Decomposing household wealth portfolios across countries: An age-old question?*

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September 2013

Abstract

Using harmonized wealth data and a novel decomposition approach, we show that cohort effects exist in the income profiles of asset and debt portfolios for a sample of European countries, the U.S. and Canada. We find that younger households' participation decisions in financial assets are more responsive to their income than older households. Additionally, younger households' participation decisions respond more to to the institutional setting than mature households. We investigate why identical households in different countries invest differently and find that less financially developed and economically open countries favor investment in housing. There is also a link between mortgage use and the typical mortgage characteristics of each country. These findings have important implications for policy setting during times of financial unease, indicating a scope for policies which promote participation for young household and indicating which institutional features could be manipulated.

DRAFT: COMMENTS ARE WELCOME

*This research is part of the WealthPort project (*Household Wealth Portfolios in a Comparative Perspective*) supported by the Luxembourg 'Fonds National de la Recherche' (contract CORE C09/LM/04) and by core funding for CEPS/INSTEAD by the Ministry of Higher Education and Research of Luxembourg.

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1 Introduction

There has been growing interest in studying household wealth portfolios for several reasons. On the one hand, population aging has raised questions about the long-term sustainability of pension systems and the need to assess the adequacy of saving for retirement through the study of the level and composition of assets with which households retire (e.g. Chiuri and Jappelli (2010), Gornick et al. (2009)). On the other hand, the on-going financial crisis and the resulting meltdown and subsequent appreciation of assets has had different repercussions across various demographic groups. In addition, the growing complexities of wealth portfolios and the growing efforts to create a more unified market for consumers has sparked a literature on comparing the effect of institutions on wealth portfolios.

Researchers have found that, despite greater integration of asset and labor market policies in Europe, differences in market conditions among European countries are much more pronounced than within the US and that large differences in investment patterns exist in European countries, even when controlling for other household characteristics. This has been found to be the case for mature households (Christelis et al. (2012)), for debt (Crook and Hochguertel (2007)) and for stockholding (Guiso et al. (2003)).

Nevertheless, despite several attempts, the literature on international portfolios is not abundant. Single or two-country studies are more common than cross-country comparisons due to data availability and difficulties in performing cross-national comparisons. The few sources of cross-country wealth data that do exist are, generally, not directly comparable due to differences in data collection techniques, which are shaped by the institutional environment and, indirectly, by the available wealth instruments. Consequently, a better understanding of what is captured by wealth survey data requires some knowledge of institutions. For example, a high take-up of individual loans in the US is driven by less severe credit restraints than in other countries.

Comparable cross-country data is not easily available. For example, the Survey of Health, Aging and Retirement in Europe (SHARE) captures individuals 50 and over. The Household Finance and Consumption Survey (HFCS) will soon be available for euro-zone countries only. Another option for researchers is to rely on data in the Luxembourg Wealth Study, which has thoroughly examined and harmonized comparable and non-comparable components of wealth and has made a detailed study of country wealth components and

institutions. This approach facilitates an insightful analysis of wealth portfolios across countries and allows comparisons across European, as well as non-European countries.

In this paper we follow this approach and use the conceptual framework developed by the Luxembourg Wealth Study, but apply it to independent data. We use two datasets that are used in the Household Finance and Consumption Survey (Italy and Spain) and are publicly available. In addition, we use data for Canada, Germany, Luxembourg and the United States, thus providing a unique view on household wealth portfolios in a cross-national perspective.

Our paper is novel in several ways. Apart from using data for a unique set of countries, we identify differences in asset portfolios across countries for the whole population, rather than just for mature households. Third, we extend the approach of Christelis et al. (2012) by disaggregating the effect of covariates in the participation decision. Differences in wealth holdings may not only stem from differences in the household structure, which is shown in Bover (2010), but also from other factors such as labor market attachment and education, among others.[1]

Our focus is on the main assets and liabilities held by households; financial assets, main residence, investment real estate and debt, with a focus on mortgages and non-housing debt.[2]

Past research suggests a large role for institutions in explaining cross-national differences in portfolios. We show that the role of characteristics is more important than previously thought for particular assets and for the younger population. Christelis et al. (2012) find that characteristics play a small or negligible role in generating observed international differences for the households 50 years and over. Based on surveys for the whole population, we confirm that characteristics play a relatively minor role in the decision to participate in financial assets or principal residence investment for the over-50 population. However, they do have a role to play in cross-country participation differences in investment real estate and mortgage debt. These results also hold for the younger cohort although, in this case, the principal residence investment decision is also influenced by characteristics. Additionally, we find that younger households' participation decisions in financial assets are more responsive to their income than older households. This result has implications for policy setting during times of financial unease. Younger households' participation

[1] Sierminska et al. (2010) for example, show that labor market differences between men and women explain the majority of wealth differences and work in the opposite direction to demographic factors.

[2] Although we do not take into account other factors such as different risks and returns for financial assets it has been shown that the majority of households have only a few types of assets. Less than 35% of households hold risky assets in the form of stocks or mutual funds and this number is much lower for the other countries.

decisions also respond more to to the institutional setting than mature households.

These phenomena suggest that institutional (or other unobserved) differences between countries predominantly affect the participation decision for younger households. These findings have important implications, indicating a scope for policies which promote participation for young households in particular.

In Section 2 we describe the data. Section 3 overviews the methods for participation and level decision and provides basic descriptive statistics. The results are in Section 4 and Section 5 concludes.

2 Data

We use data for Canada, Germany, Italy, Luxembourg, Spain and the United States. The data for Canada come from the 2005 Survey of Financial Security, for Germany the 2007 wealth module of the Socio-Economic Panel (SOEP), for Italy the 2008 Survey of Household Income and Wealth (SHIW), for Luxembourg from the 2007 wealth module of the PSELL-3/EU-SILC, for Spain from the 2008 EFF and the data for the United States come from the 2007 Survey of Consumer Finances (SCF). The data contain information on multiple income sources and detailed information on financial, non-financial assets and debts. On the basis of this detailed information, we use the conceptual framework developed by the Luxembourg Wealth Study (Sierminska et al. (2006)) for creating harmonized variables of net worth (total asset: financial assets, principal residence, investment real estate and business equity minus liabilities: mortgages and non-housing debt) and income. We bottom and top code each of the wealth variables at their 1% and 99% levels to stop outliers from over-influencing our results. Our monetary variables have been converted to 2007 USD using PPP and price indices.

Wealth is defined as Assets less Liabilities, where Assets are composed of Financial and Non-Financial Assets. The components of wealth that we pay particular attention to in this study are Financial Assets (deposit account, bonds, stocks, mutual funds, etc); Principal Residence which equates to owner-occupied housing; Investment Real Estate which is composed of all residential and corporate real estate besides the principal residence and, on the liabilities side, Mortgage Debt which can relate to the Principal Residence or to Investment Real Estate.

3 Methodology

The participation decision is the decision to hold or not to hold a particular asset or liability. Our raw participation results are based on detailed and comparable wealth components. In further analyses we only focus on those components that represent a significant portion of the total asset/debt portfolio. Descriptive results are available in Table 1. The participation rates are shown in the left-hand panel while mean asset levels (including zeros) are shown in the right-hand panel. There is quite a bit of cross-country variation in the decision to hold particular assets. Risky assets (including bonds, stocks and mutual funds) are particularly different. In the US, the share of people investing in this type of asset is the highest, followed by Canada. Large differences are also observed for debt. Italy has the lowest share followed by Germany, Luxembourg, Spain, Canada and the US.

The sample is partitioned by age to highlight age difference in portfolio composition. The largest age differences are seen for homeownership and housing debt, which have lower and higher participation rates respectively for the younger households (shown in the top panel of Table 1).[3]

We find smaller differences across countries in participation rates among the young than among the elderly, which suggests a smaller impact of institutional characteristics for this demographic group compared to the rest. In fact, the portfolio participation rates in the United States and Canada are almost the same for the older cohort, apart from some minor differences in business ownership and risky asset take up.

As we plot participation rates by income percentiles we find very interesting patterns. Figures 1 and 2 indicate that ownership rates of assets and liabilities generally increase as we move up the income distribution, but there are also noticeable cross country differences for most assets. Past research shows a variation in holdings of particular assets across the distribution with the wealthier holding a large share of risky assets (e.g. Carroll (2002)). We can also confirm that there is cross country variation in these trends.

As substantial differences in asset participation by income level exist across countries, as a next step, we investigate the drivers of these ownership differences. To examine whether these differences are driven by different population characteristics between countries or are unexplained we turn to an extension of the Blinder-Oaxaca nonlinear decomposition for binary variables elaborated by Fairlie (1999, 2005)

[3]We also compare our older sample (Table 1 lower panel) to that of Christelis et al. (2012) and find the participation rates to be within 10% for home and mortgage with a slightly larger discrepancy for own business.

We estimate a logit model for participation in a particular wealth component w:

$$p_j(w) = F(X\beta) \tag{1}$$

and examine the differences between country j and our reference country, in this case the U.S. ($j = us$):

$$\hat{p}^{us}(w) - \hat{p}^{j}(w) = \left(\hat{p}^{us}(w) - \hat{p}^{us}_{j}(w)\right) + \left(\hat{p}^{us}_{j}(w) - \hat{p}^{j}(w)\right) \tag{2}$$

where $\hat{p}^{us}_{j}(w)$ is the counterfactual participation of households in country j if faced with U.S. institutional features and other unobservables, given the distribution of characteristics X in country j. The first expression on the right hand side of equation 2 represents differences in participation due to characteristics, i.e., to differences in the distribution of X between the U.S. and country j. The second term represents differences due to differences in the group processes determining the decision to own or not to own a particular asset. This unexplained effect can be due to different risk preferences, cultural differences, institutional differences and other unobservables across countries. For simplicity, we refer to it as the unexplained or institutional effect.

The characteristic gap is the estimate of the total contribution of the whole set of observed characteristics to the country gap in participation. In order to identify the contribution of specific factors, we break X down into sets of characteristics: X_L (labor market characteristics), X_E (education characteristics), X_D (demographic characteristics), X_M (marital status), X_I (income) and X_W (the level of other wealth). Taking a simple example, assume that $X = X_L + X_D$. We can express the independent contribution of X_L to the gap as:

$$\frac{1}{N}\sum_{i=1}^{N}\left[F(X^{us}_{Li}\beta^{us}_{L} + X^{us}_{Di}\beta^{us}_{D}) - F(X^{j}_{Li}\beta^{us}_{L} + X^{us}_{Di}\beta^{us}_{D})\right] \tag{3}$$

For example, imagine that stock ownership is encouraged via employer company incentive plans. In this case, different employment levels between countries may explain a portion of the country differences in stock market participation. This effect will be captured in the overall characteristic effect but can also be isolated from the effect of other characteristics using equation 3. Now, imagine that company incentive plans differ across countries. This will be an institutional difference that will be part of the unexplained difference in cross-country stock market participation levels.[4]

[4]Isolating its contribution to the unexplained effect is beyond the scope of this study.

4 Results

4.1 Country differences in asset participation

In order to identify the determinants of holding a particular asset we estimate several logit specifications for each country. We present the results for the one with the best fit. The coefficient estimates are used to determine whether there are country differences in the decision to hold particular assets and to calculate the contribution of country differences in household characteristics to the country differences in asset participation.

The dependent variable is equal to one if the household holds the asset and is equal to zero otherwise. We include a number of variables, which have been shown to affect participation. These include a set of demographic variables: age, age squared, gender and the number of children under 18; education variables: indicator variables for low and high education; a set of marital status variables which consist of indicator variables for married and divorced; and labor market variables, which include indicator variables for employed, self-employed and retired. We also include income and wealth levels not pertaining to the asset in question, transformed using the inverse hyperbolic sine.[5]

Estimates from the logit regressions allow us to pinpoint important country differences in the decision to own assets. The marginal effects evaluated at the mean for the probability of holding an asset are presented in tables A1 and A2. Before we elaborate on the results for our main dependent variables below we discuss the expected direction of our results.

In a comprehensive study of household portfolios, Guiso et al. (2003) estimate the participation decision for selected assets on a common set of explanatory variables. The results for the US indicate that the ownership of almost all types of assets and liabilities rises with other wealth (except credit card balances and non-housing debt). And as wealth rises, the shares of total assets held in homes and other non-financial assets decline, while the share in risky assets and investment real estate rise. Given that risk preference vary with age, we typically expect a higher stock ownership among older cohorts. Younger people face more background risk, which affects their preference for risky assets. As their uncertainty about lifetime income declines and they enter their prime-age years they may be willing to take on more risk. Older people on the other hand exhibit less labor supply flexibility compared to younger people, who can work more or retire later if they have low returns to their investments.

[5]We experiment with various specification of the monetary variables including levels and log transformation, but find the inverse hyperbolic sine transformation to yield the best fit.

Education is generally positively correlated with income and, hence, with asset holdings. There exist some differences across countries depending on the return to education and household formation (Spain) and country specific characteristics (Luxembourg) (Bover (2010) and Mathae et al. (2011), respectively). Research indicates that married couples are generally better off and differences by family type are stronger than by gender (Bover (2010); Sedo and Kossoudji (2004) for housing; Yamokoski and Keister (2006) for wealth levels).

Younger portfolios tend to be dominated by housing wealth. Younger couples would rather pay down their mortgage or make precautionary savings rather than invest in risky assets. Older households have built up their assets and can use the cash flow to invest in risky assets or investment real estate. At the same time, other risk related to older age may temper the willingness of older people to take risks (uncertainty about life expectancy, health uncertainty).

Given the expected direction of most of the included explanatory variables as outlined above we will focus on identifying similarities and differences in our sample countries for each of the wealth components. We start with the main portfolio asset: housing, followed by financial assets and debt.

Real estate We focus on the determinants of principal residence and investment real estate ownership together as the direction of the effect of explanatory variables is similar. As expected, age has a positive effect at a decreasing rate. The number of children also has a positive effect (except in the U.S. and Luxembourg). Marriage increases the probability of owning property and divorce decreases it (except in the US for investment real estate).

Lower educated individuals are less likely to own real estate compared to those with a medium level of education and having a higher education degree suggests you are more likely to own investment real estate.

Across countries, we find some differences. In most countries, male run households are more likely to own real estate, except in Luxembourg, which may be a result of leaving the house to the woman in case of divorce and, possibly, the way the head of household is reported. Being employed or self-employed encourages owning your own home except in Italy, where the age structure of homeownership is slightly different. A negative effect of being employed on investment real estate holds for most countries.

Financial assets The effect of age on holding financial assets remains significant only in the U.S. and Italy. Age squared is also negative, as in the case of real estate. In

all countries, the number of children has a negative effect on financial assets. This can be caused by two things. First, children generally lead a household to incur higher expenses. Second, there is a higher probability of owning non-financial assets in households with children. Households reporting lower education are less likely to hold financial assets and those with higher education are more likely. Being employed has no effect on ownership in Italy and Spain.

There is cross-country variation in the effect of several variables. We find that married households are more likely to hold financial assets in the US, Canada and Germany and less likely in Luxembourg. Being self-employed has no significant effect on the likelihood of having financial assets in the Germany and Spain.

Debt The effect of age in holding debt is understandably correlated with the decision to own real estate. The number of children also has a positive significant effect as having children is correlated with having higher expenses. Only in the US is there a strong negative relationship between being low educated and holding debt. Having high education, on the other hand, has a negative effect. Being any other marital status than single is positively related to debt.

The effect of income and wealth on asset ownership Figure 1 and 2 indicates that the correlation between income and participation varies across countries, particularly for principle residence, businesses and mortgage debt. Below we examine the marginal effect in more detail.

We find a positive and significant effect of non-real estate wealth on real estate ownership in all countries, but the effect varies. The effect is also positive and significant for disposable income (except in Germany). As with real estate, for debt the effect of wealth is positive and significant, but the effect of income is negative (Canada and Luxembourg) or not significant. The effect of wealth on holding financial assets is stronger in Ger many and Luxembourg than in the US, Canada, Italy and Spain. The effect of income is the strongest in Luxembourg, Germany, Canada and the US and is not significant in Italy and Spain where family gifts or bequests may play a greater role.

4.2 Decomposition of the Participation Decision

In our decomposition we focus on the main portfolio assets: homeownership, investment real estate ownership, financial asset ownership, business ownership and mortgage hold-

ing. We group the possible factors that can affect asset ownership into: demographic (age, age squared, gender and the number of children under 18), education (indicator variable for low and high), marital status (indicator variables for married, divorced and widowed); labor market (indicator variables for employed, self-employed and retired) and income and wealth. The results for the decompositions can be found in Tables 2 and 3 for principal residence, investment real estate, debt and financial assets and businesses.[6] We use the specification from the estimation shown in Tables A1 to A2.

We find that country differences in variables such as education, labor market attachment and income provide significant contributions to the wealth participation gap. The unexplained part of the gap varies across countries and asset types. These differences may be partly caused by differences in institutions, but also by important unmeasurable factors such as risk preferences, for example.

In each of the panels in tables 2 to 7, the top section reports estimates of the contribution of country differences in specific variables to the explained portion of the participation gap. In the second panel, the probability of holding the asset in the base country (the U.S.) $P(x = 0)$ and the reference country $P(x = 1)$ is reported. Next, *Diff* indicates the raw participation gap, *Exp* refers to the explained gap (due to characteristics) and *Unexp* the unexplained gap (due to institutions or culture). In the adjacent column, for each country we show the percentage each set of characteristics contributes to the explained gap and, below this, we report the ratio of the explained and unexplained gaps to the base participation in the U.S.

For example, looking at let top left panel of Table 2, we see that 62.6% of U.S. households and 56.9% of Canadian households own their principal residence. 25% less Canadian households own their own home than U.S. households for explained reasons (this corresponds to a 15.6ppt counterfactual gap in homeownership if the institutional setting in Canada was identical to that in the U.S.). This explained gap is largely due to differences in income between Canadian and U.S. households (as evidenced by the 83% contribution of this variable to the explained gap). The unexplained gap is 16% meaning that, if Canadian households were like U.S. households in their characteristics - in this case, that would mainly require a convergence of their income levels to U.S. levels - 16% more Canadian households would own their own home than U.S. households. This gap can be attributed to different institutional or cultural features of the two countries. So, while U.S. households own their own home more often than Canadian households, this gap would be even larger were it not for institutional differences between the two countries which encourage Canadian households to buy their own home.

[6]For comparison purposes the results for those 50 and over are in Table 4 and 5, respectively.

Principal residence First, we examine real estate. U.S. households hold more principal residence than those in Canada, Germany and Italy while the opposite is true in Luxembourg and Spain. Raw participation gaps are small except in Germany (31%), which has traditionally had very low homeownership rates and Spain (14%) which has very high homeownership rates. However, in the case of Canada and Italy, the small raw participation gaps mask reasonably large explained and unexplained gaps which work in opposite directions. In each of the countries except Luxembourg, the characteristics of U.S. households, mainly income, lead them to have higher homeownership rates. In Canada and Spain, the unexplained gaps are large and negative, indicating that these countries would have higher homeownership rates if their households' characteristics were the same as those in the U.S. Only in Germany is there a large positive unexplained gap which reflects this country's traditionally low homeownership rates for reasons unrelated to household characteristics.

Investment real estate The U.S. has a higher participation in investment real estate than Canada and Germany while Italian, Luxembourgish and Spanish households have higher investment real estate ownership than the U.S. However, for each country there is a large positive explained gap in participation rates, meaning that U.S. households have characteristics which lead them to hold more investment real estate (again, generally income although demographics, education and labour market status also play a role) than each of the other countries. The unexplained gap is large and negative in each country but Germany and is largest in Spain. If the European and Canadian households were the same as those in the U.S. in terms of characteristics, their participation in investment real estate would be much higher due to the institutional setting. So, while investment real estate ownership is higher in the U.S. than in Canada and Germany, this is due to U.S. household characteristics. The institutional effect works in the opposite direction, deterring U.S. housholds from holding investment real estate compared to Canada or the European countries.

Debt In terms of debt, large differences can be observed across countries. The U.S. has higher participation in debt that any of the other countries examined. This difference is particularly large in the European countries where the unexplained and explained gaps are both positive, indicating that European countries participate less in debt than the U.S. both for reasons related to household characteristics (except Spain) and for institutional reasons. The largest differences in the take-up rate of debt is between the U.S. and Italy

(45.9ppt), Germany (36.2ppt) and Spain (20ppt).[7]

Mortgage and Non-housing debt We disaggregate debt into mortgage and non-housing debt in table 6. We find that the role of explanatory variables is greater in the case of mortgage than other debt, with income and education playing the largest role in each country. Most of the large gaps in non-housing debt participation between the U.S. and the European countries is unexplained while the gap between the U.S. and Canada is very small.

Financial Assets The U.S. has higher participation in financial assets than every country except Spain. In each country except Spain, the unexplained gap is positive indicating that households in these countries hold less financial assets due to insitutional features. For the countries with the largest participation gaps (40ppt in Germany and 28ppt in Luxembourg), most of the gap is unexplained.

Own Business A small share of the population in each of the survey countries owns their own business. The highest rates are observed in Canada (18%), Italy (21%) and Spain (15%). Germany has the lowest business ownership rate at 7%. These raw gaps are a mix of explained (mainly labour market status and other wealth) and unexplained factors which tend to increase business ownership in each country except Luxembourg, compared to the U.S.

Cohort effects The findings presented above have been estimated for the population under 50. However, portfolio choice is affected by age and cohort effects. In fact, one of the limitations of cohort specific data is the lack of insight into age differences in the drivers of wealth portfolio choices. As a result, we perform the same analysis for thosehouseholds headed by a person above 50 years old. The results can be found in tables 4 and 5. In terms of explained participation gaps, income is the main driver for the younger cohort while a range of variables, like education and marital status in particular, drive the explained participation gaps for the older cohort. Liquidity constraints may be more binding for the younger cohort who lack an earnings history and/or collateral so this is unsurprising and is true across countries.

We find that, for principal residence, investment real estate, business equity and, in some cases, for financial assets, the younger cohort has larger unexplained participation gaps

[7]Total debt information is not available for Luxembourg, because information on non-housing debt is not surveyed.

with the U.S., compared to the older cohort. This indicates that institutions may have more effect on the wealth participation decisions of younger housholds than older households. Cross-country institutional differences influence the debt participation of the older cohort more than that of the younger cohort, for whom characteristics drive more of the cross-country debt participation gaps.

Thus, a focus on the over-50 population may lead to an underestimation of the role of demographic differences, particularly income, in explaining many portfolio component differences in a given country. Equally, institutional differences are generally more important for the younger cohort (except for debt participation). This is an important finding as the younger cohort's participation decision may be more responsive to policy instruments as well as to changes in their own personal circumstances (for example, loss of income or job during the financial crisis).

4.3 The role of institutions

In an attempt to try to explain some of the unexplained wealth participation gaps, we plot correlations between the unexplained participation gap for each component of wealth against institutional features of each country. We use three indices relating to the economy. The first, the Financial Development Index, is a score for the breadth, depth and efficiency of each country's financial system and capital markets (Bilodeau (2008)). Next, the Index of Economic Freedom, measures the economic freedom in each country, with higher scores indicating lower government interference in the economy Kane (2007). Lastly, the banking regulation index, measures the degree of banking regulation in each country, including enforcement power (de Serres (2007)). We also use three features of mortgages in each country (see Andrews et al. (2011)): the maximum loan-to-value (LTV) ratio, the percentage of fixed rate mortgages issued and the typical maturity rate of mortgages in each country. We expect that these institutional indicators will help to shed some light on different cross-country investment patterns that cannot be explained by household characteristics.

The results of these simple correlations are depicted in Figures 3 to 6. The unexplained gap measures the percentage difference between each countries participation rate and the US participation rate, which is not explained by household characteristics:

$$\hat{p}^{j}(w) - \hat{p}_{j}^{us}(w) \tag{4}$$

Therefore, the U.S. always has a 0 unexplained gap and a positive unexplained gap for the

other countries means that similar households in that country have higher participation rates that those in the U.S. Hence, a positive slope in figures Figures 3 to 6 implies a positive correlation between the unexplained gap and the institutional index and, therefore, a positive correlation between participation in that particular wealth component and the institutional index.

Looking firstly at Figure 3, we see little correlation between the unexplained participation gap in Financial Assets and the indices and statistics explained above. One exception is the maximum LTV ratio. There is some evidence of a positive correlation between the unexplained gap and the maximum LTV ratio, indicating that countries with higher maximum LTV ratios have higher rates of participation in financial assets.

Figure 4 shows the correlation between the unexplained participation gaps in principal residence and institutional features. We observe a negative correlation between two of the economic indices (financial development and economic freedom) and the unexplained participation gap, indicating that countries with higher levels of financial development and economic freedom have lower homeownship rates. We also observe a negative correlation between the typical mortgage maturity length and the proportion of fixed rated mortgages and the the unexplained gap in principal residence participation. Longer potential mortgage maturities and more fixed rate mortgages imply lower homeownership rates although it is impossible to tell in which direction the causality goes. Lastly, and similarly to financial assets, we see a positive correlation home-ownership and the maximum LTV ratio, showing that countries with stricter deposit rules for mortgages have lower homeownership rates. These findings are similar for both the under-50 and the over-50 cohort.

Next, turning to Figure 5, we inspect the correlation between the unexplained gap in investment real estate and institutions. We see correlations which are very similar to those for principal residence, but stronger. Investment real estate participation is negatively associated with financial development, economic freedom, bank regulation, average mortage maturity and the proportion of fixed rate mortgages. There is also a slight positive correlation with the maximum LTV ratio.

Lastly, we examine the link between institutions and the unexplained gap in mortgage participation. In almost a mirror image of the correlations found for principal residence and investment real estate, we find positive correlations between the unexplained participation gap in mortgages and financial development and economic freedom. This implies that countries with higher levels of financial development and economic freedom have higher participation in mortgages. These correlations are stronger for households in which the head is over 50 years of age. We also see positive correlations between mortgage partic-

ipation and maturity lengths, the proportion of fixed rate mortgages (for households with a head over 50) and the maximum LTV ratio. Countries with longer-term, more fixed rate mortgages and higher LTV ratios have hgher take-up of mortgages.

5 Conclusions

In this paper, we apply novel techniques to the analysis of wealth portfolios. We decompose the participation decision for a selection of assets across households and across countries, focussing on households whose head is under 50 years of age. We find that household characteristics explain a sizable portion of the wealth participation gap, but that this varies across countries and asset components. For real estate and mortgage debt, we have large explained (mainly by income) and unexplained gaps between the U.S. and each of the countries examined while, for financial assets, most of the participation gap between the U.S., and the European countries is unexplained. This leaves scope for policy instruments to influence participation in financial assets in Europe. Older cohorts display smaller explained and unexplained wealth participation gaps and the explained gaps for this group are influenced by a range of demographic characteristics and not overly influenced by income, as is the case for the younger cohort. This is an important finding as it shows that the younger cohort's wealth participation is more vulnerable to income shocks (such as those suffered during the great recession) and is more susceptible to policy influences.

We use a selection of institutional indicators to attempt to discover why identical households in different countries invest differently. We find little evidence that the decision to hold financial assets is correlated with any of the institutional indicators we use. However, we do find that investing in housing (particularly, investment real estate) is negatively correlated with financial development and economic freedom. There is also a negative link between investment in housing and typical mortgage maturities and the proportion of fixed-rate mortgages in the country while there is a positive correlation between investment in real estate and the maximum loan-to-value ratio permitted. Examining the link between mortgage use and institution, we find our first cohort effect, with stronger correlations for the older cohort. Mortgage use is found to be positively correlated to financial development, economic freedom, typical maturity, the proportion of fixed-rate mrtgages and the maximum loan-to-value ratio. Overall, institutional features encourage European households, particularly mature ones, to participate in real estate while discouraging them from mortgage use.

This paper has focused on the participation decision in wealth, without reference to the level of investment, given participation. This, obviously, is another important aspect of wealth portfolios and deserves attention in future literature. Future research could also try to control for observable institutional factors using instrumental variables or other techniques to examine more rigorously to what degree these affect the unexplained gap in portfolio participation across countries.

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6 Tables and Figures

Table 1: Asset participation and levels for younger and mature households.

24 to 49 year olds	US	Canada	Germany	Italy	Luxembourg	Spain	US	Canada	Germany	Luxembourg	Spain
Total Fin.Assets	91.97	86.17	52.32	79.73	64.41	92.05	92840	8843	13081	24448	15902
Deposit Accounts	90.25	84.64	na	79.23	na	92.05	13334	3747	na	na	14627
Risky Assets	32.55	24.85	na	16.50	na	2.48	22800	4978	na	na	1010
Main Residence	62.61	59.59	32.02	57.66	64.09	77.00	173637	62973	77606	327419	208027
Other Property	15.46	14.39	10.31	15.95	21.40	29.19	35830	10180	17228	72190	66483
Business Equity	12.87	18.91	7.36	21.41	5.58	14.94	43288	4953	9547	18416	30233
Total Assets	93.53	93.17	64.97	88.62	86.51	98.08	367063	92916	124171	452555	323897
Total Debt	86.56	81.86	50.36	40.64	53.93	66.61	115656	35635	43456	80630	60007
Housing Debt	57.30	58.07	na	22.76	na	52.29	97858	30178	na	na	55401
Mortgage	55.46	46.48	24.93	22.76	53.93	45.41	85549	24778	29174	80630	43400
Other Home Debt	6.21	4.98	5.62	na	na	10.05	7552	2405	6056	na	11079
Non-housing debt	77.31	68.07	31.22	22.59	na	30.23	17353	5101	5577	na	3954

50 and over	US	Canada	Germany	Italy	Luxembourg	Spain	US	Canada	Germany	Luxembourg	Spain
Total Fin.Assets	96.56	91.37	61.51	75.37	71.49	93.76	257549	26678	28895	42735	27884
Deposit Accounts	95.09	89.91	na	74.71	na	93.76	25564	12361	na	na	23808
Risky Assets	35.86	28.65	na	24.15	na	4.17	78667	12149	na	na	2639
Main Residence	80.93	72.71	47.78	78.38	78.52	88.53	239019	75003	118227	436873	244294
Other Property	24.43	19.66	15.31	25.94	34.77	42.89	75950	13772	34646	184475	119787
Business Equity	12.27	15.06	5.25	13.80	5.70	9.85	71568	5277	8520	17421	30325
Total Assets	97.36	96.00	76.28	92.87	90.74	98.56	718537	129732	199975	693655	431238
Total Debt	68.31	55.08	26.53	16.21	14.89	28.14	78339	16003	21983	14189	15918
Housing Debt	47.45	37.22	na	6.22	na	14.43	67114	13038	na	na	13147
Mortgage	41.29	22.98	13.74	6.22	14.89	8.78	53144	8804	9712	14189	6786
Other Home Debt	5.40	4.38	6.07	na	na	6.20	7744	1894	7555	na	6075
Non-housing debt	55.84	43.35	13.72	11.08	na	16.92	10184	2844	2718	na	2521

Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: The levels are in 2007 Euros and include zeros.

Table 2: Decomposition of portfolio participation decision for the 25 to 49 year olds (Home, Investment Real Estate, and Debt.

	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Principal Residence										
demog	0.015***	10	0.004	3	-0.018***	-20	0.004	-13	0.001	1
educ	-0.003***	-2	-0.007***	-6	0.050***	55	0.025***	-80	0.035***	32
marstat	-0.000	0	0.022***	19	-0.022***	-24	-0.008***	26	-0.031***	-28
LM	0.002	1	0.010***	8	-0.001	-1	0.005**	-16	0.015***	14
asini	0.130***	83	0.086***	73	0.092***	101	-0.042***	134	0.098***	89
asinwp	0.012***	8	0.002***	2	-0.011***	-11	-0.015***	48	-0.010***	-9
		100		99		100		99		98
P(x=0)	0.626		0.626		0.626		0.626		0.626	
P(x=1)	0.569		0.320		0.577		0.641		0.770	
Diff	0.057		0.306		0.050		-0.015		-0.144	
Exp	0.156	25	0.118	19	0.091	15	-0.031	-5	0.110	18
Unexp	-0.099	-16	0.188	30	-0.041	-7	0.017	3	-0.254	-41
Investment Real Estate										
demog	0.013***	16	0.014***	20	0.002	3	0.021***	45	0.019***	23
educ	0.001	1	0.002	3	0.020***	33	0.006***	13	0.012***	15
marstat	0.010***	12	0.009***	13	0.002**	3	0.006***	13	0.003**	4
LM	0.009***	11	0.009***	13	-0.009***	-15	0.011***	24	0.007***	9
asini	0.047***	58	0.033***	47	0.046***	76	0.004***	9	0.043***	52
asinwi	0.001	1	0.002	3	-0.001	-2	-0.002	-4	-0.001	-1
		100		99		99		99		101
P(x=0)	0.155		0.155		0.155		0.155		0.155	
P(x=1)	0.139		0.103		0.160		0.215		0.292	
Diff	0.016		0.052		-0.005		-0.060		-0.137	
Exp	0.081	52	0.070	45	0.061	39	0.046	30	0.082	53
Unexp	-0.065	-42	-0.019	-12	-0.066	-42	-0.106	-69	-0.219	-141
Total Debt										
demog	0.013***	19	0.013***	8	0.013***	23	na		0.016***	804
educ	-0.001***	-1	-0.003***	-2	0.028***	50			0.020***	1005
marstat	0.009***	13	0.006***	4	-0.002	-4			-0.004	-201
LM	0.003	4	0.009***	5	0.002	4			0.013***	653
asini	0.010***	15	0.018***	11	0.009***	16			0.010***	503
asinwd	0.033***	49	0.122***	74	0.008***	14			-0.053***	-2663
		99		101		103				101
P(x=0)	0.866		0.866		0.866				0.866	
P(x=1)	0.814		0.504		0.406				0.666	
Diff	0.0518		0.362		0.459				0.200	
Exp	0.0674	8	0.164	19	0.0564	7			0.002	0
Unexp	-0.016	-2	0.198	23	0.403	46			0.198	23

Table 3: Decomposition of portfolio participation decison for the 25 to 49 year olds (Financial Assets and Businesses).

	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Financial Assets										
demog	-0.007***	-33	-0.003	-6	-0.003**	-2	-0.002	30	-0.004**	-9
educ	0.008***	38	0.006***	12	0.081***	170	0.046***	-701	0.061***	143
marstat	-0.005***	-23	-0.003***	-6	-0.034***	-71	-0.024***	366	-0.035***	-82
LM	0.003**	14	0.011***	21	-0.007***	-15	0.002	-30	0.011***	26
asini	0.023***	108	0.041***	79	0.020***	42	-0.017***	259	0.026***	61
asinwf	-0.002***	-9	0.000	0	-0.010***	-21	-0.012***	183	-0.016***	-37
		94		100		103		107		100
P(x=0)	0.920		0.920		0.920		0.92		0.920	
P(x=1)	0.860		0.523		0.797		0.644		0.920	
Diff	0.060		0.397		0.122		0.276		-0.001	
Exp	0.021	2	0.052	6	0.0476	5	-0.007	-1	0.043	5
Unexp	0.039	4	0.345	38	0.074	8	0.283	31	-0.044	-5
Business ownership										
demog	0.007***	12	0.008***	15	0.004***	-11	0.008***	22	0.007***	34
educ	-0.001**	-2	-0.002**	-4	0.009***	-24	0.001	3	0.009***	43
marstat	0.003**	5	0.002	4	0.001**	-3	0.001	3	0.001**	5
LM	0.022***	39	0.023***	42	-0.059***	160	0.033***	89	0	0
asini	0.007***	12	0.004***	7	0.007***	-19	0.000**	0	0.010***	48
asinwb	0.019***	34	0.021***	38	0.001**	-3	-0.007***	-19	-0.006***	-29
		101		103		101		97		101
P(x=0)	0.129		0.129		0.129		0.129		0.129	
P(x=1)	0.176		0.074		0.214		0.056		0.149	
Diff	-0.047		0.055		-0.0854		0.0727		-0.021	
Exp	0.057	44	0.055	42	-0.0368	-29	0.037	29	0.021	16
Unexp	-0.104	-80	0.001	0	-0.049	-38	0.036	28	-0.042	-32

Table 4: Decomposition of portfolio participation decision for households with head 50 and over (Home, Investment Real Estate, and Debt).

	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Principal Residence										
demog	0.006**	5	0.003*	5	-0.001	-3	-0.001	5	-0.002	-2
educ	0.010***	9	0.002***	3	0.039***	106	0.002	-11	0.038***	38
marstat	0.051***	45	0.019***	32	-0.001	-3	0.003***	-16	0.000	0
LM	0.004	4	0.008	14	0.003	8	0.011	-60	0.015	15
asini	0.012***	11	0.009***	15	0.006***	16	-0.006***	33	0.060***	60
asinwp	0.031***	27	0.017***	29	-0.010***	-27	-0.027***	148	-0.011***	-11
		100		98		98		99		101
P(x=0)	0.809		0.809		0.809		0.809		0.809	
P(x=1)	0.721		0.478		0.784		0.785		0.885	
Diff	0.088		0.331		0.026		0.024		-0.076	
Exp	0.114	14	0.059	7	0.037	5	-0.018	-2	0.100	12
Unexp	-0.026	-3	0.272	34	-0.011	-1	0.042	5	-0.176	-22
Investment Real Estate										
demog	-0.005*	-6	-0.001	-1	-0.004**	-5	-0.001	-20	-0.004	-4
educ	-0.002	-2	0.007***	10	0.063***	76	0.019***	380	0.056***	53
marstat	0.019***	23	0.003***	4	-0.000	0	-0.001	-20	-0.000	0
LM	0.005***	6	0.001	1	-0.005**	-6	0.003	60	0.002	2
asini	0.041***	50	0.026***	38	0.025***	30	-0.004***	-80	0.046***	43
asinwi	0.024***	29	0.033***	48	0.004***	5	-0.011***	-220	0.007***	7
		100		101		100		100		101
P(x=0)	0.244		0.244		0.244		0.244		0.244	
P(x=1)	0.191		0.153		0.259		0.348		0.429	
Diff	0.053		0.091		-0.015		-0.103		-0.185	
Exp	0.082	34	0.069	28	0.083	34	0.005	2	0.106	43
Unexp	-0.030	-12	0.023	9	-0.098	-40	-0.108	-44	-0.291	-119
Total Debt										
demog	-0.004*	-4	0.043***	45	0.040***	52	na		0.017***	-128
educ	0.016***	16	-0.005***	0	0.015*	19			0.017**	-128
marstat	0.065***	64	0.005***	5	-0.001	-1			-0.001	8
LM	-0.006**	-6	-0.008	-8	0.012***	16			-0.035***	263
asini	-0.001	-1	-0.001	-1	-0.001	-1			-0.003	23
asinwd	0.033***	32	0.061***	64	0.012***	16			-0.009***	68
		101		105		99				105
P(x=0)	0.683		0.683		0.683				0.683	
P(x=1)	0.544		0.265		0.162				0.281	
Diff	0.139		0.418		0.521				0.402	
Exp	0.102	15	0.096	14	0.077	11			-0.013	-2
Unexp	0.037	5	0.323	47	0.444	65			0.415	61

Table 5: Decomposition of portfolio participation decision for households with head over 50 (Financial Assets and Businesses).

	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Financial Assets										
demog	0.005***	25	0.004**	49	0.003**	13	0.006***	-38	0.001	3
educ	0.019***	96	0.007***	86	0.044***	190	0.010***	-64	0.040***	104
marstat	0.004	20	-0.001	-12	-0.007***	-30	-0.006***	38	-0.004***	-10
LM	-0.003	-15	-0.004*	-49	0.004**	17	-0.004**	26	-0.014**	-37
asini	0.007***	35	0.008***	99	0.004***	17	-0.004***	26	0.064***	167
asinwf	-0.011***	-56	-0.005***	-62	-0.024***	-104	-0.018***	115	-0.048***	-125
		106		111		104		103		102
P(x=0)	0.966		0.966		0.966		0.966		0.966	
P(x=1)	0.915		0.615		0.754		0.715		0.938	
Diff	0.0505		0.350		0.212		0.251		0.028	
Exp	0.0198	2	0.008	1	0.023	2	-0.016	-2	0.038	4
Unexp	0.0307	3	0.342	35	0.189	20	0.267	28	-0.010	-1
Business ownership										
demog	-0.012***	-17	0.000	0	-0.005***	-28	-0.003	-6	-0.008***	-49
educ	-0.006***	-10	0.005***	8	0.007	39	0.014***	30	0.003	18
marstat	0.004*	7	-0.000	0	-0.002**	-11	-0.003***	-6	-0.001*	-6
LM	0.033***	55	0.032***	48	0.003***	17	0.042***	89	0.016***	98
asini	-0.001	-2	-0.000	0	-0.000	0	-0.000	0	-0.001	-6
asinwb	0.041***	69	0.029***	44	0.015***	83	-0.003***	-6	0.007***	43
		103		100		99		100		98
P(x=0)	0.123		0.123		0.123		0.123		0.123	
P(x=1)	0.145		0.053		0.138		0.057		0.099	
Diff	-0.022		0.070		-0.015		0.066		0.024	
Exp	0.060	48	0.066	54	0.018	15	0.047	38	0.016	13
Unexp	-0.081	-66	0.004	3	-0.033	-27	0.019	15	0.008	6

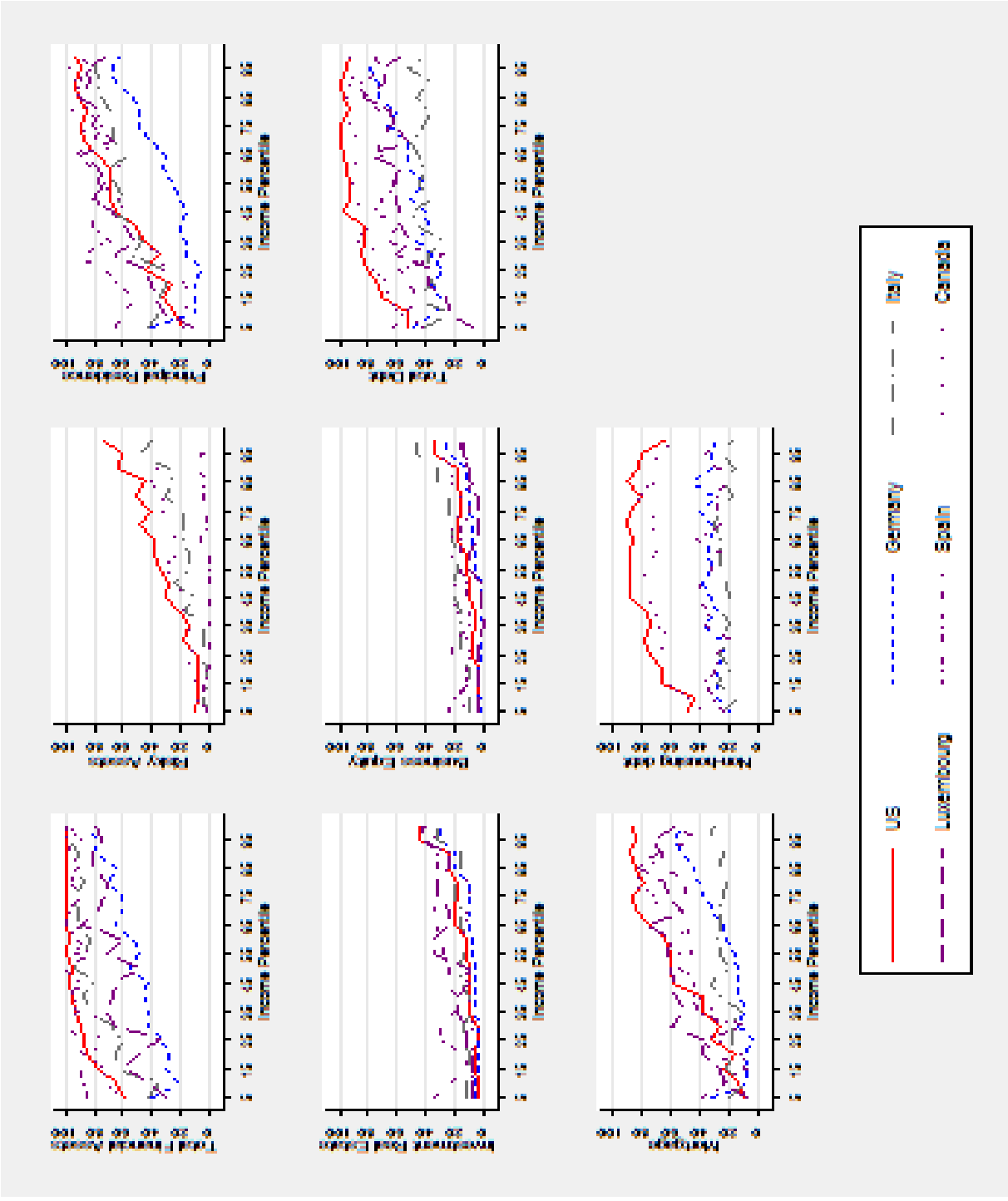
Table 6: Decomposition of portfolio participation decision for the 25 to 49 year olds (Mortgage and Non-housing Debt).

	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Mortgage										
demog	0.002	1	-0.011**	-9	-0.020***	-14	-0.013***	49	-0.015***	-11
educ	-0.004***	-3	-0.006***	-5	0.069***	47	0.029***	-109	0.054***	41
marstat	0.003	2	0.028***	23	-0.019***	-13	-0.004***	15	-0.028***	-21
LM	0.001	1	0.010***	8	-0.000	0	0.006**	-23	0.015***	11
asini	0.158***	100	0.102***	83	0.118***	80	-0.045***	170	0.107***	80
		101		100		100		102		100
P(x=0)	0.555		0.555		0.555		0.555		0.555	
P(x=1)	0.447		0.249		0.228		0.539		0.454	
Diff	0.108		0.305		0.327		0.016		0.101	
Exp	0.158	28	0.123	22	0.148	27	-0.027	-5	0.133	24
Unexp	-0.050	-9	0.182	33	0.179	32	0.042	8	-0.032	-6
Non-housing debt										
demog	0.013***	35	0.016***	28	0.018***	19	0.017***	40	0.017***	14
educ	-0.003***	-8	-0.009***	-16	0.060***	63	0.032***	76	0.049***	40
marstat	0.010***	27	0.013***	23	-0.010***	-11	-0.001	-2	-0.013***	-11
LM	-0.001	-3	0.013***	23	0.010***	11	0.000	0	0.025***	20
asini	0.018***	49	0.025***	43	0.016***	17	-0.005***	-12	0.043***	35
		101		101		99		102		99
P(x=0)	0.773		0.773		0.773		0.773		0.773	
P(x=1)	0.679		0.312		0.226		0		0.302	
Diff	0.094		0.461		0.547		0.773		0.471	
Exp	0.037	5	0.058	7	0.095	12	0.042	5	0.122	16
Unexp	0.057	7	0.404	52	0.452	58	0.731	95	0.349	45

Table 7: Decomposition of portfolio participation decision for household heads 50 and over (Mortgage and Non-housing Debt).

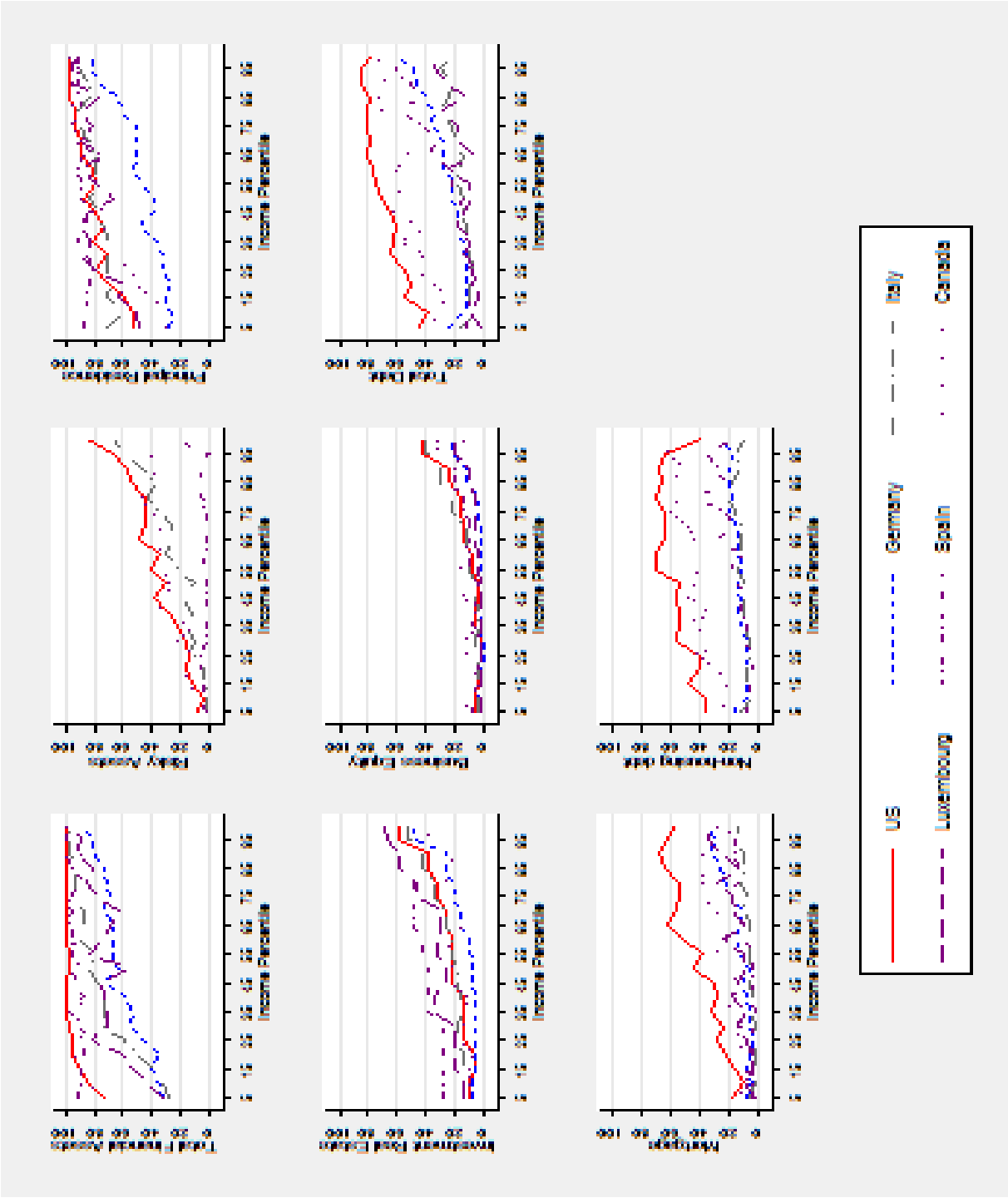
	Canada		Germany		Italy		Luxembourg		Spain	
	(1)	%	(2)	%	(3)	%	(4)	%	(5)	%
Mortgage										
demog	0.011***	13	0.043***	48	0.039***	31	0.010**	20	0.028***	26
educ	0.015***	17	0.005***	6	0.052***	42	0.026***	52	0.049***	45
marstat	0.038***	44	0.009***	10	-0.003**	-2	0	0	-0.001	-1
LM	0.007***	8	0.017***	19	0.027***	22	0.018**	36	0.018**	17
asini	0.016***	18	0.014***	16	0.010***	8	-0.003***	-6	0.016***	15
		101		99		100		101		102
P(x=0)	0.413		0.413		0.413		0.413		0.413	
P(x=1)	0.22		0.137		0.062		0.149		0.088	
Diff	0.192		0.275		0.351		0.263		0.325	
Exp	0.087	21	0.089	22	0.125	30	0.050	12	0.108	26
Unexp	0.106	26	0.186	45	0.226	55	0.213	51	0.217	53
Non-housing debt										
demog	-0.009***	-18	0.033***	231	0.031***	37	na		0.007**	40
educ	0.006**	12	-0.010***	-70	0.043***	51			0.046***	261
marstat	0.063***	129	0.007***	49	0.001	1			0.001	6
LM	-0.007**	-14	-0.013*	-91	0.014***	17			-0.033**	-188
asini	-0.004	-8	-0.003	-21	-0.002	-2			-0.004	-23
		100		98		103				97
									16,376	
P(x=0)	0.558		0.558		0.558				0.558	
P(x=1)	0.428		0.137		0.111				0.169	
Diff	0.131		0.421		0.448				0.389	
Exp	0.049	9	0.014	3	0.085	15			0.018	3
Unexp	0.082	15	0.407	73	0.363	65			0.371	67

Figure 1 Participation across the income distribution for the 25 to 49 population.



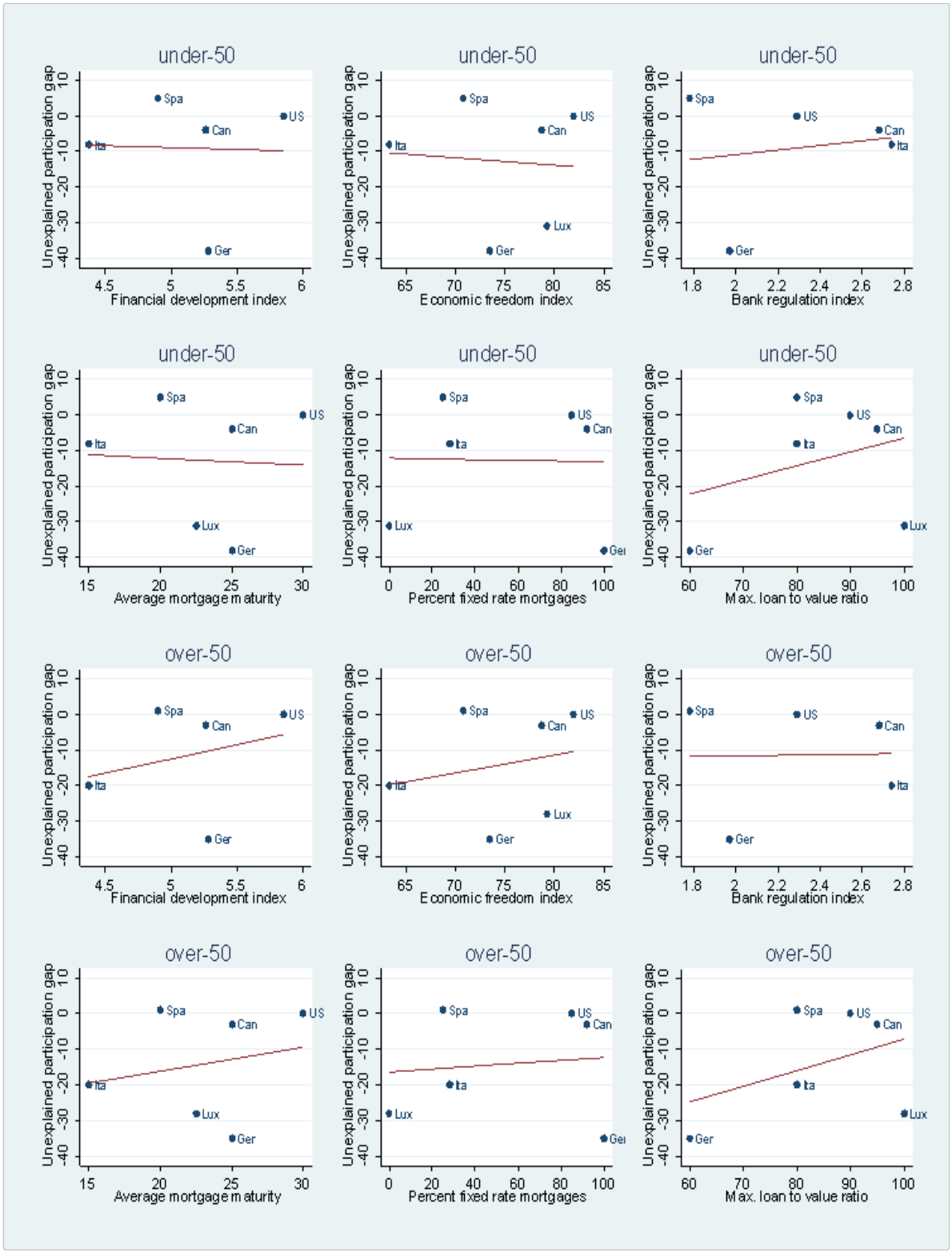
Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Figure 2 Participation across the income distribution for the 50 and over population.



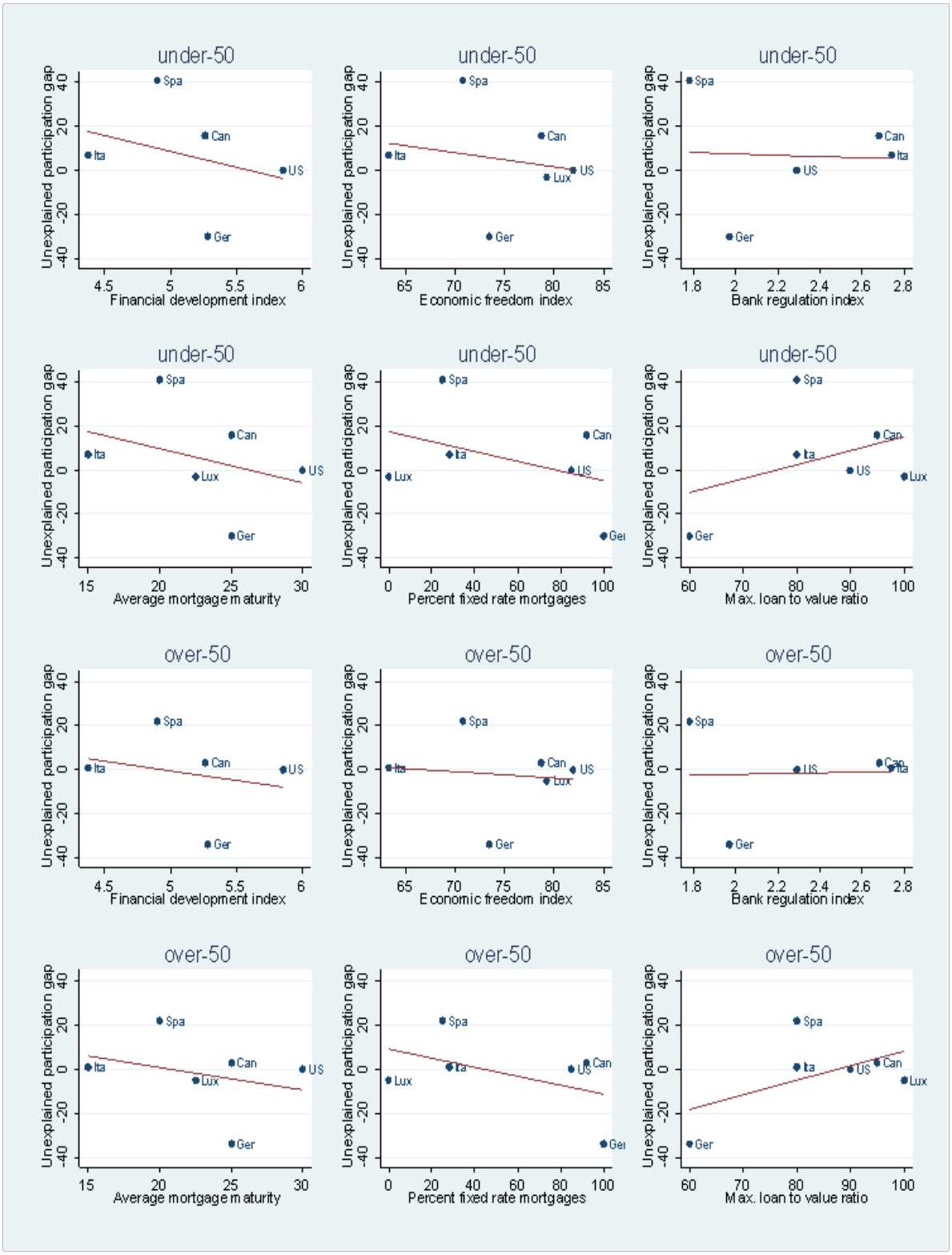
Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Figure 3 Linear correlations between the unexplained participation gap in Financial Assets and the institutional setting.



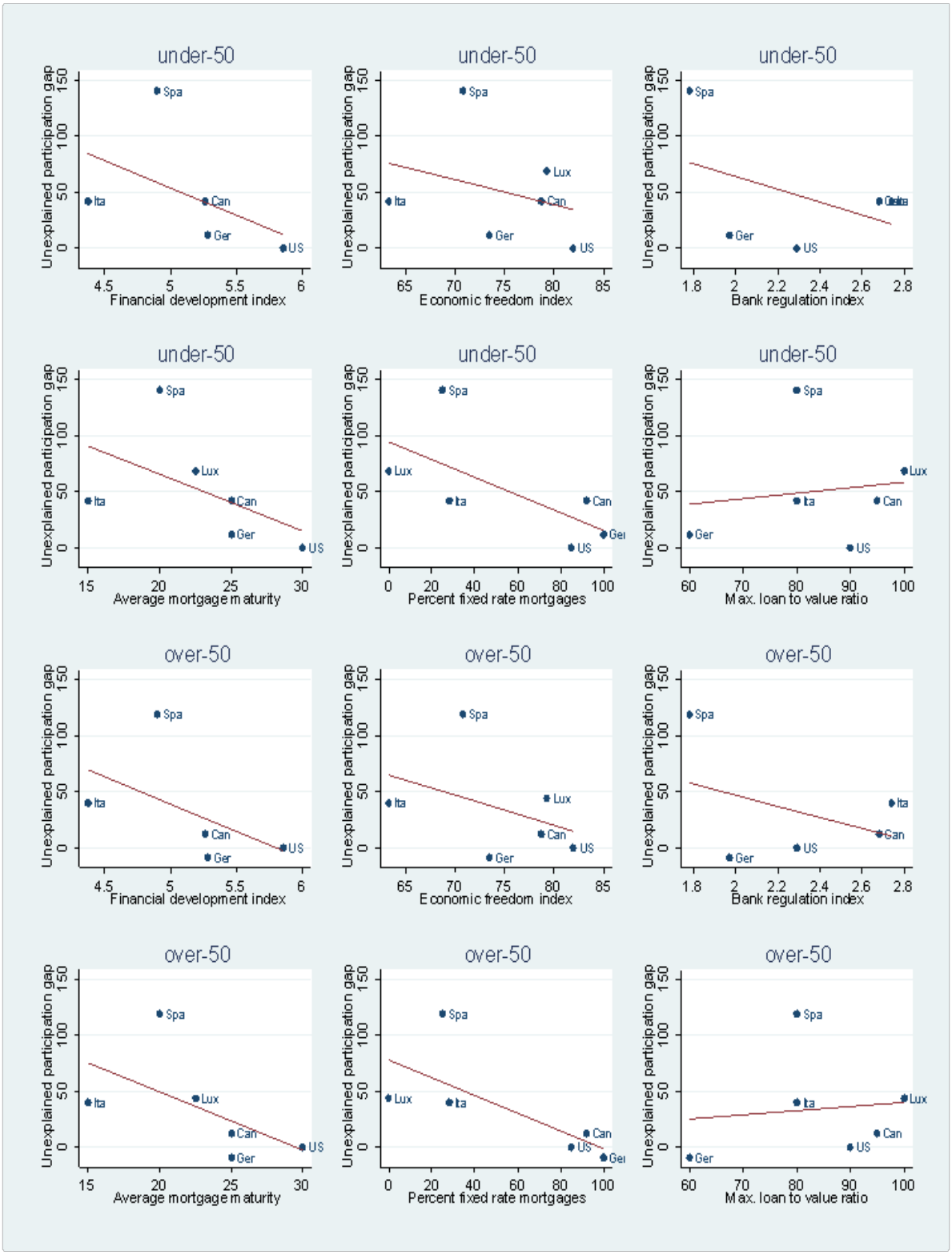
Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Figure 4 Linear correlations between the unexplained participation gap in Principal Residence and the institutional setting.



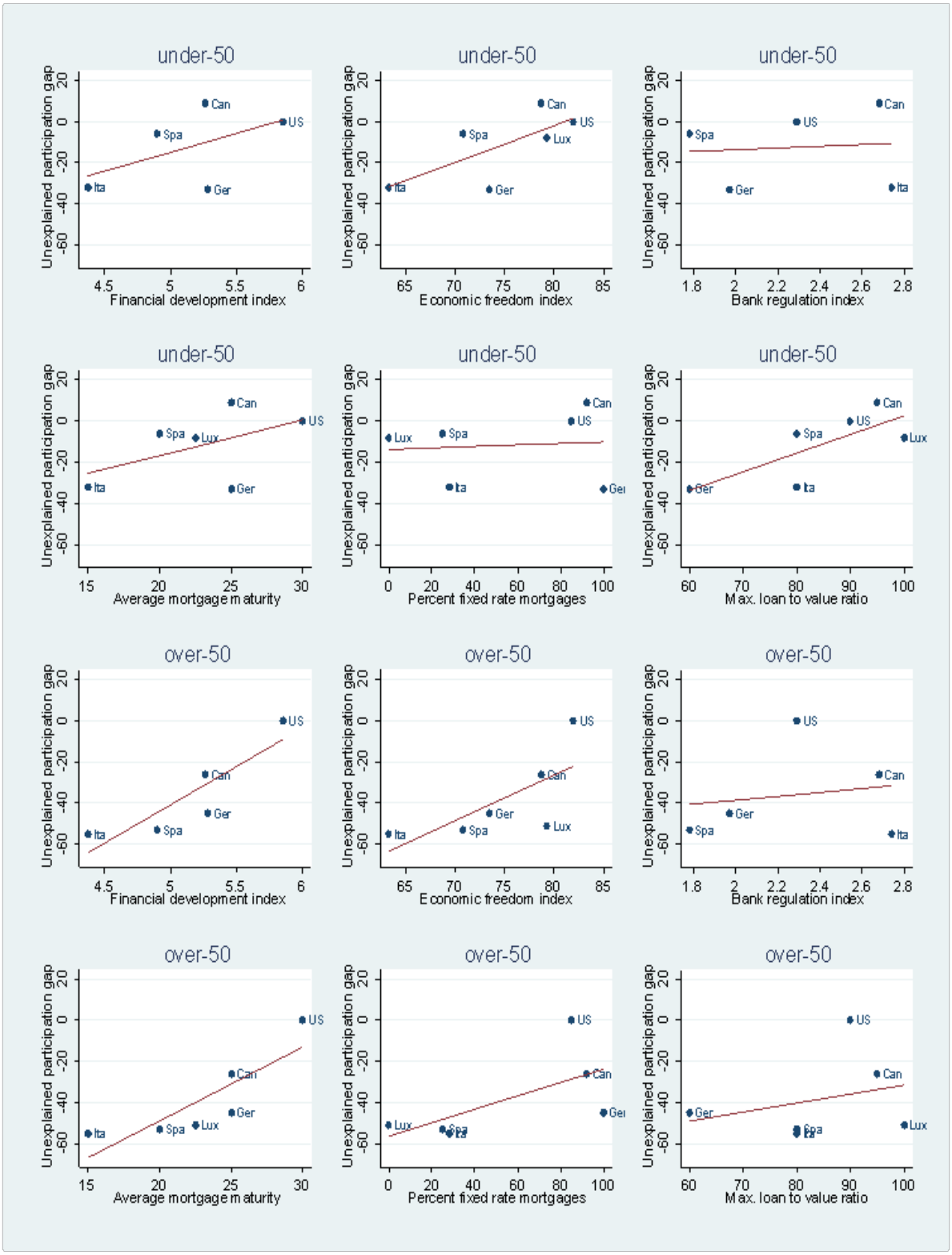
Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Figure 5 Linear correlations between the unexplained participation gap in Investment Real Estate and the institutional setting.



Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Figure 6 Linear correlations between the unexplained participation gap in Mortgages and the institutional setting.



Source: 2005 SFS, 2007 SCF, 2007 SOEP, 2008 SHIW, 2007 PSELL3 and 2008 EFF
Note: Weighted statistics

Table A1: Marginal effects for asset participation (principal residence, investment real estate and financial assets).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
PR	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	0.054***	(0.011)	0.072**	(0.030)	0.034***	(0.010)	0.035	(0.028)	0.032**	(0.015)	0.022	(0.025)
age2	-0.053***	(0.014)	-0.068*	(0.040)	-0.025**	(0.012)	-0.027	(0.036)	-0.022	(0.019)	-0.018	(0.032)
male	0.062***	(0.018)	0.038	(0.041)	-0.018**	(0.009)	-0.004	(0.034)	-0.069***	(0.017)	0.054*	(0.031)
noch18	-0.005	(0.006)	0.093**	(0.047)	0.043***	(0.005)	0.035*	(0.018)	-0.010	(0.009)	0.040**	(0.020)
low education	-0.186***	(0.020)	-0.066	(0.061)	-0.111***	(0.014)	-0.192***	(0.034)	-0.114***	(0.021)	0	(0.033)
high education	-0.033*	(0.017)	-0.059	(0.040)	-0.005	(0.011)	0.007	(0.050)	-0.189***	(0.025)	0.011	(0.039)
married	0.207***	(0.019)	0.189***	(0.060)	0.264***	(0.012)	0.066	(0.046)	0.096***	(0.029)	0.078**	(0.037)
divorced	0.026	(0.018)	-0.093	(0.087)	-0.065***	(0.015)	-0.111**	(0.054)	-0.070***	(0.026)	-0.029	(0.045)
employed	0.103***	(0.027)	-0.009	(0.094)	0.164***	(0.012)	-0.055	(0.050)	0.049*	(0.025)	-0.004	(0.039)
self-employed	0.143***	(0.034)	0.138	(0.102)	0.252***	(0.019)	0.053	(0.062)	0.088**	(0.036)	0.023	(0.056)
income	0.209***	(0.023)	0.332***	(0.085)	-0.008***	(0.001)	0.006	(0.012)	0.179***	(0.051)	0.010**	(0.004)
wealth (non-PR)	0.005***	(0.001)	0.005**	(0.002)	0.008***	(0.001)	0.012***	(0.002)	0.005***	(0.002)	0.007***	(0.002)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
IR	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	-0.000	(0.006)	0.017	(0.015)	0.012***	(0.004)	-0.008	(0.019)	0.003	(0.005)	-0.003	(0.034)
age2	0.004	(0.008)	-0.017	(0.020)	-0.011**	(0.005)	0.017	(0.024)	-0.006	(0.006)	0.018	(0.043)
male	0.098***	(0.013)	-0.018	(0.019)	0.004	(0.005)	-0.001	(0.022)	0.019***	(0.006)	-0.01	(0.033)
noch18	0.002	(0.003)	0.005	(0.022)	0.007***	(0.002)	0.009	(0.011)	-0.002	(0.003)	0.027	(0.020)
low education	-0.043***	(0.014)	0.007	(0.030)	-0.005	(0.008)	-0.044**	(0.021)	0.039***	(0.009)	-0.051	(0.039)
high education	0.013	(0.008)	0.023	(0.019)	0.052***	(0.005)	0.029	(0.026)	0.025***	(0.007)	0.066*	(0.040)
married	0.073***	(0.012)	0.016	(0.033)	0.004	(0.006)	0.004	(0.030)	-0.008	(0.008)	0.019	(0.048)
divorced	0.090***	(0.013)	0.006	(0.045)	-0.031***	(0.007)	-0.041	(0.043)	-0.016	(0.010)	-0.028	(0.061)
employed	-0.004	(0.015)	0.031	(0.048)	0.009	(0.006)	-0.035	(0.030)	-0.020**	(0.009)	-0.045	(0.040)
self-employed	0.072***	(0.017)	0.081	(0.051)	0.039***	(0.008)	0.044	(0.035)	0.014	(0.012)	0.205***	(0.069)
income	0.062***	(0.008)	0.022	(0.032)	0.000	(0.001)	0.005	(0.008)	0.017**	(0.008)	0.011	(0.011)
wealth (non-IR)	0.001	(0.001)	0.005***	(0.002)	0.005***	(0.000)	0.009***	(0.002)	0.042***	(0.002)	0.010***	(0.004)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	-11	(12)
FA	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	0.006***	(0.002)	-0.000	(0.015)	0.012	(0.009)	0.041*	(0.022)	0.018	(0.015)	0.003	(0.010)
age2	-0.008***	(0.002)	-0.002	(0.019)	-0.016	(0.012)	-0.050*	(0.029)	-0.025	(0.020)	-0.003	(0.014)
male	0.000	(0.003)	-0.024	(0.020)	-0.046***	(0.011)	-0.036	(0.025)	-0.018	(0.017)	0.012	(0.015)
noch18	-0.003***	(0.001)	-0.001	(0.025)	-0.034***	(0.006)	-0.034***	(0.012)	0.008	(0.009)	-0.016**	(0.007)
low education	-0.034***	(0.004)	-0.062***	(0.024)	-0.194***	(0.017)	-0.111***	(0.024)	-0.199***	(0.021)	-0.070***	(0.016)
high education	0.053***	(0.005)	0.070***	(0.023)	0.191***	(0.013)	0.023	(0.050)	0.030	(0.026)	0.021	(0.031)
married	0.026***	(0.005)	0.044*	(0.025)	0.069***	(0.014)	0.015	(0.034)	-0.128***	(0.028)	-0.006	(0.019)
divorced	0.006**	(0.003)	0.030	(0.039)	-0.115***	(0.016)	-0.049	(0.042)	-0.164***	(0.028)	0.005	(0.024)
employed	0.010***	(0.003)	0.095***	(0.026)	0.146***	(0.013)	0.035	(0.034)	0.114***	(0.027)	0.009	(0.013)
self-employed	0.050***	(0.010)	0.132***	(0.042)	-0.028	(0.022)	0.105**	(0.048)	0.092**	(0.044)	-0.020	(0.034)
income	0.011***	(0.002)	0.020*	(0.011)	0.007***	(0.002)	0.044	(0.029)	0.083**	(0.041)	0.005	(0.003)
wealth (non-fin)	0.000***	(0.000)	0.002**	(0.001)	0.016***	(0.001)	0.005***	(0.001)	0.012***	(0.002)	0.003***	(0.001)
Observations	1,848		2,080		4,723		2,539		2,207		1,809	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A2: Marginal effects for asset participation (financial assets and own business).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
BUSINESS	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	0.009**	(0.005)	0.006	(0.016)	0.005***	(0.002)	-0.004	(0.017)	0.000	(0.000)	-0.004	(0.005)
age2	-0.013**	(0.006)	-0.005	(0.022)	-0.006***	(0.002)	0.006	(0.021)	-0.000	(0.000)	0.005	(0.006)
male	0.023***	(0.008)	-0.054**	(0.021)	-0.006***	(0.002)	-0.008	(0.018)	0.000	(0.000)	-0.016	(0.011)
noch18	0.004**	(0.002)	0.022	(0.024)	0.003***	(0.001)	0.003	(0.009)	-0.000	(0.000)	-0.001	(0.002)
low education	-0.044***	(0.010)	-0.005	(0.040)	-0.010***	(0.003)	-0.014	(0.015)	-0.000	(0.000)	0.001	(0.004)
high education	-0.000	(0.005)	0.009	(0.022)	-0.008***	(0.002)	-0.050**	(0.025)	0.000*	(0.000)	-0.006	(0.006)
married	0.006	(0.008)	0.105***	(0.027)	0.008**	(0.003)	0.025	(0.023)	0.000	(0.000)	0.006	(0.007)
divorced	0.015*	(0.008)	0.006	(0.053)	-0.011***	(0.003)	0.015	(0.024)	0.000*	(0.000)	-0.025	(0.018)
employed	0.010	(0.011)	0.021	(0.041)	-0.021***	(0.003)	-0.109***	(0.022)	-0.000*	(0.000)	0.003	(0.005)
self-employed	0.182***	(0.020)	0.341***	(0.054)	0.080***	(0.006)	0.213***	(0.040)	0.001**	(0.000)	0.058	(0.041)
retired							-0.124	(0.076)			0.007	(0.013)
income	0.006***	(0.002)	-0.003	(0.010)	0.000	(0.000)	0.041**	(0.016)	-0.000	(0.000)	-0.001	(0.001)
wealth (non-BUS)	0.006***	(0.001)	0.006***	(0.002)	0.003***	(0.000)	0.012***	(0.002)	0.001***	(0.000)	0.013**	(0.005)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
MORTGAGE	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	0.034***	(0.012)	0.076***	(0.019)	0.000***	(0.000)	0.003	(0.012)	0.036***	(0.008)	0.045	(0.037)
age2	-0.054***	(0.016)	-0.109***	(0.025)	-0.001***	(0.000)	-0.009	(0.016)	-0.058***	(0.011)	-0.088*	(0.048)
male	-0.105***	(0.022)	0.039	(0.024)	0.000	(0.000)	-0.003	(0.015)	0.014	(0.010)	-0.008	(0.039)
noch18	0.020***	(0.006)	0.004	(0.028)	0.000***	(0.000)	-0.001	(0.008)	0.022***	(0.006)	0.060***	(0.023)
low education	-0.067**	(0.029)	-0.070	(0.046)	0.000	(0.000)	0.003	(0.013)	0.013	(0.013)	-0.030	(0.041)
high education	-0.168***	(0.016)	-0.064***	(0.023)	-0.002***	(0.000)	0.001	(0.018)	-0.059***	(0.013)	-0.005	(0.051)
married	0.157***	(0.022)	0.106***	(0.033)	0.002***	(0.000)	0.046**	(0.021)	-0.001	(0.013)	0.219***	(0.059)
divorced	0.065***	(0.022)	0.113**	(0.053)	0.001***	(0.000)	-0.002	(0.033)	-0.008	(0.017)	0.231***	(0.075)
employed	0.092***	(0.032)	0.157***	(0.050)	0.001***	(0.000)	0.049**	(0.022)	0.077***	(0.016)	0.065	(0.045)
self-employed	-0.091**	(0.037)	0.006	(0.063)	-0.000	(0.000)	0.037	(0.025)	-0.039*	(0.021)	-0.099	(0.069)
retired							-0.086	(0.086)			-0.177	(0.241)
income	0.005	(0.009)	-0.036*	(0.022)	-0.000**	(0.000)	-0.007	(0.005)	-0.035***	(0.008)	0.004	(0.014)
wealth (assets)	0.249***	(0.005)	0.135***	(0.007)	0.003***	(0.000)	0.052***	(0.004)	0.133***	(0.009)	0.139***	(0.012)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NON-HOUSING	US	se	Canada	se	Germany	se	Italy	se	Luxembourg	se	Spain	se
age	-0.031***	(0.008)	-0.007	(0.024)	0.010	(0.008)	-0.040*	(0.022)	na		-0.039	(0.029)
age2	0.033***	(0.011)	0.002	(0.032)	-0.015	(0.010)	0.050*	(0.029)			0.050	(0.037)
male	0.007	(0.013)	-0.035	(0.031)	0.021**	(0.009)	-0.052**	(0.026)			-0.007	(0.033)
noch18	0.013***	(0.004)	-0.030	(0.037)	-0.003	(0.005)	0.002	(0.014)			0.028	(0.020)
low education	-0.114***	(0.014)	-0.023	(0.051)	-0.043***	(0.014)	0.022	(0.025)			0.024	(0.036)
high education	-0.074***	(0.011)	-0.098***	(0.031)	-0.089***	(0.011)	-0.101***	(0.039)			-0.002	(0.043)
married	0.079***	(0.014)	0.073*	(0.040)	0.180***	(0.012)	0.112***	(0.040)			0.112**	(0.046)
divorced	0.089***	(0.014)	0.197***	(0.069)	0.138***	(0.014)	0.087*	(0.047)			0.042	(0.060)
employed	0.080***	(0.015)	0.157***	(0.060)	0.004	(0.012)	0.064*	(0.037)			-0.011	(0.039)
self-employed	-0.016	(0.020)	0.177**	(0.072)	0.058***	(0.020)	-0.016	(0.046)			0.004	(0.063)
retired							-0.116	(0.118)			-0.030	(0.150)
income	0.005	(0.004)	0.069**	(0.031)	0.015***	(0.002)	0.004	(0.008)			-0.000	(0.011)
wealth (assets)	0.016***	(0.001)	-0.002	(0.005)	-0.012***	(0.001)	-0.001	(0.003)			-0.016***	(0.006)
Observations	1,848		2,080		4,723		2,539		2,207		1,809	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3: Means by country by age groups (25 to 49 year olds and 50 and over).

25 to 49 year olds	US	Canada	Germany	Italy	Luxembourg	Spain	Total
ageh	38.04	37.37	38.70	39.63	38.74	38.74	38.48
age2	14.98	14.50	15.44	16.08	15.47	15.42	15.28
sexh	0.78	0.61	0.52	0.66	0.45	0.50	0.62
noch18	1.34	0.42	0.79	0.94	1.00	0.93	0.98
low	0.14	0.13	0.11	0.50	0.09	0.42	0.16
high	0.32	0.61	0.22	0.13	0.04	0.22	0.27
married	0.53	0.56	0.42	0.66	0.58	0.71	0.49
div	0.22	0.08	0.20	0.12	0.13	0.10	0.19
emp	0.78	0.81	0.71	0.67	0.80	0.63	0.73
self	0.11	0.07	0.07	0.21	0.05	0.11	0.09
retired	0.05	0.00	0.00	0.01	0.00	0.01	0.02
asini	11.32	10.47	10.25	10.59	11.52	9.63	10.62
asinwp	3.61	-0.25	2.66	6.81	7.85	6.86	3.35

50 and over	US	Canada	Germany	Italy	Luxembourg	Spain	Total
ageh	64.89	63.94	67.28	67.12	64.73	65.54	66.41
age2	43.37	41.83	46.44	46.16	42.93	43.96	45.30
sexh	0.67	0.60	0.58	0.62	0.51	0.52	0.61
noch18	0.36	0.04	0.08	0.12	0.19	0.05	0.16
low	0.17	0.32	0.19	0.74	0.20	0.72	0.25
high	0.30	0.45	0.20	0.08	0.05	0.14	0.22
married	0.52	0.53	0.48	0.58	0.58	0.58	0.51
div	0.41	0.01	0.43	0.33	0.34	0.34	0.40
emp	0.40	0.37	0.24	0.16	0.24	0.19	0.28
self	0.11	0.06	0.05	0.10	0.03	0.07	0.07
retired	0.47	0.48	0.50	0.68	0.43	0.39	0.50
asini	11.21	10.37	10.58	10.71	11.44	8.26	10.66
asinwp	8.53	4.97	5.88	8.13	9.41	8.99	6.93

Table A4: Glossary of sets of characteristics and variables

Set	Variables included
demog	age, age squared, male (0/1), number of children under 18
educ	indicator variable for low and high education
marstat	married (0/1), divorced (0/1), widowed (0/1)
LM	employed (0/1), self-employed (0/1), retired (0/1)
asini	household disposable income