Information Asymmetries and Institutional Investor Mandates

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Abstract

The preference among foreign institutional investors for large firms is widely documented. This paper deepens our understanding of international investments by providing evidence that foreign institutional investors with broader investment scopes prefer to invest in firms where they are less prone to information disadvantages than more specialized ones. In other words, there is heterogeneity in

how information asymmetries affect investors' portfolio choices. Theoretically, a model with costly information and short-selling constraints shows that the broader the investor's mandate, the smaller the incentives to gather and process costly information. Empirically, an analysis of the mutual fund industry in the United States supports this hypothesis.

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During the last decades, international capital flows have grown significantly, playing an increasingly important role in the economies of both developed and developing countries alike. Many studies have analyzed the behavior of international capital flows. For instance, it is well known that investors have not been nearly as internationally diversified as their consumption and income path would imply. This literature has highlighted some factors that can explain the patterns of international cross-country investments and this lack of international diversification in particular – for example, the existence of explicit costs to international investment and the presence of implicit ones, like political or country risks and informational asymmetries.¹

Although somewhat successful in describing some features of international portfolio investments, only a few of these theories have been able to address the firm-level aspect of international portfolio choices. For example, there is evidence that information asymmetries play an important role in explaining differences in portfolio holdings between domestic and foreign investors within a given country.² In particular, widely documented is a preference among foreign investors for large firms if compared to the preferences of domestic investors, a pattern also known as the foreign investor bias. Kang and Stulz (1997) document these preference patterns in Japan and the results are interpreted as an indication that information asymmetries are an important explanation for this bias as a model in which foreigners know less about small firms would be able to fit their investment decisions. Furthermore, Dahlquist and Robertsson (2001)

¹ Most arguments can be classified into two categories: deviations from the international CAPM affecting foreign asset holdings, and foreign investors facing direct or indirect barriers in foreign investments. See for example Lewis (1999) and Karolyi and Stulz (2003) for surveys of the home bias literature.

² See for example, Brennan and Cao (1997), Edison and Warnock (2004), Aggarwal, Klapper, and Wysocki (2005), Bae, Stulz, and Tan (2008), Leuz, Lins and Warnock (2009), among many others.

argue that these preferences for larger firms are not particular to foreign investors, but distinctively of institutional investors. They analyze portfolio holdings of different types of investors in Sweden and find that institutional investors, independent of their nationality, tend to hold assets from larger and more visible firms. In other words, they document an institutional investor bias.³ Hence, the existing evidence suggests that foreign institutional investors prefer to invest in larger firms. This paper expands this literature by further analyzing the foreign holdings of institutional investors. In particular, we provide evidence that foreign institutional investors with broader investment scopes prefer to invest in firms where they are less prone to information disadvantages than more specialized ones. In other words, there is actually heterogeneity in how information asymmetries affect the portfolio choices of investors with different investment scopes (i.e. different mandates).

Theoretically, a portfolio model with costly information and short-selling constraints shows that the broader the investor's scope of investment, the smaller his incentives to gather and process costly information. Therefore, more specialized investors (e.g. more specialized funds such as regional or country funds) can be more informed about particular countries or firms than investors with broader mandates (e.g. global funds) as they have greater incentives to acquire costly information. Hence, less specialized funds would prefer to invest in firms where they are less prone to information disadvantages than the more specialized ones. The simple model thus gives rationale to the hypothesis described above.

³ Choe, Kho, and Stulz (2005) also provide evidence that foreign and domestic institutional investors are at a relative disadvantage in trading if compared to domestic individual investors in the Korean stock exchange between 1996 and 1998.

Empirically, we analyze U.S. equity mutual funds with an international investment scope as they have clearly defined investment mandates, allowing us to examine the extent that information asymmetries affect the portfolio decisions of foreign institutional investors with different mandates. There are mutual funds specialized in some countries or regions (*specialized funds*) and those with a wider, unrestricted investment scope (*global funds*). Managers from both fund types can be considered equally sophisticated and skilled in acquiring and processing information.⁴ However, as shown in our portfolio choice model, they might not be equally informed about the regions/countries/firms they are allowed to invest in as managers with different mandates have different incentives to pay for costly information. We then examine to what extent the firm-level portfolio choice of these funds differ from one another. We construct a unique micro dataset of actual asset-level portfolios for U.S. mutual funds to study in detail the behavior of their international investments from 1997 to 2003. Given the regular reporting requirements for mutual funds, asset-level portfolios can be constructed and traced over time. This characteristic of the mutual fund industry is unique and contrasts with other types of investors such as hedge funds, pension funds, and individual international investors, for which portfolio information is not publicly available.

We focus primarily on firm size, which has been extensively used as a proxy for information asymmetries.⁵ One possible explanation is through its association with cash flow volatility. Coval (2003) argues theoretically that a greater variance of cash flows for small firms

⁴ Grinblatt and Keloharju (2000) emphasize that the degree of investors' sophistication matters for portfolio choice and their consequent performance.

⁵ See for example Falkenstein (1996), Kang and Stulz (1997), Dahlquist and Robertsson, (2001), Edison and Warnock (2004), and Chan, Covrig, and Ng (2005), among many others.

implies larger holdings by informed investors as uninformed investors would face more severe adverse selection when investing in the assets of these firms. In other words, the larger the firm, the less exposed to informational frictions a firm is. Our results show that firms in the portfolio of U.S. mutual funds are on average significantly larger than the average firm in our universe of firms, hence providing evidence of a foreign bias in our database. Moreover, we provide evidence that the average firm in the portfolio of global funds is significantly larger in than that on the portfolio of specialized funds, independently of the proxy chosen for firm size, suggesting that global fund managers indeed prefer to invest in firms less prone to information asymmetries than specialized fund managers. Furthermore, although less emphasized in the literature, leverage can also be an indicator of information asymmetries.⁶ The mechanism is analogous to the one for firm size, in which there is greater uncertainty in the future returns of highly leveraged firms. Our findings based on firm leverage reinforce the evidence based on firm size. Not only U.S. mutual funds tend avoid highly leveraged firms, but also the difference in firm leverage in the portfolios of specialized funds and global funds is significantly positive.

Firm size, through its correlations with other variables, nevertheless might be capturing other effects that are not purely related to information asymmetries. First, firm size is positively correlated with liquidity. If institutions turnover their portfolio often and they are large relative to foreign stocks, they might prefer firms with high liquidity and low transaction costs.⁷ For instance, Chen, Hong, Huang, and Kubik (2004) argue that a large asset base might erode

⁶ Coval and Moskowitz (1999) find that small and highly leveraged firms are more likely to be held by local investors – who supposedly know more about them – than nonlocal investors within the United States.

⁷ See for example, Schwartz and Shapiro (1992).

performance because of trading costs associated with liquidity or price impact. If this were the case, firm size would not reflect any effects related to information asymmetries. Adding control variables for liquidity and transaction costs does not change our results. We still find robust evidence that global funds hold assets from larger and less leveraged firms than specialized funds, indicating that information asymmetries become more pronounced as mutual funds mandate becomes broader.

Second, we address other direct and indirect barriers to international capital flows. Firm size is typically found to be positively correlated with foreign listings, for example.⁸ The shares of large firms tend to be more easily available abroad through direct cross-listings or ADRs. This association implies that asset holders of large firms in practice face fewer barriers to international investments. Furthermore, firms adopting discretionary policies such as cross-listings abroad also make themselves more attractive to foreign investors by overcoming institutional shortcomings of their home country.⁹ In sum, foreign investors could be more attracted to assets from these firms because of either lower barriers to investment, or improved shareholder protection, or greater information disclosure. This last effect has implications for the hypothesis explored in this paper. If firms disclose more information when issuing ADRs, they reduce the cost of information for investors. Hence, these firms should become more attractive to global fund managers, the relatively uninformed investor, than to specialized funds. We provide empirical evidence that this is indeed the case. We find a heterogeneous effect of ADR issues associated

⁸ See Foerster and Karolyi (1999), Pagano, Roell, and Zechner (2002), and Reese and Weisbach (2002), among many others.

⁹ See, for example, Lang, Lins, and Miller (2003) and Doidge, Karolyi and Stulz (2004).

with increased information disclosure across investors with different mandates. Most importantly, no such heterogeneous effect exists if ADRs are not associated with greater disclosure of information. In addition, firm size and leverage are still found to affect the portfolio choice of global and specialized funds differently. In other words, we find robust evidence of asymmetric effects of informational frictions across investors with different mandates, in spite of the added controls.

Lastly, we analyze whether firm size is capturing Merton's familiarity effect.¹⁰ Merton (1987) argues that investors hold shares of firms that they are familiar with. Through its correlation with exports, firm size could then be a proxy for visibility: larger firms are more likely to be well-known abroad. Although an interesting point to be analyzed, it is not essential to the main argument of this paper as it is associated with our hypothesis on informational asymmetries. Moreover, any residual effect of firm size on mutual fund portfolio choice is still interpreted as evidence regarding information asymmetries. For example, there are no controls that allow us to identify differences in costs related to information acquisition and processing across investors types. Firm size still captures these effects and hence, we test whether these residual effects of firm size on portfolio choice are significant and different across mutual funds with different mandates. Our findings indicate that not only firms with greater exports do attract more investments from mutual funds, but also that this effect is heterogeneous across global and specialized funds, being significantly larger for global funds. Furthermore, our standard

¹⁰ See also Huberman (2001). Moreover, in a similar line of work, Coval and Moskowitz (1999) and Grinblatt and Keloharju (2001) provide evidence proximity is an important factor for the stock preference of investors. We do not consider proximity in our analysis as we only examine the foreign investments of US mutual funds.

measures of information asymmetries, firm size and leverage, still robustly indicate heterogeneous effects across mutual fund with different mandates. In sum, we provide robust empirical evidence that funds with a broader investment mandate prefer larger and less leveraged firms than those with a more restrict mandated, suggesting a heterogeneous effect of information asymmetries on their portfolios.

Our results stand in contrast with the findings of Coval and Moskowitz (1999). In a different context with a different database, they provide evidence that information asymmetries matter for the domestic investments of US investment managers as they exhibit a strong preference for geographically close, particularly small, and highly leveraged firms. However, they also find that these preferences are independent of mutual fund characteristics such as fund size or research style. In this paper, we provide robust evidence that investors' investment mandates actually matter for their portfolio choices. Furthermore, the findings of this paper are consistent with the literature on portfolio concentration and performance. Ivkovic, Sialm, and Weisbenner (2008) and Kacperczyk, Sialm, and Zheng (2005) provide evidence that investors with more concentrated portfolios (hence more specialized ones) tend to outperform investors with more diversified portfolios. Both papers argue that this can be explained by the presence of informational asymmetries across market participants. Didier, Rigobon, and Schmukler (2010) provide evidence that specialized funds (the ones with more concentrated portfolios) do indeed outperform global ones.¹¹

¹¹ The results are also consistent with the widely documented abnormal return for small and highly leveraged firms. Portfolios with holdings concentrated on these firms should outperform those with larger and less leveraged firms.

The paper is organized as follows: Section I provides a theoretical framework that gives rationale for the hypothesis that that global funds would prefer to invest in firms where they are subject to milder information asymmetries than specialized funds. Section II describes our data. Section III presents the bivariate analysis of firm characteristics and mutual fund holdings while Sections IV and V reports the multivariate analysis with logit and poisson models with over-dispersion of the determinants of mutual fund holdings. Section VI concludes.

I. Theoretical Framework

A simple portfolio model with short-selling constraints allows us to relate the mandate of mutual funds to their incentives to gather and process costly information. The theoretical framework used here is based on Calvo and Mendoza (2000) and adequately reflects the cost-benefit analysis of information acquisition and processing faced by Global and Specialized funds. The model shows that more specialized investors will be more informed about particular countries or firms than investors with broader mandates. Hence, global funds would prefer to invest in firms where they are less prone to information disadvantages than the more specialized ones. The model thus gives rationale to the hypothesis of this paper – there is heterogeneity in how information asymmetries affect investors’ portfolio choices.

The model assumes that a representative investor can choose assets from J countries ($2 \leq J \leq \infty$) of which $J-1$ are identical countries and there is a single different Country i . All

See for example, Fama and French (1992, 1993, 1996) and Daniel and Titman (1997) for evidence on abnormal returns for small firms.

countries but i pay asset returns that follow i.i.d. processes with mean ρ and variance σ^2 .¹² The portfolio share allocated to these $J-1$ countries would thus be equal in equilibrium. Country i also pays asset returns that follow i.i.d. processes with mean r and variance σ^2 . For tractability, and without loss of generality, we assume that there is no correlation between assets from Country i and assets from other $J-1$ countries. This representative investor chooses a portfolio weight α , defined as the portfolio share allocated to the $J-1$ countries, in order to maximize the following indirect expected utility function:

$$EU(\alpha) = \mu(\alpha) - \frac{\gamma}{2} \sigma(\alpha)^2 - \kappa, \quad (1)$$

where $\gamma > 0$ is the coefficient of absolute risk aversion, μ and σ define the mean and standard deviation of the investor's portfolio as a function of the portfolio weight α , and κ represents a fixed cost of acquiring country-specific information.

In this set up, if Country i is identical to the other countries ($r = \rho$), the investor would choose equal portfolio shares to every country. In other words, $1/J$ of its wealth would be allocated to each country, implying a portfolio expected return of ρ and variance of σ^2/J . This last expression represents the gains from international diversification in this simple model. The more countries an investor has access to (greater J), the smaller the variance on his portfolio.

To introduce costly information, we assume that this investor is given the option of learning about Country i . He can acquire and process country-specific information at the fixed cost κ . If he decides to pay this fixed cost, we assume, without loss of generality, that he learns

¹² This is a partial equilibrium analysis in which investors face exogenous asset returns.

the “true” return of the asset from Country i .¹³ On the other hand, if the investor decides not to pay this fixed cost, his information about Country i remains unchanged. Asset return characteristics from $J-I$ countries remain unchanged whether the investor decides to pay the fixed cost or not. In sum, the investor knows that by paying κ he will learn a new return r^I with zero variance for the asset from Country i , and if he does not pay, he would still believe that this asset pay an expected return r with variance σ^2 . Before paying κ , the potential update of this asset return r^I is itself a random variable drawn from a known probability distribution function. This pdf represents the investor’s priors. Moreover, in order to simplify the analysis, we keep analyzing the case in which the expected return on the asset from Country i is equal to the expected return on the assets from other countries ($r = \rho$).

We assume that this framework represents the portfolio choice of both global and specialized funds. We also assume that they have access to the same information set regarding the current state of the world, which implies that they have the same priors about r^I . Both global and specialized funds can be considered equally sophisticated and talented and thus face the same fixed cost to acquire and process information. The only distinction between the two investor types is the number of countries they are allowed to invest on. Global funds have access to a greater number of countries than specialized funds ($J^G > J^S$). We know that these investors’ decision to pay the fixed cost κ depends on whether the gain from costly information is positive. They will pay the cost if the expected utility conditional on costly information

¹³ We could have assumed that the expected return and the variance of the asset from Country i are updated once the fixed cost is paid. Although a more realistic assumption, it would only complicate the analysis without any further insights.

(EU^I) is greater than the expected utility conditional on free information (EU^U) . Notice that the outcome of this decision might be different for global and specialized funds as they have access to assets from a different number of countries. In other words, if $dS/dJ \neq 0$, where $S \equiv EU^I - EU^U$, global and specialized funds could optimally decide to have different information about Country i . We will show next that as the fund mandate becomes broader, i.e. the fund can invest in more countries, its incentives to gather and process country-specific information declines ($dS/dJ < 0$). Therefore, this simple portfolio model implies that specialized fund managers can be more informed about particular countries (or firms) than global fund ones as they have greater incentives to acquire costly information.

Let α^I and α^U be the portfolio weights on the $J-1$ countries chosen by the investor if he decides to be informed or uninformed, respectively. α^U is chosen so as to maximize:

$$EU^U = \rho - \frac{\gamma}{2} \left[\frac{(\alpha^U)^2}{J-1} + (1-\alpha^U)^2 \right] \sigma^2. \quad (2)$$

The first order condition for this maximization problem implies the following optimal portfolio weight for an internal solution:

$$\alpha^U = \frac{J-1}{J}. \quad (3)$$

Given the nature of mutual fund investments, we rule out leveraged portfolios by assuming strict short-selling constraints. We impose that $0 \leq \alpha^U \leq 1$. This condition is clearly satisfied for any value of J , given all the assumptions so far. EU^U is thus given by:

$$EU^U = \rho - \frac{\gamma}{2} \frac{\sigma^2}{J}. \quad (4)$$

The informed investor faces a slightly different maximization problem. His state-contingent utility is given by:

$$U^I(r^I) = \alpha^I \rho + (1 - \alpha^I) r^I - \frac{\gamma}{2} \left[\frac{(\alpha^I)^2}{J-1} \right] \sigma^2 - \kappa. \quad (5)$$

The internal solution for this problem implies the following state-contingent portfolio weight:

$$\alpha^I(r^I) = (J-1) \left[\frac{\rho - r^I}{\gamma \sigma^2} \right]. \quad (6)$$

Short-selling constraints imply that $\alpha^I(r^I) = 0$ if $r^I \geq r^{\max}$ and $\alpha^I(r^I) = 1$ if $r^I \leq r^{\min}$ where:

$$\begin{aligned} r^{\max} &= \rho, \\ r^{\min} &= \rho - \frac{\gamma \sigma^2}{J-1}. \end{aligned} \quad (7)$$

Therefore, EU^I is given by:

$$\begin{aligned} EU^I &= \int_{-\infty}^{\infty} \left[\alpha^I(r^I) \rho + (1 - \alpha^I(r^I)) r^I - \frac{\gamma}{2} \left[\frac{(\alpha^I(r^I))^2}{J-1} \right] \sigma^2 \right] f(r^I) dr^I - \kappa \\ &= \left[\rho - \frac{\gamma \sigma^2}{2(J-1)} \right] F(r^I) + \int_{r^{\min}}^{r^{\max}} \left[r^I + \frac{(J-1)}{2\gamma \sigma^2} (\rho - r^I)^2 \right] dF(r^I) \\ &\quad + \int_{r^{\max}}^{\infty} r^I dF(r^I) - \kappa. \end{aligned} \quad (8)$$

The difference in expected utility conditional on costly information (EU^I) and the expected utility conditional on free information (EU^U), $S \equiv EU^I - EU^U$, is given by:

$$\begin{aligned}
S = & \left[\rho - \frac{\gamma \sigma^2}{2(J-1)} \right] F(r^{\min}) + \int_{r^{\min}}^{r^{\max}} \left[r^I + \frac{(J-1)}{2\gamma \sigma^2} (\rho - r^I)^2 \right] dF(r^I) \\
& + \int_{r^{\max}}^{\infty} r^I dF(r^I) - \kappa - \rho + \frac{\gamma}{2} \frac{\sigma^2}{J}.
\end{aligned} \tag{9}$$

We now can show that the value of acquiring information to eliminate the uncertainty of a single asset decreases as the number of available assets increase.

Proposition. *Assuming that: (i) ex-ante all assets are identical (i.e. $r = \rho$), (ii) strict short-selling constraints are in place, (iii), costly information reveals the true return on the asset from Country i , (iv) both F and f are continuously differentiable, and (v) f is symmetric (i.e. $E(r^I) = \rho$); S is decreasing in J , i.e. $dS/dJ < 0$, for $J < \infty$, if the number of countries in the global market is at least $1/[1 - [F(\rho)]^{1/2}]$.*

Proof. Since $F(r^I)$ is differentiable:

$$\frac{dS}{dJ} = \frac{\gamma \sigma^2}{2(J-1)^2} F(r^{\min}) + \int_{r^{\min}}^{r^{\max}} \left[\frac{(\rho - r^I)^2}{2\gamma \sigma^2} \right] dF(r^I) - \frac{\gamma}{2} \frac{\sigma^2}{J^2}. \tag{10}$$

To obtain an upper bound for dS/dJ , we set $r^I = r^{\min}$ in the second RHS term of equation (10), which implies that:

$$\frac{dS}{dJ} \leq \frac{\gamma \sigma^2}{2(J-1)^2} \left[F(\rho) - \left(\frac{J-1}{J} \right)^2 \right]. \tag{11}$$

Since $r^{\min} < r = \rho$, it follows that $1/[1 - [F(\rho)]^{1/2}] < J < \infty$ is a sufficient condition for $dS/dJ < 0$.

This proposition shows that as the fund mandate becomes broader, i.e. the mutual fund has access to more countries (greater J), its incentives to gather (and process) country-specific information declines ($dS/dJ < 0$). When a fund has access to a great number of countries, the benefits of international diversification are clear as it is able to obtain lower portfolio variances for a given return, independent of whether the fund chose to pay for the costly information or not. In other words, a fund with a broader mandate has an effective way of diversifying risk. On the other hand, mutual funds with a more restrictive investment opportunity set have a greater incentive to acquire and process costly information as the benefits from further international diversification are not attainable. This result however relies on mutual funds' inability to short the asset from Country i . This restriction does not allow them to take full advantage of costly information. If a fund could arbitrarily hold large short positions on the asset from Country i , S would actually be increasing in J .

The model implies that, depending on the value of κ , S eventually becomes negative and the investor won't pay for the costly information. Therefore, specialized fund managers can indeed be more informed about particular countries (or firms) than global fund ones as they have greater incentives to acquire costly information. Hence, global funds, the less informed investors, would prefer to invest in firms where they are less prone to information disadvantages than the specialized funds, the informed ones. The model thus gives rationale to the hypothesis that there is heterogeneity in how information asymmetries affect the portfolio choices of investors with different investment mandates.

II. Data Description

We focus on U.S. equity mutual funds that are established to purchase assets around the world. Funds that focus on both debt and equity are excluded from our sample, even though they do invest a significant share of their portfolios in foreign stocks. We use two types of data in our empirical analysis: data on mutual fund holdings and data on firm attributes.

Mutual fund holdings are available from Morningstar, a company that collects mutual fund data. We analyze monthly reports from March 1992 (when they became available) until June 2004. While some mutual funds provide monthly reports, most do so quarterly or semiannually (depending on the reporting SEC rules at the time). Given this heterogeneity in the release of new information, we construct our database with the last reported portfolio information for each fund in any given year. For example, our sample of mutual fund holdings for 2003 contains portfolio data for the Fidelity Worldwide fund, with portfolio holdings as of October 2003, and portfolio data for Scudder global fund, with portfolio holdings as of December 2003. We collect detailed information on portfolio holdings: stock names, amount invested in each stock by each fund, and country of origin of these holdings on a yearly basis.^{14,15}

The U.S. mutual fund industry is organized by splitting funds according to their investment scope. In particular, funds are classified into five distinct categories: world funds,

¹⁴ Some families sell the same portfolio to investors under different names depending on their fee structure and minimum investment requirements. We consider these different funds (with identical portfolios) only once; i.e., we do not treat them as separate funds as Morningstar does. For example, Fidelity Advisors Funds contain the following Latin America funds with the same portfolio: Fidelity Advisors Latin America A, Fidelity Advisors Latin America B, and Fidelity Latin America T.

¹⁵ We classify holdings according to the country of origin of the company issuing the stock, independent of whether these assets are traded in domestic or international markets.

foreign funds, emerging market funds, regional funds, and country funds. Regional funds are divided into: Asia (and Pacific) funds, Europe funds, Latin America (and the Caribbean) funds, and Middle East and Africa funds.¹⁶ World funds invest all over the world including the U.S., while foreign funds invest around the world excluding the U.S., while emerging market funds can purchase only emerging market assets.¹⁷ Regional and country funds invest only in a particular region or country, respectively. Hence, funds classified as either world or foreign funds are also called global funds throughout this paper as they have the broadest possible mandate. All other fund types are called specialized funds, investing in a subset of the assets of global funds.

Table 1 summarizes the main characteristics of our sample of mutual fund portfolios. There are on average 722 mutual funds in any given year on our sample, out of which 465 are classified as global funds, and 257 as specialized funds. Global funds are not only more numerous but also larger than specialized funds. They managed US\$760 million on average between 1997 and 2003, whereas specialized funds had on average around US\$199 million on net assets under management. Thus, once the size of these funds is taken into account, global funds are significantly more important than specialized funds, being almost four times as large as specialized funds. Table 1 also reports the average number of mutual fund holdings in developing countries. Specialized funds invest in 72 firms on average in any given year of our

¹⁶ Asia funds can actually invest in countries located in both the Asian and the Pacific regions. Latin America funds can also invest in countries in the Caribbean. Some Europe funds also tend to invest in countries in Africa, such as South Africa.

¹⁷ Emerging markets are typically middle-income countries. However, these funds might also invest a small proportion of their portfolios in low-income countries.

sample and global funds invest in only 22 firms. In other words, a considerably large proportion of the number holdings of specialized funds in developing countries are not shared by the global funds.

[Insert Table 1 about here]

The other type of data collected is firm characteristics on a yearly basis. We use three types of data: information on foreign activity (i.e. whether and when a firm issues ADRs), balance sheet data, and trading data. On foreign activity, we have data from the Bank of New York, which covers the three major stock exchanges in the U.S.: NYSE, NASDAQ, and AMEX. The Complete DR Directory contains the list of current DR programs and the effective date of each program. However, to account for DR programs that were terminated during the 1997-2003 period, we use an additional database, also provided by the Bank of New York, which lists all terminated DR programs. These two databases allow us to determine whether a firm has issued (or have outstanding) ADRs on any year in our sample.

We collect firm-level balance sheet data from Worldscope (Thomson Financial Company). This constitutes our “universe” of firms covering the period 1997-2003. Based on an extensive literature characterizing portfolio choice with balance sheet data, we have grouped the variables into 4 categories according to their effect on portfolio choice: firm size measures, performance variables, a prudence variable, and financial health variables.¹⁸ In particular, the following attributes are considered:

¹⁸ See Falkenstein (1996), Kang and Stulz (1997), Dahlquist and Robertsson (2001), Gompers and Metrick (2001), Edison and Warnock (2004), among many others.

1. *Total sales*: measured in US\$ million. In the regressions, we consider the log of a firm's total sales as a measure of firm size.
2. *Total assets*: measured in US\$ million. In the regressions, we consider the log of a firm's total assets as a measure of firm size.
3. *Market capitalization*: this is the market value of a firm's shares at the end of the fiscal year, measured in US\$ million. In the regressions, we consider the log of the market capitalization as a measure of firm size.
4. *Price-to-book value ratio*: this is a valuation measure of the firm, capturing historical returns. "Growth" firms typically have high price-to-book value ratios, whereas "value" firms have low ratios. This ratio is defined as the market value of equity at year-end divided by the book value of equity. This is a performance variable.
5. *Price-earnings ratio*: it is also a performance measure capturing the value of the firm calculated as the market value per share divided by earnings per share. A high ratio suggests that investors are expecting higher earnings growth in the future in comparison to companies with a lower price-earnings ratio.
6. *Dividend yield*: a prudence variable. This is the value of dividends paid during the fiscal year divided by the market value of the firm at year-end. Stocks paying higher dividend yields are considered safer as they guarantee some income to its holders. Also, there might be institutional restrictions on holdings of assets that do not pay dividends.
7. *Return on assets*: this is the net income divided by total assets at year-end. This is a variable related to financial health of the firm.

8. *Leverage*: also related to financial health, it captures a firm's financial vulnerability in the long run. It is calculated as the ratio between total liabilities to total assets at year-end.

9. *Current Ratio*: this is a proxy for short-term financial distress, measuring a firm's ability to meet its short-term payment requirements. It is calculated as current assets divided by current liabilities at year-end.

Lastly, firm-level domestic stock market trading data comes from Standard & Poor's Emerging Markets Data Base (EMDB), which was formerly collected by the International Finance Corporation. The EMDB provides data on domestic market capitalization and domestic value traded in current U.S. dollars by firm. Although the EMDB is the most comprehensive database on firm-level trading of equities around the world, it focuses on emerging markets only and does not include 100 percent of local firms (e.g., while varying by country, the EMDB typically covers about 70 percent of market capitalization). Given the importance of trading activity for our analysis, we restrict our sample to firms from developing countries. The following countries are included in our sample: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Hong Kong SAR, China, Hungary, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Russia, Slovakia, South Africa, Taiwan, China, Thailand, Turkey, and Venezuela.¹⁹

III. Firm Characteristics and Mutual Fund Portfolio Holdings

¹⁹ It should be noted that Hong Kong SAR, China has been included in our database because of Chinese firms listed in its exchange. However, the results documented here are robust to its exclusion from the sample.

In this section, we provide empirical evidence on our hypothesis of a heterogeneous effect of information asymmetries across the portfolio of mutual funds with different investment mandates based on a bivariate analysis that characterizes the association between mutual fund investments and firm characteristics. As suggested by the model presented in the Section I, information asymmetries affect more significantly the investment decisions of global funds than that of specialized funds. Although managers from both global and specialized funds can be considered equally sophisticated and skilled, our model showed that they might not be equally informed about the firms (or countries) they are allowed to invest in. In particular, we showed that mutual fund managers with broader mandates have smaller incentives to gather and process costly information than managers of more specialized funds. Therefore, global fund managers would prefer to invest in firms less prone to information asymmetries than specialized fund managers.

Following an extensive literature, firm size is used as our main proxy for information asymmetries. One possible mechanism through which firm size captures these informational frictions is through its association with cash flow volatility. Small firms tend to have more volatile cash flow than larger firms. Uninformed investors would thus face more severe adverse selection when investing in such firms, implying that they would hold relatively smaller proportions than informed investors. In other words, a greater variance in cash flows is associated with larger holdings by informed investors – the larger the firm, the less prone to informational asymmetries a firm is.

As discussed in the introductory section, there are many of papers providing evidence that foreign institutional investors invest in larger firms. The evidence in Table 2 confirms this

previous finding in our database. The table reports firm characteristics in the portfolio holdings of specialized and global funds. Our universe of firms include 10,143 firms, out of which 1,347 have stocks held by global funds and 2,211 firms have equity in the hands of specialized funds at some point in our sample. The average firm size in our sample has US\$358 million in total sales, US\$1,015 million in total assets, and US\$400 million in market capitalization. However, the average size of firms in mutual fund portfolios is significantly larger than these sample averages, independently of the measure considered. Global funds invest in firms with an average size of US\$1,365 million in market capitalization for example, more than three times as large as the sample average. Specialized funds also hold significantly larger firms: US\$867 million in total sales. Therefore, these results support the existence of a foreign bias – foreign investors’ propensity to invest in larger firms than domestic investors. Furthermore, the average firm in the portfolio of global funds is significantly larger than that on the portfolio of specialized funds, independently of the proxy chosen for firm size. The bivariate analysis thus suggests that there is heterogeneity in how information asymmetries affect institutional investors with different investment mandates.

[Insert Table 2 about here]

The evidence on leverage also supports our view that global fund managers would prefer to invest in firms less prone to information disadvantages than specialized fund managers. Although less emphasized in the literature, leverage can also be an indicator of the importance of information asymmetries. The mechanism is analogous to the one for firm size. Highly leveraged firms usually have greater future returns uncertainty. As shown by Coval (2003), larger variance

of future returns implies more holdings by informed investors. Hence, similar to the argument above, if information asymmetries are more pronounced for the portfolio choice of global funds, they would invest in less leveraged firms than specialized funds. The evidence in Table 2 confirms this hypothesis. Not only mutual funds tend avoid highly leveraged firms, but also the difference in firm leverage in the portfolios of specialized funds versus those on the portfolios of global funds is significantly positive. The average leverage of firms in mutual fund portfolios is 24.5% for global funds and 25.7% for specialized funds, whereas the average firm in our sample has a ratio between total liabilities to total assets at 28.2%.

With respect to the other balance sheet variables, the results in Table 2 are generally consistent with what has been reported in the literature.²⁰ While mutual funds tend to invest in larger and less leveraged firms, they do not deviate significantly from the average firm in our dataset if the price-to-book value ratio is considered. However, the other performance variable, the price-earning ratio, is on average smaller for firms in the portfolio of mutual funds if compared to the average firm. Nonetheless, Table 3 also shows that both performance variables are not statistically different at 5% significance level among the firms in the portfolios of global and specialized funds. If dividend yield is considered though, mutual funds invest in firms with slightly higher values than the average firm in our database. The results on the financial health variables are somewhat mixed. Mutual funds pick firms with low current ratio, suggesting that they give greater weight to “safer” firms. Mutual funds also seem to prefer firms with higher return on assets.

²⁰ Similar results have been reported in Kang and Stulz (1997), Dahlquist and Robertsson (2001), and Edison and Warnock (2004).

For robustness purposes, in Table 3 we show the average firm size in the portfolio of global and specialized funds on a yearly basis since 1997. The top panel reports the average values for total sales, the middle one for total assets, and the bottom one for market capitalization. Typically, firms in the portfolio of U.S. mutual funds are on average significantly larger than the average firm in our database.²¹ These results consistently support the existence of a foreign bias. Moreover, confirming the preliminary evidence based on full-sample averages, the results in Table 3 show that the average firm in the portfolio of global funds is significantly larger in than that on the portfolio of specialized funds for each year on our sample, independent of the proxy chosen for firm size.

[Insert Table 3 about here]

The evidence shown in this section based on a bivariate analysis strongly suggests that there is heterogeneity in how information asymmetries affect institutional investors with different investment mandates. Nevertheless, firm size, through its correlations with other variables, might be capturing other effects that are not purely related to information asymmetries. We explore this possibility in the next section.

IV. Multivariate Regressions

To disentangle the various relationships found in the previous section, we run multivariate regressions with firm-level attributes as explanatory variables to analyze the determinants of mutual fund holdings. Ideally, we would like to analyze the impact of firm-level variables on

²¹ Although not reported, results from these tests are available upon request.

ownership measures. The standard ownership measure used in the literature is constructed as the number of shares held by certain investors (e.g. domestic or foreign investors) divided by the total number of outstanding shares at a given point in time. As described in Section II, Worldscope reports the number of outstanding shares at year-end. However, our database on holdings is not as consistent – portfolio holdings are reported on different dates. Therefore, we are not able to construct confidently an ownership measure given that numerator and denominator would not be consistently measured at the same point in time. Hence, we focus on two other variables. First, we analyze a dummy variable capturing mutual fund ownership – it equals one when a firm is held by a certain mutual fund type and zero otherwise. In this case, maximum-likelihood logit models are estimated.²² Alternatively, we use count data: the number of funds with a certain mandate that holds assets of a given firm in a certain year. The count variables however contain evidence of over-dispersion, and thus negative binomial maximum-likelihood models are estimated.²³ Both variables capture the relevant information for the purposes of the analysis conducted here. We are able to quantify the impact of firm-level attributes on the portfolio choice of mutual funds, although we are not able to measure their impact on the size of mutual fund investments. Multivariate models dividing mutual funds according to their mandate, namely global and specialized funds, are estimated. The multivariate setup accounts for any residual correlation between the equations for different investor types. We are thus able to perform hypothesis tests on the estimated coefficients across equations.

²² We do not report estimates based on a linear probability models as it predicts probabilities outside the 0-1 range for a significant number of observations in our sample.

²³ A poisson model assumes that the mean and the variance of the count data are equal. However, in our dataset, the variance is considerably larger, making the negative binomial model more appropriate.

First, full-sample pooled regressions are reported in Table 4. In these estimations, standard errors are clustered at the firm-level.²⁴ In the first three columns of the table, we show the estimated maximum-likelihood logit model. These regressions measure the probability of a positive outcome, i.e. the probability that a given firm in a certain year is part of the portfolio of either global or specialized funds. The reported coefficients can be interpreted as the effect on the log of the odds ratio of a unit change in the independent variable. Hence, an odds ratio of one means that there is no association between them.²⁵ The odds ratio captures the strength of the association between a predictor (a firm-level attribute) and the response (likelihood of being part of mutual fund portfolio).

The results are consistent with the ones obtained on the bivariate analysis. Firms with larger total sales, larger total assets, and larger market capitalization are more likely to be in the portfolio of mutual funds, a finding consistent with the foreign bias. The odds ratio for market capitalization is 2.52 in the regression explaining holdings of global funds, a number significantly larger than one. In other words, an increase in 1 unit in the log of market capitalization, which corresponds to about US\$ 100 million in market capitalization for the average firm, improves the odds of being held by a global mutual fund in 2.52. Similarly, for specialized funds, these odds increase by 2.08. These estimations in Table 4 also support our

²⁴ No fixed effects are included in these regressions as fixed effects logit (or probit) model estimates are generally inconsistent when the length of the panel T is fixed, which is our case, and possibly biased in finite sample. On a more practical note, if these dummies were included, we would be able to obtain the primary slope parameters but not the estimators for the full set of the model parameters, precluding thus the computation of marginal effects, which is essential to the analysis in this paper. See for example Greene (2004).

²⁵ There is a direct association between the reported coefficients and the odds ratio: the log of the odds ratio is equal to the estimated coefficients.

main hypothesis of differences in foreign portfolio holdings across institutional investors with different investment mandates with respect to firm size. A Wald test rejects the hypothesis that these estimated coefficients for are equal in the equations for global and specialized funds. In other words, firm size is a stronger determinant of whether a global fund holds assets from a certain firm than it is for specialized funds. If the other measures of firm size are considered, i.e. total assets or total sales, the results are similar. In other words, there is evidence that global funds tend to hold assets from larger firms than specialized funds do.

Leverage, the ratio between total liabilities to total assets, is also consistently estimated to affect differently the portfolio holdings across mutual fund types for our different specifications. Specialized funds tend to invest in more leveraged firms than global funds, supporting our hypothesis that informational frictions affect the portfolios of mutual funds differently depending on their investment mandate. This result however should be taken with care as the effects of leverage on portfolio holdings sometimes have different signs, depending on which variable is used for firm size. Nevertheless, the difference in coefficients across fund types is a robust finding.

[Insert Table 4 about here]

The last three columns of Table 4 report the estimated maximum-likelihood negative binomial model. Coefficients on a negative binomial regression can be interpreted as follows: for a unit change in the predictor variable, the difference in the logs of expected counts of the response variable is expected to change by the respective regression coefficient, given that the other predictor variables in the model are held constant. In our case, the dependent variable is the

number of mutual funds, global or specialized, that holds assets from a certain firm at a given point in time. Hence, the estimated coefficients indicate that a unit change in a firm characteristic increases the number of funds that invest on that company if the estimated coefficient is positive, where the coefficient value measures the magnitude of such increase.

The results for the negative binomial model are similar to the ones obtained using a logit model with respect to the firm size across mutual fund types. The number of global mutual funds with positive holdings increases significantly more than the number of specialized funds with positive holdings as firms get larger. In other words, global funds tend to hold firms that are considerably larger than the firms held by specialized funds. In these regressions, similarly to the ones using the logit model, the portfolios of global and specialized funds also tend to differ with respect to firm's leverage. In sum, these multivariate estimations indicate a preference among global funds for larger firms and less leveraged firms in comparison to specialized funds' preferences. These findings suggest that global funds do indeed invest in firms where they are subject to milder information disadvantages than specialized funds.

Next, for robustness purposes, we estimate our regressions on a yearly basis instead of the pooled-sample regression. In order to save space, we report only the results in which total assets is a proxy for firm size, although the results are robust to the other proxies for firm size used throughout the paper. The results are reported in Tables 5A for the logit model and 5B for the negative binomial model. The results are comparable to the full-sample estimations. The heterogeneous effect of firm size and leverage across mutual fund types is consistently significant over time. The effects of all other firm attributes change considerably with the sample

year and/or are not consistently different across portfolios of different mutual fund types once both estimated models are considered. Overall, the results reported in Tables 5A and 5B support our hypothesis of a heterogeneous effect of information asymmetries on the portfolio choice of global funds and specialized funds. Given the similarities of the results, we will only report estimations based on pooled full-sample regressions for the rest of the paper.

[Insert Tables 5A and 5B about here]

V. Disentangling the Effects of Firm Size

We have used so far firm size and leverage as proxies for information asymmetries – the larger and the less leveraged the firm, the less exposed to informational frictions a firm is. However, firm size, through its correlations with other variables, might be capturing other effects that are not purely related to information asymmetries, and are thus addressed in this section.

A. Liquidity and Transaction Costs

Firm size is positively correlated with liquidity. If institutions turn over their portfolio often, they might prefer firms with high liquidity, independent of their information set. Nevertheless, liquidity might also be capturing an aspect of information asymmetries: the less informed about a particular region/country a manager is, the greater the incentives to hold assets from more liquid firms because of lower transaction costs. In other words, those who know the market well have an advantage in liquid assets. Given the methodology followed, we are not able to distinguish these two effects as turnover information at the mutual fund level would be

necessary. Furthermore, we do not have evidence on the trading behavior of funds with different investment mandates. We thus have no strong prior about the impact of liquidity across mutual fund mandates.

A preference for low transaction cost assets might reflect other factors than informational frictions. If institutions are large relative to foreign stocks, they might prefer firms with low transaction costs. For example, Perold and Salomon (1991) and Chen, Hing, Huang, and Kubik (2004) argue that a large asset base might erode performance because of trading costs associated with price impact. In this case, firm size would not be capturing any effects related to information asymmetries. Moreover, because global funds tend to be larger than specialized funds, as reported in Table 1, transaction costs, particularly a price impact measure, should have a greater negative effect on the portfolio choices of global funds than on the specialized funds.

Lastly, we interpret the residual effect of firm size on mutual fund portfolio choices as evidence in favor of informational frictions, given that only a particular aspect of it might be captured by the liquidity and transaction costs controls. For example, these controls should not be associated with different costs of processing information between global and specialized funds. Hence, we test whether these residual effects are significantly different across mutual fund mandates.

To control for price impact, we use a country-level transaction cost variable measuring price impact from Elkins/McSherry. This price impact variable is calculated by comparing trades

to the volume-weighted average price (VWAP) on a given trade day.²⁶ The reported values are the yearly averages of the principally weighted loss to the VWAP. We use the log of the turnover ratio at the firm-level to control for liquidity effects. Turnover ratio is defined as the number of traded shares during the year divided by the total number of outstanding shares in local markets. The results are shown in Tables 6A and 6B for the logit and the negative binomial models, respectively. The coefficients on firm size are strongly significant and robust across the different specifications and models. Moreover, Wald tests show that the effect of firm size on mutual fund portfolio choice is significantly larger for global funds than for specialized funds. Also supporting our previous results, funds with different mandates also show different preferences with respect to firm leverage. Specialized funds tend to prefer more leveraged firms than global funds. Nevertheless, this effect is not as strong as the firm size effect – it becomes less robust once the sample size is severely reduced because of data availability on turnover.

The estimated coefficients on the transaction cost control indicate a negative effect on the portfolio choice of mutual funds, as expected. Furthermore, transaction costs related to price impact have a larger negative effect on the portfolio of global funds as opposed to specialized funds. This evidence is consistent with the fact that global funds tend to be larger than specialized funds, and thus might be more responsive to market impact costs. The effects of turnover as a determinant of mutual fund holdings are usually positive, but not strongly significant. The regressions suggest that firms with greater share liquidity are more likely to be held by a mutual fund, but there is little evidence suggesting a heterogeneous effect across

²⁶ VWAP are calculated by calculating the ratio between all shares traded in a particular stock on a particular day and the total principal traded within that stock.

mutual fund types. The results on the literature on these effects are also mixed at best. For example, Dahlquist and Robertsson (2001) document a positive relation between foreign ownership and liquidity. On the other hand, Kang and Stulz (1997) find mixed effects, with negative estimates on cross-sectional regressions. Edison and Warnock (2004) also find a negative impact if holdings in Emerging Asia are considered.

In sum, adding control variables for liquidity and transaction costs did not change our previous results. We find robust empirical evidence that there is heterogeneity in how information asymmetries affect the portfolio choices of investors with different investment mandates.

[Insert Tables 6A and 6B about here]

B. Other Barriers to International Capital Flows

In this sub-section, we address other direct and indirect barriers to international capital flows. For example, firm size is significantly correlated with foreign listings – larger firms are more likely to be cross-listed in a U.S stock exchange or have shares available abroad through ADRs. Therefore, asset holders of large firms might face fewer direct barriers to international investments. Moreover, firms adopting these discretionary policies also make themselves more attractive to foreign investors by overcoming institutional shortcomings of their home country, such as weak shareholder protection and greater information disclosure. This is indeed the case when firms issue ADRs. Firms not only reduce direct barriers to international investments but they might also improve their information environment due to stricter disclosure rules for

example. This last effect has straightforward implications for the hypothesis explored in this paper. If firms disclose more information when issuing ADRs, they reduce the cost of information for investors and thus become less prone to informational frictions. Hence, these firms should become more attractive to global fund managers, the relatively uninformed investor when compared to specialized funds.

With the ADR data collected, we can distinguish between these two effects. ADRs can be basically classified into two types: private issues with no additional requirement on information disclosures (Levels I and IV, which are OTC and private placements), and public issues that are required to comply with U.S. disclosure rules (Levels II and III). Notice that both types of ADRs involve reductions in the direct barriers to foreign investors, but only the “public” type is associated with a better informational environment. We thus expect public ADRs to have a stronger effect on the portfolio choice of global funds than on the portfolio of specialized funds. But no such heterogeneity is expected from private issues.

Our second set of controls is related to direct measures of restrictions to foreign investments, namely investability. This is a firm-level variable from EMDB capturing the legal availability of a firm’s stocks to foreigners. Hence, a larger number of available shares to foreigners would allow greater investments by mutual funds. Given that this measures a direct barrier to foreign investment, we expect no heterogeneity of its effect on mutual funds with different mandates.

The estimations are reported in Tables 7A and 7B for the logit and negative binomial models, respectively. Our hypothesis that global funds prefer to invest in firms where they are

less prone to information disadvantages than specialized ones is strongly supported by the evidence presented in these tables. These effects are captured with five variables this time: firm size, leverage, public and private ADRs, and investability. Firm size, independent of the proxy considered, and ADR dummies are always significant at 1% significance level for the estimated models. For both firm size and Public ADR, the estimated coefficients are significantly larger for global funds than for specialized funds, suggesting greater effects of these variables on the portfolio choice of global funds. In other words, firms less prone to informational frictions, i.e. larger firms and those with public ADRs, are more attractive to global fund managers than specialized fund managers, and in addition, to a greater number of these managers. Furthermore, we cannot reject the hypothesis that the coefficient on Private ADRs is equal for both mutual fund types, with the exception of one specification of the negative binomial model. These results also corroborate the hypothesis analyzed in this paper, since private listings do not affect the informational environment for these firms and therefore should not necessarily have different effects across investors with different mandates. Analogously, and as expected, the effects of investability on funds' portfolio choice are not statistically different for global and specialized funds. Furthermore, the estimated coefficients are significantly positive in all specifications for both investor types. As more shares become legally available to foreigners, we observe a larger the probability of being held by a mutual fund and a larger number of funds with positive holdings. Lastly, the evidence based on leverage is relatively weaker than that reported in the previous sections as the statistical significance of our results is diminished. Nevertheless, we still

tend to observe higher estimated parameters on the equations for specialized funds than for global funds.

[Insert Tables 7A and 7B about here]

C. Merton's Familiarity Effect

Although not essential to the main argument of the paper because it is related to information frictions, we try to disentangle whether firm size captures Merton's (1987) familiarity effect. Investors tend to hold shares in firms with which they are familiar, and they are more likely to be familiar with large firms. Firm size can thus be a proxy for visibility to foreign investors through its positive correlation with exports: larger firms would be more well-known.²⁷ In order to assess whether informational asymmetries are more pronounced for the portfolio decisions of investors with different investment mandates, we expect familiarity effects to have a higher effect on the portfolio choice of global funds than of specialized funds. Familiarity effects are captured by foreign sales to total sales, our proxy for exports. It should be noted though that exports is not the only variable capable of capturing the familiarity effects. Participation in standard indexes such as the MSCI and the number of analysts following a given firm has also been used in the literature as proxies for visibility. Hence, we believe that the coefficient on firm size might still capture part of the familiarity effects, not completely covered by the control used here.

²⁷ Some might argue that exports might be indirectly capturing the fear of capital controls as firms with export sales do have a source of income in foreign exchange. Although important in debt markets, we believe that the argument has limited scope for equity markets.

The estimations are reported in Table 8. First, the variable capturing the familiarity effect is typically statistically significant and positive in both the logit and the negative binomial regressions, indicating that firms with greater exports do attract more investments from mutual funds. Second, as expected, we find that it affects global and specialized funds asymmetrically, having a significantly larger effect on global funds' portfolios. Lastly, our standard measures of information asymmetries, firm size and leverage, still robustly indicate heterogeneous effects across mutual fund mandates.

[Insert Table 8 about here]

D. Information Asymmetries Across Mutual Fund Mandates

In this sub-section, for robustness, we include all controls analyzed in Section V in our estimations. Thus, we estimate both logit and negative binomial models with controls for transaction costs, liquidity, other barriers to international capital flows, and familiarity effects. Most importantly, any residual effect of firm size on mutual fund portfolio choices is still interpreted as evidence of heterogeneity in how information asymmetries affect investors' portfolio choices. For example, there are no controls in the analysis that allow us to identify, or even capture, differences in costs related to information acquisition and information processing across investors types. Firm size and leverage still captures these effects. Therefore, the heterogeneous effects of informational frictions across mutual fund with different mandates can be supported by the residual effects of firm size as well as by leverage, public and private ADRs, and export variables. The estimated regressions are shown in Tables 9A and 9B for the logit and

negative binomial models, respectively. All the results previously reported are typically robust to the added controls here.

Firm size and Public ADRs are always significant at 1% confidence level, independent of the type of regression or mutual fund mandate. Furthermore, in all of the estimations, the coefficients for global funds are significantly larger than the ones for the specialized funds. For the logit regressions, a larger estimated coefficient means that a unit increase in a firm's size is associated with an increase in the odds that a firm is held by a certain mutual fund type. In the case of the ADR dummy, an estimated positive coefficient measures the increase in the odds ratio for the case in which the dummy equals one relative to the case in which the dummy equals zero. In other words, as firms issue ADRs publicly, they increase their probability of being held by a fund. In the poisson regressions with over-dispersion, a unit increase in a firm's size is associated with an increase in the log of number of funds holdings assets from this firm. In either case, the implications are similar: firm size and the issuance of Levels II and III ADRs have a greater impact on the portfolio choice of global funds than on the portfolio choice of specialized funds.

The evidence based on the estimated coefficients on Private ADRs suggests symmetric effects on the portfolios of global and specialized funds, as expected. These results are strongly robust in the logit model. However, the estimations of the negative binomial model are slightly mixed, with a couple of specifications suggesting a slightly larger impact of the issuance of private ADRs on the portfolio decision of global funds than on those of specialized funds.

Similar to the results of the previous sub-section, export sales tend to affect positively the probability of a firm being held by a mutual fund as well as the number of managers investing on it. Nevertheless, the strong heterogeneous effect found is not as robust when other controls are added. We still observe a significantly larger estimated coefficient on the negative binomial regressions for global funds than for specialized funds. However, no such difference is found in the logit regressions.

The effects of transaction costs are unchanged although they are not as strong as the ones found in previous specifications. Transaction costs always affect more negatively global fund holdings than specialized funds; however, the coefficients themselves are not always statistically significant. These results are consistent with the fact that global funds are considerably larger than specialized funds. Thus, transaction costs related to market impact might be more relevant for them. The effect of firm-level turnover and investability, measuring liquidity and direct barriers to foreign investors, are usually correctly signed. Greater liquidity and larger availability of shares to foreigners are associated with greater investments by mutual funds. Moreover, we find no evidence of an asymmetric effect across mutual funds with different mandates.

Lastly, with respect to other firm-level attributes, results shown in Tables 9A and 9B suggest that their impact on mutual fund portfolios is not robust across the different specifications. This finding is supported by the existing literature. Depending on the sample used and the type of investor analyzed, the effects of firm attributes, other than the ones described above, on portfolio choices do not yield consistent results across different samples and specifications.

In sum, we find strongly robust evidence that as investment mandates become broader, mutual fund managers prefer to invest in firms less prone to information disadvantages. Hence, our results suggest that information asymmetries vary across institutional investors with different investment mandates, being significantly more pronounced for funds with broader mandates – namely global funds – in comparison to specialized funds.

[Insert Tables 9A and 9B about here]

VI. Conclusions

Many studies have analyzed the behavior of international capital flows, although only a few of these have addressed the firm-level aspect of international investments. In particular, there is evidence that information asymmetries play an important role in explaining differences in portfolio holdings between domestic and foreign investors within a given country. For example, widely documented is a preference among foreign institutional investors for large firms. This paper went further in understanding the foreign holdings of institutional investors and reported robust evidence that there is actually heterogeneity in how information asymmetries affect the portfolio choice of foreign institutional investors with different investment mandates.

We show theoretically that equally sophisticated and skilled investors with different investment opportunity sets, namely access to a different set of assets, might not be equally informed about their common assets. Based on a simple portfolio choice model with costly information and short-selling constraints, we show that managers with different mandates have different incentives to gather and process costly information. In particular, funds with a more

restrictive mandate have greater incentives to acquire and process costly information in comparison to more global funds, and can thus be more informed about particular countries (or firms). Hence, funds with a wider investment scope would prefer to invest in firms where they are less prone to information disadvantages. This model thus supports our hypothesis of heterogeneity in how information asymmetries affect investors' portfolio choices.

Empirically, our analysis focused on the foreign equity holdings of U.S. equity mutual funds. We interpreted firm size and leverage as proxies for information asymmetries – the larger and the less leveraged the firm, the less prone to informational related-frictions a firm is. Reinforcing the existing evidence on the foreign bias, U.S. mutual funds tend to invest in larger and less leveraged firms than those in our universe of firms. Furthermore, we find that the average firm in the portfolio of global funds is significantly larger and less leveraged than that on the portfolio of specialized funds. However, firm size, through its correlations with other variables, might be capturing other effects not purely related to information asymmetries. Nevertheless, after controlling for transaction costs, liquidity, and other direct and indirect barriers to international capital flows, we still found a heterogeneous effect of firm size and leverage on investors with different mandates.

Also giving strong support to our hypothesis, we found an asymmetric effect of ADR issues associated with increased information disclosure on the portfolio choice of investors with different mandates. Moreover, no such asymmetry exists if ADRs are not associated with greater disclosure of information. Therefore, these results also suggest that institutional investors with broader mandates prefer to invest in firms where they are less prone to information

disadvantages than more specialized ones. In sum, we have presented robust evidence supporting the heterogeneity in how information asymmetries affect investors' portfolio choices.

Although shedding light on the extent to which information asymmetries affect the portfolio decisions of different institutional investors, this paper has not addressed the consequences of these market frictions. In particular, our results suggest that information asymmetries may play an increasingly important role in investors' home bias – namely, their lack of international diversification – in light of a growing importance of global funds in comparison to specialized ones in recent years as documented in Didier, Rigobon, and Schmukler (2010). Our findings also indicate that the benefits of international risk sharing might be limited to select firms. Further understanding the market frictions that affect the investment decisions of foreign investors and how these frictions have evolved over time is important for both individuals (who supply funds) and firms and countries (which demand funds). For individuals, it might help improve the performance of their savings invested through mutual funds. For borrowers (firms and governments) in developing countries, imperfect international diversification in developed countries due to information asymmetries restricts significantly the set of policies that can facilitate access to foreign finance.

Although not explored, the results presented in the first part of the paper suggest that informational frictions became more pronounced in recent years. For example, firm size affects considerably more the portfolio choice of mutual funds in the later part of the sample, independent of their mandate. Although not reported, similar evidence can be obtained in the

second part of the paper. Understanding the causes of such phenomenon as well as its consequences is left for future research.

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Table 1. Sample Description			
Fund Type:	Average No. of Funds per Year	Average Fund Size	Average No. of Holdings in Developing Countries
All Funds	722	560	44
Global Funds	465	760	22
Specialized Funds	257	199	72
t-statistic:			
Ho: Global = Specialized	.	8.6	20.6

This table describes our sample of mutual fund portfolios. We report the average number of funds per year, the average fund size, captured by their net assets under management, and the average number of holdings in assets from developing countries in mutual fund portfolios. The table also reports the t-statistic of a t-test that a given fund characteristic is equal across mutual fund types. Mutual funds are classified as either global or specialized funds. Global funds include both world and foreign funds. Specialized funds include: emerging market funds, regional funds, and country funds. Data on net assets under management is in US\$ million.

Table 2. Characteristics of Firms in Mutual Fund Portfolios

	Universe of Firms	Global Funds	Specialized Funds	t-statistic	
				Universe vs. Mutual Funds	Global vs. Specialized
No. of Firms	10,143	1,347	2,211	.	.
Firm-Level Characteristics:					
Size Variables:					
Total Sales	358	1,171	867	29.16	7.57
Total Assets	1,015	3,250	2,329	20.80	8.40
Market Capitalization	400	1,365	933	20.98	7.02
Performance Variables:					
Price-to-Book Value Ratio	1.9	2.0	1.8	0.75	1.32
Price-Earnings Ratio	15.6	15.0	14.3	2.55	0.90
Prudence Variables:					
Dividend Yield	3.0	3.4	3.2	1.98	0.59
Financial Health Variables:					
Return on Assets	4.5	7.5	6.3	6.91	5.11
Leverage	28.2	24.5	25.7	7.95	3.48
Current Ratio	2.4	2.0	2.0	2.63	0.06

This table reports the average values of firm attributes in mutual fund portfolios as well as the averages for all firms in our sample (called the universe of firms). The table also shows the total number of firms in our sample, the total number of firms actually held by global funds, and the total number of firms in the portfolios of specialized funds. A t-test that average firm characteristics are equal across the portfolio of mutual funds and the average firm in our universe of firms is reported. A similar t-test across portfolios of different mutual fund types is also reported. See main text for a detailed description of firm characteristics. Data on firm size is in US\$ million.

Table 3. Average Size of Firms in Mutual Fund Portfolios

Total Sales				
	Universe of Firms	Global Funds	Specialized Funds	t-statistic
1997	478	836	642	3.32
1998	460	862	686	2.46
1999	349	952	711	3.14
2000	345	1,154	927	2.02
2001	310	1,343	1,068	2.06
2002	319	1,455	1,025	3.12
2003	367	1,908	1,100	5.25
Total	358	1,171	867	7.57
Total Assets				
	Universe of Firms	Global Funds	Specialized Funds	t-statistic
1997	1,453	2,572	1,912	3.02
1998	1,312	2,497	1,988	2.28
1999	985	2,817	2,073	3.21
2000	939	3,187	2,499	2.44
2001	847	3,270	2,585	2.27
2002	929	4,008	2,659	3.69
2003	1,036	5,090	2,744	5.70
Total	1,015	3,250	2,329	8.40
Market Capitalization				
	Universe of Firms	Global Funds	Specialized Funds	t-statistic
1997	568	1,062	741	3.79
1998	449	835	741	0.45
1999	505	1,515	1,038	2.91
2000	392	1,491	1,084	2.27
2001	325	1,367	960	2.77
2002	293	1,324	854	3.77
2003	410	2,198	1,133	5.53
Total	400	1,365	933	7.02

This table reports the average size of firms in mutual fund portfolios. Averages are shown across mutual fund types and over time. The table also shows the average firm size for the universe of firms in our sample on a yearly basis. Three proxies for firm size are analyzed: total sales, total assets, and market capitalization. A one-sided t-test that the average firm in the portfolio of global funds is larger than the average firm in the portfolio of specialized funds is reported. Data on firm size is in US\$ million.

Table 4. Portfolio Holdings across Mutual Fund Types

Fund Type:	Logit Model						Negative Binomial Model					
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	0.861 [0.025]	0.762 [0.020]					1.070 [0.045]	0.879 [0.026]				
Total Assets			1.036 [0.026]	0.929 [0.021]					1.229 [0.037]	1.026 [0.019]		
Market Capitalization					0.924 [0.022]	0.732 [0.015]					1.041 [0.059]	0.909 [0.016]
Price to Book Value	0.007 [0.003]	0.003 [0.002]	0.008 [0.004]	0.004 [0.003]	-0.006 [0.002]	-0.009 [0.004]	0.025 [0.028]	0.016 [0.016]	0.045 [0.017]	0.035 [0.019]	-0.011 [0.006]	-0.011 [0.005]
Price Earnings Ratio	-0.001 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.002 [0.000]	-0.004 [0.000]	-0.004 [0.000]	-0.001 [0.001]	-0.001 [0.000]	-0.002 [0.000]	-0.001 [0.000]	-0.004 [0.001]	-0.004 [0.000]
Dividend Yield	0.001 [0.002]	-0.001 [0.002]	0.001 [0.003]	0.002 [0.002]	0.007 [0.003]	0.006 [0.003]	-0.001 [0.001]	0.000 [0.001]	0.001 [0.001]	0.000 [0.001]	0.004 [0.003]	0.004 [0.002]
Return on Assets	0.006 [0.001]	0.001 [0.001]	0.009 [0.001]	0.004 [0.001]	0.001 [0.001]	-0.001 [0.001]	0.008 [0.003]	0.008 [0.003]	0.015 [0.003]	0.013 [0.003]	-0.003 [0.001]	-0.001 [0.001]
Leverage	-0.011 [0.002]	-0.006 [0.001]	-0.022 [0.002]	-0.014 [0.002]	0.001 [0.001]	0.003 [0.001]	-0.012 [0.003]	-0.007 [0.002]	-0.025 [0.003]	-0.016 [0.002]	-0.001 [0.003]	0.003 [0.001]
Current Ratio	0.010 [0.006]	0.014 [0.008]	0.003 [0.002]	0.003 [0.001]	0.001 [0.003]	0.000 [0.002]	0.042 [0.022]	0.032 [0.017]	0.002 [0.001]	0.001 [0.001]	-0.002 [0.002]	-0.002 [0.001]
Pseudo R2	0.23	0.19	0.28	0.24	0.29	0.21	0.13	0.12	0.17	0.15	0.17	0.16
No. Obs.	30,249		30,469		30,464		30,249		30,469		30,464	
Chi2-statistic:												
Firm Size	22.36		21.91		99.50		23.27		39.76		6.55	
Price to Book Value	2.32		2.82		0.72		0.20		0.97		0.01	
Price Earnings Ratio	2.49		3.30		0.40		0.03		0.48		2.76	
Dividend Yield	2.21		0.68		1.10		4.50		0.68		0.01	
Return on Assets	31.61		20.59		7.59		0.06		0.38		2.74	
Leverage	12.98		24.26		1.66		8.82		18.19		3.54	
Current Ratio	0.92		0.05		0.30		0.75		0.43		0.02	

This table reports the estimation results of multivariate logit and negative binomial models of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firme level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 5A. Determinants of Mutual Fund Holdings: Cross-Sectional Logit Estimations

Fund Type:	1997		1998		1999		2000		2001		2002		2003	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size: Total Sales	0.739	0.580	0.636	0.553	0.846	0.676	0.820	0.938	0.959	0.928	1.005	0.859	1.011	0.807
	[0.039]	[0.036]	[0.036]	[0.033]	[0.041]	[0.038]	[0.038]	[0.041]	[0.040]	[0.037]	[0.038]	[0.030]	[0.034]	[0.028]
Price-to-Book Value Ratio	0.023	-0.003	0.003	0.002	0.015	0.002	-0.001	0.002	0.003	0.013	0.011	-0.004	0.011	-0.003
	[0.012]	[0.009]	[0.003]	[0.003]	[0.007]	[0.005]	[0.003]	[0.008]	[0.002]	[0.005]	[0.002]	[0.002]	[0.002]	[0.001]
Price-Earnings Ratio	-0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.001	0.000	-0.001	-0.002	-0.002	-0.003	-0.004
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Dividend Yield	0.002	0.000	0.002	-0.002	-0.006	-0.013	-0.022	-0.014	-0.021	-0.021	0.002	0.005	-0.015	-0.004
	[0.002]	[0.002]	[0.003]	[0.003]	[0.010]	[0.009]	[0.009]	[0.008]	[0.010]	[0.008]	[0.006]	[0.005]	[0.014]	[0.010]
Return on Assets	0.006	0.005	0.003	0.000	0.006	-0.003	0.006	0.012	0.007	0.008	0.008	-0.004	-0.006	0.006
	[0.004]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.002]	[0.002]	[0.001]	[0.003]	[0.002]	[0.003]
Leverage	-0.005	-0.005	-0.006	-0.009	-0.018	-0.010	-0.017	-0.011	-0.019	-0.008	-0.019	-0.010	-0.018	-0.010
	[0.003]	[0.002]	[0.004]	[0.005]	[0.003]	[0.003]	[0.003]	[0.002]	[0.003]	[0.002]	[0.003]	[0.002]	[0.003]	[0.002]
Current Ratio	0.051	0.037	0.099	0.060	0.013	0.011	0.013	0.011	0.031	0.035	0.008	0.008	0.005	0.071
	[0.011]	[0.015]	[0.020]	[0.019]	[0.008]	[0.011]	[0.013]	[0.011]	[0.007]	[0.007]	[0.003]	[0.005]	[0.004]	[0.035]
Pseudo R2	0.17	0.12	0.14	0.12	0.23	0.17	0.22	0.25	0.27	0.26	0.29	0.23	0.30	0.21
No. Obs.	2,402		2,675		3,054		4,039		4,775		6,469		6,835	
Chi2-statistic:														
Fim Size	14.51		5.86		16.18		7.78		0.48		13.13		27.84	
Price to Book Value	3.96		0.56		3.38		0.26		3.18		29.23		38.50	
Price Earnings Ratio	1.09		0.01		0.51		0.41		0.84		0.00		1.80	
Dividend Yield	2.53		6.66		1.12		0.66		0.00		0.23		0.56	
Return on Assets	0.15		1.17		12.56		3.49		0.26		14.99		18.04	
Leverage	0.00		0.87		5.54		5.81		14.78		10.22		5.92	
Current Ratio	1.94		6.17		0.22		0.78		0.42		0.01		3.56	

This table reports the estimation results of cross-sectional multivariate logit models of the determinants of mutual fund holdings. Firm characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the cross-sectional estimations for the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 5B. Determinants of Mutual Fund Holdings: Cross-Sectional Negative Binomial Estimations

Fund Type:	1997		1998		1999		2000		2001		2002		2003	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size: Total Sales	0.909	0.667	0.917	0.749	1.065	0.824	1.111	1.053	1.163	1.057	1.149	0.964	1.205	0.796
	[0.047]	[0.035]	[0.051]	[0.035]	[0.057]	[0.041]	[0.057]	[0.042]	[0.068]	[0.041]	[0.108]	[0.031]	[0.107]	[0.023]
Price-to-Book Value Ratio	0.049	0.028	0.009	0.058	0.029	0.054	0.003	0.003	0.016	0.021	0.057	0.003	0.012	0.003
	[0.024]	[0.027]	[0.030]	[0.055]	[0.022]	[0.024]	[0.002]	[0.003]	[0.021]	[0.023]	[0.017]	[0.003]	[0.005]	[0.003]
Price-Earnings Ratio	0.000	0.000	-0.001	0.000	0.002	0.000	0.003	0.003	0.001	0.000	-0.001	-0.001	-0.003	-0.003
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Dividend Yield	0.001	0.000	-0.003	-0.002	-0.009	-0.009	-0.041	-0.024	-0.037	-0.040	0.000	-0.001	-0.023	-0.008
	[0.001]	[0.001]	[0.003]	[0.002]	[0.006]	[0.006]	[0.011]	[0.011]	[0.013]	[0.010]	[0.005]	[0.004]	[0.023]	[0.008]
Return on Assets	0.007	0.008	0.010	0.005	0.012	0.008	-0.002	0.014	0.008	0.010	0.008	0.005	0.015	0.001
	[0.005]	[0.003]	[0.005]	[0.003]	[0.006]	[0.007]	[0.005]	[0.005]	[0.004]	[0.005]	[0.004]	[0.002]	[0.006]	[0.001]
Leverage	-0.001	-0.003	-0.010	-0.009	-0.019	-0.010	-0.020	-0.010	-0.026	-0.014	-0.028	-0.015	-0.025	-0.013
	[0.003]	[0.002]	[0.006]	[0.004]	[0.004]	[0.003]	[0.004]	[0.003]	[0.004]	[0.003]	[0.005]	[0.002]	[0.004]	[0.002]
Current Ratio	0.135	0.148	0.115	0.123	0.061	0.100	0.032	0.063	0.025	0.026	0.039	0.015	0.078	0.030
	[0.068]	[0.082]	[0.035]	[0.038]	[0.083]	[0.056]	[0.030]	[0.071]	[0.032]	[0.016]	[0.039]	[0.012]	[0.044]	[0.027]
Pseudo R2	0.10	0.08	0.10	0.09	0.14	0.11	0.14	0.12	0.16	0.16	0.16	0.19	0.16	0.19
No. Obs.	2,402		2,675		3,054		4,039		4,775		6,469		6,835	
Chi2-statistic:														
Fim Size	36.06		17.60		23.24		1.11		2.72		4.63		16.94	
Price to Book Value	0.76		3.09		4.47		0.01		0.32		11.63		3.75	
Price Earnings Ratio	0.01		0.83		2.14		0.17		0.39		0.01		0.11	
Dividend Yield	4.74		0.04		0.01		1.41		0.04		0.13		0.46	
Return on Assets	0.16		1.30		0.63		22.61		0.17		0.94		4.86	
Leverage	0.45		0.08		8.56		6.97		13.59		10.66		9.51	
Current Ratio	0.06		0.10		0.95		0.47		0.00		0.57		1.95	

This table reports the estimation results of poisson models of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the cross-sectional estimations for the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 6A. Logit Model: Controlling for Liquidity and Transaction Costs

Fund Type:	(1)		(2)		(3)		(4)		(5)		(6)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	0.849	0.762	0.650	0.521								
	[0.026]	[0.023]	[0.039]	[0.035]								
Total Assets					1.013	0.952	0.812	0.633				
					[0.028]	[0.024]	[0.043]	[0.038]				
Market Capitalization									0.959	0.856	0.769	0.452
									[0.025]	[0.019]	[0.036]	[0.030]
Transaction Costs: Mkt. Impact	-0.012	-0.007			-0.012	-0.007			-0.005	0.001		
	[0.002]	[0.001]			[0.002]	[0.001]			[0.002]	[0.001]		
Turnover			-0.005	0.036			0.025	0.053			0.046	0.058
			[0.028]	[0.026]			[0.029]	[0.026]			[0.028]	[0.024]
Price to Book Value	0.008	0.004	0.027	-0.001	0.010	0.006	0.038	-0.001	-0.004	-0.007	-0.002	-0.015
	[0.004]	[0.003]	[0.017]	[0.003]	[0.004]	[0.004]	[0.020]	[0.003]	[0.003]	[0.004]	[0.005]	[0.026]
Price Earnings Ratio	0.001	0.001	-0.001	-0.003	0.000	0.000	-0.002	-0.003	-0.001	-0.001	-0.003	-0.005
	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.001]	[0.001]
Dividend Yield	0.001	-0.001	-0.001	-0.001	0.002	0.000	-0.001	-0.001	0.004	0.002	0.002	0.000
	[0.002]	[0.002]	[0.004]	[0.004]	[0.003]	[0.002]	[0.004]	[0.004]	[0.003]	[0.002]	[0.004]	[0.004]
Return on Assets	0.005	0.000	0.021	0.012	0.007	0.003	0.030	0.018	-0.002	-0.004	0.011	0.008
	[0.001]	[0.001]	[0.004]	[0.003]	[0.001]	[0.001]	[0.005]	[0.004]	[0.001]	[0.001]	[0.003]	[0.0028]
Leverage	-0.009	-0.004	-0.005	-0.003	-0.019	-0.011	-0.013	-0.007	0.002	0.004	0.003	0.001
	[0.002]	[0.001]	[0.003]	[0.002]	[0.002]	[0.002]	[0.003]	[0.003]	[0.001]	[0.001]	[0.001]	[0.001]
Current Ratio	0.009	0.012	0.050	0.032	0.002	0.002	0.013	0.007	-0.001	-0.001	0.005	0.001
	[0.005]	[0.007]	[0.026]	[0.017]	[0.002]	[0.001]	[0.011]	[0.006]	[0.004]	[0.002]	[0.004]	[0.002]
Pseudo R2	0.23	0.20	0.16	0.12	0.29	0.26	0.18	0.13	0.32	0.26	0.20	0.10
No. Obs.	22,913		6,611		23,120		6,615		23,115		6,615	
Chi2-statistic:												
Firm Size	13.55		14.15		5.74		19.48		20.75		88.72	
Leverage	10.37		0.87		20.51		4.02		3.32		2.76	
Transaction Costs	12.29				8.72				10.71			
Turnover			2.80				1.17				0.21	

This table reports the estimation results of a multivariate logit model of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 6B. Negative Binomial Model: Controlling for Liquidity and Transaction Costs

Fund Type:	(1)		(2)		(3)		(4)		(5)		(6)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	1.047 [0.049]	0.864 [0.030]	0.766 [0.062]	0.562 [0.031]								
Total Assets					1.210 [0.039]	1.016 [0.02]	0.919 [0.081]	0.683 [0.027]				
Market Capitalization									1.041 [0.063]	0.933 [0.016]	0.866 [0.069]	0.649 [0.021]
Transaction Costs: Mkt. Impact	-0.011 [0.002]	-0.004 [0.001]			-0.008 [0.002]	-0.003 [0.001]			-0.001 [0.002]	0.004 [0.001]		
Turnover			-0.076 [0.039]	-0.008 [0.025]			-0.031 [0.033]	0.021 [0.024]			0.039 [0.031]	0.069 [0.02]
Price to Book Value	0.041 [0.036]	0.018 [0.029]	0.034 [0.022]	0.035 [0.016]	0.036 [0.020]	0.058 [0.029]	0.059 [0.029]	0.052 [0.02]	-0.002 [0.004]	-0.005 [0.002]	-0.007 [0.014]	-0.013 [0.007]
Price Earnings Ratio	0.001 [0.001]	0.001 [0.001]	0.000 [0.001]	-0.001 [0.000]	0.000 [0.001]	0.001 [0.000]	-0.001 [0.001]	-0.001 [0.000]	-0.002 [0.001]	-0.001 [0.000]	-0.003 [0.001]	-0.002 [0.000]
Dividend Yield	0.000 [0.001]	-0.001 [0.001]	-0.003 [0.003]	-0.002 [0.002]	0.001 [0.001]	0.001 [0.001]	-0.002 [0.003]	0.000 [0.002]	0.002 [0.001]	0.002 [0.001]	0.001 [0.002]	0.002 [0.002]
Return on Assets	0.005 [0.003]	0.007 [0.002]	0.016 [0.004]	0.011 [0.004]	0.010 [0.003]	0.011 [0.002]	0.022 [0.005]	0.015 [0.006]	-0.005 [0.002]	-0.002 [0.001]	0.001 [0.003]	0.004 [0.002]
Leverage	-0.011 [0.003]	-0.005 [0.002]	-0.008 [0.004]	-0.006 [0.002]	-0.023 [0.003]	-0.014 [0.002]	-0.015 [0.003]	-0.012 [0.002]	-0.001 [0.003]	0.004 [0.001]	0.001 [0.003]	0.001 [0.001]
Current Ratio	0.026 [0.016]	0.024 [0.013]	0.033 [0.047]	0.011 [0.011]	0.001 [0.002]	0.001 [0.001]	0.005 [0.008]	0.001 [0.003]	-0.004 [0.003]	-0.002 [0.002]	0.000 [0.001]	-0.002 [0.001]
Pseudo R2	0.13	0.12	0.08	0.06	0.17	0.16	0.10	0.08	0.19	0.20	0.11	0.09
No. Obs.	22,913		6,611		23,120		6,615		23,115		6,615	
Chi2-statistic:												
Firm Size	17.84		16.34		33.16		10.88		3.92		13.00	
Leverage	11.80		0.14		19.11		1.21		4.09		0.03	
Transaction Costs	18.94				9.86				5.86			
Turnover			7.12				6.27				1.94	

This table reports the estimation results of a negative binomial model of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 7A. Logit Model: Controlling for Other Barriers to International Capital Flows

Fund Type:	(1)		(2)		(3)		(4)		(5)		(6)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	0.730 [0.025]	0.666 [0.021]					0.497 [0.039]	0.374 [0.036]				
Total Assets			0.910 [0.028]	0.849 [0.022]					0.628 [0.045]	0.462 [0.039]		
Market Capitalization					0.804 [0.023]	0.640 [0.016]					0.699 [0.04]	0.351 [0.031]
ADR Dummy: Public	2.687 [0.238]	1.949 [0.217]	2.253 [0.230]	1.445 [0.216]	2.315 [0.209]	1.690 [0.204]	2.231 [0.25]	1.540 [0.247]	2.009 [0.243]	1.331 [0.242]	1.818 [0.234]	1.390 [0.24]
ADR Dummy: Private	1.155 [0.104]	1.098 [0.092]	0.923 [0.106]	0.864 [0.096]	1.172 [0.103]	1.177 [0.088]	0.688 [0.126]	0.761 [0.139]	0.586 [0.125]	0.682 [0.144]	0.572 [0.130]	0.784 [0.145]
Investability							1.185 [0.118]	1.367 [0.108]	1.244 [0.121]	1.392 [0.108]	1.552 [0.130]	1.551 [0.11]
Price to Book Value	0.005 [0.003]	0.001 [0.002]	0.006 [0.003]	0.001 [0.002]	-0.004 [0.001]	-0.008 [0.004]	0.036 [0.019]	-0.001 [0.003]	0.045 [0.024]	-0.001 [0.003]	0.003 [0.005]	-0.005 [0.005]
Price Earnings Ratio	-0.001 [0.000]	-0.002 [0.000]	-0.002 [0.000]	-0.002 [0.000]	-0.003 [0.000]	-0.004 [0.000]	-0.001 [0.000]	-0.002 [0.001]	-0.001 [0.000]	-0.002 [0.000]	-0.002 [0.001]	-0.003 [0.001]
Dividend Yield	0.003 [0.002]	0.001 [0.002]	0.003 [0.003]	0.003 [0.002]	0.007 [0.003]	0.006 [0.003]	-0.001 [0.003]	-0.002 [0.003]	-0.001 [0.004]	-0.002 [0.003]	0.001 [0.003]	-0.001 [0.003]
Return on Assets	0.006 [0.001]	0.001 [0.001]	0.008 [0.001]	0.004 [0.001]	0.002 [0.001]	-0.001 [0.001]	0.020 [0.004]	0.012 [0.003]	0.026 [0.005]	0.016 [0.004]	0.010 [0.003]	0.009 [0.003]
Leverage	-0.011 [0.002]	-0.005 [0.001]	-0.019 [0.002]	-0.011 [0.002]	0.000 [0.002]	0.002 [0.001]	-0.003 [0.003]	-0.002 [0.002]	-0.009 [0.004]	-0.004 [0.003]	0.004 [0.002]	0.001 [0.001]
Current Ratio	0.009 [0.004]	0.012 [0.006]	0.003 [0.002]	0.002 [0.001]	0.001 [0.002]	0.000 [0.002]	0.043 [0.024]	0.021 [0.014]	0.015 [0.011]	0.007 [0.006]	0.008 [0.006]	0.002 [0.003]
Pseudo R2	0.27	0.21	0.30	0.25	0.31	0.22	0.23	0.18	0.24	0.19	0.27	0.18
No. Obs.	27,319		27,535		27,530		6,708		6,713		6,713	
Chi2-statistic:												
Fim Size	8.27		6.18		67.21		12.23		15.71		89.93	
Leverage	15.91		24.41		3.47		0.51		2.83		3.91	
ADR Dummy: Public	12.97		15.23		9.31		9.27		9.02		3.60	
ADR Dummy: Private	0.40		0.39		0.00		0.31		0.51		2.37	
Investability							2.69		1.70		0.00	

This table reports the estimation results of a multivariate logit model of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firme level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 7B. Negative Binomial Model: Controlling for Other Barriers to International Capital Flows

Fund Type:	(1)		(2)		(3)		(4)		(5)		(6)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	0.888 [0.040]	0.753 [0.027]					0.579 [0.046]	0.429 [0.030]				
Total Assets			1.078 [0.034]	0.929 [0.023]					0.725 [0.055]	0.549 [0.028]		
Market Capitalization					0.917 [0.060]	0.820 [0.019]					0.724 [0.059]	0.556 [0.024]
ADR Dummy: Public	2.297 [0.258]	1.468 [0.108]	1.894 [0.367]	0.980 [0.127]	1.790 [0.341]	0.951 [0.115]	1.902 [0.233]	1.025 [0.111]	1.688 [0.318]	0.761 [0.116]	1.480 [0.352]	0.597 [0.112]
ADR Dummy: Private	1.231 [0.126]	0.949 [0.089]	0.890 [0.136]	0.723 [0.094]	0.956 [0.124]	0.773 [0.073]	0.560 [0.137]	0.498 [0.092]	0.453 [0.138]	0.388 [0.087]	0.418 [0.162]	0.379 [0.082]
Investability							1.259 [0.167]	1.172 [0.111]	1.205 [0.16]	1.179 [0.101]	1.299 [0.175]	1.215 [0.096]
Price to Book Value	0.019 [0.018]	0.006 [0.007]	0.037 [0.015]	0.016 [0.017]	-0.006 [0.004]	-0.009 [0.004]	0.057 [0.027]	0.042 [0.020]	0.078 [0.029]	0.057 [0.022]	0.000 [0.003]	-0.004 [0.004]
Price Earnings Ratio	-0.001 [0.001]	-0.001 [0.000]	-0.002 [0.000]	-0.001 [0.000]	-0.004 [0.000]	-0.004 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.002 [0.000]	-0.002 [0.000]
Dividend Yield	0.001 [0.001]	0.001 [0.001]	0.002 [0.001]	0.002 [0.001]	0.005 [0.003]	0.005 [0.002]	-0.003 [0.002]	-0.002 [0.002]	-0.002 [0.002]	-0.001 [0.002]	0.000 [0.002]	0.000 [0.002]
Return on Assets	0.010 [0.003]	0.008 [0.002]	0.016 [0.003]	0.012 [0.003]	0.000 [0.001]	0.000 [0.001]	0.017 [0.004]	0.011 [0.004]	0.021 [0.004]	0.014 [0.005]	0.004 [0.003]	0.005 [0.002]
Leverage	-0.009 [0.002]	-0.005 [0.002]	-0.021 [0.003]	-0.013 [0.002]	0.000 [0.002]	0.003 [0.001]	-0.002 [0.003]	-0.003 [0.002]	-0.008 [0.003]	-0.007 [0.002]	0.004 [0.002]	0.002 [0.001]
Current Ratio	0.021 [0.011]	0.021 [0.011]	0.001 [0.002]	0.001 [0.001]	-0.003 [0.003]	-0.002 [0.002]	0.022 [0.035]	0.010 [0.009]	0.006 [0.007]	0.003 [0.003]	0.001 [0.001]	0.000 [0.001]
Pseudo R2	0.15	0.13	0.18	0.16	0.18	0.17	0.12	0.09	0.13	0.10	0.15	0.11
No. Obs.	27,319		27,535		27,530		6,708		6,713		6,713	
Chi2-statistic:												
Firm Size	15.69		32.63		3.69		25.10		18.43		12.96	
Leverage	6.83		12.99		2.93		0.27		0.09		1.56	
ADR Dummy: Public	20.01		11.14		10.69		29.13		15.10		10.44	
ADR Dummy: Private	8.21		2.79		3.35		0.46		0.44		0.11	
Investability							0.63		0.05		0.42	

This table reports the estimation results of a negative binomial model of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 8. Familiarity Effects

Fund Type:	Logit Model						Negative Binomial Model					
	(1)		(2)		(3)		(4)		(5)		(6)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:												
Total Sales	0.790 [0.032]	0.640 [0.026]					1.046 [0.059]	0.796 [0.025]				
Total Assets			0.935 [0.033]	0.763 [0.026]					1.175 [0.032]	0.874 [0.023]		
Market Capitalization					0.812 [0.028]	0.649 [0.022]					1.038 [0.026]	0.804 [0.018]
Foreign Sales to Total Sales	0.006 [0.001]	0.004 [0.001]	0.008 [0.001]	0.004 [0.001]	0.009 [0.001]	0.005 [0.001]	0.005 [0.002]	-0.001 [0.002]	0.005 [0.002]	-0.001 [0.001]	0.006 [0.001]	0.000 [0.001]
Price to Book Value	0.000 [0.003]	0.000 [0.002]	0.001 [0.007]	0.000 [0.002]	-0.031 [0.013]	-0.036 [0.016]	0.004 [0.004]	0.004 [0.003]	0.030 [0.039]	0.010 [0.030]	-0.022 [0.013]	-0.014 [0.008]
Price Earnings Ratio	0.000 [0.000]	0.000 [0.000]	-0.001 [0.000]	-0.001 [0.000]	-0.002 [0.000]	-0.002 [0.000]	0.001 [0.001]	0.000 [0.001]	0.000 [0.001]	0.000 [0.000]	-0.002 [0.001]	-0.002 [0.000]
Dividend Yield	0.003 [0.004]	0.001 [0.002]	0.005 [0.005]	0.002 [0.003]	0.008 [0.006]	0.004 [0.004]	0.001 [0.002]	0.001 [0.001]	0.003 [0.002]	0.002 [0.001]	0.007 [0.004]	0.003 [0.002]
Return on Assets	0.006 [0.001]	0.002 [0.001]	0.008 [0.002]	0.004 [0.001]	0.001 [0.001]	0.000 [0.001]	0.008 [0.003]	0.007 [0.002]	0.014 [0.004]	0.011 [0.004]	-0.003 [0.002]	0.001 [0.001]
Leverage	-0.010 [0.002]	-0.005 [0.002]	-0.019 [0.003]	-0.009 [0.002]	-0.001 [0.002]	0.002 [0.001]	-0.012 [0.003]	-0.007 [0.002]	-0.021 [0.003]	-0.013 [0.002]	0.000 [0.002]	0.002 [0.001]
Current Ratio	0.003 [0.004]	0.008 [0.005]	-0.002 [0.005]	0.003 [0.001]	-0.015 [0.012]	0.000 [0.003]	0.023 [0.026]	0.021 [0.018]	-0.001 [0.004]	0.000 [0.001]	-0.017 [0.014]	-0.003 [0.003]
Pseudo R2	0.22	0.16	0.26	0.19	0.26	0.18	0.13	0.11	0.17	0.13	0.18	0.15
No. Obs.	11,531		11,533		11,532		11,531		11,533		11,532	
Chi2-statistic:												
Firm Size	24.40		29.09		37.96		23.83		133.65		120.35	
Leverage	6.62		13.99		1.75		4.59		11.72		1.18	
Foreign Sales to Total Sales	4.45		6.02		9.39		25.48		28.00		35.78	

This table reports the estimation results of multivariate logit and negative binomial models of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.

Table 9A. Logit Model: The Heterogeneous Size Effect Across Mutual Fund Types

Fund Type:	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized	Global	Specialized
Firm Size:														
Total Sales	0.742 [0.027]	0.694 [0.023]	0.455 [0.040]	0.382 [0.040]					0.696 [0.035]	0.606 [0.029]				
Total Assets					0.580 [0.046]	0.496 [0.046]					0.841 [0.036]	0.750 [0.03]		
Market Capitalization							0.694 [0.043]	0.502 [0.037]					0.740 [0.031]	0.684 [0.025]
ADR Dummy: Public	2.677 [0.270]	1.749 [0.24]	2.277 [0.284]	1.466 [0.286]	2.082 [0.278]	1.276 [0.289]	1.822 [0.266]	1.096 [0.286]	2.297 [0.317]	1.358 [0.289]	1.977 [0.317]	0.974 [0.287]	1.864 [0.296]	0.863 [0.282]
ADR Dummy: Private	1.037 [0.116]	0.904 [0.104]	0.545 [0.141]	0.597 [0.158]	0.470 [0.137]	0.522 [0.161]	0.409 [0.141]	0.542 [0.164]	0.893 [0.141]	0.691 [0.121]	0.754 [0.138]	0.552 [0.127]	0.934 [0.138]	0.721 [0.121]
Transaction Costs: Mkt. Impact	-0.012 [0.002]	-0.006 [0.001]	-0.008 [0.002]	-0.010 [0.001]	-0.007 [0.002]	-0.009 [0.001]	-0.003 [0.002]	-0.005 [0.001]	-0.010 [0.003]	-0.004 [0.001]	-0.010 [0.003]	-0.004 [0.001]	-0.004 [0.003]	0.003 [0.001]
Turnover			-0.015 [0.029]	0.042 [0.028]	0.010 [0.030]	0.060 [0.029]	0.049 [0.032]	0.088 [0.030]						
Investability			0.995 [0.134]	0.879 [0.126]	0.998 [0.136]	0.841 [0.127]	1.081 [0.146]	0.788 [0.129]						
Foreign Sales to Total Sales									0.003 [0.001]	0.002 [0.001]	0.005 [0.001]	0.003 [0.001]	0.006 [0.002]	0.004 [0.001]
Price to Book Value	0.007 [0.003]	0.004 [0.003]	0.046 [0.034]	0.003 [0.010]	0.062 [0.042]	0.006 [0.016]	0.006 [0.006]	-0.004 [0.003]	0.001 [0.006]	0.002 [0.004]	0.004 [0.022]	0.003 [0.011]	-0.012 [0.007]	-0.016 [0.010]
Price Earnings Ratio	0.001 [0.000]	0.001 [0.000]	0.000 [0.001]	0.000 [0.001]	0.000 [0.000]	0.000 [0.001]	-0.001 [0.001]	-0.001 [0.001]	0.000 [0.001]	0.001 [0.001]	0.000 [0.001]	0.001 [0.001]	-0.001 [0.001]	0.000 [0.001]
Dividend Yield	0.002 [0.002]	0.000 [0.002]	-0.002 [0.003]	-0.004 [0.003]	-0.002 [0.004]	-0.004 [0.004]	-0.001 [0.003]	-0.003 [0.003]	0.004 [0.003]	0.001 [0.002]	0.005 [0.004]	0.001 [0.003]	0.007 [0.005]	0.003 [0.003]
Return on Assets	0.005 [0.001]	0.001 [0.001]	0.020 [0.005]	0.014 [0.003]	0.024 [0.005]	0.018 [0.004]	0.009 [0.004]	0.006 [0.003]	0.006 [0.001]	0.002 [0.001]	0.008 [0.002]	0.004 [0.001]	0.001 [0.001]	-0.001 [0.001]
Leverage	-0.008 [0.002]	-0.004 [0.001]	-0.003 [0.003]	-0.002 [0.002]	-0.008 [0.003]	-0.005 [0.003]	0.003 [0.002]	0.001 [0.001]	-0.009 [0.003]	-0.003 [0.002]	-0.017 [0.003]	-0.007 [0.002]	0.000 [0.002]	0.003 [0.001]
Current Ratio	0.008 [0.004]	0.011 [0.006]	0.026 [0.017]	0.013 [0.009]	0.009 [0.007]	0.003 [0.003]	0.005 [0.004]	0.000 [0.002]	0.002 [0.003]	0.008 [0.004]	-0.004 [0.005]	0.003 [0.001]	-0.015 [0.013]	0.000 [0.003]
Pseudo R2	0.27	0.21	0.20	0.14	0.21	0.15	0.25	0.17	0.25	0.18	0.28	0.21	0.28	0.22
No. Obs.	22,913		5,201		5,204		5,204		10,049		10,051		10,050	
Chi2-statistic:														
Firm Size	3.92		3.63		3.33		22.55		7.16		6.72		3.74	
Leverage	10.06		0.11		1.13		1.49		6.98		13.30		3.04	
ADR Dummy: Public	16.62		10.34		10.02		8.09		11.29		12.04		11.61	
ADR Dummy: Private	1.75		0.11		0.11		0.64		2.40		2.18		2.27	
Transaction Costs	12.26		0.57		0.81		1.15		7.24		6.17		6.30	
Foreign Sales to Total Sales									0.85		1.58		2.43	
Turnover			3.96		2.86		1.66							
Investability			0.69		1.23		3.89							

This table reports the estimation results of a multivariate logit model of the determinants of mutual fund holdings. Firm-level characteristics are the explanatory variables. See main text for more details. We divide mutual funds into two categories, global and specialized funds, and one equation for each fund type is estimated. This multivariate regression accounts for the residual correlation between the equations for different investor types. The table also reports the Chi2-statistic of a hypothesis test that the coefficients associated with a firm characteristic are equal across mutual fund types. The table shows the pooled results over the 1997-2003 sample. Standard errors are clustered at the firm level. Heteroskedasticity-consistent standard errors are reported in brackets.