Does Institutional Ownership Matter for International Stock Return Comovement?

Finance Working Paper N° 465/2016
March 2016

José A. Faias
Católica Lisbon School of Business and Economics

Miguel A. Ferreira
Nova School of Business and Economics and ECGI

ECGI Working Paper Series in Finance

Does Institutional Ownership Matter for International Stock Return Comovement?

Working Paper N°. 465/2016
March 2016

José A. Faias
Miguel A. Ferreira

We thank Rui Albuquerque, Erkin Diyarbakirlioglu, Gabriela Bertol Domingues, Arie Eskenazi Gozluklu, Mattias Hamberg, Mattias Hamberg, Pedro Matos, Joao Pedro Nunes, Ignacio Moreno, Pedro Santa-Clara, Ana Paula Serra, Adrien Verdelhan, Ying Wu, Xiaoyan Zhang and participants at the American Finance Association Annual Meeting, European Finance association Annual Meeting, FMA European Conference, the II World Finance Conference, the EcoMod Conference, XIX Foro de Finanzas, 12th Symposium on Finance, Banking, and Insurance, the 9th International Paris Finance Meeting, Eastern Economic Association Annual Meeting, Lubrafin Conference, AFFI Spring Conference, Global Finance Conference, and China International Conference for their helpful comments and discussions.

Abstract

We study the link between international stock return comovements and institutional investment. We test whether the rise of institutional ownership has increased cross-country correlations and decreased cross-industry correlations. Using stock-level institutional holdings across 45 countries during the 2001-2010 period, we find that industry and global factors are relatively more important than country factors in explaining stock return variation among stocks with higher institutional ownership. Industry diversification strategies are more beneficial than country diversification strategies for stocks with high institutional ownership. We show that cross-border portfolio investment is a powerful force of international capital market integration and convergence of asset prices.

Keywords: institutional investors, comovements, international diversification, international capital markets

JEL Classifications: F36, G11, G15

José A. Faias*
Assistant Professor
Católica Lisbon School of Business and Economics
Palma de Cima
Lisboa, 1649-023
Portugal
phone: +351 217 270 250, fax: +351 217 270 252
e-mail: jfaias@ucp.pt

Miguel A. Ferreira
Professor of Finance
Nova School of Business and Economics
Campus de Campolide
Lisbon, 1099-032
Portugal
phone: +351 213801631
e-mail: miguel.ferreira@novasbe.pt

*Corresponding Author

Does Institutional Ownership Matter for International Stock Return Comovement?*

José A. Faias
UCP - Católica Lisbon School of Business and Economics

Miguel A. Ferreira
Nova School of Business and Economics. ECGI

This Version: June 2015

Abstract

We study the link between international stock return comovements and institutional investment. We test whether the rise of institutional ownership has increased cross-country correlations and decreased cross-industry correlations. Using stock-level institutional holdings across 45 countries during the 2001-2010 period, we find that industry and global factors are relatively more important than country factors in explaining stock return variation among stocks with higher institutional ownership. Industry diversification strategies are more beneficial than country diversification strategies for stocks with high institutional ownership. We show that cross-border portfolio investment is a powerful force of international capital market integration and convergence of asset prices.

JEL classification: F36, G11, G15

Keywords: Institutional investors, Comovements, International diversification, International capital markets

---

* Corresponding author: Tel.: +351 217 270 250; Fax: +351 217 270 252; jfaias@ucp.pt (J. A. Faias). We thank Rui Albuquerque, Erkin Diyarbakirlioglu, Gabriela Bertol Domingues, Arie Eskenazi Gozluklu, Mattias Hamberg, Mattias Hamberg, Pedro Matos, Joao Pedro Nunes, Ignacio Moreno, Pedro Santa-Clara, Ana Paula Serra, Adrien Verdelhan, Ying Wu, Xiaoyan Zhang and participants at the American Finance Association Annual Meeting, European Finance association Annual Meeting, FMA European Conference, the II World Finance Conference, the EcoMod Conference, XIX Foro de Finanzas, 12th Symposium on Finance, Banking, and Insurance, the 9th International Paris Finance Meeting, Eastern Economic Association Annual Meeting, Lubrafin Conference, AFFI Spring Conference, Global Finance Conference, and China International Conference for their helpful comments and discussions.

1. Introduction

How has globalization affected the convergence of asset prices across countries? An avenue to answer this question is the debate about the importance of country versus industry effects in explaining international stock return comovements. In this paper, we contribute to this debate by examining the role of institutional investors in promoting the convergence of asset prices across countries.

The study of the determinants of international stock return comovements is central to the international finance literature. In a classical contribution, Heston and Rouwenhorst (1994) argue that country-specific factors are more important drivers of volatility than cross-country industry factors. Many other studies confirm that country factors play a bigger role in explaining stock return variation than industry factors (e.g., Griffin and Karolyi, 1998; Sonney, 2009). These findings have been challenged by Baca, Garbe, and Weiss (2000) and Cavaglia, Brightman, and Aked (2000), among others, who find a rise in industry effects in the late 1990s. However, Baele and Inghelbrecht (2009) and Bekaert, Hodrick, and Zhang (2009) attribute this apparent rise in industry effects as a temporary phenomenon stemming from the information technology bubble in the 1990s, rather than a structural change.

Research also shows that globalization has had limited effects on the convergence of asset prices across countries (e.g., Karolyi and Stulz, 2003; Bekaert and Wang, 2009). The European economic and monetary integration in the 1990s (Rouwenhorst, 1999) and the euro adoption in the 2000s (Berkaert et al., 2013) also had minimal effects on the relative importance of country and industry effects and on integration in the European capital markets. These results are surprising in light of the disappearance of formal barriers to international trade and capital flows over the last several decades. Stulz (2005, pp 1633) states that "Although barriers to international investment have fallen sharply over the last 50 years, the impact of financial globalization has been limited — countries still matter a great deal."

In this paper, we examine the role of institutional investors who invest worldwide as agents of financial globalization. Institutional portfolio managers, such as mutual funds, insurance companies, bank trusts, pension funds, and hedge funds, are playing an increasing role in capital markets around the world. According to the International Monetary Fund (2011) (IMF), institutional investors managed financial assets exceeding $60 trillion (including $25 trillion in equities) as of 2009, three times more than in 1995. As these investors pursue more industry- and global-focused portfolio strategies, asset prices should converge across countries. Thus, we expect that global and industry factors matter more for firms with higher institutional ownership, and conversely country factors should matter less. Of course, institutional investors could alternatively exhibit "home bias" (French and Poterba, 1991; Chan, Covrig, and Ng, 2005) and constrain these cross-border integration effects.

We use a comprehensive data set of institutional equity holdings to examine whether global and industry factors become more important relative to country factors in explaining stock return variation for firms in which institutional investors have a larger stake. The data covers institutional stock holdings of over 20,000 stocks from 45 countries, which exceed $18 trillion as of December 2010. Institutional ownership is about 40% at the end of 2010. Institutional ownership is highest in the U.S. market (where it represents over 70%), although institutional ownership increased at a fast pace in other countries during the 2001-2010 sample period.

We first estimate global, country, and industry factors using Heston and Rouwenhorst's (1994) dummy variable model. These authors employ country and industry dummies to explain stock returns. This model has been criticized since the authors apply constant and unit betas to country and industry specific factors. We use a factor model to overcome this issue where country and industry returns are used as factors, as in Marsh and Pfleiderer (1997) and Brooks and Del Negro (2006). The factor model we use is a parsimonious way to tackle the limitations of the Heston and Rouwenhorst (1994) model, although it is not the only possible alternative. Bekaert, Hodrick, and Zhang (2009) suggest a range of different risk-based models and find that a Fama and French and APT risk-based model fits the data covariance structure the best when regional factors are incorporated in addition to global factors, and when a time-varying beta model is used. We employ both the dummy variable and factor models and decompose returns into global, country, industry, and idiosyncratic components for all stocks and then for portfolios of stocks sorted by levels of institutional ownership. In both models, we use stock as the unit of measurement following Heston and Rouwenhorst (1994).

We confirm previous findings (e.g., Heston and Rouwenhorst, 1994; Griffin and Karolyi, 1998; Bekaert, Hodrick, and Zhang, 2009) that country effects dominate industry factors when we decompose the international variation of stock returns based on both the dummy variable and factor models. The average absolute country effect for the full sample is 9.3% per year, whereas the average absolute industry effect is 5.5% per year, which implies that the average ratio of the absolute country-to-industry effects is 1.8 based on the dummy variable model. Furthermore, we find that the average absolute of the global effect for the full sample (15.9% per year) is of a greater magnitude than that of the country and industry factors. As expected from previous studies, the idiosyncratic component is much larger than the three other sources of variation (global, country and industry), with an average absolute deviation of nearly 50% per year. We find that the relative magnitude of country effects versus industry factors became even more important over our sample period (2001-2010). The average ratio of the absolute country-to-industry effects tripled from about one in 2001 to three in 2010. The estimates based on the factor model are of similar magnitude but country effects are more dominant relative to industry effects (the average ratio of the absolute country-to-industry effects is 2.8).

We also examine the relative importance of country and industry factors in explaining global stock return variation in portfolios of stocks formed according to levels of institutional ownership. We find that global and industry effects dominate country effects for stocks with high levels of institutional ownership, while country effects dominate industry effects for stocks with low levels of institutional ownership. Furthermore, the increased importance of industry effects versus country effects is more pronounced in the case of stocks where the relative importance of foreign institutional investors is higher. These findings are consistent for both the dummy variable and factor models. Overall, our findings show that stock return comovements are different for stocks with high institutional ownership where the marginal investors setting asset prices are more likely to be institutional investors.

We perform several robustness checks of our main findings. A concern is that our findings are exclusively driven by U.S. stocks. It is important to note that the average institutional ownership is significantly higher in U.S. stocks than elsewhere. We obtain similar findings if we restrict the analysis to the sample of non-U.S. stocks. Another concern is that our findings are driven by firm size as institutional investors tend to overweight large stocks. We show that our primary findings persist if we control by firm size by taking the component of institutional ownership that is orthogonal to firm size. Furthermore, we do not find that market capitalization, by itself, has a similar effect on the relative importance of country and industry effects in explaining global stock market return variation. We also find similar patterns on the relative importance of country and industry effects in stocks with different levels of institutional ownership in several subsamples of countries and stocks.

Finally, we examine the implications of our results for portfolio diversification. We present a non-parametric visualization of the benefits of portfolio diversification among alternative geographical versus industrial allocation strategies. We show that *industrial* allocation is more beneficial for risk reduction in stocks with high institutional ownership, while *country* allocation is more beneficial for risk reduction in stocks with low institutional ownership. These findings support the notion that stocks with high institutional ownership offer fewer benefits in terms of cross-country diversification.

We contribute to the literature on the effects of financial globalization on asset prices. There are several recent studies that examine the impact of institutional investor investing on cross-market stock comovement patterns. Broner, Gelos, and Reinhart (2006) and Hau and Rey (2008) examine the role of cross-border institutional investors in "contagion" effects. Bartram et al. (2015) show that international ownership linkages (i.e., common ownership) is of similar economic significance as country and industry factors in explaining international stock returns. We also contribute to the country-industry debate by showing that institutional investment increases the relative importance of industry factors (and global factor) and decreases the relative importance of country factors. Overall, we show that the presence of institutional investors contributes to the convergence of asset prices across countries.

2. Data

The initial sample includes all publicly traded firms from January 2000 through December 2010 (132 months) included in the Worldscope database. We draw monthly U.S. dollar and local currency-denominated returns from Datastream. We apply several screening procedures for monthly returns, as suggested by Ince and Porter (2003). First, any return above 300% that is reversed within one month is treated as missing. Second, in order to exclude remaining outliers in returns, we treat the monthly returns that fall outside the 0.1% to 99.9% range in each country as missing. In order to minimize potential biases arising from illiquid and low-priced stocks, we also exclude stocks with market capitalization below $10 million and stock price below $1 at the end of the previous month. Finally, we require that a country has at least 20 stocks at all times to be included in the analysis.

Panel A of Table 1 reports summary statistics per country. The sample includes an average of 18,348 firms from 45 countries that include both developed and developing nations. At the end of the sample period, December 2010, the sample is comprised of 22,889 firms. A few countries represent a large fraction of the world total market capitalization and number of firms. U.S. firms account for about 40% of total market capitalization on average over the sample period, whereas the six other G7 countries (Canada, France, Germany, Italy, Japan, and United Kingdom) account for an additional 30% of the market capitalization. The number of industries is not uniform across countries, although many countries include firms from across all industries (17 industries).

Panel B of Table 1 reports summary statistics per industry. We use the Fama-French 17 industries classification in order to get a good partition of the universe of firms when we split the sample into deciles. However, using only 17 industries may create a bias against finding industry effects, as Beckers, Connor, and Curds (1996) and Griffin and Karolyi (1998) show that industry effects grow with a finer definition of industrial sectors.[2] From Panel B of Table 1, we see that some industries are more global than others. Financials, food, and construction exist in more countries. The industry with greatest weight is financials, as it accounts for 24% of total market capitalization. Notice that almost all countries and industries exhibit positive average stock

[2] In Section 5, we provide several robustness checks using alternative industry definitions.

returns in the full sample period (with the exception of Greece).

Institutional investors' portfolio holdings are from the FactSet/LionShares database. Institutional investors are defined as delegated portfolio managers that have discretionary mandates, such as mutual funds, bank trusts, insurance companies, investment managers and advisors, pension funds, and others including endowments or hedge funds. FactSet/LionShares collects ownership data directly from public sources including national regulatory agencies, stock exchanges, industry directories, and company proxies, as described in Ferreira and Matos (2008). In calculating institutional ownership, we include ordinary shares, preferred shares, American Depositary Receipts (ADRs), Global Depositary Receipts (GDRs), and dual listings. We handle the issue of different reporting frequencies by institutions in different countries by using the latest holdings update at each quarter-end. We then assume institutional holdings are held constant within each quarter for each firm. FactSet/LionShares provides holdings data for more than 5,700 institutions, with positions exceeding a total of $18 trillion as of December 2010.

The main variable in this study is total institutional ownership (*IO*), which corresponds to the sum of all holdings by institutions in a firm's stock divided by the market capitalization at the end of each quarter. We break down institutional ownership based on the institution's nationality (i.e., a domestic institution is a money manager that is domiciled in the same country where the firm is incorporated). Domestic (foreign) institutional ownership corresponds to the sum of holdings by domestic (foreign) institutions divided by the stock market capitalization at the end of each quarter.

Table 1 shows that countries differ markedly in terms of institutional ownership. Over the 2001-2010 sample period, institutional ownership is highest for U.S. firms, with institutions holding 70% of outstanding shares. Institutional ownership is lower for firms domiciled in other countries, where it represents, on average, 20%. There are other countries with high institutional ownership levels such as Canada (48%) and Sweden (31%). Shares are predominantly held by domestic institutions in the case of U.S. stocks but, elsewhere in the world, domestic and foreign institutional holdings are more balanced with averages, respectively, of 6% and 14% over the sample period.

Figure 1 shows the evolution of institutional ownership for the 2001-2010 sample period. Panel A shows that total institutional ownership remained constant at about 40% during the 2000s. However, domestic and foreign institutional ownership present strikingly different evolutions over the 2000s, with domestic ownership increasing and foreign ownership decreasing. This is a result of a shift in weight into non-U.S. markets.[3] Panel B shows the rise of institutional ownership in the sample of non-U.S. stocks. We can see that most holdings are from foreign-based institutions, although domestic holdings have also grown.

3. Decomposing Stock Return Variation

We use the Heston and Rouwenhorst (1994) dummy variable model and a factor model to study the importance of global, country, and industry factors in explaining global stock return variation.

3.1 Heston and Rouwenhorst Model

The Heston and Rouwenhorst (1994) approach is one of the most commonly-used models in the international finance literature.[4] In the model, it is assumed that each individual stock return

[3] IMF (2011) survey data also shows that investors domiciled in the United States still account for almost half of all assets under management in the 17 OECD countries, although their share is declining.
[4] Papers that have used this model include Heston and Rouwenhorst (1995), Griffin and Karolyi (1998), Campa and Fernandes (2006), Bekaert, Hodrick, and Zhang (2009), Bai and Green (2010), among others.

can be decomposed into four components: a global common factor, a country factor, a global industry factor, and a firm-specific factor. The return of stock i traded in country k and that belongs to industry j is:

$$r_{it} = \alpha_t + \delta_{kt} + \gamma_{jt} + \varepsilon_{it}, \tag{1}$$

where r_{it} is the return at time t, α_t is a global factor that is a term common to every stock in period t, δ_{kt} and γ_{jt} are the country and industry components of the stock return, respectively, and ε_{it} is an idiosyncratic component encompassing all unexplained variation (with mean zero, finite variance, and uncorrelated across stocks).

To estimate the realizations of the global factor, country factors, and industry factors, we estimate for each month t the following cross-sectional regression of individual stock returns on a set of country and industry dummy variables:

$$r_{it} = \alpha_t + \sum_{k=1}^{45} \delta_{kt} C_{kt} + \sum_{j=1}^{17} \gamma_{jt} S_{jt} + \varepsilon_{it}, \tag{2}$$

where C_{kt} is a dummy variable that equals one if stock i is traded in country k and S_{jt} is a dummy variable that equals one if stock i belongs to industry j. The 45 country dummies as well as the 17 (Fama-French) industry dummies add up to the unit vector across firms. It is not possible to estimate the regression in equation (2) directly because of perfect multicollinearity between the regressors. Following Heston and Rouwenhorst (1994) and others, we impose the constraints that the weighted sum of the country coefficients and the weighted sum of the industry coefficients equal zero, where the weights are the market capitalization of the stocks. Under these restrictions, the weighted least-squares estimate of the regression intercept is the value-weighted average world stock market index return. We obtain 45+17 time series of pure country (δ_{kt}) and industry (γ_{jt}) effects. For example, the estimated pure country effect can be interpreted as the return (in excess of the world market index return) of a portfolio of stocks in country k that has the same industry composition as the world value-weighted index (i.e., return of a "pure country tilt"). Similarly, the estimated pure industry effect can be interpreted as the return (in excess of the world market index return) of a portfolio of stocks in industry j that has the same country composition as the world value-weighted index (i.e., return of a "pure industry tilt").

We then use the time series of estimated δ_{kt} and γ_{jt} to determine the relative importance of the country and industry factors. We use the mean absolute deviation (*MAD*) metric proposed by Rouwenhorst (1999):

$$MAD_t^C = \sum_{k=1}^{45} w_k |\delta_{kt}| \quad (3a)$$

$$MAD_t^I = \sum_{j=1}^{17} w_j |\gamma_{jt}|, \quad (3b)$$

where w_k and w_j are the value weights of country k and industry j, respectively, in the world value-weighted market. The country (industry) *MAD* can be interpreted as the capitalization weighted average tracking error of the returns on industry-neutral (country-neutral) country (industry-neutral) portfolios. The higher the country (industry) *MAD*, the more disperse are the country (industry) returns in that period. We compute the 12-month rolling window mean of *MAD*s to reduce estimation error. Finally, we compute the ratio of the country *MAD* relative to industry (global) *MAD*s to gauge the relative importance of country factors versus industry (global) factors. A ratio that is greater than one implies that country factors are more relevant than industry (global) factors in explaining the variance of international stock market returns.

3.2 Factor Model

One of the drawbacks of the Heston and Rouwenhorst (1994) model is the assumption that all stocks have the same (unit) loadings on the country and industry factors. Another drawback is that it restricts all companies to be a member of one country and one industry, and this assumption is not applicable to conglomerates or multinational firms.

We propose an alternative model to understand the importance of global, country, and industry factors in explaining global stock return variation that overcomes the limitation of the dummy variables model. We use a factor model where country and industry portfolio returns are used as factors, as in Marsh and Pfleiderer (1997) and Brooks and Del Negro (2006).[5]

We estimate for each month t the following cross-sectional regression of individual stock returns on country and industry portfolio returns:

$$r_{it} = \alpha_t + \delta_t r_{ct} + \gamma_t r_{st} + \varepsilon_{it}, \tag{4}$$

where α_t is a global factor, r_{ct} is the value-weighted return of all stocks that belong to country c and r_{st} is the value-weighted return of all stocks that belong to industry s, and ε_{it} represents the idiosyncratic shock to the return on stock i in month t. We orthogonalize industry factors for each month using the residuals of the OLS regression of industry factors on country factors.[6] We then estimate for each month t the cross-sectional regression (4) of individual stock returns on country and industry factors.

The variance of returns can be decomposed as the sum of country, industry, and idiosyncratic firm variances:

$$Var(r_{it}) = \alpha_t^2 + \delta_t^2 Var(r_{ct}) + \gamma_t^2 Var(r_{st}) + Var(\varepsilon_{it}). \tag{5}$$

The global standard deviation (*SD*) is given by the square root of the first term on the right-hand side of equation (4). Similarly, the country-specific *SD* is given by the square root of the second term, and the industry-specific *SD* is given by the square root of the third term. The last term

[5] Brooks and Del Negro (2005) alternatively estimate a latent factor model in which loadings are not constrained to unity. There are, however, two critiques to this approach. First, the authors need a balanced sample to be able to estimate the model and, therefore, results suffer from survivorship bias, as each stock would need to be alive over the entire sample period. Second, their conclusions are over averages along the sample period.

[6] It may be argued that this orthogonalization variable order may lead to different results. As a consequence, we run the factor model by taking the industry factors and use the residuals of an OLS regression of country returns on industry returns as the country factor. The results are not substantially affected.

corresponds to the idiosyncratic *SD* component. We then compute the 12-month rolling window arithmetic mean of the *SD* components estimates. Finally, we measure the importance of country versus industry (global) effects using the ratio of country *SD* to industry (global) *SD*s.

4. Empirical Results

4.1 Heston and Rouwenhorst Model Results

Table 2 presents the results of the return decomposition into global, country, and industry effects using the dummy variable model of Heston and Rouwenhorst (1994). Several studies have documented that comovements within countries are more important drivers of international stock return variation than industry factors. The first objective of our analysis is to revisit these findings for the 2001-2010 period and also for the more extensive sample of countries that we examine. Panel A of Table 2 presents the results. The average absolute country effect for the full sample is 9.3% per year, whereas the average absolute industry effect is 5.5% per year. These results imply that the average ratio of the absolute country-to-industry effects is 1.8 based on the dummy variable model. We also find that the average absolute of the global effect for the full sample (15.9% per year) is of greater magnitude than that of the country and industry factors. Of course, the idiosyncratic component is much larger than the three other sources of variation with an average absolute deviation of about 50% per year. These estimates are in line with previous findings and confirm that country effects dominate industry effects in explaining global stock return variation. In Table 2, Panel B shows the results for the sample of non-U.S. stocks. The estimates are similar to those for the sample of all stocks, although with a higher country effect and a lower industry effect. This implies that the average ratio of the country-to-industry *MAD*s is higher at 2.5 over the full sample period.

Panel A of Figure 2 presents the time series of the country and industry *MAD* estimates from the dummy variable model for the sample of all stocks, while Panel A of Figure 3 presents the time series of the ratio of country-to-industry effects. Over time, we find that the relative magnitude of country effects versus industry factors has become even more important during our sample period (2001-2010). The average ratio of the absolute country-to-industry effects tripled from about one in 2001 to three in 2010. The findings are consistent with the notion that the increased importance of industry factors relative to country factors in the late 1990s and early 2000s was a short-lived phenomenon, as suggested by Bekaert, Hodrick, and Zhang (2009).

Institutional investors have been gaining in importance as shareholders of corporations worldwide. These investors are increasingly becoming the marginal traders that set asset prices across markets. As these investors pursue more industry or global focused strategies, asset pricing should become integrated across market boundaries. In other words, we expect that global and industry effects should be stronger for firms with higher institutional ownership, and country factors should matter less. We now test this hypothesis.

We study the decomposition of stock return volatility for stocks based on the level of total institutional ownership. We sort stocks into deciles by month based on total institutional ownership.[7] We then estimate the dummy factor model separately for the stocks in each decile. We report the value-weighted *MAD* of the global, country industry, and idiosyncratic factors for each institutional ownership decile.

We find that the relative importance of the country and industry effects in explaining stock return variation differs significantly across institutional ownership deciles. In Panel A (all stocks) of Table 2, we find that the time-series mean *MAD* of the country effect decreases from 16.0% per year going from decile 1 (low institutional ownership) to 0.8% per year for decile 10 (high

[7] Firms without institutional investors are excluded from the analysis, since this group is quite heterogeneous in terms of its characteristics.

institutional ownership). In contrast, the time-series mean *MAD* of the industry effect increases from 6.0% per year going from decile 1 to 8.8% per year for decile 10. This implies that the ratio of country-to-industry mean *MAD*s decreases dramatically from 2.7 for decile 1 to 0.1 for decile 10. The difference in the country-to-industry ratio between decile 1 and decile 10 is statistically significant at the 1% level. In addition, we find that the average absolute of the global effect for the full sample is of larger magnitude than that of the country and industry factors across all portfolios. As expected from previous studies, the idiosyncratic component is much larger than the three other sources of variation (global, country and industry) across all portfolios but it declines significantly from decile 1 (57% per year) to decile 10 (39% per year). We also find that the ratio of country to global mean *MAD*s decreases dramatically from decile 1 to decile 10.

In Table 2, Panel B shows the results for the sample of non-U.S. stocks. We see a similar pattern to that in Panel A as country effects become less important and industry effects become more important as institutional ownership increases. The effect is not as pronounced as for the sample of all stocks because the decrease in the country factor is less pronounced. The difference between Panel A and Panel B is due to U.S. stocks that have an average total institutional ownership much higher than stocks from other countries. The increase in the industry factor is similar to that in Panel A. In terms of the ratio of country-to-industry mean *MAD*s, we still see an economical and statistical significant decrease in the ratio with institutional ownership. The ratio of country-to-industry effects decreases from 2.8 for decile 1 to 1.1 for decile 10; the difference between decile 1 and 10 is statistically significant. Similarly, the mean ratio of country to global *MAD* decreases from 1.2 for decile 1 to 0.5 for decile 10 and this difference is statistically significant.

Panels B and C of Figure 2 present the time series of the country and industry *MAD* estimates from the dummy variable model for decile 1 and decile 10, while Panels B and C of Figure 3 present the corresponding time series of the ratio of country-to-industry effects and to global effects. Country effects are consistently higher in decile 1 than in decile 10 throughout the sample period. Country effects in the portfolio of stocks with high institutional ownership (decile 10) are negligible. Industry effects are higher in decile 10 than in decile 1, especially in the early and late 2000s. The ratio of country-to-industry effects is consistently above 2 in decile 1 throughout the sample period, while it is close to zero for decile 10.

Overall, we conclude that for firms with higher institutional ownership, country effects matter less than global and industry effects. This is explained by a rise in industry effects and a decrease in country effects. This finding is consistent with the idea that institutional investors promote the convergence of asset prices across countries.

4.2 Factor Model Results

Table 3 presents the results of the return decomposition into global, country, and industry effects using the factor model. Panel A shows the mean of the standard deviation of each return component over the full sample period for all stocks. The average standard deviation of the country factor for the full sample is 12.7% per year, whereas the average standard deviation of the industry factor is 4.9% per year. These results imply that the average ratio of the absolute country-to-industry effects is 2.8 based on the factor model. Thus, the relative importance of the country factors versus the industry factors is more pronounced in the factor model than in the dummy variable model. Panel B shows the results for the sample of non-U.S. stocks. The estimates are similar to those using all stocks with a ratio of country-to-industry effects even higher at 3.5. Figures 4 and 5 are comparable to Figures 2 and 3 but for the *SD* estimates of the factor model based on the cross-sectional regressions for each month in the sample. From

Panel A, we find that the time series of the ratio of country-to-industry effects is similar to that from the dummy variable model with an increased importance of country effects relative to industry effects in the 2000s. These results provide support for Heston and Rouwenhorst (1994), Griffin and Karolyi (1998), Rouwenhorst (1999), and Bekaert, Hodrick, and Zhang (2009).

We now examine the relative importance of country and industry effects for stocks with different levels of institutional ownership. In Table 3 we confirm the findings of Table 2 using the Heston and Rouwenhorst (1994) dummy variable model that the relative importance of the country and industry effects in explaining stock return variation differs significantly across institutional ownership deciles. The increase in industry effects relative to country effects is even more pronounced using the factor model. In Panel A (all stocks), we find that the mean *SD* of the country effect decreases from 16.2% per year for decile 1 (low institutional ownership) to 4.1% per year for decile 10 (high institutional ownership). In contrast, the mean *SD* of the industry effect increases from 3.1% per year going from decile 1 to 8.9% per year for decile 10. This implies that the ratio of country-to-industry mean *SD*s decreases dramatically from 5.5 for decile 1 to 0.5 for decile 10 and the difference is strongly significant. We see a similar pattern in Panel B for the sample of non-U.S. stocks with the ratio of country-to-industry *SD*s decreasing from 5.8 for decile 1 to 1.5 for decile 10.

Panels B and C of Figure 4 present the time series of the country and industry *SD* estimates from the factor variable model for decile 1 and decile 10 of institutional ownership. Figure 5 presents the corresponding time series of the ratio of country-to-industry effects. These figures confirm the patterns found in Figures 2 and 3 using the dummy variable model, but the effects are even more pronounced. We see that country effects have been consistently higher in decile 1 than in decile 10 throughout the sample period, while industry effects have been consistently higher in decile 10 than in decile 1.

In summary, the estimates from the factor model support the conclusion that for stocks with higher institutional ownership, the idiosyncratic component is lower and, more importantly, global and industry factors dominate country effects. This shows that patterns are different for firms where the marginal investors are institutional money managers. Thus institutional investor presence matters for understanding global stock return comovements.

5. Extensions

We conduct several robustness checks of our primary finding that the relative importance of country effects versus industry effects decreases significantly as institutional ownership increases.

5.1 Alternative Choices in the Analysis

Table 4 presents the estimates of the stock return variance decomposition using the factor model for different industry classifications, returns in local currency, alternative methods of controlling for firm size, changing the orthogonalization method, and different geographical and industry subsamples. The results of the dummy variable model are economically the same and we provide them upon request. Table 4 shows the mean standard deviation of the components (global, country, and industry) for the full sample period for decile 1 (low institutional ownership) and decile 10 (high institutional ownership), as well as the ratios of country-to-industry and country-to-global effects.

The first robustness check deals with alternative industry classification schemes for the Fama-French 17 industries used in our primary findings. Beckers, Connor, and Curds (1996) and Griffin and Karolyi (1998) show that estimated industry effects are larger if one uses a finer definition of industrial sectors. We analyze this by running the same regressions using three different classification schemes: two-digit SIC codes, Fama-French 49 industries, and Fama-French 10 industries. We present the results under the panel "Industry Classification" in Table 4. Industry effects are more important with a finer industry classification but we confirm previous findings that industry effects dominate country effects for high institutional ownership stocks, while country effects dominate industry for low institutional ownership stocks. For example, in the case of the two-digit SIC code, the ratio of country-to-industry effects is 2.6 for decile 1 and 0.4 for decile 10 and the difference is strongly statistically significant. We next check the robustness of the results to the use of returns denominated in local currency, rather than U.S. dollar returns. The results presented in row "Returns in Local Currency" of Table 4 are similar to before with a ratio of country-to-industry effects of 5.0 for decile 1 and 0.5 for decile 10.

An important concern is whether the effect of institutional ownership on the relative importance of country and industry effects is different from the effect of firm size. Indeed, it is well know that institutional investors overweight large stocks (Gompers and Metrick, 2001; Ferreira and Matos, 2008), therefore there is a strong positive correlation between total institutional ownership and firm size. We use three strategies to address this concern. Following Nagel (2005), we sort stocks based on the residuals of a cross-sectional regression of institutional ownership on firm's market capitalization. Specifically, for each month, we regress the logistic transformed institutional ownership on the logarithm of firm size and its square. We use the residuals of each regression, denoted as residual institutional ownership, to sort stocks into deciles. The row "Residual Institutional Ownership" in Table 4 shows that the ratio of country-to-industry effects is 5.5 for decile 1 and 0.5 for decile 10 and the difference is significant.

The second approach is to simply sort stocks based on market capitalization. If the results were driven exclusively by firm size, then we would expect to find similar patterns for the ratio of country-to-industry effects. The row "Market Capitalization" in Table 4 shows that the ratio of country-to-industry effects is 2.4 for decile 1 and 1.7 for decile 10 and the difference although statistically significant is strongly reduced. Another concern with our findings is that the factor model requires that we orthogonalize industry relative to country returns. We check whether the results are sensitive to the order of orthogonalization by using the residuals of the regression of country returns on industry returns, rather than the reverse. We find, however, that the results are similar.

We also examine the results across samples of countries or industries. We consider the sample of only European stocks and Asia-Pacific stocks. European countries are of particular interest because of the advent of the single market and the euro, but Rouwenhorst (1999) and others fail to find that increasing economic and financial integration within the European Union results in increased cross-industry comovement. If we consider just a sample with European firms, we find that country-specific effects still matter substantially but our main results prevail in that stocks with high institutional ownership have significantly lower country-to-industry effects than stocks with lower institutional ownership. We see the same pattern in Pacific-Asia, although the institutional ownership effect is lower. Thus, the effect of institutional ownership on the importance of country and industry effects is pervasive across different geographic regions.

We also separate countries into developed and emerging markets. In developed markets, we find that the ratio of country-to-industry effects is 2.9 for decile 1 and 0.4 for decile 10. Similar to Griffin and Karolyi (1998), we find that emerging stock markets are less integrated. The effect of institutional ownership in emerging markets is less pronounced. The ratio of country-to-industry effects only reduces from 3.5 for decile 1 to 2.9 for decile 10 but the difference is still strongly statistically significant. Results are also robust if we exclude the largest countries. In the sample of non-G7 countries, we also find that the ratio of country-to-industry effects drops significantly from decile 1 to decile 10.

The final robustness check is excluding specific sectors from the analysis. Baele and Inghelbrecht (2009) and Bekaert, Hodrick, and Zhang (2009) argue that the increase in global cross-industry comovements was a temporary phenomenon to the TMT sector. We exclude telecommunications, media, and technology (TMT) firms. We also exclude the financial sector due to the the effect of the financial crisis in 2007-2008. The last two rows in Table 4 show that our results are not significantly altered by excluding these two sectors.

5.2 Firm Characteristics

In this section, we examine the heterogeneity of the effect of institutional ownership on the relative importance of country and industry effects for groups of firms based on several firm characteristics: firm size, turnover, analyst coverage, market-to-book, momentum, MSCI membership, foreign sales, and U.S. cross-listing. We present the results in Table 5.

We first sort stocks into monthly terciles of stock market capitalization. The difference in the ratio of country-to-industry effects between decile 1 and decile 10 of institutional ownership is higher in big stocks (high tercile) than in small stocks (low tercile) and is significant in both cases. Even in the case of small stocks, the ratio of country-to-industry effects reduces from 2.6 in decile 1 to 1.1 in decile 10. We find similar results when we sort stocks on terciles of share turnover and analyst coverage. The difference is significant for both high liquidity stocks (high tercile) and low liquidity stocks (low tercile) but the difference is more important for the most liquid stocks. Stocks with higher analyst coverage (high tercile) also exhibit a stronger reduction in the relative importance of country versus industry effects with increased institutional ownership than stocks with lower analyst coverage (low tercile).

We then sort stocks into terciles of market-to-book ratio and momentum. We find that the ratio of country-to-industry effects is significantly lower for high institutional ownership stocks than low institutional ownership stocks. The magnitude of the effects is similar between value and growth stocks and between loser and winner stocks.

In Table 5, we also classify stocks based on proxies of firm visibility and investor recognition. We sort stocks on whether they are members of the MSCI All-Country World Index, an index with about 2,000 stocks worldwide that are commonly used by world or global stock index funds. Ferreira and Matos (2008) show that MSCI stocks are more likely to be owned by institutions than non-MSCI stocks because funds are typically benchmarked against the MSCI index or have investment mandates limiting risk relative to the MSCI index. We also classify stocks based on the percentage of foreign sales in total firm's sales. We define a firm as a multinational firm if this percentage is positive and as a non-multinational otherwise. We find that the reduction in the ratio of country-to-industry effects from low to high institutional ownership stocks is equally important and statistically significant across all these groups.

In Table 5, we also split the stocks into those with ADRs and without ADRs. ADRs enable U.S. investors to buy the securities of a foreign company without the accompanying risks or inconveniences of cross-border and cross-currency transactions. The effect of institutional ownership is significant in both groups.

Overall, institutional ownership is an important determinant of the relative importance of country and industry effects in explaining global stock return variation. There is an important reduction in the ratio of country-to-industry effects with increased institutional ownership. The findings support the idea that institutional investors play an important role in integrating financial markets worldwide and this role is pervasive across all stocks.

5.3 Domestic versus Foreign Institutional Ownership

We now examine the influence of cross-border holdings in the relative importance of country versus industry effects. We sort stocks into deciles of domestic or foreign institutional investors and then within each decile we sort by total institutional ownership. Table 6 shows the decomposition of stock return variation for the different groups of stocks. We only show results for the low and high institutional ownership deciles for brevity. Panel A presents results for the sample of all stocks and Panel B for the sample of non-U.S. stocks.

Panel A of Table 6 shows that the ratio of country-to-industry effects is significantly lower for decile 10 than for decile 1 of total institutional ownership in both the group of low and high domestic institutional ownership and the magnitude of the effect is similar. In the case of the foreign institutional ownership groups, the reduction in the ratio of country-to- industry effects is more pronounced in the group of stocks with high foreign institutional ownership than in the group of stocks with low institutional ownership. This is consistent with the idea that foreign institutional investors play a particularly important role in increasing cross-industry correlations and decreasing cross-country correlations.

6. Portfolio Diversification Implications

This section provides a different way to examine the results found using a non-parametric method. We use the same framework as in Heston and Rouwenhorst (1995) and Goetzmann and Kumar (2008) to compute the risk reduction that can be accomplished through the diversification alternatives relative to the average asset.

The diversification ratio for the alternative strategies (global, country or industry) is given by the variance of an equal-weighted portfolio relative to the average stock variance with equal weights:

$$\frac{Var\left(\frac{1}{N}\sum_{i=1}^{N} R_i\right)}{\frac{1}{N}\sum_{i=1}^{N} Var(R_i)} = \frac{1}{N} + \frac{N-1}{N}\frac{\overline{Cov(R_i,R_j)}}{\overline{Var(R_i)}} = \frac{1}{N} + \frac{N-1}{N}\overline{Corr(R_i,R_j)}, \tag{6}$$

where N denotes the number of stocks and the upper bars denote averages. Equation (6) shows that the risk reduction can come from either increasing the number of stocks, N, or decreasing the average correlation across stocks, $Corr(R_i, R_j)$. For the country diversification strategy, we diversify within an industry across countries. For each month, we randomly draw an industry and then within each industry randomly select N stocks. For the industry diversification strategy, we diversify across industries within a country. For each month, we randomly draw a country and then within each country randomly select N stocks. For the global strategy, we randomly select stocks with no restriction. We perform 1,000 simulations for each month for each strategy. We use only firms with complete observations in the last 60 months of the sample and industries or countries with at least ten stocks.

In Figure 6, we plot the portfolio diversification ratio in equation (6) of each strategy against the number of stocks in the portfolio. Panel A shows the results using the sample of all stocks. The country strategy shows greater portfolio diversification benefits than the industry diversification strategy. As the number of stocks becomes larger, the country (industry) strategy portfolio variance converges to 4% (11%) of the average variance of the stocks in the portfolio.

We next analyze the results for the stocks in decile 1 and decile 10 of total institutional ownership. Figure 6, Panel B, shows the results for the sample of stocks in decile 1. The country strategy (4% of average variance) provides significantly higher diversification benefits than the industry strategy (14%). Panel C for the sample of stocks in decile 10 presents a completely different pattern. The industry strategy (4% of average variance) provides significantly higher diversification benefits than the country strategy (8%).

We conclude that industrial allocation is more beneficial for risk reduction in stocks with high institutional ownership, while country allocation is more beneficial for risk reduction in stocks with low institutional ownership. These findings support the notion that stocks with high institutional ownership offer less benefits in terms of cross-country diversification.

7. Conclusion

We test the hypothesis that stocks with different levels of institutional ownership display different comovement patterns in international stock markets. Industrial effects are relatively more important than country effects in stocks with high institutional ownership. In contrast, country effects are the major source of stock return variation in stocks with low institutional ownership. Our findings are robust across different groups of countries and stocks. Our findings show that stocks overweighted by institutions have higher cross-industry correlations, while stocks underweighted by institutions have higher cross-country correlations.

These findings have important implications in terms of international portfolio allocation. Overall, we show that the presence of institutional investors contributes to the convergence of asset prices across countries.

References

Baca S.P., Garbe, B.L., Weiss, R.A., 2000. The rise of sector effects in major equity markets. Financial Analysis Journal 56, 34-40.

Baele, L., Inghelbrecht, K., 2009. Time-varying integration and international diversification strategies. Journal of Empirical Finance 16, 368-387.

Bai, Y., Green, C.J., 2010. International diversification strategies: revisited from the risk perspective. Journal of Banking & Finance 34, 236-245.

Bartram, S., Griffin, J., Lim, T., Ng, D., 2015. How important is foreign ownership in international stock returns? Review of Financial Studies. (forthcoming).

Beckers, S., Connor, G., Curds, R., 1996. National versus global influences on equity returns. Financial Analysts Journal 52, 31-39.

Bekaert, G., Harvey, C.R., Lundblad, C.T., Siegel, S., 2013. The European Union, the Euro, and equity market integration. Journal of Financial Economics 109, 583-603.

Bekaert, G., Hodrick, R.J., Zhang, X., 2009. International stock return comovements. Journal of Finance 64, 2591-2626.

Bekaert, G., Wang, X., 2009. Home bias revisited. SSRN Working Paper Series.

Broner, F., Gelos, R.G., Reinhart, C.M., 2006. When in peril, retrench: testing the portfolio channel of contagion. Journal of International Economics 69, 203-230.

Brooks, R., Del Negro, M., 2005. Country versus region effects in international stock returns. Journal of Portfolio Management Summer, 67-72.

Brooks, R., Del Negro, M., 2006. Firm-level evidence on international stock market comovement. Review of Finance 10, 69-98.

Campa, J.M., Fernandes, N., 2006. Sources of gains from international portfolio diversification. Journal of Empirical Finance 13, 417-443.

Cavaglia, S., Brightman, C., Aked, M., 2000. Importance of industry factors. Financial Analysts Journal 56, 41-54.

Chan, K., Covrig, V., Ng, L., 2005. What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. Journal of Finance 60, 1495-1534.

Ferreira, M., Matos, P., 2008. The colors of investors' money: the role of institutional investors around the world. Journal of Financial Economics 88, 499-533.

French, K., Poterba, J., 1991. Investor diversification and international equity markets. American Economic Review 53, 222-226.

Goetzmann, W.N., Kumar, A., 2008. Equity portfolio diversification. Review of Finance 12, 433-463.

Gompers, P.A., and Metrick, A. 2001. Institutional investors and equity prices. Quarterly Journal of Economics 116, 229-259.

Griffin, J.M., Karolyi, A.G., 1998. Another look at the role of industrial structure of market for international diversification strategies. Journal of Financial Economics 50, 351-373.

Hau, H., Rey, H., 2008. Global portfolio rebalancing under the microscope. NBER Working paper.

Heston, S.L., Rouwenhorst, K.G, 1994. Does industrial structure explain the benefits of international diversification? Journal of Financial Economics 36, 3-27.

Heston, S.L., Rouwenhorst, K.G, 1995. Industry and country effects in international stock returns. Journal of Portfolio Management Spring, 53-58.

International Monetary Fund (IMF), 2011, Global financial stability report - grappling with crisis legacies, September 2011.

Ince, O.S., Porter, R.B., 2006. Individual equity return data from Thomson datastream: handle with care! The Journal of Financial Research 29, 463-479.

Karolyi, A., Stulz, R., 2003. Are assets priced locally or globally? in Constantinides, George, Milton Harris and René Stulz (eds.), The Handbook of the Economics of Finance, North Holland, 975-1020.

Marsh, T., Pfleiderer, P., 1997. The Role of country and industry effects in explaining global stock returns. Working Paper, U.C. Berkeley and Stanford University.

Nagel, S., 2005. Short sales, institutional investors and the cross-section of stock returns. Journal of Financial Economics 78, 277-309.

Rouwenhorst, K.G., 1999. European equity markets and the EMU. Financial Analysts Journal 55, 27-34.

Sonney, F., 2009. Financial analysts' performance: sector versus country specialization. Review of Financial Studies 22, 2087-2131.

Stulz, R.M., 2005, The limits of financial globalization, Journal of Finance 60, 1595-1638.

Table 1
Summary Statistics

This table reports time series averages, by country and industry, of number of industries, number of countries, market capitalization as a percentage of the world market capitalization, total, domestic and foreign institutional ownership as a fraction stock market capitalization, average (equal- and value-weighted) monthly stock market return denominated in U.S. dollars. The sample period is from January 2000 to December 2010.

Panel A: Time Series Averages by Country

	Number of	Number	Market	Institutional Ownership (%)			Stock Return (%)	
Countries	Industries	of Firms	Cap. (%)	Total	Domestic	Foreign	EW	VW
Argentina	11	38	0.1	4.4	0.0	4.3	1.4	2.0
Australia	17	559	2.3	13.5	2.2	11.3	2.5	2.4
Austria	15	71	0.3	15.4	1.1	14.3	1.2	1.9
Belgium	16	112	0.6	14.1	1.9	12.2	0.9	1.4
Brazil	16	140	1.5	22.2	1.3	20.9	3.0	3.3
Canada	17	1,001	2.9	48.3	27.6	20.7	3.1	2.4
Chile	13	67	0.3	6.0	0.9	5.1	1.9	2.6
China	17	548	3.3	12.7	3.7	9.0	1.9	2.6
Colombia	9	21	0.2	0.7	0.0	0.6	2.3	3.6
Denmark	14	126	0.4	21.1	7.5	13.6	1.3	2.0
Finland	15	108	0.6	34.0	4.4	29.6	1.1	1.1
France	17	543	4.5	23.2	7.7	15.6	1.2	1.2
Germany	17	534	3.3	23.1	6.7	16.4	0.9	1.4
Greece	17	165	0.3	11.4	0.3	11.1	-0.4	0.9
Hong Kong	17	568	2.2	12.0	2.3	9.7	1.8	2.2
Hungary	11	24	0.1	29.4	0.6	28.8	1.1	1.9
India	17	510	1.6	12.9	3.2	9.7	2.9	3.4
Indonesia	15	120	0.3	11.3	0.0	11.3	2.3	4.1
Ireland	10	53	0.3	39.3	0.8	38.6	1.2	1.4
Israel	15	179	0.3	27.7	0.3	27.4	1.4	2.2
Italy	17	237	1.9	14.6	2.0	12.6	0.3	0.8
Japan	17	2,670	10.4	10.8	3.1	7.7	0.6	0.8
Korea (South)	17	536	1.4	16.6	0.1	16.5	1.9	2.7
Malaysia	16	382	0.5	6.7	0.6	6.2	1.0	2.0
Mexico	12	74	0.6	30.7	0.5	30.2	1.6	2.3
Netherlands	15	133	1.4	29.6	2.1	27.6	1.0	1.3
New Zealand	14	64	0.1	10.2	1.4	8.8	1.6	1.6
Norway	15	140	0.5	22.2	7.6	14.6	1.4	2.4
Peru	8	26	0.1	18.8	0.0	18.8	2.3	3.7
Philippines	12	72	0.1	11.3	0.1	11.2	2.5	3.2
Poland	15	143	0.2	20.9	12.2	8.7	2.0	2.4
Portugal	10	43	0.2	10.2	1.4	8.8	0.8	1.2
Romania	11	27	0.0	5.2	2.3	2.8	2.2	2.6
Russia	16	142	1.9	9.1	0.0	9.1	2.2	1.9
Singapore	16	277	0.7	15.3	1.9	13.4	1.3	2.0
Slovenia	9	20	0.0	9.4	6.8	2.6	0.4	0.7
South Africa	15	191	0.7	16.7	4.1	12.6	1.9	2.7
Spain	15	133	1.7	16.0	2.1	13.9	0.9	1.3
Sweden	17	242	1.1	31.1	18.2	12.9	1.4	1.9
Switzerland	15	201	2.5	23.5	3.5	20.0	1.1	1.2
Taiwan	16	504	1.3	13.5	0.5	13.0	1.4	2.1
Thailand	16	187	0.3	12.1	1.5	10.6	2.1	2.9
Turkey	16	143	0.4	9.9	0.1	9.8	2.4	3.1
U.K.	17	1,192	7.4	26.4	10.8	15.6	1.0	1.1
U.S.	17	5,218	40.3	70.2	65.5	4.7	1.7	1.3
Total	17	18,348		40.0	29.8	10.2	1.6	1.5

Panel B: Time Series Averages by Industry								
	Number of	Number	Market	Institutional Ownership			Stock Return	
	Countries	of Firms	Weight	Total	Domestic	Foreign	EW	VW
Food	42	815	4.0	37.1	25.8	11.3	1.6	1.7
Mines	31	709	2.7	31.0	12.5	18.5	3.6	4.1
Oil	38	634	8.1	42.3	28.2	14.1	1.8	2.7
Clothes	33	402	0.8	31.2	22.0	9.2	2.0	1.6
Durables	34	461	1.8	27.0	12.0	15.0	1.4	1.4
Chemicals	38	500	1.9	34.4	24.4	10.0	2.1	1.7
Consumption	37	658	7.7	47.8	36.0	11.8	1.1	1.8
Construction	41	1,114	3.0	32.5	23.3	9.2	1.7	1.5
Steel	38	395	1.7	25.0	16.4	8.6	2.7	1.9
Fabricated Products	28	152	0.3	47.4	40.8	6.5	2.2	1.9
Machinery	36	2,048	7.7	48.9	39.3	9.6	1.9	1.4
Cars	35	390	2.4	26.4	16.1	10.3	1.8	1.8
Transportation	39	682	3.7	36.2	27.5	8.7	1.7	1.5
Utilities	36	432	5.0	28.8	20.7	8.0	1.4	1.6
Retail	39	918	4.5	44.6	37.6	7.0	1.4	1.3
Financials	42	3,147	23.6	37.4	28.4	9.0	1.3	1.3
Other	42	4,893	21.3	45.3	35.6	9.7	1.2	1.3
Total	42	18,348		40.0	29.8	10.2	1.6	1.5

Table 2

Stock Return Variation and Institutional Ownership: Heston-Rouwenhorst Model

This table reports time series averages of total institutional ownership as a percentage of market capitalization, annualized value-weighted mean absolute deviations (*MAD*) of the global, country, industry and idiosyncratic factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (IO). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All Stocks									
	Institutional	*MAD*				Country Relative to			
	Ownership	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	41.0	15.9	9.3	5.5	50.1	1.8	***	0.6	***
Decile 1 (Low *IO*)	0.1	15.3	16.0	6.0	57.2	2.7	***	1.1	*
Decile 2	0.6	15.8	16.0	5.4	47.9	2.9	***	1.1	
Decile 3	1.6	16.2	15.4	5.5	46.3	2.9	***	1.0	
Decile 4	3.5	16.2	14.5	5.9	46.2	2.6	***	0.9	**
Decile 5	6.3	16.3	13.3	6.1	45.8	2.3	***	0.8	***
Decile 6	10.4	15.9	12.6	6.4	46.8	2.2	***	0.8	***
Decile 7	16.7	16.1	10.8	6.9	46.6	1.7	***	0.7	***
Decile 8	27.4	17.0	8.9	8.4	47.2	1.1		0.5	***
Decile 9	53.2	17.5	5.1	9.2	46.8	0.6	***	0.3	***
Decile 10 (High *IO*)	83.5	16.5	0.8	8.8	38.6	0.1	***	0.1	***
Low-High *IO*						2.6	***	1.0	***

Panel B: Non-U.S. Stocks									
	Institutional	*MAD*				Country Relative to			
	Ownership	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	19.5	16.0	11.2	4.6	44.9	2.5	***	0.7	**
Decile 1 (Low *IO*)	0.1	15.1	16.4	5.8	49.7	2.8	***	1.2	**
Decile 2	0.4	15.8	16.8	5.5	45.1	3.0	***	1.1	**
Decile 3	1.0	15.7	15.9	5.5	42.5	2.9	***	1.1	
Decile 4	2.0	16.3	15.3	5.2	42.3	3.0	***	1.0	
Decile 5	3.6	16.5	14.8	5.8	41.5	2.6	***	0.9	
Decile 6	5.8	16.0	13.2	5.9	41.9	2.3	***	0.9	***
Decile 7	8.9	16.4	12.6	5.5	40.9	2.4	***	0.8	***
Decile 8	13.4	16.3	12.1	6.1	40.9	2.0	***	0.8	***
Decile 9	21.1	17.2	9.7	6.4	39.5	1.6	***	0.6	***
Decile 10 (High *IO*)	39.1	17.5	8.4	7.6	37.2	1.1	**	0.5	***
Low-High *IO*						1.7	***	0.7	***

Table 3
Stock Return Variation and Institutional Ownership: Variance Decomposition

This table reports time series averages of annualized standard deviations (*SD*) of the global, country, industry and idiosyncratic factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles for each month based on lagged total institutional ownership (*IO*). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	5.1	12.7	4.9	51.3	2.8	***	2.6	***
Decile 1 (Low *IO*)	6.0	16.2	3.1	58.5	5.5	***	2.9	***
Decile 2	4.0	17.8	3.5	49.3	5.3	***	4.7	***
Decile 3	4.9	16.5	3.7	48.1	4.6	***	3.5	***
Decile 4	5.1	14.6	4.2	48.4	3.8	***	3.0	***
Decile 5	6.2	13.4	4.1	47.7	3.5	***	2.3	***
Decile 6	7.0	12.5	5.0	48.5	2.6	***	2.1	***
Decile 7	6.6	11.3	5.1	48.4	2.4	***	1.9	***
Decile 8	8.6	9.0	5.5	49.0	1.8	***	1.1	*
Decile 9	11.0	6.3	6.5	48.0	1.1		0.7	***
Decile 10 (High *IO*)	7.7	4.1	8.9	40.3	0.5	***	0.6	***
Low-High *IO*					5.0	***	2.3	***

Panel B: Non-U.S. Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	4.4	14.3	4.2	46.2	3.5	***	3.4	***
Decile 1 (Low *IO*)	5.3	18.3	3.3	50.7	5.8	***	3.9	***
Decile 2	4.2	18.8	3.3	46.5	6.1	***	4.7	***
Decile 3	4.5	17.7	3.7	44.0	4.8	***	4.1	***
Decile 4	4.8	16.7	3.8	44.1	4.4	***	3.7	***
Decile 5	5.0	15.7	4.1	43.6	4.0	***	3.4	**
Decile 6	6.6	14.1	4.3	43.6	3.5	***	2.3	***
Decile 7	7.1	13.1	4.7	42.6	2.9	***	2.2	***
Decile 8	6.8	13.0	5.4	42.7	2.5	***	2.1	***
Decile 9	7.5	11.1	5.0	41.4	2.3	***	1.6	***
Decile 10 (High *IO*)	9.1	9.0	6.1	39.6	1.5	***	1.1	
Low-High *IO*					4.3	***	2.8	***

Table 4

Stock Return Variation and Institutional Ownership: Robustness

This table reports time series averages of annualized standard deviations (*SD*) of the global, country and industry factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles for each month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. In the "Industry Classification" item, different industry classifications of stocks are used. In the "Currency" item, returns are in local currency. In the "Controlling for Firm Size" item, stocks are divided into deciles based on the residuals of a cross-sectional regression of institutional ownership on market capitalization and based on market capitalization. In the "Orthogonalization Method" item, industry returns are orthogonalized with respect to country returns using an ordinary least squares regression. The "Subsamples" item uses subsamples of stocks excluding U.S., G7 countries, non-European, emerging markets, developed markets, financial sector, and technology, media and telecommunication sector stocks. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	SD						Country Relative to					
	Low *IO*			High *IO*			Industry			Global		
	Global	Country	Industry	Global	Country	Industry	Low *IO*	High *IO*	Low-High *IO*	Low *IO*	High *IO*	Low-High *IO*
Industry Classification												
SIC 2-Digit	5.9	16.3	6.2	7.7	4.1	12.0	2.6 ***	0.4 ***	2.2 ***	2.9 ***	0.6 ***	2.3 ***
Fama-French 49 Industries	6.0	16.2	5.5	7.7	4.1	11.4	3.0 ***	0.4 ***	2.6 ***	2.9 ***	0.6 ***	2.3 ***
Fama-French 10 Industries	6.0	16.2	2.9	7.7	4.1	8.8	6.2 ***	0.5 ***	5.7 ***	2.9 ***	0.6 ***	2.3 ***
Currency												
Returns in Local Currency	5.7	14.6	3.0	7.4	3.9	8.9	5.0 ***	0.5 ***	4.5 ***	2.8 ***	0.6 ***	2.2 ***
Controlling for Firm Size												
Residual Institutional Ownership	6.0	16.2	3.1	7.7	4.1	8.9	5.5 ***	0.5 ***	5.0 ***	2.9 ***	0.6 ***	2.3 ***
Market Capitalization	0.6	20.3	9.0	2.9	11.7	7.3	2.4 ***	1.7 ***	0.7 ***	34.0 ***	4.5 ***	29.5 ***
Orthogonalization Method												
Country on Industry	11.0	16.0	4.0	6.4	3.7	9.1	3.9 ***	0.4 ***	3.5 ***	2.6 ***	0.7 ***	1.9 ***
Subsamples												
Europe	5.3	15.3	4.6	10.5	7.0	5.1	3.3 ***	1.4 **	1.9 ***	3.0 ***	0.7 ***	2.3 ***
Asia-Pacific	6.6	13.0	7.1	8.2	9.1	6.3	1.9 ***	1.5 ***	0.4 **	2.2 ***	1.2 **	1.0 ***
Developed Markets	6.0	12.1	4.2	7.4	3.2	9.2	2.9 ***	0.4 ***	2.5 ***	2.2 ***	0.5 ***	1.7 ***
Emerging Markets	7.4	21.1	6.2	7.1	16.8	5.8	3.5 ***	2.9 ***	0.6 ***	3.0 ***	2.7 ***	0.3 *
Non-G7	6.9	19.9	4.6	8.1	11.9	4.4	4.4 ***	2.8 ***	1.6 ***	3.2 ***	1.5 ***	1.7 ***
Non-TMT	6.1	16.6	3.1	7.7	4.5	9.6	5.4 ***	0.5 ***	4.9 ***	2.9 ***	0.6 ***	2.3 ***
Non-Financial	6.6	16.8	3.4	8.4	4.3	9.0	5.1 ***	0.5 ***	4.6 ***	2.7 ***	0.6 ***	2.1 ***

Table 5
Stock Return Variation and Institutional Ownership: Groups of Firms

This table reports time series averages of annualized standard deviations (*SD*) of the global, country and industry factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. For each month, stocks are sorted based on the first characteristics (size, turnover, analyst coverage, market-to-book, momentum, MSCI membership, foreign sales, and U.S. cross-listing) and then, within each group, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The small and big groups consist of those firms whose market capitalization is in the lowest and highest terciles. The low and high groups consist of those firms whose turnover or analyst coverage is in the lowest and highest terciles. The value and growth groups consist of those firms whose market-to-book ratio is in the lowest and highest terciles. The loser and winner groups consist of those firms whose annual stock return is in the lowest and highest terciles. The MSCI group consists of those firms whose stock is included in the MSCI All-Country World index. The multinational group consists of those firms whose foreign sales are positive. The ADR group consists of those firms whose stock is listed on a U.S. exchange. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	SD						Country Relative to											
	Low *IO*			High *IO*			Industry						Global					
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*	
Firm Size																		
Small	3.7	23.5	8.9	6.9	12.3	11.9	2.6	***	1.1		1.5	***	6.7	***	2.0	***	4.7	***
Big	2.9	19.1	5.3	5.0	3.9	10.4	3.7	***	0.4	***	3.3	***	7.1	***	0.8	***	6.3	***
Turnover																		
Low	5.2	13.2	3.6	7.0	9.5	4.3	3.8	***	2.4	***	1.3	***	2.7	***	1.4	***	1.3	***
High	6.7	26.7	6.7	6.0	4.5	10.4	4.1	***	0.5	***	3.6	***	4.4	***	0.4		4.0	***
Analyst Coverage																		
Low	5.9	18.4	5.1	7.7	11.1	5.9	3.8	***	2.2	**	1.6	***	3.5	***	1.8	**	1.7	***
High	4.7	18.3	5.3	5.7	3.5	10.5	3.5	***	0.3	***	3.2	***	4.2	***	0.6	***	3.6	***
Market-to-Book																		
Value	4.7	20.4	5.2	9.9	7.3	8.2	4.0	***	1.0		3.0	***	2.9	***	0.7	***	2.2	***
Growth	7.2	19.5	5.2	6.8	4.3	9.4	3.9	***	0.5	***	3.4	***	3.5	***	0.6	***	2.9	***
Momentum																		
Loser	6.5	20.1	5.7	10.8	5.6	9.0	3.7	***	0.6	***	3.1	***	3.5	***	0.6	***	2.9	***
Winner	6.8	17.8	4.9	7.1	6.0	9.9	3.8	***	0.7	***	3.1	***	2.8	***	0.9		1.9	***
MSCI Membership																		
MSCI	3.2	21.7	6.7	4.9	4.7	11.9	3.3	***	0.4	***	2.9	***	7.2	***	1.1		6.1	***
Non-MSCI	6.2	16.4	3.2	6.1	4.9	9.4	5.4	***	0.5	***	4.9	***	2.8	***	0.8	**	2.0	***
Foreign Sales																		
Multinational	5.5	16.7	4.2	7.5	4.0	9.1	4.0	***	0.4	***	3.6	***	3.3	***	0.6	***	2.7	***
Non-Multinational	6.6	16.9	3.7	7.2	5.1	9.7	4.7	***	0.5	***	4.2	***	2.7	***	0.8	***	1.9	***
U.S. Cross-Listing																		
ADR	7.6	24.7	17.3	8.2	11.2	14.7	1.5	***	0.8	**	0.7	***	3.5	***	1.7	***	1.8	***
Non-ADR	5.9	16.3	3.1	7.3	3.5	8.8	5.5	***	0.4	***	5.1	***	3.0	***	0.5	***	2.5	***

Table 6
Stock Return Variation and Domestic and Foreign Institutional Ownership

This table reports time series averages of annualized standard deviations (*SD*) of the global, country and industry factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. For each month, stocks are divided into terciles based on lagged domestic or foreign institutional ownership and then, within each tercile, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The low and high groups of domestic and foreign institutional ownership consist of those firms whose domestic or foreign institutional ownership is in the lowest and highest terciles. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and if the difference between ratios is equal to zero are calculated using Newey-West adjusted standard errors. *,**,and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All Stocks

	SD						Country Relative to											
	Low *IO*			High *IO*			Industry						Global					
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*	
Domestic Institutional Ownership																		
Low	4.9	16.3	4.6	4.7	14.0	4.6	2.9	***	2.3	***	0.6	**	2.8	***	2.6	**	0.2	
High	14.4	2.4	11.7	11.7	2.3	12.4	0.2	**	0.2	***	0.0		0.2	***	0.2	***	0.0	
Foreign Institutional Ownership																		
Low	7.1	15.9	9.6	5.4	9.0	11.1	1.8	***	0.9		0.9	***	2.4	***	1.9	***	0.5	**
High	5.3	21.9	6.6	6.4	13.3	12.0	3.5	***	1.2	**	2.3	***	4.7	***	2.2	***	2.5	***

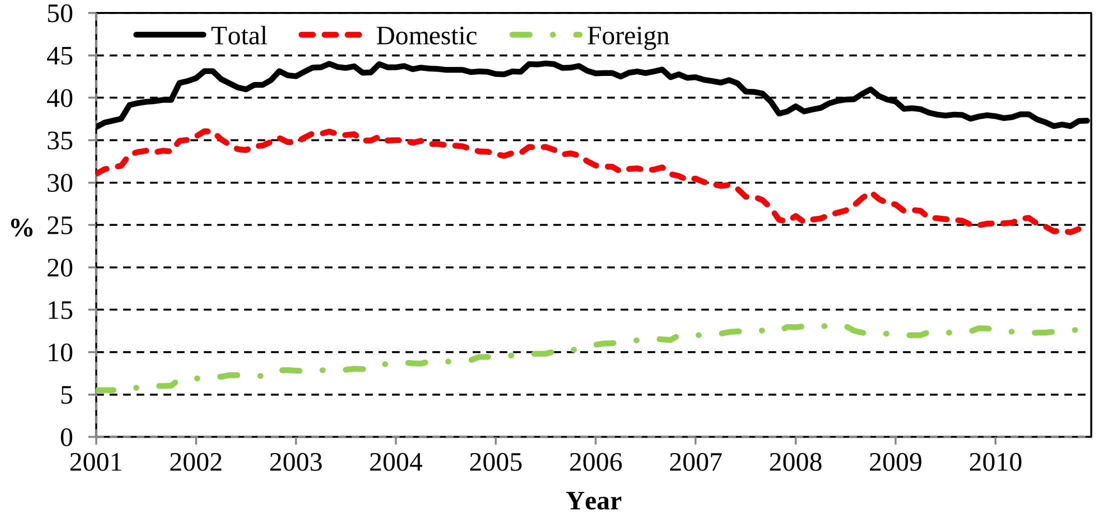
Panel B: Non-U.S. Stocks

	SD						Country Relative to											
	Low *IO*			High *IO*			Industry						Global					
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*	
Domestic Institutional Ownership																		
Low	7.4	11.5	6.9	7.4	11.5	6.9	1.8	***	1.8	***	0.0		1.7	***	1.7	***	0.0	
High	4.6	16.7	6.8	7.6	9.5	8.2	2.5	***	1.2	*	1.3	***	4.4	***	1.3	***	3.1	***
Foreign Institutional Ownership																		
Low	5.3	20.7	4.7	4.7	12.7	7.3	4.4	***	1.9	**	2.5	***	4.4	***	3.4	***	1.0	
High	6.5	17.7	5.4	8.0	10.6	8.2	3.4	***	1.4	***	2.0	***	3.0	***	1.5	***	1.5	***

Figure 1
Evolution of Institutional Ownership

This figure presents the evolution of total, domestic, and foreign institutional ownership as a percentage of stock market capitalization from January 2001 to December 2010.

Panel A: All Stocks



Panel B: Non-U.S. Stocks

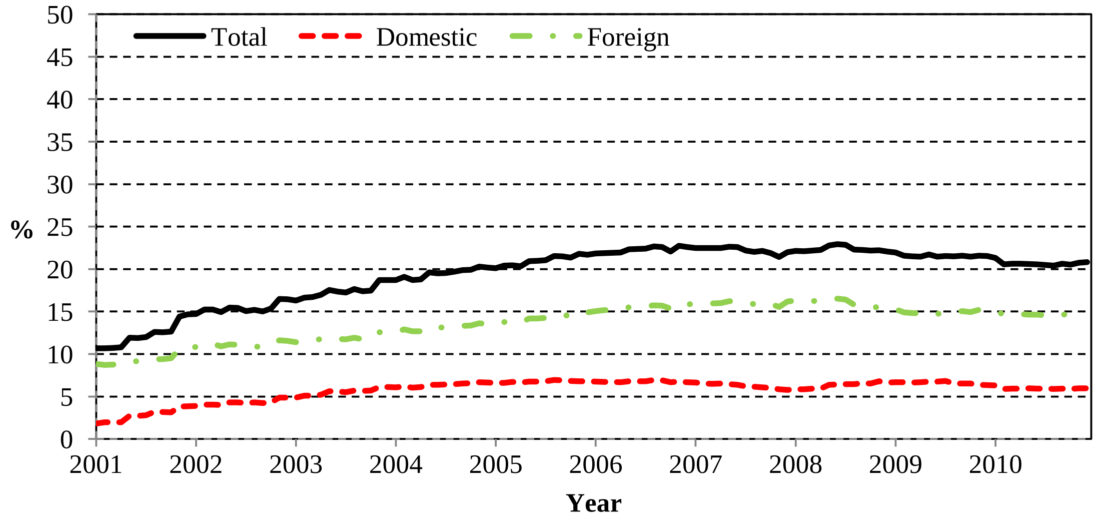
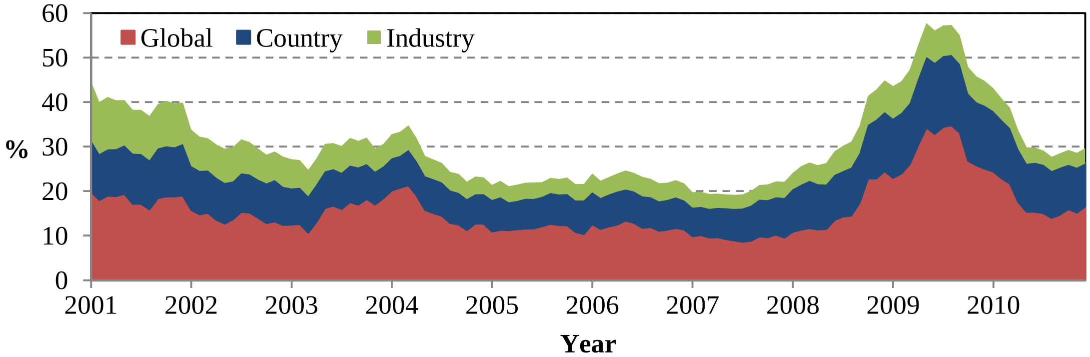


Figure 2

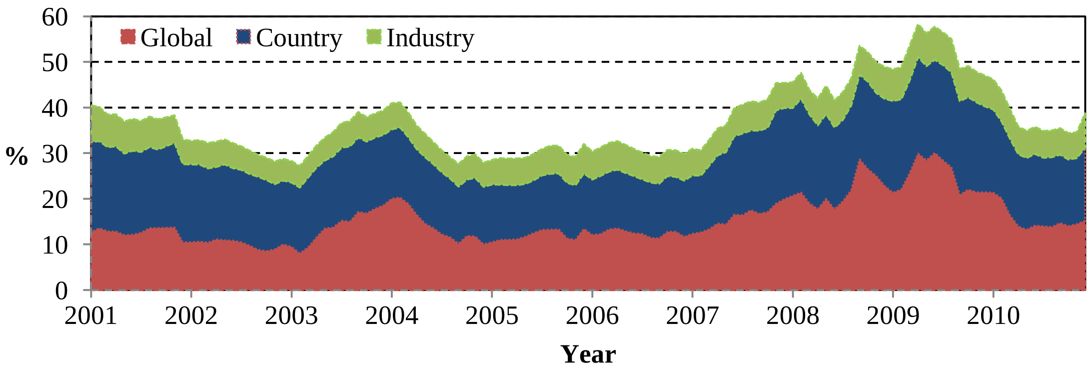
Country and Industry Effects and Institutional Ownership: Heston-Rouwenhorst Model

This figure presents the 12-month moving average of annualized value-weighted mean absolute deviations (*MAD* in percentage) of the global, country and industry factors for different groups of stocks using the Heston and Rouwenhorst (1994) model from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles.

Panel A: All Stocks



Panel B: Low Institutional Ownership



Panel C: High Institutional Ownership

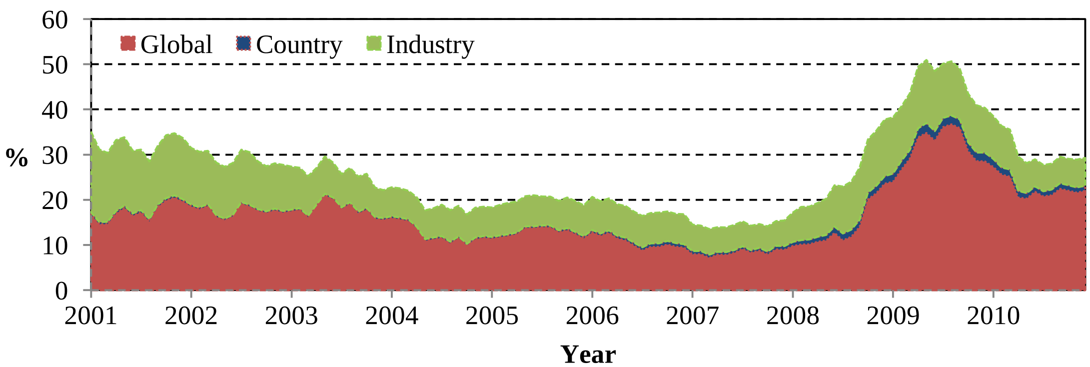
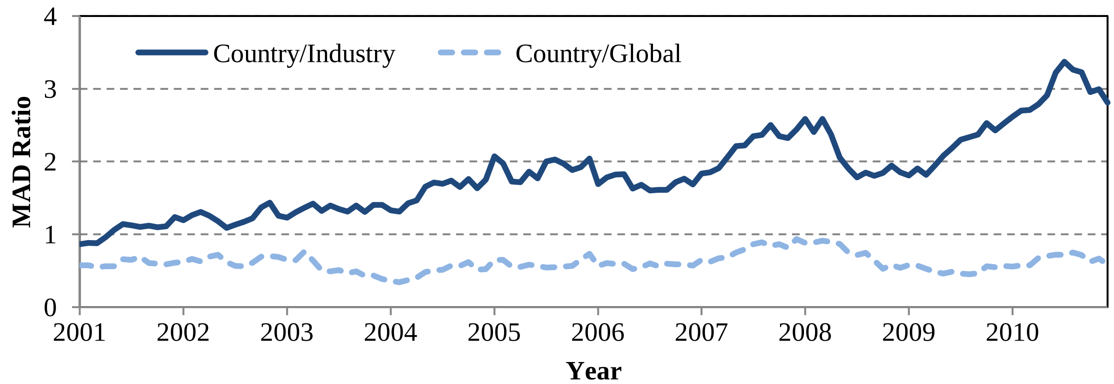


Figure 3

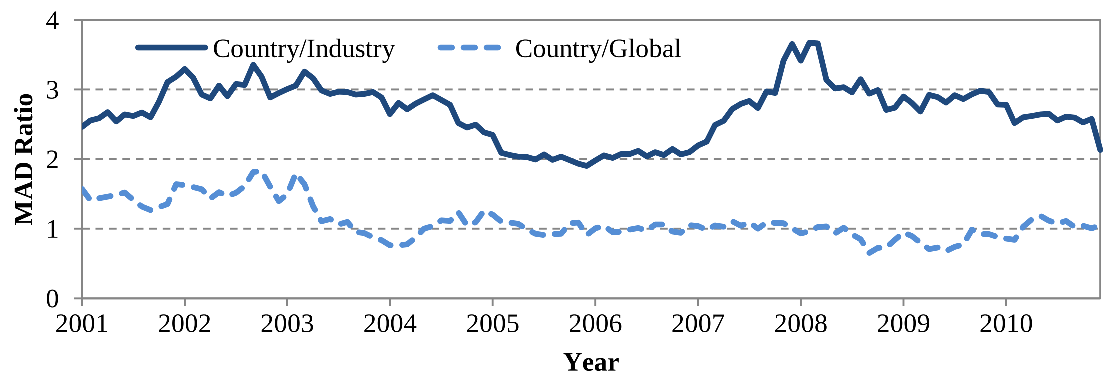
Country-to-Industry Ratio and Institutional Ownership: Heston-Rouwenhorst Model

This figure presents the 12-month moving average of ratios of annualized value-weighted mean absolute deviations (*MAD*) of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles.

Panel A: All Stocks



Panel B: Low Institutional Ownership



Panel C: High Institutional Ownership

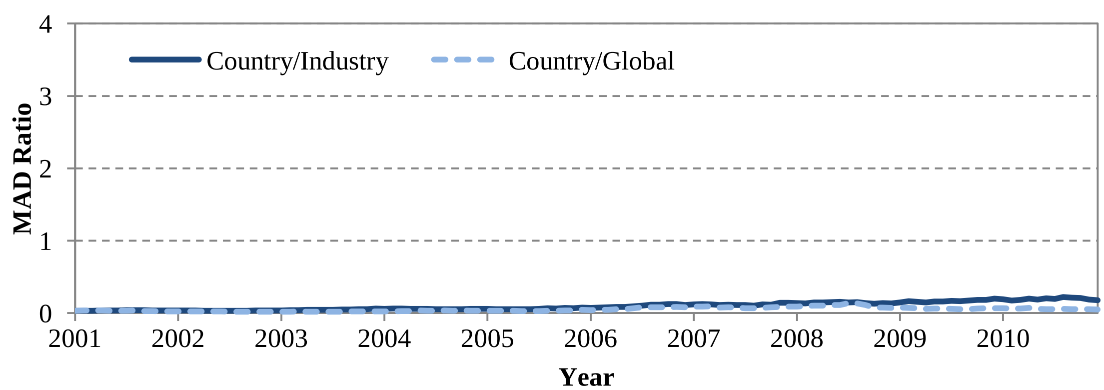


Figure 4

Country and Industry Effects and Institutional Ownership: Variance Decomposition

This figure presents the 12-month moving average of annualized standard deviations (*SD* in percentage) of the global, country, and industry factors for different groups of stocks using a variance decomposition of stock returns from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles.

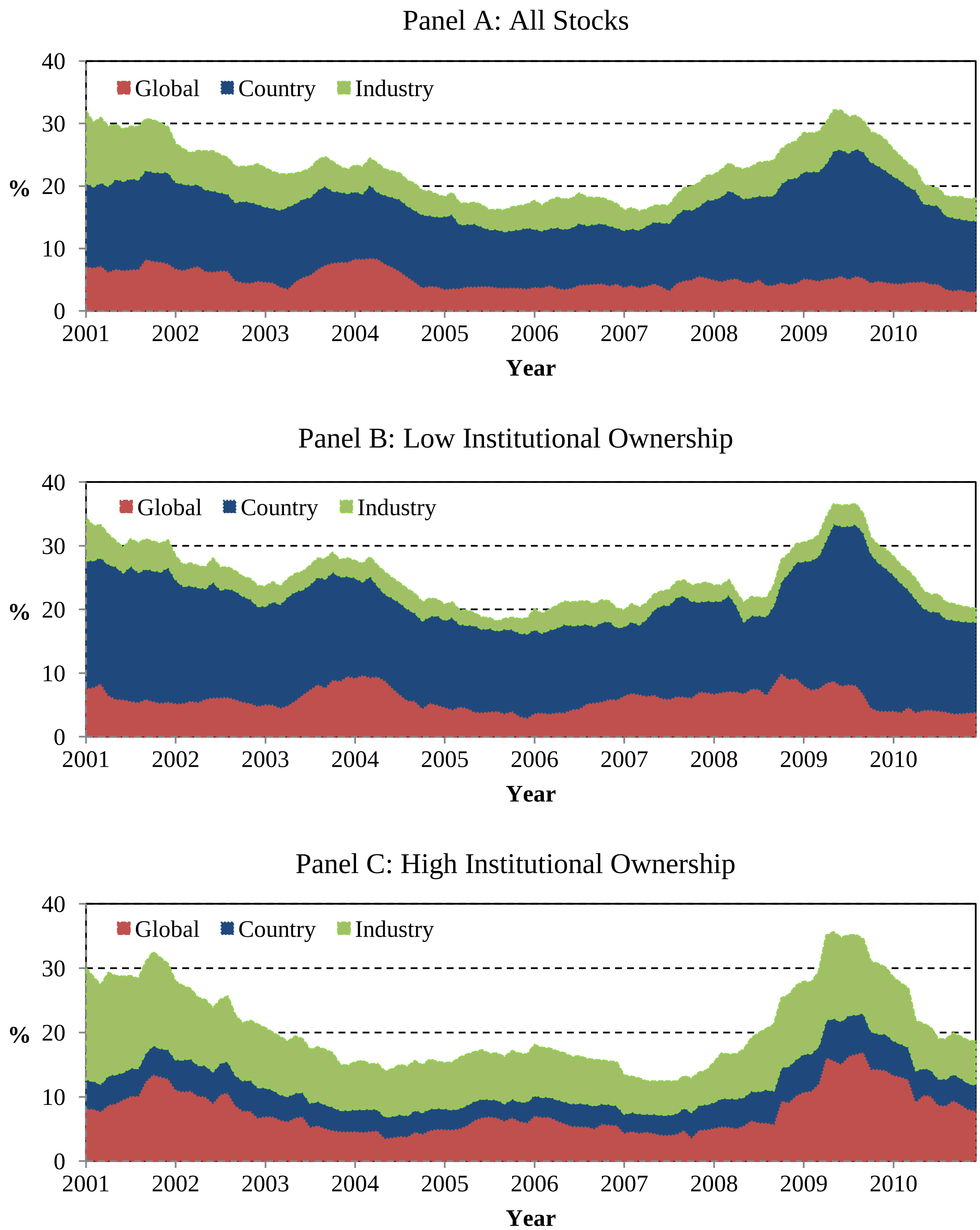
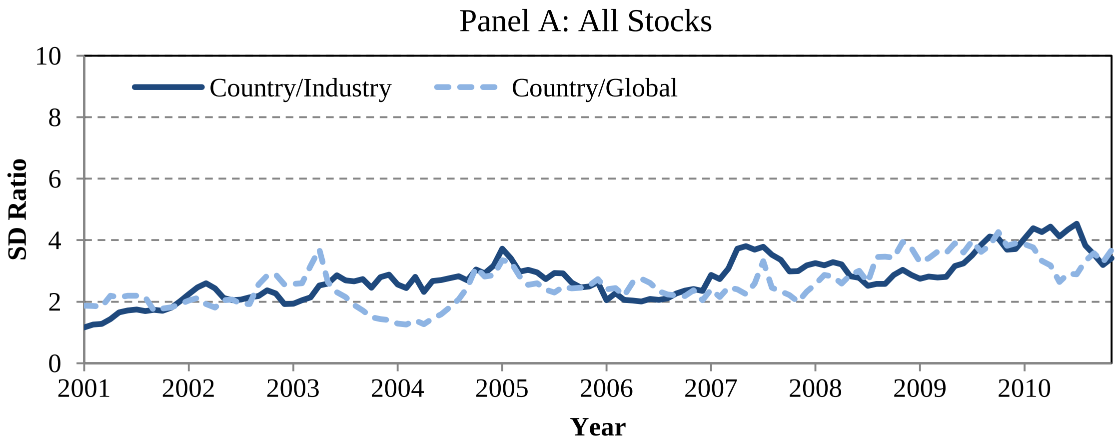
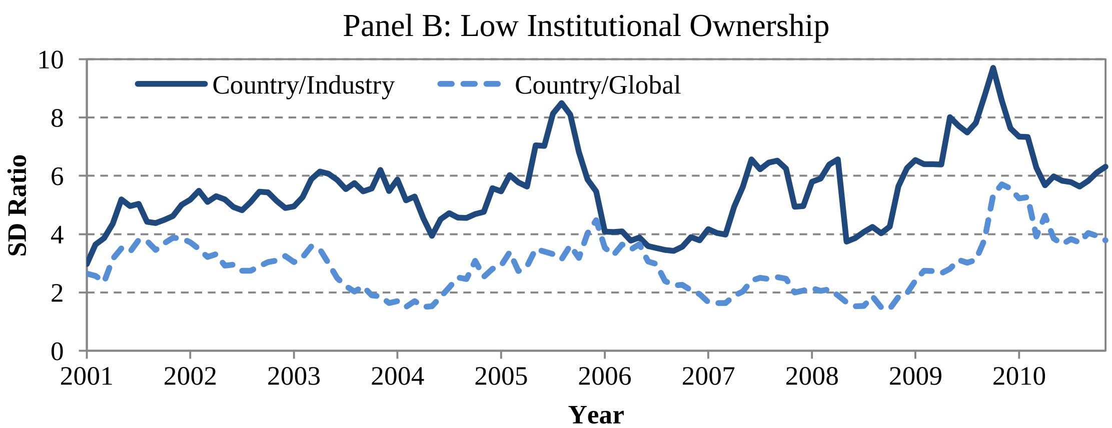


Figure 5

Country-to-Industry Ratio and Institutional Ownership: Variance Decomposition

This figure presents the 12-month moving average of ratios of annualized standard deviations (*SD*) of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles.





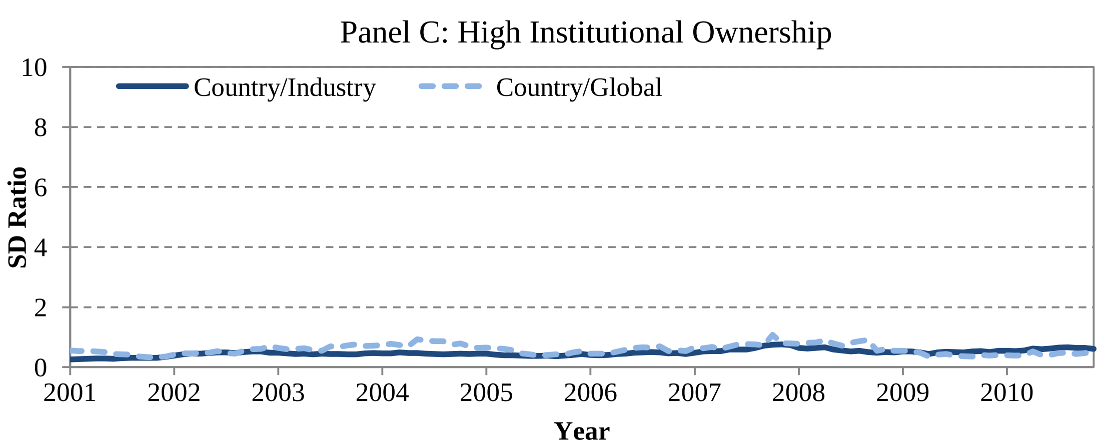
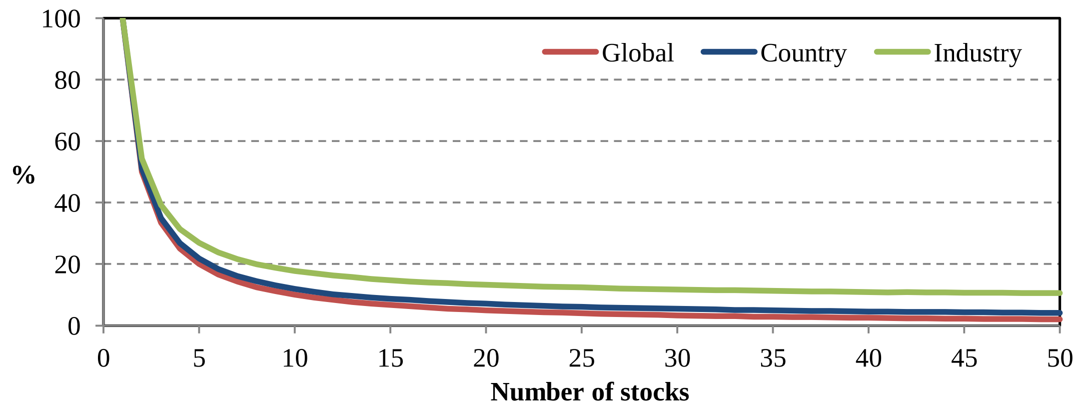


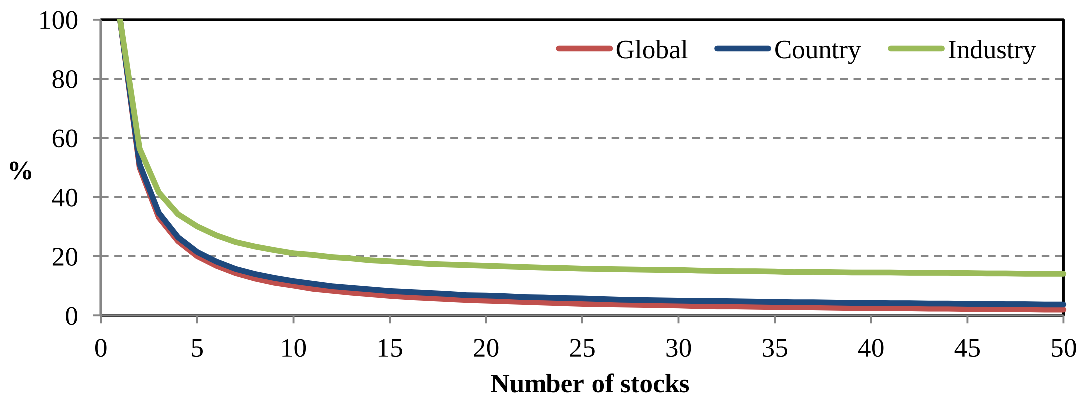
Figure 6
Diversification Benefits by Level of Institutional Ownership

This figure plots the ratio (in percentage) of the variance of an equal-weighted stock portfolio relative to the average stock variance for portfolios with different number of stocks returns from January 2001 to December 2010. For each month, stocks are picked with no restriction (global strategy) from a randomly drawn industry (country strategy) or country (industry strategy). The number of simulations is 1,000 for each month. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles.

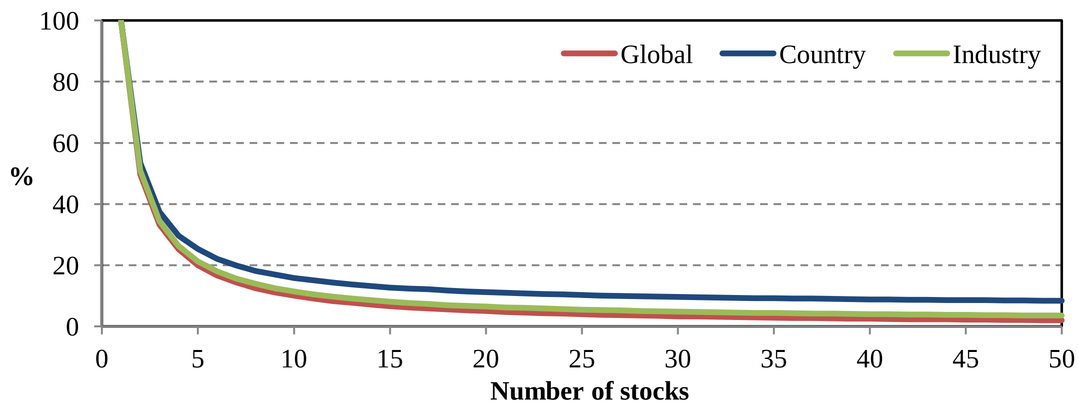
Panel A: All Stocks



Panel B: Low Institutional Ownership



Panel C: High Institutional Ownership



Online Appendix for

“Does Institutional Ownership Matter for International Stock Return Comovement?”

José A. Faias
UCP - Católica Lisbon School of Business and Economics

Miguel A. Ferreira
Nova School of Business and Economics. ECGI

This Version: June 2015

Table A1
Stock Return Variation and Institutional Ownership: Robustness

This table reports time series averages of annualized value-weighted mean absolute deviations (*MAD*) of the global, country, and industry factors, and ratios of the MAD of the country factor relative to the MAD of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. In the "Industry Classification" item, different industry classifications of stocks are used. In the "Currency" item, returns are in local currency. In the "Controlling for Firm Size" item, stocks are divided into deciles based on the residuals of a cross-sectional regression of institutional ownership on market capitalization and based on market capitalization. In the "Orthogonalization Method" item, industry returns are orthogonalized with respect to country returns using an ordinary least squares regression. The "Subsamples" item uses subsamples of stocks excluding U.S., G7 countries, non-European, emerging markets, developed markets, financial sector, and technology, media and telecommunication sector stocks. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	MAD						Country Relative to					
	Low *IO*			High *IO*			Industry			Global		
	Global	Country	Industry	Global	Country	Industry	Low *IO*	High *IO*	Low-High *IO*	Low *IO*	High *IO*	Low-High *IO*
Industry Classification												
SIC 2-Digit	16.5	19.7	12.0	18.7	1.8	17.5	1.7 ***	0.1 ***	1.6 ***	1.4 **	0.1 ***	1.3 ***
Fama-French 49 Industries	15.7	15.1	7.7	16.9	0.8	11.7	2.0 ***	0.1 ***	1.9 ***	1.0	0.1 ***	0.9 ***
Fama-French 10 Industries	15.3	16.0	6.0	16.5	0.8	8.8	2.7 ***	0.1 ***	2.6 ***	1.1 *	0.1 ***	1.0 ***
Currency												
Returns in Local Currency	13.1	15.0	5.9	16.3	0.8	8.8	2.5 ***	0.1 ***	2.4 ***	1.2 ***	0.1 ***	1.1 ***
Controlling for Firm Size												
Residual Institutional Ownership	15.3	16.0	6.0	16.5	0.8	8.8	2.7 ***	0.1 ***	2.6 ***	1.1 *	0.1 ***	1.0 ***
Market Capitalization	18.0	13.4	8.0	14.5	7.4	6.9	1.7 ***	1.2 *	0.5 ***	0.8 ***	0.5 ***	0.3 ***
Orthogonalization Method												
Country on Industry	15.3	16.0	6.0	16.5	0.8	8.8	2.6 ***	0.1 ***	2.5 ***	2.4 *	1.7 ***	0.7 ***
Subsamples												
Europe	13.4	9.9	7.5	16.8	6.8	7.6	1.3 ***	0.9 *	0.4 ***	0.8 ***	0.4 ***	0.4 ***
Asia-Pacific	19.1	17.9	7.8	16.6	11.3	7.5	2.3 ***	1.5 ***	0.8 ***	1.0	0.7 ***	0.3 ***
Developed Markets	13.4	10.6	7.3	16.9	0.6	9.1	1.5 ***	0.1 ***	1.4 ***	0.8 ***	0.1 ***	0.7 ***
Emerging Markets	19.6	19.4	10.6	21.6	14.6	9.2	1.9 ***	1.6 ***	0.3 ***	1.0	0.7 ***	0.3 ***
Non-G7	18.2	19.7	8.3	18.6	10.7	6.9	2.4 ***	1.6 ***	0.8 ***	1.2 ***	0.6 ***	0.6 ***
Non-TMT	15.1	15.9	6.0	16.0	0.9	9.4	2.6 ***	0.1 ***	2.5 ***	1.1 ***	0.1 ***	1.0 ***
Non-Financial	16.8	17.5	7.1	17.9	0.9	8.8	2.5 ***	0.1 ***	2.4 ***	1.1 ***	0.1 ***	1.0 ***

Table A2
Stock Return Variation and Institutional Ownership: Groups of Firms

This table reports time series averages of annualized value-weighted mean absolute deviations (*MAD*) of the global, country and industry factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. For each month, stocks are sorted based on the first characteristics (size, turnover, analyst coverage, market-to-book, momentum, MSCI membership, foreign sales, and U.S. cross-listing) and then, within each group, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The small and big groups consist of those firms whose market capitalization is in the lowest and highest terciles. The low and high groups consist of those firms whose turnover or analyst coverage is in the lowest and highest terciles. The value and growth groups consist of those firms whose market-to-book ratio is in the lowest and highest terciles. The loser and winner groups consist of those firms whose annual stock return is in the lowest and highest terciles. The MSCI group consists of those firms whose stock is included in the MSCI All-Country World index. The multinational group consists of those firms whose foreign sales are positive. The ADR group consists of those firms whose stock is listed on a U.S. exchange. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	SD						Country Relative to											
	Low *IO*			High *IO*			Industry						Global					
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*	
Firm Size																		
Small	17.7	19.1	9.1	21.1	7.1	10.0	2.1	***	0.8	***	1.3	***	1.1	*	0.4	***	0.7	***
Big	14.0	15.7	6.1	16.6	0.6	9.1	2.6	***	0.1	***	2.5	***	1.2	**	0.1	***	1.1	***
Turnover																		
Low	12.3	13.1	7.5	15.9	8.6	6.8	1.7	***	1.3	***	0.4	***	1.1	*	0.5	***	0.6	***
High	25.7	21.8	10.6	17.4	0.5	9.4	2.0	***	0.1	***	1.9	***	0.9		0.1	***	0.8	***
Analyst Coverage																		
Low	14.7	16.5	9.6	15.6	10.2	7.9	1.7	***	1.4		0.3	*	1.2	***	0.7	***	0.5	***
High	16.6	16.1	6.5	17.1	0.5	9.2	2.5	***	0.1	***	2.4	***	1.0		0.1	***	0.9	***
Market-to-Book																		
Value	15.6	18.9	8.4	20.0	4.3	8.8	2.2	***	0.6	***	1.6	***	1.3	***	0.2	***	1.1	***
Growth	17.2	17.8	9.4	17.0	0.9	9.3	1.9	***	0.1	***	1.8	***	1.1		0.1	***	1.0	***
Momentum																		
Loser	17.7	19.8	9.5	22.4	1.9	9.4	2.1	***	0.2	***	1.9	***	1.2	**	0.7	***	0.5	***
Winner	17.2	17.8	9.9	17.3	2.2	10.1	1.8	***	0.2	***	1.6	***	1.1		0.1	***	1.0	***
MSCI Membership																		
MSCI	19.2	22.3	6.9	15.1	0.6	9.8	3.3	***	0.1	***	3.2	***	1.5	**	0.0	***	1.5	***
Non-MSCI	15.2	16.2	6.2	18.2	1.1	8.7	2.6	***	0.1	***	2.5	***	1.1	**	0.1	***	1.0	***
Foreign Sales																		
Multinational	15.7	15.1	8.2	18.0	0.8	9.3	1.8	***	0.1	***	1.7	***	1.0		0.1	***	0.9	***
Non-Multinational	15.6	17.4	7.3	15.5	1.0	8.6	2.4	***	0.1	***	2.3	***	1.2	***	0.1	***	1.1	***
U.S. Cross-Listing																		
ADR	19.1	22.8	19.3	20.0	9.4	17.2	1.3	**	0.6	***	0.7	***	1.3	***	0.5	***	0.8	***
Non-ADR	15.3	16.0	5.9	16.4	0.2	8.6	2.7	***	0.1	***	2.6	***	1.1	*	0.1	***	1.0	***

Table A3
Stock Return Variation and Institutional Ownership: Robustness Non U.S. – Excluding U.S. Firms

This table reports time series averages of annualized standard deviations (*SD*) of the global, country and industry factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. In the "Industry Classification" item, different industry classifications of stocks are used. In the "Currency" item, returns are in local currency. In the "Controlling for Firm Size" item, stocks are divided into deciles based on the residuals of a cross-sectional regression of institutional ownership on market capitalization and based on market capitalization. In the "Orthogonalization Method" item, industry returns are orthogonalized with respect to country returns using an ordinary least squares regression. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	SD						Country Relative to											
	Low *IO*			High *IO*			Industry						Global					
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*	
Industry Classification																		
SIC 2-Digit	5.9	16.3	6.2	7.7	4.1	12.0	2.6	***	0.4	***	2.2	***	2.9	***	0.6	***	2.3	***
Fama-French 49 Industries	6.0	16.2	5.5	7.7	4.1	11.4	3.0	***	0.4	***	2.6	***	2.9	***	0.6	***	2.3	***
Fama-French 10 Industries	6.0	16.2	2.9	7.7	4.1	8.8	6.2	***	0.5	***	5.7	***	2.9	***	0.6	***	2.3	***
Currency																		
Returns in Local Currency	5.7	14.6	3.0	7.4	3.9	8.9	5.0	***	0.5	***	4.5	***	2.8	***	0.6	***	2.2	***
Controlling for Firm Size																		
Residual Institutional Ownership	6.0	16.2	3.1	7.7	4.1	8.9	5.5	***	0.5	***	5.0	***	2.9	***	0.6	***	2.3	***
Market Capitalization	0.6	20.3	9.0	2.9	11.7	7.3	2.4	***	1.7	***	0.7	***	34.0	***	4.5	***	29.5	***
Orthogonalization Method																		
Country on Industry	11.0	16.0	4.0	6.4	3.7	9.1	3.9	***	0.4	***	3.5	***	2.6	***	0.7	***	1.9	***

Table A4
Stock Return Variation and Institutional Ownership: Groups of Firms – Excluding U.S. Firms

This table reports time series averages of annualized standard deviations (*SD*) of the global, country and industry factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. For each month, stocks are sorted based on the first characteristics (size, turnover, analyst coverage, market-to-book, momentum, MSCI membership, foreign sales, and U.S. cross-listing) and then, within each group, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The small and big groups consist of those firms whose market capitalization is in the lowest and highest terciles. The low and high groups consist of those firms whose turnover or analyst coverage is in the lowest and highest terciles. The value and growth groups consist of those firms whose market-to-book ratio is in the lowest and highest terciles. The loser and winner groups consist of those firms whose annual stock return is in the lowest and highest terciles. The MSCI group consists of those firms whose stock is included in the MSCI All-Country World index. The multinational group consists of those firms whose foreign sales are positive. The ADR group consists of those firms whose stock is listed on a U.S. exchange. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one and of the test of the difference in ratios between the lowest and highest deciles are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

	SD						Country Relative to												
	Low *IO*			High *IO*			Industry						Global						
	Global	Country	Industry	Global	Country	Industry	Low *IO*		High *IO*		Low-High *IO*		Low *IO*		High *IO*		Low-High *IO*		
Firm Size																			
Small	3.7	23.5	8.9	6.9	12.3	11.9	2.6	***	1.1		1.5	***	6.7	***	2.0	***	4.7	***	
Big	2.9	19.1	5.3	5.0	3.9	10.4	3.7	***	0.4	***	3.3	***	7.1	***	0.8	***	6.3	***	
Turnover																			
Low	5.2	13.2	3.6	7.0	9.5	4.3	3.8	***	2.4	***	1.4	***	2.7	***	1.4	***	1.3	***	
High	6.7	26.7	6.7	6.0	4.5	10.4	4.1	***	0.5	***	3.6	***	4.4	***	0.4		4.0	***	
Analyst Coverage																			
Low	5.9	18.4	5.1	7.7	11.1	5.9	3.8	***	2.2	**	1.6	***	3.5	***	1.8	**	1.7	***	
High	4.7	18.3	5.3	5.7	3.5	10.5	3.5	***	0.3	***	3.2	***	4.2	***	0.6	***	3.6	***	
Market-to-Book																			
Value	4.7	20.4	5.2	9.9	7.3	8.2	4.0	***	1.0		3.0	***	2.9	***	0.7	***	2.2	***	
Growth	7.2	19.5	5.2	6.8	4.3	9.4	3.9	***	0.5	***	3.4	***	3.5	***	0.6	***	2.9	***	
Momentum																			
Loser	6.5	20.1	5.7	10.8	5.6	9.0	3.7	***	0.6	***	3.1	***	3.5	***	0.6	***	2.9	***	
Winner	6.8	17.8	4.9	7.1	6.0	9.9	3.8	***	0.7	***	3.1	***	2.8	***	0.9		1.9	***	
MSCI Membership																			
MSCI	3.2	21.7	6.7	4.9	4.7	11.9	3.3	***	0.4	***	2.9	***	7.2	***	1.1		6.1	***	
Non-MSCI	6.2	16.4	3.2	6.1	4.9	9.4	5.4	***	0.5	***	4.9	***	2.8	***	0.8	**	2.0	***	
Foreign Sales																			
Multinational	5.5	16.7	4.2	7.5	4.0	9.1	4.0	***	0.4	***	3.6	***	3.3	***	0.6	***	2.7	***	
Non-Multinational	6.6	16.9	3.7	7.2	5.1	9.7	4.7	***	0.5	***	4.2	***	2.7	***	0.8	***	1.9	***	
U.S. Cross-Listing																			
ADR	7.6	24.7	17.3	8.2	11.2	14.7	1.5	***	0.8	**	0.7	***	3.5	***	1.7	***	1.8	***	
Non-ADR	5.9	16.3	3.1	7.3	3.5	8.8	5.5	***	0.4	***	5.1	***	3.0	***	0.5	***	2.5	***	

Table A5

Stock Return Variation and Domestic and Foreign Institutional Ownership

This table reports time series averages of annualized value-weighted mean absolute deviations (*MAD*) of the global, country and industry factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. For each month, stocks are divided into deciles based on lagged domestic or foreign institutional ownership and then, within each decile, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The low and high groups consist of those firms whose domestic or foreign institutional ownership is in the lowest and highest deciles. *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	SD						Country Relative to					
	Low *IO*			High *IO*			Industry			Global		
	Global	Country	Industry	Global	Country	Industry	Low *IO*	High *IO*	Low-High *IO*	Low *IO*	High *IO*	Low-High *IO*
Domestic Institutional Ownership												
Low	21.0	15.4	8.2	16.7	11.3	9.4	1.9 ***	1.2 *	0.7 ***	0.7 *	0.7 *	0.1
High	15.1	17.4	9.2	17.1	0.3	9.2	1.9 ***	0.1 ***	1.8 ***	1.2	0.1 ***	1.1 ***
Foreign Institutional Ownership												
Low	19.1	8.3	13.0	16.6	0.8	9.8	0.6 **	0.1 ***	0.6 ***	0.4 ***	0.1 ***	0.4 **
High	17.6	14.9	7.1	15.2	3.7	8.7	2.1 ***	0.4 ***	1.7 ***	0.8 *	0.2 ***	0.6 ***

Panel B: Non-U.S. Stocks

	SD						Country Relative to					
	Low *IO*			High *IO*			Industry			Global		
	Global	Country	Industry	Global	Country	Industry	Low *IO*	High *IO*	Low-High *IO*	Low *IO*	High *IO*	Low-High *IO*
Domestic Institutional Ownership												
Low	17.7	15.9	8.8	21.5	14.4	8.3	1.8 ***	1.7 ***	0.1	0.9	0.7 **	0.2
High	15.1	17.5	9.9	17.8	7.1	9.6	1.8 ***	0.7 ***	1.0 ***	1.2 *	0.4 ***	0.8 ***
Foreign Institutional Ownership												
Low	17.4	14.4	8.1	17.9	8.9	8.3	1.8 ***	1.1	0.7 ***	0.8 *	0.5	0.3 *
High	18.5	9.1	9.6	19.1	8.3	13.0	0.9	0.6 **	0.3 *	0.5 **	0.4 ***	0.1

Table A6
Stock Return Variation and Institutional Ownership:
Heston-Rouwenhorst Model – Quintiles

This table reports time series averages of total institutional ownership as a percentage of market capitalization, annualized value-weighted mean absolute deviations (*MAD*) of the global, country, industry and idiosyncratic factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into quintiles for each month based on lagged total institutional ownership (IO). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	Institutional	*MAD*				Country Relative to			
	Ownership	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	41.0	15.9	9.3	5.5	50.1	1.8	***	0.6	***
Quintile 1 (Low *IO*)	0.4	15.4	15.6	4.9	53.1	3.2	***	1.1	
Quintile 2	2.7	16.2	14.6	5.1	46.5	3.0	***	0.9	**
Quintile 3	8.7	15.9	12.6	5.7	46.6	2.5	***	0.8	***
Quintile 4	22.8	16.5	9.3	7.2	47.2	1.4	***	0.6	***
Quintile 5 (High *IO*)	69.2	16.9	3.1	8.5	43.2	0.4	***	0.2	***
Low-High *IO*						2.8	***	0.9	***

Panel B: Non-U.S. Stocks

	Institutional	*MAD*				Country Relative to			
	Ownership	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	19.5	16.0	11.2	4.6	44.9	2.5	***	0.7	**
Quintile 1 (Low *IO*)	0.2	15.3	16.0	4.7	48.0	3.4	***	1.1	*
Quintile 2	1.6	16.1	15.1	4.6	42.7	3.3	***	1.0	
Quintile 3	5.0	16.2	13.6	5.1	42.0	2.8	***	0.9	***
Quintile 4	11.4	16.2	12.0	5.2	41.2	2.4	***	0.8	***
Quintile 5 (High *IO*)	31.0	17.2	8.5	6.5	38.7	1.4	***	0.5	***
Low-High *IO*						2.0	***	0.6	***

Table A7
Stock Return Variation and Institutional Ownership:
Variance Decomposition – Quintiles

This table reports time series averages of annualized standard deviations (*SD*) of the global, country, industry and idiosyncratic factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into quintiles by month based on lagged total institutional ownership (IO). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks								
	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	5.1	12.7	4.9	51.3	2.8	***	2.6	***
Quintile 1 (Low *IO*)	4.5	16.7	3.0	54.4	5.7	***	4.0	***
Quintile 2	4.5	15.4	3.9	48.4	4.3	***	3.6	***
Quintile 3	6.2	12.9	4.6	48.3	3.0	***	2.3	***
Quintile 4	6.9	10.2	5.3	49.0	2.1	***	1.6	***
Quintile 5 (High *IO*)	9.4	5.2	7.8	44.6	0.7	**	0.6	***
Low-High *IO*					5.0	***	3.4	***

Panel B: Non-U.S. Stocks								
	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	4.4	14.3	4.2	46.2	3.5	***	3.4	***
Quintile 1 (Low *IO*)	4.3	18.3	3.0	49.0	6.4	***	4.6	***
Quintile 2	4.2	16.9	3.5	44.4	5.0	***	4.2	***
Quintile 3	5.6	14.6	4.2	43.8	3.7	***	2.8	***
Quintile 4	6.5	13.0	5.0	42.9	2.7	***	2.3	***
Quintile 5 (High *IO*)	7.9	9.6	5.6	40.5	1.8	***	1.3	***
Low-High *IO*					4.7	***	3.3	***

Table A8
Stock Return Variation and Institutional Ownership: Heston-Rouwenhorst Model for Domestic Institutional Ownership Deciles

This table reports time series averages of total institutional ownership as a percentage of market capitalization, annualized value-weighted mean absolute deviations (*MAD*) of the global, country, industry and idiosyncratic factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles for each month based on lagged domestic institutional ownership (*IO_Dom*). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	Domestic Institutional Ownership	Mean Absolute Deviation (*MAD*)				Country Relative to			
		Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	30.9	17.3	9.3	5.5	50.1	1.8	***	0.6	***
Decile 1 (Low *IO_Dom*)	0.0	20.3	14.8	4.7	32.3	3.2	***	0.8	**
Decile 2	0.0	19.1	19.8	11.3	55.9	2.2	***	1.1	*
Decile 3	0.2	18.1	15.5	7.8	47.9	2.2	***	0.9	
Decile 4	0.9	15.9	12.4	5.9	44.2	2.3	***	0.8	***
Decile 5	2.2	15.4	11.3	6.0	44.6	2.0	***	0.8	***
Decile 6	4.6	15.2	9.7	6.9	46.6	1.6	***	0.7	***
Decile 7	9.1	16.5	8.3	7.9	50.0	1.1	***	0.5	***
Decile 8	19.1	16.1	7.6	8.3	50.6	1.0		0.5	***
Decile 9	51.4	17.3	2.3	9.3	49.0	0.3	***	0.1	***
Decile 10 (High *IO_Dom*)	78.6	16.5	0.1	8.6	30.0	0.1	***	0.1	***
Low-High *IO_Dom*						3.1	***	0.7	***

Panel B: Non-U.S. Stocks

	Domestic Institutional Ownership	Mean Absolute Deviation (*MAD*)				Country Relative to			
		Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	5.8	16.0	11.2	4.6	44.9	2.5	***	0.7	**
Decile 1 (Low *IO_Dom*)	0.1	19.2	15.5	4.5	40.5	3.5	***	1.0	
Decile 2	0.1	19.2	15.5	4.5	40.5	3.5	***	1.0	
Decile 3	0.1	19.2	16.5	6.4	30.4	2.6	***	0.9	**
Decile 4	0.3	18.5	15.5	5.7	32.8	2.7	***	0.9	**
Decile 5	0.9	15.7	13.9	6.4	38.4	2.3	***	0.9	
Decile 6	1.7	15.6	11.5	6.1	38.9	2.0	***	0.8	***
Decile 7	3.1	14.5	10.8	5.9	39.9	1.9	***	0.8	***
Decile 8	5.6	16.1	9.5	6.5	41.9	1.5	***	0.6	***
Decile 9	10.2	16.6	7.5	6.9	43.1	1.1		0.5	***
Decile 10 (High *IO_Dom*)	27.2	16.9	7.5	7.1	39.7	1.1		0.4	***
Low-High *IO_Dom*						2.4	***	0.6	***

Table A9
Stock Return Variation and Institutional Ownership:
Variance Decomposition For Domestic Institutional Ownership Deciles

This table reports time series averages of annualized standard deviations (*SD*) of the global, country, industry and idiosyncratic factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles for each month based on lagged domestic institutional ownership (*IO_Dom*). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	5.1	12.7	4.9	51.3	2.8	***	2.6	***
Decile 1 (Low *IO_Dom*)	3.4	12.1	2.8	38.9	3.3	***	2.9	***
Decile 2	5.6	19.9	7.6	58.1	3.6	***	3.9	***
Decile 3	5.9	13.5	4.3	51.1	3.6	***	2.7	***
Decile 4	5.7	13.0	3.9	46.1	3.6	***	2.4	***
Decile 5	6.4	11.9	3.9	46.0	3.5	***	2.1	***
Decile 6	6.1	11.8	4.3	47.9	3.0	***	2.1	***
Decile 7	6.5	11.3	5.5	51.2	2.5	***	1.9	***
Decile 8	8.2	9.1	7.2	51.2	1.6	*	1.3	*
Decile 9	11.7	5.5	6.2	49.5	1.1		0.6	***
Decile 10 (High *IO_Dom*)	20.8	1.6	8.8	40.9	0.2	***	0.2	***
Low-High *IO_Dom*					3.1	***	2.7	***

Panel B: Non-U.S. Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	4.4	14.3	4.2	46.2	3.5	***	3.4	***
Decile 1 (Low *IO_Dom*)	4.4	14.3	4.2	46.2	3.5	***	3.4	***
Decile 2	3.8	15.3	3.2	44.5	4.3	***	4.0	***
Decile 3	3.5	15.5	3.3	36.2	4.2	***	4.0	***
Decile 4	4.0	14.0	3.5	37.6	3.8	***	3.3	***
Decile 5	5.7	14.6	4.5	40.3	3.5	***	2.7	**
Decile 6	6.6	12.5	4.2	40.4	3.4	***	2.1	***
Decile 7	5.3	12.1	4.0	41.4	3.3	***	2.5	***
Decile 8	5.9	12.5	4.8	43.3	2.8	***	2.3	***
Decile 9	7.3	11.9	5.4	44.0	2.4	***	1.9	***
Decile 10 (High *IO_Dom*)	7.3	9.2	6.1	41.4	1.7	**	1.3	**
Low-High *IO_Dom*					1.8	***	2.1	***

Table A10
Stock Return Variation and Institutional Ownership:
Heston-Rouwenhorst Model for Foreign Institutional Ownership Deciles

This table reports time series averages of total institutional ownership as a percentage of market capitalization, annualized value-weighted mean absolute deviations (*MAD*) of the global, country, industry and idiosyncratic factors, and ratios of the *MAD* of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles for each month based on lagged foreign institutional ownership (*IO_For*). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	Foreign Institutional Ownership	*MAD* Global	Country	Industry	Idiosyncratic	Country Relative to Industry		Global	
All Stocks	10.1	15.9	9.3	5.5	50.1	1.8	***	0.6	***
Decile 1 (Low *IO_For*)	0.1	16.1	12.2	6.7	58.9	2.1	***	0.8	***
Decile 2	0.1	15.8	14.2	10.0	56.5	1.5	***	0.9	**
Decile 3	0.1	16.1	13.9	6.5	51.9	2.3	***	0.9	***
Decile 4	0.3	15.8	13.6	6.1	47.4	2.3	***	0.9	***
Decile 5	0.7	15.6	12.8	6.1	45.9	2.2	***	0.9	***
Decile 6	1.4	15.9	10.7	5.9	45.0	1.9	***	0.7	***
Decile 7	2.6	16.0	9.5	6.0	44.4	1.7	***	0.6	***
Decile 8	4.6	16.3	5.8	6.3	42.9	1.0		0.4	***
Decile 9	7.9	16.3	8.6	6.1	41.1	1.5	***	0.6	***
Decile 10 (High *IO_For*)	22.6	17.5	8.9	6.9	39.3	1.4	***	0.5	***
Low-High *IO_For*						0.7	***	0.3	***

Panel B: Non-U.S. Stocks

	Foreign Institutional Ownership	*MAD* Global	Country	Industry	Idiosyncratic	Country Relative to Industry		Global	
All Stocks (non-U.S.)	13.7	16.0	11.2	4.6	44.9	2.5	***	0.7	**
Decile 1 (Low *IO_For*)	0.1	16.6	14.3	5.2	43.7	2.8	***	0.9	
Decile 2	0.1	17.0	16.6	6.7	40.8	2.5	***	1.1	
Decile 3	0.2	16.2	15.7	5.8	32.6	2.7	***	1.0	
Decile 4	0.4	16.1	15.3	5.5	34.1	2.8	***	1.0	
Decile 5	0.9	16.1	14.9	5.5	38.1	2.8	***	1.0	
Decile 6	1.7	16.1	14.3	5.3	37.9	2.8	***	0.9	*
Decile 7	3.3	15.9	12.9	5.7	38.7	2.4	***	0.9	***
Decile 8	5.9	16.7	11.7	5.7	41.3	2.1	***	0.7	***
Decile 9	10.3	16.6	11.1	6.1	42.5	1.9	***	0.7	***
Decile 10 (High *IO_For*)	25.0	17.7	8.7	7.4	38.9	1.2	***	0.5	***
Low-High *IO_For*						1.6	***	0.4	***

Table A11
Stock Return Variation and Institutional Ownership:
Variance Decomposition for Foreign Institutional Ownership Deciles

This table reports time series averages of annualized standard deviations (*SD*) of the global, country, industry and idiosyncratic factors, and ratios of the *SD* of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns. Returns are in percent per month and denominated in U.S. dollars. The sample period is from January 2000 to December 2010. Stocks are divided into deciles by month based on lagged foreign institutional ownership (*IO_For*). *P*-values of the test whether the ratios of country-to-industry and country-to-global factors are equal to one are calculated using Newey-West adjusted standard errors. *,**,*** indicate significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks	5.1	12.7	4.9	51.3	2.8	***	2.6	***
Decile 1 (Low *IO_For*)	3.8	13.4	5.3	60.3	3.2	***	4.0	***
Decile 2	6.5	15.3	7.0	57.5	2.6	***	2.4	***
Decile 3	5.7	15.8	4.5	53.1	4.0	***	3.2	***
Decile 4	4.9	16.1	4.7	48.7	3.6	***	3.6	***
Decile 5	4.5	15.4	5.0	47.2	3.2	***	3.7	***
Decile 6	5.1	14.5	5.0	46.1	3.1	***	3.1	***
Decile 7	6.0	13.5	5.3	45.3	2.7	***	2.5	***
Decile 8	7.4	12.3	5.5	43.4	2.4	***	1.9	***
Decile 9	6.5	12.3	5.9	42.3	2.2	***	2.0	***
Decile 10 (High *IO_For*)	7.2	11.4	6.1	41.3	2.0	***	1.7	***
Low-High *IO_For*					1.2	**	2.3	***

Panel B: Non-U.S. Stocks

	SD				Country Relative to			
	Global	Country	Industry	Idiosyncratic	Industry		Global	
All Stocks (non-U.S.)	4.4	14.3	4.2	46.2	3.5	***	3.4	***
Decile 1 (Low *IO_For*)	3.8	16.9	4.1	48.6	4.2	***	5.2	***
Decile 2	6.1	18.4	4.4	50.0	4.3	***	3.2	***
Decile 3	4.6	17.1	3.5	46.7	5.0	***	4.0	***
Decile 4	4.3	17.1	3.8	43.8	4.7	***	4.3	***
Decile 5	4.8	16.4	4.1	43.3	4.1	***	3.7	**
Decile 6	4.8	15.7	4.3	42.8	3.8	***	3.5	***
Decile 7	5.8	14.5	4.8	42.2	3.2	***	2.8	***
Decile 8	7.0	13.4	4.9	41.5	2.8	***	2.3	***
Decile 9	6.3	13.2	5.6	40.7	2.4	***	2.2	***
Decile 10 (High *IO_For*)	7.9	11.0	6.2	39.7	1.9	***	1.5	***
Low-High *IO_For*					2.3	***	3.7	***

Table A12
Time Series Restricted Carhart Factor Model

This table reports time series averages of betas for a Carhart factor model using a rolling window of 12 months. We impose for each type of beta that region and local betas add to one. Region means Europe, North America, Asia-Pacific, as well as Emerging and local stands for country. For each month, stocks are divided into deciles based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total institutional ownership is in the lowest and highest deciles. The sample period is from January 2000 to December 2010.

	Market beta		SMB		HML		WML	
	Region	Local	Region	Local	Region	Local	Region	Local
Decile 1 (Low *IO*)	0.65	0.35	0.68	0.32	0.60	0.40	0.69	0.31
Decile 2	0.64	0.36	0.54	0.46	0.58	0.42	0.55	0.45
Decile 3	0.68	0.32	0.54	0.46	0.52	0.48	0.51	0.49
Decile 4	0.74	0.26	0.64	0.36	0.48	0.52	0.52	0.48
Decile 5	0.77	0.23	0.54	0.46	0.51	0.49	0.39	0.61
Decile 6	0.85	0.15	0.49	0.51	0.56	0.44	0.41	0.59
Decile 7	0.91	0.09	0.44	0.56	0.60	0.40	0.31	0.69
Decile 8	0.85	0.15	0.37	0.63	0.59	0.41	0.37	0.63
Decile 9	0.87	0.13	0.04	0.96	0.25	0.75	0.15	0.85
Decile 10 (High *IO*)	1.04	-0.04	0.01	0.99	0.03	0.97	0.02	0.98
Low - High *IO*	0.40	-0.40	-0.67	0.67	-0.57	0.57	-0.67	0.67

Figure A1

Country and Industry Effects and Institutional Ownership:

Heston-Rouwenhorst Model for Non U.S. firms

This figure presents the 12-month moving average of annualized value-weighted mean absolute deviations (*MAD*s in percentage) of the global, country, and industry factors for different groups of stocks using the Heston and Rouwenhorst (1994) model from January 2001 to December 2010. Stocks are divided into deciles for each month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total *IO* is in the lowest and highest deciles.

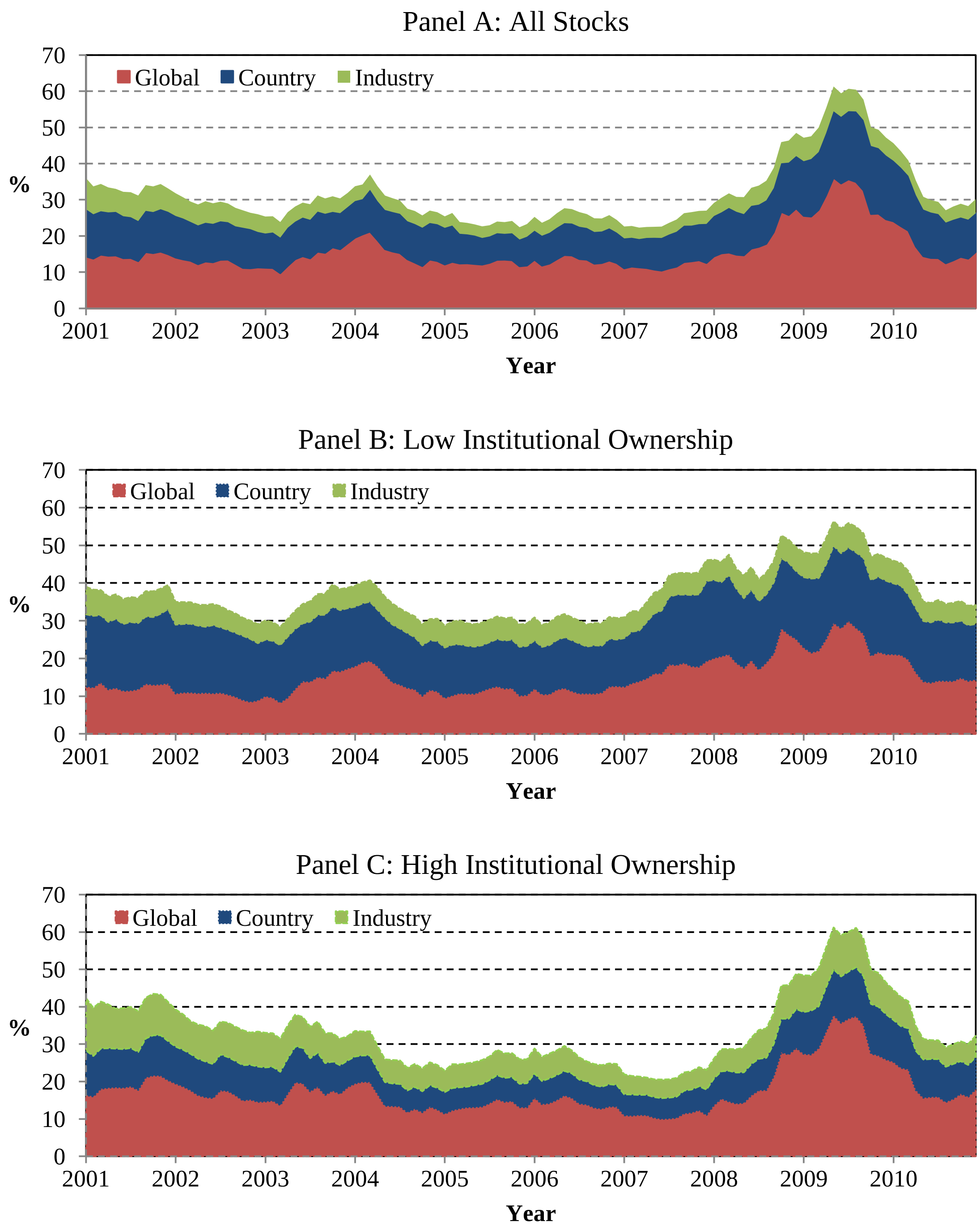
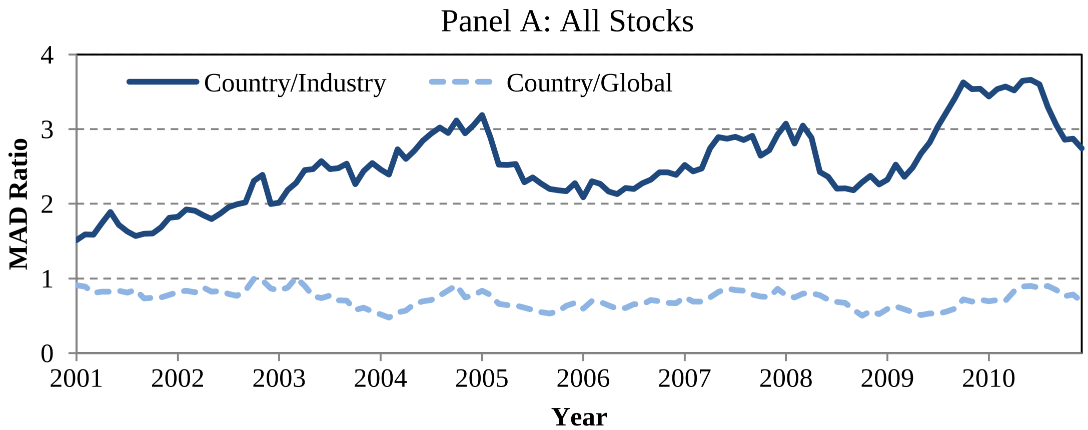
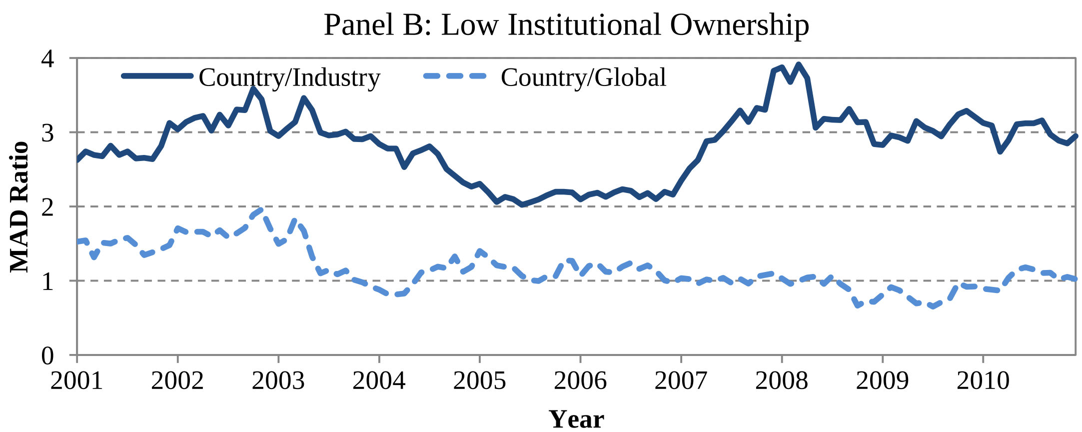


Figure A2
Country-to-Industry Ratio and Institutional Ownership:
Heston-Rouwenhorst Model for Non U.S. firms

This figure presents the 12-month moving average of ratios of annualized value-weighted mean absolute deviations (*MAD*s) of the country factor relative to the *MAD* of the industry factor and global factor for different groups of stocks using the Heston and Rouwenhorst (1994) model from January 2001 to December 2010. Stocks are divided into deciles for each month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total *IO* is in the lowest and highest deciles.





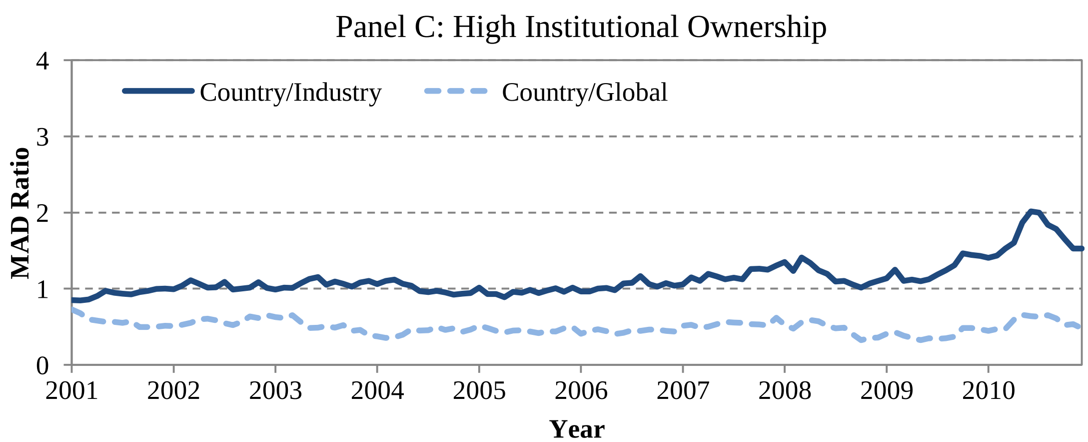
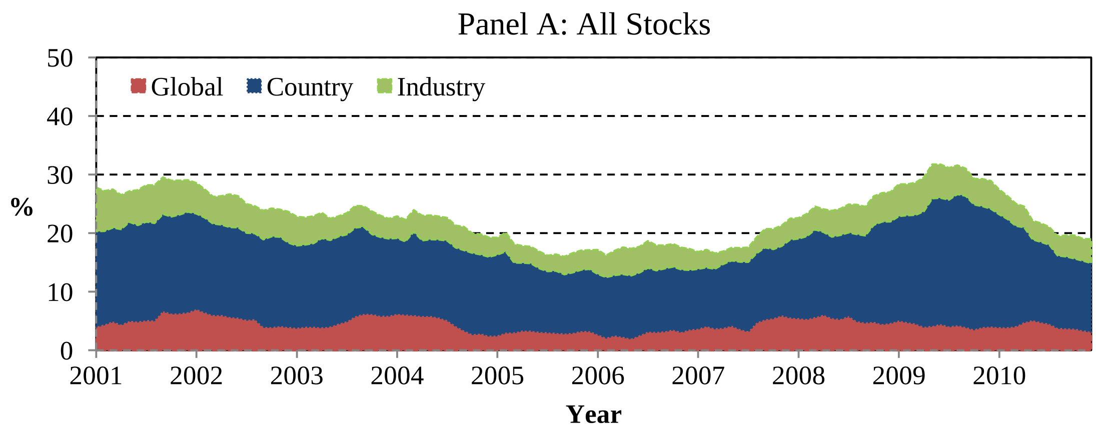
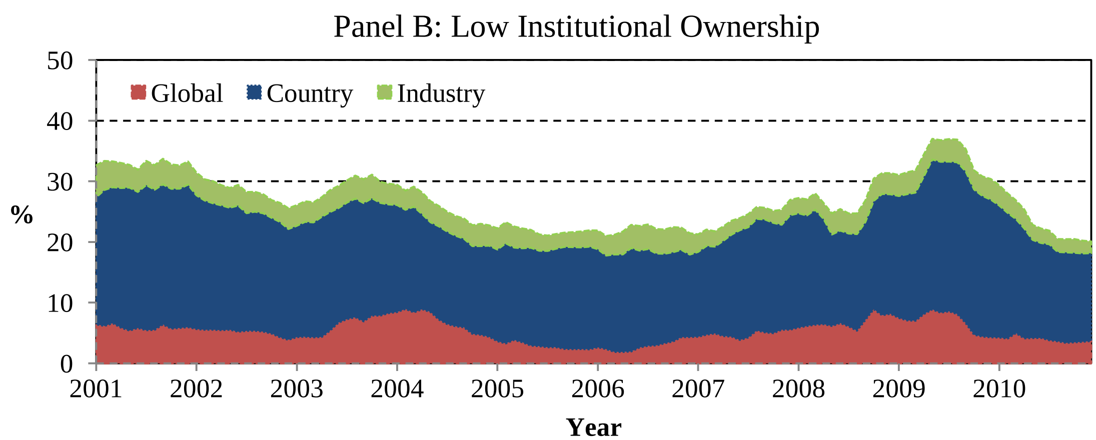


Figure A3
Country and Industry Effects and Institutional Ownership: Variance Decomposition for Non U.S. Firms

This figure presents the 12-month moving average of annualized standard deviations (*SD* in percentage) of the global, country, and industry factors for different groups of stocks using a variance decomposition of stock returns from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total *IO* is in the lowest and highest deciles.





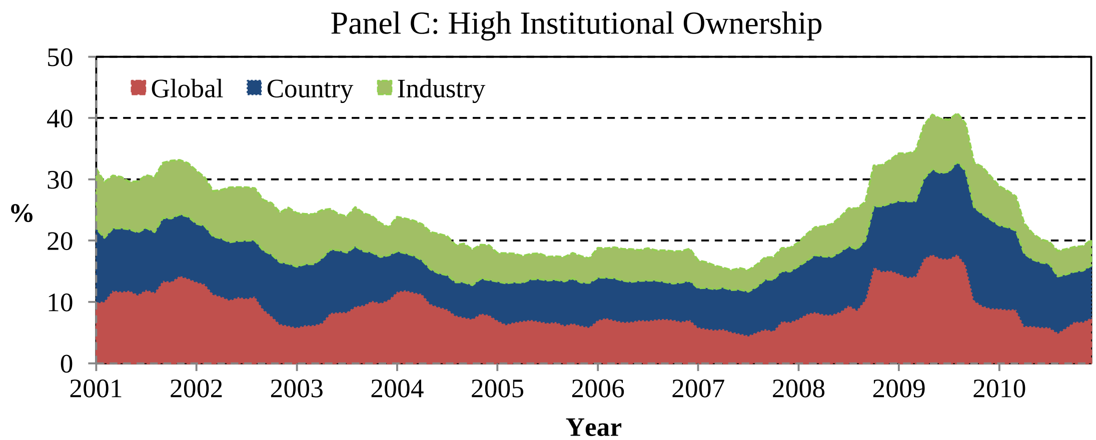
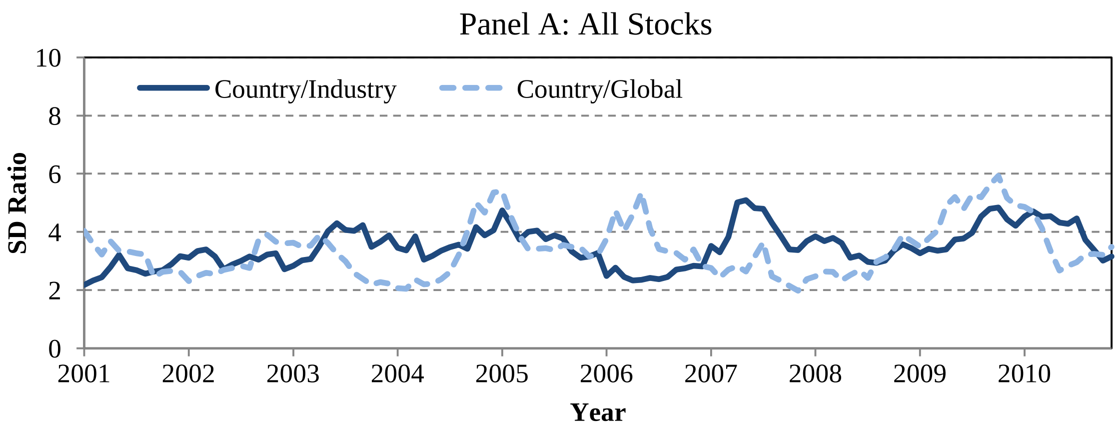
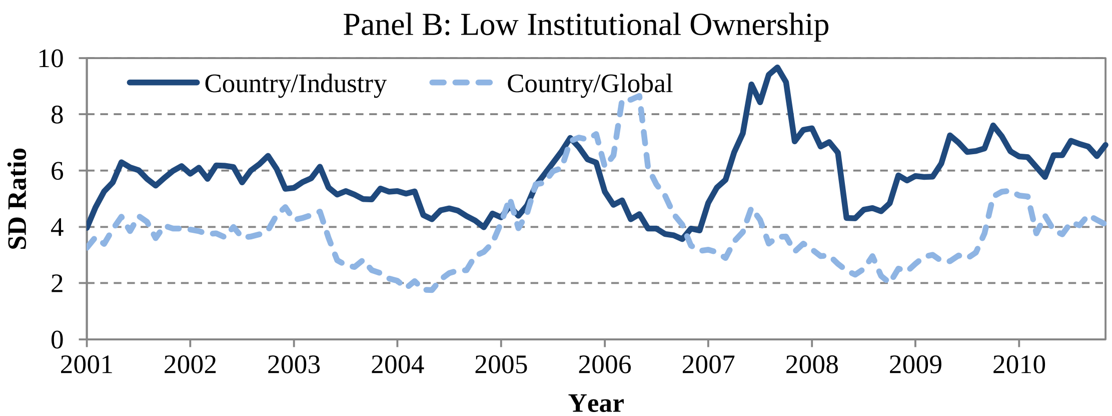


Figure A4
Country-to-Industry Ratio and Institutional Ownership: Variance Decomposition for Non U.S. Firms

This figure presents the 12-month moving average of ratios of annualized standard deviations (*SD*) of the country factor relative to the *SD* of the industry factor and global factor for different groups of stocks using a variance decomposition of stock returns from January 2001 to December 2010. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total *IO* is in the lowest and highest deciles.





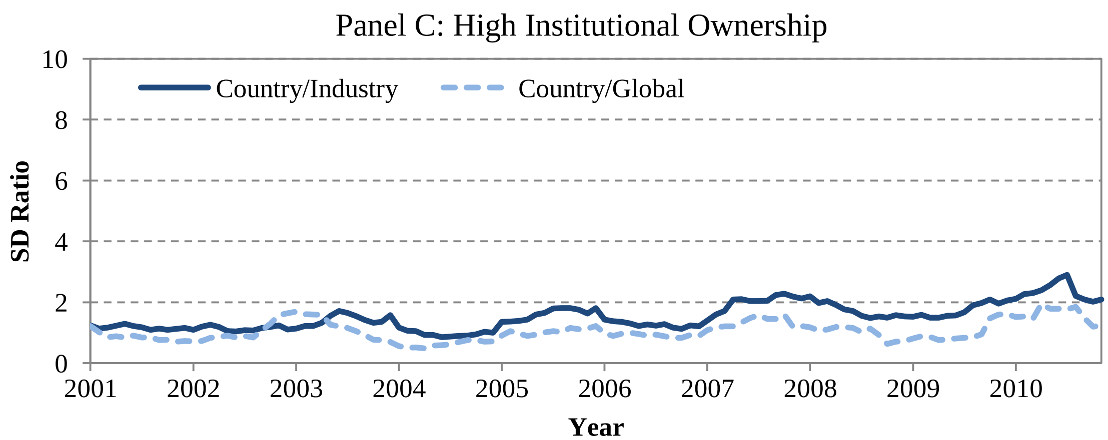
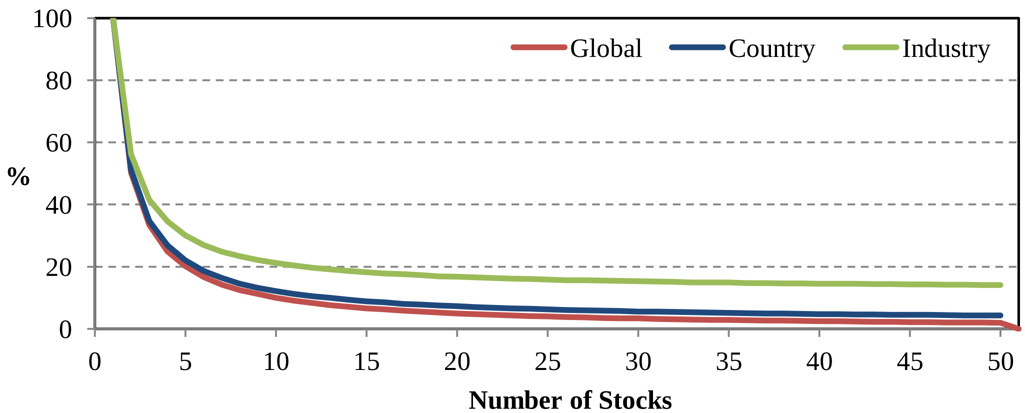


Figure A5

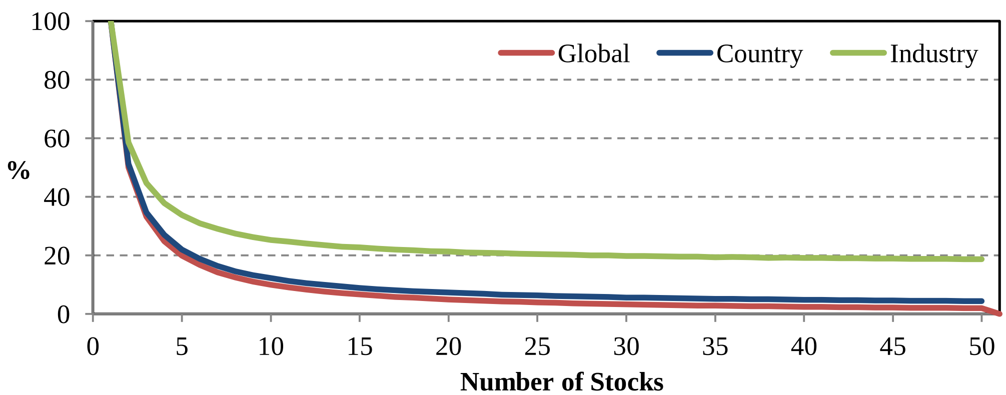
Diversification Benefits by Level of Institutional Ownership – Non U.S. stocks

This figure plots the ratio (in percentage) of the variance of an equal-weighted stock portfolio relative to the average stock variance for portfolios with different number of stocks returns from January 2001 to December 2010. For each month stocks, are picked with no restriction (global strategy) from a randomly drawn industry (country strategy) or country (industry strategy). The number of simulations is 1,000 for each month. Stocks are divided into deciles by month based on lagged total institutional ownership (*IO*). The low and high *IO* groups consist of those firms whose total *IO* is in the lowest and highest deciles.

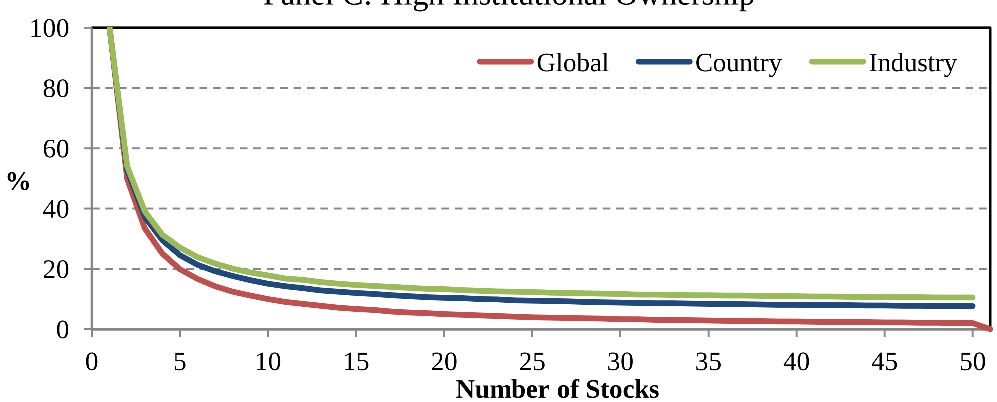
Panel A: All Stocks



Panel B: Low Institutional Ownership



Panel C: High Institutional Ownership



about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI produces and disseminates high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It draws on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.org/wp) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Finance.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html