Foreign Investments of U.S. Individual Investors: Causes and Consequences

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ABSTRACT

Using thousands of brokerage accounts of U.S. individual investors, we analyze the motivations and consequences of foreign equity investment. We find that diversification is not the only reason that investors trade foreign securities. While wealthier, more experienced investors enjoy an informational advantage and, thus, are more likely to invest overseas and experience good portfolio performance, other investors appear to venture abroad for the wrong reasons. In particular, behaviorally-biased investors often under-use or misuse foreign equity securities and experience poor portfolio performance. Some investors appear to use foreign securities for speculation or to improve upon poor domestic portfolio performance.

1. Introduction

The diversification benefit to holding foreign equities results from the relatively low correlations among stock returns of various countries. To maximize diversification benefits, all investors should hold international stocks through low-cost mutual funds. This yields a risk-return tradeoff that is superior to what a purely domestic portfolio offers. In reality, however, there is much evidence that U.S. investors typically do not diversify abroad as extensively as expected.[1] In particular, the percentage of the typical U.S. portfolio held in foreign equities is many times smaller than that prescribed by the basic tenets of portfolio theory.

Despite this home bias puzzle, some U.S. investors do invest in foreign equity securities. Few studies examine the characteristics of these investors and the consequences of their investments. The purpose of our paper is to uncover the motivations for the foreign equity investment choices of U.S. investors and the consequences of those choices for portfolio performance. We study a database of tens of thousands of brokerage records of U.S. individual investors which includes both personal characteristics and end-of-month portfolio holdings and trades for each investor. This data set presents an opportunity to directly examine the characteristics of individual investors, the foreign portfolio investments they undertake, and the implications of these investments for portfolio performance.

Our empirical analysis focuses on three hypotheses. First, we test the *diversification benefit* hypothesis and check whether individual investors who appear to follow the principles of diversification in their domestic portfolio are also more likely to own international equity securities. Second, we test the *informational advantage* hypothesis and examine whether individual investors who are more capable of obtaining and processing information about foreign securities are also more likely to own international equity securities and experience superior performance as a result. Last, we test the *behavioral bias* hypothesis. We measure each individual's decision-making biases and relate the degree of bias to his or her use of foreign equity securities. The dimensions of behavioral bias that we measure range from aggressive tendencies

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[1] See, for example, French and Poterba (1991), Bohn and Tesar (1996), Coval and Moskowitz (1999), and Ahearne, Griever, and Warnock (2004). For a survey of the home bias literature, see Lewis (1999).

(implying misuse of foreign equities) to the inability to make investment choices in a broad, long term context (implying under-use of foreign equities).

We find that diversification is not the only motivation for the international investment activities of our sample of investors, although some investors whose domestic portfolio choices indicate an understanding of diversification are more likely to invest in foreign securities. Informational advantage partially explains international investment decisions: investors who are more affluent or experienced are more likely to invest in foreign equity securities. Perhaps most interestingly, we find that behavioral biases lead some individuals to under-use or misuse international equity securities, indicating that poor decision-making regarding foreign equity securities has deep-rooted behavioral causes that also offset the performance benefits of international portfolio diversification. For example, some investors appear to use foreign securities to speculate, perhaps even to improve upon the poor performance of their domestic portfolio.

Our paper makes three contributions to the literature. First, while the international finance literature documents the substantial home bias in U.S. portfolios, there are very few studies that relate individual investor characteristics to foreign investment decisions and their consequences for portfolio performance. Our paper fills this gap by examining U.S. individual investor data. To the best of our knowledge, our paper is the first to offer direct evidence on foreign equities trading by U.S. individual investors and its impact on portfolio performance.[2]

Second, the international finance literature emphasizes the benefits of investing in foreign stocks but typically ignores another important side of the issue. While some investors select foreign equities, they may do so for the wrong reasons as a result of their behavioral biases. Pointing out this facet of the international investment decision is useful for policy-makers and practical investment purposes, as the benefits of international investing are easily erased by strong behavioral biases.

Third, the behavioral finance literature has identified different biases in individual investor decision-making regarding domestic securities. We show how these behavioral biases extend to decisions about

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[2] Two contemporaneous studies investigate the foreign investment decisions of individual investors. Karlsson and Norden (2004) study the selection of mutual funds by Swedish pension-plan beneficiaries while Kyrychenko and Shum (2005) examine the Survey of Consumer Finances (SCF) data on self-reported holdings of broad asset classes.

international investing. We find that overconfident individuals (defined as those whose domestic portfolios display frequent trading but bad performance) are more likely to invest in foreign equities, while others who display behavioral symptoms such as "local bias", "narrow framing", and "disposition effect" are less likely to invest in foreign equities.

The balance of the paper is organized as follows. Section 2 reviews the literature and explains our three hypotheses further. Section 3 describes our individual investor database and related data needed to support our tests and presents summary statistics. Section 4 examines the characteristics of investors who are more likely to invest abroad. Section 5 studies associations between foreign investment decisions and security characteristics. Section 6 assesses the contribution of international investing to portfolio performance. Finally, we conclude in Section 7 with a brief summary of the paper.

2. Literature Review and Hypothesis Development

There are many U.S. investors with substantial holdings of non U.S. securities. Our first testable hypothesis, diversification benefit, assumes that there exists a clientele of U.S. individual investors who understand this basic tenet of portfolio management and act on it. We test this hypothesis by looking for evidence that those investors whose domestic holdings demonstrate an understanding of the value of diversification are more likely to invest in foreign equity securities. However, empirical evidence implies that diversification may not be the only driver of international investment. French and Poterba (1991) document the very small average fraction of U.S. equity portfolios that is invested outside the U.S., while Bohn and Tesar (1996) and Froot, O'Connell, and Seasholes, 2001) report evidence of "return-chasing" by U.S. investors. Put another way, U.S. investors seem to devote too small a fraction of their portfolios to foreign securities, but turn over their foreign holdings rapidly in search of high returns.

To better understand these stylized facts about foreign investments, we offer a second testable hypothesis, informational advantage. In Kang and Stulz (1997), deadweight costs to learning about foreign securities deter investors below a certain level of wealth. In Brennan and Cao (1997), positive feedback trading results because rational U.S. investors lack information about foreign securities and condition their trades on the recent return performance of foreign securities. Motivated by these studies, we posit the

informational advantage hypothesis, where investors have to learn about foreign markets before they invest abroad. Specifically, wealthy investors with large portfolios are more likely to find it worthwhile to pay the fixed costs of learning and invest abroad. Experienced investors are more likely to be able to obtain and process information efficiently and, therefore, are more likely to invest abroad. Given the superior information on which they base their decisions, investors who hold foreign securities should perform relatively well.

Our third testable proposition, the behavioral bias hypothesis, is motivated by the behavioral finance literature. Under this hypothesis, investors may perform badly even if they hold foreign securities. We consider a number of behavioral biases. For instance, some investors might display a familiarity bias or local bias related to geographic proximity (Coval and Moskowitz, 1999; Ivkovich and Weisbenner, 2005). Such a bias could drive an investor away from shares of geographically-distant domestic companies and may also discourage the holding of foreign securities. Investors could also display a narrow framing bias (Kahneman and Lovallo, 1993; Kumar and Lim, 2005), which might lead them to ignore portfolio-wide considerations in selecting individual securities, or a disposition effect (Odean, 1998), which could lead them to sell winners too quickly and losers too slowly. Both narrow framing and disposition effect biases imply that an investor does not take a portfolio perspective in making investment decisions. Such investors might not recognize the benefits of international diversification and invest too little internationally.

Furthermore, Odean (1999), Barber and Odean (2000, 2001), and others suggest that some individuals are overconfident, that is, they trade securities too frequently and exhibit poor performance. Such investors may overestimate their ability to overcome information asymmetry and invest abroad, as suggested by the finding of Graham, Harvey, and Huang (2004) that investors with greater self-reported "competence" often invest more internationally. Kumar (2005) finds evidence that some individuals prefer speculative, gambling-like stocks. Thus, some investors may employ a small, relatively less diversified foreign portfolio as a vehicle for speculation.

To summarize, the behavioral bias hypothesis predicts that some investors under-use or misuse foreign securities due to flaws in their decision-making processes. As a result, their sub-optimal investment decisions may negate any potential diversification benefits from international investing.

3. Data and Sample Selection

Our primary database is a record of trades and monthly portfolio positions of individual investors with accounts at a major U.S. discount broker from January 1991 to November 1996. The database has been used by a number of other previous authors. It indicates the end-of-month portfolios of all investors, records all trades by these investors, and supplies demographic information such as age, occupation, income, self-reported net worth, gender, marital status, and zip code. Additionally, for each ADR or other foreign-incorporated stock in our sample, we obtain monthly prices, returns, and market capitalization data from the Center for Research in Security Prices (CRSP) and quarterly book value of common equity data from COMPUSTAT. We also use the CRSP mutual fund database to obtain mutual fund returns and information on the international open end mutual funds held by our sample of investors. Finally, we obtain the monthly time-series of the three Fama-French factors and the momentum factor from Professor Ken French's data library, and the three international factors of Zhang (2005).

Table 1 presents summary statistics on the variables constructed from the individual investor database and other sources. Panel A shows that, among the 77,995 investors in the database, 62,387 have traded equities. More specifically, 30,572 investors have traded international open end mutual funds,[3] American Depositary Receipts (ADRs) and other U.S. listed foreign incorporated stocks, or closed-end country funds. Panel B shows that the sample contains 65,367 trades of international open end mutual funds, 122,073 trades of ADRs and foreign incorporated stocks, and 31,449 trades of closed end country funds.

The use of individual foreign stocks, rather than international equity mutual funds, is evidence that many investors deviate from the prescriptions of basic portfolio theory. The sample investors trade 930 foreign securities (142 international open end funds, 696 ADRs and foreign stocks, and 92 closed end country

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[3] Open end mutual funds with CDI objective code "GE" (global equity, where holdings in international equities is 25% or more) or IE (international equity, where holdings are primarily international equities), or an "international" Strategic Insight objective code (for example, EGG, EIG, EIT, or EID) are classified as "international".

funds) spread over 40 countries, with buys substantially outnumbering sells. Average (median) trade amounts are $9,023 ($4,013), $10,522 ($4,850), and $8,894 ($4,640) for international open end funds, ADRs and other foreign stocks, and closed end country funds respectively. The mean (median) market value of individual investor holdings is $16,383 ($5,707) for international open end mutual funds, $10,877 ($4,849) for ADRs and other foreign-incorporated stocks, and $11,771 ($5,540) for closed end country funds. The median number of international open end funds, ADRs, other individual foreign stocks, or closed end country funds held is one. In contrast, the mean (median) value of domestic equities held is $35,629 ($13,869) and the median number held is three.

To examine the representativeness of our sample, we compare the stock holdings of our set of investors with other benchmarks. First, the Census Bureau (Survey of Income and Program Participation 1995) shows that the median U.S. household held $16,900 in stocks, while the Federal Reserve Survey of Consumer Finances (1992, 1995) indicates $15,300. These figures compare closely to the median domestic stock holding of $13,869 for our sample. Second, the Survey of Consumer Finances (SCF) shows that more than 60% of investors held only one brokerage account in 1992, rising to two accounts in 1995. While SCF does not have data on international mutual funds, it does include aggregated information on directly-held foreign stocks in 1992 and 1995. Among all investors in our sample, 3.87% of total portfolio holdings are individual foreign stocks, while the SCF data reports 4.44% for 1992 and 4.53% for 1995. Third, Ivkovich, Poterba, and Weisbenner (2005) compare the same dataset we use to IRS data, and find that the distribution of stock holding periods is very similar across the two data sets. In summary, our sample closely resembles the U.S. individual investor population along many important dimensions.

4. Foreign Investment Decisions and Investor Characteristics

In this section, we study the investor characteristics associated with trading and holding foreign equities. The decision to invest in foreign equities and the extent of trading and holding foreign equities are examined separately. Our empirical analysis is organized around our three hypotheses, which motivate the independent variables we use to explain the use of foreign equities across our sample of individual investors. Detailed definitions of these variables are listed in Appendix A.

A. Overview of Explanatory Variables

First, we construct several variables to test the diversification benefit hypothesis. We measure the preference for diversification with *mutual fund holdings*, the average proportion of domestic mutual funds in the investor's domestic portfolio. We also create two proxies for the diversification level of the domestic portfolio, negative of *normalized portfolio variance* (domestic portfolio variance divided by the average variance of the individual securities in the portfolio) and *total risk* (variance of the domestic portfolio's return). Furthermore, we use *domestic portfolio performance* (the Sharpe ratio of the domestic portfolio) to proxy for performance, and the *dividend yield* of the domestic portfolio to capture conservativeness (Graham and Kumar, 2006).

Second, we create several variables to test the informational advantage hypothesis. Investors with higher income, wealth, or portfolio size are more likely to find that the benefits to international diversification outweigh the costs of becoming informed about such investments. Therefore, we construct the variables *income* (the total annual household income), *wealth* (the self-reported net worth of the investor), and *portfolio size* (the sample-period average market capitalization of the investor's domestic portfolio).[4] We also include measures of experience (years since the brokerage account was open, investor age), and access to information about foreign economies (residence within 50 miles of one of the 20 largest metropolitan areas) because they may indicate the ease with which a particular investor can learn about foreign investing. Investors residing in cosmopolitan cities may be more exposed to immigrants and foreigners, may experience more foreign travel, or may have other characteristics that make foreign stocks relatively familiar to them.

Third, we measure several facets of poor domestic portfolio decision-making to detect effects predicted by the behavioral bias hypothesis. Some biases reflect a lack of portfolio perspective, implying under-use of foreign securities. *Local bias* (which drives an investor away from geographically-distant U.S. stocks and may also discourage investors from holding foreign securities) is computed as the distance between home zip code and headquarters zip code of each company in an investor's domestic portfolio minus the distance for each company in the market portfolio. *Narrow framing* bias (the lack of a broad portfolio

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[4] The results are virtually unchanged if we use the portfolio size at the time an investor enters the sample.

perspective needed to recognize the value of diversification) is measured with the adjusted trade clustering measure of Kumar and Lim (2005). *Disposition effect* (selling winners too quickly and losers too slowly) is measured following Odean (1998).

Other biases imply inappropriately aggressive use of foreign equity securities. *Overconfidence* is measured with a dummy variable set to one for investors who belong to the highest domestic portfolio turnover quintile and the lowest risk-adjusted domestic portfolio performance quintile. We also include a male gender dummy variable, given the finding of Barber and Odean (2001) that male investors often display overconfident behavior. Intimately related to overconfidence are speculative motives. If foreign stocks are perceived as more risky than domestic stocks, they will attract investors who seek speculative opportunities. We measure each investor's propensity to speculate with four variables. *Domestic portfolio turnover rate* measures an investor's trading intensity. *Gambling preference* (Kumar, 2005) is measured with the excess portfolio weight (relative to the weight in the market portfolio) on domestic stocks that have bottom quintile prices, top quintile idiosyncratic volatility, and top quintile idiosyncratic skewness. *Short-sell* and *options* dummies are set to one for portfolios with at least one such trade during the period, indicating a relatively sophisticated investor who may also have a preference for speculation.

B. Explaining the Foreign Equity Participation Decision

Specifications (1) to (4) of Table 2 present estimates of several cross-sectional logit regressions to explain the foreign equities participation dummy across our sample of investors. This dummy variable is set to one if an investor holds or trades at least one international open end mutual funds, ADRs, other foreign-incorporated stocks, or closed end country funds at some point during the six-year sample-period. The individual investor characteristics employed as explanatory variables are arranged in diversification benefit, informational advantage, and behavioral bias groups. They are standardized so coefficient estimates can be compared directly within a regression specification and also across various specifications.

Specification (1) in Table 2 presents the regression estimate for the diversification benefit group of explanatory variables. Strong positive signs on diversification level of domestic portfolio and domestic mutual fund holdings, plus the strong negative sign on domestic portfolio total risk suggest that

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diversification motives for foreign equity participation are very strong. Similarly, investors who prefer dividends (a signal of conservatism, as in Graham and Kumar, 2006) are more likely to seek the risk-reducing benefits of foreign equity investments. Overall, specification (1) contains much evidence that some investors use foreign equities for the reasons predicted by our diversification benefit hypothesis.

Specification (2) in Table 2 presents the regression estimate for the informational advantage group of explanatory variables. The regression estimates indicate that wealthier investors with relatively large domestic portfolios and relatively greater investment experience (coefficients on time since account opening date and age) are more likely to invest abroad. Investors residing in large metropolitan areas are also more likely to invest abroad, particularly if they are wealthy. This evidence is consistent with an information costs based explanation for investing in foreign equities (Kang and Stulz, 1997).

Following Wooldridge (2003), we use a factor of 25% to interpret the logit regression results. For example, a one standard deviation increase in wealth results in a 1.4 percent (0.25 times 5.6%) increase in the propensity to participate in foreign equities. Similarly, a one standard deviation increase in domestic portfolio size increases this propensity by 2.4 percent (0.25 times 12.8%).

Specification (3) in Table 2 presents the regression estimates for the behavioral bias group of explanatory variables. All variables are statistically significant except for the gender dummy. The negative slope on narrow framing suggests investors who focus on stocks one at a time are less likely to trade foreign equities. For example, if narrow framing increases by one standard deviation relative to the mean level for the peer group, the propensity to participate in foreign equities drops by 1.1 percent (that is, 0.25 x −4.5%). The negative slope on disposition effect indicates that investors who make poor decisions (sell winners too quickly, hold losers too long) with their domestic portfolios are less likely to trade foreign equities. Both narrow framing and disposition effect biases imply that an investor does not take a portfolio perspective in making investment decisions. Our evidence confirms that such investors might also not recognize the benefits of international diversification and, therefore, invest too little internationally.

Specification (3) also shows a strongly negative slope on the local bias measure, indicating that investors whose domestic portfolios are tilted towards shares in geographically close companies also tend to

avoid foreign equities. Thus, familiarity manifests itself in both local bias and home bias, echoing the finding

of Goetzmann and Kumar (2004) that local bias is weaker in relatively better diversified portfolios.

To better understand the relation between local bias and home bias, we examine whether familiarity

is a common determinant of the two biases. We consider a measure of local information, the difference

between the k-day return following local buys and local sells.[5] The idea is that, if an investor enjoys superior

information about local stocks, her buy transactions should outperform her sell transactions, and the return

difference would be positive. This local information proxy is then used as an additional explanatory variable

in the participation regressions of Table 2 (also the holdings ratio regressions of Table 3) to see if local

information subsumes the explanatory power of local bias. However, the results (unreported) indicate that

local bias retains its significance while the local information measure is insignificant in all cases. The

coefficients on other variables are virtually unaffected. Thus, familiarity, rather than superior information,

influences both the local bias and the home bias of individual investors.

To this point, we have evidence that investors with narrow framing, disposition effect, or local bias

are less likely to trade foreign equities. However, there is also evidence that other biased investors (scoring

high on overconfidence or speculative tendency) are attracted to foreign equities. The positive slope on

overconfidence indicates that investors who display poor performance and high turnover in their domestic

equity portfolio are more likely to participate in foreign equities. The strong positive slope on domestic

portfolio turnover suggests that investors who tend to trade too frequently are also attracted to foreign

equities, and the strong negative slope on domestic portfolio performance suggests that ineffective investors

are drawn to foreign equities as well. Similarly, the positive slope coefficient on domestic equity gambling

preference suggests that investors who choose speculative stocks for their domestic portfolios are also prone

to extend their speculative activities to foreign equities, as are investors who use particularly aggressive

trading strategies (options or short sales).

Specification (4) in Table 2 combines diversification benefit, informational advantage, and

behavioral bias groups of explanatory variables. Although the domestic equity gambling preference variables

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[5] We set k equal to 126 days, but results are very similar for other horizons.

lose statistical significance, the main findings of the previous specifications hold up well when all variables are combined in one specification. Given that all explanatory variables are standardized, we can identify the dominant determinants of investors' foreign market participation decisions by comparing the absolute magnitudes of the coefficient estimates. While the domestic portfolio's diversification level has the largest estimate (coefficient = 0.420, t-stat = 15.329), the domestic portfolio's turnover also has a large estimate (coefficient = 0.115, t-stat = 7.839). Thus, it is clear that both rational motives and behavioral biases are important determinants of foreign investment decisions among individuals.

C. Distinct Investor Clienteles

Our empirical analysis so far aggregates foreign participation across several vehicles for international equity investment ranging from open end funds to individual stocks. Specifications (5) and (6) of Table 2 examine participation dummies for specific classes of foreign investments to understand whether they attract different investor clienteles.

International Open End Mutual Funds. **S**pecification (5) of Table 2 explains participation in international open end equity mutual funds. We re-estimate the regression of specification (4) with the participation dummy set to one only if an investor holds or trades at least one open end international mutual fund during the six-year sample period. To identify the unique characteristics of international open end mutual fund investors, we compare the results presented in Specification (5) to those presented in (4).

Among informational advantage variables, participation with international equity mutual funds differs from foreign participation generally in that the coefficient on portfolio size becomes negative, showing that investors with smaller portfolios typically prefer to invest in mutual funds. Among behavioral bias variables, the negative impact of narrow framing and disposition effect are much stronger, indicating that mutual funds attract investors who are more aware of the benefits of thinking broadly about portfolio construction. The significance of overconfidence, domestic portfolio turnover, and domestic portfolio performance vanishes. The negative coefficient on domestic equity gambling preference indicates that investors who select international mutual funds are unlikely to hold speculative domestic stocks. In brief, international equity mutual fund investors are more likely to be smaller investors who suffer fewer behavioral

biases. If we view mutual funds as a sensible choice in terms of diversification and trading costs, it appears that these investors typically approach foreign equities effectively.

Individual Foreign Stocks. Specification (6) describes the characteristics of those investors who select individual foreign stocks or closed end country funds. For these regressions, the participation dummy is set to one only if an investor holds or trades at least one ADR, other foreign incorporated stock, or closed end country fund during the six-year sample period. We compare the estimates in specification (6) to those for all foreign equities in specification (4) and for international equity mutual funds in specification (5). Relative to (4), the most noticeable differences for investors in individual stocks are the decrease in the significance of domestic portfolio total risk and the increase in the significance of domestic equity gambling preference. Thus, relative to foreign equities generally, the choice of individual foreign stocks is less strongly associated with the desire for diversification and more strongly associated with a preference for gambling.

Compared to the results for participation in international equity mutual funds, we see the reversal of domestic portfolio size very plainly. Thus, investors who tend to select individual foreign stocks (specification 6) have larger domestic portfolios, compared to investors who select international equity mutual funds (specification 5). Among the behavioral bias factors, the effect of overconfidence is insignificant for international equity mutual fund selection but significantly positive for individual foreign stock selection. In contrast, the effect of narrow framing, disposition effect, and local bias is similar in sign and significance across international equity fund and international individual stock investors. Among the diversification benefit variables, the negative effect of domestic portfolio risk is weakened while the impact of domestic portfolio turnover, poor domestic portfolio performance, the use of short sales or options, and the preference for gambling-type stocks are greatly enhanced for those who select individual foreign stocks versus those who select international equity mutual funds.

In summary, when we look at participation in any foreign equity security (specifications (1) to (4)), we combine different types of securities. In doing so, we obscure some of the underlying forces. Measures of speculative behavior in an investor's domestic portfolio are more strongly related to the decision to invest in individual foreign stocks. Indeed, poor domestic portfolio performance seems associated with a preference

for extending aggressive trading strategies into individual foreign stocks, rather than more prudent international equity mutual funds. This again shows that foreign equity investment may serve both sensible diversification motives and more questionable speculative motives, depending on the individual investor.

D. Explaining Portfolio Holdings and Trading Activities

Once individual investors decide to invest in foreign securities, how do they construct their portfolios? What factors influence their trading behavior? To identify the determinants of the degree of foreign equity holding and trading, we estimate several Tobit cross-sectional regression specifications.[6] In these regressions, the dependent variable is *Relative Foreign Portfolio Holding*, defined as the mean market capitalization of an investor's foreign-related equity portfolio divided by the mean market capitalization of her domestic stock portfolio.

Table 3 shows that the estimates roughly parallel our previous findings on foreign participation in Table 2. Specification (1) looks at holdings of all foreign equity vehicles. Those investors who hold a larger fraction of their portfolio in foreign-related securities tend to be wealthier, more diversified, more overconfident, and more attuned to aggressive strategies involving options or speculative stocks.[7] Differences in investor characteristics across types of foreign equity positions are also evident in comparing holdings of international mutual funds (specification 2) to holdings of all other types of foreign equities. As was found for foreign equity participation, mutual funds are more likely to be selected by smaller investors who know the value of diversification and have less narrow framing bias. In contrast, investors who are more likely to select individual foreign stocks prefer short sales, options, and speculative domestic stocks.[8]

5. More Evidence on Speculative Motives

Our previous evidence raises the intriguing possibility that some investors use foreign equities to speculate or to improve on the poor performance of their domestic portfolios. We present three additional sets of tests for such effects. First, we split our sample period into two parts and test whether poor domestic

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[6] In these regressions, we limit our sample only to those investors who have international activity. Since a linear regression in this case may not yield consistent estimates, we use the tobit censored regression model.
[7] While much activity is in Canadian, Mexican, and U.K. stocks, results are similar if those countries are excluded.
[8] Regressions with the "relative foreign trading ratio" (number of foreign trades divided by number of domestic trades) as dependent variable look very similar to those for relative holdings ratio reported in Table 3.

portfolio performance and low use of foreign equities during the first half is associated with greater use of foreign equities during the second half. Second, we measure whether investors exhibit stronger preferences for certain types of ADRs and foreign stocks, notably, those that we categorize as speculative. Third, we examine the characteristics of investors who prefer foreign individual stocks to foreign equity mutual funds.

A. Does Poor Domestic Performance Prompt Use of Foreign Securities? Evidence from Split-Sample Tests

We test whether poor domestic performance and low use of foreign equities during the first half of our sample period (1991 to 1993) induce greater use of foreign equities during the second half of our sample period (1994 to 1996). Table 4 presents estimates of logit regressions along the lines of those reported in Tables 2 and 3. The 1991 to 1993 period is used to estimate domestic portfolio performance, which is then inserted as an explanatory variable for foreign participation in the 1994 to 1996 period. Following Table 2, different specifications are estimated for participation in all foreign equity vehicles, participation in international equity mutual funds only, and participation in ADRs, foreign stocks, and closed-end funds only.

Panel A of Table 4 summarizes regression estimates to explain foreign participation from 1994 to 1996 with 1991 to 1993 domestic portfolio performance and 1994 to 1996 values of other variables. Specification (1) indicates that lagged domestic performance is associated with higher participation in foreign securities (coefficient −0.027 with a z-stat of −3.226), with the negative sign indicating that poor prior domestic performance tends to lead to greater subsequent participation in foreign equities. This is driven by higher participation in ADRs, foreign stocks, and closed-end funds in particular (coefficient −0.028 with a z-stat of −3.388), as indicated by specification (3). Participation in open-end funds, specification (2), is not significantly related to prior domestic performance (coefficient −0.008 with a z-stat of −1.484). Coefficients on other variables are very similar to what Table 2 reports for the full sample period.

Panel B of Table 4 summarizes several similar specifications to explain relative foreign portfolio holding, paralleling what is reported in Table 3. The results largely mirror those of the participation specifications in Panel A. Bad lagged domestic performance is associated with higher relative foreign holdings (coefficient −0.053 with a z-stat of −9.360), and this is more strongly related to higher holdings of ADRs, foreign stocks, and closed-end funds (coefficient −0.071 with a z-stat of −8.886) rather than open-end

funds (coefficient −0.020 with a z-stat of −3.502). Thus, investors who make poor domestic equity decisions are more likely to reach out to foreign equities for help, particularly individual securities rather than more prudent diversified mutual funds.

B. What Types of Individual Foreign Securities Do Investors Prefer?

To identify the characteristics of U.S. listed foreign stocks that tend to attract individual U.S. investors, we rotate the point-of-view from the cross-section of investors to the cross-section of securities. Instead of aggregating the trades and holdings of each investor, we aggregate investors' holdings by individual foreign stock and examine the cross-sectional patterns in holdings across security characteristics.[9] We proceed as follows. At the end of each month, we define an aggregate foreign stock portfolio by combining the ADR and other foreign stock holdings of all investors in our sample. For each security in the aggregate foreign portfolio, we compute its actual weight in the portfolio. We also compute the expected weight of each security in the aggregate foreign portfolio as the market capitalization of the security divided by the total market capitalization of all securities in the portfolio. The excess weight (Actual Weight − Expected Weight) of a foreign security in the aggregate portfolio provides a measure of the aggregate investor preference for the security. We use the excess and raw measures as the dependent variables in regression specifications with individual security characteristics and home country characteristics as explanatory variables. For ease of interpretation of the regression output, all independent variables have been standardized. Additionally, standard errors are computed using country clusters.

Table 5 presents the results. The estimates indicate that investors prefer small-cap, low book-to-market (that is, growth), and volatile foreign securities. The aggregate preference for these groups of securities is surprising because information asymmetry is likely to be greatest for them. We also find that, all else equal, investors exhibit a marginal preference for Leading ADRs over other ADRs, and they tend to prefer securities which have higher analyst coverage. Paralleling our evidence on local bias, familiarity also appears to affect the selection of individual foreign stocks: slope coefficients on the Mexico dummy (a

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[9] We must exclude international open end mutual funds and closed-end country funds from this analysis since they do not have individual characteristics (such as analyst coverage) like the ADRs and other foreign stocks.

country relatively familiar to U.S. investors) and the number of major news stories on a country are significantly positive in some specifications. The coefficient estimates for country characteristics suggest that the home country governance environment (as proxied by accounting standard, anti-director rights, and a composite capital market governance index) does not seem to affect U.S. investor preferences, perhaps because these cross-listed stocks have to adhere to higher U.S. levels of disclosure and governance.[10]

We compare the preference for ADRs and other individual foreign stocks to the preference for domestic stocks with specifications (3) to (6). Across both domestic and foreign individual stocks, investors prefer more volatile, small-cap stocks with more analyst coverage. However, investors have a preference for international growth stocks but not for domestic growth stocks. This suggests that U.S. individual investors are more speculative in their international choices than in their domestic choices.

C. Do Investors Trade Foreign Stocks Differently Than Domestic Stocks?

To further investigate why investors select foreign stocks, we examine the characteristics of investors who tend to select individual foreign stocks rather than international equity mutual funds. Specification (1) in Table 6 presents estimates of cross-sectional regressions to explain the proportion of the foreign portfolio held in individual foreign equity securities, while specification (2) presents comparable evidence on the proportion of the domestic portfolio held in individual domestic equity securities.

We find both commonalities and contrasts across the two specifications. For the foreign portfolio, the small but statistically significant positive slope (coefficient 0.026 with a z-stat of 4.744) [11] on the proportion of the domestic portfolio held in individual stocks indicates that an investor who holds a high proportion of individual domestic stocks is also likely to hold a high proportion of individual foreign stocks.

Among the diversification benefit variables, the diversification level of the domestic portfolio affects the fraction of both foreign and domestic portfolios held in individual stocks, though the effect is many times larger for the foreign portfolio. However, the signs on the other diversification measures (domestic portfolio

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[10] Ahearne, Griever, and Warnock (2004) find that U.S. investors underweight foreign securities from poor reporting and disclosure environments while Leuz, Lins, and Warnock (2005) find U.S. institutional investors avoid foreign companies with potential governance problems and foreign countries with poor governance and disclosure generally.
[11] A univariate regression yields a coefficient (t-statistic) of 0.111 (23.329) and adjusted R-squared of 1.23%.

total risk, dividend yield, and performance) differ in comparing domestic and foreign use of individual securities. For example, a seemingly cautious, effective investor (high domestic portfolio dividend yield and performance) is likely to place a smaller portion of her foreign portfolio in individual foreign stocks but a larger portion of her domestic portfolio in individual domestic stocks. A seemingly risk averse investor (low domestic total risk) is more likely to use individual stocks extensively in his foreign portfolio but less likely to do so in his domestic portfolio.

Among the informational advantage variables, affluence (income, wealth, wealth*metropolitan dummy) is associated with less use of individual domestic stocks, but there is no such effect for individual foreign stocks. The size, experience, and metropolitan variables are roughly similar in sign, if not size and significance, in explaining the fraction of the foreign or domestic portfolio held in individual securities. Among the behavioral bias proxies, greater narrow framing, disposition effect, and gambling preference predict greater use of individual stocks in both the domestic and foreign portfolios. This is consistent with the notion that some investors misuse individual foreign securities in the same way that they misuse individual domestic securities. However, there is also evidence that aggressive investment strategies are even more likely to be implemented with individual foreign securities: the slope coefficients on the overconfidence, domestic portfolio turnover, and short-sell dummies are significantly positive in explaining the proportion of the foreign portfolio held in individual stocks.

Overall, several behavioral biases appear common to decisions about both domestic and foreign individual stocks, but the effects are often more prominent in decisions concerning foreign equities. These results confirm our basic finding that U.S. individual investors often use foreign stocks not as diversification tools, but for less ideal purposes.

6. Potential Benefits from International Investing

A. *Average Benefit from International Investing*

Whether the decision to venture abroad is driven by diversification or speculation, investors are likely to benefit from international investment simply due to the correlation structure of equity returns across borders. For instance, Lewis (1999) measures the diversification gains when moving from investing fully in

the S&P 500 index to a partial investment in a fund that emulates the MSCI Europe, Australia and Far East (EAFE) index. During the period from 1970 to 1996, rebalancing from 100% in U.S. stocks to the minimum variance combination of 61% in the U.S. and 39% in the EAFE reduces monthly portfolio standard deviation by about 1.5% and increases monthly expected return by about 50 basis points.

To estimate the benefits of international equity investment actually attained by U.S. individual investors, we compare the investment performance of each foreign-participating investor with the average performance of investors in her peer group, a set of other investors holding the same number of securities but investing exclusively in U.S. equities. We compute several standard performance measures, including the mean monthly portfolio return, Sharpe ratio, and the multifactor alpha. In addition, we measure raw portfolio volatility since the main stated benefit of foreign investing is reduced volatility.

We find that the mean monthly portfolio return of foreign-inclined investors is very similar to their respective domestic benchmarks (1.28% versus 1.33%). However, as expected, a significant reduction in mean portfolio volatility is achieved through international investing. The mean monthly portfolio volatility reduction is −0.892%, which is statistically significant (p-value < 0.010). Combining the improvements in these two performance measures, we find that investors increase their Sharpe ratios by investing abroad. The mean Sharpe ratio of the "joint" portfolio is 0.196, which is higher than the mean Sharpe ratio of benchmark domestic portfolios (0.114). The mean Sharpe ratio improvement of 0.082 (8.2 basis points per month) is statistically significant.

To quantify the benefits of international investing more accurately, we compute the reduction in portfolio volatility due to the addition of international equities across portfolios with different number of securities. It is likely that the incremental benefits of international investing decrease as the number of securities in the portfolio increases. We find that the incremental benefits of international investing decrease as the number of securities in the portfolio increases, where the mean benefit is highest for a three-security portfolio. For portfolios that contain more than 12 securities, the incremental benefit of international investing is not statistically significant. Overall, contrary to the commonly-held belief that international

diversification is always sensible, our results indicate that international investing may not be necessary for investors who diversify extensively using domestic securities.

If the decision to invest in foreign equities is partially driven by informational reasons, there could also be an improvement in the average alpha of the portfolios of foreign-participating investors. To examine investors' incremental stock selection abilities, we compare the average multifactor alphas of foreign-inclined investors with the corresponding average alphas of their respective domestic peer groups. For robustness, we estimate alphas using both domestic and international factors.[12] When we compute alpha with domestic factors, we find that the mean three-factor alphas for foreign inclined investors and domestic peer groups are −0.343 and −0.420, respectively. The monthly differential of 0.077 corresponds to an annual differential of 0.924%, which is marginally significant in economic terms. However, the annual performance differential is considerably lower (0.468%) when we compute domestic four-factor alphas. Finally, when we compute three-factor alphas using international factors, the annual differential is −0.228%, which is not statistically different from zero. Taken together, the alpha estimates provide weak evidence of performance improvement from international investing.

B. Investor Characteristics and Performance Improvements from International Investing

Next, we seek to identify the characteristics of investors who are able to better exploit the benefits of international investing. Our prior evidence on the profile of investors who are more likely to venture abroad does not paint a consistent picture. On the one hand, internationally-inclined investors are relatively wealthy and more experienced. Those investors may be better able to exploit the benefits of international investing. On the other hand, some internationally inclined investors may trade too frequently or look for speculative opportunities that may not lead to substantial benefits from international investing. Table 7 presents estimates of three cross-sectional regressions, where the dependent variable is the improvement in portfolio volatility, Sharpe Ratio, or 3-Factor Alpha, and the independent variables are portfolio and investor characteristics first introduced in the "participation" regressions. Note that the improvement for portfolio volatility equals the decline in volatility while the improvement in Sharpe Ratio or 3-Factor Alpha is the signed change.

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[12] International alphas use Zhang (2005)'s three-factor model, which is analogous to a Fama-French model.

Among the foreign holdings and trading variables, Table 7 shows evidence of conventional wisdom concerning international equity investment: portfolio volatility and performance improve with foreign equity activity. Among the diversification benefit variables, we see that investors who recognize the value of diversification in their domestic portfolio (diversification level, mutual fund holding, total risk) and are conservative in other respects (domestic portfolio dividend yield) enjoy significant reductions in portfolio variance and, to a lesser degree, increases in portfolio performance as a result of adding foreign equity securities. This echoes earlier findings that some investors seem to follow conventional portfolio management wisdom and benefit as a result.

There is also evidence that more aggressive strategies come at a cost. Investors who are prone to pick speculative domestic stocks or use options enjoy less portfolio variance reduction and poorer Sharpe ratio performance. For example, a one standard deviation increase in domestic equity gambling preference increases portfolio standard deviation by 1.411 percent monthly while options participation increases portfolio standard deviation by 0.774 percent monthly. Investors who trade domestic stocks very frequently (coefficients on domestic portfolio turnover) find that this is associated with poorer Sharpe ratio and alpha performance improvements due to international investing too. For example, a one standard deviation increase in domestic portfolio turnover reduces alpha by a few hundred basis points (−0.024 x 12 x 100) per year.

Among the informational advantage proxies, the volatility improvements are stronger for older and wealthier investors. There are virtually no associations between performance (Sharpe ratio, alpha) and the informational advantage measures. Among the behavioral bias proxies, there is evidence that beneficial declines in portfolio volatility are enjoyed by investors who take a broad view of their portfolio (negative slope on narrow framing) and avoid selling winners too quickly or holding losers too long (negative slope on disposition effect). For the Sharpe ratio and alpha measures of performance, it is clear that overconfidence and, to a lesser degree, a propensity towards the disposition effect are associated with significantly weaker portfolio performance. Consider, for example, the slope coefficient estimate of −0.111 for overconfidence in the regression for alpha. This means that overconfidence costs a considerable amount (0.111 x 12 = 1.332% annualized) of the potential improvement in alpha due to international equity investing. In summary, we

21

again find that some investors appear to take good advantage of opportunities for international diversification while others misuse those opportunities.

7. Summary and Conclusions

There is a large literature documenting home bias, that is, the surprisingly low degree to which investors hold assets beyond their home country. Nevertheless, a considerable number of U.S. individuals invest in foreign equities. In this study, we use an extensive database of individual investor brokerage accounts to test both existing and new explanations for the foreign investment decisions of individual investors. We test for the presence of diversification benefit, informational advantage, and behavioral bias motivations in the portfolio decisions and performance of our extensive sample of individual investors.

There is considerable evidence that rational forces motivate the use of foreign equity investments by some investors. Investors who appear to recognize the value of diversification in their domestic portfolio also tend to use foreign securities. Wealthier or more experienced investors, who are likely to enjoy an informational advantage, are more likely to use foreign securities and enjoy good portfolio performance. However, other investors appear to use foreign equity securities for the wrong reasons. In particular, investors who display behavioral biases in their domestic portfolios often make poor use of foreign equity investment opportunities. Some display the classic home bias pattern and under-use foreign securities while others misuse these securities, applying the same faulty decision-making displayed in their domestic portfolios. Both types of behavioral bias lead to poor portfolio performance. Some of these investors even appear to use foreign securities to make up for poor domestic portfolio performance.

Collectively, our results indicate that the foreign equity vehicles available in the U.S. capital market allow U.S. individual investors to benefit from international diversification. International open end mutual funds appear to be the most straightforward and efficient way for U.S. individual investors to enjoy international diversification. It is ironic that we find evidence that many U.S. investors either ignore or abuse these opportunities.

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Appendix A: Definitions of Explanatory Variables

Variable Name	Definition
Diversification Benefits	
Domestic Portfolio Diversification	The negative of normalized portfolio variance, which is defined as the ratio of portfolio variance and the average portfolio variance of stocks in the portfolio.
Domestic Mutual Fund Holdings	Proportion of domestic mutual funds in the entire equity position in the investor's brokerage portfolio.
Domestic Portfolio Total Risk (Std Dev)	Variance of the domestic portfolio.
Domestic Portfolio Dividend Yield	Dividend yield of the domestic portfolio.
Domestic Portfolio Performance	Sharpe ratio of the domestic portfolios of the investor.
Informational Advantage	
Income	Total annual investor income.
Wealth	Self-reported net worth of the investor.
Domestic Portfolio Size	Sample-period average market capitalization of investor's domestic portfolio.
Time Since Account Opening Date	Time between brokerage account opening date and 31st December 1996.
Age	Age of the head of the household.
Metropolitan Dummy	Dummy variable that is set to one if the investor lives within a 50-mile radius of the twenty largest metropolitan locations and zero otherwise.
Wealth * Metropolitan Dummy	Interaction term between Wealth and Metropolitan Dummy.
Behavioral Biases	
Peer Group Adjusted Narrow Framing	The raw narrow framing measure is defined as (Number of trading days/Number of trades). A high number means that the trades of the investors are temporally separated, and thus the degree of narrow framing is higher. The peer group adjusted measure is obtained by subtracting the mean narrow framing of the peer group and dividing by the standard deviation of the narrow framing measures of the peer group, where the peer group has similar portfolio size, similar number of stocks, and exhibit similar trading frequency. A positive (negative) adjusted narrow framing measure for an investor indicates that she is more (less) likely to adopt a narrow decision frame, compared to other investors in her peer group.
Peer Group Adjusted Disposition Effect	The raw disposition effect is defined as the difference between an investor's actual propensity to realize gains and the propensity to realize losses. The peer group adjusted is carried out as described above. A positive (negative) value of adjusted disposition effect indicates that the investor is more (less) likely to hold on to losers, compared to other investors in her peer group.
Local Bias	Difference in weighted distance between an investor's home and the headquarters of stocks in her portfolio and weighted distance between an investor's location and the headquarters of the stocks in the market portfolio.
Overconfidence Dummy	Dummy variable that equals one for investors in the highest portfolio turnover quintile and the lowest risk-adjusted performance quintile.
Gender Dummy	Dummy variable that equals one if the investor is male, zero otherwise.
Domestic Portfolio Turnover	Turnover of the domestic portfolios of the investor.
Domestic Equity Gambling Preference	Sample period mean weight in lottery-type stocks (i.e., stocks with low prices, high idiosyncratic volatility, and high skewness).
Short-Sell Dummy	Dummy variable equal to one if the investor has short selling trade, zero otherwise.
Options Dummy	Dummy variable equal to one if investor has traded options, zero otherwise.

Table 1
Summary Statistics on Investor Trades and Positions in Foreign Equities

Panel A: Summary Statistics

Number of investors	77,995
Number of investors with domestic equity trades	62,387
Number of investors with foreign equity trades	30,572
Number of investors with foreign equity positions	20,263

Panel B: Summary Statistics by Assets

	International Open End Mutual Funds	ADRs and Foreign-Incorporated Stocks	Closed End Country Funds	Domestic Equities
Number of investors with trades	11,564	21,629	6,103	62,387
Number of investors with positions	4,162	15,589	4,619	55,270
Number of trades	65,367	122,073	31,449	1,854,776
Number of buys	46,531	71,685	18,224	1,015,735
Number of sells	18,836	50,388	13,225	839,041
Number of countries/regions	-	46	44	-
Number of assets traded	142	696	92	10,486
Mean (median) trade size	$9,023 ($4,013)	$10,522 ($4,850)	$8,894 ($4,640)	$12,352 ($5,350)
Mean (median) number of shares traded	636 (259)	729 (300)	584 (300)	661 (200)
Mean (median) size of investor portfolio	$16,383 ($5,707)	$10,877 ($4,849)	$11,771 ($5,540)	$35,629 ($13,869)
Mean (median) number of assets in the portfolio	1.43 (1)	1.22 (1)	1.45 (1)	3.89 (3)

Note: Table 1 summarizes the sample of investors and their investing activities in U.S. listed foreign equities over the period January 1991 to November 1996. Panel A presents the overall summary statistics. Panel B shows the summary statistics by assets. Panel C shows the summary statistics by variables. The individual investor data are from a large U.S. discount brokerage house. In Panel A, the number of investors with domestic (foreign) equity trades (positions) is the number of investors who have traded (held) at least one domestic (foreign) equity security during the sample period. In Panel B, the number of investors with trades and positions in international open end mutual funds, ADRs, foreign incorporated stocks, closed end country funds and domestic equities are reported. The total number of trades, buys, sells, countries, regions and assets are also reported. Finally, we also report the mean trade size, portfolio size, number of shares traded and number of assets listed. Medians are indicated in parentheses. International open end mutual funds are typically global or regional and, therefore, cannot be attributed to particular countries. In Panel C, we list the mean, median, standard deviation, 25th percentile, and 75th percentile for the positions and trades in foreign equities as well as independent variables associated with diversification benefits, informational advantage and behavioral bias hypothesis. The variables are as follows. Weight in International Equity Holdings is the average value of all foreign equities (foreign stocks, open-end funds, closed-end funds, and ADRs) scaled by average size of domestic portfolio, Weight in International Open End Fund Holdings is the average size of the international open end fund portfolio scaled by average size of the domestic portfolio, and Weight in Other Foreign Equities is the average value of foreign stocks, closed-end funds, and ADRs scaled by average size of domestic portfolio. Relative Foreign Trading is the average ratio of foreign trades to domestic trades. Appendix A defines the other independent variables.

Table 2
Investor Characteristics Participation Decisions: Logit Regression Estimates

Dependent Variable is the Participation Dummy for All Foreign Securities in (1) to (4), International Open-End Mutual Funds in (5), and ADRs, Foreign Stocks & Closed-End Country Funds in (6)

Independent Variables	(1) Coeff	z-stat	(2) Coeff	z-stat	(3) Coeff	z-stat	(4) Coeff	z-stat	(5) Coeff	z-stat	(6) Coeff	z-stat
Intercept	0.433	7.832	0.404	3.395	0.388	4.310	0.441	5.002	0.202	6.891	0.167	7.438
Diversification Motives												
Diversification Level of Domestic Portfolio	0.421	20.324					0.420	15.329	0.127	5.392	0.434	11.292
Domestic Mutual Fund Holdings	0.165	23.422					0.107	8.329	0.228	17.417	0.174	5.774
Domestic Portfolio Total Risk	−0.088	−6.392					−0.083	−3.147	−0.073	−3.728	−0.036	−1.704
Domestic Portfolio Dividend Yield	0.050	2.713					0.076	3.258	0.050	3.408	0.075	5.237
Domestic Portfolio Performance (Sharpe Ratio)	−0.078	−4.954					−0.068	−2.226	−0.019	−1.592	−0.023	−2.832
Informational Advantage												
Income			0.043	1.820			0.022	1.056	0.039	2.901	0.012	1.121
Wealth			0.056	4.948			0.071	3.665	0.059	2.099	0.033	2.439
Domestic Portfolio Size			0.128	8.602			0.085	2.411	−0.056	−3.760	0.083	2.967
Time Since Account Opening			0.037	3.511			0.029	2.529	0.020	2.113	0.077	4.366
Age			0.185	9.026			0.154	3.845	0.126	3.011	0.062	4.429
Metropolitan Dummy			0.027	2.608			0.026	2.050	−0.022	−1.626	0.041	2.028
Wealth * Metropolitan Dummy			0.051	3.775			0.042	2.849	0.056	2.841	0.045	3.344
Behavioral Biases and Speculative Motives												
Peer Group Adj Narrow Framing					−0.045	−3.338	−0.042	−2.994	−0.066	−3.055	−0.028	−2.555
Peer Group Adj Disposition Effect					−0.032	−2.710	−0.037	−2.742	−0.106	−2.865	−0.035	−2.558
Local Bias					−0.072	−5.632	−0.074	−3.290	−0.057	−2.621	−0.146	−3.428
Overconfidence Dummy					0.060	4.443	0.046	2.050	0.013	0.846	0.056	2.366
Gender Dummy					0.011	0.759	0.014	1.013	0.016	1.007	0.004	0.267
Domestic Equity Gambling Preference					0.041	3.115	0.023	1.212	−0.085	−3.591	0.073	3.880
Domestic Portfolio Turnover					0.120	11.519	0.115	7.839	0.034	1.264	0.130	8.849
Short-Sell Dummy					0.034	2.059	0.025	1.990	−0.029	−1.881	0.051	2.095
Options Dummy					0.054	3.829	0.049	3.270	−0.042	−2.765	0.066	3.425
Pseudo R^2	8.63%		3.11%		5.30%		11.65%		10.85%		12.01%	
Number of Observations	30,759		25,075		22,470		21,535		21,535		21,535	

Note: Table 2 tests for investor characteristics that explain whether or not a particular individual trades foreign securities. The participation dummy equals one if an investor holds or trades a particular type of foreign security at least once during the 1991 to 1996 period and zero otherwise. Logistic regressions are estimated to explain the participation dummy with household characteristics. Specifications (1) to (4) show results for participation in all foreign securities. Specification (5) shows results for open-end mutual funds. Specification (6) shows results for foreign stocks, closed-end funds or ADRs. Definitions for the independent variables are in Appendix A. Independent variables are standardized so coefficient estimates can be compared within and across regression specifications.

Table 3
Investor Characteristics, Foreign Equity Holdings, and Foreign Equity Trading

Dependent Variable: Average Portfolio Position During the Sample Period

Independent Variables	(1): All Foreign Coeff	(1): All Foreign t-stat	(2): Open-End Only Coeff	(2): Open-End Only t-stat	(3): Exclude Open-End Coeff	(3): Exclude Open-End t-stat
Intercept	−0.005	−0.366	0.008	0.532	−0.006	−0.453
Diversification Motives						
Diversification Level of Domestic Portfolio	0.020	1.365	0.001	0.205	0.036	2.419
Domestic Mutual Fund Holdings	0.097	7.372	0.168	11.950	0.050	3.758
Domestic Portfolio Total Risk (Std Dev)	−0.012	−2.728	−0.014	−2.842	−0.004	−0.277
Domestic Portfolio Dividend Yield	−0.012	−0.846	0.026	1.653	−0.020	−1.333
Domestic Portfolio Performance (Sharpe Ratio)	−0.041	−2.359	−0.031	−2.269	−0.051	−2.990
Informational Advantage						
Income	0.006	0.475	0.020	1.815	0.007	0.492
Wealth	0.057	5.003	0.052	4.091	0.026	2.554
Domestic Portfolio Size	−0.125	−8.380	−0.067	−4.233	−0.118	−7.931
Time since Account Opening Date	0.036	2.579	0.012	0.794	0.041	2.995
Age	0.041	3.470	0.029	2.601	0.018	1.255
Metropolitan Dummy	0.015	1.091	−0.011	−1.734	0.022	2.467
Wealth * Metropolitan Dummy	0.051	4.014	0.043	2.827	0.036	2.087
Behavioral Biases and Speculative Motives						
Peer Group Adjusted Narrow Framing	−0.027	−1.895	−0.0422	−2.307	−0.0136	−0.943
Peer Group Adjusted Disposition Effect	−0.034	−2.425	−0.033	−2.250	−0.032	−1.923
Local bias	−0.030	−2.178	−0.036	−2.341	−0.021	−1.714
Overconfidence Dummy	0.029	2.582	−0.015	−0.834	0.033	2.238
Gender Dummy	−0.004	−0.591	0.033	2.238	−0.017	−1.220
Domestic Portfolio Turnover	0.042	2.741	−0.023	−1.424	0.056	3.681
Domestic Equity Gambling Preference	0.146	9.659	0.017	1.051	0.162	10.712
Short-Sell Dummy	0.013	1.843	−0.016	−0.970	0.022	2.431
Options Dummy	0.026	2.720	0.013	0.793	0.030	1.987
Adjusted R^2		10.06%		6.96%		14.16%
Number of Observations		10,928		10,928		10,928

Note: Table 3 presents estimates of tobit regressions that relate investor's mean relative foreign holding or trading to investor and portfolio characteristics. Results are reported for all foreign equities, international open end mutual funds, and ADRs, other foreign stocks and closed end country funds. Tobit regressions are estimated using the maximum likelihood procedure. Data are from a large U.S. discount brokerage house. Definitions for the independent variables are in Appendix A. The column heading "Open end only" indicates holding or trading of international open end mutual funds only. Independent variables are standardized so coefficient estimates can be compared within and across regression specifications.

Table 4
Lagged Domestic Performance and Foreign Investment Decisions: Split Sample Results

	Panel A: Participation Regressions						*Panel B: Portfolio Holding Regressions*					
	(1): All Foreign		(2): Open-End Only		(3): Exclude Open-End		(1): All Foreign		(2): Open-End Only		(3): Exclude Open-End	
Independent Variables	Coeff	z-stat	Coeff	z-stat	Coeff	z-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	0.15	3.407	0.135	2.450	0.201	5.516	−0.004	−0.402	0.009	0.628	−0.006	−0.337
Lagged Domestic Portfolio Performance	−0.027	−3.226	−0.008	−1.484	−0.028	−3.388	−0.053	−9.360	−0.020	−3.502	−0.071	−8.868
Diversification Motives												
Diversification Level of Domestic Portfolio	0.220	10.800	0.053	9.492	0.434	11.292	0.013	2.345	0.017	2.923	0.036	2.419
Domestic Mutual Fund Holdings	0.163	13.705	0.246	14.803	0.104	5.774	0.126	12.857	0.170	10.503	0.050	3.758
Domestic Portfolio Total Risk (Std Dev)	−0.010	−1.638	−0.047	−7.824	0.036	1.704	0.037	1.114	−0.011	−1.811	0.040	1.277
Domestic Portfolio Dividend Yield	0.021	1.827	−0.008	−1.484	0.057	5.237	−0.015	−3.655	0.001	0.234	−0.020	−4.333
Informational Advantage												
Income	0.016	1.576	0.023	2.196	0.006	0.624	0.003	0.278	0.021	2.043	−0.009	−0.934
Wealth	0.044	3.828	0.07	5.086	0.040	3.52	0.052	4.482	0.055	3.815	0.031	2.706
Domestic Portfolio Size	0.046	4.154	−0.049	−4.381	0.080	7.282	−0.108	−11.642	−0.094	−8.487	−0.097	−8.886
Time since Account Opening Date	0.022	2.134	0.018	2.745	0.032	2.207	0.047	3.729	0.003	0.277	0.052	3.226
Age	0.084	8.002	0.054	5.053	0.098	9.309	0.036	3.463	0.024	2.256	0.038	3.443
Metropolitan Dummy	0.021	1.843	−0.036	−2.089	0.045	3.259	0.011	1.864	−0.018	−1.508	0.023	2.289
Wealth * Metropolitan Dummy	0.037	2.983	0.041	3.304	0.031	2.520	0.049	3.510	0.031	2.496	0.055	2.384
Behavioral Biases and Speculative Motives												
Peer Group Adjusted Narrow Framing	−0.045	−3.338	−0.072	−5.413	−0.031	−2.330	−0.040	−3.099	−0.069	−5.049	−0.018	−1.392
Peer Group Adjusted Disposition Effect	−0.025	−1.740	−0.028	−2.191	−0.024	−3.041	−0.032	−2.543	−0.032	−1.984	−0.026	−2.047
Local bias	−0.072	−5.632	−0.068	−2.225	−0.075	−5.915	−0.044	−3.540	−0.046	−3.568	−0.035	−2.816
Overconfidence Dummy	0.066	3.044	−0.001	−0.082	0.070	5.533	0.041	3.310	0.001	0.106	0.048	3.884
Gender Dummy	0.010	0.759	0.015	1.024	−0.003	−0.235	−0.003	−0.256	0.023	2.032	−0.014	−1.105
Domestic Portfolio Turnover	0.014	1.115	−0.059	−3.943	0.065	4.398	0.048	3.845	−0.039	−2.948	0.070	5.619
Domestic Equity Gambling Preference	0.120	5.159	−0.010	−0.784	0.132	3.015	0.120	9.320	0.038	2.812	0.139	9.184
Short-Sell Dummy	0.053	2.059	−0.030	−1.913	0.073	2.315	0.021	1.942	−0.004	−0.244	0.030	2.128
Options Dummy	0.054	3.829	−0.033	−2.126	0.077	4.001	0.028	2.032	0.009	0.597	0.029	2.127
Adjusted R^2		9.97%		9.37%		9.45%		8.43%		7.10%		9.47%
Number of Observations		15,636		15,636		15,636		7,692		7,692		7,692

Note: Table 4 presents estimates of Logit and Tobit regressions that relate investor's mean relative foreign holding or trading to investor and portfolio characteristics from 1994 to 1996. Lagged domestic portfolio performance refers to the investor's Sharpe ratio in her domestic portfolio from 1991 to 1993. Results are reported for all foreign equities, international open end mutual funds, and ADRs, other foreign stocks and closed end country funds. Data are from a large U.S. discount brokerage house. Definitions for the independent variables are in Appendix A. The column heading "Open end only" indicates holding or trading of international open end mutual funds only. Independent variables are standardized.

Table 5

Explaining ADR and Other Foreign Stock Holdings by Security and Country Characteristics

					Dependent Variable is:							
	Position in ADRs				Position in ADRs				Position in Domestic Stocks			
	(1): Excess		(2): Raw		(3): Excess		(4): Raw		(5): Excess		(6): Raw	
Independent Variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	−0.261	−3.242	−0.296	−3.937	−0.178	−2.718	−0.213	−3.528	0.008	0.743	0.032	4.648
Stock Characteristics												
Stock Volatility	0.229	2.437	0.155	2.900	0.197	2.429	0.190	2.530	0.067	5.750	0.025	3.281
Market Cap	−0.595	−9.555	0.178	3.059	−0.483	−8.258	0.279	5.168	−0.309	−18.762	0.845	20.667
Book-to-Market Ratio	−0.079	−3.014	−0.069	−2.951	−0.059	−2.534	−0.044	−2.435	0.003	0.254	0.004	0.532
3 Month Momentum	0.039	0.511	0.063	0.893	−0.012	−0.179	0.017	0.277	0.004	0.395	0.010	1.362
Number of Analysts	0.302	3.705	0.449	5.894	0.296	4.251	0.412	6.407	0.247	11.722	0.172	14.111
Forecast Dispersion	0.020	0.314	0.029	0.489	0.025	0.429	0.024	0.436	0.002	0.130	0.003	0.253
Lead ADR Dummy	0.209	3.735	0.225	4.308								
Governance Measures												
Capital Mkt Governance	−0.101	−0.399	−0.109	−0.462								
Accounting Standards	0.026	0.236	0.076	0.729								
Anti−Director Rights	−0.003	−0.011	−0.005	−0.021								
GDP Per Capita	0.083	0.608	0.044	0.345								
Country Characteristics												
Emerging Mkt Dummy	0.075	0.504	0.026	0.190								
Mexico Dummy	0.055	2.093	−0.021	−0.174								
Canada Dummy	−0.047	−1.093	−0.019	−0.747								
No of News Stories (Country)	0.103	3.567	0.126	2.871								
Adjusted R^2		29.78%		35.09%		18.43%		30.66%		10.93%		65.07%
Number of observations		537		537		626		626		8,299		8,299

Note: Table 5 explains aggregate portfolio holdings across individual securities. For each foreign security, the sample-period expected weight in the aggregate foreign portfolio equals the market cap of the security divided by the total market cap of the portfolio. The excess weight (actual minus expected) measures the aggregate investor preference for the security. The actual and excess weights are then regressed on stock and home country characteristics. Specifications (1) to (4) examine ADR holdings, while specifications (5) and (6) examine domestic stock holdings. Emerging market dummy equals one if the stock's home country is an emerging market country and zero otherwise. Mexico (Canada) dummy equals one if the stock's home country is Mexico (Canada) and zero otherwise. Lead ADR dummy equals one if the stock is one of the most heavily-traded ADRs from its country. Number of news stories is the total number of news stories on that country from the "Major Business Publications" category of Factiva during the sample period. Stock volatility is the average standard deviation of the stock over the sample period. Market cap is the mean level of market capitalization of the company in the sample period. Book-to-Market ratio is the book equity divided by market capitalization of the firm. 3 month momentum is the return of the stock in the past three months. Number of analysts is the average number of stock analysts covering the stock during the sample-period, and forecast dispersion is the cross-sectional variance of analysts' earnings forecast scaled by the absolute value of the median earnings forecast. Capital market governance measure is a composite index from Daouk, Lee, and Ng (2006) that reflects a country's insider trading law, earning opacity and short selling laws. A higher number reflects improved governance. Accounting standards and anti-director rights are proxies defined in La Porta et al. (1998). GDP per capita in US dollars is obtained from IFS and ICRG. The individual investor data are from a large U.S. discount brokerage house. The analyst and dispersion data come from the I/B/E/S database. The independent variables are standardized.

Table 6
Aggregate Portfolio Holdings: Domestic versus Foreign Securities

Independent Variables	(1) % of Foreign Portfolio Held in ADRs, Individual Foreign Stocks and Closed-End Country Funds		(2) % of Domestic Portfolio Held in Individual Domestic Stocks	
	Coeff	t-stat	Coeff	t-stat
Intercept	−0.007	−0.683	0.004	0.405
Percentage of Domestic Portfolio in Stocks	0.026	4.744		
Diversification Motives				
Diversification Level of Domestic Portfolio	0.269	10.011	0.035	6.251
Domestic Mutual Fund Holdings	0.049	8.909		
Domestic Portfolio Total Risk (Std Dev)	−0.034	−4.684	0.039	6.357
Domestic Portfolio Dividend Yield	−0.034	−2.354	0.015	2.451
Domestic Portfolio Performance (Sharpe Ratio)	−0.033	−5.796	0.053	9.225
Informational Advantage				
Income	0.003	0.320	−0.017	−1.630
Wealth	0.005	0.246	−0.032	−2.038
Domestic Portfolio Size	0.117	6.72	0.173	5.881
Time Since Account Opening Date	0.016	1.625	0.063	6.245
Age	0.070	6.688	0.014	1.345
Metropolitan Dummy	0.018	1.499	0.046	3.819
Wealth * Metropolitan Dummy	−0.003	−0.257	−0.019	−1.935
Behavioral Biases and Speculative Motives				
Peer Group Adjusted Narrow Framing	0.041	3.089	0.111	8.379
Peer Group Adjusted Disposition Effect	0.008	1.653	0.027	2.105
Local Bias	−0.070	−5.529	−0.001	−0.109
Overconfidence Dummy	0.019	2.726	−0.045	−3.553
Gender Dummy	−0.017	−1.317	−0.022	−1.762
Domestic Portfolio Turnover	0.029	2.220	0.005	0.706
Domestic Equity Gambling Preference	0.030	3.279	0.048	3.706
Short-Sell Dummy	0.093	6.516	0.012	0.811
Options Dummy	0.001	0.590	0.013	0.900
Adjusted R^2		10.84%		5.22%
Number of Observations		10,928		17,885

Note: Table 6 presents estimates of regressions that relate the percentage of investor's portfolio invested in individual securities to investor and portfolio characteristics. Specification (1) shows the results for the percentage of foreign portfolio held in ADRs, other foreign stocks and closed end country funds, while specification (2) shows the results for the percentage of domestic portfolio held in individual stocks. Data are from a large U.S. discount brokerage house. Definitions for the independent variables are in Appendix A. Independent variables are standardized so coefficient estimates can be compared within and across regression specifications.

Table 7
Investor Characteristics and Performance Improvement from International Investing

	Dependent Variable is Improvement in:					
	(1): Monthly Percent Portfolio Standard Deviation		(2): Sharpe Ratio (in Percentage)		(3): 3-Factor Alpha using International Factors	
Independent Variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	−0.681	−7.384	1.496	3.083	0.022	0.888
Foreign Holdings and Trading						
Relative Foreign Trading	0.565	5.779	4.242	5.788	0.005	0.184
Weight in International Open-End Funds	1.076	11.283	2.109	2.418	0.087	3.388
Weight in Other Foreign Equities	0.362	3.822	5.218	3.988	0.157	6.025
Diversification Motives						
Diversification Level of Domestic Portfolio	0.890	14.456	4.816	2.759	0.042	2.185
Domestic Mutual Fund Holdings	0.576	10.372	1.317	0.524	0.006	0.435
Domestic Portfolio Total Risk (Std Dev)	−0.597	−4.883	4.067	1.372	0.018	1.165
Domestic Portfolio Dividend Yield	0.649	10.679	4.150	1.454	0.048	3.034
Domestic Portfolio Performance (Sharpe Ratio)	0.118	1.452	11.396	4.310	−0.016	−1.222
Informational Advantage						
Income	0.050	0.539	1.073	0.221	−0.016	−0.628
Wealth	0.125	3.087	3.330	0.845	0.029	1.013
Domestic Portfolio Size	−0.136	−1.280	4.786	1.954	0.012	0.413
Time since Account Opening Date	0.095	2.026	14.443	2.974	0.017	0.675
Age	0.170	2.682	−0.675	−0.137	0.037	1.207
Metropolitan Dummy	−0.298	−2.700	−4.520	−0.938	0.035	1.335
Wealth * Metropolitan Dummy	0.194	1.731	−4.734	−0.983	−0.053	−1.627
Behavioral Biases and Speculative Motives						
Peer Group Adjusted Narrow Framing	−0.710	−2.628	1.079	0.387	0.011	0.320
Peer Group Adjusted Disposition Effect	−0.382	−3.424	−3.415	−2.618	0.005	0.143
Local Bias	−0.062	−0.565	−2.061	−0.389	−0.017	−0.517
Overconfidence Dummy	−0.015	−0.145	−37.310	−7.148	−0.111	−3.365
Gender Dummy	−0.064	−0.588	−7.910	−1.634	−0.055	−1.695
Domestic Equity Gambling Preference	−1.411	−8.740	−11.045	−3.666	−0.031	−1.874
Domestic Portfolio Turnover	0.093	0.808	−9.656	−3.071	−0.024	−2.663
Short-Sell Dummy	−0.115	−0.921	−5.054	−2.352	0.006	0.164
Options Dummy	−0.774	−6.787	−2.689	−1.721	0.043	1.173
Adjusted R^2		15.54%		5.01%		4.33%
Number of Observations		10,928		10,928		10,928

Note: Table 7 reports cross-sectional regressions to explain the performance improvement for individuals who invest in foreign securities at least once during our sample period. The performance improvement for an investor is the difference in her performance minus the average performance of investors who hold the same number of securities but invest only domestically. Performance measures are monthly percent portfolio standard deviation, the percent improvement in monthly Sharpe ratio, and monthly percent three-factor international alpha. Independent variables are described in Appendix A. Foreign trading and holding variables are as follows: relative foreign trading (average ratio of foreign trades to domestic trades), weight in international open end fund holdings (average size of international open end fund portfolio scaled by average size of domestic portfolio), and weight in other foreign equities (average size of foreign stocks, closed-end funds, and ADRs scaled by average size of domestic portfolio). Independent variables are standardized.