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Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan[1]

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Abstract

This paper studies stock ownership in Japanese firms by non-Japanese investors from 1975 to 1991. Existing models predicting that foreign investors hold national market portfolios or portfolios tilted towards stocks with high expected returns are inconsistent with our evidence. We document that foreign investors hold disproportionately more shares of firms in manufacturing industries, large firms, and firms with good accounting performance, low unsystematic risk, and low leverage. Controlling for size, there is evidence that small firms that export more, firms with greater share turnover, and firms that have ADRs have greater foreign ownership.

Keywords: Japan; Home bias; International diversification; Equity ownership

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1. Introduction

Over the last 25 years, we have seen a dramatic decrease in obstacles to international portfolio investment. Before the 1970s, most countries had restrictions on foreign exchange transactions that limited cross-border portfolio investment. Few developed countries have such restrictions now and many emerging countries are eliminating them. Often, countries would forbid inbound foreign portfolio investment altogether. Such a practice has almost disappeared, although many countries still have limitations on foreign ownership. In addition, the lack of tax harmonization meant that foreign investors often would find it difficult to get refunds or credits for taxes paid abroad. This is less of a problem now. Although not all obstacles have disappeared, investors in most countries can now invest abroad both directly and through mutual funds.

Financial economists have noticed that even though the barriers to international investment have fallen dramatically, foreign ownership of shares is still extremely limited and much smaller than one would expect in the absence of barriers to international investment. French and Poterba (1991), Cooper and Kaplanis (1994), and Tesar and Werner (1995) document this phenomenon. In particular, if investors care only about the mean and the variance of the real return of their invested wealth, and if barriers to international investment are as small as many observers suggest, one would expect investors, as a first approximation, to hold the world market portfolio of stocks. The available data on ownership of shares shows that shares are mostly held by domestic residents, at least for large countries such as the US and Japan. Several explanations have been suggested for this so-called home bias in portfolios, but so far no explanation seems to be generally accepted.

Existing investigations of the home bias use countrywide data rather than firm-specific data. In other words, we know well that non-Japanese investors hold too few Japanese shares, but we do not know how foreign holdings in Japan are divided among shares. In this study, we provide new insights into the home-bias puzzle by using disaggregated data for Japan. Although foreign investment in Japan is interesting on its own merits, Japan also happens to be the only large country that we know for which detailed data on holdings by foreign investors are available. In many countries, there are shares that cannot be bought by foreign investors and others that can only be bought by foreign investors (see Stulz and Wasserfallen, 1995). For these countries, therefore, one can estimate shares held by foreign investors, but these estimates reflect binding constraints on foreign ownership. In the case of Japan, the foreign ownership constraints are not binding and therefore the data on foreign ownership reflect the choices of foreign investors. We use a dataset that provides foreign ownership for individual firms in Japan for a period of 17 years.

Our most robust result is that foreign investors invest primarily in large firms: on average, they hold 6.97% of the equity of the firms in the top size quintile, compared to 1.21% of the equity of firms in the smallest size quintile. Throughout our sample period, foreign investors in Japan have disproportionately high holdings of firms in manufacturing industries and firms with good accounting performance, low leverage, high market-to-book ratios, and with low unsystematic risk relative to the weights of the Japanese market portfolio.

Why do foreign investors prefer large firms? Firm size is correlated with many firm attributes that might affect investors' portfolio holdings. We therefore investigate what makes large firms more attractive. First, it could be that large firms are better known internationally. For instance, large firms are more likely to sell goods abroad. We find some evidence that smaller firms that export more have greater foreign ownership. Second, large firms could be more liquid, so that foreign investors would find it cheaper to establish a position without inside knowledge of the market. Consistent with this view, we find evidence that the firms with the lowest turnover (defined as volume divided by the number of shares outstanding) have less foreign ownership. Finally, investors in large firms could face fewer barriers to international investment. For instance, the shares of these firms might be more easily available outside Japan. We find that firms with American Depository Receipts (ADRs) have more foreign ownership, although this was true even before the ADR program was established.

The home-bias literature has emphasized that investors do not hold the world market portfolio. In this paper, we show that, in addition, when investors invest outside their home country, they do not hold the market portfolio of the countries in which they invest. The evidence presented in this paper is inconsistent with simple explanations of the home bias that assume that foreign investors face similar obstacles to holding all shares in a country. The obstacles to foreign investment must be inversely related to size to explain non-Japanese ownership of shares in Japanese firms. However, foreign ownership is small even for large firms relative to what it would be if foreign investors held the world market portfolio.

The paper proceeds as follows. In Section 2, we review the implications of the literature on international portfolio choice for equity portfolios of foreign investors within a country. In Section 3, we describe our data and provide annual summary measures of foreign investment in Japan for our sample period. Section 4 investigates the determinants of foreign ownership using multivariate regressions. In Section 5, we pursue several possible explanations for the size bias we observe. In Section 6, we evaluate the performance of foreign investors in Japan relative to the performance of the market. In Section 7, we analyze the relation between foreign ownership and the cross-sectional variation in returns. A conclusion is provided in Section 8.

2. The firm-level implications of possible explanations for the home-bias puzzle

Many papers have pointed out that despite the decline in barriers to international investment, investors allocate only a very small fraction of their portfolio to foreign investments.[2] This evidence constitutes what is generally referred to as the home-bias puzzle. A number of explanations have been proposed for this puzzle, but none individually has succeeded in resolving it. Each of these explanations has implications for the holdings of foreign stocks by domestic investors not only at the country level but also at the firm level. The most important explanations for the home-bias puzzle and their implications for foreign investment at the firm level involve explicit and implicit barriers to international investment as well as departures from mean-variance optimization.

Explicit barriers to international investment are those that are directly observable and quantifiable. For instance, a restriction on foreign exchange transactions is an explicit barrier to international investment. Explicit barriers to international investment have fallen over time because of, for instance, international tax accords and the removal of foreign exchange controls. However, there are still visible barriers to foreign investment, so that some home bias should still exist. French and Poterba (1991) and Cooper and Kaplanis (1994) argue that explicit barriers to international investment are no longer large enough to explain the observed portfolio allocations of investors. They suggest that, to explain the home-bias puzzle, these barriers would have to be much larger than withholding taxes, which often are mentioned as the most significant observable deterrent to foreign investment. If barriers to international investment are the same across securities in a foreign country, foreign investors should tilt their portfolios toward securities that have a higher expected excess return (see Stulz, 1981a). If explicit barriers differ across securities, foreign investors will prefer securities that have lower explicit barriers. We investigate this by examining separately the ownership of firms with ADR programs, since these programs should decrease transaction costs and holding costs for foreign investors.

Implicit barriers to international investment, on the other hand, are not directly observable. As explicit barriers have fallen, researchers have put more emphasis on obstacles to foreign investment that cannot be identified from brokerage statements. The two main classes of such barriers are political risk differences between domestic and foreign investors and information asymmetries.

Political risk differences arise if non-resident investors feel that there is some probability that they might have trouble repatriating their holdings or that their

[2] See Frankel (1995) for references as well as French and Poterba (1991), Cooper and Kaplanis (1994), and Tesar and Werner (1995).

holdings might be expropriated altogether, so that their expected return on foreign shares is lower than the expected return for residents. As long as this political risk does not materialize, investors appear to be insufficiently diversified internationally. A problem with this argument is that money markets seem well integrated at short maturities and do not reflect potential political risks. Hence, to make the political risk argument convincing, one has to explain why foreign investors would be more at risk with equities than with short-term money market instruments. One possibility is that short-term money market instruments are highly liquid, so that investors can change their positions quickly and at low cost. In contrast, markets for stocks are less liquid, so that investors may find it expensive to sell stocks quickly to avoid political risk. The possibility of unexpected surges in political risk would suggest that foreign investors invest more in securities that have liquid markets. We explore this hypothesis with a study of the relation between foreign ownership and share turnover as a proxy for liquidity.

As for information asymmetries, if non-resident investors are less well informed about a country than resident investors, they will invest less in that country because the variance of their predictive distribution is higher.[3] One can think of some information asymmetries that affect all securities similarly and others that do not. Information asymmetries that affect all securities in a similar way have no impact on portfolio allocation within a country. Merton (1987) argues that investors invest in the securities they know about. If investors behave this way, we would expect foreign investors to invest more in securities that are known abroad. Since heavy exporters are presumably better known abroad, the extent to which a firm exports may be a good proxy for how well it is known abroad. We therefore examine the Merton hypothesis by investigating whether foreign ownership is higher in firms that export more. In addition to having different information, investors could process information differently because of cognitive biases. French and Poterba (1990) argue that the holdings of Japanese investors in the US and the holdings of US investors in Japan can be explained if Japanese investors are substantially more optimistic about the expected return of Japanese shares than are American investors. Shiller et al. (1990) provide some survey evidence consistent with the view that investors are more optimistic about their own market than are foreign investors.

Finally, departures from mean-variance optimization would suggest that investors might be tailoring their asset holdings to hedge against changes in variables that matter to them. Stulz (1981a) argues that investors' desire to

[3] See Low (1993) for a model where investors are asymmetrically informed and a home bias emerges. Low's model assumes that the investment opportunity set changes over time. Brennan and Cao (1996) build a model where asymmetric information leads investors to buy foreign assets when their return is high and sell them when their return is low.

hedge against unanticipated changes in their consumption and investment opportunities might lead to a home bias. For instance, they might want to hold a portfolio that is hedged against unanticipated changes in the purchasing power of their currency, that has a return negatively correlated with the return to their human capital, or that has a return correlated with the spot rate of interest. One can think of many variables that affect the expected utility and the portfolio selection of an investor. When investors hedge against unanticipated changes in state variables, limited diversification may be optimal even though markets are fully integrated internationally. However, hedging against state variables often seems to imply that investors should hold disproportionately more foreign securities than domestic securities. For instance, it would seem more likely that foreign securities have returns negatively correlated with the returns to human capital and with the purchasing power of the investor's domestic currency. Cooper and Kaplanis (1994) show, for instance, that hedging purchasing power risks cannot explain the home bias. Using a fully specified general equilibrium model, Uppal (1993) finds that there is a home bias only if risk aversion is low. If investors are more risk averse than investors with logarithmic utility as one would expect, his model predicts a reverse home bias. Finally, Baxter and Jermann (1993) and Baxter et al. (1994) argue that taking into account the return to human capital should lead US investors to be short in the US market portfolio of traded securities because of its high correlation with the return to human capital. The implications of hedging demands at the firm level cannot be made precise without positing what investors hedge against. Unfortunately, we are not aware of a well-specified hypothesis for state-variable risks predicting that investors hold portfolios with a substantial home bias. We therefore provide no evidence on hedging demands as a possible explanation for the home bias.

3. The data

In Japan, shares are registered. Firms report foreign ownership and this information is available from annual reports and stock guides. Foreign ownership includes all shares held by non-residents irrespective of where they are located. It includes institutional as well as individual ownership by non-resident investors. It also includes ADRs and all ADRs are counted as foreign ownership. The ownership data are available from the Pacific-Basin Capital Market Research Center (PACAP) files. The file includes all firms in existence as of the beginning of 1991. In this paper, we use the data reported on these files from 1975 to 1991. For each firm, the file provides foreign ownership as of the end of the fiscal year (which is March 31 for many Japanese firms). Table 1 provides a summary of our data. In the second column, we show for each year the number of firms for which foreign ownership data are available and the number of firms

Table 1
Equally and value-weighted foreign ownership for nonfinancial Japanese firms by year.

Year	Sample size (missing)[a]	Equally-weighted [Standard deviation]	Value-weighted
1975	868	2.46%	4.64%
	(385)	[7.71]	
1976	988	2.34	4.47
	(267)	[7.22]	
1977	1,014	2.36	4.02
	(250)	[7.10]	
1978	1,043	2.35	3.39
	(230)	[6.86]	
1979	1,089	2.30	3.25
	(191)	[6.67]	
1980	1,106	2.73	4.80
	(187)	[7.23]	
1981	1,113	4.08	7.98
	(204)	[8.44]	
1982	1,118	4.45	8.80
	(235)	[8.60]	
1983	1,144	5.07	10.46
	(251)	[8.96]	
1984	1,191	5.76	11.31
	(217)	[8.96]	
1985	1,308	5.15	9.97
	(109)	[8.28]	
1986	1,298	5.17	8.97
	(93)	[7.96]	
1987	1,268	4.25	6.88
	(77)	[7.25]	
1988	1,309	3.77	4.50
	(52)	[6.74]	
1989	1,341	3.71	5.02
	(82)	[6.11]	
1990	1,426	3.99	4.76
	(29)	[6.38]	
1991	1,452	4.02	5.59
	(13)	[6.50]	
Average of annual values		3.76	6.40
Standard deviation of annual values		1.16	2.64

[a]Missing means the number of observations for which foreign ownership or market value of equity is not available at the end of the fiscal year.

for which foreign ownership or market value of equity data are missing from the files. It is immediately apparent that the proportion of firms for which data are missing falls steadily throughout our sample period. In the last sample year, 1991, we have data for 1,452 firms and 13 firms have missing data. In contrast, in 1975 (the first sample year), we have data for 868 firms and missing data for 385 firms.

To obtain summary statistics of foreign ownership, we could proceed in at least two different ways. First, we could compute the percentage of shares owned by foreign investors for each firm and average this percentage across firms. This number is given for each year in the third column. In brackets, we also provide the cross-sectional standard deviation of the percentage of shares owned by foreign investors in each firm. The equally weighted measure of foreign ownership is quite small. It never exceeds 6%. It exhibits a hump-shaped pattern: foreign ownership first increases and then falls, reaching a peak in 1984. This hump-shaped pattern is also documented by French and Poterba (1990) who use aggregated Tokyo Stock Exchange data. They argue that such a pattern is especially puzzling in light of the fact that barriers to international investment decrease throughout the 1980s for investors wanting to invest in Japan. Second, we could add up the market capitalization of all the firms for which we have data and compute the market value of the shares held by foreign investors as a percentage of this market capitalization. We provide this measure in the last column of Table 1. The value-weighted measure of foreign ownership is always larger than the equally weighted measure and always by at least 50%. This difference reflects an important characteristic of the portfolios held by foreign investors that we will discuss throughout the paper: foreign investors have disproportionately more shares of large firms in their portfolios.

The firms with missing data are not included in the estimates of foreign investment reported in Table 1. If these firms have more foreign investment than the firms used in that table, then we are underestimating foreign investment. We find, however, that including the firms for which the market value of equity is missing but foreign ownership data are available in our equally weighted measure of foreign ownership does not change our conclusions. In any case, few firms have missing data in the last years of our sample period. Another issue with our data is that there could be reporting errors or biases that lead some foreign investors to be counted as domestic investors and some domestic investors could be counted as foreign investors because they use a foreign vehicle to invest in Japan. We have no clear way of assessing the importance of these biases. Finally, Japanese firms issued large amounts of convertible debt and debt with warrants offshore. Kang et al. (1995) provide an analysis of Japanese offshore issues. It could be that the obstacles to holding offshore debt were smaller for foreign investors than the obstacles to holding domestic shares, so that foreign investors substituted offshore equity-linked debt for domestic shares. Since the offshore issues are largely concentrated in the late 1980s, this

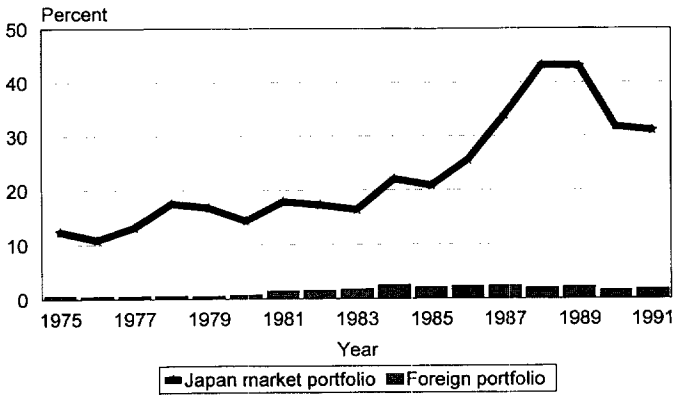

Fig. 1. Market value of Japanese shares held by foreign investors and of the Japanese market portfolio in percent of the world market portfolio.

The world market portfolio is the one of Morgan Stanley Capital International measured at the end of March. The value of Japanese shares held by foreign investors and the Japanese market portfolio are measured at the same time.

substitution could play a role in the decrease in foreign ownership in the late 1980s documented in Table 1.

Fig. 1 shows the extent of the home bias over our sample period. If investors hold the world market portfolio, the weight of Japan in their portfolio is equal to the weight of Japan in the world market portfolio. The weight of Japan in the world market portfolio is plotted in Fig. 1 using the Morgan Stanley Capital International world market portfolio.[4] We also plot the value of the portfolio of Japanese stocks held by foreign investors as a percentage of the value of the world market portfolio. This percentage corresponds to the fraction of the Japanese market portfolio held by foreign investors multiplied by the fraction of the world market portfolio represented by Japanese stocks ($\times 100$). If foreign investors held the world market portfolio, their portfolio of Japanese stocks would constitute the same percentage of the world market portfolio as the market portfolio of Japanese stocks. Not surprisingly, foreign investors always hold disproportionately less of the Japanese market portfolio. The difference between the two weights represents the shortfall in holdings of Japanese stocks by foreign investors relative to the case where they would hold the world market portfolio. Since the portfolio of Japanese stock of foreign investors is always a small fraction of the world market portfolio, the shortfall is highly correlated

[4] We are grateful to Campbell Harvey for helping us find this data.

Table 2
Deviation in percent of each industry's weight in the portfolio held by foreign investors from its weight in the Japanese market portfolio. The sample size is in parentheses. The *p*-values for a *t*-test of the null hypothesis that the 17 differences are equal to zero for an industry are given in square brackets.

Year	Agriculture Forestry Fishery & Mining	Construction	Manufacturing	Wholesale & Retail	Real Estate	Transportation & Communication	Electric & Power Gas	Services
1975	0.76%	− 5.46%	7.82%	− 3.12%	N.A.%	N.A.%	N.A.%	N.A.%
	(15)	(78)	(708)	(67)				
1976	0.49	− 3.60	15.75	− 1.03	− 0.69	− 4.78	− 5.70	− 0.44
	(14)	(79)	(725)	(71)	(16)	(48)	(13)	(22)
1977	0.18	− 4.47	15.45	− 0.76	− 0.71	− 4.05	− 5.29	− 0.35
	(14)	(85)	(738)	(72)	(16)	(53)	(13)	(23)
1978	0.76	− 4.23	16.12	− 2.19	− 0.83	− 4.54	− 4.93	− 0.16
	(14)	(88)	(749)	(83)	(16)	(56)	(13)	(24)
1979	2.22	− 2.87	15.33	− 2.21	− 0.46	− 4.68	− 7.26	− 0.07
	(14)	(96)	(779)	(89)	(16)	(56)	(13)	(26)
1980	1.41	− 3.54	20.00	− 5.41	− 0.65	− 5.00	− 6.68	− 0.13
	(15)	(102)	(785)	(93)	(16)	(57)	(13)	(25)
1981	− 0.03	− 3.10	17.40	− 4.48	− 0.54	− 4.04	− 4.91	− 0.30
	(15)	(100)	(793)	(93)	(15)	(58)	(14)	(25)
1982	0.02	− 2.30	15.56	− 3.66	− 0.24	− 3.83	− 5.35	− 0.21
	(15)	(99)	(793)	(98)	(16)	(56)	(14)	(27)
1983	− 0.13	− 1.93	13.80	− 3.66	− 0.00	− 3.22	− 4.58	− 0.28
	(15)	(100)	(811)	(102)	(16)	(57)	(13)	(30)

1984	– 0.17	– 1.84	12.74	– 3.31	0.04	– 2.82	– 4.03	– 0.60
	(15)	(104)	(846)	(107)	(17)	(58)	(13)	(31)
1985	– 0.16	– 1.69	11.32	– 2.21	0.39	– 2.75	– 4.31	– 0.58
	(15)	(112)	(914)	(125)	(19)	(74)	(15)	(34)
1986	– 0.23	– 0.57	7.52	– 0.73	0.65	– 2.38	– 3.94	– 0.33
	(15)	(111)	(896)	(130)	(19)	(77)	(15)	(35)
1987	0.05	1.62	6.37	0.36	2.06	– 3.81	– 6.37	– 0.29
	(14)	(105)	(864)	(140)	(18)	(79)	(15)	(33)
1988	0.23	0.10	20.89	1.61	0.70	– 17.28	– 6.57	0.32
	(15)	(98)	(899)	(147)	(19)	(76)	(15)	(40)
1989	0.51	1.26	11.63	1.40	0.82	– 12.02	– 3.58	– 0.01
	(16)	(109)	(914)	(152)	(19)	(78)	(15)	(38)
1990	0.36	0.64	12.09	0.62	0.96	– 10.00	– 4.58	– 0.01
	(16)	(115)	(981)	(156)	(20)	(81)	(15)	(48)
1991	0.16	0.56	13.17	– 0.46	0.63	– 10.22	– 3.83	– 0.02
	(16)	(120)	(989)	(160)	(23)	(83)	(15)	(46)
Average	0.38	– 1.84	13.70	– 1.72	0.13	– 5.96	– 5.12	– 0.22
	[0.03]	[< 0.01]	[< 0.01]	[< 0.01]	[0.51]	[< 0.01]	[< 0.01]	[< 0.01]

with the share of the Japanese market portfolio in the world market portfolio and keeps increasing with that share during the 1980s even though Japanese capital markets become less regulated.

Table 2 provides a different perspective on foreign ownership. Instead of looking at the whole market, we look at separate industries. For each industry, we report the difference between the industry's value-weighted foreign ownership and the industry's weight in the Japanese market portfolio. The numbers are in percentage terms, so that 1% means that foreign investors invest 1% more of their Japanese portfolio in an industry than they would if their investment weights were those of the Japanese market portfolio. There are striking patterns of foreign ownership across industries. Throughout our sample period, foreign investors hold disproportionately more of the manufacturing sector every year, less of the utilities sector every year, and more of the services sector every year but one. Surprisingly, they hold disproportionately less of the real estate sector every year for the first eight years of our sample and more every year afterwards. A similar pattern holds for construction. The deviations for manufacturing are extremely large throughout the sample. On average, foreign investors invest 13.70% more of their Japanese portfolio in manufacturing than in the market portfolio. Because the deviations are fairly stable over time, even small average deviations are significantly different from zero. The only average deviation that is not significantly different from zero is for real estate. A surprising result is the dramatic increase in the bias against the transportation industry starting in 1988. The capitalization of that industry increases strongly that year, but since foreign investors invest disproportionately less in that industry, they do not participate in that capitalization increase as much as the market portfolio.

4. Firm characteristics and foreign ownership

In this section, we use multivariate regressions to explore how ownership of Japanese shares by non-Japanese investors is related to firm characteristics. We pursue two different approaches. In the first approach, we estimate regressions each year. The advantage of this approach is that every year we can include in our sample all firms for which we have data. There is therefore no requirement that we have complete information on each firm every year. The disadvantage of these regressions is that they make no use of the time-series information. In the second approach, we use times-series cross-section regressions. These regressions require a fixed sample so that they suffer from sample selection bias. However, they take full account of the time-series information. As we will show, the results with the second approach are stronger, but they are fully consistent with the results from the first approach. We use the following firm characteristics:

(a) *Leverage.* Leverage is measured as the ratio of total liabilities to total assets at the end of the fiscal year. Leverage is fairly high for Japanese firms

compared to firms in other countries for much of our sample period. If foreign investors believe that the leverage of Western firms is more appropriate, one would expect them to underinvest in the Japanese firms with the highest leverage.

(b) *Current ratio.* We use the current ratio, defined as the ratio of current assets to current liabilities at the end of the fiscal year, as a measure of short-run financial health of a firm.

(c) *Return on assets.* Return on assets is defined as net income divided by total assets as of the end of the fiscal year.

(d) *Beta.* Beta is the market model beta estimated using daily returns for the previous calendar year (e.g., if foreign ownership is measured in March 1987, the end of the fiscal year, then the corresponding beta is calculated using 1986 daily returns). The market portfolio is the Japanese equally weighted portfolio from the PACAP files. Models of barriers to international investment that treat these barriers as proportional taxes generally conclude that investors facing such barriers when they invest abroad hold disproportionately more foreign high beta stocks.

(e) *Residual variance.* Residual variance is the variance of the market model error estimated using daily returns for the previous calendar year.

(f) *Excess return.* Excess return is measured as the return net of the equally-weighted PACAP portfolio return. It is measured as the cumulative compound excess return using the 12 monthly returns preceding the end of the fiscal year (e.g., for foreign ownership measured in March 1987, the excess return is calculated using monthly returns from April 1986 to March 1987). Including this variable makes it possible to evaluate whether foreign investors are contrarian or extrapolative.

(g) *Market value.* This is the market value of the firm's shares at the end of the fiscal year. Size could play a role in portfolio allocations. First, it is often argued that more information is available about large firms, so that information asymmetries between Japanese and non-Japanese investors might be less important for such firms. Second, transaction costs are lower for such firms, so that if barriers to international investment include higher transaction costs for foreign investors, it is possible that they are lower for such firms. Third, foreign investors are more likely to know about large firms.

(h) *Book-to-market.* The book-to-market ratio is measured as the book value of equity divided by the market value of equity as of the end of the fiscal year.

We present the first set of results in Table 3. For these results, we proceed as follows. Each year, we estimate a cross-sectional regression of foreign ownership in a firm on eight explanatory variables. Note that if foreign investors hold the market portfolio of the domestic country, foreign ownership is the same in each firm and the coefficients of our cross-sectional multivariate regression should be insignificantly different from zero. Hence, these coefficients show how foreign investors depart from the market portfolio in their holdings. Rather than reproduce the coefficient estimates for each year, we average them first for the

whole sample period and then for two subsamples. We provide three different measures to help assess the statistical significance of the results: the average of the t-statistics for a coefficient, the number of t-statistics for a coefficient significantly different from zero at least at the 0.10 level, and the p-value of a t-test for the average t-statistic.

The results for the first column of Table 3 aggregate the coefficient estimates for 16 regressions. The only explanatory variable that has a significant coefficient each year is firm size. Each year, foreign investors invest more in large firms controlling for the seven other firm characteristics. The coefficient on leverage is significantly negative in 12 years out of 16, indicating that foreign investors prefer firms with low leverage. There is a strong book-to-market effect in the first subperiod, but this effect weakens substantially in the second subperiod. In contrast, the return-on-assets effect is strong in the second-half of the sample, but much less so in the first half. The other variables sometimes have significant coefficients, but they do not provide convincing results. The result that dominates Table 3 is the importance of firm size in the investment decisions of foreign investors. One might be concerned that this reflects a reporting bias, in that the smaller firms might be more likely to have missing observations. However, if that were the case, one would expect the effect should falter in the second-half of the sample and it does not. An alternative way to regress foreign ownership on our explanatory variables is to pool years together and allow firms to enter in the panel as they become available. We do so allowing for dummy variables for each year. This alternative approach assumes that the coefficients are constant through time, whereas the results in Table 3 allow the coefficients to change through time. Nevertheless, the results are similar except that the book-to-market ratio and beta are much more significant. This pooling approach does not account for correlation in the residuals, so that the t-statistics might be inflated.

Table 4 provides regressions that use both cross-sectional and time-series data. In that table, we estimate random-effect models using the Fuller–Battese (1974) method. This method divides the error term for a firm at year t into three components: an error for firm i across years, an error for firm i in year t and an error for year t common across firms. The variance components are estimated first by the fitting-of-constants method and the regression parameters are estimated using generalized least squares. To implement this approach, we have to use a fixed panel, however. Since we are interested in deviations of the portfolio held by foreign investors from the market portfolio for Japan, we use as our dependent variable foreign ownership for a firm in a given year minus the equally weighted foreign ownership for that year. The dependent variable therefore measures how the foreign ownership in a firm differs from what it would be if foreign investors had acquired the same fraction of each firm. The regressions in Table 4 show again a strong effect of firm size on ownership. Leverage and book-to-market have significantly negative coefficients for the whole sample regression and the two subsample regressions and ROA has

Table 3
Regression estimates of foreign ownership on explanatory variables. Regression coefficients are the time-series average from year-by-year regressions for the 1976–1991 period.[a] Average t-statistics are in parentheses; the second number in parentheses is the p-value for a t-test that the average t-statistic is zero. Numbers in brackets are those of coefficients that are significantly positive at the 0.10 level and those of coefficients that are significantly negative at the 0.10 level, respectively.

Variables	Full period: 1976–1991	Subperiod: 1976–1983	Subperiod: 1984–1991
Intercept	− 0.0635 (− 2.19; < 0.01) [0,10]	− 0.0370 (− 1.09; 0.01) [0,2]	− 0.0899 (− 3.29; < 0.01) [0,8]
Leverage	− 0.0397 (− 2.03; < 0.01) [0,12]	− 0.0452 (− 2.03; < 0.01) [0,6]	− 0.0342 (− 2.03; < 0.01) [0,6]
Current ratio	0.0017 (0.48; 0.04) [1,0]	0.0010 (0.23; 0.44) [0,0]	0.0024 (0.74; 0.06) [1,0]
ROA	0.1495 (1.72; < 0.01) [8,0]	0.1683 (1.69; < 0.01) [3,0]	0.1308 (1.75; < 0.01) [5,0]
Beta	0.0025 (0.61; 0.24) [4,1]	0.0006 (0.14; 0.80) [1,0]	0.0044 (1.07; 0.24) [3,1]
Residual variance	6.7279 (0.76; 0.08) [4,0]	12.1359 (1.41; 0.08) [3,0]	1.3199 (0.10; 0.73) [1,0]
Excess return	0.0036 (0.38; 0.55) [4,3]	0.0049 (0.45; 0.65) [2,1]	0.0022 (0.31; 0.69) [2,2]
Book-to-market	− 0.0246 (− 2.10; < 0.01) [1,10]	− 0.0390 (− 3.28; < 0.01) [0.7]	− 0.0101 (− 0.93; 0.18) [1,3]
Log (MV)	0.0127 (6.57; < 0.01) [16,0]	0.0114 (5.22; < 0.01) [8.0]	0.0140 (7.92; < 0.01) [8,0]
Average sample size	1,122	993	1,251
Adjusted R^2 (%)	11.626	10.413	12.840

[a]Firms with an extreme ROA (ROA larger than 1 or smaller than − 1) and firms with negative book equity are deleted.

Table 4
Time series cross-section regression estimates of foreign ownership on explanatory variables. The Fuller–Battese method is used to estimate the model. Only 519 firms with complete data during the 1975–1991 period are used (*t*-statistics are in parentheses).

Variables	Full period: 1976–1991	Subperiod: 1976–1983	Subperiod: 1984–1991
Intercept	−0.1883	−0.2022	−0.1092
	(−9.33)	(−7.40)	(−4.27)
Leverage	−0.0284	−0.0795	−0.0278
	(−3.74)	(−6.43)	(−2.58)
Current ratio	0.0010	0.0022	−0.0012
	(1.379)	(0.95)	(−1.54)
ROA	0.1121	0.0596	0.1730
	(4.72)	(1.95)	(5.47)
Beta	0.0031	−0.0008	0.0070
	(3.53)	(−0.77)	(5.55)
Residual variance	−2.5213	2.1579	−11.4160
	(−1.43)	(1.18)	(−4.83)
Excess return	0.0059	0.0020	0.0072
	(4.71)	(1.27)	(4.76)
Book-to-market	−0.0211	−0.0138	−0.0490
	(−5.66)	(−2.93)	(−8.36)
Log (MV)	0.0201	0.0261	0.0132
	(15.03)	(13.47)	(7.38)
Root MSE	0.03573	0.02961	0.03175

a significant positive coefficient for the three regressions. None of the other variables have coefficients that are significant in both subperiods. In contrast to Table 3, all coefficients in the second subperiod are significant except the one for the current ratio. In the second subperiod, beta and the excess return have significant positive coefficients and the residual variance has a significant negative coefficient.

5. An investigation of the size bias

A useful way to understand the magnitude of the size bias is to look at the correlation between firm market value and foreign ownership. We compute the Spearman rank correlation between foreign ownership and the log of the market value each year. The average Spearman rank correlation is 0.455; it is significantly positive every year at the 0.01 level. Why this extraordinary size bias? Size could proxy for several variables that might affect foreign ownership. In this section, we try to assess this proxy effect.

5.1. Size and the Merton effect

Merton (1987) argues that investors hold shares in firms with which they are familiar and that investors are more likely to be familiar with large firms. Falkenstein (1996) shows that mutual funds hold more shares in firms that have a lot of news stories associated with them. A proxy for how well known a firm is to foreign investors is the extent to which a firm exports. For a subset of firms (almost all manufacturing firms), we have data made available by Daiwa Securities Co. that provide the ratio of exports to sales for the parent company. These data suffer from the fact that they do not include information for unconsolidated foreign subsidiaries. On average, the data are available for 678 firms per year. The average ratio of exports to sales is 0.1612 per year. Computing the correlation between foreign ownership and the exports ratio, we find an average correlation of 0.18. This correlation is positive every year and significant at the 0.01 level for 16 years and at the 0.05 level for one additional year. It appears from these correlations that foreign investors invest more in firms that have a higher export ratio. However, larger firms are likely to have higher export ratios, so that the correlations might just reflect the correlation between size and foreign ownership documented earlier.

To separate the effect of the export ratio and the effect of size, we present in Table 5 foreign ownership for size quintiles and foreign trade quintiles. Ignoring size, foreign ownership increases monotonically with the ratio of exports to sales, going from 3.69% for the lowest export ratio quintile to 5.71% for the largest. The impact of size is much larger, however, since foreign ownership is, on average, 1.80% for the smallest quintile and 7.66% for the largest quintile. Among the largest firms, the ratio of exports to sales is uninformative: foreign ownership is 8.16%, on average, for the lowest quintile of the exports ratio and 8.50% for the largest. In contrast, for small firms, foreign trade seems to affect foreign ownership. In particular, for the smallest size quintile, the firms in the smallest export ratio quintile have average ownership of 1.03% and in the largest export ratio quintile average ownership is 2.82%. The average difference between these two quintiles is significant with a t-statistic of 4.67. The difference between the high and low exporters for the next size quintile is significant also, but the differences for the other size quintiles are not significant. There is therefore some evidence that foreign activities matter for foreign ownership if a firm is small but not if it is large. Note, however, that our measure of the ratio of exports to sales is likely to be much less informative for large firms since many of these have foreign activities through unconsolidated subsidiaries. In constructing Table 5, we ignore firms for which we have no export data. An alternative approach is to assume that these firms have no exports. If Table 5 were constructed that way, the qualitative results would be similar, but the export ratio quintiles appear somewhat more related to foreign ownership.

Table 5
Mean and median foreign ownership (%) by portfolios formed on the market value of equity and then the exports-to-sales ratio during the 1975–1991 period. Each year, the firms for which data are available on the exports-to-sales ratio are divided into size quintiles. Each quintile is then divided into five quintiles based on the exports-to-sales ratio. The cells in the table provide the time-series mean (median) of the yearly means (medians). We also provide the average difference between the largest and smallest quintiles with the *t*-statistic computed from the time-series of the yearly differences.

Exports/Sales ratio	Size quintiles					
	Smallest	2	3	4	Largest	All
Smallest (1)	1.03	2.63	3.39	4.87	8.16	3.69
	(0.96)	(2.85)	(3.36)	(5.04)	(9.62)	(3.84)
2	1.41	2.86	3.95	5.94	6.69	3.74
	(1.46)	(3.03)	(3.22)	(5.79)	(6.04)	(3.90)
3	2.26	2.44	3.99	5.09	7.73	4.10
	(2.55)	(2.25)	(4.34)	(4.15)	(5.92)	(3.81)
4	1.46	3.21	3.47	6.44	7.18	4.46
	(1.45)	(3.11)	(3.86)	(5.57)	(6.08)	(4.25)
Largest (5)	2.82	4.15	4.17	4.72	8.50	5.71
	(2.78)	(3.62)	(4.30)	(4.26)	(8.68)	(5.68)
(5) – (1)	1.79	1.52	0.78	– 0.15	0.34	2.02
[*t*-statistic]	[4.67]	[2.95]	[1.18]	[– 0.17]	[0.33]	[3.44]
All	1.80	3.05	3.79	5.41	7.66	
	(1.78)	(3.07)	(4.10)	(5.15)	(6.83)	

An alternative approach to investigate whether the export ratio plays an important role in explaining the coefficient on size in our cross-sectional regressions is to reestimate these regressions with the export ratio as an additional explanatory variable. We reestimated the regressions from Tables 3 and 4 on the subsample of 263 companies for which we have export data every year. The export ratio has an insignificant coefficient in the foreign ownership regressions for the whole sample and the first-half of the sample. It has a positive coefficient of 0.04 with a *t*-statistic of 2.39 for the second-half of the sample (1984–1991), in the time-series cross-section regression and an average coefficient of 0.039 with an average *t*-statistic of 2.34 for the cross-section regressions. Adding the export ratio has little impact on the size coefficient. Consequently, while the export ratio seems to be a determinant of foreign ownership, it cannot explain the size coefficient in our regressions.

5.2. *Size and liquidity*

It is less costly to build positions in shares that are more liquid. If a share lacks liquidity, those who know the market well have an advantage. They can time

Table 6
Mean and median foreign ownership (%) by portfolios formed on the market value of equity and then the turnover ratio (defined as volume divided by the number of shares outstanding) during the 1975–1991 period. Each year, the firms for which data are available on the turnover ratio are divided into size quintiles. Each quintile is then divided into five quintiles based on the turnover ratio. The cells in the table provide the time-series mean (median) of the yearly means (medians). We also show the average difference between the largest and smallest quintiles with the *t*-statistic obtained from the time-series of annual differences.

	Size quintiles					
Turnover ratio	Smallest	2	3	4	Largest	All
Smallest (1)	0.83	2.06	2.38	3.90	4.80	2.71
	(0.86)	(2.02)	(2.36)	(3.82)	(4.92)	(2.64)
2	1.05	2.22	3.27	5.50	6.48	3.33
	(0.98)	(2.27)	(3.21)	(5.49)	(6.21)	(3.37)
3	1.27	2.32	4.36	5.57	7.85	4.10
	(1.33)	(2.37)	(4.62)	(5.95)	(6.64)	(3.49)
4	1.44	2.72	3.48	4.90	8.45	4.49
	(1.40)	(2.85)	(3.44)	(5.17)	(7.70)	(4.58)
Largest (5)	1.44	2.58	3.08	4.82	7.27	4.16
	(1.40)	(2.79)	(3.21)	(5.19)	(7.12)	(4.27)
(5) − (1)	0.61	0.52	0.70	0.92	2.47	1.45
[*t*-statistic]	[2.43]	[1.47]	[1.22]	[1.44]	[2.78]	[2.92]
All	1.21	2.38	3.31	4.94	6.97	
	(1.10)	(2.46)	(3.59)	(4.97)	(6.47)	

their purchases to take advantage of their information about the supply of shares. In such a setting, foreign investors might well prefer large firms because the market for their shares is more liquid. Further, as argued in Section 2, concerns about political risk might also induce investors to hold liquid shares since they can exit their positions at lower cost. We do not have a measure of liquidity that we can use. However, shares with higher turnover (defined as volume divided by the number of shares outstanding) should be more liquid. We create an annual turnover measure by using monthly volume to obtain a daily average turnover measure for a month. We then average the daily average turnover measures across the year.

Table 6 makes it possible to address the issue of whether size proxies for liquidity. We rank shares by size and then divide each size quintile into five turnover quintiles. Turnover seems to be related to foreign ownership. For a given size quintile, the lowest turnover quintile always has substantially lower ownership. The turnover effect does not seem to be present for the other turnover quintiles. The average differences between the highest and lowest turnover quintiles are significant for the smallest and largest size quintiles as well

as for the whole sample. We also reestimate Tables 3 and 4 using the turnover variable as an additional independent variable. The coefficient on turnover is positive and significant in the cross-section regressions only in the last two years of the sample. In the time-series cross-section regressions, the coefficient on

Table 7
Event study of foreign ownership when ADRs become available for a firm. Year 0 is the fiscal year during which ADRs become available. When a year is before 1975, we do not have available data. A matching firm is chosen for each ADR firm using market values in year 0.

	ADR firms Mean ownership [median] Sample size (%)	Matching firms Mean difference [median] Sample size (%)	Mean ownership difference (*t*-statistic for difference) [median difference] {Wilcoxon-*z* for difference} (%)
Year −2	11.61	2.42	9.19 (1.96)*
	[11.20]	[1.88]	[9.32]
	6	6	{1.04}
Year −1	8.37	4.00	4.37 (1.75)*
	[9.57]	[2.93]	[6.64]
	10	10	{1.32}
Year 0	10.21	5.12	5.09 (1.69)
	[10.17]	[3.56]	[6.61]
	11	11	{1.58}
Year +1	7.98	5.51	2.47 (1.12)
	[6.92]	[3.29]	[6.61]
	14	14	{1.08}
Year +2	6.39	3.57	2.82 (1.85)*
	[5.32]	[2.66]	[2.66]
	14	14	{1.68}*
Year +3	5.68	2.63	3.05 (2.92)**
	[4.01]	[1.74]	[2.27]
	26	26	{2.64}**
Year +4	7.63	3.80	3.83 (2.74)**
	[7.38]	[2.95]	[4.43]
	27	27	{2.51}**

*Significant at the 0.10 level.
**Significant at the 0.01 level.

turnover has an unexpected negative sign and is significant for the whole sample and for the second-half of the sample. Again, however, the additional explanatory variable has little effect on the size coefficient.

5.3. *The barriers to international investment effect*

Could it be that explicit barriers to international investment are smaller for large firms? Large firms are more likely to have ADR programs. Such programs could lower the pecuniary barriers to international investment. In Table 7, we provide the results of an event study of foreign ownership. The event year is the year that an ADR program starts for a firm. Unfortunately, many ADR programs for the firms in the sample started before 1975, so that we have no ownership data for many firms in the event year. Each year we use all the firms for which we have data. We find that the ADR firms have more foreign ownership than firms of similar size at year 0. However, somewhat surprisingly, there is no evidence in the table that the ADR program itself increases foreign ownership. It seems rather that firms with more foreign ownership choose to have ADR programs. Firms with ADR programs are mainly firms in manufacturing and generally are well known in the US for their brand goods. It may well be, therefore, that these firms have ADRs to reduce the costs of share ownership for existing shareholders and that they have more shareholders abroad because they are well known.

6. The investment performance of foreign investors

Barriers to international investment that take the form of a deadweight cost imply that the portfolio of domestic securities held by foreign investors should have a higher expected return than the portfolio held by domestic investors before taking into account the deadweight cost. Table 8 provides yearly average excess returns of foreign investors over the PACAP monthly value-weighted return and associated t-statistics. To construct the returns of foreign investors, we proceed as follows. For year t, we use ownership information at the end of fiscal year $t-1$. We use market value information as of the end of June of year t to construct a portfolio that mimics holdings of foreign investors and then compute the monthly return on a portfolio with these weights for the next 12 months. Note that the excess returns for foreign investors are obtained by taking the difference of two yen returns. They therefore have the interpretation of excess returns for foreign investors irrespective of their currency if the optimal currency hedge for Japanese securities is to go short an amount of yen equal to the price of the security. We investigate the correlation between yen returns on the portfolio held by foreign investors and the yen/dollar exchange rate and find the correlation to be economically trivial and statistically insignificant. The

Table 8
Time-series average excess returns earned by foreign investors during the period 1976–1991 period. Excess return is the difference between value-weighted monthly returns of foreign investors (where the weight is the market value of each Japanese company held by foreign investors divided by the total market value of Japanese shares held by foreign investors) and value-weighted PACAP monthly market returns. Foreign ownership is measured in fiscal year $t-1$ and market value is measured in June of year t. These values are matched with returns for the months from July of year t to June of year $t+1$.

Period	Average monthly excess return	t-statistics
76/07 – 77/06	– 0.0699%	– 0.09
77/07 – 78/06	– 0.3734	– 0.63
78/07 – 79/06	0.7072	0.97
79/07 – 80/06	– 0.1564	– 0.30
80/07 – 81/06	0.4017	0.83
81/07 – 82/06	– 0.6305	– 0.71
82/07 – 83/06	0.9495	1.74
83/07 – 84/06	– 0.7257	– 1.36
84/07 – 85/06	– 1.2831	– 1.32
85/07 – 86/06	– 0.2069	– 0.15
86/07 – 87/06	– 0.6993	– 0.32
87/07 – 88/06	0.4136	0.59
88/07 – 89/06	0.7365	2.40*
89/07 – 90/06	0.5461	1.03
90/07 – 91/06	0.2565	0.46
91/07 – 91/12	– 0.3085	– 0.53
76/07 – 84/06	0.0128	0.06
84/07 – 91/12	– 0.0520	– 0.13
76/07 – 91/12	– 0.0190	– 0.08

*Significant at the 0.05 level.

procedure we use allows us to obtain returns for 16 years. Out of these 16 years, foreign investors underperform the value-weighted PACAP index portfolio nine times. Their average excess return relative to the value-weighted PACAP is negative over the whole sample period and in the second subsample period, which is the period from 1984 to 1991. The underperformance is not significant, however.

Did foreign investors choose a portfolio with a greater expected return than the market portfolio, as one would expect if the explanation for the home bias is a proportional deadweight cost? We have seen that their portfolio is weighted towards large firms, which would correspond to a smaller expected excess return. In addition, the beta of their portfolio with respect to the value-weighted PACAP portfolio is less than one. Interestingly, though, the beta is much higher in the first-half of the sample (1.23) than in the second-half of the sample (0.84).

Hence, investors did choose a higher-risk portfolio when barriers to international investment were higher.

By choosing a portfolio weighted towards large firms, foreign investors did not perform significantly worse than the market portfolio. They did, however, hold a portfolio with a greater standard deviation than if they had held the market portfolio. The standard deviation of the monthly return on the market portfolio is 4.81% over our sample period and 5.38% for the portfolio held by foreign investors. (The p-value for the F-test that the variances are equal is 0.1287.) In other words, foreign investors had a portfolio with a higher volatility than the market portfolio without any gain in expected return. This means that the portfolio they were holding was a poor proxy for the market portfolio. Another indication of this is that the R^2 in a regression of the foreign portfolio return on the market portfolio return is 69%. As explained in Section 2, however, investors might have wanted a portfolio that correlates in specific ways with state variables they care about. It is therefore possible that the portfolio they held had these correlations and that the market portfolio did not.

7. Does foreign investment affect expected returns on domestic securities?

The evidence presented in this paper shows that foreign investors increase the demand of some domestic securities relative to other domestic securities. One would expect that this differential demand affects expected returns. In this section, we investigate the relation between expected returns on domestic securities and the holdings of foreign investors. We proceed in the same way as Fama and French (1992) to find out whether foreign ownership is related to the cross-sectional variation in expected returns. Each month, we regress the individual stock returns of that month on foreign ownership. We use our previous timing convention in that we use the end of fiscal year $t-1$ ownership data for 12 months starting with July of year t.

Table 9 provides the average slopes of the monthly regressions with t-statistics obtained from their time-series standard deviation. The average slope for the whole sample is negative but not significant. We also give the average slope obtained from regressions of returns on the log of market value. There is a size effect throughout our sample and it dominates the foreign ownership effect. When we divide the sample in two subperiods, we find that the average slope for foreign ownership is insignificantly positive for the first subperiod and significantly negative for the second subperiod. There is no size effect in the first subperiod but there is a size effect in the second subperiod. When we allow for both an ownership effect and a size effect, the average coefficient on foreign ownership is not significant in the second subperiod and its absolute value falls by almost two-thirds. Our evidence shows that there are some traces of foreign

Table 9
Regression estimates of monthly returns on foreign ownership and market value of equity. Regression coefficients are the time-series average from month-by-month regressions from July 1976 to December 1991, and t-statistics are the average coefficient divided by its time-series standard error. Foreign ownership is measured in fiscal year $t-1$ and market value is measured in June of year t. These values are matched with returns for the months from July of year t to June of year $t+1$. Average t-statistics are in parentheses.

Model	Foreign ownership	Log (market value)
July 1976–December 1991		
(Sample size = 186)		
(1)	−0.0132	
	(−1.48)	
(2)		−0.0025
		(−2.58)
(3)	−0.0010	−0.0025
	(−0.12)	(−2.49)
July 1976–June 1984		
(Sample size = 96)		
(4)	0.0002	
	(0.02)	
(5)		−0.0019
		(−1.47)
(6)	0.0084	−0.0020
	(1.07)	(−1.58)
June 1984–December 1991		
(Sample size = 90)		
(7)	−0.02758	
	(−1.77)	
(8)		−0.0032
		(−2.14)
(9)	−0.0111	−0.0030
	(−0.73)	(−1.92)

ownership in returns. However, this effect seems weak and does not stand up when we allow for a size effect. Although from the perspective of forecasting expected returns it makes sense to allow for a size effect, the fact that foreign investors seem to have greater demand for large-firm stocks may be a helpful clue in understanding why there is a size effect.

8. Conclusion

This paper provides evidence on the distribution of foreign share ownership in Japan from 1975 to 1991. We confirm the existence of a substantial home bias

using a different data source. We show, further, that ownership by foreign investors is consistently and strongly biased against small firms. The cost to foreign investors of overinvesting in large firms is that their return in Japan is more volatile than if they held the Japanese market portfolio. We find that, although foreign investors do not earn a greater return than if they had held the market portfolio, the volatility of their monthly return is 5.38% whereas the volatility of the return of the market portfolio is 4.81%. Models that are consistent with the existence of a home bias are generally inconsistent with our evidence since these models predict that foreign investors either hold the market portfolio of a country or a portfolio with disproportionately more securities that have high expected excess returns. A model in which nonresident investors know more about large firms than small firms in the markets in which they invest (other than their home market country) is one that can produce the cross-sectional patterns of ownership that we document.

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