is cumulative gross returns over the past three months.

$REL_{t-12, t-3}$ is cumulative gross returns over the nine months preceding the beginning of the filing quarter.

Country institutional infrastructure

Law equals one if a country has a common law legal origin and zero otherwise. Source: *La Porta et al. (1998)*.

ENF is a law enforcement index for the country where the company is located. It is equal to 0.5* (rule of law index) + anti-directors rights. The variable is taken from *Choi and Wong (2007)*, who use the rule of law index from *La Porta et al. (1997)* and the anti-directors rights index from *Djankov et al. (2008)*.

Appendix B: Definition of short-term and long-term institutional investors

Yan and Zhang (2009) classify institutional investors into short- and long-term investors on the basis of their portfolio turnover (churn rate) over the past four quarters. Specifically, for each quarter, we first calculate the aggregate purchase and sale for each institution:

$$CR\_buy_{k,t} = \sum_{i=1}^{N_k} | S_{k,i,t}P_{i,t} - S_{k,i,t-1}P_{i,t-1} - S_{k,i,t-1}\Delta P_{i,t} |, S_{k,i,t} > S_{k,i,t-1} \quad \text{(a)}$$

$$CR\_sell_{k,t} = \sum_{i=1}^{N_k} | S_{k,i,t}P_{i,t} - S_{k,i,t-1}P_{i,t-1} - S_{k,i,t-1}\Delta P_{i,t} |, S_{k,i,t} <= S_{k,i,t-1} \quad \text{(b)}$$

where $P_{i,t}$ is the share price for stock i at the end of quarter t, $S_{k,i,t}$ is the number of shares of stock i held by investor k at the end of quarter t, and $CR\_buy_{k,t}$ and $CR\_sell_{k,t}$ are institution k's aggregate purchase and sale for quarter t, respectively. Institution k's churn rate for quarter t is then defined as

$$CR_{k,t} = \frac{\min(CR\_buy_{k,t}, CR\_sell_{k,t})}{\sum_{i=1}^{N_k} \frac{S_{k,i,t}P_{i,t} + S_{k,i,t-1}P_{i,t-1}}{2}} \quad \text{(c)}$$

Next, we calculate each institution's average churn rate over the past four quarters as

$$AVG\_CR_{k,t} = \frac{1}{4}\sum_{j=0}^{3} CR_{k,t-j} \quad \text{(d)}$$

Given the average churn rate measure, for each quarter, we sort all institutional investors into three tertile portfolios based on $AVG\_CR_{k,t}$. Those ranked in the top tertile, with the highest average churn rate, are classified as short-term institutional investors, and those ranked in the bottom tertile, with the lowest average churn rate, are classified as long-term institutional investors. Finally, for each stock, we define short- and long-term institutional ownership (hereafter *IO_SHORT* and *IO_LONG*, respectively) as the ratio between the number of shares held by short- and long-term institutional investors, respectively, and the total number of shares outstanding.

Table 1 Summary statistics by country

This table shows the number of observations, the average of return comovement and institutional ownership by country, and the country level variables of legal infrastructure.

		Comovement	Institutional ownership			Country institutions	
Country	N. obs.	Mean	*IO_ TOTAL*	*IO_ DOM*	*IO_ FOR*	Common law	Enforcement
ARGENTINA	225	-0.657	0.064	0.046	0.018	0	4.68
AUSTRALIA	2,333	-1.722	0.088	0.048	0.040	1	9.00
AUSTRIA	312	-1.486	0.091	0.022	0.068	0	7.50
BELGIUM	472	-1.420	0.106	0.062	0.044	0	8.00
BRAZIL	458	-1.114	0.142	0.089	0.053	0	8.16
CANADA	3,023	-1.710	0.227	0.178	0.049	1	9.00
CHILE	383	-1.166	0.050	0.044	0.007	0	7.51
CHINA	432	-1.113	0.235	0.013	0.222	0	-
DENMARK	518	-1.497	0.096	0.046	0.050	0	9.00
FINLAND	567	-1.400	0.185	0.071	0.115	0	8.50
FRANCE	2,937	-1.448	0.125	0.078	0.047	0	7.99
GERMANY	2,320	-1.442	0.144	0.075	0.069	0	8.12
GREECE	1,034	-0.706	0.078	0.059	0.019	0	5.09
HONG KONG	2,259	-1.371	0.070	0.007	0.063	1	9.11
HUNGARY	110	-1.034	0.146	0.001	0.145	0	-
INDIA	1,405	-0.726	0.109	0.071	0.038	1	7.09
INDONESIA	606	-0.897	0.068	0.000	0.068	0	5.99
IRELAND	181	-1.476	0.138	0.007	0.131	1	8.90
ISRAEL	504	-1.156	0.083	0.002	0.081	1	6.41
ITALY	1,037	-1.110	0.090	0.038	0.052	0	6.17
JAPAN	15,601	-1.099	0.042	0.024	0.018	0	8.99
KOREA (SOUTH)	1,906	-1.066	0.061	0.001	0.060	0	7.18
MALAYSIA	2,044	-1.006	0.049	0.032	0.017	1	8.39
NETHERLANDS	220	-1.392	0.292	0.061	0.231	0	7.50
NEW ZEALAND	274	-1.444	0.058	0.001	0.058	1	9.00
NORWAY	458	-1.152	0.181	0.109	0.071	0	8.50
PAKISTAN	103	-0.146	0.028	0.000	0.028	1	5.52
PHILIPPINES	297	-1.103	0.034	0.001	0.033	0	5.37
POLAND	273	-1.102	0.143	0.070	0.073	0	-
PORTUGAL	259	-1.307	0.120	0.073	0.047	0	6.84
RUSSIA	112	-0.661	0.042	0.000	0.042	0	-
SINGAPORE	1,231	-1.176	0.057	0.016	0.041	1	9.29
SOUTH AFRICA	865	-1.451	0.123	0.093	0.029	1	7.21
SPAIN	615	-1.110	0.154	0.083	0.071	0	8.90
SWEDEN	1,027	-1.155	0.267	0.186	0.081	0	8.50
SWITZERLAND	932	-1.382	0.174	0.075	0.099	0	8.00
TAIWAN	2,999	-0.747	0.076	0.048	0.028	-	-
THAILAND	896	-1.065	0.065	0.017	0.049	1	7.13
TURKEY	115	-0.368	0.128	0.000	0.128	0	5.59
U.K.	4,406	-1.645	0.171	0.134	0.037	1	9.29

Table 2 Descriptive statistics

This table reports descriptive statistics. To be included in sample, a firm must have stock returns and trading volume in the *Datastream* database and assets and other financial data in the *Worldscope* database for the period 1998–2006, as well as lagged financial data. The institutional ownership data are obtained from the *Thomson Financial Equity Ownership* database. The exact definitions of variables are provided in Appendix A.

	N. obs.	*Mean*	*Std. Dev.*	*5th Pctl*	*Median*	*95th Pctl*
Panel A: Institutional ownership variables						
IO_TOTAL_{t-1}	55,749	0.099	0.133	0.001	0.047	0.375
IO_DOM_{t-1}	55,749	0.057	0.095	0.000	0.016	0.244
IO_FOR_{t-1}	55,749	0.042	0.085	0.000	0.008	0.207
$IO\_FOR\_US_{t-1}$	55,749	0.015	0.044	0.000	0.001	0.077
$IO\_FOR\_NUS_{t-1}$	55,749	0.027	0.061	0.000	0.003	0.141
$IO\_FOR\_COMMON_{t-1}$	55,749	0.031	0.070	0.000	0.004	0.156
$IO\_FOR\_CIVIL_{t-1}$	55,749	0.011	0.031	0.000	0.000	0.061
$IO\_DOM\_HIGH_{t-1}$	55,749	0.013	0.050	0.000	0.000	0.095
$IO\_DOM\_LOW_{t-1}$	55,749	0.019	0.029	0.000	0.007	0.078
$IO\_FOR\_HIGH_{t-1}$	55,749	0.008	0.039	0.000	0.000	0.056
$IO\_FOR\_LOW_{t-1}$	55,749	0.020	0.039	0.000	0.005	0.095
$IO\_FOR\_US\_HIGH_{t-1}$	55,749	0.003	0.025	0.000	0.000	0.000
$IO\_FOR\_US\_LOW_{t-1}$	55,749	0.006	0.015	0.000	0.001	0.030
$IO\_FOR\_NUS\_HIGH_{t-1}$	55,749	0.004	0.030	0.000	0.000	0.000
$IO\_FOR\_NUS\_LOW_{t-1}$	55,749	0.013	0.028	0.000	0.001	0.066
$IO\_DOM\_SHORT_{t-1}$	55,749	0.012	0.032	0.000	0.000	0.062
$IO\_DOM\_LONG_{t-1}$	55,749	0.014	0.035	0.000	0.000	0.076
$IO\_FOR\_SHORT_{t-1}$	55,749	0.010	0.028	0.000	0.000	0.056
$IO\_FOR\_LONG_{t-1}$	55,749	0.010	0.028	0.000	0.001	0.049
$IO\_FOR\_US\_SHORT_{t-1}$	55,749	0.002	0.010	0.000	0.000	0.010
$IO\_FOR\_US\_LONG_{t-1}$	55,749	0.005	0.020	0.000	0.000	0.022
$IO\_FOR\_NUS\_SHORT_{t-1}$	55,749	0.009	0.025	0.000	0.000	0.048
$IO\_FOR\_NUS\_LONG_{t-1}$	55,749	0.005	0.016	0.000	0.000	0.025
Panel B: Return Comovement as test variable						
$Comovement_t$	55,749	-1.228	0.885	-2.728	-1.219	0.219
Panel C: Firm-specific control variables						
$SIZE_{t-1}$	55,749	9.783	1.738	7.202	9.602	13.054
$Comovement_{t-1}$	55,749	-1.259	0.884	-2.752	-1.258	0.194
MB_{t-1}	55,749	2.223	2.872	0.367	1.380	6.884
LEV_{t-1}	55,749	0.123	0.133	0.000	0.084	0.393
$ACCR_t$	55,749	0.931	1.731	0.067	0.576	2.744
ROA_t	55,749	0.132	0.110	0.019	0.108	0.315
$DIVERS_t$	55,749	3.821	2.021	1.000	3.000	8.000
HERF	55,749	0.245	0.235	0.028	0.159	0.803

$NIND_t$	55,749	7.050	1.063	5.124	7.133	8.331
NAF_t	55,749	1.239	1.084	0.000	1.099	3.178
$TURN_t$	55,749	0.088	0.152	0.003	0.037	0.366
$SIZE_t$	55,713	9.888	1.755	7.270	9.703	13.173
Q_{t-1}	55,749	1.523	1.226	0.663	1.142	3.695
$CASHt_{t-1}$	54,300	0.188	0.268	0.009	0.114	0.576
$VOLA_t$	54,275	0.076	0.145	0.002	0.026	0.331
AGE_t	55,749	4.826	0.761	3.401	4.920	5.956
DP_{t-1}	52,530	0.022	0.027	0.000	0.014	0.076
$RET_{t-2, t}$	53,143	0.034	0.234	-0.311	0.015	0.443
$RET_{t-12, t-3}$	52,639	0.170	0.553	-0.485	0.080	1.145

Table 3 Comovement and domestic versus foreign institutions

This table reports the regression analysis of stock return comovement on domestic versus foreign institutional ownership. The sample consists of 55,749 firm–year observations drawn from 40 countries for 1998–2006. The dependent variable is $Comovement_t$. The coefficients and the test statistics are based on the regression model in Eq. (3). The *t*-statistics, reported in parentheses, are based on robust standard errors corrected for firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)
IO_TOTAL_{t-1}	-0.011			
	(-0.345)			
IO_DOM_{t-1}		0.017	0.018	0.006
		(0.430)	(0.446)	(0.153)
IO_FOR_{t-1}		-0.044*		
		(-1.932)		
$IO\_FOR\_US_{t-1}$			-0.331***	
			(-3.504)	
$IO\_FOR\_NUS_{t-1}$			0.135**	
			(2.273)	
$IO\_FOR\_COMMON_{t-1}$				-0.257***
				(-4.556)
$IO\_FOR\_CIVIL_{t-1}$				0.770***
				(6.261)
$SIZE_{t-1}$	0.118***	0.118***	0.119***	0.118***
	(33.870)	(33.850)	(34.050)	(33.910)
$Comovement_{t-1}$	0.225***	0.225***	0.224***	0.223***
	(47.700)	(47.710)	(47.670)	(47.530)
MB_{t-1}	0.001	0.001	0.001	0.001
	(0.335)	(0.361)	(0.300)	(0.368)
LEV_{t-1}	0.119***	0.118***	0.118***	0.118***
	(4.191)	(4.168)	(4.183)	(4.157)
$ACCR_t$	-0.000	-0.000	0.000	0.000
	(0.004)	(-0.000)	(0.030)	(0.022)
ROA_t	-0.232***	-0.231***	-0.232***	-0.231***
	(-7.460)	(-7.443)	(-7.474)	(-7.435)
$DIVERS_t$	0.016***	0.016***	0.016***	0.016***
	(7.926)	(7.917)	(7.930)	(7.895)
$HERF_t$	-0.011	-0.011	-0.019	-0.010
	(-0.494)	(-0.494)	(-0.550)	(-0.453)
$NIND_t$	-0.122***	-0.123***	-0.123***	-0.118***
	(-6.626)	(-6.653)	(-6.676)	(-6.372)
NAF_t	0.055***	0.055***	0.054***	0.054***
	(10.750)	(10.800)	(10.660)	(10.680)
$TURN_t$	0.359***	0.359***	0.361***	0.355***
	(14.290)	(14.260)	(14.370)	(14.130)
Intercept	-1.357***	-1.355***	-1.363***	-1.429***
	(-6.905)	(-6.902)	(-6.787)	(-6.728)
No. observations	55,749	55,749	55,749	55,749
Adjusted R^2	0.351	0.351	0.352	0.352

Table 4 Comovement and high versus low institutional stakeholdings

This table reports the regression analysis of stock return comovement on institutions of high- / low- stakeholdings. The sample consists of 55,749 firm–year observations drawn from 40 countries for 1998–2006. The dependent variable is $Comovement_t$. The coefficients and the test statistics are based on the regression model in Eq. (3). The *t*-statistics, reported in parentheses, are based on robust standard errors corrected for firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix A.

	(1)	(2)
$IO\_DOM\_HIGH_{t-1}$	-0.270***	-0.274***
	(-4.322)	(-4.400)
$IO\_DOM\_LOW_{t-1}$	1.312***	1.336***
	(8.095)	(8.359)
$IO\_FOR\_HIGH_{t-1}$	-0.428***	
	(-5.217)	
$IO\_FOR\_LOW_{t-1}$	0.785***	
	(6.160)	
$IO\_FOR\_US\_HIGH_{t-1}$		-0.423***
		(-2.879)
$IO\_ FOR\_US\_LOW_{t-1}$		-0.678*
		(-1.865)
$IO\_ FOR\_NUS\_HIGH_{t-1}$		-0.387*
		(-1.823)
$IO\_ FOR\_NUS\_LOW_{t-1}$		1.435***
		(8.037)
$SIZE_{t-1}$	0.105***	0.106***
	(28.860)	(29.210)
$Comovement_{t-1}$	0.222***	0.221***
	(46.950)	(47.020)
MB_{t-1}	0.001	0.001
	(0.511)	(0.392)
LEV_{t-1}	0.120***	0.120***
	(4.250)	(4.278)
$ACCR_t$	0.000	0.000
	(0.114)	(0.078)
ROA_t	-0.242***	-0.245***
	(-7.795)	(-7.891)
$DIVERS_t$	0.016***	0.016***
	(7.892)	(7.980)
$HERF_t$	-0.008	-0.010
	(-0.369)	(-0.449)
$NIND_t$	-0.124***	-0.123***
	(-6.783)	(-6.691)
NAF_t	0.039***	0.038***
	(7.701)	(7.435)
$TURN_t$	0.323***	0.328***
	(12.840)	(13.180)
Intercept	-1.228***	-1.241***
	(-6.574)	(-6.624)
No. observations	55,749	55,749
Adjusted R^2	0.354	0.354

Table 5 Comovement and short- versus long-term institutional investors

This table reports the regression analysis of stock return comovement on short- / long-term institutions. The sample consists of 55,749 firm–year observations drawn from 40 countries for 1998–2006. The dependent variable is $Comovement_t$. The coefficients and the test statistics are based on the regression model in Eq. (3). The *t*-statistics, reported in parentheses, are based on robust standard errors corrected for firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix A.

	(1)	(2)
$IO\_DOM\_SHORT_{t-1}$	0.029	0.029
	(0.280)	(0.277)
$IO\_DOM\_LONG_{t-1}$	0.031**	0.035**
	(1.993)	(1.967)
$IO\_FOR\_SHORT_{t-1}$	0.134	
	(0.999)	
$IO\_FOR\_LONG_{t-1}$	-0.155	
	(-1.202)	
$IO\_FOR\_US\_SHORT_{t-1}$		-1.081***
		(-2.768)
$IO\_ FOR\_US\_LONG_{t-1}$		-0.328
		(-1.510)
$IO\_ FOR\_NUS\_SHORT_{t-1}$		0.336
		(1.490)
$IO\_ FOR\_NUS\_LONG_{t-1}$		0.133
		(0.671)
$SIZE_{t-1}$	0.118***	0.119***
	(33.850)	(34.070)
$Comovement_{t-1}$	0.225***	0.224***
	(47.690)	(47.670)
MB_{t-1}	0.000	0.001
	(0.293)	(0.355)
LEV_{t-1}	0.119***	0.118***
	(4.189)	(4.187)
$ACCR_t$	-0.000	0.000
	(-0.003)	(0.014)
ROA_t	-0.232***	-0.233***
	(-7.473)	(-7.489)
$DIVERS_t$	0.016***	0.016***
	(7.952)	(7.965)
$HERF_t$	-0.011	-0.012
	(-0.507)	(-0.547)
$NIND_t$	-0.123***	-0.123***
	(-6.656)	(-6.649)
NAF_t	0.054***	0.054***
	(10.660)	(10.650)
$TURN_t$	0.357***	0.362***
	(14.190)	(14.420)
Intercept	-1.349***	-1.360***
	(-6.851)	(-6.872)
No. observations	55,749	55,749
Adjusted R^2	0.351	0.352

Table 6 The impact of changes in institutional ownership on changes in comovement

This table reports the results of regression of changes in stock return comovement from year t-1 to t on changes in institutional ownership from year t-2 to t-1. In column (2), *IO_DOM, IO_FOR, IO_FOR_US*, and *IO_FOR_NUS* are interacted with *HIGH* or *LOW*, while in column (3), *IO_DOM, IO_FOR, IO_FOR_US*, and *IO_FOR_NUS* are interacted with *SHORT* or *LONG*. The sample consists of 32,416 firm–year observations drawn from 33 countries for 1999–2006. The t-statistics, reported in parentheses, are based on robust standard errors corrected for both firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2) High vs. Low	(3) Short vs. Long	(4)
ΔIO_DOM_{t-1}	0.058*			0.054*
	(1.838)			(1.770)
$\Delta IO\_FOR\_US_{t-1}$	-0.149**			
	(-2.077)			
$\Delta IO\_FOR\_NUS_{t-1}$	0.281***			
	(2.735)			
$\Delta IO\_DOM\_HIGH_{t-1}$ or $SHORT_{t-1}$		-0.098	0.017	
		(-0.977)	(0.130)	
$\Delta IO\_DOM\_LOW_{t-1}$ or $LONG_{t-1}$		1.000***	-0.109	
		(4.322)	(-0.817)	
$\Delta IO\_FOR\_US\_HIGH_{t-1}$ or $SHORT_{t-1}$		-0.027**	-0.314***	
		(-2.141)	(-2.604)	
$\Delta IO\_FOR\_US\_LOW_{t-1}$ or $LONG_{t-1}$		0.028	-0.299	
		(0.058)	(-1.251)	
$\Delta IO\_FOR\_NUS\_HIGH_{t-1}$ or $SHORT_{t-1}$		-0.033	0.154	
		(-0.225)	(0.825)	
$\Delta IO\_FOR\_NUS\_LOW_{t-1}$ or $LONG_{t-1}$		1.727***	0.690**	
		(5.931)	(2.518)	
$\Delta IO\_FOR\_COMMON_{t-1}$				-0.088**
				(-1.996)
$\Delta IO\_FOR\_CIVIL_{t-1}$				0.711***
				(3.653)
$\Delta SIZE_{t-1}$	0.115***	0.106***	0.117***	0.115***
	(13.700)	(12.400)	(13.940)	(13.680)
$\Delta Comovement_{t-1}$	-0.458***	-0.458***	-0.457***	-0.458***
	(-121.000)	(-121.100)	(-120.900)	(-121.000)
ΔMB_{t-1}	0.002	0.002	0.002	0.002
	(0.766)	(0.848)	(0.715)	(0.788)
ΔLEV_{t-1}	0.007	0.008	0.005	0.006
	(0.113)	(0.129)	(0.080)	(0.092)
$\Delta ACCR_t$	-0.000	-0.000	-0.000	-0.000
	(-0.195)	(-0.169)	(-0.193)	(-0.188)
ΔROA_t	-0.093**	-0.095**	-0.092**	-0.094**
	(-1.995)	(-2.036)	(-1.978)	(-2.012)
$\Delta DIVERS_t$	-0.106	-0.105	-0.108	-0.105
	(-1.113)	(-1.101)	(-1.143)	(-1.105)
$\Delta HERF_t$	0.218***	0.214***	0.215***	0.217***
	(5.510)	(5.406)	(5.405)	(5.483)
$\Delta NIND_t$	0.047***	0.043***	0.048***	0.047***
	(5.228)	(4.823)	(5.318)	(5.209)
ΔNAF_t	-0.389***	-0.388***	-0.387***	-0.389***
	(-8.940)	(-8.910)	(-8.895)	(-8.929)
$\Delta TURN_t$	(-4.930)	(-7.808)	(-4.900)	(-5.748)
	-0.002	-0.000	-0.002	-0.000
Intercept	0.408***	0.403***	0.415***	0.412***
	(4.869)	(5.056)	(5.070)	(4.821)
N. observations	44,172	44,172	44,172	44,172
Adjusted R^2	0.313	0.314	0.313	0.313

Table 7 Comovement and residual institutional ownership

This table reports the regression analysis of stock return comovement on residual institutional ownership. The sample consists of 37,256 firm–year observations drawn from 36 countries for 1999–2006. The dependent variable is $Comovement_t$. In column (2), *IO_DOM, IO_FOR, IO_FOR_US,* and *IO_FOR_NUS* are interacted with *HIGH* or *LOW*, while in column (3)**,** *IO_DOM, IO_FOR, IO_FOR_US,* and *IO_FOR_NUS* are interacted with *SHORT* or *LONG*. The *t*-statistics, reported in parentheses, are based on robust standard errors corrected for firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix A.

	(1)	(2) High vs. Low	(3) Short vs. Long	(4)
RIO_DOM_{t-1}	0.039			0.036
	(0.720)			(0.659)
$RIO\_FOR\_US_{t-1}$	-0.523***			
	(-4.630)			
$RIO\_FOR\_NUS_{t-1}$	0.272***			
	(3.331)			
$RIO\_DOM\_HIGH_{t-1}$ or $SHORT_{t-1}$		-0.340	-0.023	
		(-1.062)	(-0.149)	
$RIO\_DOM\_LOW_{t-1}$ or $LONG_{t-1}$		1.955***	0.092	
		(9.813)	(0.779)	
$RIO\_FOR\_US\_HIGH_{t-1}$ or $SHORT_{t-1}$		-0.686***	-1.446***	
		(-3.593)	(-3.435)	
$RIO\_FOR\_US\_LOW_{t-1}$ or $LONG_{t-1}$		-0.629*	-0.718*	
		(-1.671)	(-1.621)	
$RIO\_FOR\_NUS\_HIGH_{t-1}$ or $SHORT_{t-}$		-0.357*	0.516*	
		(-1.689)	(1.864)	
$RIO\_FOR\_NUS\_LOW_{t-1}$ or $LONG_{t-1}$		1.655***	-0.034	
		(7.823)	(-0.137)	
$RIO\_FOR\_COMMON_{t-1}$				-0.310***
				(-4.237)
$RIO\_FOR\_CIVIL_{t-1}$				0.695***
				(4.487)
$SIZE_{t-1}$	0.110***	0.095***	0.113***	0.112***
	(25.460)	(21.260)	(26.020)	(25.840)
$Comovement_{t-1}$	0.232***	0.227***	0.232***	0.232***
	(39.440)	(38.460)	(39.360)	(39.380)
MB_{t-1}	0.001	0.001	0.001	0.001
	(0.649)	(0.740)	(0.707)	(0.707)
LEV_{t-1}	0.121***	0.123***	0.116***	0.118***
	(3.578)	(3.641)	(3.423)	(3.483)
$ACCR_t$	-0.001	-0.000	-0.001	-0.001
	(-0.196)	(-0.068)	(-0.226)	(-0.189)
ROA_t	-0.239***	-0.250***	-0.239***	-0.237***
	(-5.168)	(-5.446)	(-5.185)	(-5.123)
$DIVERS_t$	0.018***	0.018***	0.018***	0.018***
	(7.836)	(8.024)	(7.813)	(7.743)
$HERF_t$	-0.022	-0.020	-0.023	-0.019
	(-0.858)	(-0.781)	(-0.880)	(-0.734)
$NIND_t$	-0.158***	-0.154***	-0.157***	-0.157***
	(-4.344)	(-4.291)	(-4.310)	(-4.308)
NAF_t	0.056***	0.035***	0.057***	0.058***
	(8.913)	(5.601)	(9.130)	(9.324)
$TURN_t$	0.471***	0.414***	0.477***	0.474***
	(11.060)	(9.811)	(11.200)	(11.100)
Intercept	-0.954***	-0.840***	-0.976***	-0.972***
	(-3.058)	(-2.810)	(-3.153)	(-3.068)
N. observations	37,256	37,256	37,256	37,256
Adjusted R^2	0.335	0.339	0.335	0.335

Table 8 The impact of changes in stock return comovement on changes in institutional ownership

This table reports the regression analysis of changes in institutional ownership from year *t-1* to *t* on changes in stock return comovement from year *t-2* to *t-1*. Regressions include change in the control variables (coefficients are not tabulated) in the following regression.

$$\Delta IO_{i,t} = \alpha_0 + \alpha_1 \Delta Comovement_{i,t-1} + \alpha_2 \Delta SIZE_{i,t} + \alpha_3 \Delta MB_{i,t-1} + \alpha_4 \Delta Q_{i,t-1} + \alpha_5 \Delta LEV_{i,t-1} + \alpha_6 \Delta CASH_{i,t-1} + \alpha_7 \Delta VOL_{i,t} + \alpha_8 \Delta VOLA_{i,t} + \alpha_9 \Delta AGE_{i,t} + \alpha_{10} \Delta DP_{i,t-1} + \alpha_{11} \Delta RET_{i,t-12,t-3} + \alpha_{12} \Delta RET_{i,t-1,t-3} + (Year, Industry\ and\ Country\ dummies) + \varepsilon_{i,t}$$

The sample consists of 38,890 firm–year observations drawn from 40 countries for 1999–2006. The *t*-statistics, reported in parentheses, are based on robust standard errors corrected for firm-level clustering. Year, industry and country dummies are included. Here ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix A.

	Coefficient for Δ *Comovement* $_{t-1}$	*N. observations*	*Adjusted* R^2
ΔIO_TOTAL_t	-0.111**	38,890	0.088
	(-2.398)		
ΔIO_DOM_t	-0.072**	38,890	0.046
	(-2.149)		
ΔIO_FOR_t	-0.039	38,890	0.063
	(-1.274)		
$\Delta IO\_FOR\_US_t$	-0.042	38,890	0.060
	(-1.291)		
$\Delta IO\_FOR\_NUS_t$	0.003	38,890	0.028
	-0.138		
$\Delta IO\_DOM\_HIGH_t$	-0.022	38,890	0.006
	(-0.913)		
$\Delta IO\_DOM\_LOW_t$	-0.007	38,890	0.056
	(-0.682)		
$\Delta IO\_FOR\_US\_HIGH_t$	-0.004	38,890	0.008
	(-0.314)		
$\Delta IO\_FOR\_US\_LOW_t$	-0.013**	38,890	0.086
	(-2.309)		
$\Delta IO\_FOR\_NUS\_HIGH_t$	0.013	38,890	0.065
	-0.859		
$\Delta IO\_FOR\_NUS\_LOW_t$	-0.003	38,890	0.060
	(-0.414)		
$\Delta IO\_DOM\_SHORT_t$	0.003	38,890	0.036
	-0.204		
$\Delta IO\_DOM\_LONG_t$	-0.014	38,890	0.015
	(-0.704)		
$\Delta IO\_FOR\_US\_SHORT_t$	-0.001	38,890	0.011
	(-0.131)		
$\Delta IO\_FOR\_US\_LONG_t$	-0.025**	38,890	0.013
	(-2.491)		
$\Delta IO\_FOR\_NUS\_SHORT_t$	-0.007	38,890	0.032
	(-0.522)		
$\Delta IO\_FOR\_NUS\_LONG_t$	0.029***	38,890	0.007
	(-3.368)		
$\Delta IO\_FOR\_COMMON_t$	-0.026	38,890	0.058
	(-1.031)		
$\Delta IO\_FOR\_CIVIL_t$	-0.013	38,890	0.02
	(-0.874)		