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INTERNATIONAL DIVERSIFICATION AT HOME AND ABROAD

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### **ABSTRACT**

It is an established fact that investors favor the familiar—be it domestic securities or, within a country, the securities of nearby firms—and avoid investments that would provide the greatest diversification benefits. While we do not rule out familiarity as an important driver of portfolio allocations, we provide new evidence of investors’ international diversification motive. In particular, our analysis of the security-level U.S. equity holdings of foreign and domestic institutional investors indicates that institutional investors reveal a preference for domestic multinationals (MNCs), even after controlling for familiarity factors. We attribute this revealed preference to the desire to obtain “safe” international diversification. We then show that holdings of domestic MNCs are substantial and, after accounting for this home-grown foreign exposure, that the share of “foreign” equities in investors’ portfolios roughly doubles, reducing (but not eliminating) the observed home bias.

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Over the past decade, there has been a surge of research on international portfolio allocation. Theoretical work in this literature often begins by noting the empirical fact that investors underweight foreign securities. For example, Figure 1 depicts a prime motivation in both Stulz (2005) and van Nieuwerberg and Veldkamp (2005), that investors are biased against foreign equities (where bias means that their allocations are less than those given by market-cap weightings). Empirical work in this literature often aims to understand why global investors favor (or neglect) certain countries, where again ‘favor’ is defined relative to a market-cap-weighted allocation. For example, this under-/over-weighting relative to market-cap weights is at the heart of the empirical analysis in Gelos and Wei (2005), Chan, Covrig, and Ng (2005), Dahlquist, Pinkowitz, Stulz, and Williamson (2003), and Ahearne, Grier, and Warnock (2004). All of these papers neglect the potentially important point that investors might obtain substantial international diversification at home.

We utilize a unique security-level dataset to show that if one changes the basis for defining a firm to be ‘foreign’ from the location of the firm’s headquarters to the locations of its operations, the home bias that many papers are predicated on is greatly reduced. Our analysis shows that institutional investors overweight domestic multinationals (MNCs) relative to purely local domestic firms. That is, institutional investors favor precisely the domestic firms that may provide the greatest international diversification benefits.

The finding that investors prefer domestic stocks that provide greater diversification benefits is important because evidence for investors’ diversification motives is scarce. There has been abundant academic evidence that investors favor the

familiar and avoid investments that would provide the greatest diversification benefits. The home bias literature itself owes its origins to the fact that investors overweight the familiar (domestic securities) at the expense of the less known foreign stocks (French and Poterba, 1991). Even within their foreign portfolios—however small those foreign portfolios might be—investors prefer the stocks of foreign countries that are closer (Portes and Rey, 2005) and whose equity markets are *more*, not less, correlated with their own (Chan, Covrig, and Ng, 2005). Within countries, foreign investors prefer large, familiar stocks (Kang and Stulz, 1997; Dahlquist and Robertsson, 2001). Even within their domestic portfolios, investors show a strong preference for the familiar (Coval and Moskowitz, 1999; Grinblatt and Keloharju, 2001; Huberman, 2001) and tend to shun stocks that are less correlated with the rest of their portfolio (Giannetti and Siminov, 2005)—exactly those stocks that would provide the greatest diversification benefits.<sup>1</sup>

In this paper we, too, find ample evidence that investors favor the familiar. Foreign investors overweight large firms, those that trade the most, and those with foreign operations—just the firms one could reasonably expect foreigners to know more about. But more importantly, we also find interesting evidence of the international diversification motive. We find that *domestic* institutional investors show a distinct preference for *domestic* multinationals. One could argue that these MNCs are large, well-known firms, and that this finding is merely more evidence of the important role of familiarity. But even after we control for size, inclusion in a major index (S&P500), tradability of the firm's product, and turnover, the preference for domestic firms that

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<sup>1</sup> Of course, there are good reasons for investing in the familiar. In a Markowitz (1952) world, diversification is optimal, but we do not live in such a world. In an environment of market imperfections investing in the familiar can have its advantages, be it abnormal returns from investing locally (Coval and Moskowitz, 2001) or private benefits to control (Dyck and Zingales, 2004; Nenova, 2003).

have overseas operations remains. Given the potential presence of a discount to corporate international diversification<sup>2</sup> and given that we control for many common familiarity-type variables, this preference for domestic MNCs appears to be evidence of the hard-to-document diversification motive.

The finding of a diversification motive comes from our analysis, as of two points in time (March 2000 and December 1994), of the security-level U.S. equity holdings of domestic institutions (obtained from SEC Form 13-f data) and, for the first time in the literature, foreigners (obtained from comprehensive benchmark surveys). These portfolio regressions then motivate us to rethink how holdings of “foreign” equities are typically calculated, and this leads to the second main contribution of this paper: We show that the home bias puzzle is overstated by quantifying the foreign exposure U.S. investors obtain through the holdings of U.S. MNCs.

The domestic preference for firms that themselves are internationally diversified implies that U.S. investors have substantial claims on cash flows that originate from non-U.S. operations. Reported statistics on international equity positions are not designed to capture these indirect foreign holdings. One way to compute the foreign exposure obtained from holding domestic MNCs is to reconsider the notion of *country* and redefine the term *foreign*. A firm’s country is typically defined by the residence of its corporate headquarters—Procter & Gamble (P&G), because it is headquartered in Cincinnati, is a U.S. firm—but one could also define a firm’s country by the location in which it operates. For many firms, the two definitions would produce identical country attributions. But some firms would be residents of many countries in a way determined by the distribution of their operations around the world. For example, P&G, with about

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<sup>2</sup> See Denis, Denis, and Yost (2002) and, for an alternative view, Bodnar, Tang, and Weintrop (2003).

half of its sales originating from U.S. operations, would still be a primarily U.S. firm, but would also be part Filipino, part Argentinian, and a bit of the other 67 countries in which it operates.<sup>3</sup>

In that vein, one estimate of the dollar value of foreign exposure gained by investing in domestic firms—which we call home-grown foreign exposure—is produced by summing, across each U.S. firm, the product of U.S. investors' holdings of its equity and the percent of its sales that originates from foreign operations. This estimate requires firm-level data on holdings of domestic equities, which we form by subtracting foreigners' holdings (obtained from the same benchmark survey utilized in the first half of the paper) from market capitalization. We calculate the sum to be \$3.5 trillion as of March 2000, which, when added to the \$2 trillion reported in published measures of U.S. investors' holdings of foreign equities, increases the share of “foreign” equities in U.S. investors' equity portfolios to 32%, a sharp increase from the officially reported 12%. Counting foreign holdings in this manner would nearly eliminate the home bias puzzle.

However, \$3.5 trillion likely overstates the dollar value of foreign exposure obtained through these domestic firms and should be considered an upper-bound estimate. Returns are determined primarily in an equity's trading market (Jacquillat and Solnik, 1978; Chan, Hameed, and Lau, 2003; Grammig, Melvin, Schlag, 2003), so from a returns-perspective P&G will look to a large extent like an NYSE-based equity. Thus, the diversification benefit P&G provides U.S. investors is not simply given by the extent of its foreign operations. To account for this, we use an international factor model, similar to that in Griffin (2002), to calculate for each firm the extent to which its

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<sup>3</sup> We distinguish operations (i.e., having production facilities) from exports.

foreign beta varies with the amount of its foreign operations. The factor model suggests that a more refined estimate of home-grown foreign exposure is one half of the \$3.5 trillion. Adding this to direct holdings of foreign equities puts the share of foreign equities in U.S. investors' portfolios at about 21 percent, substantially greater than the traditionally reported 12 percent. Home bias still exists, but it appears to be much less than standard data would suggest.

Moreover, we argue that *foreigners'* preference for U.S. MNCs could also be evidence of the diversification motive, but in another way. While firm-level data on the location of foreign operations is not available to us,<sup>4</sup> aggregate data indicates that foreign equity investors reside predominantly in industrial countries, whereas U.S. firms' foreign operations are disproportionately in emerging markets. Here, because of data limitations, we are reduced to conjecture, but foreigners' preference for U.S. multinationals could indicate a desire for "safe" diversification in risky markets.

One way to view our paper is as the completion of the important story begun in Errunza, Hogan, and Hung (1999).<sup>5</sup> Errunza et al. showed that it is possible to obtain substantial international diversification at home. By analyzing actual portfolio holdings, we are able to show that the types of firms Errunza et al. had in mind are preferred by domestic investors, indicating that in practice the home-grown foreign exposure is substantial. Errunza et al. suggested that the home bias might be overestimated; we complete the story by showing that it is.

The paper proceeds as follows. The next section describes the data sets on foreign and U.S. institutional holdings of U.S. equities and shows that both foreigners

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<sup>4</sup> Access to detailed firm-level data on U.S. companies' foreign operations is limited to employees of the Bureau of Economic Analysis.

<sup>5</sup> See, also, Rowland and Tesar (2004).

and domestic institutions reveal a preference for global firms. Section II then quantifies the home-grown foreign exposure that investors obtain through holdings of domestic equities. Section III concludes.

## **I. The Preferences of Domestic Institutions and Foreigners**

In this section we analyze the preferences of domestic institutions and foreigners as they are revealed in the composition of their U.S. equity portfolios. Similar to the Dahlquist and Robertsson (2001) study of Swedish equities, this analysis can be seen as encompassing country-level studies of foreigners' holdings—such as the investigations of foreigners' positions in Japan (Kang and Stulz, 1997) and Finland (Grinblatt and Keloharju, 2001)—and studies of the preferences of domestic institutions (Falkenstein, 1996; Gompers and Metrick, 2000).

### *A. Dependent Variables and Sample Selection*

Following Gompers and Metrick (2000) and Falkenstein (1996), we define ownership as holdings divided by market capitalization as of the dates of the two benchmark surveys, end-March 2000 and end-December 1994. Specifically, let subscript  $i$  denote a U.S. firm and superscript  $F$  or  $I$  denote foreign or institutional investors. Define  $Own_i^F$  as the dollar amount of foreigners' holdings of firm  $i$ 's equity ( $H_i^F$ ) divided by firm  $i$ 's market capitalization ( $MCap_i$ ):

$$Own_i^F = \frac{H_i^F}{MCap_i} . \quad (1)$$

Ownership by domestic institutional investors,  $Own_i^I$ , is similarly defined. In a cross-sectional study such as ours, variations in these ownership measures are observationally



equivalent to variations in deviations from a market-capitalization-weighted portfolio. For example, let foreigners' deviations from a market-capitalization-weighted U.S. equity portfolio,  $\omega_i^F$ , be defined as follows:

$$\omega_i^F = \frac{H_i^F / H^F}{MCap_i / MCap_w} \quad (2)$$

where  $H^F$  and  $MCap_w$  are foreigners' total equity holdings and world market capitalization, respectively. For each firm  $i$ ,  $\omega_i^F$  is just  $Own_i^F$  divided by a constant,  $H^F / MCap_w$ . Thus, our regressions can be interpreted as identifying factors associated with deviations from a market-capitalization-weighted benchmark such as the international CAPM.

Data on foreigners' holdings of U.S. stocks are from comprehensive benchmark surveys conducted by the U.S. Treasury Department and the Federal Reserve System as of December 1994 and March 2000. The data are confidential and are collected from two types of reporters: issuers of securities and, because issuers typically do not have information on the ultimate owner of their securities, U.S. custodians that manage the safekeeping of U.S. securities for foreigners. Custodians—primarily banks but also some broker-dealers—are the main source of information, reporting 87 percent of the market value of foreign holdings of U.S. long-term securities measured on the 2000 survey; all U.S. custodians that held at least \$20 million in U.S. securities for foreigners were required to submit survey data. Reporting on the survey is mandatory, and penalties may be imposed for noncompliance. Because most U.S. securities are in the

possession of U.S. custodians for safekeeping and all significant U.S. custodians were included in the surveys, the survey data are the most comprehensive available.<sup>6</sup>

For data on the holdings of domestic institutional investors—banks, brokers, insurance companies, mutual funds, and pensions—we rely on the Spectrum database. The Spectrum data are compiled from SEC 13-F filings, which institutions with greater than \$100 million of securities under discretionary management are required to submit. The 13-F filings are quarterly; we use data on the two quarters that correspond with our survey data of foreigners' holdings, fourth quarter 1994 and first quarter 2000. Gompers and Metrick (2001), among others, have analyzed the 13-F data and provide a complete description.

To be included in our study, we require a firm to be listed on NYSE, Amex, or Nasdaq and have market capitalization data in CRSP as of a survey date. That leaves us with 5,980 firms for 2000 and 5,533 firms for 1994. To guard against data errors, we further require that the market capitalization from CRSP differ by no more than 20 percent from data provided through the benchmark survey, when available. That

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<sup>6</sup> The surveys provide high quality, security-level data, but they have two drawbacks. First, the data collection technique does not permit identification of the type of foreign investor beyond whether the investor is a government or a private entity. Since governments do not typically hold other countries' equities, we can assume the foreign holdings in our sample are those of private investors. Moreover, it is likely that the representative foreign investor is an institution, but there is no concrete evidence supporting this. Second, the country attribution of foreign investment in U.S. securities is far from perfect, precluding an analysis of, say, Germans' investment patterns in U.S. equities. The distortion in country attribution in the survey is caused by instances in which multiple custodians are involved in the safekeeping of a security. For example, a resident of Germany may buy a U.S. security and place this security in the custody of a Swiss bank. To facilitate settlement and custody operations, the Swiss bank will then normally employ a U.S.-resident custodian bank to act as its foreign subcustodian for this security. When portfolio surveys are conducted, the legal authority to collect information extends only to U.S.-resident entities. The U.S. resident bank acting as the subcustodian of the Swiss bank will report this security on the survey, but this U.S. bank will typically know only that it is holding this security on behalf of a Swiss bank and will report this security as Swiss- held. Because of this custodial center bias, we do not use information on the residence of the foreign investor in our empirical work. A detailed description of the methodology, as well as results from the latest survey, is in Treasury Department et al. (2002), available at [www.treas.gov/tic/fpis.html](http://www.treas.gov/tic/fpis.html). For a primer on the surveys, see Grierer, Lee, and Warnock (2001).

eliminated 163 firms in 2000 and 220 in 1994.<sup>7</sup> Foreign and institutional ownership that in sum exceeds 100 percent of the outstanding shares indicates a data error; this criterion eliminates no firms in 2000 and 67 in 1994. In multivariate regressions, we use data on firm characteristics from CompuStat, which reduces our sample to 5,330 firms in 2000 and 4,690 in 1994, comparable to the 5,199 firms in the end-1996 sample in Gompers and Metrick (2001). We then gather data on the amount of a firm's sales that originates from foreign operations from Worldscope, because it has greater coverage for this variable than Compustat's Geography file; including foreign sales reduces our sample by 787 firms in 2000 and 1,907 firms in 1994.<sup>8</sup> Our final working samples in the years 2000 and 1994 are 4,543 and 2,783, respectively.

### *B. Explanatory Variables*

We focus on one variable, *Foreign Sales*, the percent of a firm's sales that are derived from foreign operations. In general, but especially for domestic investors, this variable captures any preference for multinationals. From the perspective of foreigners, *Foreign Sales* might also proxy for information or familiarity; foreigners likely have better quality information about, or are more familiar with, the "nearby" U.S. firms with foreign operations.

We incorporate many "familiarity" variables that should help explain the holdings of domestic institutional investors and foreigners. These familiarity variables include:

***Size:*** log market capitalization as of the survey date (March 2000 or December 1994);

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<sup>7</sup> To assist in the editing of the benchmark surveys, the U.S. government purchases vendor data on prices, shares outstanding, and market capitalization. Not every record contains this information, however, so we cannot make this comparison with CRSP for every security.

<sup>8</sup> Our results do not hinge on whether we treat firms that have no foreign sales data as having zero foreign sales, or discarding them, as we do in our regression analysis.

***S&P 500***: an indicator variable set equal to one if the equity is in the S&P 500 index;

***Turnover***: the value of trading over the previous 12 months over market capitalization;

***Tradable***: an indicator variable set equal to one if the firm has any exports.

The familiarity roles of *Size*, *S&P 500*, and *Turnover* should be clear. Larger firms, those in a major index, and those that are traded more often are more familiar to investors. *Tradable*, in the spirit of Coval and Moskowitz (1999), also proxies for familiarity; in the simplest sense, if its product can travel, the firm is familiar to more people. One should note the distinction between *Foreign Sales*, which refers to foreign operations, and *Tradable*, which refers to the exports stemming from U.S.-based production. Of the 4543 firms in our main regressions, 1851 have foreign operations (i.e., have a positive value for *Foreign Sales*); of those, only 377 also export from U.S.-based operations (i.e., have a value of one for *Tradable*). To describe the distinction another way, *Foreign Sales* concerns where the firm's production is located, while *Tradable* concerns whether its product crosses national borders.

We also include other control variables that regularly appear in the empirical literature on the equity holdings of domestic institutions and foreigners. Kang and Stulz (1997) and Dahlquist and Robertsson (2001) provide a short list of factors that foreigners might prefer. The studies of Falkenstein (1996) and Gompers and Metrick (2001) provide factors that influence the composition of domestic institutions' investments in U.S. equities. Similar to these studies, we include the following variables:<sup>9</sup>

***Dividend Yield***: dividend per share over the year-end market price;

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<sup>9</sup> All explanatory variables are from CompuStat, with the exception of *Foreign Sales* and *Tradable*, which are from Worldscope, and returns-based variables, which are computed from CRSP data on returns.

***Book-to-market***: the book value per share over the year-end market price;

***Momentum***: cumulative monthly returns over the preceding one-year period;

***Leverage***: the ratio of total debt to total equity;

***Beta***: the systematic risk of a stock;

***Volatility***: the standard deviation of the residual.<sup>10</sup>

The control variables are intended to capture a range of investor preferences. Prudential considerations might prompt some institutions to prefer firms that pay dividends and have low volatility (Del Guercio, 1996). Investors who prefer growth firms might show an affinity for stocks with low dividends (as revenues are plowed back into the firm) or low book-to-market. The predicted sign of *Beta* is ambiguous; Kang and Stulz (1997) note that, in the presence of proportional barriers to investment, foreigners should hold high beta stocks, but such barriers should not pertain to the U.S. market. *Momentum* will provide an indication of whether investors can be characterized as momentum traders. *Leverage* is included as a measure of long-term financial health.

### *C. Empirical Results*

Summary statistics for all variables are presented in Table I. In our full sample of 4,543 firms, the median firm is a growth firm (book-to-market of 0.49) that pays no dividends, is not in the S&P 500, has 4 percent foreign ownership and 29 percent of its shares held by U.S. institutions, and does not produce a tradable good or have foreign

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<sup>10</sup> Beta and volatility are computed from a market model that is estimated using monthly returns over the preceding four-year period.

operations.<sup>11</sup> It also has a market capitalization of \$171 million ( $= e^{5.14}$ ), a turnover rate of 0.86, and liabilities that are 115 percent of its equity. In the slightly smaller samples (due to data availability), the median firm had 12-month returns of 5 percent with a beta and residual variance (calculated over a 48-month period) of 0.84 and 0.14, respectively.

Simple bivariate correlations are presented in Table II. The first two columns indicate that  $Own_i^F$  and  $Own_i^I$  are both positively related to size, liquidity, S&P inclusion, beta, and foreign sales, and negatively related to book-to-market and leverage. In contrast, they differ in their relations to volatility, dividends, tradable, and momentum; foreign holdings are greater in firms with higher volatility, lower dividends, and greater past returns, whereas domestic institutional ownership is greater in firms that paid higher dividends and had less volatile returns (consistent with the prudential considerations of Del Guercio (1996)), but is unrelated to past returns. While the simple correlations in Table II suggest that domestic institutions shy away from firms that produce a tradable good, we caution against reading too much into these bivariate relationships.

Table III shows our multivariate regressions of ownership by foreign investors (left panels) and domestic institutional investors (right panels) for our samples in 2000 and 1994. Because preferences can change over time—for example, at times investors might prefer growth stocks, at other times value stocks—we denote with bold coefficients that are significant in all four regressions for a particular type of investor. We first report results of regressions that include a parsimonious set of variables and

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<sup>11</sup> Note that, while the minimum investment by foreigners or institutional investors rounds to zero percent, there are only 8 firms in our sample for which foreign or institutional holdings are truly zero.

maximum sample size (4,543 firms in columns 1 and 5) before adding CRSP returns variables with less coverage. In some cases, the preferences revealed by these regressions change across samples. For example, for foreigners, S&P500 is not in bold because, controlling for size and the other listed factors, foreigners showed a preference for S&P 500 firms in 2000 but not in 1994. However, some characteristics come through strongly in all regressions for a type of investor. For example, the regressions reveal a preference by foreign investors for high-growth, high-risk U.S. firms about which they have sufficient information; specifically, they prefer U.S. firms that are large, liquid, pay low dividends, have volatile returns, and have high foreign sales. The right-panel regressions show that domestic institutional investors show consistent preferences for firms that are large, not in the S&P 500, and have high book-to-market, less volatile returns (perhaps for prudential reasons), and high foreign sales.<sup>12</sup>

Our regressions indicate a common preference for internationally diversified firms,<sup>13</sup> which extends results from the Dahlquist and Robertsson (2001) study of Swedish equities, in which size was the only common preference. We note, however, that while both *Foreign Sales* and *Size* are statistically significant in all specifications, their economic impacts are markedly different for foreign and domestic institutional investors. Table IV shows the impact on ownership of a move from each characteristic's 25<sup>th</sup> percentile value to its 75<sup>th</sup> percentile value. All entries in the table are the percentage point change in ownership expressed as a share of median ownership. The economic importance of size is very large on both foreign and domestic

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<sup>12</sup> The unconditional correlations in Table 3 show that domestic institutional investors' holdings are indeed positively related to S&P inclusion. Table 4 shows, however, that after controlling for size there is no evidence of a positive index inclusion effect.

<sup>13</sup> This does not necessarily mean that *all* other groups of investors show a significant aversion to firms with high foreign sales. We cannot say much about the positions of other investors because they are a diverse group consisting of, among others, individuals, insiders, and hedge funds.

institutional ownership. Moving from the 25<sup>th</sup> percentile of size to the 75<sup>th</sup> percentile increases foreign ownership by 23 percent (of median foreign ownership) and domestic institutional ownership by 84 percent of median. In contrast, the economic importance of foreign sales is much larger for foreign investors (15 percent as compared to 3 percent).

Finally, we note that domestic investors' preference for MNCs, even after controlling for size and many other characteristics, could be considered surprising, especially given the many papers that conclude that corporate international diversification is value-destroying.<sup>14</sup> But it is consistent with a "safe diversification" hypothesis. Specifically, investors might prefer to obtain foreign exposure through firms from countries with strong shareholder protections (in this case, the United States). For example, the large institutional investor, CalPERS, will not invest in Universal Robina, because shareholder protections in the Philippines are not strong enough for it to make its permissible country list. But CalPERS obtains at least some exposure to the Philippine market through its \$600 million of holdings in P&G equity. Foreign investors could also be driven by this motive. In particular, to some extent, foreign investment in the equity of U.S. firms originates in different countries from those that have U.S. firms' foreign operations, suggesting that foreigners might hold multinationals to get exposure to other foreign markets. Specifically, Table V, which shows the country distributions of holdings of U.S. equities by foreign investors and U.S. direct investment abroad, indicates that a disproportionate amount of U.S. firms' foreign activity is in emerging markets (21 percent, compared to emerging market holdings of U.S. equities of only 6 percent). Foreign exposure through multinationals

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<sup>14</sup> See, for example, Denis, Denis, and Yost (2002). The surveys of Fatemi (1984) and Bodnar, Tang, and Weintrop (2003) indicate that this is the subject of considerable debate.



could be preferred to direct foreign holdings if investor protection regulations are weak or weakly enforced in some countries, as suggested by the work of La Porta et al. (2000).

In the next section we estimate the extent to which reported data on foreign equity holdings should be modified to take into account “safe diversification” or, more generally, home-grown foreign exposure.

## **II. Home-Grown Foreign Exposure and the Home Bias**

Graphs like Figure 1 are often used to motivate home bias studies. Such figures, however, do not take into account how much international diversification is obtained through domestic investors’ holdings of domestic multinationals. In this section, we quantify the home-grown foreign exposure by first showing that the foreign exposure that a domestic firm provides U.S. investors increases with the share of its sales that originates abroad, and then calculating the dollar amount of home-grown foreign exposure. The end result from this section is a redrawing of the typical home bias graph—a redrawing that shows that the home bias puzzle is overstated.

### *A. The Exposure of Domestic Firms to Foreign Equity Markets*

Recent evidence indicates that a security’s returns are determined primarily by the market in which the security trades, rather than by the location of the firm’s operations (Chan, Hameed, and Lau, 2003; Grammig, Melvin, Schlag, 2003). In light of this, it is conceivable that firms with more extensive foreign operations do not provide investors with greater international diversification benefits. In this subsection, to ascertain the extent to which foreign factors influence the returns of U.S. equities, we

first calculate each firm's foreign beta by estimating an international market model and then show how foreign betas vary with foreign sales.

To compute firm  $i$ 's foreign beta ( $\beta_{i,F}$ ), we follow Griffin (2002) and estimate an international market model with two components, a U.S. factor and a foreign factor. Specifically, for each stock in our sample, we estimate the following international market model, using 48 months (April 1996 to March 2000) of returns data:<sup>15</sup>

$$r_{i,t} = a_i + \beta_{i,US} r_{US,t} + \beta_{i,F} r_{F,t} + \varepsilon_{i,t} \quad (3)$$

where  $r_i$  is firm  $i$ 's stock returns,  $r_{US}$  is the return on a CRSP value-weighted U.S. equity portfolio,  $r_F$  is the return on a foreign equity portfolio, and  $\beta_{i,US}$  is firm  $i$ 's domestic beta.

A crucial choice in this analysis is the weighting scheme for the foreign factor. The easiest weighting scheme would be derived from data on market capitalizations, enabling the use of a readily available equity index such as the MSCI World ex US. However, this choice is inappropriate for a particular firm if the distribution of its foreign operations across countries differs greatly from the distribution of world equity market capitalization. A better weighting scheme would be derived from firm-specific information, perhaps on the distribution of the firm's foreign sales across countries. For example, consider a U.S. firm that has substantial exposure to Latin America. Professional investors know this and purchase its equity as one way to obtain this exposure. In this case, a conventional foreign equity index, such as the MSCI World ex US, which has a weighting on Latin America of 2 to 3 percent, would not likely uncover the foreign exposure obtained through this firm. Because firm-level data on the distribution of operations across foreign countries are not available to us, we rely on the next best alternative, industry-specific trade weights developed in Goldberg (2004). As

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<sup>15</sup> To be included in this regression, the firm must have at least 36 months of returns data. Our results are similar if we restrict this regression to firms that have returns data for all 48 months.

shown in the appendix, these industry-specific weights differ from MSCI weights but should more accurately represent the countries in which the firm conducts business.<sup>16</sup>

Table VI (Panel A) presents average results from the international market model estimates for the full sample of firms as well as four portfolios sorted by the extent of foreign sales. The table shows that, across all firms for which data on foreign sales and at least three years of returns are available, the average domestic beta (0.757) is much larger than the average foreign beta (0.215), confirming that the returns of these U.S. firms owe predominantly to U.S. factors. The importance of the foreign factor, however, increases with foreign sales: the average foreign beta for firms with no foreign sales is only 0.142, but it increases to 0.322 for firms with 25 to 50 percent foreign sales, and is 0.468 for firms with sales that originate primarily in foreign countries. In contrast, there is no apparent relationship between domestic betas and foreign sales.

To form an estimate of the dollar value of home-grown foreign exposure, we require an estimate of the relationship between foreign sales and foreign beta. To obtain this estimate we use weighted least squares, with weights that are the inverse of the standard error of each  $\hat{\beta}_{i,F}$ , to estimate the following model:

$$\hat{\beta}_{i,F} = \kappa + \gamma_{FS} ForeignSales_i + \zeta_i \quad (4)$$

The coefficient estimate of  $\gamma_{FS}$  of 0.490 (Panel B) indicates that firms with 10 percent greater foreign sales have foreign betas that are 0.049 higher, consistent with the results

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<sup>16</sup> See the appendix for further details on the industry-specific trade weights, which have been used by others to form trade-weighted exchange rates that have been applied to studies of the effect of exchange rates on corporate profits (Goldberg, 2004) and of firms' exchange rate exposure (Ihrig and Prior, 2003). For our purposes, weights of foreign operations might be preferable, but we cannot use BEA's publicly available data on U.S. firms' operations by country by industry because in many cases it is withheld for disclosure reasons. The ideal weighting scheme would be the proportion of *market value* represented by the MNC's non-U.S. operations and sales (Agmon and Lessard, 1977). But firms do not regularly report profits and losses by location, so such a measure is not knowable to a researcher. Our adjustment factor is consistent with estimates from the Brooks and del Negro (2004) factor model.

in Panel A. As a robustness check—and because in the next subsection we will apply our estimate of  $\gamma_{FS}$  to calculate the “foreign” holdings multinationals provide—we investigate whether this result owes to a difference between firms with no foreign sales and those with some foreign sales. It does not; the coefficient ( $\gamma_{FS}=0.533$ ) is very similar for firms with positive foreign sales.

Our estimate of  $\gamma_{FS}$  in Panel B comes from a two-step approach that utilizes generated regressors (the  $\hat{\beta}_{i,F}$ ) in the second step. To the extent that the first step does not produce estimates that are independent across firms, the standard errors in (4) might be biased. A one-step approach alleviates this issue. Specifically, in Panel C we present results from a pooled fixed-effects panel model that encompasses both (2) and (4):

$$r_{i,t} = a_i + \beta_{i,US} r_{US,t} + (\beta_{0,F} + \beta_{1,F} ForeignSales_i) r_{F,t} + \eta_{i,t} \quad (5)$$

We restrict estimation to include only those firms for which Foreign Sales is positive, because these are the relevant firms for our calculations of home-grown foreign exposure. The coefficient on what becomes an interaction term of Foreign Sales and  $r_F$  is positive and highly significant, indicating that as in Panel A and B, as foreign sales increases, so does the foreign beta.<sup>17</sup> Moreover, the magnitude of the coefficient ( $\beta_{1,F}=0.46$ ) is nearly identical to the estimate of  $\gamma_{FS}$  in Panel B.

Overall, the results in Table VI indicate that investors do obtain increased international diversification benefits through U.S. firms that themselves are internationally diversified. A firm’s returns depend primarily on the local market, as in (Chan, Hameed, and Lau, 2003; Grammig, Melvin, Schlag, 2003), so there is not a one-

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<sup>17</sup> The results for the full sample are nearly identical.

to-one relationship between foreign sales and foreign exposure, but home-grown foreign exposure is substantial: Our regressions in Panels B and C indicate that, for every one percentage point of foreign sales, the firm's foreign beta increases about a half of that.<sup>18</sup> We use this estimate in the next subsection to quantify the dollar amount of home-grown foreign exposure.

### *B. The Dollar Value of Home-Grown Foreign Exposure*

We estimate the dollar value of home-grown foreign exposure by weighting the dollar value of *all* U.S. investors' holdings of U.S. equities by the percent of each firm's sales that originate from foreign operations. Because data on all U.S. investors' holdings of individual U.S. equities does not exist, we form it by subtracting from firm *i*'s market capitalization the amount held by foreigners.

We start by biasing our estimate downward; for the firms in our sample that do not have foreign sales data in Worldscope and for all firms not in our sample, we assume zero foreign sales. After subtracting foreign holdings from firm market capitalization to get U.S. holdings, we weight U.S. holdings of U.S.-based firms by the degree of internationalization—the percent of each firm's sales that originates from foreign operations—to get an upper-bound estimate of home-grown foreign exposure of \$3,531 billion in March 2000 (Table VII). The models in Table VI showed, however, that foreign exposure does not increase one-for-one with foreign sales. Thus, we form model-based estimates by multiplying domestic holdings not by the weight of foreign sales, but by foreign sales times  $\hat{\gamma}_{FS}$ , which from equations (4) and (5) is roughly 0.5 for firms with positive foreign sales. Our model-based estimates of the dollar value of

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<sup>18</sup> Our adjustment factor is consistent with the results in Brooks and del Negro (2004).

home-grown foreign exposure are therefore 0.5 times our upper-bound estimate, or \$1,766 billion.<sup>19</sup>

To gauge the importance of this magnitude, we also show in Table VII the dollar value of U.S. investors' direct exposure to foreign equities. An upper-bound estimate of this is the amount of foreign equities held by U.S. investors (\$2,074 billion). But, as with U.S. equities, the returns of some of those foreign equities will owe to U.S. factors and thus provide less than complete diversification benefits to U.S. investors. A lower-bound estimate of the direct foreign exposure, formed by subtracting all of the foreign firm's market capitalization attributable to foreign sales, is \$1,343 billion.<sup>20</sup> Applying what we have learned from our model-based estimates of equations (4) and (5), more refined estimates would put direct foreign exposure at \$1,891 billion, which assumes that 50 percent of the foreign sales of foreign firms originates in the United States and that foreign firms have the same  $\hat{\gamma}_{FS}$  of 0.5 that U.S. firms have (i.e., returns are predominately determined in their home market).

At roughly \$1.9 trillion, foreign exposure through foreign equities (direct foreign exposure) represents 11 percent of U.S. investors' equity portfolios. The international diversification that U.S. investors gain through their holdings of U.S. multinationals is comparable; including home-grown foreign exposure of \$1,766 billion increases the foreign component of U.S. equity portfolios to 21 percent.

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<sup>19</sup> As a check of the reasonableness of our estimates, note that the Bureau of Economic Analysis estimate of the market value of U.S. firms' foreign operations (\$2,817 billion) lies between our upper-bound estimate and our best guess of home-grown foreign exposure.

<sup>20</sup> This lower-bound estimate of direct foreign exposure is derived as follows. Data from Ammer, Holland, Smith, and Warnock (2004) indicate that U.S. holdings of foreign equities weighted by foreign sales anywhere (not just in the United States) totaled about \$360 billion in 1997, or 35 percent of overall foreign holdings. If *all* of those sales were in the United States and the 35 percent rule still applied in 2000, \$731 billion would be an appropriate estimate of the amount of U.S. investors' direct foreign holdings that owed to operations in the United States.

To obtain a time series representation of this adjustment, as well as ascertain its implications for the home bias of other countries, we can apply estimates that are consistent with the analysis in this section to published direct investment data.<sup>21</sup> Bureau of Economic Analysis (BEA) data on foreign direct investment put the market value of U.S. firms' foreign operations at \$2.8 trillion as of end-1999; omitting foreigners' holdings of U.S. multinationals and allowing for the fact that the returns of U.S. multinationals are primarily determined by domestic forces brought our model-based estimate of home-grown foreign exposure to roughly half that. Thus to extrapolate our findings to other years, we add one half of reported direct investment stocks to reported foreign holdings. We also adjust reported equity holdings downward by 10 percent, because investors hold some foreign firms that have a substantial presence in the domestic economy.

These adjustments produce the thin solid lines in Figures 2 and 3, which lie well above the previously reported holdings (dashed lines). Including home-grown foreign exposure greatly reduces, but does not eliminate, the home bias puzzle.

### **III. Conclusion**

We analyze portfolios of U.S. equities and find that *foreigners* prefer large, liquid, internationally oriented firms, consistent with previous studies. Interestingly, we find that *domestic institutions* also have strong preferences for large, internationally diversified firms. We interpret the preference for domestic MNCs—which holds even

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<sup>21</sup>Data availability precludes a rigorous study of the home-grown foreign exposure obtained by investors from other countries. Returns data are available across a wide range of non-U.S. firms, so it is possible to estimate an international factor model. But, to our knowledge, security-level data on domestic investors' holdings of domestic equities are available for only a handful of countries (and even those are not available to most researchers).

after controlling for size, turnover, inclusion in a major index, and other indicators of familiarity—as evidence of the hard-to-document diversification motive.

The preference for domestic MNCs implies that U.S. investors obtain substantial international diversification through their holdings of U.S. multinationals. This is confirmed using an international factor model that indicates that, while U.S. factors are most important for the returns of U.S. firms, the influence of foreign factors increases with the extent of the firm's foreign sales. We use the relationship between foreign sales and foreign beta to inform our estimate of the dollar value of home-grown foreign exposure, the foreign exposure U.S. investors obtain by holding U.S. equities. The amount of home-grown foreign exposure is comparable (in dollar value) to direct foreign exposure (through holding foreign equities), implying that the international diversification of U.S. investors has been substantially underestimated.

It must be noted that, while our results suggest that typical measures overestimate the extent of home bias, even with our adjustments a substantial underweighting of foreign equities remains. We suspect this owes primarily to the lack of investor protection regulations in many countries and the fact that the typical shareholder in many countries is a large insider (La Porta et al., 1999). Foreigners' investment in U.S. equities is not restricted by U.S. laws, but because the typical non-U.S. country does not have an established class of equity shareholders, foreign investment in the United States is limited. Similarly, U.S. investors might fear investing in countries where the rules are not designed to protect outside shareholders. Thus, if investor protection regulations are strengthened and more countries develop a class of equity shareholders, the home bias would likely decrease in both directions.



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## Appendix: Notes on industry-specific returns

Our industry-specific returns use the industry weights developed in Goldberg (2004). For U.S. industries—20 two-digit manufacturing SIC codes and 10 nonmanufacturing groupings (Business Services, Construction, Educational Services, Film and Tape Rental, Financial Services, Legal Services, Insurance, Passenger Fares, Installation and Repair Services, and Telecommunications)—Goldberg (2004) provides the weight of each foreign country in each sector’s international trade and uses these time-varying weights to construct trade-weighted exchange rate indices.

We use the industry weights to construct equity indices. The weights for selected industries’ trade with the Euro area, Japan, emerging Asia, and Latin America are given in the following table, as are correlations of returns formed using the industry trade weights and MSCI returns:

Selected Industry (SIC)	1996 Weights (%)				Returns Correlation	
	Euro area	Japan	Emerging Asia	Latin America	w/ MSCI World exUS	w/ MSCI US
Tobacco (21)	31	23	9	8	0.95	0.75
Chemicals (28)	28	11	14	12	0.92	0.79
Apparel (23)	8	10	37	30	0.74	0.71
Leather (31)	16	7	48	16	0.66	0.67

memo:

MSCI World exUS	20	35	12	3
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Note: For illustration purposes, weights shown are as of December 1996. Correlations are computed using monthly returns for the period January 1995 - December 2000. To conserve space, we do not present the weights and correlations for the other 26 industries.

For each industry, the country weights based on international trade differ from the country weights in the MSCI World ex US index. However, as the table shows, some have a similar mix between developed and emerging markets. For example, the first two industries listed—Tobacco and Chemicals—are heavily weighted toward the Euro area and Japan, as is the MSCI index. Not surprisingly, equity indices computed using country weights for these two industries are highly correlated (0.95 and 0.92, respectively) with the MSCI World ex US index. (For completeness, we also include the correlation with the MSCI US index.) In contrast, Apparel and Leather are heavily weighted toward the emerging markets; as expected, their correlations with the MSCI World ex US are somewhat lower.

**Table I: Basic Summary Statistics**

The sample size for all variables is 4,543, with the exception of Beta and Volatility (N=3,742). Own<sup>F</sup> and Own<sup>I</sup> are foreign holdings and U.S. institutional holdings, respectively, divided by market capitalization. Size is the log of market capitalization. Turnover is the average of twelve months of shares traded divided by beginning of month shares outstanding. S&P is equal to one if the stock is in the S&P 500 index, zero otherwise. Book-to-market is book value over market value. Yield is dividends paid over a one-year period over beginning of period price. Leverage is total liabilities divided by total equity. Momentum is the cumulative returns over the preceding year. Foreign Sales is the proportion of the firm's sales that are abroad. Tradable is equal to one if the firm exports its product, zero otherwise. Beta and Volatility are the systematic risk and residual variance from a market model calculated with monthly data for a four-year period. Book-to-market, dividend yield, leverage, and turnover are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. The value of each variable at its 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles are presented in the columns labeled 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup>. Data are for 2000; statistics for 1994 are available upon request.

<b>Variable</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>Min</b>	<b>25<sup>th</sup></b>	<b>50<sup>th</sup></b>	<b>75<sup>th</sup></b>	<b>Max</b>
Own <sup>F</sup>	0.052	0.060	0.00	0.01	0.04	0.07	0.79
Own <sup>I</sup>	0.331	0.250	0.00	0.11	0.29	0.53	0.96
Size	5.31	2.01	0.67	3.77	5.14	6.62	13.2
Turnover	1.53	1.77	0.01	0.42	0.86	1.87	9.48
S&P 500	0.076	0.266	0	0	0	0	1
Book-to-Market	0.740	1.03	-0.76	0.17	0.49	0.93	7.21
Yield	0.009	0.016	0	0.00	0.00	0.01	0.08
Leverage	2.74	4.72	-9.93	0.45	1.15	2.74	24.2
Momentum	0.674	2.04	-0.93	-0.23	0.05	0.72	34.2
Foreign Sales	0.124	0.204	0	0.00	0.00	0.20	1
Tradable	0.164	0.370	0	0	0	0	1
Beta	0.908	0.686	-4.14	0.46	0.84	1.27	6.27
Volatility	0.162	0.104	0.033	0.09	0.14	0.20	1.353

**Table II: Cross Sectional Correlations**

The table shows the March 2000 cross-sectional correlation between ownership and firm characteristics and for all pairs of these characteristics. P-values for the correlation coefficients are italics. Definitions are provided in Table I.

	Own <sup>F</sup>	Own <sup>I</sup>	Size	Turnover	S&P	Beta	Vol	BM	Yield	Lev	Momentum	For. Sales
Own <sup>I</sup>	0.118 <i>0.000</i>											
Size	0.190 <i>0.000</i>	0.626 <i>0.000</i>										
Turnover	0.327 <i>0.000</i>	0.041 <i>0.017</i>	0.202 <i>0.000</i>									
S&P	0.125 <i>0.000</i>	0.333 <i>0.000</i>	0.550 <i>0.000</i>	-0.031 <i>0.022</i>								
Beta	0.184 <i>0.000</i>	0.215 <i>0.000</i>	0.451 <i>0.000</i>	0.470 <i>0.000</i>	0.181 <i>0.000</i>							
Volatility	0.091 <i>0.000</i>	-0.260 <i>0.000</i>	-0.182 <i>0.000</i>	0.299 <i>0.000</i>	-0.097 <i>0.000</i>	0.077 <i>0.000</i>						
Book-to-Market	-0.082 <i>0.000</i>	-0.153 <i>0.000</i>	-0.288 <i>0.000</i>	-0.094 <i>0.000</i>	-0.101 <i>0.000</i>	-0.157 <i>0.000</i>	0.005 <i>0.688</i>					
Yield	-0.153 <i>0.000</i>	0.033 <i>0.015</i>	0.063 <i>0.000</i>	-0.226 <i>0.000</i>	0.120 <i>0.000</i>	-0.147 <i>0.000</i>	-0.143 <i>0.000</i>	0.161 <i>0.000</i>				
Leverage	-0.053 <i>0.000</i>	-0.049 <i>0.000</i>	-0.031 <i>0.022</i>	-0.060 <i>0.000</i>	0.015 <i>0.274</i>	-0.046 <i>0.001</i>	-0.041 <i>0.002</i>	0.028 <i>0.040</i>	0.084 <i>0.000</i>			
Momentum	0.141 <i>0.000</i>	0.003 <i>0.826</i>	0.167 <i>0.000</i>	0.320 <i>0.000</i>	-0.040 <i>0.003</i>	0.160 <i>0.000</i>	0.187 <i>0.000</i>	-0.149 <i>0.000</i>	-0.151 <i>0.000</i>	-0.072 <i>0.000</i>		
Foreign Sales	0.208 <i>0.000</i>	0.260 <i>0.000</i>	0.288 <i>0.000</i>	0.093 <i>0.000</i>	0.175 <i>0.000</i>	0.142 <i>0.000</i>	-0.035 <i>0.017</i>	-0.089 <i>0.000</i>	-0.086 <i>0.000</i>	-0.067 <i>0.000</i>	0.124 <i>0.000</i>	
Tradable	0.011 <i>0.429</i>	-0.030 <i>0.029</i>	-0.070 <i>0.000</i>	0.084 <i>0.000</i>	-0.045 <i>0.001</i>	0.055 <i>0.000</i>	0.123 <i>0.000</i>	-0.018 <i>0.202</i>	-0.093 <i>0.000</i>	-0.133 <i>0.000</i>	0.116 <i>0.000</i>	0.059 <i>0.000</i>

**Table III: Determinants of Foreign and Institutional Ownership**

Table III presents regression results where the dependent variable is the share of security  $i$  held by foreigners (columns 1 - 4) or by domestic institutions (columns 5 - 8) as of March 2000 or December 1994. Reported are parameter estimates, with p-values computed from robust standard errors in parentheses. Bold type indicates estimates that, for a type of investor, are significant at the 10 percent level and the same sign in all four specifications. Industry dummies corresponding to the Campbell (1996) grouping are included but not reported. See Table I for definitions of explanatory variables.

	Foreign Ownership				Institutional Ownership			
	2000		1994		2000		1994	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Size	<b>0.0022</b> <b>(0.000)</b>	<b>0.0038</b> <b>(0.000)</b>	<b>0.0071</b> <b>(0.000)</b>	<b>0.0077</b> <b>(0.000)</b>	<b>0.0909</b> <b>(0.000)</b>	<b>0.0793</b> <b>(0.000)</b>	<b>0.0832</b> <b>(0.000)</b>	<b>0.0753</b> <b>(0.000)</b>
Turnover	<b>0.0095</b> <b>(0.000)</b>	<b>0.0084</b> <b>(0.000)</b>	<b>0.0072</b> <b>(0.000)</b>	<b>0.0057</b> <b>(0.000)</b>	-0.0095 (0.000)	0.0141 (0.000)	0.0319 (0.000)	0.0398 (0.000)
S&P	0.0193 (0.000)	0.0160 (0.000)	0.0006 (0.859)	0.0000 (0.992)	<b>-0.0666</b> <b>(0.000)</b>	<b>-0.0792</b> <b>(0.000)</b>	<b>-0.0510</b> <b>(0.000)</b>	<b>-0.0479</b> <b>(0.000)</b>
Tradable	-0.0058 (0.038)	-0.0047 (0.058)	0.0017 (0.519)	0.0011 (0.713)	-0.0009 (0.803)	-0.0051 (0.514)	-0.0027 (0.783)	-0.0072 (0.503)
Foreign Sales	<b>0.0343</b> <b>(0.000)</b>	<b>0.0277</b> <b>(0.000)</b>	<b>0.0364</b> <b>(0.000)</b>	<b>0.0354</b> <b>(0.000)</b>	<b>0.0497</b> <b>(0.002)</b>	<b>0.0308</b> <b>(0.062)</b>	<b>0.0423</b> <b>(0.062)</b>	<b>0.0484</b> <b>(0.042)</b>
Book-to-Market	0.0012 (0.199)	0.0018 (0.087)	0.0026 (0.006)	0.0029 (0.009)	<b>0.0212</b> <b>(0.000)</b>	<b>0.0176</b> <b>(0.000)</b>	<b>0.0092</b> <b>(0.002)</b>	<b>0.0129</b> <b>(0.000)</b>
Yield	<b>-0.2931</b> <b>(0.000)</b>	<b>-0.3309</b> <b>(0.000)</b>	<b>-0.4641</b> <b>(0.000)</b>	<b>-0.4292</b> <b>(0.000)</b>	0.1908 (0.291)	-0.3986 (0.043)	-0.6783 (0.002)	-0.8779 (0.002)
Leverage	-0.0002 (0.372)	-0.0002 (0.447)	0.0002 (0.447)	0.0001 (0.636)	-0.0008 (0.255)	-0.0018 (0.027)	-0.0015 (0.028)	-0.0022 (0.002)
Momentum	-0.0002 (0.633)	-0.0007 (0.202)	-0.0141 (0.000)	-0.0166 (0.000)	-0.0139 (0.000)	-0.0104 (0.000)	-0.0122 (0.145)	-0.0145 (0.165)
Beta		0.0007 (0.704)		0.0038 (0.012)		0.0292 (0.000)		0.0074 (0.215)
Volatility		<b>0.0255</b> <b>(0.055)</b>		<b>0.0391</b> <b>(0.000)</b>		<b>-0.7174</b> <b>(0.000)</b>		<b>-0.3023</b> <b>(0.096)</b>
N	4543	3742	2783	2214	4543	3742	2783	2214
Adjusted R <sup>2</sup>	0.532	0.557	0.531	0.537	0.802	0.837	0.827	0.849

**Table IV: The Impact of Characteristics on Foreign and Domestic Institutional Ownership**

Impact on ownership of a shift from the characteristic's 25<sup>th</sup> percentile to its 75<sup>th</sup> percentile is expressed as a ratio of median ownership. Median ownership is 4 percent for foreigners and 29 percent for domestic institutions. Percentiles are given in Table I. Impact is only computed for variables that are significant and the same sign in every Table III regression for a given type of investor. Average coefficient estimates from 2000 are used to calculate impact; blank cells indicate that the characteristic's coefficient is insignificantly different from zero in some regressions. For the S&P dummy, impact is defined as a shift from not included in the index to being included.

	<b>Impact on Foreign Ownership</b>	<b>Impact on Institutional Ownership</b>
Size	0.23	0.84
Turnover	0.33	
S&P dummy		-0.25
Book-to-Market		0.05
Yield	-0.08	
Leverage		
Momentum		
Foreign Sales	0.15	0.03
Tradable dummy		
Beta		
Volatility	0.08	-0.27



**Table V: The Distribution of U.S. Direct Investment Abroad (USDIA) and Foreigners' Holdings of U.S. Equities**

USDIA is end-1999 data valued at historical cost from the Bureau of Economic Analysis; the data are available online at [www.bea.gov/bea/di/di1usdbal.htm](http://www.bea.gov/bea/di/di1usdbal.htm). Shown are percent of total USDIA and total foreigners' holdings of U.S. equities.

	<b>USDIA</b>	<b>Foreigner's Holdings</b>
Emerging Markets	21.4	6.1
Latin America	10.2	0.9
Emerging Asia	7.8	4.0
Other Emerging	3.2	1.2
Europe	50.4	57.9
Canada	9.8	10.2
Japan	4.5	8.5
Caribbean Financial Centers	10.7	10.5

**Table VI: The Relationship between Foreign Exposure and Foreign Sales**

Panel A shows the average regression results of the international factor model estimated for each stock over the period from April 1996 to March 2000:

$$r_{i,t} = a_i + \beta_{i,US} r_{US,t} + \beta_{i,F} r_{F,t} + \varepsilon_{i,t}$$

where  $r_i$  is firm-specific stock returns,  $r_{US}$  is the return on a CRSP value-weighted US portfolio, and  $r_F$  is the return on a firm-specific foreign portfolio. The foreign portfolio uses a weighting scheme based on the Goldberg (2004) industry-specific trade weights. Standard errors are in parentheses; these are computed as  $s()/N$ , where  $s()$  is the cross-sectional standard deviation of the coefficient estimates and  $N$  is the sample size.

Panel B shows the coefficient estimates and p-values (in parentheses) for the independent variables from cross-sectional weighted least squares regressions of the following form:

$$\hat{\beta}_{i,F} = \kappa + \gamma_{FS} ForeignSales_i + \zeta_i$$

where  $\hat{\beta}_{i,F}$  is firm  $i$ 's estimated foreign beta from the international model and the weights are the inverse of the standard error of  $\hat{\beta}_{i,F}$ .

Panel C shows selected coefficient estimates and p-values (in parentheses) from the following fixed effects panel regression restricted to firms with positive foreign sales:

$$r_{i,t} = a_i + \beta_{i,US} r_{US,t} + (\beta_{0,F} + \beta_{1,F} ForeignSales_i) r_{F,t} + \eta_{i,t}$$

<b>Panel A</b>	N	lal	$\beta_{US}$	$\beta_F$	Adj. $R^2$
Full Sample	2852	0.019	0.757	0.215	0.088
Subsamples with Foreign Sales					
above 50%	266	0.020	0.795	0.468	0.118
between 25% and	558	0.018	0.781	0.322	0.119
between 0% and 25%	598	0.016	0.829	0.175	0.107
Zero	1430	0.021	0.711	0.142	0.059

<b>Panel B</b>	N	Foreign Sales
Full Sample	2852	0.49 (0.000)
Subsample with Non-zero Foreign Sales	1422	0.53 (0.000)

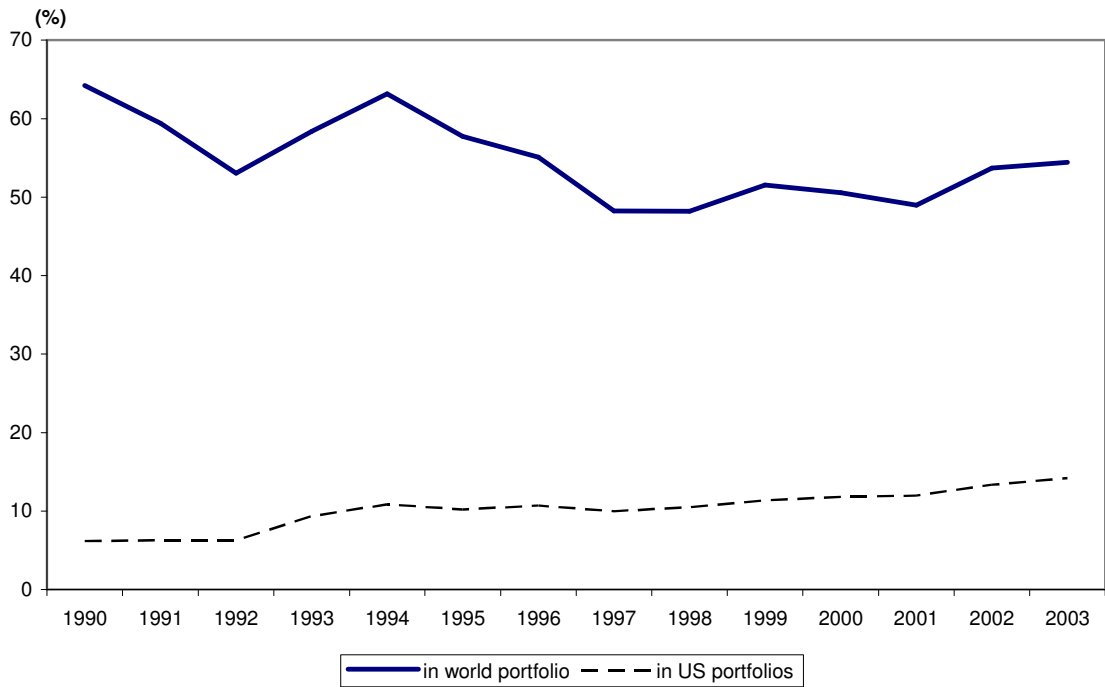
<b>Panel C</b>	$\beta_{0,F}$	$B_{1,F}$
	1410	0.1191 (0.000)
		0.46 (0.000)

**Table VII: The International Equity Exposure of U.S. Investors**

Data are as of March 2000. For home-grown foreign exposure, the upper bound estimate is computed as U.S. holdings (that part of the market capitalization not held by foreigners) times the percent of sales that is generated by foreign operations. The model based estimates utilize results in Panels B and C of Table VI that each percentage point of foreign sales contributes 0.005 to foreign exposure. For direct exposure to foreign stocks, the upper bound estimate is U.S. investors' portfolio holdings of foreign equities as constructed by Thomas, Warnock, and Wongswan (2004); the lower bound estimate subtracts the market capitalization of U.S. holdings of foreign equities that *could* owe to U.S. operations; and the model based assumes that 50 percent of non-U.S. firms' foreign operations are in the US (and that the relationship between sales and foreign exposure is as in Table VI). The size of the US equity portfolio is calculated as US market capitalization minus foreigners' holdings of US stocks plus US holdings of foreign stocks.

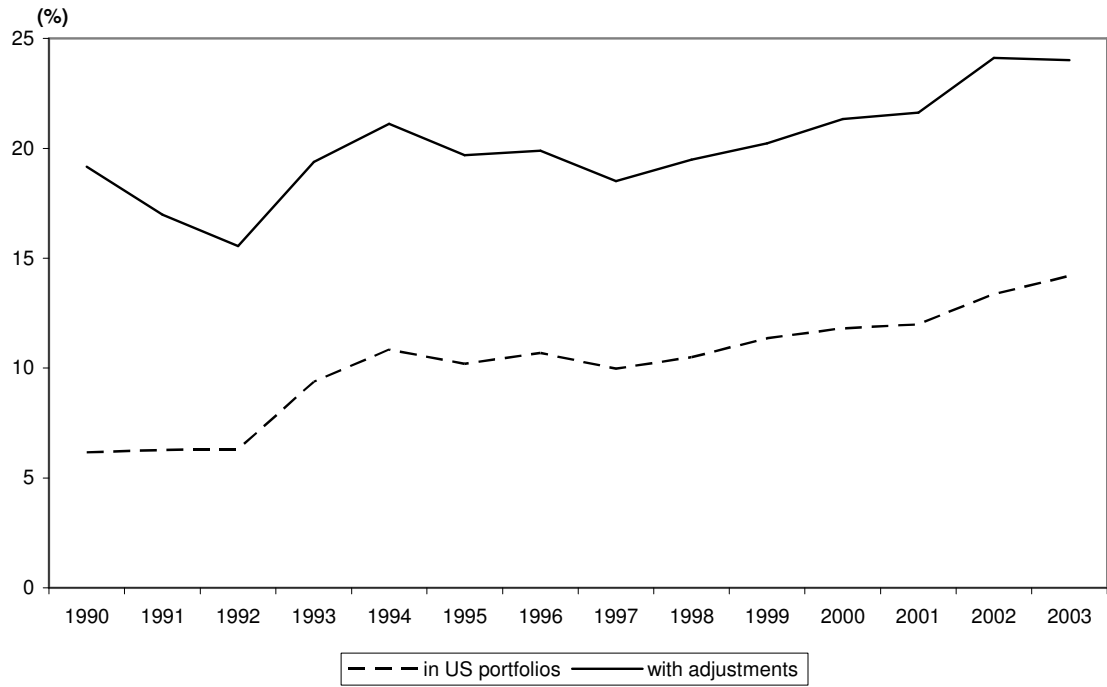
<b>Home-Grown Foreign Exposure</b>			
	upper bound	\$3531 billion	
	model based	\$1766 billion	
<b>Direct Exposure to Foreign Stocks</b>			
	upper bound	\$2074 billion	
	lower bound	\$1343 billion	
	model based	\$1891 billion	
<b>Total Exposure (model based)</b>			<b>% of US Equity Portfolio</b>
	Direct only	\$1891 billion	11%
	Direct and Home-Grown	\$3657 billion	21%

Figure 1  
The Share of Foreign Equities in World and US Portfolios



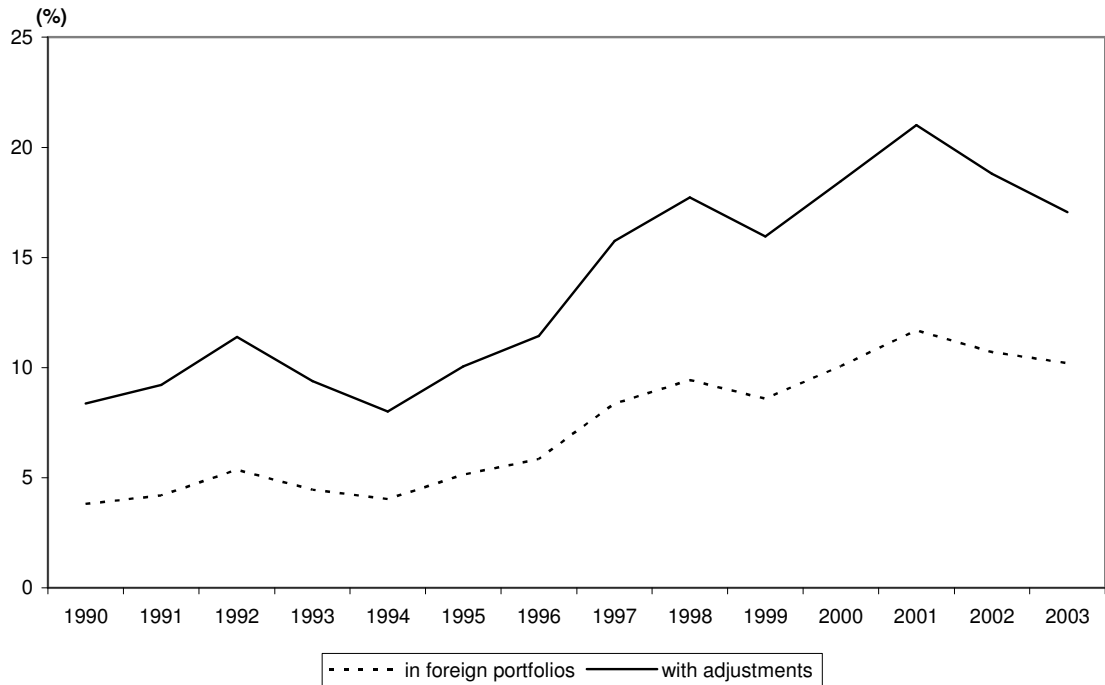
Notes. The share of foreign (i.e., non-U.S.) equities in the world portfolio is calculated as U.S. market capitalization divided by global market capitalization. For the share of foreign equities in U.S. portfolios, the size of the foreign equity portfolio is from the BEA's International Investment Position data and the size of the U.S. portfolio is calculated as U.S. market capitalization less foreigners' holdings of U.S. equities plus U.S. investors' foreign equity holdings. Market capitalization data are from S&P's Emerging Stock Markets Factbook (various issues).

**Figure 2**  
**The Share of Foreign Equities in US Portfolios**



Notes. For the share of foreign equities in U.S. portfolios, the size of the foreign equity portfolio is from the BEA's International Investment Position data and the size of the U.S. portfolio is calculated as U.S. market capitalization less foreigners' holdings of U.S. equities plus U.S. investors' foreign equity holdings. Market capitalization data are from S&P's Emerging Stock Markets Factbook (various issues). Adjustments to U.S. investors' foreign equity portfolio include the addition of one-half of reported U.S. direct investment abroad and the subtraction of 10 percent of U.S. investors' reported foreign equity holdings.

**Figure 3**  
**The Share of US Equities in Foreign Portfolios**



Notes. For the share of U.S. equities in foreign portfolios, the size of the U.S. equity portfolio is from the BEA's International Investment Position data and the size of the foreign portfolio is calculated as non-U.S. market capitalization less foreigners' holdings of non-U.S. equities plus foreign investors' U.S. equity holdings. Market capitalization data are from S&P's Emerging Stock Markets Factbook (various issues). Adjustments to foreign investors' foreign equity portfolio include the addition of one-half of reported foreign direct investment in the US and the subtraction of 10 percent of foreign investors' reported U.S. equity holdings.