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Home Bias at Home: Local Equity Preference in Domestic Portfolios

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ABSTRACT

The strong bias in favor of domestic securities is a well-documented characteristic of international investment portfolios, yet we show that the preference for investing close to home also applies to portfolios of domestic stocks. Specifically, U.S. investment managers exhibit a strong preference for locally headquartered firms, particularly small, highly levered firms that produce nontraded goods. These results suggest that asymmetric information between local and nonlocal investors may drive the preference for geographically proximate investments, and the relation between investment proximity and firm size and leverage may shed light on several well-documented asset pricing anomalies.

THE STRONG PREFERENCE FOR DOMESTIC EQUITIES exhibited by investors in international markets, despite the well-documented gains from international diversification,[1] remains an important yet unresolved empirical puzzle in financial economics. As French and Poterba (1991) document, U.S. equity traders allocate nearly 94 percent of their funds to domestic securities, even though the U.S. equity market comprises less than 48 percent of the global equity market. This phenomenon, dubbed the "home bias puzzle," exists in other countries as well, where investors appear to invest only in their home country, virtually ignoring foreign opportunities.

Though such behavior appears to be grossly inefficient from a diversification standpoint, academics have offered a variety of explanations for this phenomenon. Initial explanations focused on barriers to international investment such as governmental restrictions on foreign and domestic capital flows, foreign taxes, and high transactions costs.[2] Although many of these obstacles to foreign investment have substantially diminished, the propensity to invest in one's home country remains strong. Thus, other explanations have been put forth, which can be broadly grouped into two categories:

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[1] Grubel (1968), Solnik (1974), Eldor, Pines, and Schwartz (1988), and DeSantis and Gerard (1997), among others, document significant benefits from diversifying internationally.

[2] For examples of such explanations see Black (1974) and Stulz (1981a).

explanations associated with the existence of national boundaries (perhaps the distinguishing feature of international capital markets), and explanations associated with a preference for geographic proximity. Under the first set of explanations, when capital crosses political and monetary boundaries, it faces exchange rate fluctuation, variation in regulation, culture, and taxation, and sovereign risk, which many home bias explanations focus on as the primary factors discouraging investment abroad. Some studies argue that informational differences between foreign and domestic investors are the driving force behind home bias, others claim that the primary cause is investor concern about hedging the output of firms that produce goods not traded internationally.[3]

A key point largely overlooked in the debate, however, is that not all home bias explanations rely on properties unique to the international economy. For instance, the existence of national boundaries may amplify information asymmetries and the concern for hedging nontradable goods, but these frictions arise even in the absence of country borders—that is, when only geographic distance separates an investor from potential investments. For example, investors may have easier access to information about companies located near them, preferring to hold local firms rather than distant ones for which they have a relative information advantage. Local investors can talk to employees, managers, and suppliers of the firm; they may obtain important information from the local media; and they may have close personal ties with local executives—all of which may provide them with an information advantage in local stocks. Likewise, investors may prefer proximate investments in order to hedge against price increases in local services or in goods not easily traded outside the local area. More generally, investors may have a preference for geographically proximate investments arising from a number of potential sources. For instance, investors may simply feel more comfortable about local companies, or firms they hear a lot about, or they may have a psychological desire to invest in the local community.[4] Local brokerage firms also may encourage local investment, particularly if close ties exist between brokers and local corporate executives, for which some mutual benefit can be derived from keeping local money in the community.

This paper investigates whether investors have a preference for geographically proximate investments and assesses the importance of such a preference for portfolio choice. Since geographic separation is certainly part of both domestic and international settings, we analyze the effect of geographic proximity (distance) on investment portfolio choice by avoiding confounding factors due to political and monetary boundaries by restricting our attention

[3] Low (1993), Brennan and Cao (1997), and Coval (1996) offer asymmetric information-based explanations of international capital market segmentation. Stockman and Dellas (1989) and a number of subsequent papers suggest the hedging of nontraded goods consumption as a motive for holding domestic securities.

[4] Huberman (1998) finds that individuals choose to invest in their local Regional Bell operating companies more often than any other "baby Bell" even though the companies are listed on the same exchange, and he attributes such behavior to a cognitive bias for the familiar.

to the domestic economy. If international portfolio choice is influenced by frictions associated with distance, then these frictions should play an identifiable domestic role as well.

More generally, this study supplements a recent resurgence in research documenting the economic significance of geography, and represents the first attempt to uncover the effect of distance on domestic portfolio choice.[5] This line of inquiry not only highlights a potential new role for geography in the economy, but may also shed light on various explanations for the international home bias puzzle.

Specifically, we measure the degree of preference for geographically proximate equities exhibited by U.S. money managers in their holdings of U.S.-headquartered companies. Using a unique database of mutual fund manager and company location, identified by latitude and longitude, we find that the average U.S. fund manager invests in companies that are between 160 to 184 kilometers, or 9 to 11 percent, closer to her than the average firm she could have held. Alternatively, one of every 10 companies in a fund manager's portfolio is chosen because it is located in the same city as the manager. Using a variety of measures, the null hypothesis of no local equity preference (or local bias) is consistently rejected, demonstrating that the distance between investors and potential investments is a key determinant of U.S. investment manager portfolio choice.

We also wish to determine why U.S. investment managers, in a setting of a single currency and relatively little geographic variation in regulation, taxation, political risk, language, and culture, prefer to hold companies located close to them.[6] Some clues may exist in how the cross section of firm and manager characteristics relates to the degree of local investment preference.

We find that local equity preference is strongly related to three firm characteristics: firm size, leverage, and output tradability. Specifically, locally held firms tend to be small and highly levered, and they tend to produce goods not traded internationally. These results suggest an information-

[5] Geography continues to play a key role in the domestic economy despite sharp declines in transportation and communication costs and vast increases in information technology, and is the subject of renewed academic debate. For instance, Audretsch and Feldman (1996) test the importance of geographic location for innovative activity in various industries, and Audretsch and Stephan (1996) examine the role of university-based scientists in local biotechnology firms. Jaffe, Trajtenberg, and Henderson (1993) show that knowledge spillovers tend to be geographically localized, although this localization fades over time, and Lerner (1995) finds distance to be an important determinant of the board membership of venture capitalists, where venture capital organizations with offices less than five miles from a firm's headquarters are shown to be twice as likely to provide board members to the firm as those more than 500 miles away. For additional references on the economic significance of geography see Krugman (1991), Lucas (1993), and Zucker, Darby, and Armstrong (1995).

[6] It could be the case that the clients of these money managers are holding a geographically diverse set of funds, and that managers, therefore, invest locally in order to minimize information gathering and travel costs. However, Coval and Moskowitz (1998b) find that clients exhibit a strong preference for local managers.

based explanation for local equity preference because small, highly levered firms, whose products are primarily consumed locally, are exactly those firms where one would expect local investors to have easy access to information and they are firms in which such information would be most valuable. Additionally, the importance of output tradability may lend empirical support for the nontraded goods explanation of the international home bias puzzle, although it is hard to believe that the role of *internationally* traded goods output significantly affects proximity preferences in a domestic setting. Consistent with these findings, Kang and Stulz (1997), in their examination of foreign ownership of Japanese stocks, find that foreign investors underweight small, highly levered firms, and firms that do not have significant exports, which they claim may be a response to the severe information asymmetries associated with such firms.

Furthermore, since size and leverage are associated with higher average returns, and aid in explaining the cross section of expected stock returns,[7] the relation between the propensity to invest locally and these firm characteristics may have important asset pricing implications. For example, Fama and French (1992) argue that such characteristics may proxy for firm risk sensitivities, thus compensating investors with higher average returns. Daniel and Titman (1997) suggest that it is the characteristics themselves that seem to be related to expected returns, having little resemblance to risk. Although the interpretation of the relation between these characteristics and average returns can be debated, evidence in this paper indicates that the influence of geographic proximity on portfolio composition and these cross-sectional asset pricing anomalies may be linked in an important way.

Finally, our analysis may offer insight for determining the importance of distance in international portfolio choice relative to that of national boundaries, assessing how much of the "home bias" phenomenon can truly be considered an international puzzle. Extrapolating our findings to the international scale, we find that distance may account for roughly one-third of the observed home country bias in U.S. portfolios estimated by French and Poterba (1991). That is, as much as one-third of the home bias puzzle may only be a feature of a geographic proximity preference and the relative scale of the world economy, rather than a consequence of national borders. These results should be interpreted only as qualitative evidence of the importance of distance in the international setting, since the amount of international home bias accounted for by a preference for geographic proximity is sensitive to the form of extrapolation employed.

The remainder of this paper is organized as follows. Section I describes the data and methodology employed in our study. Section II outlines and conducts a test for local equity preference, and Section III examines the

[7] See Banz (1981), Bhandari (1988), and Fama and French (1992). Fama and French find leverage and market-to-book to be redundant as firm distress measures and find market to book to have greater explanatory power for expected returns. In our analysis, firm leverage better captures local equity preference than the market-to-book ratio.

relation between a variety of firm characteristics and the degree of proximity preference on portfolio choice. Section IV extends the analysis to include a number of fund manager characteristics, and Section V concludes.

I. Data and Methodology

Our primary data source is *Nelson's 1996 Directory of Investment Managers*, which contains the cross section of 1995 holdings data on the largest U.S. money managers along with their location (city and state). From Compact Disclosure, we obtain the headquarters location of every U.S. company covered by that database.[8] Using latitude and longitude data from the *U.S. Census Bureau's Gazetteer Place and Zip code Database*, we match each fund manager and the headquarters of each U.S. company with the latitude and longitude coordinates. To create our sample, we identify the top 10 holdings of each fund managed by a U.S. investment manager and investing primarily in U.S. equities for 1995,[9] which we define as those funds for which at least five of the top 10 holdings are U.S.-headquartered firms. Using the coordinate data, we compute an arclength between each manager and every firm in which the manager invests or could have invested.

To prevent outliers from dominating the analysis, we restrict our analysis to the continental United States, excluding firms and funds located in Alaska, Hawaii, or Puerto Rico. Although including fund managers and firms located in Alaska, Hawaii, and Puerto Rico may potentially provide the strongest evidence for a geographic proximity preference, our results are only slightly strengthened when we include these funds and firms in the analysis. Since there are very few such funds and firms in our sample, including them marginally affects the results. Hence, to be conservative and for brevity, all results in the paper exclude Alaskan, Hawaiian, and Puerto Rican funds and firms. This also eliminates the possibility that our results are largely driven by these remote locations exaggerating the effect of distance, or that our results are due to more significant cultural differences between these three locations and the rest of the continental United States.

Since we wish to focus on the behavior of managers that are in a position to make portfolio choices, we exclude all index funds from the analysis. The dataset also includes information on fund size, research sources, number of firms followed by the manager, and whether the manager has any branch offices, as well as a number of firm characteristics obtained from the 1995 COMPUSTAT tapes and the 1995 Compact Disclosure database.

[8] We use the headquarters location as opposed to the state of incorporation, for the simple reason that companies tend to incorporate in a state with favorable tax laws, bankruptcy laws, etc., rather than for any operational reasons, and typically do not have the majority of their operations in their state of incorporation. In fact, very few firms in our sample were headquartered in the same state they were incorporated.

[9] The Nelson's dataset only records the top 10 positions of each investment manager. The 10 largest positions typically account for about 30 percent of a manager's total asset value.

Since a wide variety of restrictions prohibit mutual funds from investing in certain companies, our universe of available assets consists only of those companies held by at least one mutual fund,[10] and firms not covered by COMPUSTAT or Compact Disclosure are also excluded. Furthermore, we ignore investments made by one manager in another's fund. While such investments may be locally biased as well,[11] the funds may still ultimately end up invested in a geographically diversified portfolio. Relatively few such investments occur in our sample, and hence are excluded for simplicity. Thus, our final sample consists of 1,189 investment managers running 2,183 different U.S. equity funds with primary holdings in 2,736 different U.S. companies. These managers account for approximately $1.8 trillion of investment in U.S. equities. Table I displays summary statistics for our database of investment managers.

Figure 1 provides an overview of the geographic distribution of our sample of fund managers and the companies they hold across the United States. The axes are marked with the actual latitude and longitude degree values. Interestingly, the graph's distribution of firms and managers resembles a plot of U.S. population by location, suggesting that companies and investment managers simply locate close to the supply of human capital. Overall, investment managers appear to cluster together more than companies, suggesting that they are not simply locating close to labor. For instance, the New York and Boston areas contain a disproportionate share of managers relative to the rest of the country. However, there is generally a fair degree of dispersion of managers throughout the country. In fact, managers from all of the lower 48 states, except Wyoming and the Dakotas, are represented in our sample.

II. A Test for Local Equity Preference

Investors seem to exhibit preferences for certain securities based on a variety of potential characteristics, including risk and return, liquidity, tax considerations, and possibly due to several cognitive biases. In particular, Falkenstein (1996) and others have shown that mutual fund managers also prefer certain types of stocks, for a variety of potential reasons. For instance, Falkenstein (1996) documents that mutual fund managers prefer large, liquid stocks, and stocks that belong to the S&P 500. However, to date, no one has examined whether investors, and in particular fund managers, exhibit geographic preferences, particularly within a domestic setting. In this section, we outline a test for geographically local preferences among fund managers, attempting to control for other factors that might lead to a spu-

[10] Our results are largely unchanged when we expand the universe to all 10,523 firms for which we could obtain data.

[11] Coval and Moskowitz (1998b) find that geographic proximity plays a central role in determining institutional investors' choice of investment managers.

Table I

Summary Statistics of U.S. Investment Managers

All data are from *Nelson's 1996 Directory of Investment Managers*. Summary statistics are reported on funds managed by U.S.-based investment managers that invest primarily in U.S. equities, defined as those funds for which at least five of the top 10 holdings are U.S.-headquartered firms. Fund managers located in Alaska, Hawaii, and Puerto Rico are excluded, and index funds are also removed from the sample. The average percentage of research and number of companies followed regularly are obtained via a survey questionnaire Nelson's sends to each investment manager. Managers are asked to allocate the percentage of research conducted among three categories: (1) in-house, (2) on the street, and (3) consultant/other, as well as report the number of firms they follow on a "regular basis."

Total number of managers:	1189
Managers with branch offices:	426
Managers based in NYC:	347
Number of funds under management:	2183
Total number of different equities held:	2736
Fund size (000's):	
Mean	$820,000
Median	$149,000
Min	$100
Max	$28,702,000
Total	$1,789,509,000
Average percentage of research:	
In-house	66%
Street	28%
Consultant/other	6%
Number of companies followed regularly:	
Mean	748
Median	250
Min	8
Max	10000

rious finding of such preferences. For example, if fund managers prefer stocks belonging to the S&P 500 (regardless of their motivation), and these stocks happen to cluster around the New York area, then it will appear as if fund managers prefer New York-based stocks. If the managers also locate in the New York area, then it will appear as if managers have a proximity preference, when in fact no such preference may exist.

To assess manager preferences for local stocks, while controlling for other preferences managers might have, we conjecture an explicit null hypothesis which claims deviations of manager portfolios from a prespecified benchmark should be unrelated to distance. We begin, simply, with the Capital Asset Pricing Model (CAPM) as our benchmark. However, our null hypothesis is not the CAPM, but rather that deviations from the CAPM-implied portfolio weights are unrelated to distance. We know fund managers deviate from holding the market portfolio, but these deviations should be unrelated

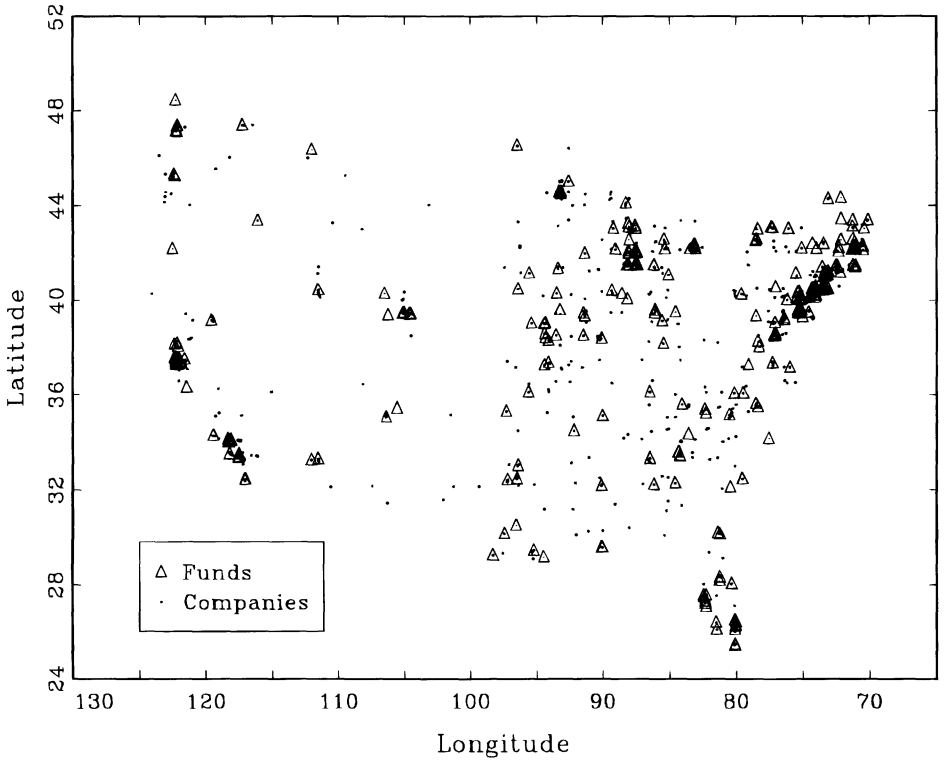

Figure 1. Geographic distribution of U.S. firms and investment managers. Plot of the location of the 1,189 investment fund managers in our sample and the headquarters location of the 2,736 different companies they hold. The horizontal axis contains the actual longitude, converted to degree values, of the fund manager and corporate headquarters location. The vertical axis contains the actual latitude degree values. Latitude and longitude coordinates were obtained from the *U.S. Census Bureau's Gazetteer Place and Zip code Database*. A small amount of random noise was added to each location, so that the mass of funds and companies locating in a given area can be gauged, rather than a single point appearing for New York, for example.

to the manager's distance from the companies she is holding. In other words, each manager holds the market weight of each security plus noise, where disturbances from market weights should be uncorrelated (under the null) with geographic proximity.

More formally, based on this intuition, our test statistic is developed as follows. Suppose there are F different fund managers and n different securities in the economy. Let $m_{i,j}$ represent the portfolio weight on stock j in the benchmark portfolio for which fund manager i is compared. If the market portfolio is the relevant benchmark for all funds, then $m_{i,j}$ is the same across all fund managers i and represents the market value weight of stock j in the

economy. Next, let $h_{i,j}$ represent the actual weight that fund i places on stock j. We then compute the distance, $d_{i,j}$, between fund manager i and the corporate headquarters of stock j as follows:

$$\begin{aligned} d_{i,j} = \arccos\{&\cos(lat_i)\cos(lon_i)\cos(lat_j)\cos(lon_j) \\ &+\cos(lat_i)\sin(lon_i)\cos(lat_j)\sin(lon_j) \\ &+ \sin(lat_i)\sin(lat_j)\}2\pi r/360, \end{aligned} \tag{1}$$

where *lat* and *lon* are latitudes and longitudes (measured in degrees) of the fund manager and company headquarters locations and r is the radius of the earth ($\approx$ 6378 km).

Finally, we compute the average distance of fund i from all securities j it could have invested in, by weighting the distances between manager i and all n stocks in the economy, by the appropriate benchmark weights. More formally,

$$d_i^M = \sum_{j=1}^{n} m_{i,j} d_{i,j}. \tag{2}$$

With variables defined as above, our test for whether fund i exhibits a proximity preference is stated in Proposition 1.

PROPOSITION 1: *Consider the test statistic* $LB_i \equiv \sum_{j=1}^{n}(m_{i,j} - h_{i,j})(d_{i,j}/d_i^M)$, *which measures how much closer fund manager i is to her portfolio than to her benchmark (as a fraction of the distance she is from her benchmark). If deviations from the benchmark portfolio are unrelated to the distance between manager i and the securities she chooses to hold, then the null hypothesis* $H_0: LB_i = 0$ *cannot be rejected.*

Proof: Defining μ to be the unknown true mean of LB_i, we can express the sample mean estimate as:[12]

$$\hat{\mu} = E(m_{i,j} - h_{i,j})E\left(\frac{d_{i,j}}{d_i^M}\right) + \mathrm{Cov}\left(m_{i,j} - h_{i,j}, \frac{d_{i,j}}{d_i^M}\right). \tag{3}$$

Under the benchmark (in this case the market portfolio), the unconditional expectation of deviations from market portfolio weights are zero. Thus, μ will only be nonzero if the second term is nonzero. In other words, the co-

[12] Here, distance can be viewed as a random variable since fund managers choose which securities to hold and the weights assigned to them in the portfolio, both of which determine the average distance a fund manager is from her holdings.

variance between portfolio weight deviations and distance (scaled) determines the value of LB_i, and whether fund manager i exhibits a geographic proximity preference.

More generally, we compute the local bias test statistic, LB_i, for all F fund managers and aggregate the results. For ease of notation let $\mathbf{M}$ denote an $(F \times n)$ matrix in which elements of each row are weights of the n securities in some benchmark portfolio, where the benchmark can differ for each of the F managers. Using the market portfolio as the benchmark for all managers, every row $\mathbf{m_i}$ is the same, where each row represents the market value weights of the n securities in the market. In principle, however, the elements of $\mathbf{M}$ may differ across managers (rows) to reflect other factors that may also influence security choice, such as membership in an index against which the particular manager is measured. Next, let $\mathbf{H}$ denote an $(F \times n)$ matrix in which element $h_{i,j}$ reflects the actual weight of security j in manager i's portfolio, and define the $(F \times n)$ matrix $\mathbf{D}$ such that element $d_{i,j}$ is the distance between manager i and security j. Next, let the matrix $\mathbf{D}^{\mathrm{M}}$ denote the $(F \times F)$ diagonal matrix of benchmark-weighted distances between a given manager and her benchmark portfolio. That is, diagonal element $d^M_{i,i} = \mathbf{m_i'd_i}$, where d_i is the ith row of $\mathbf{D}$. Finally, let $\mathbf{w}$ be an $(F \times 1)$ manager weighting vector whose elements are nonnegative and sum to one. That is, $\mathbf{w}$ assigns weights to fund managers to determine the importance (contribution) each manager has on the test statistic. Two weighting schemes are employed: (1) equally weighting each manager (i.e., $\mathbf{w}$ equals an $(F \times 1)$ vector with all elements equal to $1/F$), and (2) value weighting each manager by the fraction of aggregate total asset value each fund comprises.

The test statistic, LB, is defined as

$$LB \equiv \mathbf{w}'\mathrm{diag}\big((\mathbf{M} - \mathbf{H})(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1})\big) \tag{4}$$

with sample moment estimates as follows:

$$\hat{\mu} = \mathbf{w}'\mathrm{diag}\big(\mathrm{E}(\mathbf{M} - \mathbf{H})\mathrm{E}(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1}) + \mathrm{Cov}(\mathbf{M} - \mathbf{H}, \mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1})\big) \tag{5}$$

$$\hat{\sigma}^2 = \mathbf{w}'\big(\mathrm{diag}\big((\mathbf{M} - \mathbf{H})(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1}) - \mathbf{w}'\mathrm{diag}\big((\mathbf{M} - \mathbf{H})(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1})\big)\big)^2, \tag{6}$$

where $\mathrm{Cov}(X,Y)$ represents the element by element covariance between the entries in matrices X and Y.

A positive LB measure indicates a preference for geographically proximate equities, and a negative measure signifies a preference for distant firms. As the number of fund managers (F) becomes large, LB approximately follows a normal distribution, so test statistics on LB can be computed via sample means and variances and a simple mean test on LB can be applied. Additionally, we have defined distances as percentages or scaled values of a manager's average distance from all stocks (i.e., $\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1}$) in order to normalize distances across fund managers and reduce heteroskedasticity in manager-

holding distances. For instance, a fund manager in Seattle is much farther away from the average stock than a manager in Chicago, and thus may be given more importance and will have higher distance variances than the Chicago-based manager if distances are not scaled appropriately.

This is the basis for our tests of local equity preference. Though our benchmark portfolio has thus far been the market, in subsequent tests we employ other benchmark weights as well. For instance, the relevant benchmark for aggressive growth fund managers would be the aggregate aggressive growth index, defined as the universe of stocks held by aggressive growth fund managers. Therefore, for this subset of managers, the *LB* statistic measures deviations from the relevant aggressive growth index that are correlated with distance. Similarly, a small stock index is employed as the relevant benchmark for small company managers, and so forth. Thus, the elements of **M** differ across managers (rows) to reflect their relevant benchmarks and other influences on security choice. Redefining the benchmark in this manner for subsets of managers alleviates concerns about spurious rejection of the null hypothesis, since managers from each subset are compared relative to the average manager from that subset. Thus, the exogenous location of aggressive growth fund managers, for example, and of growth stocks, cannot drive rejection of the null, since the benchmark portfolio weights already account for the fact that such managers happen to be located near growth stocks. In other words, only deviations in *relative* portfolio weights (relative to other aggressive growth funds) and their correlation with (scaled) distance can lead to rejection.[13]

A. Empirical Results

Table II presents the results for our tests of local equity preference. The tests differ in terms of the benchmark portfolio weights, **M**, and the manager weighting vector, **w**. When firms are equally weighted, the elements of **M** are all $1/n$ (i.e., the benchmark portfolio is the equal-weighted index of all stocks being held by at least one fund), and when firms are value weighted, each column j is firm j's fraction of total market capitalization. When funds are equally weighted, the elements of **w** are all $1/F$, and when funds are value weighted, element w_i is manager i's fraction of the total \$1.8 trillion under management by our sample of fund managers. In addition to reporting the local bias measure, *LB*, Table II also reports the components that comprise the *LB* statistic. Column 2, for instance, reports the average distance fund managers are from the securities they hold in their portfolios

[13] Of course, if location is endogenous, and, under the null, distance is unimportant, then there is no ex ante reason why aggressive growth fund managers should be located near growth stocks. In this case, the benchmark model of the CAPM (market portfolio) seems appropriate for all subsets of fund managers. We ran both sets of tests, however, for robustness, and found very little difference in the results. Therefore, compared to the average manager in the economy, and compared to the average manager in a particular subset, the preference for local equities is exhibited strongly.

Table II

Test for Local Equity Preference among All Nonindex Funds

Tests for local bias are reported for the 2,183 nonindex funds in our sample (1,836 excluding funds based in New York City). All combinations of equal-weighted and value-weighted funds and firms are reported, where value weights for firms (**M**) are the firm's fraction of total market capitalization, and value weights for funds (**w**) are the fund's fraction of total aggregate asset value under management. Also reported are the components that comprise the local bias statistic, *LB*. Column 2, for instance, reports the average distance fund managers are from the securities they hold in their portfolios (i.e., $\mathbf{w}'\text{diag}(\mathbf{HD}')$), where **w** is the weighting vector applied to the F funds, **H** is the $(F \times n)$ matrix of *actual* portfolio weights each of the F fund managers applies to the n stocks in the economy, and **D** is the $(F \times n)$ matrix of distances between fund managers and the headquarters of each stock in the economy. Column 3 reports the average distance fund managers are from their benchmark portfolio (in this case either the equal- or value-weighted index), which is computed as $\mathbf{w}'\text{diag}(\mathbf{MD}')$, where **M** is the $(F \times n)$ matrix of benchmark portfolio weights fund managers are compared to. Column 4 reports the difference between columns 2 and 3, which represents how much closer (in km) managers are actually investing their money relative to their benchmark portfolio. Column 5 reports the *LB* measure (reported as a percentage), which is $\mathbf{w}'\text{diag}((\mathbf{M} - \mathbf{H})(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1}))$. t-statistics for *LB* are reported in the last column. Tests are also run excluding funds located in New York city.

Weights: Funds (**w**)-Firms (**M**)	Avg. Distance from Holdings	Avg. Distance from Benchmark	Difference	Percentage Bias (*LB*)	t-stat
Equal-Equal	1654.18	1814.59	160.41	9.32	14.28
Equal-Value	1654.18	1830.32	176.15	10.31	15.93
Value-Equal	1663.09	1833.30	170.21	10.27	15.21
Value-Value	1663.09	1847.44	184.35	11.20	16.82
Equal-Equal (ex-NYC)	1685.73	1841.03	155.30	8.95	13.36
Value-Value (ex-NYC)	1734.71	1892.32	157.61	9.61	13.95

(i.e., $\mathbf{w}'\text{diag}(\mathbf{HD}')$). Column 3 reports the average distance fund managers are from their benchmark portfolio (in this case either the equal-weighted or value-weighted index), which is computed as $\mathbf{w}'\text{diag}(\mathbf{MD}')$. Column 4 reports the difference between columns 2 and 3, which represents how much closer (in km) managers are actually investing their money relative to their benchmark portfolio. Finally, column 5 reports the *LB* measure (reported as a percentage), which is $\mathbf{w}'\text{diag}(\mathbf{M} - \mathbf{H})(\mathbf{D}'(\mathbf{D}^{\mathrm{M}})^{-1}))$.

Table II shows that, on average, fund managers are 1,654 to 1,663 kilometers away from the securities they choose to hold, and 1,814 to 1,847 kilometers away from their benchmark portfolio. Thus, the average manager invests in securities that are 160 to 184 kilometers closer to her than her benchmark. In percentage terms, managers are investing in securities that are 9.32 percent to 11.20 percent closer to them than the average security in their benchmark portfolio. From columns 5 and 6, we see that the null hypothesis of no local bias is soundly rejected in all test specifications, and appears to be economically significant.

Finally, since many firms and funds are clustered around New York City (NYC), our finding of a local bias may be driven by the exogenous concentration of companies and managers in this area. Therefore, we remove the 347 New York City-based fund managers from our sample, defined as those managers located within 100 km of downtown New York, and recompute our test statistics. As Table II shows, the existence of a strong proximity preference is robust to the exclusion of NYC fund managers.

A.1. Regional, Sector, and Small-Cap Funds

We consider the possibility that our results may be driven by a particular class of fund managers. For instance, a number of funds invest only in stocks from a particular region. If location is unimportant for investing, then these funds could presumably be run from any location, and thus do not necessarily need to be located in the same region they are investing. However, it is interesting to see if there remains a predominant local bias once we exclude regional funds.

We also control for two other types of funds: sector and small-cap funds. Sector funds are excluded because stocks in the same industry or sector tend to cluster geographically, and thus may provide another interesting subset of funds to examine. Additionally, because of the large number of funds focusing on small capitalization stocks, it is interesting to determine if these funds primarily drive the local bias phenomenon. Before excluding these funds from the analysis, however, we run our tests on each of these subsets of funds individually. Results are presented for tests in which firms and funds are both equally weighted and value weighted. As stated earlier, the benchmark portfolios are adjusted in each test to reflect the equal- and value-weighted portfolio appropriate for the class of manager being tested. Thus, for small-cap funds, the appropriate benchmark portfolio is the aggregate small-cap fund holdings of all stocks held by at least one small-cap fund manager. In other words, deviations in portfolio weights of a particular manager are measured relative to the aggregate holdings of all small-cap managers. Similar benchmarks are employed for the regional and sector funds, as well as for all other funds not classified under any of these categories.

As Table III demonstrates, the 14 regional funds exhibit a considerable local bias. The average regional fund holds a portfolio biased between 42 and 53 percent in favor of local securities. This provides additional evidence that investors prefer to be near the pool of investments from which they select, for if investors had no preference for investing in nearby securities, then a fund such as Capital Consultants' WestCap Equity fund (a fund focusing on companies headquartered in the 10 western states) could be just as easily run out of New York City as out of Portland, Oregon, its current headquarters.

The local bias results for sector and small-cap funds are somewhat more ambiguous, and depend heavily on whether equal-weighted or value-weighted specifications are employed. The 85 sector funds exhibit between

Table III

Test for Local Equity Preference across Fund Types

Tests are reported for local bias among four subsets of funds: regional, sector, small-cap, and all others. For each subset of funds, the number of managers, average weighted distance from securities held, average distance from the relevant benchmark portfolio, and the difference between these two measures (both in actual km and in percentage terms) are reported. The benchmark portfolio consists of only those stocks being held by at least one fund in the subclass of funds being analyzed. Both equal- and value-weighting schemes are employed to funds and firms, and *t*-statistics on the local bias measure are provided in the last column.

Fund Type	Weights: Firms-Funds	Avg. Distance from Holdings	Avg. Distance from Benchmark	Difference	Percentage Bias	*t*-stat
Regional:	Equal-Equal	705.73	1593.25	887.52	53.06	6.55
(n = 14)	Value-Value	983.60	1701.82	718.21	41.79	4.89
Sector:	Equal-Equal	1737.04	1801.11	64.07	3.18	0.78
(n = 85)	Value-Value	1672.43	1892.85	220.42	11.62	2.79
Small-cap:	Equal-Equal	1755.36	1879.40	124.03	5.69	3.88
(n = 435)	Value-Value	1814.25	1758.25	−55.99	−5.52	−3.69
All others:	Equal-Equal	1625.83	1793.85	168.02	10.24	14.03
(n = 1676)	Value-Value	1645.27	1853.81	208.54	12.74	16.80

3.2 percent and 11.6 percent local bias, whereas the 435 small-cap funds exhibit between 5.7 percent and −5.5 percent bias. Since both types of funds are more constrained in terms of the set of securities in which they may invest, these results are not entirely unexpected. For example, an automotive sector fund located on the east coast simply will not be in a position to bias locally since there are few local automotive firms. Likewise, the scope for investment by small-cap funds is limited to regions experiencing high economic growth, independent of their proximity to the manager. On the other hand, if distance is important, managers of such funds should locate near the pool of securities in which they expect to invest, much like the regional funds appear to do. One reason this may not be taking place is that, unlike regional funds, small-cap and sector funds are usually part of a large investment firm's family of funds. Therefore, a firm such as Fidelity, with more than 30 different sector funds, will be highly limited in its ability to locate near the firms in each of these sectors; thus the degree of local bias among sector funds may be somewhat weak. The same may be true for small-cap funds.

This is consistent with the empirical evidence as regional funds are typically run by a single manager from a small investment firm, while both sector and small-cap funds are generally part of the largest investment firms' array of funds. However, the negative local bias measure for the value-weighted specification of small-cap funds is puzzling, although this apparent preference for geographically remote firms is quite small, only 56 km farther away than the average small capitalization stock. Most important,

however, is that when regional, sector, and small-cap funds are removed from the sample, the degree of local bias increases to between 10.2 percent and 12.7 percent, verifying that the preference for proximate investments is indeed a broad phenomenon not driven by or restricted to a particular class of fund managers.

B. Comparison to International Home Bias

Thus far, we have established that a significant geographic preference for proximate firms exists among professional money managers within a domestic setting. An interesting question is: How important is this proximity preference in the international setting? To get a qualitative idea of the significance of our results in the context of the international home bias evidence, we project our findings onto the international scale by extrapolating our results using global distances. In this way, we can obtain a rough measure of how much of the home bias in international portfolios can be attributed solely to a preference for geographic proximity.

Our most conservative domestic results, when firms and managers are equally weighted, reveal a 9.32 percent local bias, where the average security is 1815 kilometers away from the average fund manager. Determining how much of the international home bias can be attributed to a preference for local securities, given the vast distances separating investors from potential investments in the global setting, may be difficult. One possibility is to simply allow for a linear extrapolation of our results; to shift 9.32 percent of the market capitalization weight of a country in the global market portfolio to the domestic economy for every 1,815 kilometers that separate the country from the investor. A potential problem with this approach is that it may induce short positions in very distant countries. Another possibility, is to reduce overseas holdings proportionately, by shifting 9.32 percent of the country's remaining portfolio weight to the domestic economy for every 1,815 kilometers that separate the country and the investor. Denoting s as the home country's share of the world market and d as its distance from the United States investor, each country's distance-adjusted portfolio share is computed as $s^d = s * (1 - 0.0932)^{d/1815}$. Table IV compares the weights of Japan, the U.K., France, Germany, Canada, and the United States in the world market portfolio to weights of portfolios constructed using proportional extrapolation of our calculated domestic distance effect to international scales, and to French and Poterba's (1991) estimates of the U.S. portfolio share allocated among these countries at the end of 1989.

As illustrated in Table IV, distance may indeed account for a substantial portion of the home bias phenomenon. The distance-adjusted portfolio weights appear to move portfolio shares about one-third of the way between the market and actual weights. In other words, perhaps as much as one-third of the home-bias puzzle is not an international puzzle at all, but merely a feature of the scale of the world economy and a preference for proximate investments. The distance or proximity effect explains some of the relative

Table IV

The Distance Effect on U.S. Equity Portfolio Weights

Market capitalization weights of the United States, Japan, United Kingdom, France, Germany, and Canada in the world market portfolio are compared to actual weights assigned by U.S. investors to these countries based on the results from French and Poterba (1991) using 1989 capital flows data, and to distance-adjusted weights calculated by shifting 9.32 percent of a country's remaining market capitalization weight to the United States for every 1,815 km that separate the country from the United States (New York City). Denoting s as each country's share of the world market and d as its distance from the United States, each country's distance-adjusted portfolio share is computed as $s^d = s * (1 - 0.0932)^{d/1815}$

	Portfolio Weights			Distance from NYC (km)
	Market Weight	Actual Weight	Distance-Adjusted	
U.S. (New York)	0.478	0.938	0.655	0
Japan (Tokyo)	0.265	0.031	0.147	10918
U.K. (London)	0.138	0.011	0.102	5602
France (Paris)	0.043	0.005	0.031	5871
Germany (Frankfurt)	0.038	0.005	0.028	6042
Canada (Toronto)	0.038	0.010	0.037	551

U.S. holdings as well. For example, Canadian equities represent a smaller share of the world portfolio than those of either Germany or France and yet account for twice as much of the average U.S. portfolio. When distance is taken into account, the picture improves substantially, as the Canadian distance-adjusted weight is larger than that of Germany or France, consistent with the actual weights U.S. investors assigned to these countries.

The above computations raise several issues worth considering. First, our measures of local bias focus solely on investment manager holdings. However, since individual investors hold almost half of all U.S. equity, a measure of their degree of local preference is required for a complete assessment of the distance effect in both domestic and international settings. However, our calculations for fund manager local preference may be closer to a lower bound on individual investor local preferences, since individuals likely exhibit stronger geographic preferences than professional money managers. For instance, if local equity preference is the result of a local information advantage, then individual investors trading distant securities are expected to be at an even greater disadvantage than institutional investors, who have extensive resources, research facilities, and contacts that make information easier to acquire. The international evidence appears to support this view, as institutions account for a relatively large share of U.S. investment holdings abroad. Thus, our results appear conservative, and will likely be strengthened if individual investor preferences are included.

Second, we should consider the possibility that although managers bias locally, clients of the fund may diversify geographically among managers. Thus, the correct metric to apply to the international setting is actually a product of clients' local manager preference, and managers' local stock pref-

erence. This issue is addressed by Coval and Moskowitz (1998b), who investigate client selections of investment managers and find that clients tend to invest with managers who are approximately 30 percent closer than the average manager. When extrapolated to international distances, this suggests that clients are highly averse to investing with managers based overseas. As a result, we remain confident that the above calculations, though somewhat crude, are a fairly realistic picture of the effect of distance on international portfolio holdings.

Finally, distance itself, particularly in the international context, might be more usefully thought of in terms of "economic distance." For example, compared with Paris, in economic terms London may be considerably closer to New York than the 269 kilometer (4.5 percent) difference in physical distance suggests. Integrating information contained in varying languages, cultures, airline routes, and phone rates, for example, may provide a richer characterization of the financial frictions associated with geographic distance. Qualitatively, however, geographic distance alone appears relevant for both domestic and international portfolio choice.

III. Local Bias and Firm Characteristics

More generally, whether or not a geographic proximity preference is responsible for or contributes to the international home bias phenomenon, we wish to understand why a proximity preference exists, particularly among professional money managers. In this section, we examine whether the preference for local equities varies across different kinds of firms. Identifying traits common to locally favored firms will improve our understanding of why investment managers bias their portfolios locally. We begin by examining the relation between the propensity to invest locally and a variety of firm characteristics, including accounting numbers, market values, employment figures, and sector data.

A. Regression Specification

Our dependent variable in the following analysis is the local bias exhibited by a fund manager (in percentage terms) in a particular *holding*, thus preserving potential information contained in the cross-sectional variation within a given manager's portfolio. For instance, if fund manager i holds 10 securities in her portfolio, then the distance between her and the first security she holds, multiplied by the difference between the benchmark weight applied to that security and the actual weight she applies, scaled by the average distance she is from her benchmark, is the first observation of the dependent variable. Formally, this first sample point for the dependent variable can be expressed as

$$y_{i,1} = (m_{i,1} - h_{i,1}) \frac{d_{i,1}}{d_i^M}. \tag{7}$$

This calculation is repeated for the nine other securities fund manager i holds in her portfolio. The cross section of these 10 local bias measures are then regressed on the various characteristics of the 10 securities she chose to hold. This allows us to gauge the influence (if any) that the type of firm has on the propensity for fund manager i to invest locally. Hence, the regression coefficients can be interpreted as the increase in (percent) local bias of a particular holding when the firm characteristic is one unit larger. This regression is run across all fund managers, where the dependent variable is an $(N \times 1)$ vector of local bias measures, with N being the total number of fund manager holdings (N = 18,187).

The cost of such an approach is that now the error terms will no longer be independent across a particular manager's portfolio. To accommodate this correlation, we run a Feasible Generalized Least Squares regression (FGLS) to allow for nonzero off-diagonal elements of the error variance-covariance matrix. Specifically, letting $\mathbf{Y}$ be the $(N \times 1)$ vector of dependent variables, and defining $\mathbf{X}$ as the $(N \times k)$ matrix of independent variables, where k is the number of firm characteristics we explore to describe the degree of local bias, our regression model is expressed as

$$\mathbf{y} = \mathbf{X}\beta + \epsilon, \tag{8}$$

$$\mathrm{E}(\epsilon\epsilon') = \sigma^2\mathbf{\Omega}, \tag{9}$$

where β is the $(k \times 1)$ vector of coefficients on the firm characteristics, σ^2 is a scalar, and Ω is an $(N \times N)$ matrix with element $\omega_{i,j} = 1$ if $i = j$, $\omega_{i,j} = \rho$ if holdings i and j belong to the same fund manager, and $\omega_{i,j} = 0$ otherwise. Using the iterative two-step procedure of Oberhofer and Kmenta (1974), we estimate ρ jointly with β and σ^2.

B. Multivariate Regressions

For brevity, the results reported for the remainder of the paper correspond to a benchmark portfolio of the equal-weighted index. However, our results are largely unchanged when we use a value-weighted index as the benchmark for the dependent variable. The first three regressions incorporate the same firm characteristics as those in Kang and Stulz (1997): firm size (market capitalization), leverage, current ratio, return on assets, and market-to-book ratio. A fourth regression adds firm employees and a tradable/nontradable dummy variable explained below.

The first regression (regression A) includes only the log of firm size. As mentioned earlier, Kang and Stulz (1997) find that foreign investors overweight large firms when investing in Japanese equities. They argue that this behavior may be related to the lower information asymmetries associated with large firms. Including firm size in our regression allows us to address whether this effect is present within a domestic setting and thus whether it is related to distance.

In regression B, we add to the first regression a pair of accounting figures: leverage and the current ratio. Leverage, defined as the ratio of total liabilities to total assets, is often used as a measure of firm distress, and the current ratio, which measures the ratio of current assets to current liabilities, captures the short-run financial health of a firm. Thus, the current ratio complements the leverage variable, allowing us to identify the horizon at which financial distress may be most important.

In regression C, we add return on assets and the market-to-book ratio to the other three firm characteristics. A firm's return on assets (ROA), defined as the ratio of income before extraordinary items divided by total assets plus accumulated depreciation, is a useful measure of accounting performance. Firm market-to-book ratios provide a measure of a firm's potential growth and may indicate whether managers prefer local firms which have experienced price run-ups and whose market values may reflect substantial growth opportunities. It is also possible that the market-to-book ratio represents a systematic firm distress factor as Chan and Chen (1988) and Fama and French (1992, 1993, 1996) argue. If market-to-book ratios signal the exposure of firms to an economy-wide distress factor, then we can see whether investors respond differently to a firm's relative distress sensitivity, depending on their proximity to the firm.

Finally, in regression D, we look at the number of employees of the firm and the tradability of firm output in relation to local bias, by adding these variables to our model. The number of employees helps determine whether managers obtain information from the labor side of production. In particular, if managers obtain private information through the employees of local firms, manager holdings may be concentrated in firms with more employees. The number of employees also provides a non–market value measure of a firm's size. To assess the impact of output tradability, we include a dummy variable identifying firms that had positive total foreign sales recorded in COMPUSTAT's 1994 Geographic Segment File. Of our sample of firms, 37 percent are assigned a traded-goods indicator (i.e., had positive foreign sales). Examining output tradability is supported by a number of authors who have argued that investors may be concerned with the correlation between the return on their investments and the degree of availability of the goods that they consume.[14] In particular, Stockman and Dellas (1989) argue that investor concern over the correlation between investment returns and their consumption of nontraded goods compels them to hold equity in firms that produce these goods. If these motives are important for investment managers, we should expect them to overweight local firms that produce nontradable goods. However, our measure of tradability, whether a firm had positive foreign sales, is probably a very crude measure of the tradability of a firm's output

[14] This proposed relation is not necessarily straightforward. For examples of such models, see Stulz (1981b), Adler and Dumas (1983), Stockman and Dellas (1989), Backus and Smith (1993), Tesar (1993), Uppal (1993), Ghosh and Pesenti (1994), and Serrat (1997).

in a *domestic* setting. Some of the firms with no foreign sales do in fact produce goods not easily transferable across distances (i.e., construction, highways, services, etc.), but others may produce highly tradable products that simply do not traverse international boundaries for any number of reasons. Thus, the tradable dummy variable may be better interpreted in an informational role, as Kang and Stulz (1997) suggest, where the relation between the export propensity of firms and foreign ownership may be due to information asymmetries rather than concerns for hedging nontradable goods.[15]

C. Empirical Results

Table V reports the results of our regressions of local bias on these various firm characteristics. As the table demonstrates, size, leverage, and the traded-goods dummy are highly economically and statistically significant in all regressions. Examining the results from regression A, we see that managers' investments in large firms tend to be further away than those in small firms, as the size coefficient is significant at the five percent level. Controlling for other firm characteristics, primarily leverage, the size coefficient is significant at the one percent level. Moreover, a one-standard deviation decrease in log-size increases the propensity to invest locally by one and a half percent, indicating an economically significant relation between size and degree of local bias as well. This result is consistent with Kang and Stulz (1997), who find that foreigners prefer larger firms when investing in the Japanese market, and suggests that the preference for large Japanese equities is at least partly due to a proximity preference rather than a national border effect.

Turning next to our distress variables, leverage is highly significant, with t-statistics over 18, and a one standard deviation increase in leverage is associated with holdings biased approximately 10 percent closer to the manager. When we control for other characteristics, the significance of the leverage coefficient remains unchanged. This result is also consistent with the findings of Kang and Stulz (1997), although they find the foreign investor preference for low-leverage firms disappears when controlling for size. The current ratio, however, is insignificant, suggesting that important firm distress information is better captured by the long-run leverage measure than the short-run current ratio.

In regression C, the return on assets is significant at the one percent level, indicating that investors favor local firms with relatively poor accounting performance. However, this preference is not manifested in an economically important way. To illustrate, consider a holding that has a return on assets of 26.9 percent (which is an ROA 20 percent above the mean). Although fewer than one percent of all holdings enjoy such a high ROA, this translates into a decrease in local preference of only 0.33 percent. Thus, a

[15] We thank the referee for pointing this out.

Table V

Multivariate Regression (Firm Characteristics)

The dependent variable in the following regressions is the local bias exhibited by a fund manager in a particular holding. The local bias of each holding is calculated as a percentage by multiplying the distance between the manager and each of her holdings by the difference between her benchmark weight applied to each stock and the actual weight she assigned to each stock, divided by the weighted average distance the fund manager is from her benchmark. More formally, $y_{i,j} = (m_{i,j} - h_{i,j})(d_{i,j}/d_i^M)$, $\forall i,j$, where $m_{i,j}$ is the portfolio weight of stock j in fund manager i's benchmark portfolio, $h_{i,j}$ is the actual weight fund manager i assigns to stock j, $d_{i,j}$ is the distance between manager i and stock j, and d_i^M is the weighted average distance between manager i and her benchmark (i.e., $d_i^M = \sum_j m_{i,j} d_{i,j}$). The regression is run across all fund managers and all of their holdings (18,187 observations) on various firm characteristics. The benchmark portfolio employed is the equal-weighted index of all stocks held by at least one fund. Regressions are run using a Feasible Generalized Least Squares (FGLS) procedure described in Section III.A, where the correlation estimate, ρ (%), from that procedure is reported at the bottom of the table. Coefficient estimates on the firm characteristics are reported, along with their t-statistics in parentheses.

Regression	A	B	C	D
Constant	22.86**	16.74*	17.48**	17.12**
	(3.50)	(2.60)	(2.71)	(2.33)
ln(MV)	−0.60*	−1.46**	−1.53**	−1.39**
	(−2.07)	(−5.04)	(−5.20)	(−4.10)
Leverage		42.65**	43.16**	40.60**
		(18.24)	(18.33)	(16.93)
Current ratio		0.24	0.26	0.29
		(0.50)	(0.55)	(0.62)
Return on assets			−1.25**	−1.21**
			(−2.91)	(−2.84)
Market-book ratio			0.15	0.23
			(1.23)	(1.85)
Employees (thousands)				0.02**
				(4.33)
Tradable dummy				−7.91**
				(−6.76)
ρ	9.50	8.81	8.79	8.85

* , ** Significant at the 5 and 1 percent levels, respectively.

firm's return on assets appears, at best, marginally important in accounting for local bias. The lack of significance of the market-to-book ratio for explaining local bias is likely due to the strong explanatory power of the leverage variable in capturing firm distress. Thus, leverage appears to be the only relevant firm distress variable accounting for local bias.[16]

[16] Fama and French (1992) find that leverage and market to book are redundant firm distress factors, but that market to book has stronger explanatory power for capturing cross-sectional variation in expected returns. In terms of explaining the propensity to invest locally, we find leverage to have greater explanatory power.

Finally, in regression D, adding the number of firm employees as well as the tradable-goods dummy, both variables are significant at the one percent level, yet only the traded-goods dummy appears economically important. A one-standard deviation increase in number of employees only increases local bias by 0.2 percent. On the other hand, holdings of firms whose output is nontradable, as measured by an absence of foreign sales, exhibit a 7.9 percent greater bias than firms producing tradable goods. This finding is consistent with the international evidence of Kang and Stulz (1997) who document a preference by foreign investors for firms with substantial exports, which may indicate the lower degree of information asymmetry associated with these firms. Likewise, firms with primarily local sales have higher information costs, and may be difficult to evaluate at a distance. The preference of local money managers for these firms is consistent with this information story, since local managers, who presumably have a local informational advantage, can better exploit that advantage in these firms. Furthermore, the strong relation between the traded-goods dummy and local bias may lend support to nontraded goods hedging explanations for the international home bias puzzle, if the tradability of goods is just as likely associated with distance as it is with political boundaries.[17]

D. Implications for Informed Trading

Overall, the regression results are supportive of an information-based explanation for local equity preference. In addition to the interpretation of our results for the traded-goods variable, the relation between the degree of proximate investment and size and leverage is perhaps the best evidence of an asymmetric information interpretation for the effect of distance on portfolio choice. For instance, in Merton (1987), it is argued that there are several important costs associated with the conveyance of useful information from the firm to the investor. Not only must the firm take steps toward signaling accurate information, but the investor also needs to be equipped to receive these signals. Since a particular manager cannot follow all publicly traded securities, Merton (1987) argues that investors select specific firms for which to incur "receiver set-up costs."[18] If such costs are similar in absolute terms across firm size, then, relative to the costs of trading such information (i.e., liquidity costs), these costs are larger in smaller firms. Of course, ceteris paribus, investors are compensated for these costs. The question, though, is which investors will do so most willingly? Clearly, investors with lower fixed set-up costs will choose to incur the costs. In the present

[17] Whether this is or is not the case is beyond the scope of this paper. However, for an analysis of the relative importance of borders and distance in inhibiting the tradability of goods between the United States and Canada, see Engel and Rogers (1996).

[18] Merton (1987), p. 489.

case, it seems that proximity may be lowering this fixed cost, with small firms offering the proportionately largest decline. As a result, local investors appear to have the largest comparative advantage informatively trading in small firms.

Our finding that leverage significantly accounts for local bias cannot be fully explained by receiver set-up costs, however, as it is difficult to see why highly levered firms should have relatively lower set-up costs for local investors. The significance of the leverage variable is most likely accounted for by its association with future earnings variance. That is, highly levered firms have greater future returns uncertainty. In Coval (1996), it is shown that this variance is associated with larger holdings by informed investors. Because uninformed investors face more severe adverse selection when investing in such securities, they hold relatively smaller proportions than informed investors. If local investors obtain superior forecasts of future returns, their shares should be largest in firms for which these forecasts are most valuable. Of course, the same argument also applies to small firms, whose cash flows appear more volatile as well.

Perhaps the more intriguing result is that the size and leverage firm characteristics have been identified as significant explanatory variables for the cross section of expected returns. Numerous studies have documented the apparent abnormal returns associated with small, highly levered firms. Fama and French (1992, 1993, 1996) suggest that such firm characteristics proxy for earnings risk factors, compensating investors with higher average returns. This point is consistent with the findings of Shumway (1996), who shows that firm size and leverage are important in constructing bankruptcy hazard rates. The evidence presented here suggests that because local investors have more accurate estimates of future earnings prospects, they may expose themselves more willingly to earnings risk factors. In other words, investors are willing to place larger and riskier bets on firms they know more about. Thus, risky firms (i.e., small, highly levered firms) are more likely to be held by local investors. Another possibility is that if size and leverage are proxies for systematic risk, then perhaps local investors understand local firms' exposure to these factors better than do nonlocal investors. Thus, an apparent relation between size and leverage and the propensity to invest locally will exist. Alternatively, size and leverage may simply proxy for the degree of local ownership of a firm, which may measure the degree of asymmetric information or adverse selection faced by outside investors. These issues are explored in Coval and Moskowitz (1998a) and are left for further research.

Finally, it is worth emphasizing that if investors can costlessly hold diversified portfolios of distant, small, highly levered securities, abnormal returns on such portfolios should eventually be arbitraged away. Distance-associated information asymmetries will offer a resolution to the cross-sectional returns puzzles only when barriers to such arbitrage activity are identified.

IV. Manager Characteristics and Local Bias

In addition to examining the relationship of firm characteristics to local equity preference, we also consider manager characteristics associated with this preference. Two goals motivate this line of inquiry. First, we are interested in determining whether local bias is concentrated among a narrow subset of managers or is common across the investment management industry. Second, we want to know why managers prefer to invest locally, and what drives this proximity preference. Since the results of the previous section indicate an association between local preference and private information, we look for further evidence that locally biased managers obtain superior local information. Moreover, to verify the robustness of our results, we run our regressions on four different sets of managers: the full sample, all nonregional and nonsector funds, small-cap funds, and all funds that are not regional, sector, or small-cap.

We consider four manager characteristics. The first, the natural logarithm of a fund's total asset value under management, represents fund size as well as resources available for investment research. However, although larger managers may have a greater ability to obtain information, this information is likely to be spread thin across their considerable pool of holdings. The second characteristic, a dummy variable indicating whether the manager has any branch offices, is an indirect measure of size and is expected to supply two additional characteristics to our study: the geographical dispersion of the investor base and the sources of firm research and information. Coval and Moskowitz (1998b) show that firms with subsidiaries have a more widely dispersed investor base than those with a single office. Additionally, if manager research and information acquisition are carried out at the branch level, the indicator variable should capture any effect of geographically dispersed sources of investment research and information.

Our final two manager variables characterize research styles. Our first variable captures the percentage of manager research which is generated in-house. If managers invest locally because of some informational advantage, it may be useful to identify the source of this edge. Presumably, in-house information would have an advantage over "street" research in obtaining local firm information, to the extent that street research originates in New York City and not the manager's city. Our second variable addresses the number of companies followed regularly by the manager.[19] Again, if local equity preference is driven by information asymmetries, it will be helpful to understand whether managers obtain information by following a limited number of stocks or by casting their net more widely.[20]

[19] The average percentage of research and number of companies followed regularly are obtained via a survey questionnaire Nelson's sends to each investment manager. Managers are asked to allocate the percentage of research conducted among three categories: (1) in-house, (2) on the street, and (3) consultant/other, as well as report the number of firms they follow on a "regular basis."

[20] Because of the highly skewed dispersion of this variable, we use the log of the number of companies.

Table VI

Multivariate Regression (Firm and Manager Characteristics)

The dependent variable in the following regressions is the local bias exhibited by a fund manager in a particular holding. The local bias of each holding is calculated as a percentage by multiplying the distance between the manager and each of her holdings by the difference between her benchmark weight applied to each stock and the actual weight she assigned to each stock, divided by the weighted average distance the fund manager is from her benchmark. More formally, $y_{i,j} = (m_{i,j} - h_{i,j})(d_{i,j}/d_i^M)\ \forall i,j$ where $m_{i,j}$ is the portfolio weight of stock j in fund manager i's benchmark portfolio, $h_{i,j}$ is the actual weight fund manager i assigns to stock j, $d_{i,j}$ is the distance between manager i and stock j, and d_i^M is the weighted average distance between manager i and her benchmark (i.e., $d_i^M = \sum_j m_{i,j} d_{i,j}$). The regression is run across all fund managers and all of their holdings (18,187 observations) on various firm *and manager* characteristics. The benchmark portfolio employed is the equal-weighted index of all stocks held by at least one fund. Regressions are run using a Feasible Generalized Least Squares (FGLS) procedure described in Section III.A, where the correlation estimate, ρ (%), from that procedure is reported at the bottom of the table. Finally, regressions are run on the full sample of funds, funds not classified as regional (R) or sector funds (S), only small capitalization funds (SC), and all funds not classified as regional, sector, or small-cap. Coefficient estimates on the firm and manager characteristics are reported, along with their t-statistics in parentheses.

Regression:	Full Sample	Non-R,S	Small-Cap	Non-R,S,SC
Constant	27.62**	24.23**	74.92**	33.01**
	(2.78)	(2.41)	(3.24)	(2.80)
ln(MV)	−1.58**	−1.47**	−2.87**	−2.14**
	(−4.31)	(−3.95)	(−2.91)	(−4.89)
Leverage	38.53**	38.61**	17.49**	49.16**
	(15.14)	(14.93)	(3.67)	(15.41)
Current ratio	0.11	0.09	1.79	−0.02
	(0.22)	(0.17)	(0.87)	(−0.03)
Return on assets	−1.16**	−1.13**	−0.81	−8.53**
	(−2.73)	(−2.65)	(−1.83)	(−4.13)
Market-to-book ratio	0.28*	0.32*	0.28	0.48**
	(2.17)	(2.39)	(1.46)	(2.67)
Employees (thousands)	0.02**	0.02**	0.08*	0.02**
	(3.58)	(3.70)	(2.39)	(2.54)
Tradable dummy	−7.67**	−7.68**	−7.62**	−7.21**
	(−6.14)	(−6.05)	(−2.43)	(−5.19)
ln(Manager assets)	−0.06	−0.04	−1.42	0.09
	(−0.16)	(−0.11)	(−1.66)	(0.21)
Branch office dummy	1.37	1.63	3.64	1.47
	(0.93)	(1.10)	(1.16)	(0.87)
% Research in-house	0.01	0.01	0.01	0.01
	(0.28)	(0.40)	(0.19)	(0.35)
ln(companies followed)	−0.79	−0.83	0.66	−1.04
	(−1.54)	(−1.63)	(0.55)	(−1.84)
ρ	8.60	8.16	6.77	8.58

* , ** Significant at the 5 and 1 percent levels, respectively.

The results of the manager characteristic regressions are presented in Table VI. As shown in the table, neither assets under management nor the branch office indicator variable seem to have additional explanatory power

for local bias. While a manager's assets seem to be negatively related to local bias, with smaller funds more inclined to have a local bias, this result is not statistically significant. The branch office dummy, though positively related to local bias, is also statistically insignificant. The lack of branch office explanatory power may be due to two opposing effects. On the one hand, managers with branch offices have a more geographically dispersed investor base, and if their clients' other income sources are not tied to the local economy, these managers might be more inclined to have a local bias. On the other hand, if these managers obtain substantial information from branch offices, any informational advantage they obtain is less likely to be geographically concentrated at the headquarters. The net result of these two effects may be somewhat ambiguous.

In-house research is not associated with local bias with any economic or statistical significance; however since these data were obtained from surveys, we question the reliability of this measure and thus place little weight on these particular results. Our final variable, the number of firms followed regularly by the manager, is of economic but only marginal statistical significance in accounting for local bias. Managers that focus research resources on a few firms are more inclined to favor those that are geographically proximate. A one-standard deviation increase in the log-scaled number of firms tracked leads to a decrease in local bias of 1.0 to 1.3 percent. This result provides a degree of additional support for an information-based explanation of the proximity preference. If a manager's comparative advantage is obtaining local information, then the optimal allocation of research resources would suggest they be restricted to the set of local firms.

Finally, the lack of importance of these manager characteristics in explaining local bias and the consistency of the size, leverage, and tradable dummy coefficients across the four subsets of funds indicate that the preference for small, highly levered local firms, which produce nontraded goods, is robust across a wide variety of manager and fund types.

V. Summary and Conclusion

Although home bias is regarded as an intriguing and important puzzle in international finance, researchers differ in explaining why investors consistently favor domestic securities. Home bias explanations can be assigned to two groups: those that rely on national/governmental frictions and those that rely on frictions associated with distance. As we demonstrate in this study, since the latter set of frictions is not unique to the international economy, the distance effect can be gauged by examining domestic investment portfolios. Indeed, judging from the domestic evidence in this paper, geographic proximity plays an important role in determining investor portfolio choice. On an international scale, investment proximity may account for a large portion of the observed abstinence in holdings of foreign securities.

Furthermore, we identify several firm characteristics that account for a substantial fraction of the local equity preference. Specifically, local holdings tend to be in small, nontraded-goods-producing firms with high degrees of financial leverage. These results suggest that information asymmetries may be driving the observed preference for geographically proximate firms. Moreover, they may indicate an important link between local equity preference and the cross-sectional asset pricing implications associated with size and firm distress. Finally, these results are common across a variety of manager types and fund classes.

This research suggests a number of promising directions for further inquiry. First, to fully understand the relationship between local equity preference and cross-sectional asset pricing anomalies, we need a careful measurement of the performance of locally held firms over time.[21] Second, the definition of firm location could be further explored. For example, a firm's location might be more accurately captured by a measure of its economic center of gravity rather than its headquarters address. In particular, plant and branch-level employment data could provide a better picture of where a firm's operations are concentrated from an economic standpoint. Finally, as stated earlier, distance itself might be more usefully thought of in terms of "economic distance." Certainly Los Angeles is economically closer to New York City than to El Paso, Texas, and this should be reflected in air fares or phone rates data for example. Overall, the findings of this paper identify geographic proximity as an important dimension to investor portfolio choice and raise several potentially interesting issues for further research.

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[21] Coval and Moskowitz (1998a) find that locally held firms outperform the market and outperform distant firms, even after adjusting for size, distress, and other firm characteristics, as well as accounting for risk.

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