THE NEXUS BETWEEN FOREIGN PORTFOLIO DIVERSIFICATION AND KINSHIP

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Abstract: This study seeks to understand the effect of kinship tightness of a society on foreign portfolio diversification. Using data for 42 home investor countries and 44 destination countries for the period of 2004-2021, it is found that investors from more tight-knit kinship societies tend to have smaller proportion of equities invested abroad, thus holding sub-diversified portfolios. The enforcement of these tight kinship societies is based on shame and communal values fostering local monitoring practices which leads to the absence of cooperation and trust, thus reducing stock market participation. It is further shown that kinship tightness can be shaped by enhanced financial literacy, which in turn fosters international diversification. On the other hand, loose kinship societies can be viewed as trust-promoting alternative mechanisms where formal institutions are less effective.

JEL classification: G15, G11, O16, Z10

Keywords: international portfolio diversification, kinship, trust, financial literacy

1. Introduction

It has been long acknowledged that investors diversify their portfolios with domestic and foreign assets to maximize expected returns (Markowitz, 1952). According to financial theory, with the rising financial globalization capital should be fully mobile across borders. However, when looking at the data on portfolio holdings, a contradiction called the equity home bias puzzle is seen, covering a high preference of individuals towards local stocks or bonds. Even if investors diversify their portfolios abroad, they tend to outweigh their portfolio holdings picking those investments which are "geographically close", often referred as the "familiarity bias" (Karolyi et al. 2020).

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There is ample evidence in the literature associating cultural ties to foreign portfolio diversification (Beugelsdijk et al., 2010; Anderson et al., 2011; Siegel et al., 2011; Aggarwal et al, 2012). The aim of this study is to step forward from the culture-foreign bias association, primary focusing on analyzing foreign investment patterns from the point of view of family networks. It has been shown that in the absence of well-developed institutions, informal institutions such as extended family networks can cope with financial shocks and risk sharing (Fafchamps et al., 2007). In this way, family members can be considered as an "insurance policy" and are likely to play a role in the process by which households make decisions regarding investments. Tightly-knit kinship structure societies try to regulate behavior by emphasizing communal moral values, in-group favoritism, experiencing external shame and adopting the concept of purity and disgust. On the other hand, societies with more loosely connected kinship structures tend to promote cooperation through universal moral values, an internal sense of guilt and altruistic punishment (Enke, 2019). Put differently, loose kinship societies have a trust promoting attitude, and can be considered as a substitute for formal financial institutions, a finding that is consistent with prior research highlighting the significance of kinship networks (Cox et al., 2008).

On the other hand, there is sufficient evidence in the literature regarding the limited stock holding puzzle which is influenced by financial sophistication (Rooij et al., 2011). Hence, households shy away from stock market participation because they have limited domain knowledge. Guiso et al. 2003 argues that there exists an unsettled issue on the whether responsibility of providing this financial education should be placed on the market or should governments interfere by addressing specific financial educational programs. The missing puzzle of financial education causes a loss of welfare, since less financially educated individuals will be hesitant even in investing in foreign assets (Giofré, 2017). It is known that financial information spreads from informed consumers to uninformed ones within the same social circle. In this manner, financial literacy can be considered an important factor in reducing the effects of tight kinship structures on foreign portfolio diversification.

The study contributes to the existing literature in several ways. Firstly, it considers the growing number of studies assessing cooperation, trust and stock market participation (Guiso et al., 2008), stock market literacy and investment decisions (Ballock et al., 2014), investor protection rights and foreign portfolio diversification (Driessen et al., 2007). Secondly, it goes beyond the nexus of culture-foreign portfolio diversification by using an internally consistent moral system, kinship tightness that influences the preferences and constraints of individuals in stock picking strategies. Thirdly, the study analyzes the moderating effect of education, more specifically financial literacy over foreign bias (Giofré 2017; Rooij and Lusardi, 2011).

The remainder of this paper is classified as follows. The second part presents the literature review. The third section describes data and methodology. The fourth section presents the model set-up and main empirical results, as well as robustness checks. The final section contains concluding remarks.

2. Literature review

With the outset of the home versus foreign bias literature many studies have focused on explaining the phenomena from multiple angles ranging from: variables included in gravity models such as physical distance, shared common language,

common border (Portes and Ray, 2005), destination market size and characteristics (Chan et al., 2005), investor protection rights (Gianetti et al., 2010), financial literacy (Giofré, 2017), capital and trade flows as informational advantages (Karolyi et. al., 2020) and culture (Beugelsdijk and Frinjs, 2010). Going further in the literature of culture, kinship is often overlooked as an explanation in foreign capital allocations.

According to dictionary Merriam-Webster, the kinship system is "*the system of social relationships connecting people in a culture who are or are held to be related and defining and regulating their reciprocal obligations*". In the anthropological view, the kinship systems differ in their tightness, respectively how strongly people are embedded in very large extended family networks. In tight kinship societies people trust only those in their group, and cooperation takes place within in-groups, mistrust of those outside the group being high. In loosely kinship societies, people have greater generalized trust in out-groups and are more willing to cooperate and build productive relationships with strangers (Alesina and Giuliano, 2013). These variations in the structure of extended family relationships have led to heterogeneity of the moral systems that regulate people's behavior. The theoretical model developed by Enke (2019) predicts that in tight kinship systems, cooperation and trust is suppressed by communal moral values, emotions of external shame, notions of purity and disgust, and revenge taking. On the other hand, in loose kinship systems, cooperation and trust is strengthened through universal moral values, internalized guilt, altruistic punishment, and moralizing gods.

The societal trust is positively associated with financial development and stock market participation (Guiso et al., 2008) and with superior local and cross-country portfolio diversification (Drobetz et al., 2021). In a similar fashion, Niu et al., (2020) has shown in China that the increased number of brother is associated with a higher likelihood of participating in the stock market. It has also been conjectured that social capital and interactions affect stock market participation (Liu et al., 2014). Thus, the expectation is that investors from loose comparatively to tight kinship countries would invest more in foreign markets diversifying their portfolio internationally.

Moreover, the boundaries of tight kinship "limitations" could be reduced by education, being in line with Roger's (2003) terminology regarding that highly educated people are more open-minded being "innovators" and "early adaptors" of a society. As an illustration, individuals with higher literacy levels might have a greater tendency to select funds with lower fees and possess more knowledge about fund expenses (Hastings and Mitchell 2010). Thomas and Spataro 2018 have shown on a sample of European countries that the marginal effect of financial literacy considerably increases stock market participation. From the perspective of financial system's point of view, a greater participation rate could benefit in the development of capital markets, which is a significant factor in determining equity market premiums. Hence, financial education can act as an anchor in societies characterized by tight kinship values, enhancing foreign equity portfolio allocations.

3. Data and Summary Statistics

Our data is built up using a panel specification formed of 42 investor countries having foreign investments in 44 destination ones covering a period between 2004-2021. The range of countries has been selected in accordance with MSCI classification, while to determine the amount of foreign portfolio allocations for each country data from Coordinated Portfolio Investment Survey (CPIS, IMF) has been used.

3.1 Dependent variable

Following Chan et al. (2005), the foreign bias measure is calculated as a deviation from an optimal portfolio. The dependent variable is computed on annual basis as shown in the upcoming equation:

$$FB_{ij} = log\left(\frac{w_{ij}}{w_j}\right), (1)$$

where w_{ij} is the weight of investor country i's stock holdings in the destination country j, and w_j represents destination country j in the world market capitalization. In most of the cases since countries usually underinvest in other markets, the value of the foreign bias is negative, lower values of foreign bias denoting less foreign investment. The equilibrium level (*i.e.*,w_j) is given by 0.

The CPIS (IMF) database does not provide information regarding domestic positions; the ratio of actual portfolio holdings is calculated in two steps. The overall portfolio of country *i* (w_{ij}) is equal to its market capitalization plus the total sum of foreign equities allocated to destination market j, less the whole amount of liabilities allocated by country *j* in the home market *i.* Then the foreign equities invested by country i into host market j is taken, relative to the overall portfolio holding computed in the previous step.

The denominator in equation (1) is determined using the International CAPM model, w_j is the weights of the stock market capitalization of destination country j relative to the total market capitalization of all countries in the sample. Following Dahlquist (2003) suggestion, the amount of home countries market capitalization is excluded from the total market capitalization, having at the end the weight that shows the relative attractiveness of foreign countries.

3.2 Independent variables

To measure kinship systems, the kinship tightness index developed by Enke (2019) is used. The aim of the index is to measure the level of interconnectedness within closely-knit, extended family systems. This index is constructed in two stages. In the first stage, an anthropological index of historical kinship systems was constructed using ethnographic data set from Ethnographic Atlas. It reflects the extent to which people were embedded in large, interconnected extended family networks in the pre-industrial period. It takes into consideration the family structure built up by the components of domestic organization, post weeding residence and descent system via the decedent lines and the degree of segmentation of a community. The anthropological index has been obtained as an average of four dummy variables associated to these four dimensions of kinship. In the second stage, the anthropological index was matched with countries combining ancestry-adjustment methods based on migration matrixes on one hand (Putterman and Weil, 2010) and language based matching methods on the other (Giuliano and Nunn, 2013).

Furthermore, the study uses the Standard & Poor's Rating Services Global Financial Literacy Survey (S&P Global FinLit Survey) which provides comprehensive financial literacy scores for a wide range of countries. The questions which were

conducted by the Gallup World Poll survey during 2014, addressing 150,000 individuals nationally, focused on four fundamental concepts in finance: risk-diversification, inflation, basic numeracy, and interest rate compounding. According to the survey, the variation of financial literacy scores between countries is widespread, and on average 1-in-3 adults is financially literate. Moreover, following Klapper et al. (2020) the gap for financial literacy is wide not only between developed and emerging markets, but also in the category of developed ones having rates between 37% for Italy and 68% for Canada. In this category, the average values for financial education and financial skills obtained from Giofré (2017) are also added. These indicators are derived from the IMD World Competitiveness Yearbook (WCY) addressing questions to senior executives regarding the importance of education in finance and financial abilities.

Moreover, in order to account for the conventional economic rationale behind preference for foreign and domestic investments we incorporate a set of control variables further used in the models. Thus, *home bias* represents the weight of domestic equities invested in the home market; host country attractiveness category is measured by *risk profile* (International Country Risk Guide) accounting for political risk in the host market. *Exchange rate regime* represents exchange rate arrangement classification from Reinhart and Rogoff (2019).Capital control measures is the *overall inflow restrictions index* obtained from Fernández et al. (2016). In addition the average values for withholding taxes in destination markets are from Kwabi et al. (2021).

The models contain destination country risk and return profile attributes, in addition to the aforementioned controls. *Turnover ratio* is calculated using the total value of shares traded on an exchange to the average stock market capitalization (DataStream). From the perspective of *stock market returns*, the one and five years lagged returns are computed using monthly data from DataStream. The destination market risk has been included using the measure of *volatility* computed over 5 years. To prevent the omitted variable bias, we also include a group of familiarity and gravity variables. Because foreign investments might be influenced by import-export relationships across countries, we assess the *Bilateral trade* measure which is the sum of import and exports between home and host countries relative to the home countries overall import and exports (IMF, Direction of Trade and Statistics). Moreover, values for *linguistic distance* have been obtained by Spolaore and Wacziarg (2009). In the distance variables set the log of *geographic distance* between country pairs (in kilometers) from the CEPII database is incorporated, together with the values for religious distance indicators from Spolaore and Wacziarg (2016). Besides distance and language variables, we include in the model dummy variables for *shared common law*, and a shared *common currency*. According to the finance and law literature, common law system typically have more robust investor protection regimes compared to French civil law systems (La Porta et al., 1998). Lastly, we add *zonal cluster* from Ronen and Shenkar (2013) to the model a as a dummy variable for country pairs belonging from the same cultural clustering.

Table 1: Summary statistics for dependent variable of foreign bias and the main variables of interest: kinship, financial literacy and home bias

Investor country	Average foreign bias	Average home bias	Kinship scores	Financial literacy scores
Argentina	-12.377	6.774	0.260	0.280
Australia	-5.700	3.554	0.082	0.640
Austria	-2.250	5.575	0.047	0.530
Belgium	-2.617	4.704	0.082	0.550
Brazil	-8.136	4.151	0.107	0.350
Canada	-1.929	2.945	0.126	0.680
Chile	-6.204	5.410	0.399	0.410
Colombia	-15.173	6.200	0.295	0.320
Czech Republic	-5.674	7.133	0.496	0.580
Denmark	-1.347	4.698	0.004	0.710
Egypt	-15.688	6.839	0.589	0.270
Finland	-5.166	5.009	0.063	0.630
France	-2.149	2.956	0.197	0.520
Germany	-2.247	3.162	0.014	0.660
Greece	-9.707	6.609	0.250	0.450
Hong Kong	-7.382	2.924	0.784	0.430
Hungary	-5.364	7.451	0.490	0.540
India	-12.961	3.719	0.776	0.240
Indonesia	-15.325	5.259	0.448	0.320
Israel	-9.529	5.437	0.657	0.680
Italy	-2.980	4.123	0.064	0.370
Japan	-3.066	2.351	0.576	0.430
Korea	-3.979	3.812	0.750	0.330
Malaysia	-7.859	4.999	0.477	0.360
Mexico	-13.139	4.984	0.315	0.320
Netherlands	-1.037	3.303	0.261	0.660
New Zealand	-13.330	6.305	0.614	0.610
Norway	-1.325	4.227	0.005	0.710
Pakistan	-17.800	7.027	0.809	0.260
Philippines	-15.070	5.932	0.076	0.250
Poland	-12.464	5.886	0.500	0.420
Portugal	-9.061	6.313	0.500	0.260
Russia	-12.503	4.554	0.327	0.380
Singapore	-8.366	4.125	0.631	0.590
South Africa	-6.824	4.123	0.694	0.420
Spain	-9.247	3.912	0.220	0.490
Sweden	-1.795	4.036	0.001	0.710
Switzerland	-2.066	3.418	0.000	0.570
Thailand	-11.095	5.226	0.287	0.270
Turkey	-13.182	5.641	0.711	0.240
United Kingdom	-1.304	2.363	0.023	0.670
United States	-1.293	0.937	0.158	0.570

Note: Foreign and home bias measures have been calculated in line with Chan et al. (2005) using data from CPIS (IMF) and DataStream. The values for Kinship scores are from Enke (2019), while scores for financial literacy are from Standard & Poor's Rating Services.

Table 1 provides summary statistics for the dependent variable of foreign bias, as well as for the key variable of interest: kinship index and financial literacy measure. In the first column of Table 1, we report the average values for the foreign bias from the perspective of the investor market. As we can observe the average values for the foreign portfolio allocations are negative as there is a tendency to underinvest in foreign markets relative to the benchmark predicted by the ICAPM model. The largest values for the foreign bias are observed for: Netherlands (-1.037), United States (-1.293), United Kingdom (-1.304) the results being in line with Beugelsdijk et al. (2010). On the other hand, the smallest values for the bias van be observed for mostly emerging markets: Indonesia (-15.325), Egypt (-15.688) and Pakistan (-17.800). Values for home bias, in all countries are positive since investors exhibit a preference for local stocks. The highest average values for the home bias are present primarily in emerging markets: Hungary (7.451), Czech Republic (7.133), and Pakistan (7.027). In parallel the lowest home biased countries are developed ones: United Kingdom (2.363), Japan (2.351) and United States (0.937). In the sample the kinship tightness index for investor countries varies between 0 for Switzerland, which is the loosest country, and 0.809 for Pakistan, which is the tightest country. Looking at the data on financial literacy, the highest scores are observed in northern Europe in Norway, Sweden, Denmark followed by countries like Israel and Canada. Moreover Figure 1 and 2 from the Appendix reveals more readily the association between kinship score, financial literacy and foreign bias.

4. Main results

4.1 Empirical design

I study the effect of kinship tightness over the foreign bias measure as follows:

$$FB_{ij} = f(KIN_i, HB_i, CV),$$

where FB_{ij} is the foreign bias measure; KIN_i is the kinship tightness index developed by Enke (2018); HB_i is the home bias; and CV accounts for the control variables presented in the previous section. Specifically, the data is constructed as a panel model having investor-destination country pair and year dimensions.

The data is formed of 32,508 country-pair observations, where 8,698 observations are 0 values, with the majority as true zeros (since investors choose not to invest in that target country). Moreover, amounts less than 500,000 dollars are set to zero in the CPIS dataset and there are country-pair investment information which are confidential. Assuming all this, the dependent variable of foreign bias is a truncated one; therefore, we choose a Tobit estimation, where all the foreign bias scores are censored on the left. Standard errors are clustered at country-pairs to account for within covariance, obtaining robust estimations (Petersen, 2009). All regressions are estimated with time fixed effects.

Table 2: The effect of kinship tightness on foreign bias

	Benchmark model	Base model	World benchmark portfolio	Excluding major financial centers
Kinship tightness		-7.5965***	-7.4605***	-8.3086***
		(-12.03)	(-11.87)	(-12.27)
Home bias	-2.5170***	-2.0300***	-2.0265***	-1.8715***
	(-21.35)	(-16.47)	(-16.53)	(-12.39)
Turnover ratio	0.7585***	0.7719***	0.7691***	0.8240***
	(3.25)	(3.36)	(3.36)	(3.34)
Risk profile	0.0594***	0.0622***	0.0618***	0.0637***
	(2.80)	(3.02)	(3.02)	(2.86)
Exchange rate regime	-0.2127***	-0.1266***	-0.1165***	-0.1460***
	(-6.75)	(-4.22)	(-3.91)	(-4.47)
Overall inflow restrictions	1.1491*	0.8608	0.8492	0.9613
	(1.72)	(1.36)	(1.35)	(1.38)
Withholding tax	-0.2193***	-0.2476***	-0.2477***	-0.2818***
	(-3.92)	(-4.67)	(-4.70)	(-4.86)
Return correlation	6.8306***	6.2131***	6.1834***	7.6827***
	(8.21)	(7.73)	(7.73)	(8.71)
5-year lagged volatility	-30.9099***	-27.4374***	-27.3372***	-29.9640***
	(-5.01)	(-4.64)	(-4.64)	(-4.64)
1-year lagged yearly return	-0.2640	-1.0529	-1.1323	-1.1932
	(-0.08)	(-0.34)	(-0.36)	(-0.34)
5-year lagged yearly return	-7.8089**	-7.6652***	-7.6759***	-8.4515***
	(-2.56)	(-2.59)	(-2.60)	(-2.60)
Bilateral trade	-5.3027*	-3.3389	-3.4232	-7.2109
	(-1.91)	(-1.06)	(-1.09)	(-1.43)
Linguistic distance	1.3411	-1.2144	-1.1917	-1.9741*
	(1.24)	(-1.19)	(-1.17)	(-1.89)
Geographic distance	-2.0598***	-1.9351***	-1.9338***	-2.0667***
	(-10.88)	(-10.47)	(-10.51)	(-10.24)
Common law	0.3399	-0.0316	-0.0291	-0.0388
	(0.84)	(-0.08)	(-0.07)	(-0.09)
Common currency	-0.0956	-0.0122	-0.0519	-0.5401
	(-0.19)	(-0.02)	(-0.10)	(-1.07)
Zonal cluster	1.7048***	1.7507***	1.7695***	2.0458***
	(2.98)	(2.95)	(2.99)	(3.08)
Religious distance	-2.6798**	2.3281**	2.3218**	2.1520*
	(-2.37)	(2.07)	(2.08)	(1.81)
Log-likelihood	-90938.362	-90219.668	-90113.967	-82986.254
Pseudo r-square	0.068	0.0754	0.0751	0.0725
N (left- censored obs.)	32508	32508	32508	30186
	(8698)	(8698)	(8698)	(8684)

Note: This table presents the foreign bias in international allocation from the view of kinship tightness index. The dependent variable of foreign bias is defined in Equation 1 representing the log ratio of foreign equity portfolio allocations from country *i* into country *j*. The models use left-censored Tobit regression results. Robust t-statistics clustered by home-destination countries are reported in brackets. *, **, and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

4.2 Baseline regression results

In Table 2 Tobit regression results of the equity foreign bias on kinship tightness are presented. To establish the benchmark for the study in the first column of Table 2 regression results are estimated using variables from Chan et al. (2005) and Giofré (2017). The obtained results are pretty much the same as the ones obtained by these studies. Furthermore, the coefficient of kinship tightness index is negative and statistically significant at 1% level in all our specifications. As one might anticipate, in tight kinship societies where individuals are more likely to rely on people within their own group, mistrusting those outside of the group, as a result, they will be less inclined to diversify their equity portfolios abroad. This is somehow anticipated as individuals belonging to these types of societies have a behavior regulated by communal values, revenge taking, emotions and external shame coupled with in-group favoritism.

Column 3 of Table 2 reconsiders the foreign bias measure by using the ratio of stock market capitalization of the 44 destination markets relative to the world market capitalization. Furthermore, in line with Poshakwale et al. (2011) in the last column the major financial centers like the United States, United Kingdom and Japan were excluded from the sample. Investors from these major financial centers besides being key players on international financial markets they also benefit from a better investor protection rights regulation giving them major advantages on foreign portfolio diversification. Even after the exclusion of the large markets from the sample, the coefficient of kinship remains significant and negative.

The compelling link between kinship tightness and foreign portfolio allocation presented before prompts to speculate between the association of kinship and education on one hand. In the upcoming table besides the index of kinship the measure of financial literacy from S&P Global FinLit Survey, Financial education and financial skills from Giofré (2017) have been considered. Given the results in Table 3, Columns 1-3, there is a positive effect of financial education, literacy on foreign portfolio allocations. By interacting kinship tightness with the measures of financial literacy and financial education (columns 4-5), we observe a diminishing effect of the product over the foreign bias measure. Consequently, we can view financial literacy and education as a channel through which the negative effect of kinship over international diversification can be decreased.

Table 3: Interaction between kinship tightness and foreign bias

	SP Financial literacy	Financial education	Financial skills	Interaction with SP Financial literacy	Interaction with Financial education
Kinship tightness	-5.4903*** (-7.50)	-7.7185*** (-11.56)	-7.7495*** (-11.56)	-5.3657*** (-7.43)	-8.1404*** (-12.41)
SP Financial literacy	0.2025*** (17.89)			0.2003*** (17.76)	
Financial education		1.5801*** (16.95)			1.6744*** (17.96)
Financial skills			1.4705*** (14.89)		
SP Financial literacy x Kinship tightness				-0.0326*** (-3.35)	

	SP Financial literacy	Financial education	Financial skills	Interaction with SP Financial literacy	Interaction with Financial education
Financial education x Kinship tightness					-1.1182*** (-3.29)
Financial skills x Kinship tightness					
Control variables	Yes	Yes	Yes	Yes	Yes
Log-likelihood Pseudo r-square	-89868.16	-90059.504 0.077	-90301.144 0.0746	-89802.72 0.0797	-89997.154 0.0777
N (left-censored obs.)	32508 (8698)	32508 (8698)	32508 (8698)	32508 (8698)	32508 (8698)

Note: The models from (1)-(5) are Tobit regressions using the as main variables of interest the Kinship tightness, financial literacy from S&P FinLit Survey and Financial education and skills from Giofré (2017). Robust t-statistics clustered by home-destination countries are reported in brackets. *, **, and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

4.3 Robustness checks

4.3.1 Alternative Foreign Bias measure

Because the foreign bias measure shall account for the level of home bias in a particular country, Bekaert et al. (2009) has proposed a new way of measuring foreign portfolio allocations. We have seen that most of the literature accounts for the home bias to be a dominant phenomenon in relationship with the foreign bias, thus the measure adjusts the optimal weigh calculation by excluding the home markets capitalization. It assesses the overinvestment and underinvestment in a given country comparing it to the optimal portfolio allocation, where lower degrees of the value account for higher foreign investments whilst higher scores denote under-diversification in a particular target country. Similarly, to the results deployed in the main section Table 3, the relationship between kinship system and the foreign bias measure is being analyzed.

In Table 4 the results are being reported, where I exclude the home bias measure as a control variable. In the base setting we can observe the positive relationship between kinship tightness and foreign bias, where the opposite sign compared to the previous results is given by the scaling of the foreign bias measure. This positive relationship is maintained even after introducing the variables regarding financial literacy. In columns (4) to (5) I introduce one-by-one the variables used in the interaction terms. The magnitude and the sign of the variables is maintained in all the specifications.

Table 4: Robustness checks based on Bekaert et al. (2009) foreign bias measure

	Base model	SP Financial literacy	Financial education	Financial skills	Interaction with SP Financial literacy	Interaction with Financial education
Kinship tightness	0.4820*** (16.47)	0.1920*** (5.85)	0.3294*** (10.13)	0.3431*** (10.24)	0.1827*** (5.73)	0.3728*** (11.71)
SP Financial literacy		-0.0097*** (-19.67)			-0.0115*** (-18.92)	
Financial education			-0.0739*** (-12.06)			-0.0703*** (-14.64)
Financial skills				-0.0635*** (-8.07)		
SP Financial literacy x Kinship tightness					0.0058*** (3.52)	
Financial education x Kinship tightness						0.0948*** (6.28)
Financial skills x Kinship tightness						
Control variables		Yes	Yes	Yes	Yes	Yes
Log-likelihood	-14253.23	-12133.15	-11909.82	-12346.35	-12065.16	-12829.87
Pseudo r-square	0.4084	0.4964	0.4506	0.4304	0.4993	0.4675
N (left-censored obs.)	32,508 (8723)	32,508 (8723)	30,186 (6888)	30,186 (6888)	32,508 (8723)	32,508 (8723)

Note: This table reports the results of a right-censored Tobit model, using as a dependent variable the foreign bias measure introduced by Bekaert et al. (2009). The t-statistics using robust standard error clustered at home-destination country level are reported in parentheses. All the control variables used in the base model from Table 2 have been added for each model. Moreover, the interaction between financial literacy, financial education have been introduced. *, **, and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

4.3.2 Alternative estimation procedures

Similarly, to Beugelsdijk et al. (2010) the model is tested in various settings. Table 5 presents the results for the model as well as using control variables in supporting the main results. Primary, I re-assess the question of zero investment as a potential bias in CPIS (Coordinated Portfolio Investment), IMF database. So far to check the validity of the results, OLS regressions including and excluding zeros are run. As results show in Table 5, the coefficient of kinship is negative and statistically significant in all the specifications in relationship with foreign bias. Furthermore, a random effects model is being estimated to control for unobserved heterogeneity.

According to Dahlquist et al. (2003) this heterogeneity only affects the values of home bias, by accounting for the free-float market capitalization. In this manner, random effects with and without zeros and a random effects Tobit models are run. The results underline the negative effect of kinship on foreign bias. Thirdly, similarly to Beugelsdijk and Frinjs (2010) an OLS model with two-step Heckman sample correction is being estimated to account for the truncated dependent variable. Similarly, the same control variables as in Beugelsdijk et al. (2010) are introduced: GDP per capita for the home country, differences in capital controls, capital controls in the home market, differences in the size of the stock market, transaction costs at home, differences in transaction costs between home and host. Even in this setting, the results remain unchanged.

Table 5: Alternative estimation models

	Base model	SP Financial literacy	Financial education	Financial skills	Interaction with SP Financial literacy	Interaction with Financial education
OLS with zeros investments included	-5.9534*** (-12.81)	-2.7458*** (-5.51)	-4.4309*** (-8.42)	-4.7705*** (-8.91)	-2.7856*** (-5.61)	-5.1645*** (-10.56)
OLS with zeros investment excluded	-2.3024*** (-9.07)	-0.4433** (-2.00)	-1.4782*** (-5.10)	-1.8277*** (-5.95)	-0.4632** (-2.05)	-2.0266*** (-7.44)
Random effects with zeros investment included	-8.0235*** (-15.64)	-3.6191*** (-6.58)	-5.4677*** (-9.59)	-5.7757*** (-10.09)	-3.6251*** (-6.70)	-6.1029*** (-11.56)
Random effects with zeros investments excluded	-3.2309*** (-11.42)	-3.2309*** (-11.42)	-2.0499*** (-6.47)	-2.3076*** (-6.94)	-0.4569* (-1.90)	-2.6646*** (-9.15)
Tobit with random effects	-11.2299*** (-15.57)	-5.3321*** (-7.22)	-6.7478*** (-9.63)	-7.1380*** (-9.81)	-5.3202*** (-7.20)	-7.4172*** (-10.29)
OLS with Heckman control	-2.0795*** (-16.82)	-0.6295*** (-8.05)	-1.8450*** (-14.97)	-2.0349*** (-15.21)	-0.6287*** (-8.04)	-2.5110*** (-19.70)

Source: *Note:* This table presents robustness tests for our foreign bias measure. The dependent variable is the foreign bias measure calculated by Chan et al. (2005). In the table the values for kinship scores in different settings are reported. The t-statistics using robust standard error clustered at home-destination country level are reported in parentheses. *, **, and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

5. Conclusions

The influence of culture over external portfolio equity has been long acknowledged in the economics and financial literature. Besides culture, tightness of the kinship system influences individual's decision making and behavior. The study sheds light over the assumption that tight and loose kinship ties shapes financial decision making. The evidence suggests that tight kinship structures in a country disproportionally lower investors' tendency to participate in international markets. This pattern considers the mechanism that tight kinship societies rely on shame, communal values and the existence of localized monitoring, and in-group favoritism in economic decision making.

Furthermore, the impact of tight kinship systems on foreign portfolio diversification can be decreased by higher levels of education and more specifically by educational programs targeting financial literacy. Thus, highly literate individuals could make wise choices when investing in international markets. On the other hand, loose kinship societies can be considered as an alternative where formal institutions are weak and lax, by promoting values of trust and cooperation. In this way a loose kinship society, can be viewed as 'tool' which acts against unethical corporate decisions.

The findings have important implications for policymakers and researchers. Overall, the study supports the notion that kinship structures collectively influences investment behavior. The implication of policy holders in understanding and shaping the level of tightness kinship barriers of a society is essential. As foreign portfolio diversification can be enhanced by promoting the role of financial literacy among individuals, therefore reaching domain knowledge is necessary to make sound financial decisions. Moreover, kinship tightness or looseness might be another asset in explaining the enduring nature of equity home bias puzzle in the finance literature.

References

Alesina, A., & Giuliano, P. (2013). Family ties. In *Handbook of economic growth* (Vol. 2, pp. 177-215). Elsevier.

Anderson, C. W., Fedenia, M., Hirschey, M., & Skiba, H. (2011). Cultural influences on home bias and international diversification by institutional investors. *Journal of Banking & Finance*, *35*(4), 916-934.

Balloch, A., Nicolae, A., & Philip, D. (2015). Stock market literacy, trust, and participation. *Review of Finance*, *19*(5), 1925-1963.

Beugelsdijk, S., & Frans, B. (2010). A cultural explanation of the foreign bias in international asset allocation. *Journal of Banking & Finance*, 34(9), 2121-2131.

Chan, K., Covrig, V., & Ng, L. (2005). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *The Journal of Finance*, 60(3), 1495-1534.

Cox, D., Fafchamps, M., (2008). Extended family and kinship networks: Economic in- sights and evolutionary directions. Handb. Devel. Econ. 4, 3711–3784.

Dahlquist, M., Pinkowitz, L., Stulz, R. M., & Williamson, R. (2003). Corporate governance and the home bias. *Journal of financial and quantitative analysis*, 38(1), 87-110.

Dichtl, H., Drobetz, W., & Wendt, V. S. (2021). How to build a factor portfolio: Does the allocation strategy matter?. *European Financial Management*, *27*(1), 20-58.

Driessen, J., & Laeven, L. (2007). International portfolio diversification benefits: Cross-country evidence from a local perspective. *Journal of Banking & Finance*, *31*(6), 1693-1712.

Enke, B. (2019). Kinship, cooperation, and the evolution of moral systems. *The Quarterly Journal of Economics*, *134*(2), 953-1019.

Ethan Ilzetzki, Carmen Reinhart and Ken Rogoff, Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold? (2019). *Quarterly Journal of Economics,* 134(2), 599–646.

Fafchamps, M., Gubert, F., (2007). The formation of risk sharing networks. *J. Devel. Econ.* 83, 326–350 .

Fernández, A., Klein, M. W., Rebucci, A., Schindler, M., Uribe, M. (2016). Capital Control Measures: A New Dataset. *IMF Economic Review*, Palgrave Macmillan; International Monetary Fund, 64(3):548-574

Giannetti, M., & Koskinen, Y. (2010). Investor protection, equity returns, and financial globalization. *Journal of Financial and Quantitative Analysis*, *45*(1), 135-168.

Giofré, M. (2017). Financial education, investor protection and international portfolio diversification*. Journal of International Money and Finance*, 71, 111-139.

Giuliano, P., & Nunn, N. (2013). *The transmission of democracy: from the village to the nation-state* (No. w18722). National Bureau of Economic Research.

Guiso, L., Haliassos, M., & Jappelli, T. (2003). Household stockholding in Europe: where do we stand and where do we go?. *Economic Policy*, *18*(36), 123-170.

Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the stock market. *the Journal of Finance*, *63*(6), 2557-2600.

Hastings, J. S., & Mitchell, O. S. (2010). How financial literacy and impatience shape retirement wealth and investment behaviors. *Michigan Retirement Research Center Research Paper*, (2010-233), 2018-10.

Karolyi, G. A., Ng, D. T., & Prasad, E. S. (2020). The Coming Wave: Where Do Emerging Market Investors Put Their Money? *Journal of Financial and Quantitative Analysis,* 55(4), 1369-1414.

Klapper, L., & Lusardi, A. (2020). Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, *49*(3), 589-614.

Kwabi, F. O., Boateng, A. (2021). The effect of insider trading laws and enforcement on stock market transaction cost, *Review of Quantitative Finance and Accounting*, 56(3), 939–964.

Liu, Y. J., Meng, J., You, W., & Zhao, L. (2014). Word-of-mouth communication, observational learning, and stock market participation

Markowitz, H. (1952). Portfolio Selection *J Finan* 7:77–91.

Niu, G., Wang, Q., Li, H., & Zhou, Y. (2020). Number of brothers, risk sharing, and stock market participation. *Journal of Banking & Finance*, *113*, 105757.

Petersen, M.A., (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Rev. Financ. Stud*. 22 (1), 435–480.

Portes, R., & Rey, H. (2005). The determinants of cross-border equity flows. *Journal of international Economics,* 65(2), 269-296.

Poshakwale, S. S., & Thapa, C. (2011). Investor protection and international equity portfolio investments. *Global finance journal*, 22(2), 116-129.

Putterman, L., & Weil, D. N. (2010). Post-1500 population flows and the long-run determinants of economic growth and inequality. *The Quarterly journal of economics*, *125*(4), 1627-1682.

Rogers, Everett M. (2003). Diffusion of innovations, 5th ed. New York: Free Press.

Ronen, S., & Shenkar, O. (2013). Mapping world cultures: Cluster formation, sources and implications. *Journal of International Business Studies*, *44*, 867-897.

Siegel, J. I., Licht, A. N., & Schwartz, S. H. (2011). Egalitarianism and international investment. *Journal of Financial Economics*, *102*(3), 621-642.

Spolaore, E., & Wacziarg, R. (2009). The diffusion of development. The Quarterly journal of economics, 124(2), 469-529.

Spolaore, E., & Wacziarg, R. (2016). *Ancestry, language and culture*. Palgrave Macmillan UK, 174-211.

Van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. Journal of Financial economics, 101(2), 449-472

Graph 1 and 2: Foreign bias and kinship tightness and financial literacy scores

Source: This figure presents the average values of foreign bias measure against the Kinship tightness and S&P Financial literacy index. The foreign bias measure has been calculated in line with Equation (1). Kinship scores are obtained from Enke (2019) while financial literacy index scores have been collected from Standard & Poor's rating services.