Economic Integration and Mature Portfolios[#]

Dimitris Christelis
CSEF, University of Salerno

Dimitris Georgarakos
Goethe University Frankfurt and CFS

Michael Haliassos
Goethe University Frankfurt, CFS, MEA

June 29, 2007

Abstract

This paper documents and studies sources of international differences in asset holdings (stocks, private businesses, and homes) among households well into the accumulation stage (50+) in the US, England, and 11 continental European countries, using newly available and internationally comparable household-level data. With greater integration of asset and labor markets and policies, households of given characteristics should be holding more similar portfolios for their old age. We use econometric techniques to decompose observed differences in participation rates and in asset holdings into those arising from differences: a) in characteristics of the two populations and b) in influence of given characteristics under two different country environments. We make comparisons across the Atlantic, within the US, and within Europe. Both Europe and the US exhibit a rich and often surprising pattern of departures from full integration that needs to be explained in research and addressed in policy and financial practice.

Keywords: Integration, aging, household portfolios, stockholding, homeownership, private businesses, housing.

1. Introduction

Integration represents the removal of market segmentation imposed by country (or regional) barriers. In its broad sense, it applies to all markets, for goods and services, assets (financial and real), debts, and labor. As an ideal, often echoed in public discussions on the European Union and on US federalism, it aims at harmonizing the market conditions within which households operate, regardless of their specific location within the Union. This is a demanding and multifaceted objective, which is unlikely to be attained fully in practice but can provide a useful benchmark for computing and comparing international differences.

Our intertemporal optimization models provide a way to understand and formalize the implications of this benchmark. An economic agent of given preferences and characteristics faces a particular set of processes (e.g. for labor income and asset returns), policy features (e.g. for taxation or retirement financing) and constraints (e.g. credit market imperfections, informational limitations) and makes optimizing choices (e.g. of consumption and asset holdings). The resulting policy rules for consumption and asset demands interact with the supply side of each relevant market and produce observed levels of consumption and asset holdings. These need not be the same in different countries, even in a fully integrated set of countries, in view of different configurations of population characteristics. Once differences in population characteristics are controlled for, however, greater integration should be reflected in greater similarity of the relationship between household characteristics and levels of asset holdings.

Starting from this premise, the paper uses recently available data to document international differences in asset holdings among older households (with heads aged 50+)

in the US and in 12 European countries, and decomposes them econometrically into differences arising from population characteristics, and from differences in market conditions, as reflected in the link between given characteristics and asset participation or holdings among owners. It first uses the US as a benchmark against which to compare European countries; it then looks within the US to compare different regions; and finally it compares countries within Europe (using Germany as the benchmark). Results are reported for a range of assets, from stockholding (direct plus indirect), to private businesses, to homes.

Asset holdings of older households are particularly interesting and topical not only because such households tend to hold the majority of wealth but also because they tend to be considerably influenced by policies and expectations regarding retirement and its financing.[1] Moreover, they can provide clues to likely future asset market developments, including prospects of an 'asset meltdown', as they point to assets in which older households are more heavily invested and thus more likely to want to liquidate in the future. Substantial dissimilarities in the link between characteristics and asset participation or holdings across countries would suggest that market conditions in certain countries are not as conducive to participation and/or to large holdings among asset owners as those in other countries in the group.[2] Moreover, the pattern of these international differences could vary among assets. Identifying such patterns, across countries and assets, seems an important first step to examining whether they can be influenced through greater integration, in the form of policy harmonization, coordination, and institutional reforms.[3]

The broad existing literature on economic integration has followed three main approaches, each focused on a different feature of a fully integrated world or group of countries. One approach is based on the idea that integration should be reflected in considerable international *flows* across integrated markets. Depending on which market is chosen for study, emphasis is placed on cross-border flows of goods and services,[4] claims to financial[5] or real assets,[6] or labor with its implications for immigration policy.

A second approach focuses on *prices* instead of quantities. In a fully integrated market for goods, the law of one price should hold.[7] In a fully integrated asset market, the price of risk should be the same, i.e. expected returns should be the same across assets that have the same covariance with world risk.[8] As market segmentation diminishes, expected returns in a country should be more a function of covariance with world risk and less a function of the variance of that country's returns.

A third approach has focused on *consumption* behavior under international risk sharing. In a fully integrated world, households would insure against output risks idiosyncratic to their countries by holding securities in other countries subject to different shocks. Under perfect risk sharing, country-specific shocks to consumption growth would bear no correlation to country-specific output growth shocks; and consumption growth rates would have high correlations internationally even if output growth rates did not. Lewis (1999) termed the observed violation of these patterns 'consumption home bias', surveyed the literature, and linked it to home equity bias.

Up to now, large-scale international comparisons of the structure of mature household portfolios were not possible, because sufficiently detailed, internationally comparable data on portfolios and on household characteristics and attitudes of older households did

not exist. Our study is the first to study portfolios of older households using *all* internationally comparable household-level data. For the United States, we use data from the Health and Retirement Study (HRS); for England, data from the English Longitudinal Study of Aging (ELSA); and for 11 additional European countries, we use data from the Survey of Health, Aging and Retirement in Europe (SHARE).

Our analysis in this paper points to a rich pattern of international, and even interregional, variation in the conditions governing participation in this broad range of assets, as well as those governing the level of asset holdings among participants. Although US regions appear more integrated than European countries between them, they also present an interesting pattern of differences across financial and real assets.

In Section 2, we describe the data for households aged 50 or above. In Section 3, we focus on asset market participation. We distinguish between the role of the configuration of characteristics and of the contributions of given characteristics to participation in the US and Europe. We also examine the different role of key household characteristics in the decision to participate in an asset, across countries and asset categories. In Section 4, we focus on asset holders and decompose observed international differences in asset holdings at various percentiles of the distribution of such holdings into two parts: (i) those that result from differences in configuration of household characteristics; and (ii) those that arise from a different relationship between characteristics and amounts. Again, we compare Europe to the US, but also consider within-US and within-Europe integration. Section 5 offers some concluding remarks.

2. The Data

2.1 Data Features

We use the three most comprehensive data sets on portfolios of older households that are currently available: HRS, ELSA, and SHARE. The Health and Retirement Study (HRS) is a panel survey of Americans aged 50 and above, which has been conducted every two years since 1992. The English Longitudinal Study of Aging (ELSA) is also a panel survey of those 50 and above in England. There have been two waves conducted, one in 2002 and the other in 2004. Finally the Survey of Health, Aging and Retirement in Europe (SHARE), which is modeled after the HRS and ELSA, also surveys those aged 50 and above in several European countries. The first wave of SHARE took place in 2004 in Sweden, Denmark, Germany, the Netherlands, France, Switzerland, Austria, Italy, Spain, and Greece; and in 2005 in Belgium. It is currently taking place in Israel while the second wave will start in autumn 2006 and will include the aforementioned countries and in addition Ireland, the Czech Republic, and Poland.

All three surveys have several modules, which allow comparison of asset holdings across countries while controlling for a wide array of household characteristics: demographic background, family structure, physical and mental health, cognitive abilities, health expenses and insurance, employment status, retirement perspectives, job history, incomes, financial transfers, housing, assets, social activities and expectations. Special emphasis has been placed on eliciting information about the health status of participants, who are asked detailed questions about their health history, current health problems and their experiences with the health system of their countries. In addition, the respondents are subjected to various tests administered by health professionals (e.g. grip

5

strength and walking speed) that are very informative on their health status. On the economic side, the modules on employment, income and assets provide detailed information about their various income sources and about a wide array of financial and real assets that they may possess.

2.2   Participation Rates and Levels of Asset Holdings

Table 1 reports participation rates and levels by quartiles of three main classes of assets: stockholding, private business, and principal residence. Ownership of stocks, either direct or indirect through mutual funds and retirement accounts, is greatest in Sweden, Denmark, and in the US. It is smallest in Austria, Italy, Spain, and Greece. Homeownership is highest in Spain, and lowest in Germany, Netherlands, Switzerland, and Austria. The highest rates of business ownership are observed in Sweden and Switzerland, with the US and Denmark a short distance behind them. The lowest rates of business ownership are observed among older households of Austria and England.

The US and Switzerland exhibit the largest medians of stock holdings among owners. Heterogeneity in levels at various quartiles is much more evident across European countries than across US regions. The value of private businesses at all quartiles is lower in the US compared to European countries, where heterogeneity is particularly present at higher levels of the distribution. The Netherlands and Switzerland display the highest median housing wealth levels. Heterogeneity in terms of housing values at all quartiles is evident not only across European countries, but also within the US with values in West and North East being well above those in the South.

All in all, inspection of asset holdings of older households reveals considerable international variation, both in participation rates and in asset holdings conditional on participation. Yet, this is not necessarily a sign of lack of integration. Part of this variation may be due to differences in the configuration of characteristics in the population of households across countries and not to differences in the economic environment a given population faces.[9] Econometric analysis is needed to uncover differences in the effects of given characteristics on (i) the decision to participate; and (ii) on asset holdings conditional on participation. It is to this that we now turn.

3. Sources of International Differences in Asset Participation

In this part, we consider determinants of international differences in participation rates in each of three asset classes: stocks, private businesses, and primary residence. Country-wide average participation probabilities in a particular asset are a function of the configuration of observable characteristics in the population ('covariates') and of the country-specific contributions of those characteristics ('coefficients'). We estimate the roles of these two determinants of asset participation. We also examine the individual contribution of a few important characteristics.

The more integrated a set of countries or regions, the closer the probabilities of participation would be for households of given characteristics located in different countries/regions. Coefficient effects would speak directly to this question, but covariate effects are also interesting in that they show the extent to which estimated differences in participation probabilities are due to an unfavorable composition of the population in a particular country or region. We first use the US as the benchmark ('base country') and

compare all European countries to it. We then consider the extent of integration among US regions; and among European countries with Germany as the benchmark.

3.1 US-Europe Comparisons

3.1.1 Country Effects on Participation Probabilities

Figure 1 shows estimated coefficient and covariate effects on average participation probabilities for all European countries using the US as a base. Starting with participation in stockholding (direct and indirect), our findings imply that the market conditions faced by households in most European countries are not as conducive to participation as those of the US. In fact, there are only four European countries whose older households would be discouraged from participating if they were to face US market conditions: Sweden (where the probability effect is huge, exceeding 25 percentage points), Denmark, France and England. Older households of all other countries would be more likely to participate in stocks if they faced US market conditions, and all estimates of coefficient effects are statistically significant.

In addition to market conditions, older households in Europe have observable characteristics that are less conducive to participation in the stock market than their US counterparts. This is true even in Sweden, where market conditions dominate and result in higher stockholding participation than in the US. We estimate statistically significant effects of household characteristics for all countries except Italy. Although in most cases coefficient effects dominate covariate effects in estimated size, population characteristics are estimated to be more important than market conditions in Spain, France and in

8

England; in the latter two cases, they point in the opposite direction and are responsible for the observed more limited stockholding in these two countries compared to the US.

Let us now turn to private business ownership (or ownership of a share in a private business), in Figure 2. According to our estimates, it is the dominant role of market conditions over population characteristics that is largely responsible for lower participation rates in private business in Europe than in the US. Countries where market conditions are found to favor business ownership less than those in the US include Denmark, Belgium, Austria, Germany, France, the Netherlands, Italy, Greece and England. There is only one European country among those examined where market conditions are more conducive to such participation than in the US, namely Sweden. No statistically significant effects are found for the remaining countries in our sample. European older populations are estimated to have characteristics that are equally conducive to business ownership as those of the US population, with the exception of Spain, Greece and England where characteristics are less conducive.

Comparisons of homeownership probabilities give a more varied picture (Figure 3). In central and northern European countries, with the exception of Belgium and England, market conditions are found to discourage homeownership relative to those of the US. This is not the case in the South (especially in Spain and Greece and to a lesser extent in Italy), where we find that housing market conditions favor homeownership.[10] In southern countries, characteristics of older households are less conducive to homeownership than those in the US, while covariate effects tend to be insignificant or small in central and northern Europe.

3.1.2 Marginal Effects of Selected Characteristics

We also present marginal effects of selected covariates, i.e. estimated changes in the probability of participation in an asset in response to a change in status. Following the estimation of probit regressions within each country, we calculate marginal effects for each household separately and then report weighted average marginal effects over all older households in this country. Standard errors for estimated marginal effects are derived using the bootstrap. Details are given in an Appendix. For each country, we plot three bars showing estimated marginal effects (one for each asset category) and their confidence intervals. This allows us to compare the relative intensity with which a given factor influences participation in different assets within a country, and across countries.

The effects of having a college degree (compared to being a high school drop out) are displayed in Figure 4. Our estimates for the role of a higher education degree on direct and indirect participation in stocks (through mutual funds and individual retirement accounts) are positive and significant. Estimates are also large, with seven of them exceeding 10 percentage points.

There is considerable variation of estimates across countries. By far the largest estimate is obtained for the US, where a college degree raises the probability of participation by older households in stockholding by about 25 percentage points, controlling for other characteristics. There is no simple relationship between high participation rates and the estimated size of effects: Sweden has an even higher stockholding participation rate than the US and yet exhibits a very small and insignificant estimate. By contrast, Italy – a country with very low participation rates in stockholding – exhibits a sizeable, significant effect of the order of 10 percentage points.

Existing literature on participation in stockholding typically finds strongly significant effects of educational attainment of the household head in a given country, especially with regard to having a college degree or more. These results on the role of education are even more favorable to the importance of education for stockholding participation than those in existing studies, because they refer to older households, i.e. to a group more distant to the time of completion of formal education. Thus, they imply that the effects of higher education on participation in stockholding go well beyond formal knowledge into the realm of information processing abilities and ability to make the best of available opportunities. To the extent that our regressors do not fully control for cognitive skills and innate ability, education variables may also account for such factors.

In complete contrast to results on stockholding, a college degree has no effect on business ownership among older households. Exceptions are the US, Sweden, and Austria, where the effect is statistically significant but the estimate is quite small. Since we also control for retirement status in these regressions, it does not seem that these findings are merely a result of the fact that a large part of older households are retired and therefore unlikely to still own a business. This finding suggests that there is enough variation in business types to match every background, so that the effect of the college degree on participation probability vanishes.

A college degree plays a (positive) role in homeownership, controlling for other factors, only in some of the countries.[11] There is also considerable international variation of estimates, with the largest estimates being obtained in the Netherlands, France and in England. In the US the estimate is very small, and marginally significant. This unclear

role of a college degree may be partly due to the preference for geographical mobility it generates.

As a second illustration, we report the estimated average marginal effects of self-reported bad health on participation probabilities in the three assets. Bad health has already been found to reduce probability of participation in stockholding in the US (Rosen and Wu, 2004). It is worthwhile to see what effect it has on stockholding in other countries but also on business ownership and homeownership.

There are several channels through which bad health could impact asset ownership. First, if bad health implies higher current and expected future out-of-pocket expenditures, it makes it less likely that funds can be set aside in the form of illiquid asset holding. Second, to the extent that asset ownership requires effort on the part of the asset owner (in the form of management or monitoring of managers), bad health can make participation more difficult to handle. Third, and in the opposite direction, the precautionary motive associated with higher risk of future health expenditures increases the precautionary demand for assets that can be liquidated to meet future expenditures and to buffer consumption.

Figure 5 shows the average estimated effects of self-reported bad health on asset ownership across countries and across assets. The vast majority of estimates, and all the statistically significant ones, are negative. Yet neither the estimated magnitudes nor the rankings across assets are the same across countries. In the US, Sweden and England, estimated marginal effects are biggest for stockholding, then for homeownership and smallest for private business ownership. In the Netherlands, bad health substantially reduces the probability of homeownership and of business ownership but has no effect on

stockholding. In Germany, Netherlands, Switzerland, and Italy we observe a clear discouragement effect on private business ownership. In Belgium, France, Austria, Spain and Greece, self-reported bad health is not estimated to have any significant effect on asset ownership probabilities.

This rich pattern of effects is consistent with the multiple channels through which health considerations can influence asset participation. Bad health would tend to be insignificant when asset ownership is not closely linked to management and control; and when it does not imply substantial out-of-pocket costs that might necessitate asset liquidation, either because of relatively inexpensive health care or because of adequate provision of health insurance. While negative effects on stockholding and on business ownership are consistent both with high out of pocket health costs (leaving less funds to be invested) and with high involvement in ownership and control (requiring high levels of activity), negative effects on homeownership probabilities are more likely to suggest high out-of-pocket health costs. Insignificance may be suggestive of the limited importance of both of these factors, but may also arise from limited set of negative responses on how respondents consider their health condition, either because they do not admit it or because they do not realize it.

3.2   Integration within the US

The top panel of Table 2 shows regional effects on average participation probabilities within the US. The first column ('Diff.') reports differences in the actual proportion of owners between the reference region (Midwest) and the region shown. Households in the Midwest have higher actual participation rates in all three assets

examined. Differences are largest with the South for stockholding, and with the Northeast for homeownership and for business ownership. This is then broken down into coefficient and covariate effects.

The second column ('Coeff.') reports by how much participation probabilities would change on average if the residents of the region shown faced the market conditions of the reference region. In virtually all cases, these estimates are statistically significant and positive, suggesting that market conditions in the Midwest are more conducive to participation in any of these asset classes. The exception is that the Northeast is estimated to have more favorable conditions for stockholding than the Midwest. Though statistically significant, estimated differences are rather small, with only two exceptions (of about eigth percentage points). Market conditions in the South are estimated to be substantially less favorable to stockholding than in the Midwest; and similarly for the Northeast and homeownership.

The third column ('Covar.') reports covariate effects, i.e. the difference between the actual rate of participation for residents of the reference region (Midwest) and the counterfactual average estimated probability of participation that residents of the region shown would exhibit if they also faced the market conditions of the Midwest. These are typically statistically significant, positive, but all quite small. Thus, the configuration of (older) household characteristics in the Midwest is estimated to be only slightly more conducive to ownership of the three assets considered than in the remaining three regions.

3.3 Integration within Europe

The bottom panel of Table 2 reports differences in actual rates of participation, and their breakdown into coefficient and covariate effects, for Europe using Germany as the base country. Our estimates suggest that differences in participation rates across Europe arise mainly from differences in market conditions rather than in the particular mix of household characteristics across European countries. We find that, with very few exceptions, coefficient effects are statistically significant (second column); and they are often quite large, especially for stockholding and homeownership, though they tend to be much smaller for business ownership. Covariate effects are significant more often than not, but they are usually quite small.

As reflected in coefficient effects, market conditions in Germany are estimated to be impressively less conducive to stockholding compared to a number of other countries. The largest coefficient effects are estimated for Sweden: if Swedes were to face German market conditions, their average participation rate in stockholding would drop by more than 45 percentage points. The Danes and the French would also exhibit substantial drops in participation, between 21 and 28 percentage points. Still, German conditions are more conducive to stockholding than those in Austria, Spain, Italy, and Greece. Covariate effects are generally small for stockholding, except perhaps that Spanish and Italian households are estimated to exhibit 6 to 8 percentage points lower average participation probabilities compared to the German population, if both were to be faced with the same conditions.

Germany has notoriously low homeownership rates. Our estimates show that this has nothing to do with the mix of observed characteristics of German households, which is

15

either similar or more conducive to homeownership (sometimes substantially so – witness Southern countries and England) than the other European countries considered. The real source of the difference is housing market conditions, and the economic significance of this difference is very large indeed. Homeownership rates in the South and England would drop by between 33 and 50 percentage points if their populations were confronted with German conditions. But even in Belgium and France, drops would be of the order of 30 percentage points.

Starting from these findings, it would be worthwhile to find methods to investigate which part of these differences has to do with differential transactions costs, credit market conditions, and policies towards housing across Europe. Undoubtedly, there are also cultural differences with respect to housing: the importance attributed to homeownership, or to providing housing gifts to children when they marry. This task would not be easy, as there is likely close interaction between the two: policies need to be acceptable given cultural predispositions of the electorate; and long-standing policies or features of the housing and employment markets may promote a particular 'culture' with respect to housing (e.g. a tendency to accumulate housing and give housing gifts to children).

Our findings suggest greater similarity across Europe with respect to market conditions for private business ownership. Coefficient effects are insignificant in Belgium, Greece, and England; and relatively small when significant. Except for Austrians, all other populations with significant effects would experience drops in average estimated probabilities of participation if they were exposed to German conditions. Covariate effects are small or insignificant. Our estimates imply that the

characteristics of Spanish, Italian, French, and English populations are somewhat less conducive to business ownership, but no differences are visible for other countries.

All in all, we find that although US regions do not provide complete uniformity in market conditions favoring ownership of different assets, European differences are quantitatively larger and by no means uniform across asset categories. In some cases, we also find that characteristics of the population of households also differ in ways that matter, statistically and quantitatively, for international differences in asset ownership.

4.   Levels of Asset Holdings

Having studied asset participation across countries, we turn in this section to levels of asset holdings across their entire distribution among holders. First, we compare levels of asset holdings at given percentiles of the distribution of such holdings among holders. This allows us to see where holdings of a particular asset category tend to be higher and where lower. We then ask to what extent observed international differences in asset holdings arise from differences in the demographic characteristics of asset holders in various countries and to what extent they arise from differences in the influence of characteristics on observed holdings.

For this second task, we employ a variant of a technique proposed by Machado and Mata (2005), described in an Appendix. As part of this approach, we first estimate quantile regressions for asset holdings in a base country (or region), for the sample of owners of such assets.[12] These yield sets of estimates that can have a varying impact on asset holdings across different parts of the distribution without being restricted to the modeling of the mean tendency (as in OLS).

We then decompose differences in asset holdings between the base country or region and the country or region being compared to it into (i) a component due to differences in the distribution of *covariates*, i.e. in the configuration of characteristics of asset holder pools across countries or regions; and (ii) a component due to differences in the *coefficients* on these covariates for various quantiles of the distribution of asset holdings. For example, an increase in income by 1000 Euro (PPP-adjusted) may have different effects on median holdings of a particular asset in the US and in a European country, because of differences in market conditions governing holdings of this asset.

Differences in holdings of a particular asset between the base and a comparison country or region i can be decomposed in the following manner:

$$f\left(y^{Base}\right) - f\left(y^{i}\right) = \left\{f\left(y^{Base}\right) - f^{*}\left(y; X^{i}b^{Base}\right)\right\} + \left\{f^{*}\left(y; X^{i}b^{Base}\right) - f\left(y^{i}\right)\right\} \quad (1)$$

The densities without asterisk represent the actual levels of the asset in question among owners. The starred density is the counterfactual we construct. It represents the density that would have been observed if we were to combine the configuration of characteristics of asset holders in country or region i with the coefficients on those characteristics estimated for the base country or region. We present results from these decompositions in the form of percentiles of the relevant densities.

In interpreting this decomposition, we can think of starting with the distribution of asset holdings in a particular country or region i and comparing it to what would have been observed if the population of asset holders were confronted with the same market conditions facing asset holders in the base country, i.e. if markets were completely integrated. The resulting difference (in the second bracket) represents these coefficient effects. We also compare this counterfactual to the actual density in the base, which

obviously results from combining coefficients of the base with the configuration of characteristics among holders of this asset in the base. This difference (in the first bracket) represents covariate effects, i.e. those attributable to differences in configuration of characteristics between holders of this asset in country or region i and in the base.

As we did for participation, we examine coefficient and covariate effects for direct and indirect stockholding, private business, and primary residence. We first use the US as the base country and compare it to each European country. Then, we examine how integrated US regions are, using the Midwest as the base region. Finally, we examine the extent of European integration as regards market conditions governing levels of asset holdings among participants, using Germany as the base.

4.1   Europe versus the US

4.1.1   Direct and Indirect Stockholding

Figure 6 shows coefficient and covariate effects for differences in stockholding levels between the US and each European country. We see that US stockholders hold greater amounts of stock wealth across the distribution of stock holdings. Counterfactual decompositions for most of the countries show that this difference across the board comes mainly from strong coefficient effects: European stockholders would achieve considerably higher levels of stock holdings if they were to be confronted with US market conditions. Switzerland presents the only exception to this tendency showing relatively small and insignificant coefficient effects that suggest greater similarity with US market conditions governing stock investments. On the other hand, covariate effects are small and mostly insignificant across percentiles: the US stockholder pool is able to

achieve somewhat larger levels of stock holdings than what the European pool of stockholders would achieve if they were to be faced with US conditions. Sweden is the only exception to this tendency.

Coefficient effects are particularly strong in Denmark, Austria, and Greece. They are strong and mostly unchanged across the distribution, suggesting a similar influence, in Germany, France and England, while in Belgium they clearly diminish at the upper end. This suggests that Belgian stock owners with substantial investments in stocks face conditions that are more similar to those in the US, compared to the conditions faced by smaller stockholders in their country. Coefficient effects are also dominant in Spain and Italy, but with a tendency to increase as we move across the distribution. For Germany, France, Denmark, England and the three southern countries, covariate effects are negligible, implying that the configuration of the stockholder pool is every bit as conducive to high stockholding levels as that in the US. It is the conditions they face upon entering that result in observed differences with US stockholders.

Indeed, covariate effects dominate coefficient effects only in Sweden. This implies that the configuration of the stockholder pool (among older households) is not as conducive to high stockholding levels in these countries as it is in the US. With participation rates at 71%, Sweden exhibits more widespread stockholding compared to the US. Taken together, participation rates and our findings imply that the stockholder pool in Sweden is less conducive to high stock holding levels, because it contains a larger proportion of 'marginal stockholders' with characteristics that warrant limited exposure to the stock market.

4.1.2 Private Businesses

Figure 7 shows observed differences and counterfactual decompositions for private business holdings among older households across various US-European country pairs. In most of the cases US households hold lower real amounts in private businesses across the entire distribution of such holdings. Most of the difference can be accounted for by differences in market conditions facing those who have private business holdings. If European private business holders were faced with US markets conditions, they would be holding lower amounts in private businesses. For countries like Greece, Spain and Italy (with the exception of the high percentiles) these factors play a limited (and in most percentiles) insignificant role. On the other hand, market conditions in Sweden, Germany, France and the Netherlands seem to make much of a difference for entrepreneurs with larger private business holdings. England represents the only case where business holders (in particular small ones) would hold higher amounts if they were faced with US market conditions. Covariate effects are insignificant in all pairwise comparisons.

4.1.3 Value of Main Residence

In this section we examine differences in gross value of primary residence between the US and various European countries (Figure 8). With the exception of Sweden, the overall picture is one of higher home values among older owners in Europe than in the US, across the entire distribution of such values. Does this reflect different market conditions facing homeowners in the two sides of the Atlantic or should be attributed to the different configuration of their characteristics?

We find that European homeowners in virtually all countries considered have larger holdings than those they would have if they faced US market conditions. Coefficient effects are particularly strong and well exceed the overall differences in home values observed in England, Spain, Italy and Greece. Such strong coefficient effects are consistent with the boom in housing prices that these countries experienced in 2004. In view of our findings on stock holdings above, it may well be that European households devote larger real amounts to their primary residence because they face favorable conditions in the housing market *relative to* the conditions they face in the stock market (or other asset markets). [13]

By contrast, the pool of US homeowners has characteristics more conducive to large home equity values than the pool of European homeowners. Covariate effects are mostly[14] positive and particularly strong in southern countries. So, our findings imply that the observed lower home values in the US do not result from a poor configuration of characteristics of the US homeowner pool relative to the European one but from different market conditions facing older US households with regard to their primary residence.

4.2 Integration within the US

Table 1 shows real PPP-adjusted levels of asset holdings for holders located in four regions of the US: Midwest (MW), Northeast (NE), South (S), and West (W). NE and W exhibit the highest stockholding levels for most of the distribution, but at the highest percentile shown (95th), it is the South that compares with the NE, and W is comparable to the Midwest.

When it comes to real assets, the picture is quite different. The Midwest dominates in values of private businesses across the distribution of holdings. Northeast and West go hand-in-hand for most of the distribution, but NE is a clear second at the top end. The West dominates in values of primary residence, with NE second. While differences in home values are small at the bottom end of their distribution, they grow considerably larger as we move to the top percentiles.

Table 3 reports counterfactual decompositions at three indicative percentiles: 25th, 50th, and 75th. Asterisks denote statistical significance of estimated coefficient and covariate effects (ranging from 10% for one asterisk to 1% for 3 asterisks). For stockholding, coefficient effects are largely insignificant, suggesting that households located in different regions of the US face similar market conditions with respect to stockholding.[15] This is consistent with intuition. US households face the same stock market and have access to banks, other financial institutions, and mutual funds that are often located near them but operate in a highly competitive financial industry. Indeed, it is even possible for US households to access such institutions via the internet, even if they are not physically located close to them.

Turning to real assets, however, we find a greater incidence of statistically significant coefficient effects, for private businesses and even more so for the primary residence. For private businesses, in most cases shown, these effects are even larger in estimated value than the overall differences. For example, median holdings of private businesses are larger in the Midwest than in any of the other three regions by about 40 or 50 percent, and this is entirely due to coefficient effects, with covariate effects being quantitatively small and statistically insignificant.

As expected, amounts invested in primary residence are larger in the West and in the Northeast than in the Midwest; and smaller in the South. Our results show that coefficient effects explain the bulk of regional differences across the distribution of home values, with covariate effects making a visible contribution only in the South. This is consistent with generally held views about the state of housing markets in the different US regions.

What do these results on asset amounts imply about the extent to which households located in different regions face similar market conditions? The three asset classes considered span a broad range. With regard to stockholding (and in view also of the well-known home equity bias), US households face essentially the same stock market but what can differ is the technology they have for investing in stocks (through financial institutions, mutual funds, brokers and the like). Our results suggest that households in different regions face quite similar conditions.

At the opposite extreme is housing: those with primary home in a particular region face the local housing market conditions. In order for these to be similar across regions, households need to be willing and able to move to where the housing market offers opportunities to obtain a home at lower real cost. Even if the policy and institutional framework were harmonized across different states, differences could still arise from differential employment opportunities or quality of life across regions. Indeed, within the US, differences are not only statistically but also quantitatively significant. US results are a useful reminder that the EU cannot expect these differences to disappear, even with full labor mobility and harmonization of fiscal policies at the 'federal' level.

We can also understand why private business holding turn out to be somewhere in between financial assets and primary residence. In principle, a household does not need

to own a private business, or all its private businesses, within the region where its primary residence is located. However, supervision, control, and any participation in the management of the private business are considerably facilitated by geographical proximity. So, there is less room for taking advantage of favorable conditions in other regions, unless households are willing to move. This results in some market segmentation whose effects show up in our findings.

4.3 Integration within Europe

The bottom panel of Table 1 reports PPP-adjusted real holdings of various assets in European countries, by percentiles of the distribution of owners in each case. The first impression from these raw numbers is that there is considerable variation in levels of holdings among European countries, even when focusing on a particular percentile of the distribution. Table 3 decomposes this variation into coefficient and covariate effects, using Germany as the base country.

Stocks were the asset for which coefficient effects were largely insignificant within the US. This is not the case for Europe. The vast majority of countries exhibit strongly statistically significant coefficient effects on stockholding relative to Germany. They are also highly significant economically. In most cases, they explain most of (and sometimes more than) the observed international difference in stockholding at the particular percentile.

For example, stockholdings in France are only somewhat larger than those in Germany at the percentiles shown, but if the French faced German market conditions, their holdings would have been substantially smaller. The same is true when the

comparison is made between Germany and the Netherlands, even though observed Dutch holdings are substantially larger than German ones. When Germany is compared with Sweden, coefficient effects are not only large, but they also go in the opposite direction of total effects: although observed German stock holdings in the respective percentiles are somewhat larger than Swedish holdings, if Swedes faced the same conditions as Germans, they would exhibit significantly lower holdings than they currently do. By contrast, German and Austrian conditions seem quite similar, in the sense of producing insignificant coefficient effects. Very few covariate effects turn out to be significant, all in favor of the German stockholder pool.

Our results do not suggest substantial integration in Europe, at least as far as conditions facing stockholders are concerned. They are likely to reflect differences in the stock markets in which these households invest (i.e. home equity bias even following the adoption of the Euro) as well as differences in the ease with which they can invest (brokerage costs, availability of information, etc.). It is perhaps noteworthy that these differences are present even for large stockholders, as coefficient effects tend not to disappear at the upper end of the distribution.

Based on our findings for US regions, we would expect to find signs of considerable variation in market conditions for investments in private business. This expectation is confirmed for the 75th percentile, with strongly significant and generally larger estimated coefficient effects within Europe compared to within the US. However, coefficient effects are typically insignificant at the 25th percentile and (with the exception of southern countries) at the median of the distribution of private business holdings. This suggests that households with small or medium holdings of (shares in) private businesses tend to

face quite comparable market conditions across European countries, but statistically and economically significant differences are observed for those with the largest holdings.[16] In fact, the estimated pattern is the opposite of that in the US, where there seems to be greater harmonization of conditions faced by large business holders than by smaller ones.

Let us finally turn to results on home values. As expected, coefficient effects are statistically significant across the distribution of home values, suggesting differences in market conditions faced by homeowners in different European countries. It is noteworthy, however, that their estimated size and sign exhibit considerable variation across European countries, even though Germany has a very low homeownership rate and one might suppose a priori that it offers uniformly less favorable conditions to homeowners compared to other European countries.[17] This finding illustrates the importance of looking both at factors influencing participation in a particular asset and holdings conditional on participation. Finally, there are a number of statistically significant covariate effects having to do with characteristics of homeowners in Europe, but for some countries they are only significant for small homeowners while for others they are only significant for large homeowners.[18]

5.   Concluding Remarks

In this paper, we have studied differences in mature portfolios, i.e. portfolios of older households, across the Atlantic, as well as within the US and within Europe. We considered three asset types: stockholding, private businesses, and primary residence. Our analysis looked at the economic and statistical significance of factors influencing participation and asset holding levels among holders. Using modern econometric

27

techniques, we distinguished between those arising from differences in the composition of the relevant household pool; and into those resulting from different conditions facing households that contemplate entry or actively participate in the market.

Our analysis pointed to a rich pattern of international, and even interregional, variation in the conditions governing participation in this broad range of assets, as well as those governing the level of asset holdings among participants. Although US regions appear more integrated than European countries between them, they also present an interesting pattern of differences across financial and real assets.

Our findings imply that neither the market conditions faced by households in most European countries nor their characteristics are as conducive to participation in stockholding (direct or indirect) as those of the US. The dominant role of market conditions over population characteristics is largely responsible for lower participation rates in private business in Europe than in the US. With the exception of Southern countries and England, European older populations are estimated to have characteristics that are more conducive to business ownership than those of the US population. Comparisons of homeownership probabilities give a more varied picture.

Within the US, market conditions in the Midwest are more conducive to participation in any of these asset classes. The exception is that the South is estimated to have even more favorable conditions for homeownership than the Midwest. Though statistically significant, estimated differences are rather small. The configuration of (older) household characteristics in the Midwest is estimated to be only slightly more conducive to ownership of the three assets considered than in the remaining three regions. By contrast, when we examine integration within Europe, we find that differences in participation

rates arise mainly from differences in market conditions rather than in the particular mix of population characteristics. With very few exceptions, coefficient effects are statistically significant and often quite large, especially for stockholding and homeownership, though they tend to be much smaller for business ownership.

Turning to amounts held by owners, US stockholders hold greater amounts of stock wealth across the distribution of stock holdings. This difference across the board comes mainly from strong coefficient effects: European stockholders would achieve considerably higher levels of stock holdings if they were confronted with US market conditions. Covariate effects are small and mostly insignificant across percentiles.

Most of the differences in business holdings across the Atlantic can be accounted for by differences in market conditions. If European private business holders were faced with US markets conditions, they would be holding lower amounts in private businesses. England represents the only case where business holders (in particular small ones) would hold higher amounts. Covariate effects are insignificant.

European homeowners in virtually all countries considered have larger holdings than those they would have if they faced US market conditions. Coefficient effects are particularly strong and well exceed the overall differences in home values observed in England and in the South. By contrast, the pool of US homeowners has characteristics more conducive to large home equity values than the pool of European homeowners.

Within the US, coefficient effects suggest that households located in different regions face similar market conditions with respect to stockholding, but we find a greater incidence of statistically significant coefficient effects for private businesses and even more so for the primary residence.

The picture within Europe is considerably different. The vast majority of countries exhibit strongly statistically significant coefficient effects on stockholding relative to Germany, which are also economically significant. Households with small or medium holdings of (shares in) private businesses tend to face quite comparable market conditions across European countries, but statistically and economically significant differences are observed for those with the largest holdings. Coefficient effects are statistically significant across the distribution of home values, but their estimated size and sign exhibit considerable variation across European countries when compared to Germany. There are a number of statistically significant covariate effects, implying that differences in home values arise partly from differences in characteristics of homeowners across European countries.

Tracing the differences we have identified to the more detailed market, policy, institutional and possibly even cultural heterogeneity between pairs of countries or regions can potentially lead country experts and policy makers to design measures that will promote further economic integration; and the financial sector to market its products and services in ways that reduce the currently observed differences in market conditions..

References

Albrecht, James, Anders Björklund, and Susan Vroman (2003). "Is There a Glass Ceiling in Sweden?", *Journal of Labor Economics*, 21, 145-77.

Bilias, Yannis, Dimitris Georgarakos and Michael Haliassos (2006a). "Equity Culture and the Distribution of Wealth", mimeo, Goethe University Frankfurt.

Bilias, Yannis, Dimitris Georgarakos and Michael Haliassos (2006b). "Portfolio Inertia and Stock Market Fluctuations", mimeo, Goethe University Frankfurt.

Bekaert, Geert, and Campbell R. Harvey (1995). "Time-Varying World Market Integration", Journal of Finance, 50, 403-44.

Bekaert, Geert, and Campbell R. Harvey (2000). "Foreign Speculators and Emerging Equity Markets", Journal of Finance, 55, 565-614.

Campbell, JohnY. (2006). "Household Finance", Journal of Finance, 61, 1553-604.

Campbell, John Y., and João F. Cocco (2003). "Household Risk Management and Optimal Mortgage Choice", Quarterly Journal of Economics, 118, 1449-94.

Campbell, John Y. and Luis Viceira (2002). *Strategic Asset Allocation: Portfolio Choice for Long-term Investors*, Oxford: Oxford University Press.

Cocco, João F. (2005). "Portfolio Choice in the Presence of Housing", Review of Financial Studies, 18, 535-67.

Cocco, J., F. Gomes, and P.J. Maenhout (2005). "Consumption and Portfolio Choice over the Life Cycle," Review of Financial Studies, 18:2, 491-533.

Feldstein, Martin, and Charles Horioka (1980). "Domestic Savings and International Capital Flows", Economic Journal, 90, 314-29.

French, Kenneth and James Poterba (1991). "Investor Diversification and International Equity Markets", American Economic Review, 81, 222–26.

Gollier, Christian (2001). The Economics of Risk and Time, Cambridge, MA: MIT Press.

Gomes, Francisco and Alexander Michaelides (2005). "Optimal Life-Cycle Allocation: Understanding the Empirical Evidence", Journal of Finance, 60, 869-904.

Guiso, Haliassos, and Jappelli (2001). *Household Portfolios*, Cambridge, MA: MIT Press.

Haliassos (2006). "Household Portfolios", forthcoming in S. Durlauf and L. Blume, *The New Palgrave Dictionary of Economics,* 2nd Edition, Palgrave Macmillan.

Haliassos, Michael and Carol C. Bertaut (1995). "Why Do So Few Hold Stocks?" The Economic Journal, 105, 1110-29.

Haliassos, Michael and Alexander Michaelides (2003). "Portfolio Choice and Liquidity Constraints", *International Economic Review*, 44, 143-78.

Harvey, Campbell R. (1991). "The World Price of Covariance Risk", Journal of Finance, 46, 111-57.

Heaton, John and Deborah Lucas (2000). "Portfolio Choice in the Presence of Background Risk", The Economic Journal, 110, 1-26.

Helliwell, John F. (1998). *How Much Do National Borders Matter?* Washington, D.C.: Brookings Institution Press.

Kang, J.K. and R.M. Stulz (1997). "Why is There a Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan", Journal of Financial Economics, 46, 3–28.

King, Mervyn and Jonathan Leape (1984). "Wealth and Portfolio Composition: Theory and Evidence", *NBER Working Paper* No. 1468.

Mankiw, N. Gregory and Stephen Zeldes (1991). "The Consumption of Stockholders and Non-Stockholders", Journal of Financial Economics, 29, 97-112.

Mata, José and José Machado (2005). "Counterfactual Decomposition of Changes in Wage Distributions Using Quantile Regression", *Journal of Applied Econometrics*, 20(4), 445-65.

McCallum, John (1995). "National Borders Matter: Canada-U.S. Regional Trade Patterns", American Economic Review, 85, 615-23.

Obstfeld, Maurice, and Kenneth Rogoff (2000). "Perspectives on OECD Economic Integration: Implications for US Current Account Adjustment", in *Global Economic Integration: Opportunities and Challenges*, 169-208, Federal Reserve Bank of Kansas City.

Pastor, Lubos (2000). "Portfolio Selection and Asset Pricing Models", Journal of Finance, 55, 179-223.

Rogoff, Kenneth (1996). "The Purchasing Power Parity Puzzle", Journal of Economic Literature, 34, 647–68.

Rosen, Harvey S., and S. Wu (2004). "Portfolio Choice and Health Status", Journal of Financial Economics, 72, 457-84.

Taylor, Alan M. and Mark A. Taylor (2004). "The Purchasing Power Parity Debate", Journal of Economic Perspectives, 18, 135-58.

Tesar, L. and I. Werner (1995). "Home Bias and High Turnover", Journal of International Money and Finance, 14, 467–92.

Train, K. E. (2003), *Discrete Choice Methods with Simulation.* Cambridge: Cambridge University Press.

Appendix A: The Machado-Mata Algorithm

The algorithm for constructing counterfactual densities is based on Machado and Mata (2005) (see also Albrecht et al., 2003):

1. We first estimate 19 vectors j of Quantile Regression coefficients at every 5th percentile, θ_j, of the distribution of the asset in question in the US:

$$Q_{\theta j}^{US}\left[y^{US} \mid X^{US}\right] = X^{US}b^{US}\left(\theta_j\right)$$

2. We then make m random draws of characteristics and corresponding weights with replacement from the European country i, where m is the number of owners of the asset in question in the sample from country i. This process is repeated 19 times. Each outcome of these draws, containing m observations, is denoted by X_j^i.

3. We generate 19 counterfactual samples of size m from the desired conditional distribution: $y_j^* = X_j^i b^{US}\left(\theta_j\right)$. We use these values to generate the unconditional counterfactual distribution: $f^*\left(y; X^i b^{US}\right)$.

4. Finally, for each of the three sequences of variables (log asset holdings in the US, in European country i and counterfactual values), we calculate percentiles using population weights. The difference between percentiles of the distributions of the endogenous variable in the US and in European country i can be decomposed into:

$$f\left(y^{US}\right) - f\left(y^i\right) = \left\{f\left(y^{US}\right) - f^*\left(y; X^i b^{US}\right)\right\} + \left\{f^*\left(y; X^i b^{US}\right) - f\left(y^i\right)\right\}$$

Differences in the first and second brackets represent covariate and coefficient effects, respectively.

We also compute and present confidence bands for covariate and coefficient effects based on bootstrapped standard errors. To this end, we first derive 100 bootstrapped samples from the US sample of asset holders used in step 1. We then derive 19 vectors of QR estimates using each of these bootstrapped samples. Then, by repeating the process described in steps 2-4 100 times, we generate a series of 100 bootstrapped counterfactual distributions. These are used to derive bootstrapped standard errors for covariate and coefficient effects.

Appendix B: Computation of Marginal Effects

Standard econometric packages automatically report marginal effects for each variable evaluated at the means of the regressors. This can lead to substantially biased results (Train (2003), p.33). In addition, software packages typically fail to distinguish among single dummy variables and groups of dummy variables that represent a given attribute, or properly evaluate effects of continuous variables entering with particular functional forms.[19].

In this paper, we compute reported marginal effects in the following way. We start by estimating participation probits in each country. Using the estimated coefficients we compute the marginal effect for each household and then take the weighted average over the population of interest. We then bootstrap the model parameters by drawing from the actual sample 100 times with replacement and re-estimating the probits. For each such set of bootstrapped parameters, we calculate the average marginal effect as described above. The standard deviation of the empirical distribution of the 100 boostrapped average marginal effects provides the standard error of the marginal effect of interest.

Table 1: Asset ownership rates and levels by asset quartiles

	Obs.	Stocks						Business						Main Home					
		Owners	Percentiles among owners					Owners	Percentiles among owners					Owners	Percentiles among owners				
		%	.5	.25	.50	.75	.95	%	.5	.25	.50	.75	.95	%	.5	.25	.50	.75	.95
US	13,050	49.6	1,085	8,844	39,797	134,668	532,041	9.8	4,020	32,160	80,399	281,396	1,056,676	77.3	77,688	64,319	120,598	200,997	482,393
MW	3,228	54.5	904	8,040	36,179	120,728	487,217	13.8	5,628	40,199	120,598	321,595	1,260,962	80.9	20,100	65,927	106,126	160,798	325,615
NE	2,158	54.7	1,424	8,844	41,807	138,688	592,941	6.8	4,020	32,160	80,399	241,196	989,107	70.6	24,120	73,967	152,758	273,356	522,592
S	5,250	42.6	965	8,040	35,275	123,010	582,891	9.3	4,020	20,100	72,359	200,997	817,112	78.3	14,391	50,651	80,399	144,718	361,795
W	2,433	52.1	1,588	11,256	42,812	146,728	482,393	8.6	4,020	24,120	80,399	241,196	833,350	76.9	24,120	112,558	200,997	321,595	643,190
EUR	25,394	26.3	866	5,798	20,073	61,818	258,485	6.3	8,118	71,789	195,965	662,590	10,052,160	68.3	49,362	135,682	237,679	380,364	981,167
SE	2,140	71.1	887	4,786	15,281	44,868	191,438	12.8	2,991	37,226	179,473	593,841	4,206,494	69.0	17,947	59,824	119,649	191,438	418,771
DK	1,176	56.0	605	3,239	10,564	35,646	160,740	9.5	4,352	60,304	389,673	636,455	1,889,353	69.0	32,473	103,913	162,364	259,782	586,811
DE	2,002	24.1	797	5,378	18,444	59,753	321,685	6.3	8,516	87,913	239,012	1,487,228	12,025,456	51.1	71,704	175,660	239,012	358,519	717,037
NL	1,954	24.0	1,016	9,529	31,127	111,169	516,861	6.7	20,328	127,051	419,267	1,869,948	14,380,250	55.3	158,813	241,396	330,332	482,792	916,178
BE	2,532	37.5	901	7,390	38,590	163,215	816,286	5.4	33,911	172,611	363,435	908,588	1539,985	80.0	60,573	150,155	210,218	302,863	603,148
FR	2,110	42.9	725	5,706	22,315	67,439	165,293	5.9	13,441	80,839	220,817	382,256	14,817,674	72.2	69,743	153,304	245,544	398,491	1,662,418
CH	712	35.7	1,455	12,805	40,742	135,614	819,889	10.8	17,461	71,299	235,724	1,121,372	1,906,776	55.1	128,282	289,392	407,425	640,239	2,633,296
AT	1,409	9.8	784	5,705	16,181	51,559	315,131	4.1	12,826	92,920	130,541	189,024	383,734	56.6	62,236	124,471	224,048	373,414	658,706
IT	1,778	10.1	1,988	9,276	23,875	49,694	170,514	6.4	13,252	79,037	136,870	662,590	13,446,175	75.2	40,393	131,048	198,777	370,338	993,885
ES	1,753	11.1	1,218	6,865	18,306	38,137	155,029	7.0	9,153	63,862	145,627	290,503	3,054,535	86.9	45,765	106,784	183,059	305,098	1,128,498
GR	1,982	10.6	311	3,524	10,320	27,073	153,017	6.8	8,155	49,450	163,108	311,119	1,339,492	84.3	40,777	81,554	130,486	244,662	382,938
EN	5,846	39.4	696	5,218	17,742	59,141	260,915	2.5	87	6,958	43,486	304,401	1,739,432	76.1	104,366	217,429	313,098	452,252	834,927

Note: Weighted statistics from 2004 HRS, SHARE and ELSA data. All values are PPP-adjusted.

Table 2: Decompositions of Differences in Asset Ownership Rates within USA and Europe

	STOCKS			BUSINESS			HOME		
	Difference	Coefficient	Covariate	Difference	Coefficient	Covariate	Difference	Coefficient	Covariate
USA									
NE	-0.002	-0.021 ***	0.020 **	0.070	0.052 ***	0.018 ***	0.102	0.079 ***	0.024 ***
S	0.119	0.083 ***	0.036 ***	0.045	0.028 ***	0.017 **	0.025	-0.004	0.029 ***
W	0.025	0.024 ***	0.001	0.053	0.043 ***	0.009	0.041	0.026 ***	0.015 **
Europe									
SE	-0.469	-0.456 ***	-0.013	-0.065	-0.069 ***	0.004	-0.178	-0.227 ***	0.048 **
DK	-0.318	-0.277 ***	-0.041 ***	-0.032	-0.031 ***	-0.002	-0.178	-0.190 ***	0.012
NL	0.001	-0.001	0.002	-0.004	-0.013 *	0.008	-0.042	-0.093 ***	0.051 ***
BE	-0.133	-0.133 ***	0.000	0.009	0.006	0.003	-0.289	-0.304 ***	0.015
FR	-0.187	-0.213 ***	0.026 *	0.004	-0.009 *	0.013 **	-0.211	-0.276 ***	0.066 ***
CH	-0.116	-0.080 ***	-0.036 **	-0.046	-0.046 ***	0.001	-0.040	-0.049 ***	0.009
AT	0.144	0.131 ***	0.013	0.021	0.015 ***	0.006	-0.055	-0.120 ***	0.065 ***
IT	0.140	0.082 ***	0.058 **	-0.001	-0.024 ***	0.023 ***	-0.241	-0.334 ***	0.093 ***
ES	0.131	0.058 **	0.072 ***	-0.007	-0.039 ***	0.031 ***	-0.358	-0.495 ***	0.137 ***
GR	0.135	0.109 ***	0.026	-0.005	-0.010	0.006	-0.332	-0.417 ***	0.085 ***
EN	-0.153	-0.179 ***	0.026	0.038	-0.001	0.039 ***	-0.249	-0.410 ***	0.160 ***

Note: All decompositions for US Regions refer to differences from the Mid West, while for European countries to differences from Germany. The estimated difference in the asset ownership rates, 'diff', is decomposed into two parts: one reflecting the effect of coefficients ('coeff') and one due to the effect of covariates ('cov'). ***, **, * denote significance at 1%, 5% and 10% statistical level, respectively. Standard errors have been computed using 100 bootstrap replications.

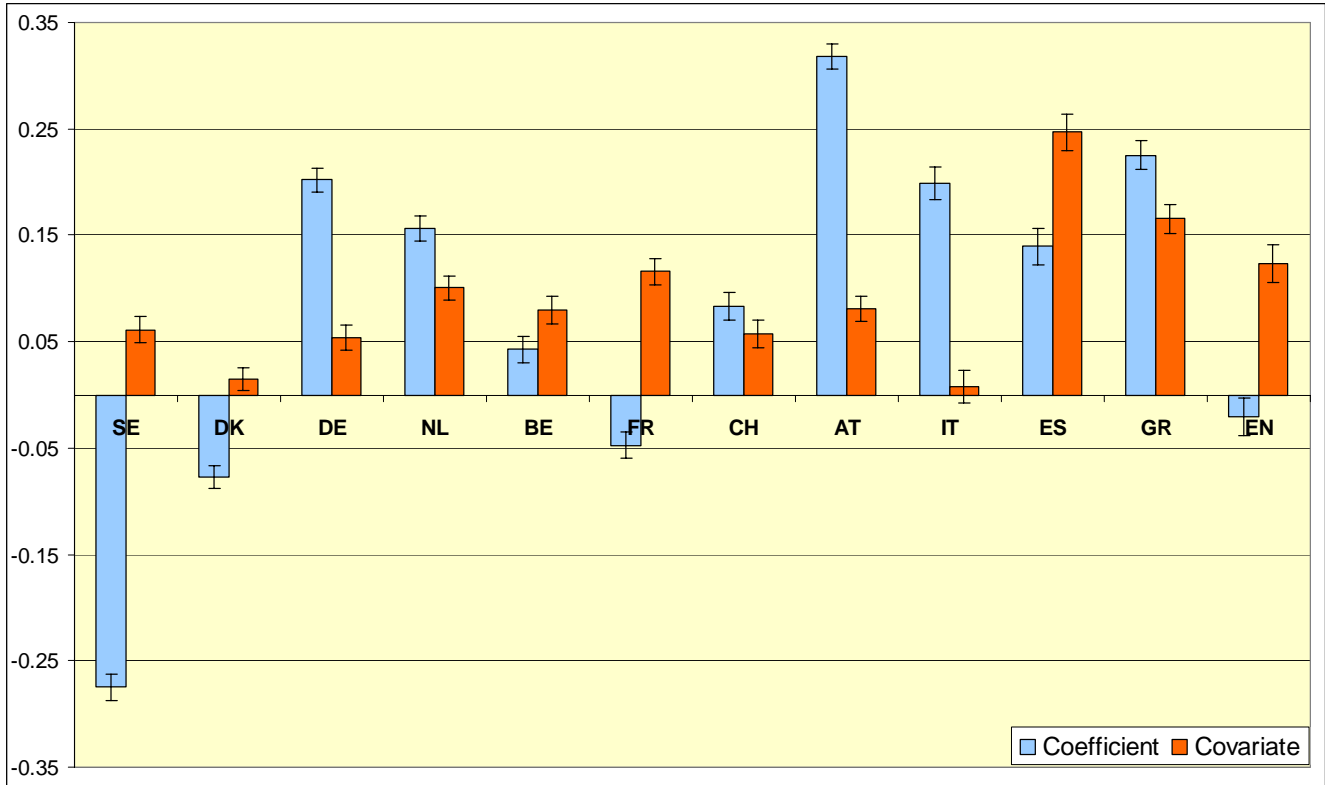**Table 3: Decompositions of Differences in Asset Distributions within USA and Europe**

		Stocks								
		.25			**.50**			**.75**		
	Diff	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**
NE	-0.10	0.10	-0.19 **	-0.14	-0.04	-0.11	-0.14	-0.02	-0.12
S	0.00	0.10	-0.10	0.03	0.02	0.01	-0.02	0.04	-0.06
W	-0.34	0.07	-0.41 ***	-0.17	0.19 *	-0.36 ***	-0.20	0.14 *	-0.33 ***
SE	0.12	-0.69 ***	0.81 ***	0.19	-0.58 ***	0.76 ***	0.29	-0.45 ***	0.74 ***
DK	0.51	0.32 ***	0.19	0.55	0.36 ***	0.19	0.52	0.31 **	0.21 *
NL	-0.57	-0.76 ***	0.19	-0.52	-0.58 ***	0.06	-0.62	-0.74 ***	0.12
BE	-0.32	-0.32 *	0.00	-0.74	-0.67 ***	-0.07	-1.01	-1.0 ***	0.03
FR	-0.06	-0.51 ***	0.45 **	-0.19	-0.51 ***	0.32 **	-0.12	-0.35 ***	0.23 **
CH	-0.87	-0.98 ***	0.11	-0.79	-0.80 ***	0.01	-0.82	-0.90 ***	0.08
AT	-0.06	0.13	-0.19	0.13	0.25	-0.12	0.15	0.13	0.02
IT	-0.55	-0.64 ***	0.09	-0.26	-0.41 **	0.15	0.18	0.12	0.06
ES	-0.24	-0.54 **	0.30	0.01	-0.14	0.15	0.45	0.29 *	0.15
GR	0.42	0.14	0.28	0.58	0.28 *	0.30 **	0.79	0.53 ***	0.26 **
EN	0.03	-0.39 ***	0.42 **	0.04	-0.18 *	0.21	0.01	-0.20 *	0.21
		Business								
		.25			**.50**			**.75**		
	Diff	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**
NE	0.22	0.35	-0.13	0.40	0.41 **	-0.01	0.29	0.26	0.03
S	0.69	0.86 ***	-0.17 *	0.51	0.52 ***	-0.01	0.47	0.41 ***	0.06
W	0.51	0.69 **	-0.18	0.41	0.49 **	-0.08	0.29	0.33	-0.04
SE	0.86	0.95 ***	-0.09	0.29	1.03 ***	-0.75 **	0.92	1.84 ***	-0.92 **
DK	0.38	0.33	0.05	-0.49	0.02	-0.51 *	0.85	1.30 ***	-0.45
NL	-0.37	-0.38	0.01	-0.56	-0.09	-0.47	-0.23	0.24	-0.47
BE	-0.67	-0.47	-0.20	-0.42	0.16	-0.58 **	0.49	0.89 ***	-0.40
FR	0.08	0.04	0.04	0.08	0.57 **	-0.49	1.36	1.71 ***	-0.35
CH	0.21	0.41	-0.20	0.01	0.52	-0.51	0.28	0.63 *	-0.35
AT	-0.06	-0.49	0.43 *	0.60	0.26	0.34	2.06	1.76 ***	0.30
IT	0.11	0.39	-0.28	0.56	1.53 ***	-0.97 ***	0.81	1.61 ***	-0.80 *
ES	0.32	0.00	0.32	0.50	0.77 **	-0.27	1.63	1.93 ***	-0.30
GR	0.58	0.63 **	-0.05	0.38	0.69 **	-0.31	1.56	1.80 ***	-0.24
EN	2.54	2.84 ***	-0.30	1.70	2.23 ***	-0.53	1.59	1.97 ***	-0.38

Table 3: Decompositions of Differences in Asset Distributions within USA and Europe (continued)

	Main Home								
	.25			**.50**			**.75**		
	Diff	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**	**Diff**	**Coeff**	**Cov**
NE	-0.12	-0.09 *	-0.03	-0.36	-0.34 ***	-0.02	-0.53	-0.50 ***	-0.03 *
S	0.26	0.17 ***	0.09 ***	0.28	0.20 ***	0.08 ***	0.10	0.05 *	0.05 **
W	-0.53	-0.50 ***	-0.03	-0.64	-0.62 ***	-0.02	-0.69	-0.66 ***	-0.03
SE	1.08	1.02 ***	0.06	0.69	0.71 ***	-0.02	0.63	0.67 ***	-0.04
DK	0.52	0.46 ***	0.06	0.39	0.43 ***	-0.04 ***	0.32	0.37 ***	-0.05 *
NL	-0.32	-0.35 ***	0.03	-0.32	-0.25 ***	-0.07 ***	-0.30	-0.23 ***	-0.07 **
BE	0.16	0.09 ***	0.07	0.13	0.18 ***	-0.05 ***	0.17	0.24 ***	-0.07 **
FR	0.13	0.04	0.10 **	-0.02	-0.01	-0.01	-0.11	-0.09	0.02
CH	-0.50	-0.45 ***	-0.05	-0.53	-0.39 ***	-0.14 ***	-.058	-0.44 ***	-0.14 ***
AT	0.34	0.17 ***	0.18 ***	0.06	0.02	0.04 **	-0.4	-0.07 ***	0.03
IT	0.29	0.12 *	0.17 ***	0.18	0.11 **	0.07 **	-0.04	-0.07	0.03
ES	0.50	0.27 ***	0.23 ***	0.27	0.21 ***	0.06	0.16	0.18 ***	-0.02
GR	0.77	0.60 ***	0.17 ***	0.61	0.57 ***	0.04	0.38	0.39 ***	-0.01
EN	-0.21	-0.41 ***	0.20 ***	-0.27	-0.30 ***	0.03	-0.23	-0.17 ***	-0.06

Note: All decompositions for US Regions refer to differences from the Mid West, while for European countries to differences from Germany. The actual difference in the (log) asset levels, 'diff', is decomposed into two parts: one reflecting the effect of coefficients ('coeff') and one due to the effect of covariates ('cov'). ***, **, * denote significance at 1%, 5% and 10% statistical level, respectively. Standard errors have been computed using 100 bootstrap replications.

Figure 1: Decompositions of Differences in Stock Ownership Rates (relative to the US)

Note: All decompositions refer to differences from the US. The error bands reflect 95% confidence intervals.

Figure 2: Decompositions of Differences in Business Ownership Rates (relative to the US)
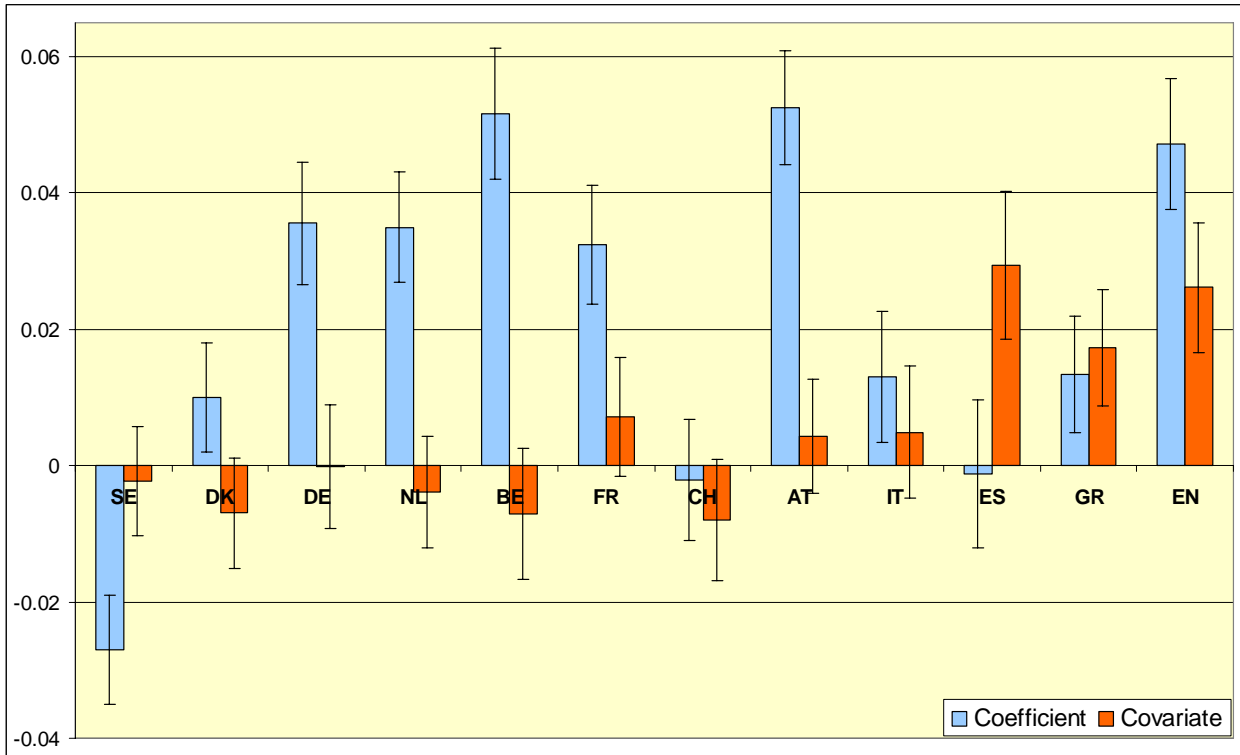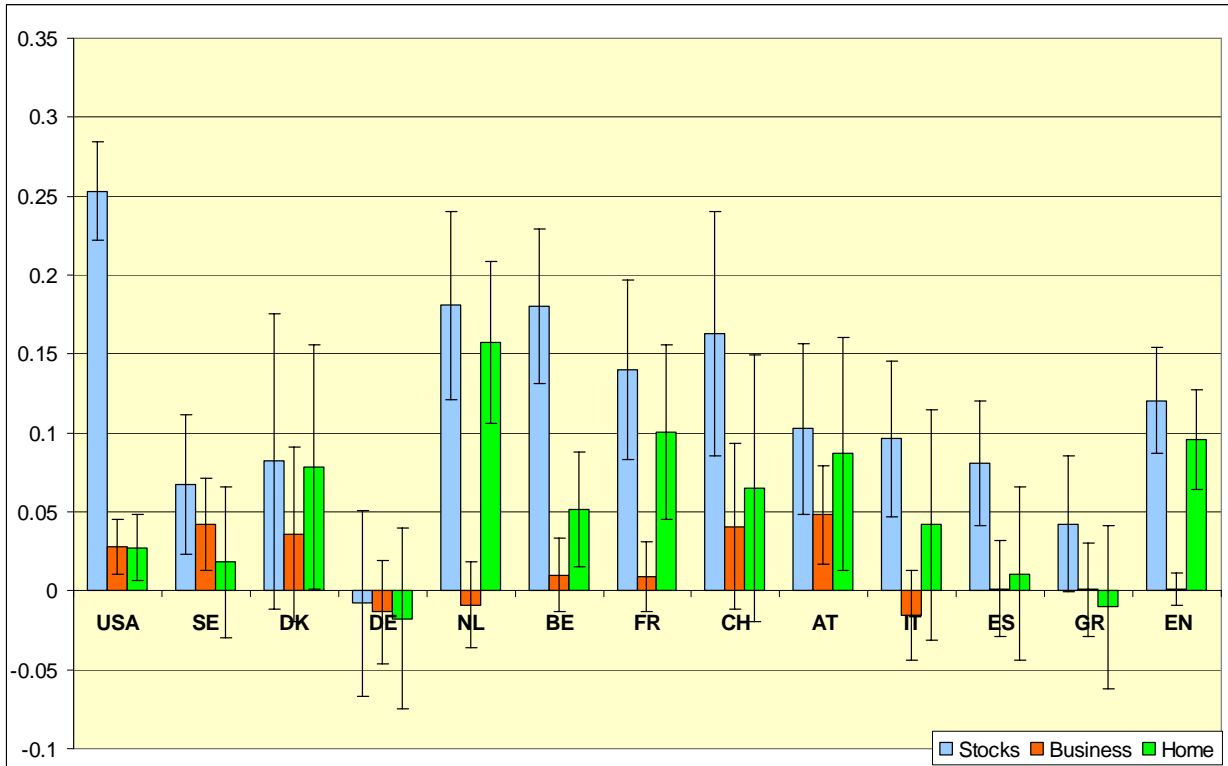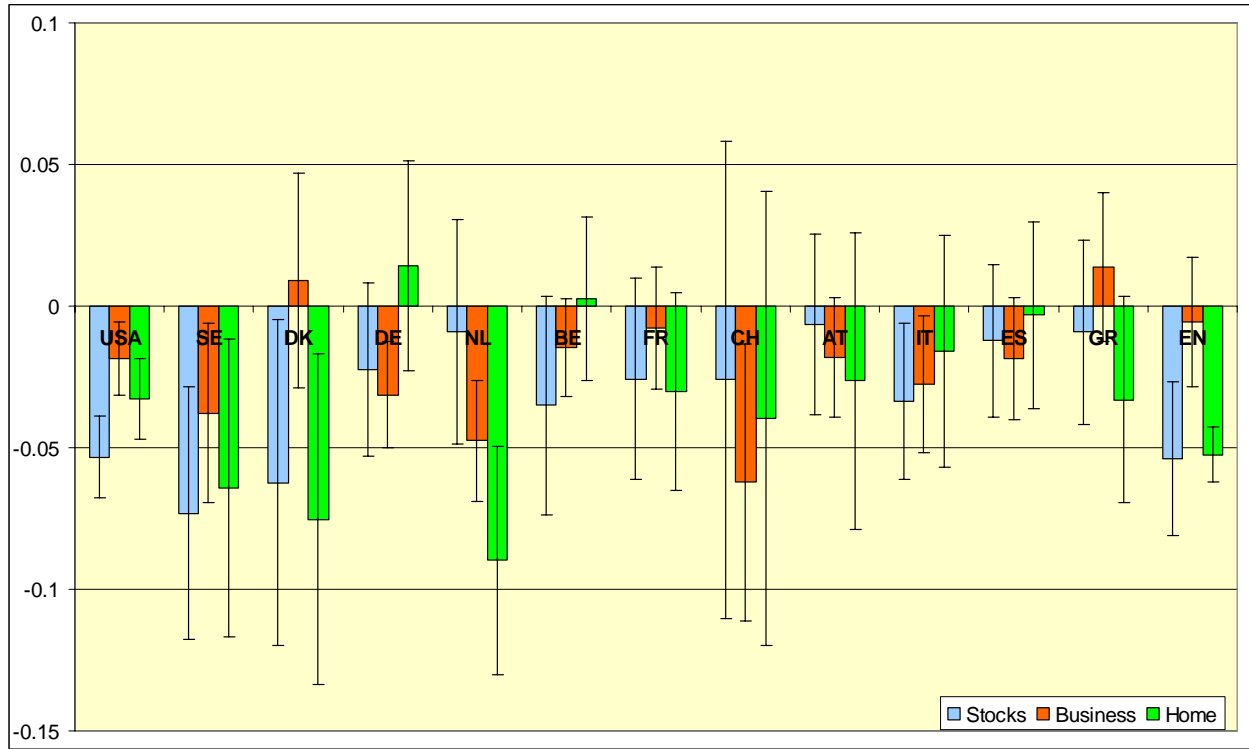

Note: All decompositions refer to differences from the US. The error bands reflect 95% confidence intervals.

Figure 3: Decompositions of Differences in Home Ownership Rates (relative to the US)
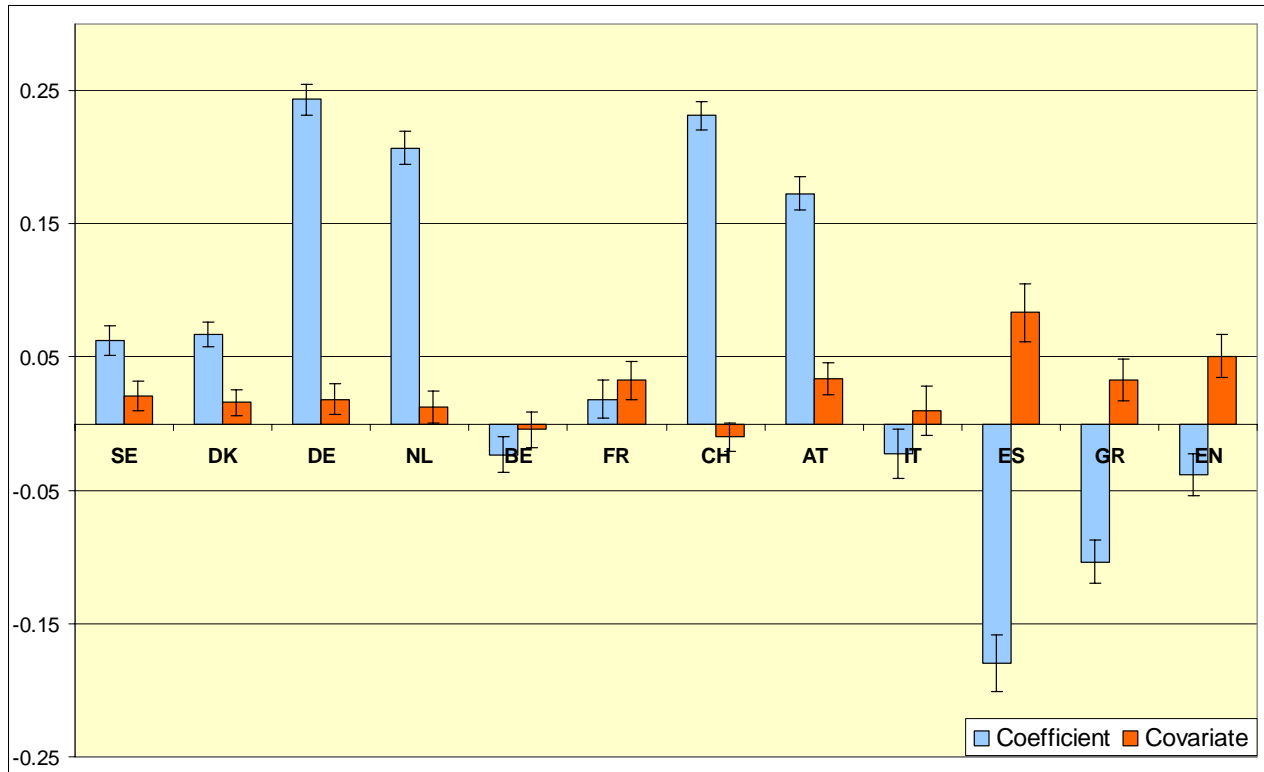
Note: All decompositions refer to differences from the US. The error bands reflect 95% confidence intervals.

Figure 4: Marginal Effects of Higher Education Degree

Note: The error bands reflect 95% confidence intervals.

Figure 5: Marginal Effects of Self-reported Bad Health

Note: The error bands reflect 95% confidence intervals.

Figure 6: Decompositions of Differences in Stock Wealth Distribution (relative to the US)
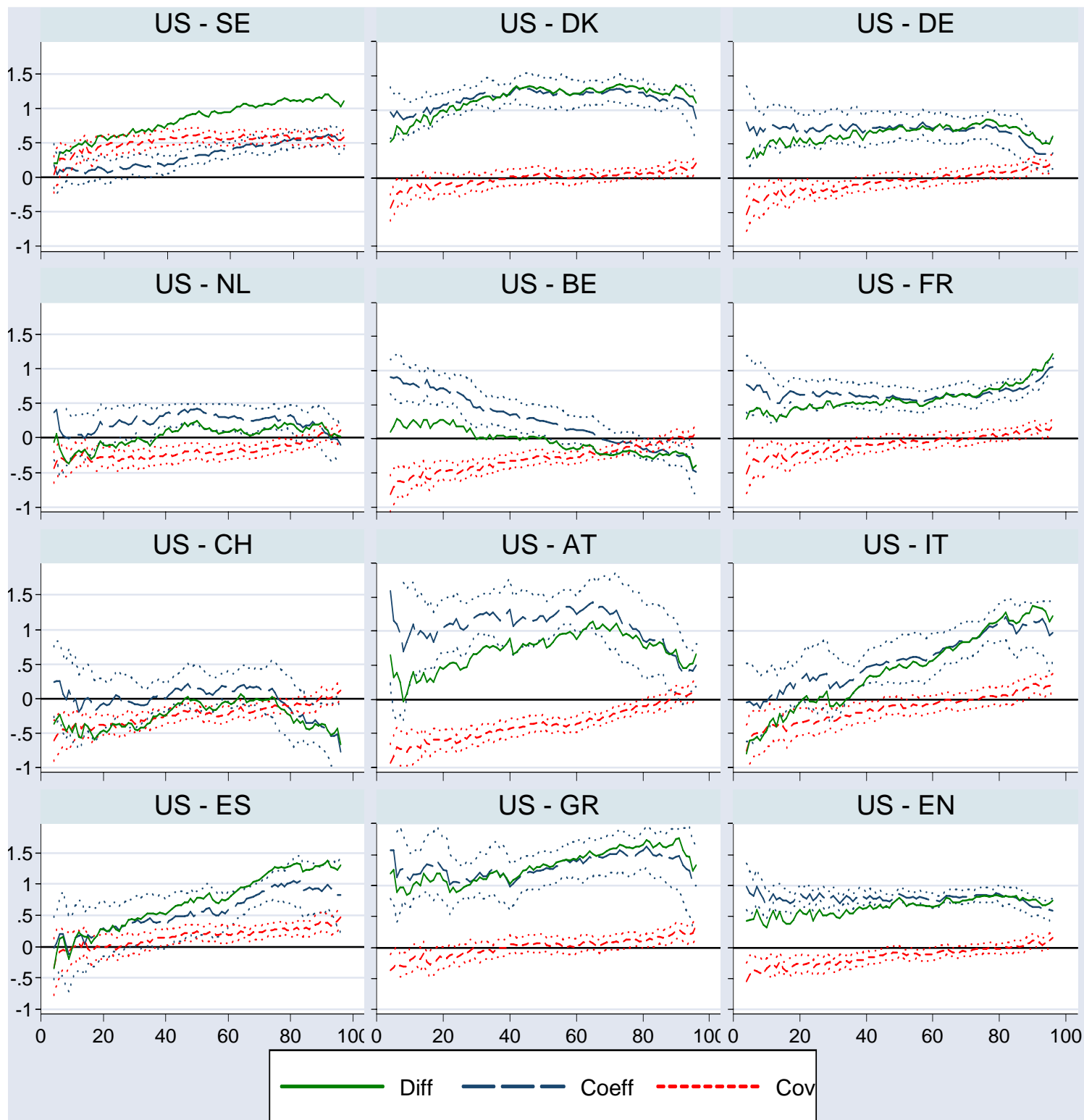
Note: The actual difference in the (log) stock wealth level, 'Diff', is decomposed at each percentile into two parts: one reflecting the effect of coefficients ('Coeff') and one due to the effect of covariates ('Cov'). Dots represent 95% confidence bands derived using 100 bootstrap replications.

Figure 7: Decompositions of Differences in Business Wealth Distribution (relative to the US)
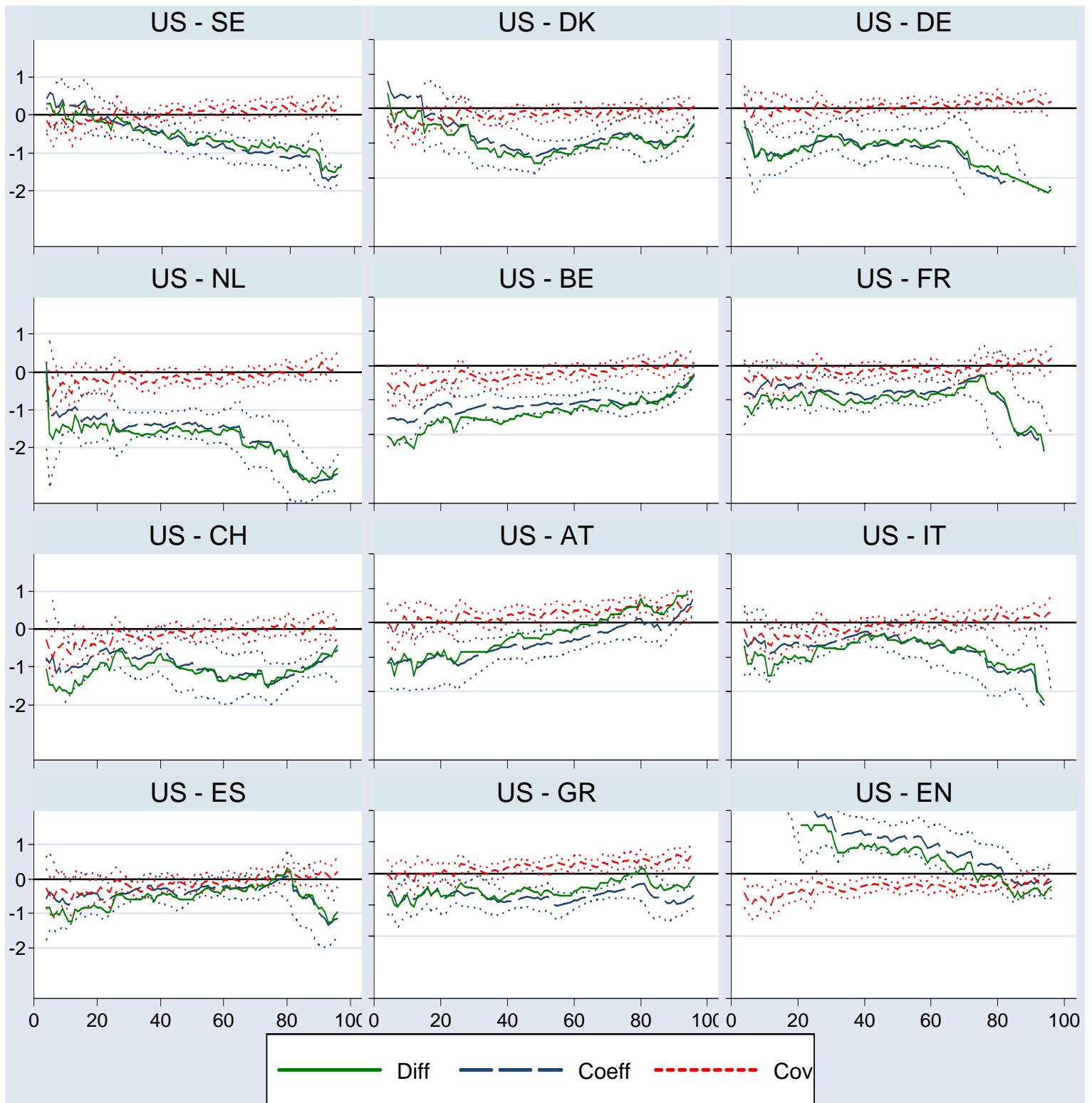
Note: The actual difference in the (log) business wealth level, 'Diff', is decomposed at each percentile into two parts: one reflecting the effect of coefficients ('Coeff') and one due to the effect of covariates ('Cov'). Dots represent 95% confidence bands derived using 100 bootstrap replications.

Figure 8: Decompositions of Differences in Housing Wealth Distribution (relative to the US)
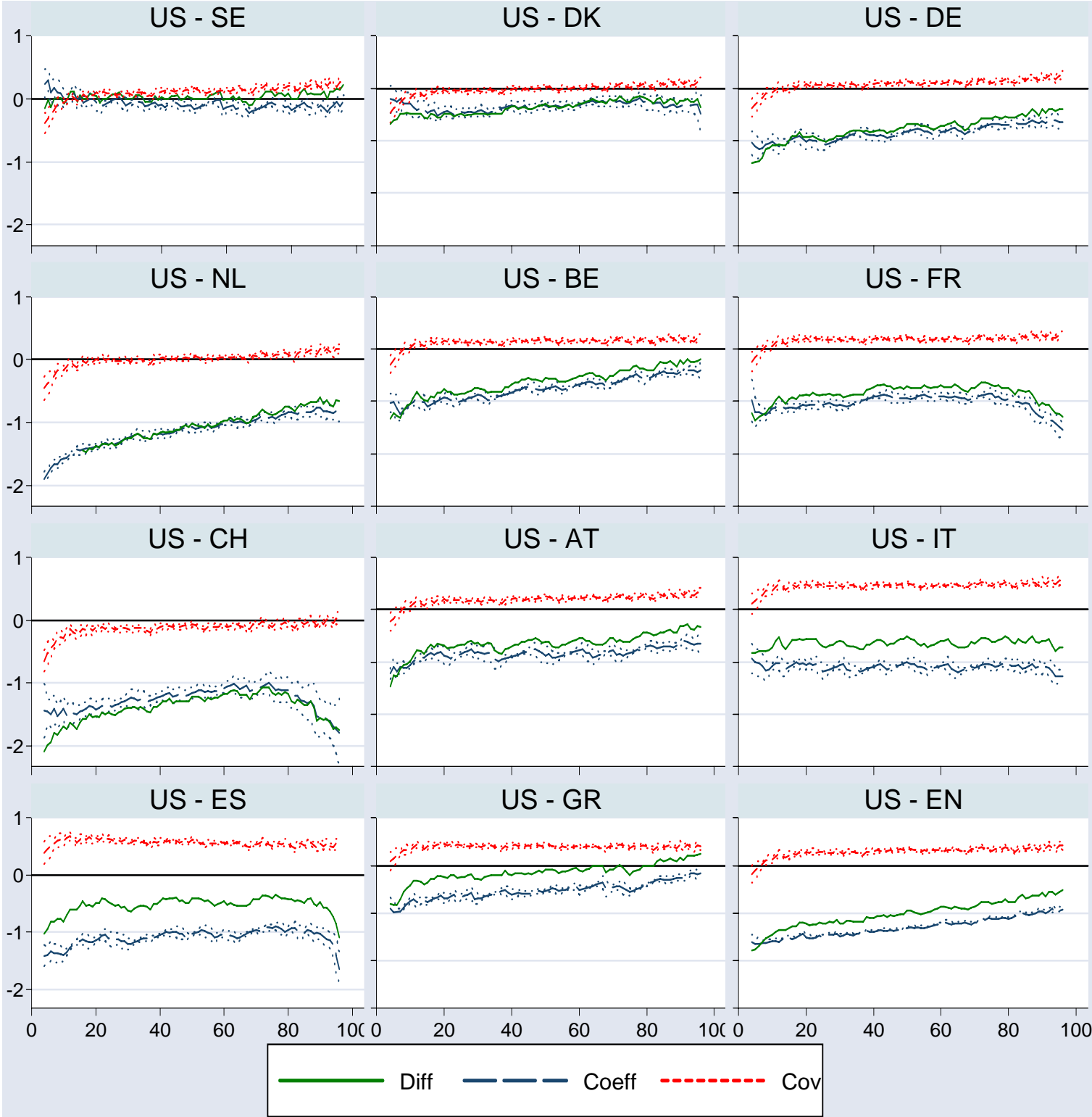
Note: The actual difference in the (log) housing wealth level, 'Diff', is decomposed at each percentile into two parts: one reflecting the effect of coefficients ('Coeff') and one due to the effect of covariates ('Cov'). Dots represent 95% confidence bands derived using 100 bootstrap replications.

Endnotes

[1] Needless to say, there is also a lot to be learnt by applying the approach to the general population, given sufficient internationally comparable data on household portfolios across the entire population.

[2] For example, the demographic transition and the resulting inability of social security systems to provide customary benefit levels are forcing households in major European countries and the US to accumulate for retirement on their own, and governments to provide tax and other incentives for doing so. The process neither started simultaneously nor is it progressing at an even pace across countries, thus intensifying cross-country variation in mature portfolios.

[3] Studying portfolio structure has recently become both more informative and more interesting in its own right. Theory and country-level data on the structure of household portfolios are presented in the contributions contained in Guiso, Haliassos, and Jappelli (2001); and in the review paper of Haliassos (2006). Retirement accounts were a major factor promoting stockholding participation in the US. Limited stockholding participation in the early to mid 1980s was documented in US data by King and Leape (1984), Mankiw and Zeldes (1991), and Haliassos and Bertaut (1995). A number of authors have recently explored determinants of participation in stockholding. See, for example, Haliassos and Bertaut (1995), Cocco, Gomes and Maenhout (2005), Heaton and Lucas (2000), Gollier (2001), Campbell and Viceira (2002), Haliassos and Michaelides (2003), and Gomes and Michaelides (2005). Bilias, Georgarakos, and Haliassos (2006 a, b) explore effects of increased participation on the distribution of wealth and stock trading patterns, respectively. Campbell (2006) discusses stockholding participation, as well as under-diversification, and mortgage behavior of households, while reviewing the relevant literature. Campbell and Cocco (2003) study optimal mortgage choice, while Cocco (2005) studies effects of housing on the composition of the financial portfolio.

[4] There is a vast literature on import controls and other trade restrictions, but we can point here to studies that find a home bias in trade, namely a tendency for trade to occur within national borders than across them with neighboring countries, even after controlling for tariffs (McCallum, 1995; Helliwell, 1998).

[5] The reference here is to the literature on foreign portfolio investment. Perhaps the most telling subset focuses on the observed tendency of households to under-invest in foreign stocks, the well-known 'home equity bias' (French and Poterba, 1991; Tesar and Werner, 1995; Kang and Stulz, 1997; Pastor, 2000).

[6] Foreign direct investment is a prime example of acquisition of a foreign real asset extensively studied in the literature. In their seminal paper, Feldstein and Horioka (1980) found that domestic saving rates explain over 90% of the variation in investment rates in a sample ending in 1974. Obstfeld and Rogoff (2000) report similar findings for the more recent period 1990-1997.

[7] For surveys of the vast literature on the law of one price and the purchasing power parity hypothesis, see for example Rogoff (1996) and Taylor and Taylor (2004).

[8] While the international version of the capital asset pricing model, ICAPM, is not rejected for developed countries (with the exception of Japan), it performs much more poorly for emerging markets that are more likely segmented (see Harvey, 1991; Bekaert and Harvey, 1995 and 2000).

[9] This notion corresponds closely to the motivation based on usual portfolio choice models: if households of given characteristics were faced with the same economic environment, they would make the same portfolio choices. One could go even further and argue that a subset of characteristics (e.g. the education level) is endogenously determined by the economic environment and that differences in the configuration of these characteristics are a further sign of lack of integration. We prefer to understate lack of integration rather than attempt a potentially arbitrary division of characteristics into exogenous and endogenous parts.

[10] This does not necessarily imply more developed mortgage markets. In the South, this finding may well be associated with less rather than more developed credit markets, encouraging parents to provide housing gifts to their children when they get married and form a family.

[11] We obtain statistically significant positive effects in the US, Denmark, Netherlands, Belgium, France, Austria and England.

[12] Regressors used in quantile regressions (estimated over owners of the particular asset or debt in the base country or region): 2nd order age polynomial, gender, household size, education (LTHS: high school dropout; HS: high school degree; COL: College degree), recall ability, self-reported bad health (includes responses 'fair' and 'poor' in HRS), work status (retired/working/unemployed-other inactive), marital status (couple/widow/never married), subjective probability to leave a bequest, whether provides help to relatives/neighbors, whether is involved in voluntary activities, income quartile, wealth quartile. The thresholds for income and wealth quartiles are defined for the base country or region over all older households. Households in the country or region under comparison to the base are then placed in quartiles according to those thresholds.

[13] There is also the issue of whether larger real values reflect housing price booms in Europe relative to the US, rather than differences in features (such as number of rooms). However, we have not found that standardizing for the number of rooms alters the main conclusions.