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# How Distance, Language, and Culture Influence Stockholdings and Trades

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**ABSTRACT**

This paper documents that investors are more likely to hold, buy, and sell the stocks of Finnish firms that are located close to the investor, that communicate in the investor's native tongue, and that have chief executives of the same cultural background. The influence of distance, language, and culture is less prominent among the most investment-savvy institutions than among both households and less savvy institutions. Regression analysis indicates that the marginal effect of distance is less for firms that are more nationally known, for distances that exceed 100 kilometers, and for investors with more diversified portfolios.

IT HAS LONG BEEN KNOWN that most investors shun foreign stocks in their portfolios (see, e.g., French and Poterba (1991), Cooper and Kaplanis (1994), and Tesar and Werner (1995)). This phenomenon, known as "home bias," refutes the implications about investor behavior developed in many standard asset-pricing models. We do not know the root cause of home bias, nor do we know if there are differences in home bias behavior across investors. Researchers such as Stulz (1981a, 1981b) and Serrat (1997) have hypothesized that home bias may be due to restrictions on international capital flows or the nontradability of some goods across international boundaries. However, recent research suggests that home bias may be part of a larger phenomenon in which investors exhibit a preference for familiar companies.[1]

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[1] Huberman (1998) observes that Regional Bell Operating Companies are more likely to be held by investors who subscribe to their local telephone service. Coval and Moskowitz (1999a, 1999b) document that mutual fund managers prefer to hold locally headquartered firms and hint that this may be due to easier access to information about the firm. Petersen and Rajan (2000) study the effect of distance on lending relationships. Kang and Stulz (1997) show that Japanese firms with a greater "international presence," as evidenced by having ADRs, or a great deal of export business, have greater foreign ownership. Tesar and Werner (1995) show that U.S. investors exhibit a bias towards Canadian stocks in their foreign investment.

Familiarity has many facets. The firm's language, culture, and distance from the investor are three important familiarity attributes that might explain an investor's preference for certain firms. This paper finds that all three of these attributes contribute to investor preferences for certain stocks. It also shows that the preferences tied to these attributes are inversely related to investor sophistication.

The results in the paper, developed by analyzing the holdings, purchases, and sales of Finnish stocks while controlling for numerous alternative explanations, show that:

- Investors in various municipalities in Finland prefer to hold and trade stocks headquartered in nearby locations to those in more distant locations.
- The distance effect is piecewise linear in the log of distance with an abrupt change in the slope of the distance coefficient at 100 kilometers.
- Firms that are headquartered in Helsinki, and thus are more nationally known, have less of a distance effect associated with them.
- Investors whose native tongue is Finnish prefer to hold and trade Finnish companies that publish their annual reports in Finnish to Finnish companies that publish their reports in Swedish and vice versa. Multilingual companies lie between the one-language companies in the preferences of both the Swedish-speaking and Finnish-speaking investors.
- Controlling for the language the firm communicates in and the distance from the investor, investors in Finland prefer to hold and trade firms whose CEO is of similar cultural origin.
- The influence of distance, language, and culture on stockholdings and trades is generally smaller for financially savvy institutions than for households or less savvy institutions.
- The influence of distance and culture on stockholdings and trades is smaller (but still sizable) for more sophisticated household investors.

In contrast to most previous studies of home bias and related stock preferences, our analysis focuses on open market purchases and sales, as well as shareownership. There are several important reasons for this. First, discounts are typically given to Finnish employees for IPO participation. Because there is some possibility of a modest bias in the shareownership results as a consequence of these IPO discounts—employee–participants in these IPOs tend to live near the firms at which they work—we analyze open market buys and sells in addition to shareownership. The buys, in particular, exclude IPOs and gifts as a source of acquisition.[2] In addition, there is a

[2] A bias may exist in the sell ratios if investors rebalance their portfolios after participating in such IPOs. Employee stock ownership plans and stock options affect relatively few investors in Finland and thus are unlikely to more than negligibly bias the results on shareownership. Moreover, we have reanalyzed our data excluding all investors who live in the same municipality as the company headquarters. Although this eliminates a large fraction of the employees of the company as potential shareowners or traders, our results are largely unchanged.

potential feedback effect in the shareownership results. If a company perceives that a large proportion of its shareowners prefer a particular language, the company may choose to communicate in that language. This feedback effect is not present when analyzing buyers of the company's stock. Finally, we are interested in buys and sells in addition to shareownership simply because it is interesting to see whether investors who live near a firm's headquarters municipality are more actively buying and selling that stock.

The paper is organized as follows. Section I of the paper describes the data. Section II presents the results. Section III concludes the paper and provides thoughts on the implications of the results for corporate policy and future research.

## I. A Unique Dataset

### *A. Motivation for and Description of the Dataset*

Restricting our focus to *intracountry* investment behavior simplifies the analysis of investor preferences in that restrictions on capital flows and the intercountry nontradability of some goods cannot explain or confound our findings.[3] We chose Finland for several reasons. First, the Finnish Central Securities Depositary (FCSD) maintains daily comprehensive official records of shareownership and trades in electronic form and has provided us with access to approximately two years of historical data from these records.[4] The data analyzed include the FCSD's January 1, 1997, shareownership records and all trades between December 27, 1994, and January 10, 1997, for its 97 publicly traded companies.[5]

Language differences also make Finland interesting to analyze. There are two official languages in Finland: Finnish and Swedish. Finnish speakers account for 93 percent of the population, whereas Swedish speakers account for 6 percent of the population. However, the influence of the Swedish-speaking investors in the Finnish financial markets exceeds what their fraction of the population would suggest. At the beginning of 1997, for example, Swedish speakers held 23 percent of household shareowner wealth.

Finnish companies also exhibit language differences. Some Finnish firms communicate exclusively in Finnish, others communicate exclusively in Swedish, and still others communicate in multiple languages, typically Swedish

[3] Although some goods may be less tradable within Finland than others, the shorter distances, unified financial markets, homogeneous regulatory environment, and lack of restrictions on labor, consumer, and capital mobility make this issue a rather negligible one in comparison with the international nontradability of goods.

[4] See Grinblatt and Keloharju (2000, 2001) for details on this dataset. The register is the official (and thus reliable) recording on a daily basis of the shareholdings and trades of virtually all Finnish investors—both retail and institutional. In contrast to Finnish domestic investment, the data on foreign investment in Finnish stocks that we employ is not comprehensive.

[5] Sixty-two of these are headquartered in Helsinki. One company, with fewer than 100 shareholders, was excluded because of its exceptionally small size. Five companies were delisted over the two-year sample period, leaving 92 firms for the January 1, 1997, shareownership analysis.

and Finnish, Swedish, Finnish, and English, or Finnish and English. Because the larger companies tend to be multilingual, our analysis of language (and distance) effects use firm dummies to control for confounding firm attributes, like firm size. Also, the language of the company may differ from the cultural background of senior management, and the cultural background of senior management differs across multilingual firms, allowing us to distinguish language from cultural preference.

*Pörssitieto 1995* and *1996* report the municipality in which Finnish firms are headquartered, the name of the CEO, as well as the language of the company's annual report.[6] We classify the language of Finnish firms as the language of their annual report—Swedish, Finnish, or multilingual—which is generally the language of the other financial information reported by the firm. Of the 97 firms, 2 report only in Swedish, 12 report only in Finnish, and the other 83 are multilingual.[7] We classify the culture of the firm based on the name and native language of the CEO.[8] Eighty-three of the firms are of Finnish cultural origin; the remaining 14 are of Swedish cultural origin. No firms have CEOs that are not of Finnish or Swedish cultural origin.

The FCSD database either contains or can be linked to detailed information about the investor. Attributes reported in FCSD include the investor's type ("household" or "institution," with the latter further broken down into four types of institutions), native language,[9] and municipality. We measure the distance between a reporting investor and the firm as the distance in meters between the centroid of the investor's municipality and the centroid of the municipality of the firm's headquarters (generously computed for us by respected Finnish researchers in geography).[10]

[6] Annual reports provided geographic location, CEO name, and firm language when *Pörssitieto* did not contain them.

[7] A previous draft of this paper, with similar language results, classified multilingual firms that did not use Swedish in their annual report as Finnish-only. Because the current draft now includes a specific distinction between language and culture, and because many Finns, irrespective of mother tongue, speak other languages, particularly English, we reclassified all multilingual firms together to isolate the impact of communication per se on investor preferences for holding and trading stock.

[8] If either the first or last name of the CEO is of Finnish origin, we classify the CEO (and firm) as being of Finnish cultural origin. If the CEO's first and last names are both of Swedish origin, we further investigate the native tongue of the CEO for the cultural classification. For this, we checked four Finnish biographical sources (*Who's Who in Finland 1998*, and three listings of Finnish university graduates) for a reported mother tongue of the CEO. In a few instances, we inferred the mother tongue from the language of his university education. The results are essentially unchanged if the board chairman's cultural origin is used instead of the CEO's cultural origin.

[9] We exclude the fewer than 0.1 percent of Finnish shareowners whose mother tongue is neither Swedish nor Finnish. This excludes only 546 of almost 500,000 buy transactions and proportionately fewer sells and shareownership data points.

[10] If the investor lives in the same municipality as the firm, we define distance as one quarter of the distance between the centroid of the municipality and the nearest neighboring municipality. As Thomas and Huggett (1980, p. 137) note, this convention is customary in the literature that models geographic phenomena.

*B. Data Aggregation*

Because of the exceptional sample size of the data on the holdings and transactions of investors, it is computationally infeasible to perform statistical analysis on the cross section at the investor level. For this reason, we aggregate our data on investors at the municipality level, which leaves us with 44,135 firm–municipality combinations. This aggregation is done separately for households and institutions, as well as for the institutional subsets of financially savvy institutions (non-financial corporations, finance and insurance institutions), which constitute the vast majority of the institutions, and unsavvy institutions (government, nonprofits). Later in the paper, we also separately aggregate data for household investors who have similar numbers of distinct stocks in their portfolio. Thus, for each municipality in Finland, we compute across all investors of a given type:

1. the number of shareowners in the municipality in each of the 97 Finnish firms in the FCSD;
2. the aggregate number of buy (sell) transactions (irrespective of the number of shares) in the municipality for each FCSD Finnish firm over the approximate two-year sample period; and
3. the fraction of shareowners (buyers, sellers) in the municipality whose mother tongue is Swedish, both for the aggregated shareowners (buyers, sellers) in the municipality and for the shareowners (buyers, sellers) of each firm. Note that because of the summation, investors who own shares in $n$ firms have their ownership counted $n$ times in both the numerator and denominator of this fraction.

## II. Holdings, Purchases, and Sales as a Function of Distance, Language, and Culture

*A. Some Simple Ratios That Document Distance Effects*

Table I, Panel A reports ratios that document the influence of distance on the behavior of Finnish investors. Two columns, representing households and institutions, generate two ratios each for shareowners (first two columns), buys (middle two columns), and sells (final two columns).

The first two columns in Panel A report statistics on the ratio

$$\frac{\left(\begin{array}{c}\text{Firm } i\text{'s shareowner weight for investors} \\ \text{in the municipality of its headquarters}\end{array}\right)}{\text{Firm } i\text{'s shareowner weight among all investors in Finland}}.$$

The numerator is simply the number of household shareowners of firm $i$ residing in the municipality the firm is headquartered in, divided by the sum, across all firms, of the number of shareowners residing in that same

**Table I**

## Summary Statistics Documenting the Influence of Distance, Language, and Culture

Panel A reports the median and fraction exceeding one on the ratio of firm *i*'s weight for investors in the municipality of its headquarters over firm *i*'s weight among all investors in Finland. Panels B and C report the median and fraction exceeding one statistics on the ratio of firm *i*'s weight among Swedish-speaking investors over firm *i*'s weight among all investors. Panel B focuses on subsamples of firms generated by the language of the firm, and Panel C's subsamples are generated by the cultural origin of the CEO. Weights are based on the number of shareowners, buys, and sells, and are separately computed for households, institutions, and for Panel A, both greater Helsinki area headquartered firms and non-Helsinki firms. The number of shareowners is computed as of January 1, 1997, whereas the buys and sells are computed between December 27, 1994, and January 10, 1997.

| | Weights Based on Number of | | | | | |
|---|---|---|---|---|---|---|
| | Shareowners | | Buys | | Sells | |
| | Households | All Institutions | Households | All Institutions | Households | All Institutions |
| **Panel A: Distance Effect** | | | | | | |
| Summary Statistics for the Ratio *Numerator*/*Denominator*<br>*Numerator* = Firm *i*'s Weight among Investors in its Municipality<br>*Denominator* = Firm *i*'s Weight among All Investors in Finland | | | | | | |
| Median for firms of following type | | | | | | |
| Helsinki area headquartered companies ($n$ = 62) | 1.41 | 1.26 | 1.11 | 1.00 | 1.11 | 0.95 |
| Rest of Finland headquartered companies ($n$ = 35) | 12.16 | 8.12 | 4.22 | 2.11 | 9.95 | 14.75 |
| All companies ($n$ = 97) | 1.81 | 1.45 | 1.34 | 1.01 | 1.31 | 1.06 |
| Fraction greater than 1 for firms of following type | | | | | | |
| Helsinki area headquartered companies | 0.83 | 0.78 | 0.71 | 0.47 | 0.69 | 0.42 |
| Standard error | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 |
| Rest of Finland headquartered companies | 1.00 | 0.91 | 0.89 | 0.63 | 0.94 | 0.89 |
| Standard error | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 |
| All companies | 0.89 | 0.83 | 0.77 | 0.53 | 0.78 | 0.59 |
| Standard error | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

Panel B: Language Effect

Summary Statistics for the Ratio *Numerator*/*Denominator*
*Numerator* = Firm *i*'s Weight among Investors who Speak Swedish
*Denominator* = Firm *i*'s Weight among All Investors in Finland

| | | | | | | |
|---|---|---|---|---|---|---|
| Median for firms of following type | | | | | | |
| Annual report only in Swedish $n = 2$ | 7.77 | 4.12 | 4.84 | 3.13 | 4.95 | 2.65 |
| Annual report only in Finnish $n = 12$ | 0.52 | 0.43 | 0.59 | 0.61 | 0.38 | 0.56 |
| Annual report multilingual $n = 83$ | 0.85 | 0.98 | 0.92 | 1.09 | 0.89 | 0.98 |
| Fraction greater than 1 for firms of following type | | | | | | |
| Annual report only in Swedish | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Standard error | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Annual report only in Finnish | 0.00 | 0.10 | 0.17 | 0.25 | 0.00 | 0.17 |
| Standard error | 0.16 | 0.16 | 0.14 | 0.14 | 0.14 | 0.14 |
| Annual report multilingual | 0.35 | 0.46 | 0.43 | 0.60 | 0.41 | 0.47 |
| Standard error | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 |

Panel C: Culture Effect

Summary Statistics for the Ratio *Numerator*/*Denominator*
*Numerator* = Firm *i*'s Weight among Investors who Speak Swedish
*Denominator* = Firm *i*'s Weight among All Investors in Finland

| | | | | | | |
|---|---|---|---|---|---|---|
| Median for firms of following type | | | | | | |
| CEO Swedish culture $n = 14$ | 2.49 | 1.82 | 1.73 | 1.34 | 2.13 | 1.15 |
| CEO Finnish culture $n = 83$ | 0.77 | 0.87 | 0.86 | 1.00 | 0.80 | 0.94 |
| Fraction greater than 1 for firms of following type | | | | | | |
| CEO Swedish culture | 0.71 | 0.79 | 0.79 | 0.93 | 0.79 | 0.57 |
| Standard error | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 |
| CEO Finnish culture | 0.27 | 0.38 | 0.35 | 0.51 | 0.30 | 0.42 |
| Standard error | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 |

municipality. The denominator is the comparable ratio for all of Finland. As an example, take the shipping firm Birka Line, which has 3,299 household shareowners, 1,669 of whom live in its headquarters city of Mariehamn. Summing the number of household shareowners over all firms, we find that Mariehamn has 14,440 household shareowners, while Finland has 1,157,783 shareowners. The numerator for Birka Line's ratio is thus 1,669/14,440, and the denominator is 3,299/1,157,783, making Birka Line's ratio 40.56.

The two types of summary statistics for this ratio are the median across firms and the fraction greater than one. In the absence of a distance effect, this ratio is one.[11] However, the third row of Panel A indicates that the median ratio for households is 1.81 and for institutions it is 1.45. Restricting the set of firms to those headquartered outside of greater Helsinki makes the distance effect stand out even more. The median ratio for households is 12.16 and for institutions it is 8.12. For the more nationally known companies headquartered in the greater Helsinki area, the median ratios are a more modest 1.41 and 1.26 for households and institutions, respectively. The fraction of firms with ratios that exceed one is equally impressive: The first column of Table I, Panel A, indicates that 100 percent of the 35 non-Helsinki firms and 83 percent of the Helsinki-area firms have household shareownership ratios that exceed one. Again, institutions, seen in the second column, indicate a more modest distance effect, but a strong one nonetheless. Using the standard errors in the table, it is evident that both percentages are statistically significant. Also, although unreported, the differences between the Helsinki and non-Helsinki firms in the fraction of the ratios that exceed one are statistically significant, except for institutional shareownership and buys.

The results in the four rightmost columns show that distance strongly influences the active purchases and sales of seasoned stock for non-Helsinki firms. The median ratios here, using the number of buy transactions, but computed analogously to the ratios for shareownership, are smaller than those for shareowners in the first two columns, but are well above one and exhibit the same pattern across the subcategories of investors. The same is true of the fraction of buy ratios that exceed one. In contrast to the shareownership results, institutions do not seem to exhibit distance effects in their trading of Helsinki-area companies.

Table I, Panel A, has clearly documented that distance influences investor behavior. We will later show that this distance effect does not arise from the ownership, purchases, and sales of customers and/or employees of the firm, who would naturally tend to reside close to it, nor is it due to language or culture effects that are linked to where investors live and firms locate.

[11] The expected numerator is the same as the expected denominator under the null. However, because of Jensen's inequality, the expectation of the ratio is greater than one. For this reason, as well as the effect of outliers, we report only the median and fraction exceeding one, although the results with the mean are very similar.

### *B. Some Simple Ratios That Document the Influence of Language on Investor Behavior*

The first two columns in Table I, Panel B, report summary statistics on the ratio

$$\frac{\text{Firm } i\text{'s shareowner weight among Swedish-speaking investors}}{\text{Firm } i\text{'s shareowner weight among all investors in Finland}}.$$

The denominator is identical to that used in the prior subsection to analyze distance. The numerator is simply firm *i*'s number of Swedish-speaking shareowners divided by the sum over all firms of the number of shareowners. The ratio is separately computed for household and institutional investors.

To illustrate this ratio, let us return to the example of Birka Line, a pure Swedish-speaking company, which (you may recall) has 3,299 household shareowners, 3,147 of whom report that Swedish is their native language. Because there are 127,750 Swedish-speaking household shareowners in all of Finland and 1,157,783 household shareowners overall, the numerator for the ratio is 3,147/127,750 and the denominator is 3,299/1,157,783, making Birka Line's ratio 8.65.

In the absence of a language effect, this ratio is one. However, the first row of Panel B indicates that the median ratio is 7.77 for household shareowners and 4.12 for institutional shareowners among the Swedish-only firms, and the second row of Panel B indicates that the same ratios are, respectively, 0.52 and 0.43 among the Finnish-only companies. In other words, the median Swedish language firm is almost 15 times more popular than the median Finnish language firm among Swedish-speaking household investors. Even for institutions, this difference is almost tenfold. The reverse is necessarily true for Finnish-speaking investors.

The fraction of firms with ratios exceeding one, as well as the median and fraction greater than one for analogous ratios computed with buys and sells, tell a similar story. Finnish-speaking investors prefer Finnish-speaking firms, Swedish-speaking investors prefer Swedish-speaking firms, and multilingual firms lie somewhere in between these two extremes in their relative proportions of Swedish-speaking and Finnish-speaking investors.[12] Note that because the ratios are based on differences between Finnish-speaking inves-

[12] The results are supported by evidence on foreign investment in Finland, which we do not formally report for brevity's sake. In particular, there is a large community of former Finnish residents in Sweden, consisting mostly (but not entirely) of Finnish-speaking people who have moved to Sweden during the last few decades. Comparing the Finnish investments of these Finnish-speaking Swedes (largely, the expatriate Finns) with the Finnish investments of Swedish-speaking Swedes tells a similar story to that in Panel B. For example, there are two Finnish firms that report only in Swedish—Birka Line and Chips. The former has 557 native Swedish speakers among its 562 Swedish investors (99 percent). For Chips, the respective ratios of native Swedish speakers are 88 out of 93 among its Swedish investors (95 percent). By contrast, the aggregate Finnish stock market has only 74 percent Swedish speakers among its Sweden-domiciled investors.

tors and Swedish-speaking investors, it is impossible to determine which of the following is the ultimate source of the observed language effect: (1) Finnish-speaking investors' preference for the pure Finnish language companies; (2) Swedish-speaking investors' preference for the pure Swedish language companies; (3) Finnish-speaking investors shunning firms with a pure Swedish language orientation; or (4) Swedish-speaking investors shunning the pure Finnish language firms. As with distance effects, institutional investors appear to be less influenced by the language of the firm than household investors.

### *C. Some Simple Ratios That Document the Effect of Culture on Investor Behavior*

The first two columns in Table I, Panel C, report summary statistics on the same ratio reported in Panel B. Here, however, we subdivide firms based on firm culture. The first row of Panel C indicates that the median Swedish-speaking shareownership ratio among the Swedish-culture firms is 2.49 for households and 1.82 for institutions. The second row of Panel C indicates that the same ratios are, respectively, 0.77 and 0.87 among the Finnish-culture companies. The fraction of firms with ratios exceeding one, as well as the median and fraction greater than one for analogous ratios computed with buys and sells, tell a similar story of preference for firms of the same culture.[13] As with language and distance, institutions are less influenced by the culture of the firm than households.

### *D. Multivariate Regression Motivation, Variable Description, and Results*

One difficulty in interpreting Table I's results is that investors with similar language and culture tend to live near one another. Hence, as noted in the introduction, a preference for proximate investments may be a manifestation of language or culture effects or vice versa: Finnish firms that tend to communicate in Swedish or have a Swedish cultural origin may locate near Swedish investors.

To disentangle distance effects from language or cultural effects, and to control for other potentially confounding variables, this subsection analyzes the determinants of a dependent variable $D_{ij}$, the difference between municipality $j$'s weight on firm $i$, $X_{ij}$, and the market's weight on firm $i$, $X_i$. That is,

$$D_{ij} = X_{ij} - X_i.$$

[13] The culture effect also applies to investors in Finnish stocks who are domiciled in Sweden. Controlling for the firm's language in an unreported dummy variable regression, Swedish-speaking investors domiciled in Sweden are 22.4 percent more likely to hold shares in a Finnish company whose CEO is of Swedish cultural origin ($t = 2.44$) than a company headed by a CEO of Finnish cultural origin.

Thus, $D_{ij}$ is the difference between the numerator and the denominator used to compute the ratios in Table I, Panel A, except municipality $j$ can be any municipality rather than just the municipality in which firm $i$ is headquartered.

Table II is based on regressions in which the dependent variable, $D_{ij}$, is projected onto (1) dummy variables for each stock (but one); (2) dummy variables for each municipality (but one); (3) the maximum of 100 kilometers and the log of the distance (in meters) of municipality $j$ from the headquarters municipality of firm $i$;[14] (4) the minimum of 100 kilometers and the log of the distance of municipality $j$ from the headquarters municipality of firm $i$; (5) two distance slope dummies, to ascertain whether a firm that is headquartered in the greater Helsinki area has a different (distance) coefficient for items 3 and 4 above than other firms; (6) two language variables representing the products of dummy variables associated with the language of the annual report times the fraction of Swedish-speaking shareowners (buys, sells) in the municipality; and (7) a Swedish culture variable that is the product of a dummy variable that is one if the CEO is of Swedish cultural origin times the fraction of Swedish-speaking shareowners (buys, sells) in the municipality. The regressions are separately run for households and institutions, as well as for two institutional subcategories, which group pairs of institutional types into financially savvy and unsavvy institutions.

The piecewise linear functional form of the distance regressors, which employ a single change in slope at 100 kilometers, is inspired by Figure 1. It plots coefficients representing the marginal effect on shareownership, $D_{ij}$, of a group of distance interval dummy variables from 0 to 450 kilometers, with each interval representing 5 kilometers. The regression used to obtain the plotted dummy coefficients also controls for the variables described above, except for distance. Panel A in Figure 1 plots household shareowner coefficients for the distance dummies, using both Helsinki firms (distance dummies plus Helsinki slope dummies) and non-Helsinki firms (distance dummies alone). Panel B plots comparable institutional shareowner coefficients.

Table II reports the coefficients and $t$-statistics for a constant and 7 regressors in each of 12 regressions with $D_{ij}$ as the dependent variable. The table does not report the regression coefficients on about 550 other included regressors—dummy variables for the firms and municipalities—that control for cross-sectional persistence in shareownership, buys, and sells due to omitted variables like firm size or urban–rural differences in familiarity with the stock market.

All 12 of the regressions indicate that there is a strong distance effect for non-Helsinki firms with a larger marginal distance effect below 100 kilometers. For the under-100 kilometer distances, the $t$-statistics range from $-6.00$ to $-40.92$. The marginal effect of distance for non-Helsinki firms beyond 100 kilometers is negligible for the institutional buy transactions, but is otherwise significant.

[14] The log functional form for distance is inspired by other distance literature in the social and physical sciences [see, for example, Sheppard (1984)]. However, the Table II results are virtually the same whether the regressors are based on the log of distance or unlogged distance.

## Table II

## Multivariate Regressions to Separate the Influence of Distance from that of Language and Culture

Table II reports goodness of fit, number of observations, and coefficients (with *t*-statistics below) for a constant and 7 regressors in each of 12 regressions with the dependent variable being firm *i*'s weight for investors in a given municipality less firm *i*'s weight among all investors in Finland. Weights are based on the number of shareowners, buys, and sells, and are separately computed for households, institutions, savvy institutions, and unsavvy institutions. Each data point is a firm–municipality combination. The table does not report the regression coefficients on about 550 other included regressors—dummy variables for the firms and municipalities. The number of shareowners is computed as of January 1, 1997, and the buys and sells are computed between December 27, 1994, and January 10, 1997.

| | Dependent Variable: Weight on Firm *i* in Municipality *j* Less Overall Weight on Firm *i* with Weight Computed from | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # of owners | | | | # of buys | | | | # of sells | | | |
| | | Institutions | | | | Institutions | | | | Institutions | | |
| Independent Variables | Households | All | Non-Fin. Corp. & Fin. and Ins. Inst. | Government & Nonprofit Inst. | Households | All | Non-Fin. Corp. & Fin. and Ins. Inst. | Government & Nonprofit Inst. | Households | All | Non-Fin. Corp. & Fin. and Ins. Inst. | Government & Nonprofit Inst. |
| Constant | 0.078 | 0.028 | 0.014 | 0.056 | 0.041 | −0.114 | −0.132 | −0.009 | 0.040 | −0.084 | −0.102 | 0.027 |
| | 9.74 | 1.90 | 0.87 | 2.40 | 3.51 | −5.09 | −5.88 | −0.22 | 3.56 | −4.04 | −4.91 | 0.69 |
| Min [ln 100, ln (distance)] | −0.024 | −0.016 | −0.014 | −0.023 | −0.012 | −0.012 | −0.010 | −0.029 | −0.028 | −0.020 | −0.015 | −0.034 |
| | −40.92 | −14.59 | −11.56 | −13.16 | −14.42 | −7.07 | −6.00 | −8.41 | −32.62 | −12.86 | −9.77 | −11.58 |
| Max [ln 100, ln (distance)] | −0.006 | −0.003 | −0.002 | −0.006 | −0.003 | 0.000 | 0.000 | 0.007 | −0.005 | −0.004 | −0.003 | −0.007 |
| | −15.24 | −4.04 | −2.72 | −4.64 | −5.56 | 0.34 | 0.21 | 1.92 | −8.44 | −3.15 | −2.69 | −2.26 |
| Min [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.021 | 0.015 | 0.013 | 0.020 | 0.010 | 0.011 | 0.009 | 0.026 | 0.022 | 0.015 | 0.012 | 0.023 |
| | 24.32 | 9.05 | 7.54 | 7.70 | 8.28 | 4.41 | 3.77 | 6.09 | 17.42 | 6.74 | 5.21 | 5.92 |
| Max [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.002 | 0.001 | 0.001 | 0.002 | 0.002 | 0.000 | 0.000 | −0.005 | 0.005 | 0.003 | 0.003 | 0.008 |
| | 4.69 | 1.23 | 0.99 | 1.66 | 2.72 | 0.08 | 0.34 | −1.32 | 8.25 | 2.79 | 2.18 | 2.51 |
| Fraction of Swedish speakers in municipality × Annual report only in Finnish dummy | 0.001 | −0.001 | −0.001 | −0.003 | 0.001 | 0.000 | 0.000 | −0.001 | −0.003 | −0.005 | −0.003 | −0.021 |
| | 0.69 | −0.67 | −0.50 | −0.77 | 0.57 | −0.07 | −0.07 | −0.16 | −1.80 | −1.79 | −1.03 | −2.62 |
| Fraction of Swedish speakers in municipality × Annual report only in Swedish dummy | 0.010 | 0.011 | 0.019 | −0.014 | 0.009 | −0.002 | −0.001 | −0.005 | −0.001 | 0.010 | 0.014 | −0.034 |
| | 3.64 | 2.32 | 3.53 | −1.73 | 2.24 | −0.24 | −0.14 | −0.27 | −0.31 | 1.37 | 2.01 | −1.70 |
| Fraction of Swedish speakers in municipality × CEO Swedish culture dummy | 0.021 | 0.007 | 0.006 | 0.012 | 0.014 | 0.003 | 0.004 | −0.007 | 0.009 | 0.002 | 0.001 | 0.021 |
| | 18.84 | 3.60 | 2.78 | 3.78 | 8.39 | 1.07 | 1.18 | −0.91 | 5.43 | 0.83 | 0.46 | 2.58 |
| Adjusted $R^2$ | 0.175 | 0.142 | 0.112 | 0.203 | 0.027 | 0.222 | 0.234 | 0.016 | 0.077 | 0.092 | 0.095 | 0.078 |
| *N* | 41676 | 41216 | 40572 | 36248 | 43747 | 37248 | 37054 | 7275 | 43844 | 37054 | 36472 | 14841 |

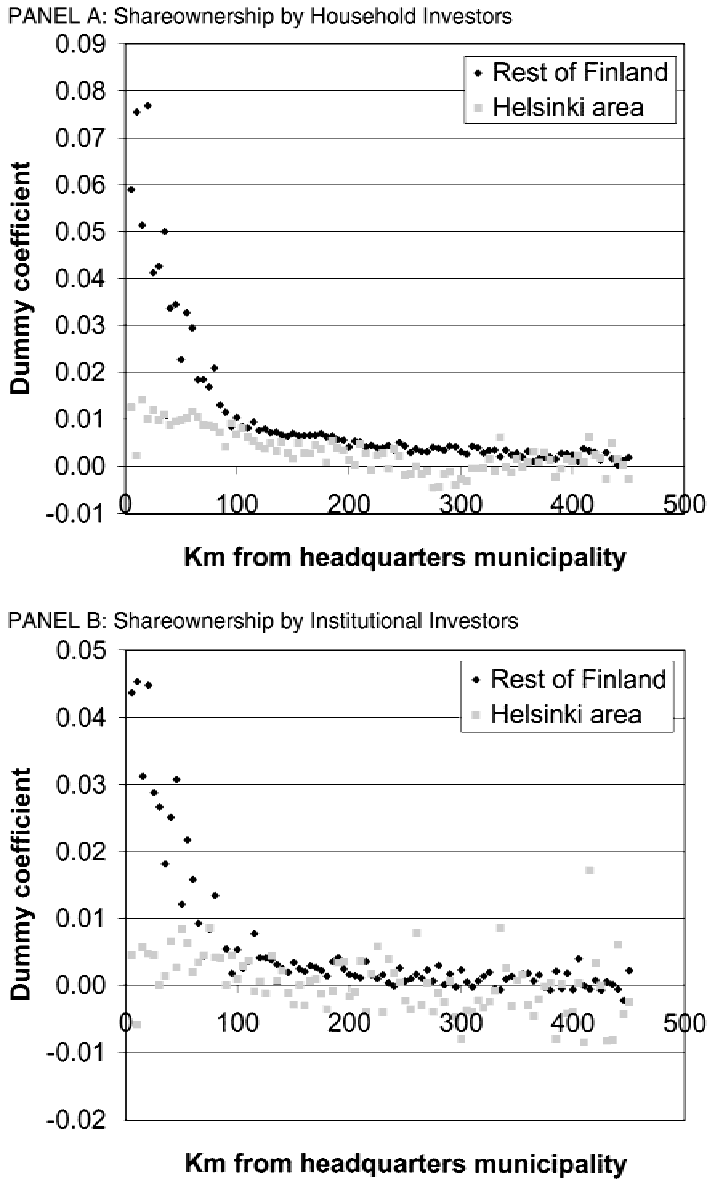


**Figure 1. Graphs of coefficients on distance dummy variables in a regression that is identical to that in Table II for shareownership, except that the two distance regressors are replaced by two sets of dummy variables representing five-kilometer distance intervals from 0 to 450 kilometers.** Separate sets of dummies for Greater Helsinki Area headquartered firms and other firms are plotted. The dependent variable in the regression is firm *i*'s weight for investors in a given municipality less firm *i*'s weight among all investors in Finland. Each data point is a firm-municipality combination. Panel A plots the coefficients on the dummy variables for households and Panel B plots the coefficients on the dummy variables for institutional investors. Shareownership is computed as of January 1, 1997.

The positive coefficients on the Helsinki slope dummies also indicate that the more prominent Helsinki-headquartered firms have negligible if any distance effect exhibited towards them.[15] The reduction in the distance effect exhibited towards Helsinki-headquartered firms is not a size effect. An unreported regression that adds two more distance cross-product variables, computed analogously to the Helsinki variables but with the log of the number of employees replacing the Helsinki dummies, has very similar results; the number of employees does not moderate the distance effect.

The lack of an effect of the number of employees on the distance effect also suggests that the distance effect results in Table II are not due to employees owning, buying, or selling their own firm's stock. Only one of the 24 employee-related distance variables in the 12 regressions is significant at the five percent level. Buttressing this argument is the functional form of the distance effect, which, if due to employee ownership, should be bunched near zero rather than be piecewise linear, as well as the similar results obtained from regressions that exclude all investors from the firm's home municipality (not formally reported for the sake of brevity). Finally, the fact that not just households, but institutions, too, are influenced by distance suggests that this effect may be part of a behavioral phenomenon that is not tied to the behavior of the firm's employees.

Consistent with the results in Table I, distance influences the investment behavior of institutions much less than households. For example, the household shareownership regression has an under 100 kilometer distance coefficient of $-0.024$, whereas the institution shareownership regression has a comparable coefficient of $-0.016$. The coefficient on the above 100 kilometer distance regressor is twice as large for households as for institutions. This pattern, in which households exhibit larger distance effect, exists for buys and sells as well.

If greater investor sophistication accounts for the relatively smaller effect of distance and language on the investment behavior of institutions, then distance may have less of an impact of the behavior of the most financially savvy institutions. Table II suggests that this is indeed the case. For the firms headquartered outside of greater Helsinki, five of the six institutional distance coefficients are significantly negative. In each of these five significant cases, a comparison of coefficients indicates that there is less of a distance effect for the savvy institutions—non-financial corporations and finance and insurance institutions—than for the unsavvy institutions. Indeed, the smaller influence of distance on all institutions relative to households appears to be entirely driven by the financially savvy institutions. Because most of the unsavvy institution category consists of nonprofits, we suspect that what drives the larger distance effect for the unsavvy institutions is the tendency of charitable foundations, particularly those located far from Helsinki, to invest heavily in local firms.

[15] The lone exception to this, government and nonprofit buys when such institutions are located far from Helsinki, is statistically insignificant.

The regression also indicates that in addition to distance, both language and culture influence the investment behavior of households. Swedish-speaking household investors have a stronger desire to own and buy companies that communicate exclusively in Swedish. Finnish-speaking investors have a relatively greater aversion to these Swedish-language companies. However, the language of the household investor does not generate a relative preference among Swedish-speaking investors for multilingual companies over Finnish-only companies. With one exception on ownership, there does not appear to be much evidence of a language effect among institutions. We believe that these "nonresults" are due to the low power of this regression specification to pick up language effects, as we will demonstrate at the end of this section.

Finally, there is quite a strong relation between culture and investor preferences, particularly for households. Swedish-speaking households prefer (whereas Finnish-speaking households disprefer) to hold and trade the shares of companies with CEOs of Swedish cultural origin, controlling for language and distance. The shareownership of institutions also is modestly altered by the culture of the firm.

### *E. More Evidence on Sophistication and Distance Effects*

We have so far demonstrated that distance influences the behavior of investment-savvy institutions less than the behavior of households and less savvy institutions, suggesting that there may be a link between the sophistication of the investor type and the influence of distance. To investigate this link further, we analyze the impact of the number of stocks held on the distance coefficients. We first separate our sample of households into 10 different subgroups based on number of different stocks held—1 through 9, and 10 or greater—and then aggregate these subgroupings of household investors into firm–municipality combinations. Table III reports the results of the same regressions in Table II on these subgroups of household investors. Although all of the subsamples exhibit distance effect, the influence of distance, for the most part, appears to be smaller the greater the number of different stocks held. To some extent, this relation between sophistication (as proxied for by different number of stocks held) and distance effects is a manufactured result, in that if investors have lexicographic preferences based on distance from a firm, those with more diversified (and, consequently, more sophisticated) portfolios necessarily hold more distant firms. However, this interpretation of Table III still implies that there is a link, albeit an indirect one, between distance effects and sophistication.[16] There is also a

[16] This link is also supported by three (unreported) regressions for households that add distance–income (based on the municipality's average income per household) and distance–education (based on the fraction of adults in the municipality with a high school diploma or equivalent) interaction terms to the regressors in Table II. The four interaction terms are generally significant in all three regressions. For proximate firms (closer than 100 kilometers), the income interaction term $t$-statistics range from a marginally significant 1.95 to a highly significant 5.86. Also, for proximate firms, the education interaction term has $t$-statistics that range from 4.56 (buys) to 17.19 (shareowners).

**Table III**

## Multivariate Regressions that Analyze the Relation between Portfolio Diversification, and the Influence of Distance, Language, and Culture

Table III reports goodness of fit, number of observations, and coefficients (with *t*-statistics below) for a constant and seven regressors in each of 10 regressions with the dependent variable being firm *i*'s shareowner weight for investors in a given municipality with a specified number of distinct stocks in their portfolio less firm *i*'s shareowner weight among all investors in Finland with the same number of stocks. Each data point is a firm–municipality combination. The table does not report the regression coefficients on about 550 other included regressors—dummy variables for the firms and municipalities. The number of shareowners is computed as of January 1, 1997.

| Dependent Variable: Weight on Firm *i* in Municipality *j* Less Overall Weight on Firm *i* with Weight Computed from # of Owners | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Stocks in Portfolio | | | | | | | | | |
| Independent Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | >9 |
| Constant | 0.068 | 0.113 | 0.097 | 0.091 | 0.074 | 0.073 | 0.066 | 0.062 | 0.061 | 0.038 |
| | 6.06 | 9.64 | 8.95 | 8.31 | 6.76 | 6.73 | 5.85 | 5.48 | 5.35 | 4.96 |
| Min [ln 100, ln (distance)] | −0.022 | −0.034 | −0.027 | −0.026 | −0.022 | −0.017 | −0.017 | −0.014 | −0.011 | −0.008 |
| | −26.88 | −39.41 | −33.84 | −31.96 | −27.08 | −21.08 | −19.67 | −16.91 | −12.36 | −13.65 |
| Max [ln 100, ln (distance)] | −0.004 | −0.008 | −0.008 | −0.007 | −0.006 | −0.006 | −0.005 | −0.004 | −0.004 | −0.004 |
| | −7.53 | −13.38 | −13.46 | −12.79 | −10.39 | −9.67 | −7.73 | −6.58 | −6.46 | −8.16 |
| Min [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.020 | 0.030 | 0.023 | 0.022 | 0.019 | 0.015 | 0.013 | 0.012 | 0.010 | 0.007 |
| | 16.36 | 23.31 | 19.72 | 18.67 | 15.82 | 12.78 | 11.09 | 10.13 | 8.21 | 8.11 |
| Max [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.001 | 0.002 | 0.003 | 0.003 | 0.002 | 0.001 | 0.002 | 0.001 | −0.001 | 0.001 |
| | 1.09 | 3.64 | 4.47 | 4.39 | 3.85 | 1.53 | 2.47 | 0.83 | −0.76 | 2.43 |
| Fraction of Swedish speakers in municipality × Annual report only in Finnish dummy | 0.002 | 0.000 | −0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.000 |
| | 1.52 | −0.27 | −0.41 | 0.35 | 0.41 | 0.54 | 0.98 | 0.32 | 0.21 | −0.03 |
| Fraction of Swedish speakers in municipality × Annual report only in Swedish dummy | 0.055 | −0.034 | 0.007 | 0.023 | 0.033 | 0.024 | 0.037 | 0.030 | 0.029 | 0.017 |
| | 14.19 | −8.54 | 1.80 | 6.37 | 8.96 | 6.33 | 10.24 | 8.38 | 7.40 | 5.95 |
| Fraction of Swedish speakers in municipality × CEO Swedish culture dummy | 0.012 | 0.033 | 0.019 | 0.019 | 0.016 | 0.015 | 0.015 | 0.010 | 0.010 | 0.009 |
| | 7.61 | 21.04 | 13.07 | 13.25 | 10.63 | 10.15 | 10.01 | 7.16 | 6.32 | 8.12 |
| Adjusted $R^2$ | 0.275 | 0.137 | 0.113 | 0.087 | 0.064 | 0.049 | 0.048 | 0.031 | 0.031 | 0.035 |
| *N* | 41676 | 41676 | 41492 | 40296 | 38916 | 34408 | 32384 | 30452 | 25300 | 32476 |

similar link between cultural effects and the number of stocks in the household investor's portfolio, which can be observed in Table III.

### *F. Motivation for Further Analysis of Language and Culture Effects and Regression Results*

Table II's analysis of language effects examines how the fraction of investors who speak Swedish in a municipality affects the municipality's overall propensity to hold, buy, or sell a company that communicates exclusively in Swedish, exclusively in Finnish, or in multiple languages. It should not be surprising that such tests fail to pick up language effects, as was generally true when comparing multilingual firms with Finnish-only firms. The dependent variable in Table II captures above- (or below-) normal investment activity in a given firm–municipality combination. Such abnormal investment activity is largely generated by omitted factors (although we have firm and municipality dummies to control for them) and noise. While municipality-to-municipality variation in the fraction of Swedish speakers may be a contributor to abnormal investment activity in a firm, it cannot account for much of the variation in abnormal investment activity when Finnish-speaking investors dominate ownership and trading in all but a few of Finland's 455 municipalities.

As an example of this problem, and how to remedy it by altering the dependent variable, take the municipality of Mariehamn. This Swedish-speaking community may be relatively more invested in the two Swedish-language-only companies than in the multilingual companies and more invested in the multilingual companies than in Finnish-language-only companies. Similarly, it may be more invested in the Swedish-culture companies. However, pooling the Swedish-speaking investors with Finnish-speaking investors in Mariehamn, as we do in Table II, does not fully take advantage of the knowledge of the allocation of Swedish-speakers' investments into different types of companies. Regressing the fraction of Swedish-speaking owners of a company in a given municipality, like Mariehamn, on dummies representing the language(s) of the company's annual report and the cultural origin of the CEO would pick these effects up better, even within Mariehamn. It also can better capture any culture effects, although there has been ample evidence of this, even within the lower power specification of Table II.

Table IV thus reports coefficients and *t*-statistics for regressions of the fraction of Swedish-speaking shareowners in a given firm–municipality combination against dummies for whether the annual report of the company is exclusively in Finnish or exclusively in Swedish (the default dummy being a multilingual annual report), as well as the Swedish culture dummy generated by the cultural background of the firm's CEO. As controls, the regressions also include the four distance variables used in Table II, a dummy for companies headquartered in the Greater Helsinki Area, as well as

**Table IV**

## Multivariate Regressions that Analyze the Determinants of the Language and Culture of Investors in a Firm–Municipality Combination

Table IV reports goodness of fit, number of observations, and coefficients (with *t*-statistics below) for a constant and eight regressors. The dependent variable is the fraction of Swedish-speaking shareowners. Unreported dummies for each municipality are also included. The regressions are separately computed for households, institutions, savvy institutions, and unsavvy institutions. Each data point is a firm–municipality combination. The number of shareowners is computed as of January 1, 1997.

| | Dependent Variable: The Fraction of Firm *i*'s Shareowners Residing in Municipality *j* who Speak Swedish | | | |
|---|---|---|---|---|
| | | Institutions | | |
| Independent Variables | Households | All | Non-Fin. Corp & Fin. and Ins. Inst. | Government & Nonprofit Institutions |
| Constant | 0.067 | 0.097 | 0.075 | 0.105 |
| | 1.55 | 1.26 | 0.92 | 0.60 |
| Min [ln 100, ln (distance)] | 0.005 | 0.008 | 0.006 | 0.018 |
| | 1.31 | 1.31 | 0.90 | 1.72 |
| Max [ln 100, ln (distance)] | −0.009 | −0.016 | −0.012 | −0.025 |
| | −2.98 | −2.38 | −1.68 | −1.48 |
| Min [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.005 | −0.005 | −0.002 | −0.019 |
| | 0.94 | −0.56 | −0.22 | −1.37 |
| Max [ln 100, ln (distance)] × Dummy for company headquartered in Greater Helsinki Area | 0.011 | 0.010 | 0.012 | −0.005 |
| | 3.04 | 1.24 | 1.33 | −0.23 |
| Dummy for company headquartered in Greater Helsinki Area | −0.193 | −0.068 | −0.122 | 0.278 |
| | −3.32 | −0.68 | −1.14 | 1.22 |
| Annual report only in Finnish dummy | −0.020 | −0.011 | −0.005 | −0.065 |
| | −6.43 | −1.70 | −0.73 | −3.13 |
| Annual report only in Swedish dummy | 0.062 | 0.009 | 0.020 | 0.063 |
| | 8.29 | 0.52 | 1.07 | 1.34 |
| CEO Swedish culture dummy | 0.025 | 0.032 | 0.025 | 0.035 |
| | 11.32 | 6.76 | 4.87 | 3.83 |
| Adjusted $R^2$ | 0.834 | 0.824 | 0.817 | 0.770 |
| $N$ | 21279 | 7612 | 6928 | 2521 |

unreported intercept dummies for each municipality. (Obviously, company dummies cannot be used here as they subsume the dummies which control for the language of the annual report.)[17]

[17] While the distance variables control for the distance effect of similar-language investors living near similar-language companies, which would be accidentally picked up as a language effect if the distance controls were omitted, their coefficients are not good estimates of distance effect per se.

Table IV indicates that there is a much stronger language influence and similar (or slightly more) cultural influence than was evident from the shareownership regressions analyzed in Table II. For households, the fraction of Swedish-speaking shareowners in Swedish-language firms is a statistically significant 0.062 higher than that in a multilingual company and 0.082 higher than in a pure Finnish-language firm, ceteris paribus. Culture adds to this effect: The fraction of Swedish-speaking household shareowners in a firm of Swedish cultural origin is 0.025 larger than a firm with CEO of Finnish cultural origin.

For institutions, the respective increase in fractional Swedish-speaker ownership for Swedish-speaking firms is a modest 0.009 relative to multilingual firms and 0.020 relative to Finnish-only firms. For financially unsavvy institutions, however, the respective increases in fractional Swedish ownership are 0.063 and 0.128, respectively, which are much larger. This indicates that the more modest influence of language on the investment behavior of institutions is driven by the savvy institutions, as was the case with distance. Because most of the unsavvy institution category consists of nonprofits, we suspect that what drives the larger influence of language on the behavior of unsavvy institutions is the tendency of Swedish charitable foundations to invest heavily in Swedish language and multilingual companies.[18]

## III. Summary and Conclusion

This paper documents that investors simultaneously exhibit a preference for nearby firms and for same-language and same-culture firms. We present a substantial amount of evidence that seems to support the hypothesis that the degree of these effects is inversely related to investor sophistication.

The language results are particularly unique and they may have implications for firm policy. Finland-domiciled companies that publish their annual reports both in Finnish and Swedish are able to tap an abnormally large Swedish-speaking investor base, both in Finland and Sweden. Firms in other countries should be able to do the same to increase their investment appeal. For example, U.S. companies, which generally publish their annual reports only in English, might be able to expand their investor base by publishing their annual reports also in, say, Spanish and Japanese.

In Europe, the success of the merging of the national stock exchanges (see Andrews (1999)) will be affected by how much distance, language, and cultural preferences alter the flow of investment capital between countries. The latter two barriers to inter-European investment are more difficult to overcome. However, according to the results in this paper, this experiment is more likely to succeed in altering the home bias already exhibited in Europe if companies listing in the unified stock market can overcome language barriers in their communications to investors, particularly for investors in nearby countries and in countries that share the same culture as the firm.

[18] The influence of language and culture on the shareownership of unsavvy institutions does not carry over to the trades of these institutions, which is consistent with the findings of Table II.

We believe that our results on the influence of language, distance, and culture are fairly robust. Although our analysis, whether focused on buys, sells, or shareownership, gives the same weight to each investor (or transaction) irrespective of the size of the investment, we have checked that the results are similar when we weight investors by the size of their investment. However, we cannot be certain that the behavioral results here will carry over to larger financial markets like the United States or United Kingdom. This distinction is important because the vast majority of Finnish investors hold poorly diversified portfolios. Ilmanen and Keloharju (1999), for example, report that a household investor holds an average of two stocks. This is not very different from shareholders in the United States about 20 years earlier, but it excludes what appears to be the U.S. investors' more diversified holdings of stocks by virtue of mutual fund and pension fund investment.

Despite the precedent in the home bias literature, we have been careful to this point not to classify the influence of distance, language, and culture as "biases," which connotes that some form of investor irrationality is behind the influence of these factors. For portfolios that are as poorly diversified as those of most households in Finland, the "biases" that have been identified here have little effect on the risk profile of the investor's holdings. The damage has been done by poor diversification per se. However, for an investor who chooses to hold a large number of stocks, concentrating the portfolio in certain stocks because of distance, language, or culture effects may make quite a large difference to the risk profile of his investment holdings. Consistent with this cost, we find more modest evidence of such effects among institutions and those households with larger numbers of firms among their holdings. However, the existence of such effects at all among the more sophisticated Finnish investors, as well as their lesser influence among the more sophisticated investor groups, leads us to conjecture that investors generally prefer to hold and trade stock in more familiar firms. If our conjecture is correct, then the investment regularities exhibited towards familiar firms in Finland probably exist in other countries, even among those with more diversified holdings. It would naturally follow that such familiarity-related effects could be the major contributor to home bias.

Of course, it is possible that any familiarity "bias" could be rational. Investors may acquire useful information about familiar firms from reading company statements in a language they understand, from general or acquired knowledge about local firms, or from the cultural groups they socialize within. Such an information-based theory of the influence of distance, language, and culture would be manifested in more active trading of these familiar firms and would generate superior performance in these firms. A performance test to verify this is beyond the scope of this paper. However, because Grinblatt and Keloharju (2000) have confirmed that portfolio performance in Finland is inversely related to investor sophistication, we are skeptical about superior information as the source of the influence of familiarity on both holdings and trades.

It is also possible but unlikely that our results are driven by reverse causation. For example, firms may choose to report in the language of their investors or their potential investors. Also, the firm's investors choose the board of directors who in turn choose the CEO. However, we think this alternative explanation is unlikely for two reasons. The first reason is the strength and relative strength of the buy results, which are the least influenced by prior actual or forecastable relationships with the firm. Except for distance, the buy results in Tables I and II are about as strong as the sell results and never less than one-half the strength of the shareownership results (where prior actual relationships are known to exist). It is also easy to be skeptical about the hypothesis that firms would choose to locate their headquarters in more remote areas of Finland to be in close proximity to potential buyers of the firm's stock. Second, the reverse causation hypothesis would imply that results that weight investors by the market capitalization of their portfolios should be stronger than those presented here. Instead, they are similar or somewhat weaker than those that identically treat each investor or each trade.

## REFERENCES


Andrews, Edmund, 1999, 8 European stock exchanges form alliance, *New York Times*, May 4.

Cooper, Ian, and Evi Kaplanis, 1994, Home bias in equity portfolios, inflation hedging and international capital market equilibrium, *Review of Financial Studies* 7, 45–60.

Coval, Joshua, and Tobias Moskowitz, 1999a, The geography of investment: Informed trading and asset prices, Working paper, University of Michigan.

Coval, Joshua, and Tobias Moskowitz, 1999b, Home bias at home: Local equity preference in domestic portfolios, *Journal of Finance* 54, 2045–2073.

French, Kenneth, and James Poterba, 1991, Investor diversification and international equity markets, *American Economic Review* 81, 222–226.

Grinblatt, Mark, and Matti Keloharju, 2000, The investment behavior and performance of various investor-types: A study of Finland's unique data set, *Journal of Financial Economics* 55, 43–67.

Grinblatt, Mark, and Matti Keloharju, 2001, What makes investors trade?, *Journal of Finance* 56, 589–616.

Huberman, Gur, 1998, Familiarity breeds investment, Working paper, Columbia University.

Ilmanen, Matti, and Matti Keloharju, 1999, Shareownership in Finland, *Finnish Journal of Business Economics* 48, 257–285.

Kock, Gunhard, 1995 and 1996, *Pörssitieto* (Pörssitieto Ky, Helsinki, Finland).

Kang, Jun-Koo, and René Stulz, 1997, Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan, *Journal of Financial Economics* 46, 3–28.

Petersen, Mitchell, and Raghuram Rajan, 2000, Does distance still matter? The information revolution in small business lending, Working paper, Northwestern University.

Serrat, Angel, 1997, A dynamic equilibrium model of international risk-sharing puzzles, Working paper, University of Chicago.

Sheppard, Eric, 1984, The distance-decay gravity model debate; in Gary Gaile and Cort Willmott, eds.: *Spatial Statistics and Models* (D. Reidel Publishing Company, The Netherlands).

Stulz, René, 1981a, On the effect of barriers to international investment, *Journal of Finance* 36, 923–934.

Stulz, René, 1981b, A model of international asset pricing, *Journal of Financial Economics* 9, 383–406.

Tesar, Linda, and Ingrid Werner, 1995, Home bias and high turnover, *Journal of International Money and Finance* 14, 467–492.

Thomas, Reginald W., and R. J. Huggett, 1980, *Modelling in Geography. A Mathematical Approach* (Barnes & Noble Books, Totowa, New Jersey).