

Exploring Differences in Household Debt across Euro Area Countries and the US[#]

Dimitris Christelis,¹ Michael Ehrmann² and Dimitris Georgarakos³

First draft: April 2013

PRELIMINARY AND INCOMPLETE – PLEASE DO NOT CIRCULATE FURTHER, PLEASE DO NOT QUOTE WITHOUT THE AUTHORS’ PERMISSION

Abstract

In several economies, household debt had risen substantially prior to the financial crisis, and the subsequent household deleveraging has strongly affected their macroeconomic performance. At the same time, there are large cross-country differences in the number of households participating in debt markets and in the amounts of debt held. Against this background, this paper uses internationally comparable household-level data for the United States and 11 European economies to decompose cross-country differences in debt holdings into differences due to household characteristics and those arising from different economic environments. The data come from the US Survey of Consumer Finances and the newly available Household Finance and Consumption Survey. The paper finds that US households show the highest prevalence of both collateralized and non-collateralized debt, and have comparatively large amounts of loans outstanding. Differences in household characteristics contribute relatively little to this outcome. In contrast, differences in economic environments have played a major role, with U.S. economic conditions having been much more conducive to debt holdings. The Netherlands are the only European economy with, at least in parts, similarly favourable conditions.

JEL-codes: D12, E21, G11

Keywords: household finance, household debt, counterfactual decompositions.

[#] This paper uses data from the Eurosystem Household Finance and Consumption Survey. It presents the authors’ personal opinions and does not necessarily reflect the views of the European Central Bank or the Eurosystem Household Finance and Consumption Network. We thank Dean Corbae, John Muellbauer, and participants at an HFCN seminar and the MEA/Bundesbank conference on “Household Finances, Saving and Inequality: An International Perspective” for useful comments.

¹ European Central Bank, CSEF, CFS and CEPAR, dimitris.christelis@gmail.com.

² European Central Bank, michael.ehrmann@ecb.europa.eu.

³ Goethe University Frankfurt, European Central Bank and CFS Dimitris.Georgarakos@hof.uni-frankfurt.de.

1. Introduction

In several advanced economies, household debt has risen substantially in the years leading up to the global financial crisis. At the same time, due to concurrent booms in house prices and stock markets, debt-to-asset ratios remained comparatively low in many countries. Hence, debt seemed to be sustainable. When share and house prices fell sharply during the recent financial crisis, however, the ensuing drop in household wealth often led to unsustainable increases in the debt-to-asset ratios. Furthermore, many households were faced with a drop in income or income prospects, making it harder for them to service their debt. As a consequence, there has been a substantial deleveraging in the household sector over the recent years.

This deleveraging process has shaped the post-crisis macroeconomic performance in several economies. Mian et al. (2011) stress the negative feedback effect of foreclosures and forced house sales on house prices, which in turn lower collateral values and lead to negative wealth effects. But even in the absence of foreclosures, households with high debt burdens have likely cut down their consumption in order to keep up with their debt service payments. Taken together, these developments have had substantial macroeconomic repercussions. For instance, using regional variation across the United States, Mian and Sufi (2010) show that U.S. household leverage in 2006 predicts most of the fall in durable consumption in the subsequent recession.

Given the importance of household debt for the macro economy and for financial stability, it is interesting to note that household debt holdings, both at the extensive and the intensive margin, differ substantially across countries. This has been shown in Christelis et al. (2013) for mortgage debt of older households, and has recently also been documented for the general population in euro area countries (Household Finance and Consumption Network 2013b). Comparisons across countries are not straightforward, however. For instance, households are heterogeneous in several dimensions, therefore, observed differences in debt holdings might arise due to both composition effects and to the economic environment within which the households operate. The paper uses recent decomposition techniques based on Firpo et al. (2009) and data from the United States and 11 European countries in order to disentangle these two effects, with respect to the prevalence and outstanding amounts of collateralized and non-collateralized debt.

The data used in this paper come from the newly available Eurosystem Household Finance and Consumption Survey (HFCS), which are combined with data from the U.S. Survey of Consumer Finances (SCF). Using this novel database, the paper first shows that among the 12 countries, households in the United States have the highest prevalence of collateralised and of non-collateralised debt. A key result of

the paper is that differences in household composition contribute relatively little to the higher prevalence of debt of U.S. households, whereas differences in economic conditions play a much larger role. In other words, U.S. economic conditions have been much more conducive to taking on debt. Furthermore, the magnitude of this effect is substantial – for instance, had European households faced the U.S. economic environment, 40% more Italian and 30% more Spanish households would have been expected to hold mortgage debt. As regards the prevalence of non-collateralised debt, exposing European households to U.S. conditions would result in between 30% and 40% more households in Belgium, Austria, Italy, Spain and Portugal assuming such debt. The differential effect of economic conditions is large, present in all countries, and is estimated to be statistically significant in all but one case, the exception being the prevalence of collateralised debt in the Netherlands. Difference in household characteristics, in contrast, typically account for less than 30% of the difference in debt prevalence.

Taking the analysis further, we document the important influence of real wealth on collateralised debt holdings: for a given level of real wealth, had European households faced U.S. economic conditions, they would have been considerably more likely to have collateralised debt. Other factors like financial wealth or inheritances received, play a much smaller role. Real wealth has an important, if smaller, effect also in the case of non-collateralised debt as well, with financial wealth, income, and education found to be additional relevant factors.

Moving on to the outstanding amounts (conditional on having a certain debt type), we find again that debt holdings are comparatively high in the United States, exceeding those in 8 of our 11 comparator countries. Only indebted households in the Netherlands, Cyprus and partially in Luxembourg (namely for collateralised debt) report higher outstanding median amounts than those in the United States. The determinants favouring higher debt holdings in the United States are less clear cut than for participation. On the one hand, household characteristics matter, typically suggesting that those of U.S. households favour higher levels of debt. On the other hand, the U.S. economic environment seems to have generally favoured higher levels of debt, although there are some instances where the European economic conditions have been more favourable, this being the case notably in the Netherlands. Importantly, house price developments have had a large effect on the levels of household debt – in an environment where house prices were growing rapidly (as measured by the cumulative growth of the national house price index in the three years prior to the mortgage take-out), the levels of household debt are estimated to be significantly higher.

To summarise, these findings suggest, first, that U.S. economic conditions have been considerably more conducive to taking out debt than those in Europe. Second, for a given level of real wealth, U.S.

households are substantially more likely to hold collateralised debt than their European counterparts. Third, the U.S. economic environment has also generally been more favourable to assuming larger amounts of debt, although the considerable house price increases that observed in some European countries have also been favouring the take-out of large mortgages therein.

The current paper is related to two strands of the literature on household debt. The first deals with the determinants of household debt. Especially since the global financial crisis, there has been renewed interest in this question. Several authors have stressed the importance of loan supply in determining debt levels: Mian and Sufi (2008) argue that more widespread securitisation practices among banks shifted the supply of mortgages; Corbae et al. (2011) point to the large number of low-down payment mortgage contracts in the United States prior to the crisis. Damar et al. (2013) show how a reduction in lending supply during the crisis has reduced household borrowing in Canada, which in turn has affected consumption. Other studies emphasise the role of loan demand in shaping debt levels. Georgarakos et al. (2013) show how the perceived income of peers leads to social effects on borrowing: those who consider themselves poorer than their social circle tend to borrow relatively more. Importantly, this demand factor also affects indicators of over-indebtedness such as debt service ratios. Finally, house prices have also been shown to be instrumental in explaining household debt: with rising house prices, debt levels tend to increase, a finding that is reported *inter alia* by Mian and Sufi (2009).

A second strand of the literature to which this paper relates uses decomposition techniques to study differences in household finances across countries. Bover (2010) estimates wealth distributions in a comparative analysis of the United States and Spain, and finds that differences in household structure account for most of the differences in the lower part of the wealth distribution, whereas its upper part would be even more heterogeneous in the absence of differences in household structure. Christelis et al. (2013) concentrate on asset holdings of households, but also study mortgage debt. They compare older households in the United States and 12 European countries, and identify the economic environment as the main driver of differences in participation and values. Sierminska and Doorley (2012) find an important role for household characteristics in determining differences in ownership rates of several assets and liabilities, and in amounts held, comparing the United States with Germany, Italy, Luxembourg and Spain. Finally, Mathä et al. (2013) disentangle wealth differences across euro area countries by looking into the importance of intergenerational transfers, home ownership and house price dynamics. The current paper adds to this literature not only by expanding the number of the country comparisons (relative to Bover and to Sierminska and Doorley) but also by analysing a broader part of the household population (relative to Christelis et al.), and crucially, by using more recent

decomposition techniques based on Firpo et al. (2009) that allow the quantification of the contribution of the various covariates to the observed differences in debt holdings.

The paper proceeds as follows: Section 2 explains the data and the econometric methodology. Section 3 reports the findings with regard to the prevalence of debt holdings, whereas Section 4 studies the amounts of debt. Section 5 concludes.

2. Data and econometric methodology

This paper makes use of the Eurosystem HFCS, a novel household wealth survey that provides ex ante comparable data for 15 euro area countries (all euro area countries with the exception of Estonia and Ireland).⁴ For the purpose of this paper, the data for Finland, Malta, Slovenia and Slovakia will not be used, as these either do not cover some relevant data, or have only small samples. This leaves us with data for Austria, Belgium, Cyprus, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal and Spain, i.e. 11 euro area countries which account for 95% of euro area GDP, and 94% of the euro area population. The reference year for the first wave of this survey is 2008 in Spain, 2009 in Greece and the Netherlands, and 2010 in all other countries. For the comparison with the United States, we match these data with those from the 2010 wave of the U.S. SCF. In total, we compare more than 44,000 European households with nearly 6,500 households in the United States.

As is evident from Figure 1, which plots overall amounts of household debt as taken from National Accounts data, household deleveraging has taken place to a different extent across countries, and at different times. The fact that the reference years for Spain, Greece and the Netherlands are earlier than those for the other European countries does not seem to pose a major problem, as in all cases, no household deleveraging has occurred prior to the HFCS fieldwork. Instead, in 2010 much of the U.S. deleveraging has already taken place. It is therefore important to keep in mind that our comparisons relate to a pre-deleveraging Europe and a post-deleveraging United States. Given that we find higher debt prevalence as well as larger outstanding volumes in the United States, these differences would be even starker if we compared to the previous wave of the SCF.

Figure 1 here

⁴ For more details on the survey, see http://www.ecb.europa.eu/home/html/researcher_hfcn.en.html as well as Household Finance and Consumption Network (2013a, 2013b). An important feature of both surveys is that missing observations (i.e. questions that were not answered by the respondent households) are multiply imputed – as a matter of fact, five datasets are provided, an issue that we will take into account when assessing the statistical significance of our estimates.

In the analysis, we consider two types of debt: collateralised debt (which include mortgages, home equity loans, and debts for other real estate) and non-collateralised debts (i.e. credit card debt, instalment loans, overdrafts and other loans).

Figure 2 here

Figures 2, 3, and 4 show how prevalence and conditional amounts (which are transformed into 2005 U.S. dollars based on PPP estimates) differ across countries. Figure 1 shows prevalence, i.e. the fraction of households in each country having collateralised and non-collateralised debt. As mentioned previously, prevalence in the United States is substantially larger than in all other countries, with a particularly large gap for the case of non-collateralised debt, where more than 60% of U.S. households participate, in contrast to around 20%-50% for European households. The transatlantic difference in holdings of collateralised debt is less stark, but it is apparent that there are enormous cross-country differences within Europe: whereas less than 20% of Austrian and Italian households report to have collateralised debt, this number stands around 40% in Cyprus, the Netherlands and Luxembourg.

Figures 3 & 4 here

Turning to conditional amounts (reported in figures 3 and 4), the median U.S. figures are much closer to those in Europe: around \$100,000 in collateralised debt is held by the median U.S. and German households, less than in the Netherlands, Luxembourg and Cyprus, where median debt holdings amount to \$140,000-\$150,000. Looking at non-collateralised debt, the overall amounts are (as expected) much smaller than for collateralised debt. Here, U.S. amounts are smaller than in the Netherlands and Cyprus and in the same order of magnitude, namely around \$10,000, as in Luxembourg and Spain. Also for conditional amounts, there is quite some cross-country heterogeneity, especially with regard to non-collateralised debt.

In order to investigate more thoroughly the aforementioned differences in both the prevalence and amounts of the two types of debt, we use counterfactual techniques that allow to decompose observed differences into two parts, one related to differences in household characteristics and another one related to differences in economic environments. Such decompositions, based on the construction of counterfactual quantities, have frequently used to perform comparisons across groups with different incomes (e.g. men versus women; minorities versus the rest) in the same country. They have also been used to compare the evolution of income and net wealth distributions across different points in time (e.g. Autor et al. 2008). Moreover, they have been used to compare differences in income distributions across countries (see for example, Blau and Kahn, 1996 who decompose differences between the US and nine OECD countries). More recently, counterfactual techniques have been used to decompose cross-

country differences in various asset components of older households between the US and twelve European countries (see Christelis, et al. 2013).

In this paper, we use new counterfactual techniques that utilize recentered influence function (RIF) regressions (see Firpo, Fortin and Lemieux, 2007 and 2009). These techniques can be used (like older techniques based on quantile regressions) to decompose differences in debt distributions over countries into two parts, related to population characteristics and economic environments. Their key advantage, however, over older techniques is that they allow to further divide these two components into the relative contributions of some key demographic characteristics. In our set up, this implies that we can decompose differences in debt holdings and link them to differences in some specific characteristics and different aspects of the economic environments related to these characteristics. Such an analysis can provide additional insights for the role of certain demographics in some countries and their interactions with the economic environment.

In what follows, we present results from decompositions of the following form:

$$Y^{US} - Y^{EA} = \{X^{US}\beta^{US} - X^{EA}\beta^{US}\} + \{X^{EA}\beta^{US} - X^{EA}\beta^{EA}\}$$

where differences in the left hand-side denote either differences in prevalence of the two types of debt between the US and the comparison euro area country, or differences in log outstanding amounts, evaluated at different percentiles of the respective distributions. X 's consist of a rich set of household-specific characteristics that are discussed in detail below. Estimated coefficients derive either from a linear probability model in the case of decompositions of participation in debt markets (discussed in section 3) or from RIF regressions evaluated at different percentiles in the case of decompositions of outstanding amounts (discussed in section 4). In the above decomposition, that uses US as a base, the first bracket represents the part of the observed difference that is due to differences in the configuration of household characteristics, while the second bracket represents the part of the difference that is due to different economic environments that households (of similar characteristics) face. These quantities are often termed as 'covariate' and 'coefficient' effects, respectively.

3. Decomposing the participation in debt markets

In this section, we first decompose into two parts the total difference between the US and each HFCS country with respect to the prevalence of collateralized and non-collateralized debt: i) the part that is due to the differences in the configuration of households' demographic and economic characteristics

(covariate effect) and ii) the other part that is due to the differential influence these characteristics exert on having the two kinds of debt in question (coefficient effect).

We will then decompose both the covariate and the coefficient effect into components that can be attributed to each group of variables present in our specification. This decomposition will provide us with some insight about the variables that account for the most important part of the difference in debt prevalence between the US and each HFCS country.

As mentioned previously, these estimations are based on linear probability models, where the dependent variable takes the value of one if a household has the relevant type of debt. Recall that we are modelling $Y^{US}-Y^{EA}$, thus a positive coefficient effect (which is given by $X^{EA}\beta^{US}-X^{EA}\beta^{EA}$) implies that the economic environment in the United States is more conducive to taking out debt than the conditions in any of the European countries under study. By contrast, a positive covariate effect (given by $X^{US}\beta^{US}-X^{EA}\beta^{US}$), implies that US households have a configuration of characteristics that is more conducive to higher debt amounts.

In our specifications we include variables that we expect to have an influence on indebtedness, as suggested by both theory and established empirical practice. It is important to note that we have harmonized the definitions of all variables across the two surveys, and thus our results are fully comparable across all pairwise US-HFCS country comparisons.

In particular, we include age group dummies (denoting age less than 39, between 40 and 49, between 50 and 59, while those aged 60 and above are in the base category), household size, and marital status (married, never married, widowed, with the divorced forming the base category). Furthermore, we control for the level of education (finished high school/having at least some post-secondary education, with not having finished high school being the base category), which should influence the willingness to borrow and the ease of getting credit by signaling the household's earning capacities. We also control for work status (being employed, retired, inactive, while being unemployed is the base category), as it also indicates the possibility to repay debt.

Importantly, we include income, real wealth and financial wealth quartiles because they indicate both the need for and the capacity to shoulder the burden of debt. We would expect, e.g. those who own an expensive house or other real estate to be more likely to finance it through a mortgage, while those who have large financial assets to be less likely to have mortgage or credit card debt. In order to make income and wealth comparable across countries in absolute terms, all quartiles are defined using the

respective US population distributions. Hence, each HFCS household is placed into a quartile depending on how its income or wealth compares to the SCF quartile threshold values.⁵

Finally we control for a number of other characteristics that could influence indebtedness: a) having received a sizeable inheritance or gift (e.g. some real estate or a large monetary transfer); b) having an unexpectedly low income the previous year, which, e.g. could induce some borrowing through credit cards; c) expecting next year's income to be higher, which could make someone more comfortable with borrowing now; d) being willing to undertake some financial risk, which could influence the propensity to get into debt.

An important role is also played by the constant term in our specification. It represents the propensity to acquire debt for households that fall into the base category with respect to a number of economic and demographic variables present in our specification. Importantly, we have chosen the base category in each case to refer to those households that are more likely to be at an economic disadvantage. In particular, the population groups reflected in the constant include the oldest, the divorced, the least educated, the unemployed and those in the lowest income and real and financial wealth quartiles. Therefore, the constant will denote how different the prevalence of the debt of the most economically disadvantaged HFCS households would have been had they faced the economic environment prevailing in the US.

The distribution of the various economic and demographic characteristics in our sample can be seen in Table A1 in the Appendix. With respect to education, US households are on average more educated than their European counterparts, with the exception of Germany. On the other hand, Portugal has the fewest individuals who have at least graduated from high school. US households are also the most likely to be working and least likely to be retired, whereas the Netherlands, Portugal, Italy and Spain have the fewest people in employment.

As regards economic resources, one notes that US households have generally higher incomes than most of their European counterparts, as seen by the relatively lower prevalence of the latter in the two top income quartiles. The two exceptions are households in Luxembourg and the Netherlands (which are richer) and in Cyprus, where the distribution is similar to the US one. With respect to financial assets, households in Luxembourg, the Netherlands, Belgium and Cyprus have the highest prevalence of households in the top two quartiles, while Greece, Portugal and Spain the lowest. As for real assets (which include the main home, other real estate, and businesses and vehicles owned), it is Luxembourg,

⁵ All income and wealth items are adjusted for differences in the purchasing power of money, and their values are all expressed in 2010 US dollars.

Cyprus, Spain and Italy that have the most households in the top two quartiles, while Germany and Austria the fewest. These differences in real wealth are to a great extent driven by discrepancies in home ownership among those countries.

We also observe that households in Cyprus, France and Spain are the most likely to have received a sizeable inheritance or gift while the opposite is true for their Dutch and US counterparts. Spanish, Greek and Cypriot households are the most likely to have had an unexpectedly low income the year prior to the survey, which could possibly reflect the onset of the acute crises currently afflicting those countries. On the other hand, German and Austrian households are the least likely to have suffered from low incomes in the previous year. Italian, US and Cypriot households are the most willing to take above average financial risk, while the opposite is true for households in Portugal, the Netherlands, Spain and Germany. Finally, Spanish households are the most optimistic with respect to their income prospects, while Greek, Portuguese and Cypriot ones the most pessimistic.

When we look at differences in participation in collateralized debt (shown in Panel A of Table 1), we observe that US households are in general much more likely to take on this debt than their European counterparts. The largest difference is observed with respect to Italy (37.6 pp), Greece (30.8 pp) and Austria (30.0 pp), and the smallest with respect to Cyprus (3.9 pp) and the Netherlands (4.2 pp). What is remarkable is that in all cases but one (the Netherlands, in which there is no significant result) the difference in taking on collateralized debt between the US and Europe is largely due to coefficient effects that are large in size and always favor the US. In other words, the economic environment in the US seems more conducive to having this kind of debt. On the other hand, differences in the prevalence of economic and demographic characteristics (i.e. covariate effects) work in favor of a number of European countries, most notably Cyprus (14.7 pp), Spain (13.4 pp), Luxemburg (12.6 pp), Greece (4 pp), Italy (2.1 pp) and Belgium (2.1 pp).

The decompositions used in this paper allow us to go more deeply than the total coefficient and covariate effects and examine which variables (or groups thereof) contribute the most to these effects. These decompositions can be found in Panel A of Table 1 for the case of collateralized debt. We can thus observe that by far the most important contributor to the coefficient effect, which are all in favor of the US, is real wealth. This coefficient effect implies that, for any given level of household real assets, the probability of getting a collateralized loan is larger in the US. The reason behind this finding could be that real assets are deemed to be a safer collateral in the US financial system compared to Europe, or to denote higher ability to repay the debt.

Besides real wealth, the coefficient effect of income is also relevant and still favoring the US compared to a number of countries, most notably Luxemburg, France and Austria. On the other hand, we find a negative coefficient of financial wealth in the Netherlands, and to some a lesser extent in France. Finally, education does not have any significant role to play in terms of coefficient effects.

As already discussed, we observe a number of covariate effects that do not favor the US, and as can be seen in Table 1 these are due to real wealth. The mechanism behind these results works as follows: given that in some countries real wealth is higher than the US, and given that real wealth is positively associated with having collateralized debt, then if the US had the higher real wealth of those countries the prevalence of this debt would have been higher. This is the reason why the covariate effect of real wealth is negative in countries with higher real wealth than the US.

In a similar vein, and given that income is positively associated with having collateralized debt (possibly because it denotes higher ability to repay), for countries in which households have higher incomes than their US counterparts (namely Luxemburg and the Netherlands) the covariate effect of income will be negative, while the opposite will be true for countries with lower household incomes.

There are also negative covariate effects due to financial wealth, but in this case the mechanism is different. Financial wealth affects negatively the probability to have collateralized debt in the US, probably because having large financial assets makes taking a mortgage loan less necessary. Given that the US has higher financial wealth than a number of countries (e.g. France Italy, Spain, Portugal and Greece), the probability of having collateralized debt in the US would have been lower if the US had had those countries' levels of financial wealth.

Going now to non-collateralized debt, we observe in Panel B of Table 1 that once more US households are much more likely to have this kind of debt, with the largest difference being observed in Italy and Portugal (43.9 pp) and the lowest in Cyprus (14.5 pp). As was the case with collateralized debt, these differences are overwhelmingly driven by coefficient effects, which are once more uniformly in favor of the US. However, in this case all covariate effects favor the US as well, although they are clearly smaller than the corresponding covariate effects.

When examining which groups of variables are most important for coefficient effects, we note that now financial wealth typically has a stronger effect than real wealth, although both effects are sizeable in most countries. This result implies that for any given level of financial and real wealth, US financial firms give non-collateralized loans more easily than European firms. The same is true for education, at least in Luxemburg, France and Italy.

One other notable coefficient effect that works in favor of the US is that of the constant, which as we discussed above, denotes the economic environment facing the most economically disadvantaged households. Hence, our results in Portugal, Italy, Spain, Greece and France imply that in those countries financial firms give non-collateralized loans to the most disadvantaged with much more difficulty compared to the US. This finding is in agreement with the well-known problem of the large number of loans in the US given to people with low resources who have problems repaying them.

Turning now to covariate effects of non-collateralized debt, we note that education works in favor of the US, which is to be expected, given that on average US households are more educated and that education is positively associated with having non-collateralized debt (possibly because it signals higher ability to pay back the loan). The same mechanism operates also for income, and thus for countries like Luxemburg and the Netherlands the covariate effect of income becomes negative.

Interestingly, financial assets have a positive association with non-collateralized debt at the second and third quartile, while a negative one at the fourth. This hump-shaped relation between prevalence of non-collateralized debt and financial wealth leads to negative covariate effects in countries with more households in the second and third quartiles (e.g. Germany, Luxemburg, France, Austria, Italy, Spain, Portugal and Greece) compared to the US. There is a similar hump-shaped pattern in the association between collateralized debt and real wealth, which is again the reason behind the small positive covariate effects in Germany, Belgium, the Netherlands, Luxemburg, France, and Austria.

4. Decomposing conditional amounts of debt

The next step in the analysis is to conduct a related exercise for the amounts of debt. Here, we will only look at those households that actually report to have debt on their balance sheet. Whereas we resorted to binary regressions previously, in this section we will estimate RIF regressions, which allow studying the importance of covariate and coefficient effects at different parts of the distribution of debt holdings. Thus, in what follows, we decompose differences in log outstanding amounts of each type of debt into two parts, one related to differences in the configuration of characteristics and another one related to different economic environments that households of similar characteristics face.

We condition our specifications on the same sets of covariates used to model the prevalence of collateralized and non-collateralized debt (see section 3). When modelling the amounts of collateralised debt held by households, the survey also contains information on the duration of the mortgage. Furthermore, we exploit the fact that we are able to identify the point in time when the mortgage was

taken out. This is important, as it allows controlling for the time that has elapsed since the mortgage take-out, and as it allows matching the household decision with the macroeconomic environment that was prevailing at the time. In particular, we will test whether the cumulative growth of the national house price index and average national unemployment rates (both defined for the three years prior to the mortgage take-out) are relevant factors in the cross-country comparisons.⁶ In particular the control for different house price developments across countries is important against the findings of the literature that house price developments are a highly relevant determinant of mortgage debt.

We first decompose differences in outstanding amounts of collateralized debt. For brevity, we report decomposition results at the 20th, 50th, and 80th percentiles in Tables 2, 3, and 4, respectively. A first thing to note is that results are less clear-cut than those for prevalence discussed in the previous section. However, coefficient effects indicate also here that U.S. economic conditions were more favourable to larger debt amounts than the environment in a large number of euro area countries. These results are furthermore rather robust across different quantiles of the collateralized debt distribution.

Detailed decompositions suggest that differences in coefficients of real wealth make a strong contribution towards a more favourable economic environment in the US, especially for differences among smaller debt holders. That is, these households would have in most euro area countries a larger outstanding collateralized debt if they were able to borrow as much as their US counterparts with comparable real wealth.

There are two exceptions, namely Germany and the Netherlands, where especially for households with relatively small amounts of collateralised debt, economic conditions are estimated to be more favourable than those in the United States. The difference in the coefficients of years elapsed since the mortgage was taken makes an important contribution to the more favourable economic conditions in Germany. It implies that German households would have had a lower collateralized debt if, for a given number of years elapsed, they were facing the US economic conditions that associate years elapsed with outstanding debt. In other words, German economic environment induces households to pay off a larger amount of their mortgage in a given period than what they would have paid off in the US. Instead, the estimated negative coefficient effects for Netherlands are mostly due to the contribution of the constant. Given that our omitted dummies from all household groups consist of the relative more disadvantageous households (i.e. less educated, lower income, less wealthy, divorced) this finding suggests that economic conditions in the Netherlands are more favourable to giving loans to this group than in the US.

⁶ These data are taken from the AMECO database.

Differences due to covariate effects are in most of the cases either insignificant or in favour of the US. The latter implies that there are certain covariates that make US households more prone to assume a larger collateralized debt than what their European counterparts would have assumed if they had faced the same (i.e. US) conditions. In most of the comparisons, differences in real wealth are in favour of the comparison country (i.e. 'pushing' covariate effects towards the opposite direction). Similarly, differences in cumulative growth rates of the housing index (three years prior to the mortgage take up) are in favour of the comparison country. This suggests that if in the US there was a stronger growth increase in housing prices (like the one recorded in most of the comparison countries), it would have resulted into a higher outstanding collateralized debt, especially among those households with smaller holdings. Nevertheless, differences in covariate effects due to years elapsed since the loan was taken and original loan duration dominate in general, reflecting the fact that US households have a shorter time elapsed (due to more frequent re-mortgaging) and a longer original duration than their European counterparts.⁷

Luxembourgish and Cypriot households represent two notable exceptions, given that their configuration of characteristics makes them more prone to larger collateralized borrowing. Recall that Luxembourg, Cyprus, and the Netherlands are the three countries in which households have larger (PPP-adjusted) outstanding collateralized debt than their US counterparts. In Luxembourg and Cyprus, household characteristics play a key role in explaining observed differences with the US, while on the other hand, differences with Netherlands are mainly driven by the economic environment.

Tables 5, 6, and 7, show decomposition differences in non-collateralized debt at the 20th, 50th, and 80th percentiles, respectively. At the 20th percentile, we find more favourable economic conditions with regard to non-collateralised debt in Luxembourg, Italy, Spain, and Cyprus. Moreover, estimated differences due to economic environment are insignificant in the Netherlands, France, Portugal, and Greece. US economic environment appears more conducive to non-collateralized debt in relation to most euro area countries, as one moves along the distribution to higher quantiles. The only exception is the Netherlands which has more favourable economic conditions for larger amounts of non-collateralized debt in comparison to the US.

Covariate effects, with very few exceptions, are in favour the US (or, in other words, household characteristics in the US differ in a fashion that makes households therein more prone to holding larger amounts of non-collateralized debt).

⁷ Note that estimated coefficients from RIF regressions (not reported) imply a negative (positive) association between years elapsed (original loan duration) and collateralized debt

5. Conclusions

Household debt has attracted a lot of attention in the academic as well as the policy debate since the onset of the financial crisis. The build-up of household debt has often been seen as one of the major imbalances that eventually triggered the crisis, and the deleveraging that has been triggered by the crisis has shaped the economic performance of several advanced economies. When comparing household debt across countries, considerable heterogeneity is apparent. However, such a comparison needs to take into account that also household characteristics as well as the economic environment differ across countries. The aim of this paper has therefore been to decompose differences in debt holdings between households in the United States and 11 European countries into these two factors.

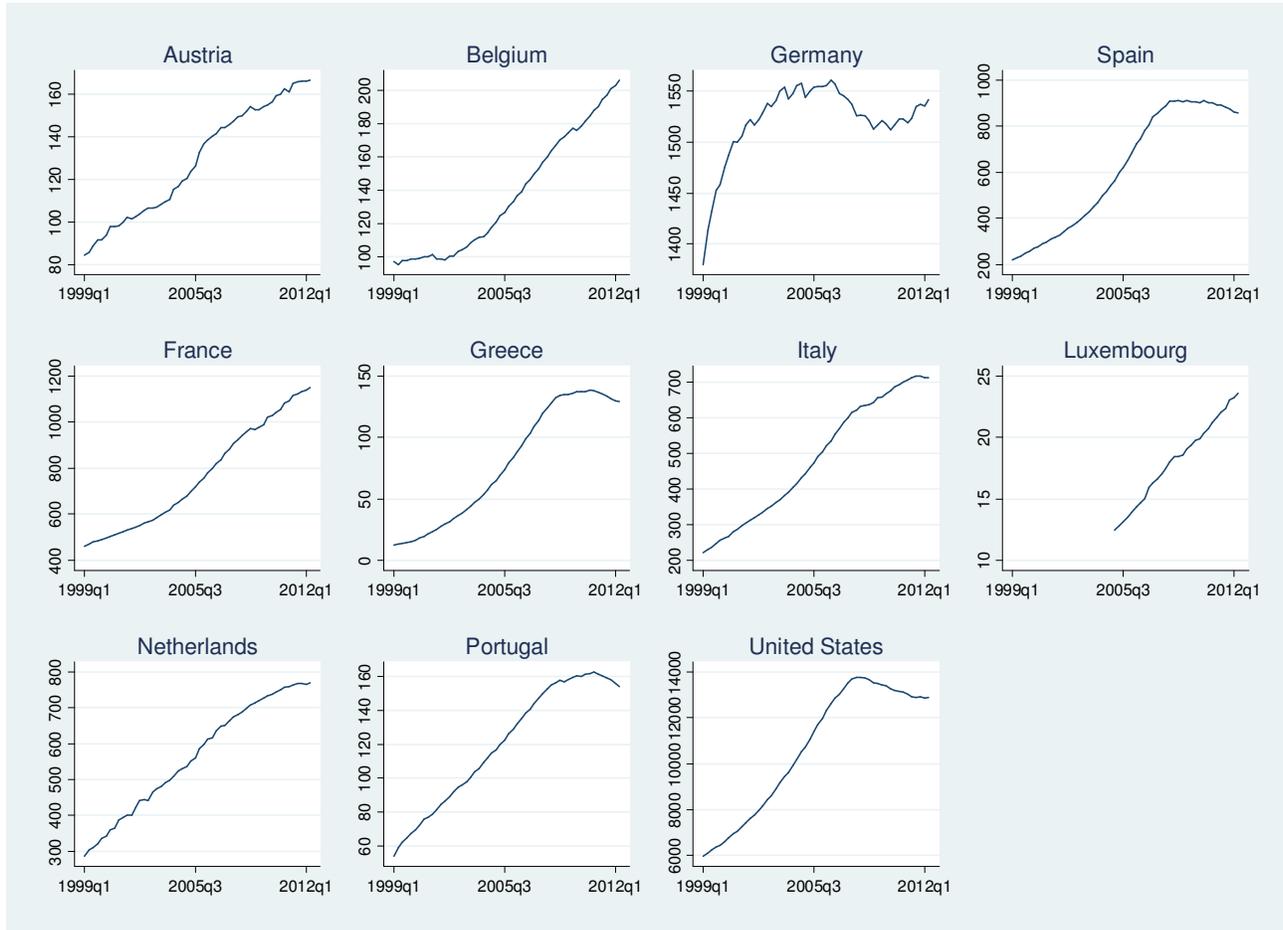
Using novel household-level data for Europe from the HFCS, and merging these with data from the U.S. SCF, the paper first shows that U.S. households tend to have a substantially higher prevalence of debt, and also hold relatively large amounts of it. This difference is largely due to a more favourable economic environment in the United States – had European households encountered the U.S. conditions, many more would be expected to hold debt, and considerably larger amounts. A notable exception to this is the Netherlands, which are also characterised by an economic environment that is rather conducive to debt holdings.

Importantly, we find a substantial role for households' assets in explaining differences in debt holdings – if European households, given the value of their assets, were to be facing U.S. conditions, they would hold more debt. With regard to collateralised debt, this is particularly the case for real assets, suggesting that U.S. households were able to get access to mortgage debt at much lower levels of collateral. This finding is in line with Corbae et al. (2011), who highlight the large number of low-downpayment mortgage contracts in the United States prior to the crisis, and find that this market segment in particular has been important in triggering the financial crisis.

References

- Autor, David H., Lawrence F. Katz, and Melissa S. Kearney (2008): "Trends in U.S. Wage Inequality: Revising the Revisionists," *Review of Economics and Statistics*, 300–323.
- Blau, Francine D.; Kahn, Lawrence M. (1996): "International Differences in Male Wage Inequality: Institutions versus Market Forces". *Journal of Political Economy* 104 (4): 791–837.
- Christelis, D., D. Georgarakos, and M. Haliassos (2013): Differences in portfolios across countries: Economic environment versus household characteristics. *Review of Economics and Statistics*, 95(1): 220–236.
- Damar, E., R. Gropp and A. Mordel (2013). Banks financial distress, lending supply and consumption expenditure. Mimeo, Bank of Canada
- Firpo, S., N. Fortin, and T. Lemieux (2007). "Decomposing Wage Distributions using Recentered Influence Functions Regressions", mimeo, University of British Columbia.
- Firpo, S., N. Fortin, and T. Lemieux (2009). "Unconditional Quantile Regressions." *Econometrica*, 77(3): 953-973.
- Georgarakos, D, G. Pasini and M. Haliassos (2013). "Household Debt and Social Interactions." CEPR discussion paper, DP9238.
- Guiso, L., Haliassos, M., Jappelli, T. (2001) *Household Portfolios*. Cambridge: MIT Press.
- Household Finance and Consumption Network (2013a). The Eurosystem Household Finance and Consumption Survey – Methodological Report for the First Wave, ECB Statistics Paper Series No. 1.
- Household Finance and Consumption Network (2013b). The Eurosystem Household Finance and Consumption Survey – Results from the First Wave, ECB Statistics Paper Series No. 2.
- Mian, A. and A. Sufi. 2011. House Prices, Home Equity-Based Borrowing, and the U.S. Household Leverage Crisis, *American Economic Review*, 101: 2132-2156.
- Mian, A. and A. Sufi. 2009. The consequences of mortgage credit expansion: Evidence from the U.S. mortgage default crisis. *Quarterly Journal of Economics* 124:1449–96.

Figure 1: Household debt levels



Note: The figure plots the level of total credit to private households including non-profit institutions serving households. Measure in billion US\$ for the United States, in billion € in all other countries. Source: BIS. Data for Cyprus are not available.

Figure 2: Prevalence of collateralized and non-collateralized debt

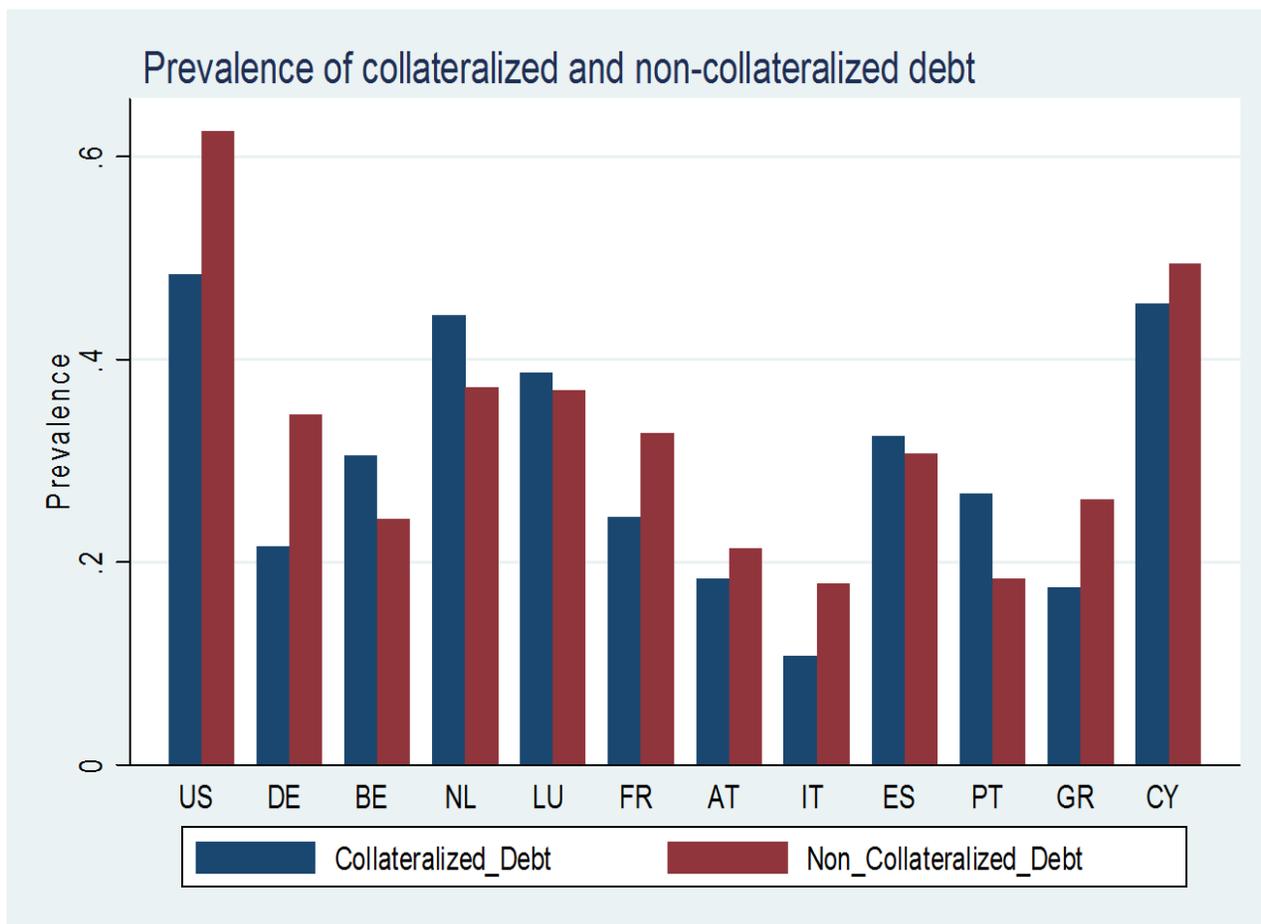


Figure 3: Collateralized debt – conditional medians

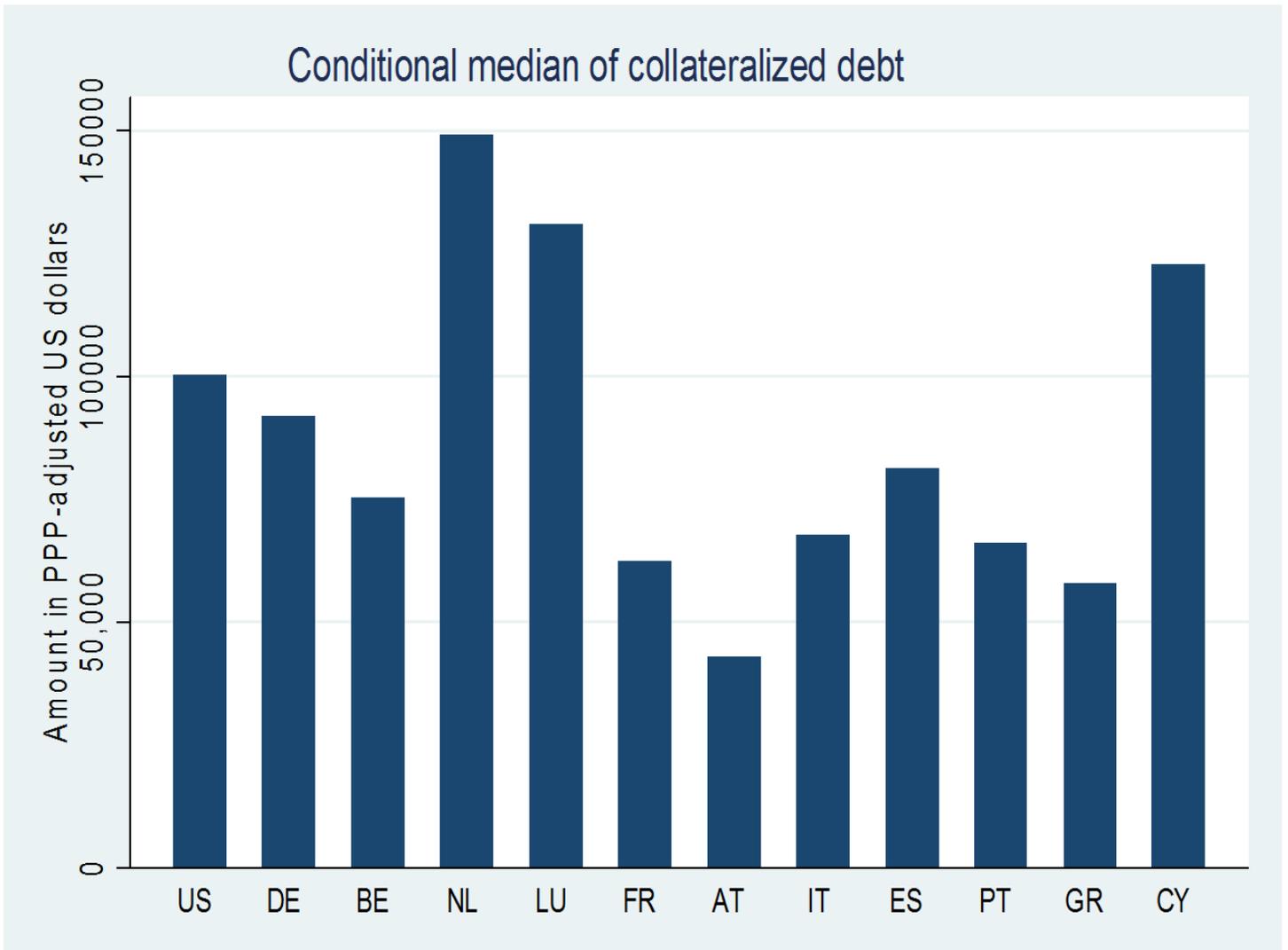


Figure 4: Non-collateralized debt – conditional medians

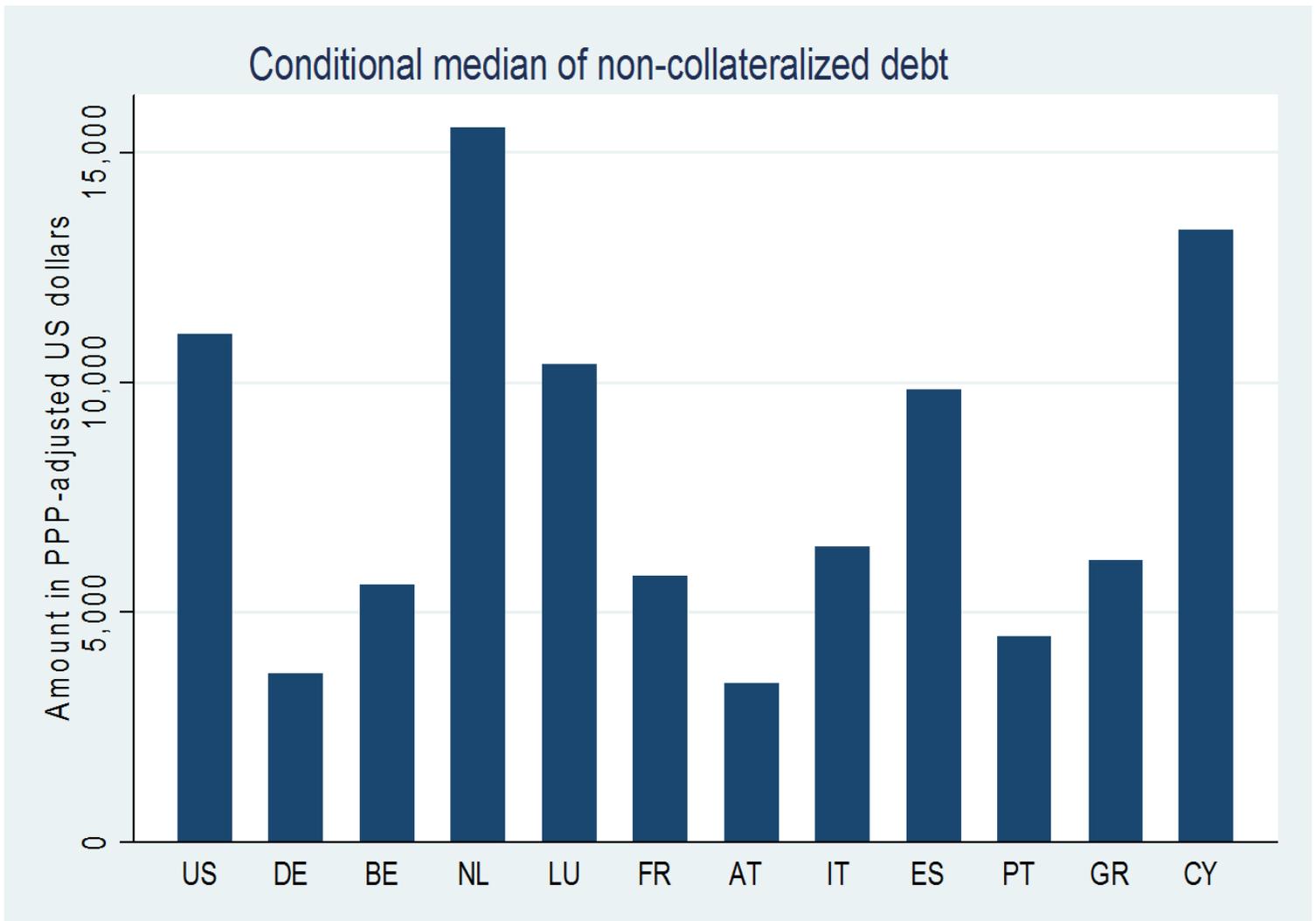


Table 1: Differences in prevalence of collateralized and non-collateralized debt - Detailed Decomposition

Panel A. Collateralized Debt																						
	DE		BE		NL		LU		FR		AT		IT		ES		PT		GR		CY	
Total Difference	0.269	0.012 ***	0.176	0.016 ***	0.042	0.020 **	0.097	0.019 ***	0.240	0.010 ***	0.300	0.011 ***	0.376	0.008 ***	0.158	0.012 ***	0.217	0.011 ***	0.308	0.010 ***	0.039	0.019 **
<i>Detailed Covariate Effects</i>																						
Education	0.002	0.001 *	0.000	0.003	0.001	0.004	0.003	0.005	0.003	0.005	0.006	0.003 *	0.005	0.009	0.003	0.008	0.007	0.013	0.004	0.006	0.002	0.007
Income	0.005	0.002 **	0.005	0.002 **	-0.011	0.003 ***	-0.029	0.005 ***	0.015	0.003 ***	0.005	0.002 *	0.018	0.003 ***	0.014	0.003 ***	0.040	0.007 ***	0.017	0.003 ***	-0.002	0.002
Financial Wealth	-0.005	0.003 *	0.007	0.003 ***	0.013	0.004 ***	0.006	0.004	-0.012	0.003 ***	-0.008	0.003 **	-0.023	0.004 ***	-0.017	0.003 ***	-0.026	0.004 ***	-0.036	0.005 ***	-0.001	0.003
Real Wealth	0.123	0.010 ***	-0.063	0.012 ***	0.012	0.015	-0.112	0.014 ***	0.030	0.006 ***	0.081	0.008 ***	-0.060	0.007 ***	-0.154	0.008 ***	0.001	0.008	-0.060	0.007 ***	-0.154	0.012 ***
Total Covariate Effects	0.155	0.011 ***	-0.021	0.015	0.021	0.019	-0.126	0.017 ***	0.066	0.010 ***	0.120	0.012 ***	-0.022	0.012 *	-0.134	0.013 ***	0.055	0.016 ***	-0.040	0.012 ***	-0.147	0.016 ***
<i>Detailed Coefficient Effects</i>																						
Education	0.004	0.023	0.015	0.021	-0.007	0.024	0.020	0.026	-0.010	0.013	0.012	0.024	0.002	0.010	-0.018	0.013	0.000	0.007	-0.008	0.015	-0.017	0.024
Income	0.038	0.021 *	0.044	0.024 *	0.069	0.035 *	0.116	0.043 ***	0.034	0.015 **	0.073	0.020 ***	0.022	0.014	0.016	0.019	0.002	0.012	0.050	0.017 ***	0.009	0.042
Financial Wealth	-0.018	0.023	-0.036	0.035	-0.072	0.035 **	-0.013	0.041	-0.040	0.016 **	-0.039	0.024	-0.030	0.016 *	0.014	0.020	-0.002	0.017	0.037	0.016 **	-0.065	0.039 *
Real Wealth	0.158	0.015 ***	0.206	0.025 ***	0.043	0.018 **	0.107	0.033 ***	0.201	0.013 ***	0.210	0.014 ***	0.437	0.015 ***	0.251	0.021 ***	0.198	0.017 ***	0.332	0.018 ***	0.319	0.043 ***
Constant	0.010	0.056	0.099	0.070	-0.031	0.078	0.142	0.106	-0.006	0.042	-0.006	0.058	0.028	0.047	0.125	0.067 *	-0.018	0.053	0.025	0.066	-0.100	0.115
Coefficient Effects	0.114	0.012 ***	0.196	0.014 ***	0.021	0.015	0.222	0.018 ***	0.174	0.011 ***	0.180	0.012 ***	0.398	0.013 ***	0.293	0.016 ***	0.161	0.017 ***	0.349	0.013 ***	0.187	0.020 ***

Panel B. Non-collateralized Debt																						
	DE		BE		NL		LU		FR		AT		IT		ES		PT		GR		CY	
Total Difference	0.281	0.013 ***	0.382	0.015 ***	0.291	0.021 ***	0.256	0.021 ***	0.298	0.009 ***	0.412	0.012 ***	0.439	0.010 ***	0.318	0.012 ***	0.439	0.010 ***	0.364	0.013 ***	0.145	0.020 ***
<i>Detailed Covariate Effects</i>																						
Education	0.001	0.001	0.012	0.004 ***	0.015	0.004 ***	0.020	0.006 ***	0.024	0.006 ***	0.002	0.003	0.033	0.011 ***	0.037	0.011 ***	0.054	0.015 ***	0.027	0.008 ***	0.027	0.007 ***
Income	0.006	0.002 ***	0.003	0.002	-0.016	0.005 ***	-0.032	0.006 ***	0.014	0.003 ***	0.005	0.003 *	0.016	0.003 ***	0.015	0.003 ***	0.044	0.008 ***	0.019	0.004 ***	-0.001	0.003
Financial Wealth	-0.025	0.004 ***	-0.001	0.004	0.002	0.006	-0.009	0.005 *	-0.034	0.004 ***	-0.032	0.004 ***	-0.044	0.004 ***	-0.038	0.004 ***	-0.041	0.005 ***	-0.047	0.006 ***	-0.008	0.004 **
Real Wealth	0.019	0.004 ***	0.012	0.004 ***	0.018	0.004 ***	0.027	0.008 ***	0.014	0.002 ***	0.015	0.003 ***	0.002	0.003	0.002	0.006	-0.009	0.002 ***	-0.009	0.002 ***	0.013	0.008
Total Covariate Effects	0.038	0.009 ***	0.053	0.010 ***	0.052	0.014 ***	0.022	0.015	0.055	0.009 ***	0.034	0.009 ***	0.050	0.013 ***	0.018	0.015	0.082	0.016 ***	0.015	0.011	0.033	0.013 **
<i>Detailed Coefficient Effects</i>																						
Education	0.046	0.039	0.038	0.026	0.030	0.033	0.071	0.031 **	0.034	0.015 **	0.054	0.029 *	0.032	0.014 **	0.031	0.016 *	0.006	0.007	0.010	0.018	-0.014	0.027
Income	0.024	0.029	0.051	0.029 *	0.081	0.074	-0.016	0.067	-0.027	0.020	0.026	0.027	0.023	0.020	-0.037	0.023	-0.002	0.012	-0.004	0.022	-0.043	0.041
Financial Wealth	0.112	0.043 **	0.116	0.039 ***	0.164	0.081 **	0.007	0.071	0.114	0.022 ***	0.107	0.035 ***	0.087	0.022 ***	0.112	0.025 ***	0.045	0.017 ***	0.087	0.018 ***	-0.019	0.037
Real Wealth	0.069	0.017 ***	0.066	0.032 **	0.095	0.038 **	0.057	0.056	0.034	0.015 **	0.111	0.021 ***	0.033	0.023	0.068	0.036 *	0.085	0.022 ***	0.031	0.028	0.099	0.049 **
Constant	0.039	0.118	0.205	0.118 *	-0.022	0.211	0.236	0.201	0.177	0.059 ***	-0.035	0.092	0.357	0.080 ***	0.287	0.093 ***	0.367	0.096 ***	0.208	0.087 **	0.012	0.123
Coefficient Effects	0.243	0.014 ***	0.329	0.018 ***	0.240	0.025 ***	0.235	0.022 ***	0.243	0.012 ***	0.378	0.015 ***	0.390	0.017 ***	0.299	0.018 ***	0.357	0.019 ***	0.349	0.015 ***	0.112	0.022 ***

Table 2: Differences in Collateralized Debt: Q20 - Detailed Decomposition

	DE		BE		NL		LU		FR		AT		IT		ES		PT		GR		CY	
Total Difference	0.299	0.132 **	0.493	0.086 ***	-0.290	0.084 ***	0.067	0.062	1.167	0.078 ***	1.264	0.258 ***	0.337	0.123 ***	0.437	0.085 ***	0.404	0.092 ***	0.539	0.137 ***	-0.063	0.191
<i>Detailed Covariate Effects</i>																						
Education	0.002	0.005	-0.002	0.016	0.005	0.029	0.010	0.028	0.013	0.027	0.028	0.020	0.023	0.051	0.005	0.063	0.022	0.104	0.016	0.050	0.003	0.035
Income	-0.023	0.011 **	0.002	0.007	0.010	0.010	-0.050	0.015 ***	0.020	0.017	-0.001	0.009	0.017	0.014	0.036	0.023	0.133	0.050 ***	0.059	0.025 **	-0.002	0.015
Financial Wealth	-0.005	0.015	-0.001	0.011	0.001	0.010	-0.005	0.011	-0.024	0.019	-0.009	0.014	-0.022	0.019	-0.025	0.022	-0.025	0.025	-0.023	0.045	-0.006	0.012
Real Wealth	-0.071	0.020 ***	-0.206	0.030 ***	-0.240	0.029 ***	-0.300	0.030 ***	-0.135	0.021 ***	-0.156	0.025 ***	-0.194	0.028 ***	-0.217	0.031 ***	-0.004	0.016	-0.083	0.017 ***	-0.308	0.033 ***
Years elapsed since loan was taken	0.360	0.052 ***	0.253	0.041 ***	0.560	0.077 ***	0.324	0.048 ***	0.122	0.023 ***	0.353	0.069 ***	0.215	0.043 ***	0.225	0.031 ***	0.403	0.051 ***	0.076	0.029 ***	-0.606	0.057 ***
Original loan duration	0.719	0.083 ***	0.405	0.051 ***	-0.161	0.030 ***	0.297	0.031 ***	0.711	0.084 ***	0.281	0.254	0.502	0.062 ***	0.194	0.030 ***	-0.083	0.031 ***	0.431	0.058 ***	0.395	0.067 ***
Housing price index growth	0.104	0.023 ***	-0.142	0.032 ***	-0.107	0.025 ***	-0.168	0.026 ***	-0.220	0.048 ***	0.022	0.014	-0.042	0.011 ***	-0.227	0.048 ***	0.028	0.008 ***	-0.170	0.036 ***	-0.082	0.022 ***
Total Covariate Effects	1.114	0.123 ***	0.258	0.082 ***	0.065	0.094	0.048	0.069	0.435	0.102 ***	0.490	0.272	0.471	0.097 ***	-0.041	0.101	0.449	0.137 ***	0.307	0.098 ***	-0.678	0.109 ***
<i>Detailed Coefficient Effects</i>																						
Education	-0.361	0.431	-0.311	0.268	-0.276	0.225	0.024	0.138	-0.037	0.198	-0.667	0.905	-0.093	0.195	0.135	0.136	0.106	0.090	0.039	0.187	1.096	0.385 ***
Income	-0.086	0.550	0.182	0.317	0.534	0.297 *	-0.141	0.373	-0.240	0.259	0.658	0.771	0.481	0.356	0.101	0.228	0.287	0.187	0.512	0.257 **	-0.747	0.677
Financial Wealth	0.269	0.547	0.144	0.277	0.413	0.223 *	-0.057	0.325	0.191	0.236	0.860	0.944	-0.304	0.262	0.200	0.160	0.014	0.163	0.070	0.115	-0.256	0.596
Real Wealth	0.368	0.854	2.469	0.447 ***	1.848	2.256	2.976	0.461 ***	2.007	0.515 ***	1.759	2.438	2.570	0.484 ***	1.832	0.946 *	1.387	2.022	3.218	0.748 ***	3.337	1.080 **
Years elapsed since loan was taken	-0.772	0.205 ***	-0.067	0.271	-0.538	0.237 **	-0.267	0.182	0.099	0.158	-0.783	0.331 **	0.256	0.304	0.374	0.213 *	-0.372	0.216 *	-0.278	0.252	-0.195	0.410
Original loan duration	0.413	0.265	0.146	0.456	1.537	0.393 ***	-0.348	0.436	-1.717	0.336 ***	0.725	0.753	-0.768	0.583	-0.569	0.390	0.270	0.496	0.438	0.381	-0.424	0.644
Housing price index growth	-0.235	0.163	0.005	0.124	0.070	0.076	0.320	0.094 ***	0.082	0.108	0.093	0.048 *	-0.154	0.126	0.106	0.094	-0.025	0.023	-0.275	0.245	0.248	0.481
Constant	0.066	1.568	-1.738	0.987 *	-4.357	2.449 *	-2.955	1.077 **	-0.006	0.878	-1.128	3.225	-0.914	1.175	-1.517	1.139	-1.945	2.137	-4.200	1.031 ***	-3.609	1.672 **
Coefficient Effects	-0.816	0.174 ***	0.235	0.098 **	-0.355	0.105 ***	0.019	0.078	0.731	0.117 ***	0.774	0.226 ***	-0.134	0.139	0.478	0.114 ***	-0.045	0.159	0.232	0.154	0.615	0.185 ***

Table 3: Differences in Collateralized Debt: Q50 - Detailed Decomposition

	DE		BE		NL		LU		FR		AT		IT		ES		PT		GR		CY	
Total Difference	0.102	0.063	0.319	0.079 ***	-0.342	0.040 ***	-0.190	0.062 ***	0.541	0.039 ***	0.769	0.298 **	0.338	0.079 ***	0.267	0.049 ***	0.399	0.054 ***	0.379	0.085 ***	-0.448	0.107 ***
<i>Detailed Covariate Effects</i>																						
Education	0.001	0.004	0.009	0.008	0.028	0.015 *	0.042	0.010 ***	0.033	0.012 ***	0.040	0.014 ***	0.063	0.025 **	0.049	0.029 *	0.102	0.052 *	0.055	0.025 **	0.042	0.014 ***
Income	-0.023	0.008 ***	0.006	0.007	0.022	0.007 ***	-0.074	0.010 ***	0.056	0.012 ***	0.012	0.010	0.045	0.011 ***	0.077	0.017 ***	0.134	0.026 ***	0.079	0.016 ***	0.040	0.016 **
Financial Wealth	0.004	0.009	0.004	0.007	0.010	0.007	0.001	0.007	-0.021	0.012 *	0.000	0.009	-0.030	0.013 **	-0.040	0.015 ***	-0.047	0.017 ***	-0.080	0.029 ***	-0.014	0.008 *
Real Wealth	-0.100	0.019 ***	-0.226	0.021 ***	-0.256	0.022 ***	-0.420	0.032 ***	-0.176	0.017 ***	-0.188	0.024 ***	-0.231	0.024 ***	-0.259	0.024 ***	0.018	0.018	-0.091	0.018 ***	-0.411	0.032 ***
Years elapsed since loan was taken	0.191	0.023 ***	0.134	0.021 ***	0.297	0.035 ***	0.172	0.022 ***	0.065	0.010 ***	0.188	0.037 ***	0.114	0.020 ***	0.119	0.016 ***	0.214	0.023 ***	0.040	0.014 ***	-0.321	0.024 ***
Original loan duration	0.383	0.037 ***	0.216	0.021 ***	-0.086	0.016 ***	0.158	0.014 ***	0.379	0.033 ***	0.149	0.136	0.268	0.029 ***	0.103	0.015 ***	-0.044	0.016 ***	0.230	0.026 ***	0.210	0.029 ***
Housing price index growth	0.034	0.014 **	-0.047	0.018 **	-0.035	0.014 **	-0.055	0.018 ***	-0.073	0.030 **	0.007	0.006	-0.014	0.006 **	-0.075	0.029 **	0.009	0.004 **	-0.056	0.022 **	-0.027	0.010 ***
Total Covariate Effects	0.517	0.055 ***	0.077	0.045 *	0.022	0.051	-0.191	0.047 ***	0.246	0.053 ***	0.201	0.156	0.194	0.051 ***	-0.050	0.060	0.363	0.064 ***	0.159	0.054 ***	-0.508	0.056 ***
<i>Detailed Coefficient Effects</i>																						
Education	-0.031	0.317	0.206	0.139	0.077	0.107	0.025	0.106	0.028	0.083	-0.143	0.321	-0.001	0.106	0.044	0.069	0.073	0.053	0.166	0.131	0.520	0.193 **
Income	0.019	0.312	-0.149	0.244	0.179	0.194	-0.699	0.381	0.058	0.111	-0.136	0.536	0.220	0.187	0.040	0.120	0.004	0.087	0.150	0.197	-0.413	0.399
Financial Wealth	-0.165	0.353	0.203	0.235	0.014	0.245	0.072	0.176	-0.094	0.119	-0.238	0.381	-0.148	0.127	-0.114	0.115	0.074	0.108	-0.003	0.091	0.330	0.247
Real Wealth	-1.168	0.599 *	-0.036	0.657	0.419	0.835	-0.176	0.948	0.733	0.224 ***	0.111	0.981	0.280	0.452	0.088	0.492	0.291	0.798	2.189	1.806	1.150	0.843
Years elapsed since loan was taken	-0.315	0.104 ***	0.243	0.143 *	-0.247	0.080 ***	0.379	0.142 **	0.376	0.070 ***	0.014	0.319	0.217	0.150	0.431	0.116 ***	0.014	0.114	0.704	0.275 **	-0.385	0.214 *
Original loan duration	0.288	0.132 **	-0.665	0.346 *	0.825	0.146 ***	-0.930	0.317 ***	-1.318	0.152 ***	-0.203	0.574	-1.234	0.316 ***	-0.614	0.208 ***	-0.132	0.219	-0.488	0.285 *	-1.251	0.419 ***
Housing price index growth	-0.089	0.065	-0.079	0.101	0.080	0.040 **	-0.035	0.076	-0.043	0.052	0.037	0.023	-0.132	0.049 ***	0.005	0.054	-0.010	0.011	-0.170	0.159	0.532	0.230 **
Constant	0.846	0.846	0.619	0.833	-2.111	0.947 **	1.607	1.023	0.444	0.366	0.681	1.606	0.159	0.736	0.064	0.560	-0.579	0.846	-2.238	2.069	0.518	1.158
Coefficient Effects	-0.415	0.079 ***	0.241	0.077 ***	-0.364	0.052 ***	0.001	0.067	0.295	0.057 ***	0.568	0.217 **	0.144	0.081 *	0.317	0.064 ***	0.036	0.074	0.220	0.089 **	0.060	0.104

Table 4: Differences in Collateralized Debt: Q80 - Detailed Decomposition

	DE		BE		NL		LU		FR		AT		IT		ES		PT		GR		CY	
Total Difference	0.142	0.059 **	0.385	0.052 ***	-0.086	0.043 **	-0.325	0.054 ***	0.466	0.035 ***	0.376	0.212	0.387	0.070 ***	0.226	0.044 ***	0.550	0.040 ***	0.491	0.062 ***	-0.485	0.152 ***
<i>Detailed Covariate Effects</i>																						
Education	0.005	0.005	-0.007	0.008	0.005	0.013	0.011	0.009	0.019	0.013	0.054	0.016 ***	0.033	0.023	-0.003	0.025	0.023	0.043	0.022	0.022	-0.006	0.012
Income	-0.012	0.009	0.012	0.008	0.036	0.009 ***	-0.076	0.012 ***	0.075	0.015 ***	0.020	0.013	0.063	0.013 ***	0.082	0.016 ***	0.087	0.027 ***	0.070	0.018 ***	0.050	0.018 **
Financial Wealth	0.000	0.009	-0.001	0.007	-0.001	0.006	0.000	0.007	0.000	0.015	0.000	0.010	0.001	0.017	0.006	0.018	0.007	0.019	0.012	0.030	0.002	0.010
Real Wealth	-0.133	0.025 ***	-0.189	0.027 ***	-0.191	0.032 ***	-0.602	0.039 ***	-0.160	0.022 ***	-0.201	0.030 ***	-0.245	0.036 ***	-0.272	0.033 ***	0.070	0.019 ***	-0.069	0.024 ***	-0.543	0.049 ***
Years elapsed since loan was taken	0.115	0.018 ***	0.080	0.015 ***	0.178	0.027 ***	0.103	0.015 ***	0.039	0.007 ***	0.113	0.023 ***	0.068	0.014 ***	0.072	0.012 ***	0.129	0.018 ***	0.024	0.009 ***	-0.193	0.021 ***
Original loan duration	0.255	0.039 ***	0.144	0.023 ***	-0.057	0.014 ***	0.105	0.016 ***	0.252	0.038 ***	0.096	0.088	0.178	0.029 ***	0.069	0.013 ***	-0.030	0.011 ***	0.153	0.026 ***	0.139	0.023 ***
Housing price index growth	-0.006	0.015	0.008	0.020	0.006	0.015	0.009	0.021	0.012	0.032	-0.001	0.004	0.002	0.006	0.013	0.032	-0.002	0.004	0.010	0.024	0.005	0.012
Total Covariate Effects	0.269	0.057 ***	0.074	0.052	0.009	0.050	-0.419	0.052 ***	0.248	0.062 ***	0.124	0.107	0.078	0.056	-0.044	0.058	0.274	0.063 ***	0.197	0.056 ***	-0.533	0.062 ***
<i>Detailed Coefficient Effects</i>																						
Education	0.142	0.250	0.000	0.131	-0.062	0.085	0.006	0.098	0.016	0.076	-0.218	0.518	-0.068	0.102	0.060	0.066	-0.017	0.046	-0.088	0.130	0.254	0.272
Income	-0.358	0.232	-0.168	0.190	0.109	0.166	-0.187	0.096 *	-0.232	0.096 **	-0.014	0.558	0.194	0.255	-0.315	0.107 ***	-0.244	0.075 ***	-0.243	0.165	-1.786	0.635 ***
Financial Wealth	-0.226	0.165	-0.056	0.156	-0.010	0.165	-0.001	0.091	-0.069	0.106	0.079	0.463	-0.038	0.180	0.211	0.104 **	0.016	0.073	0.008	0.068	-0.794	0.387 **
Real Wealth	0.013	0.272	0.319	0.205	0.349	0.398	0.332	0.255	0.229	0.234	0.347	0.408	0.032	0.316	0.275	0.188	0.188	0.481	0.153	0.363	1.411	1.198
Years elapsed since loan was taken	-0.034	0.095	0.180	0.096 *	-0.190	0.072 ***	0.159	0.073 **	0.221	0.049 ***	0.355	0.292	0.335	0.112 ***	0.159	0.089 *	0.074	0.079	0.393	0.134 ***	-0.280	0.249
Original loan duration	0.122	0.147	-0.413	0.253	0.657	0.233 **	-0.596	0.211 ***	-0.692	0.094 ***	-0.261	0.432	-1.055	0.276 ***	-0.348	0.177 *	0.063	0.182	-0.375	0.224 *	-1.386	0.542 **
Housing price index growth	0.098	0.057 *	0.025	0.094	0.033	0.035	0.024	0.065	0.043	0.053	-0.004	0.014	0.029	0.047	-0.002	0.063	-0.005	0.008	-0.119	0.117	0.382	0.275
Constant	-0.093	0.557	0.097	0.428	-1.276	0.581 **	0.871	0.528	0.382	0.345	0.231	2.008	1.625	0.671 **	0.355	0.370	-0.166	0.564	0.448	0.609	3.193	1.853 *
Coefficient Effects	-0.127	0.077	0.311	0.067 ***	-0.095	0.061	0.094	0.076	0.218	0.067 ***	0.252	0.182	0.309	0.083 ***	0.270	0.068 ***	0.276	0.072 ***	0.294	0.080 ***	0.047	0.159

Table 5: Differences in Non-collateralized Debt: Q20 - Detailed Decomposition

	DE	BE	NL	LU	FR	AT	IT	ES	PT	GR	CY
Total Difference	0.777 0.133 ***	0.613 0.187 ***	-0.150 0.356	-0.428 0.130 ***	0.311 0.091 ***	1.093 0.199 ***	0.178 0.128	-0.121 0.145	1.111 0.198 ***	0.297 0.143 **	-0.324 0.156 **
<i>Detailed Covariate Effects</i>											
Education	0.082 0.027 ***	0.179 0.056 ***	0.186 0.065 ***	0.400 0.063 ***	0.321 0.065 ***	0.193 0.048 ***	0.569 0.119 ***	0.554 0.133 ***	0.850 0.197 ***	0.301 0.069 ***	0.325 0.090 ***
Income	0.077 0.026 ***	0.014 0.024	-0.066 0.041	-0.239 0.045 ***	0.070 0.030 **	0.066 0.029 **	0.059 0.025 **	0.047 0.030	0.264 0.074 ***	0.031 0.024	-0.090 0.031 ***
Financial Wealth	-0.045 0.023 *	0.005 0.018	0.023 0.030	0.007 0.015	-0.058 0.031 *	-0.047 0.024 *	-0.063 0.030 **	-0.070 0.034 **	-0.085 0.045 *	-0.095 0.057 *	0.032 0.032
Real Wealth	0.262 0.064 ***	0.032 0.037	0.144 0.058 **	-0.055 0.050	0.103 0.030 ***	0.260 0.068 ***	-0.066 0.040 *	-0.096 0.052 *	0.017 0.022	-0.066 0.032 **	-0.153 0.083 *
Total Covariate Effects	0.314 0.095 ***	0.186 0.090 **	0.223 0.149	0.036 0.087	0.406 0.092 ***	0.520 0.112 ***	0.529 0.136 ***	0.341 0.147 **	1.015 0.222 ***	0.106 0.105	0.044 0.141
<i>Detailed Coefficient Effects</i>											
Education	1.155 0.533 **	1.181 0.398 ***	0.179 1.171	0.844 0.223 ***	0.781 0.236 ***	1.819 0.548 ***	0.553 0.207 ***	0.830 0.190 ***	0.449 0.169 ***	1.104 0.306 ***	1.250 0.330 ***
Income	0.460 0.337	-0.016 0.648	2.246 1.464	1.763 0.580 **	-0.294 0.296	-0.280 0.669	0.513 0.270 *	0.125 0.343	0.059 0.293	0.340 0.311	-0.461 0.615
Financial Wealth	-0.538 0.535	0.002 0.446	1.394 1.446	0.314 0.307	-0.363 0.227	-0.577 0.446	0.012 0.244	0.268 0.259	-0.151 0.294	0.047 0.161	0.072 0.481
Real Wealth	0.245 0.213	0.155 0.479	0.512 0.631	-0.535 0.536	0.176 0.211	0.621 0.261 **	0.524 0.368	-0.042 0.466	-0.110 0.462	0.526 0.325	-0.223 0.968
Constant	-2.971 1.098 ***	-1.446 1.485	-3.446 3.649	-1.370 1.090	-0.584 0.887	-2.022 1.332	-3.114 1.006 ***	-3.475 1.184 ***	-0.623 1.964	-3.623 1.019 ***	-0.871 1.644
Coefficient Effects	0.463 0.152 ***	0.427 0.196 **	-0.373 0.368	-0.464 0.141 ***	-0.095 0.121	0.572 0.211 ***	-0.351 0.187 *	-0.462 0.214 **	0.096 0.291	0.190 0.176	-0.368 0.211 *

Table 6: Differences in Non-collateralized Debt: Q50 - Detailed Decomposition

	DE	BE	NL	LU	FR	AT	IT	ES	PT	GR	CY
Total Difference	1.116 0.077 ***	0.631 0.116 ***	-0.555 0.226 **	0.047 0.053	0.646 0.053 ***	1.125 0.130 ***	0.540 0.074 ***	0.112 0.096	0.893 0.140 ***	0.586 0.117 ***	-0.182 0.089 **
<i>Detailed Covariate Effects</i>											
Education	0.044 0.013 ***	0.052 0.023 **	0.058 0.026 **	0.134 0.023 ***	0.116 0.024 ***	0.105 0.022 ***	0.200 0.045 ***	0.169 0.051 ***	0.275 0.074 ***	0.101 0.027 ***	0.091 0.036 **
Income	0.068 0.018 ***	0.012 0.022	-0.029 0.031	-0.197 0.029 ***	0.094 0.020 ***	0.060 0.022 ***	0.065 0.018 ***	0.080 0.021 ***	0.221 0.037 ***	0.051 0.020 ***	-0.064 0.023 ***
Financial Wealth	-0.040 0.013 ***	-0.005 0.012	0.002 0.018	-0.014 0.010	-0.048 0.017 ***	-0.036 0.014 **	-0.048 0.017 ***	-0.042 0.018 **	-0.042 0.026	-0.038 0.030	0.006 0.015
Real Wealth	0.140 0.031 ***	-0.014 0.021	0.040 0.030	-0.111 0.034 ***	0.028 0.014 **	0.139 0.034 ***	-0.072 0.024 ***	-0.104 0.030 ***	0.014 0.012	-0.058 0.018 ***	-0.165 0.049 ***
Total Covariate Effects	0.237 0.049 ***	0.080 0.052	0.140 0.085	-0.162 0.053 ***	0.200 0.043 ***	0.340 0.055 ***	0.178 0.065 ***	0.047 0.071	0.471 0.083 ***	0.057 0.054	-0.146 0.081 *
<i>Detailed Coefficient Effects</i>											
Education	0.580 0.267 **	0.320 0.235	0.262 0.417	0.207 0.111 *	0.289 0.104 ***	0.608 0.350 *	0.099 0.093	0.207 0.100 **	0.212 0.108 **	0.525 0.184 ***	0.363 0.205 *
Income	-0.176 0.215	-0.132 0.369	-0.359 1.051	0.677 0.374	-0.192 0.130	-0.296 0.374	0.275 0.161 *	0.058 0.211	-0.146 0.204	-0.105 0.269	-0.064 0.403
Financial Wealth	-0.213 0.201	-0.197 0.319	0.954 0.611	-0.146 0.228	0.075 0.126	-0.600 0.309 *	0.246 0.131 *	0.519 0.173 ***	0.030 0.201	0.181 0.129	-0.172 0.329
Real Wealth	0.143 0.123	-0.129 0.306	0.046 0.326	-0.325 0.155 **	-0.115 0.106	0.443 0.175 **	0.018 0.189	-0.177 0.240	-0.326 0.326	0.042 0.277	0.778 0.473
Constant	-0.201 0.614	-0.224 0.889	-2.907 1.842	-0.568 0.518	0.486 0.339	1.157 0.944	-0.663 0.474	-1.308 0.602 **	-0.589 1.284	-1.517 0.779 *	-0.997 0.890
Coefficient Effects	0.879 0.091 ***	0.551 0.122 ***	-0.694 0.219 ***	0.209 0.073 ***	0.445 0.061 ***	0.785 0.135 ***	0.362 0.101 ***	0.065 0.121	0.422 0.158 ***	0.529 0.126 ***	-0.036 0.106

Table 7: Differences in Non-collateralized Debt: Q80 - Detailed Decomposition

	DE	BE	NL	LU	FR	AT	IT	ES	PT	GR	CY											
Total Difference	0.888	0.084 ***	0.613	0.086 ***	-0.885	0.212 ***	0.198	0.050 ***	0.485	0.055 ***	0.462	0.168 ***	0.304	0.125 **	0.124	0.069 *	0.669	0.077 ***	0.371	0.079 ***	-0.217	0.120 *
<i>Detailed Covariate Effects</i>																						
Education	0.063	0.015 ***	0.037	0.019 *	0.049	0.026 *	0.124	0.017 ***	0.117	0.019 ***	0.149	0.026 ***	0.195	0.034 ***	0.135	0.033 ***	0.241	0.049 ***	0.094	0.020 ***	0.061	0.026 **
Income	0.063	0.015 ***	0.015	0.019	0.013	0.026	-0.163	0.024 ***	0.107	0.018 ***	0.057	0.019 ***	0.072	0.016 ***	0.093	0.017 ***	0.165	0.031 ***	0.060	0.017 ***	-0.037	0.020 *
Financial Wealth	-0.046	0.012 ***	-0.004	0.014	0.009	0.019	-0.010	0.010	-0.055	0.015 ***	-0.042	0.013 ***	-0.059	0.015 ***	-0.053	0.015 ***	-0.057	0.022 **	-0.060	0.024 **	0.012	0.016
Real Wealth	0.056	0.022 **	-0.018	0.015	0.001	0.018	-0.079	0.033 **	0.000	0.011	0.055	0.022 **	-0.044	0.020 **	-0.064	0.027 **	0.008	0.008	-0.033	0.014 **	-0.101	0.046 **
Total Covariate Effects	0.206	0.041 ***	0.072	0.044 *	0.169	0.070 **	-0.065	0.043	0.195	0.033 ***	0.295	0.051 ***	0.171	0.047 ***	0.069	0.054	0.365	0.056 ***	0.060	0.044	-0.067	0.064
<i>Detailed Coefficient Effects</i>																						
Education	0.240	0.235	0.230	0.184	0.572	0.381	0.246	0.082 ***	0.106	0.079	0.480	0.464	-0.069	0.135	0.171	0.074 **	0.126	0.062 **	0.399	0.148 ***	0.050	0.221
Income	-0.036	0.235	0.107	0.259	0.237	0.847	0.049	0.130	-0.293	0.112 ***	-0.585	0.396	-0.101	0.268	-0.170	0.190	-0.092	0.119	-0.248	0.174	-0.516	0.396
Financial Wealth	-0.008	0.200	-0.095	0.219	-0.227	0.623	-0.061	0.119	0.030	0.110	-0.721	0.316 **	0.615	0.227 ***	0.133	0.136	-0.060	0.121	0.158	0.089 *	0.060	0.343
Real Wealth	-0.061	0.133	-0.088	0.197	-0.281	0.351	0.103	0.110	-0.318	0.096 ***	0.211	0.205	-0.745	0.238 ***	0.066	0.191	0.011	0.150	-0.122	0.177	0.534	0.543
Constant	-0.482	0.726	0.014	0.711	-1.156	1.795	-0.109	0.490	0.986	0.303 ***	1.453	1.192	0.145	0.795	-0.665	0.635	-1.160	0.726	0.043	0.622	-0.880	0.939
Coefficient Effects	0.682	0.088 ***	0.540	0.094 ***	-1.053	0.205 ***	0.263	0.069 ***	0.290	0.059 ***	0.167	0.170	0.133	0.130	0.055	0.089	0.304	0.089 ***	0.312	0.090 ***	-0.150	0.132

Table A1: Household characteristics by country

	age<39	age:40-49	age:50-59	couple	single	widowed	high school	college	employed	slfempl	retired	othinact	hhsiz
AT	0.26	0.21	0.18	0.50	0.24	0.11	0.71	0.14	0.44	0.10	0.38	0.04	2.12
BE	0.27	0.20	0.19	0.55	0.20	0.13	0.38	0.36	0.44	0.05	0.33	0.07	2.29
CY	0.27	0.20	0.22	0.47	0.12	0.10	0.27	0.28	0.54	0.11	0.25	0.04	2.74
DE	0.26	0.20	0.17	0.50	0.25	0.13	0.57	0.31	0.49	0.07	0.31	0.08	2.04
ES	0.24	0.22	0.18	0.64	0.14	0.15	0.19	0.25	0.44	0.11	0.24	0.12	2.67
FR	0.28	0.18	0.17	0.46	0.29	0.14	0.40	0.21	0.45	0.08	0.35	0.06	2.23
GR	0.29	0.18	0.17	0.64	0.18	0.12	0.35	0.20	0.37	0.19	0.34	0.06	2.64
IT	0.15	0.23	0.18	0.62	0.14	0.16	0.34	0.11	0.41	0.12	0.41	0.02	2.53
LU	0.26	0.27	0.18	0.53	0.25	0.09	0.40	0.25	0.57	0.06	0.27	0.07	2.48
NL	0.22	0.24	0.22	0.44	0.36	0.08	0.39	0.32	0.45	0.04	0.22	0.14	2.21
PT	0.19	0.21	0.20	0.66	0.11	0.15	0.13	0.09	0.42	0.11	0.37	0.04	2.69
US	0.29	0.20	0.21	0.58	0.16	0.09	0.52	0.37	0.57	0.11	0.25	0.02	2.56
	income-Q2	income-Q3	income-Q4	finw-Q2	finw-Q3	finw-Q4	realw-Q2	realw-Q3	realw-Q4	inheritance received	last year inc low	dislikes risks	exp income up
AT	0.31	0.26	0.17	0.38	0.36	0.13	0.20	0.19	0.23	0.35	0.11	0.92	0.09
BE	0.28	0.23	0.21	0.26	0.35	0.25	0.08	0.27	0.41	0.34	0.19	0.95	0.08
CY	0.25	0.29	0.22	0.23	0.36	0.21	0.10	0.16	0.62	0.44	0.31	0.88	0.05
DE	0.28	0.27	0.18	0.32	0.39	0.15	0.19	0.17	0.20	0.34	0.16	0.97	0.11
ES	0.33	0.25	0.12	0.39	0.29	0.10	0.12	0.28	0.49	0.30	0.40	0.98	0.22
FR	0.36	0.27	0.10	0.39	0.33	0.12	0.13	0.24	0.29	0.40	.	.	.
GR	0.31	0.24	0.11	0.39	0.17	0.04	0.25	0.31	0.27	0.30	0.32	0.94	0.05
IT	0.32	0.24	0.10	0.38	0.34	0.06	0.18	0.26	0.35	.	0.18	0.81	0.13
LU	0.18	0.29	0.44	0.24	0.43	0.22	0.09	0.06	0.67	0.29	0.19	0.98	0.11
NL	0.29	0.39	0.20	0.27	0.39	0.26	0.08	0.24	0.34	0.07	0.07	0.98	0.14
PT	0.27	0.12	0.06	0.39	0.24	0.07	0.31	0.28	0.19	0.29	0.23	0.98	0.05
US	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.20	0.25	0.83	0.17