

## ACCOUNTING FOR CROSS-COUNTRY DIFFERENCES IN WEALTH INEQUALITY

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There is considerable cross-country variation in levels of household wealth and in wealth inequality. This paper assesses the extent to which these differences can be accounted for by differences in the distributions of households' demographic and economic characteristics. A counterfactual decomposition analysis of micro data from five countries (Italy, U.K., U.S., Sweden and Finland) is used to identify the effects of characteristics on component wealth holdings, their value and their distribution. The findings of the paper suggest that the biggest share of cross-country differences is not attributable to the distribution of household demographic and economic characteristics but rather reflect strong unexplained country effects.

**JEL Codes:** C81, D31, D63

**Keywords:** household wealth, wealth inequality, debt, housing assets, decomposition

### 1. INTRODUCTION

The distribution of household wealth differs substantially across countries. In many instances the wealth inequality ranking of countries is very different from their respective ranking in terms of income inequality (Jäntti *et al.*, 2008). A striking example of this is Sweden which, despite being one of the most equal countries in terms of income distribution, is ranked as one of the most unequal countries in terms of wealth. This paper examines the contribution of economic and demographic characteristics in explaining cross-country differences in the distribution of household wealth.

There are several explanations for why country wealth and income inequality rankings may differ. Differences in institutional settings and economic environment will have a distinct effect on household wealth accumulation, over and above the impact of income, by affecting households' saving motives and saving propensities. What the State provides in terms of education, health, housing and pensions will affect households' needs and the incentives to accumulate private wealth holdings. Cross-country differences in the importance of past inheritances

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will contribute to the impact of the above-mentioned factors and in general the fact that wealth is a stock reflecting the historical financial well-being of households while income is a measure of current financial inflow of resources partly explain why discrepancies exist. Furthermore, variation in household wealth may reflect country-specific personal preferences (shaped by cultural and historical factors) for owning specific types and levels of assets and debts. Aside from these influences, cross-country differences in the distribution of household wealth may represent pure differences in the characteristics of households.

Accordingly we focus on the contribution of age, household structure, labor market status, educational attainment and income. The analysis allows us to identify the importance of these factors in explaining cross-country differences in households' wealth and the implications for explaining differences in household wealth inequality. The unexplained component will capture the effect of all unobserved differences including differences in welfare and tax systems and other institutional factors that affect how a given population with given characteristics accumulates assets and debts. In order to understand the importance of different factors in shaping wealth distributions we investigate cross-country differences in participation, levels and the distribution of different wealth components.

Several recent studies have sought use decomposition techniques to estimate the role of population characteristics to estimate cross-country differences in wealth and debt and attempt to understand the role of institutions in explaining residual cross-country differences (Christelis *et al.*, 2013; Sierminska and Doorley, 2013; Doorley and Sierminska, 2014). Sierminska and Doorley (2013) compare wealth-participation rates across a number of European countries, the U.S. and Canada and focus on a comparison between households where the household head is aged under 50 years and 50 years or over. Doorley and Sierminska (2014) use the same set of countries and data sources to compare levels of assets and liabilities and focus on differences between younger and older age cohorts. Christelis *et al.* (2013) examine ownership and levels in stocks, private businesses, principal residence and associated mortgages. They cover a larger set of countries (12 European countries and the U.S.) but their analysis is restricted to those aged 50 or over. Closest to the analysis presented in this paper is Bover (2010) who compares the U.S. and Spain and looks at the impact of household structure on the distribution of wealth. Overall, she finds that household structure has no impact on differences in wealth inequality measured by the Gini coefficient between the two countries but this masks the fact that differences in the lower part of the distribution would be reduced if the countries shared common household-structure distributions but much greater in the upper part of the distribution; highlighting the need to consider the whole distribution. This paper is novel due to its focus on net wealth inequality and the contribution of differences in the distribution of wealth components on net worth inequality, coverage of the complete age range for a larger sample of countries that includes the U.K. and Sweden and a wider set of household characteristics. The analysis is focused on the period shortly before the financial crisis (1998–2002) when household wealth portfolios were fairly stable: before the dramatic increase in house-price inflation, in some countries, and the subsequent very turbulent period associated with the crisis. The period covered by the analysis provides a useful benchmark comparison between countries and it

could be some time before the protracted economic shock associated with the crisis allows us to make these types of comparisons between countries.

No single data resource has complete coverage of household assets and liabilities that would allow international comparability: like previous studies we have to make use of an incomplete data set which strikes a balance between coverage, comparability and completeness. International studies in the determinants and distribution of household wealth is still in its infancy and this paper contributes to a growing body of research which is building an important knowledge base.

We find that countries exhibiting both relatively low and relatively high income inequality can be characterized by relatively high wealth inequality. The analysis reveals that the greatest share of cross-country variation in wealth inequality is not due to differences in the distribution of household demographic and economic characteristics but rather reflect strong unexplained country effects. We discuss the factors that are likely to contribute to these differences.

The structure of the paper is as follows: Section 2 considers data and measurement issues; our method is outlined in Section 3; in Section 4 we present our findings in relation to cross-country differences in the distribution of net worth; Section 5 looks at individual wealth components; Section 6 explores potential reasons for the unexplained country effects and Section 7 concludes.

## 2. DATA AND MEASUREMENT ISSUES

There is no single standardized concept of personal wealth that will be appropriate across all distributional comparisons. Consider, for example, the different requirements of (A) comparisons of wealth distributions over time for a single country and (B) comparisons at a point in time across different countries. In choosing a wealth concept for problem (A) one should clearly take into account the special institutional, social and economic circumstances of the country in question and, indeed, the conventions in the literature on wealth studies in that specific country. But for problem (B) one needs to focus on a wealth concept that has essentially the same meaning across the set of countries under consideration: some wealth components relating to household tenure, pensions and the like may be very different from one country to another. In some cases the data requirements for meaningful distributional comparison may be different as between problems such as (A) and (B).

For these reasons the datasets used are drawn from the Luxembourg Wealth Study (LWS), a cross-national database which currently provides harmonized wealth data for 12 industrialized countries. From this database we have selected five countries—the U.K., Italy, Finland, Sweden and the U.S.—that provide revealing contrasts in terms of institutional frameworks and welfare state models. The original national datasets are the British Household Panel Survey (BHPS, 2000) for the U.K., the Survey of Household Income and Wealth (SHIW, 2002) for Italy, the Household Wealth Survey (HWS, 1998) for Finland and the Wealth Survey (HINK, 2002) for Sweden. For the U.S. the LWS database includes data from two national surveys: the Survey of Consumer Finances (SCF, 2001) and the Panel Study of Income Distribution (PSID, 2001). The latter is a general household survey with a special focus on income while the former is a specialized

wealth survey. An important feature of the SCF is that it over-samples the wealthy and therefore has a better representation of the upper tail of the wealth distribution which is highly right-skewed.<sup>1</sup> In this paper we use data from both the SCF and the PSID to test the sensitivity of our results to survey design features. Although there are substantial methodological differences across the national surveys, LWS has constructed comparable variables for a number of wealth measures and there is a growing body of research exploiting this rich data resource. However, some comparability issues remain. In Section 6 we discuss some of these differences and their implications for understanding cross-country differences in wealth inequality.

The main measure of wealth used is total household net worth constructed as the sum of household financial and non-financial assets minus total household debt. Financial assets include deposit accounts, stocks, bonds and mutual funds. Non-financial assets (“housing assets” hereafter) include own principal residence and investment real estate. Total debt refers to all outstanding loans, both home secured and non-home secured including informal debt—we break this total down into housing debt and all other debt (“financial debt” hereafter). A limitation of our study is that the measure of net worth that we use excludes business and pension assets, and trust funds since data on these assets are not available for all countries. Given the differential importance of these types of wealth in different countries, our comparison would—at least partly—reflect the omissions of these types of assets.<sup>2</sup> However, pension wealth and business equity are very different forms of private wealth holdings and are typically less liquid than financial and housing assets.

In addition to total net worth, we analyse four wealth components: gross financial assets, gross housing assets, net financial assets, housing equity as well as housing and financial debt. All wealth values (as all monetary values in this paper) are transformed to constant 2005 prices using the national CPI and are converted at 2005 PPP-adjusted Euros (Euro area 16 countries) using the purchasing power parities for gross domestic product (GDP).

The unit of analysis is the household, defined in most of the countries as a group of people who live in the same dwelling and share household expenses. For the U.K. (BHPS) there is no requirement that household members share household expenses. In Sweden although the household unit definition is close to the one adopted in the other surveys, for non-married individuals in the registry data who do not respond to the telephone interview (around 30 percent) it was not possible to identify if they were cohabiting unless they had children in common. These individuals were classified as single person households and therefore the number of single person and single parent households is somewhat overestimated (Statistics Sweden, 2006).

There are large cross-country differences in household net worth, with differences varying across the distribution; summary statistics are reported in Table A1

<sup>1</sup>The SCF covers around 4,500 families. A booster sample, chosen on the basis of information contained in tax returns, is selected to disproportionately sample wealthy families (but excluding the wealthiest 400 families, as defined by Forbes magazine).

<sup>2</sup>Sierminska *et al.* (2006) provides a detailed discussion on this issue and a reconciliation between LWS and the national definitions of net worth.

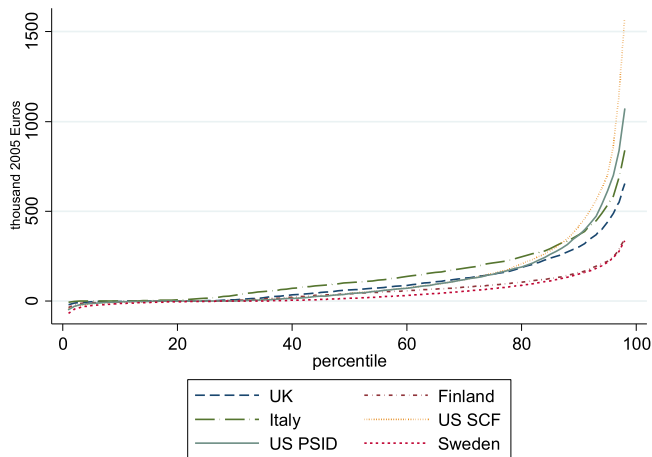


Figure 1. Cross-country differences in net worth distributions [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Note: The figure reflects wealth up to the 98<sup>th</sup> percentile.

TABLE 1  
GINI, GE(2) AND PERCENTILE RATIOS FOR HOUSEHOLD TOTAL NET WEALTH BY COUNTRY

	Gini	GE(2)	P90/P50	P25/P50
U.K.	0.66	1.18	4.86	0.04
Finland	0.68	1.61	3.90	0.02
Italy	0.60	1.16	3.55	0.15
U.S. SCF	0.83	15.23	9.88	0.01
U.S. PSID	0.80	10.07	9.00	0.00
Sweden	0.89	5.30	9.51	n.a.

Notes: Net worth (NW1) equal to the sum of net financial assets (TFA1) and housing equity (TNF1). Net financial assets equal to total financial assets (TFA1) minus financial debt - non-housing debt (NHD) in LWS wording. Housing equity equals the sum of own principal residence, investment real estate (TNF1) minus mortgage debt. All monetary values are expressed in 2005 Euros (Euro 16 ppp). n.a. denotes not applicable - in this case P25 is equal to zero.

Source: Own calculations based on LWS database.

of the Appendix. The U.S. has the highest average (mean) level of net wealth (€207,000 based on SCF; although €158,100 based on PSID), followed by Italy (€163,600), the U.K. (€116,700), Finland (€66,500) and Sweden (€50,900). At low wealth percentiles the lowest wealth levels are observed in Sweden, the U.S. and Finland (in this order) while the highest are found in Italy and the U.K. At higher points of the distribution, the highest wealth levels are observed in the U.S. and Italy while the lowest are in Sweden and Finland. To illustrate how wealth varies across the whole distribution, Figure 1 plots the percentile distribution of net worth for each country.

In terms of the Gini coefficient, Sweden and the U.S. have the highest estimated levels of wealth inequality, at 0.89 and 0.83 (SCF) respectively, while Italy has the lowest (0.60); Finland (0.68) and the U.K. (0.63) are positioned in the

middle—see Table 1. A similar picture emerges when percentile ratios are considered (see columns 3 and 4 of Table 1). Once again Sweden and the U.S. exhibit the highest levels of wealth inequality and Italy the lowest. Finland has higher inequality than the U.K. in terms of measures that measure dispersion in the lower tail of distribution (the 25/50 percentile ratio) but lower for those measuring dispersion in the upper tail (the 90/50 percentile ratio). Cowell (2013) provides a detailed comparison of wealth distributions in Canada, Sweden, the U.K. and the U.S. and shows that the high wealth inequality exhibited by Sweden is robust under alternative assumptions about the definition of wealth and about the precise shape of the upper tail of the distribution.

As we want to understand the source of cross-country variation in the distribution of wealth and in particular in characterizing the contribution of socio-economic factors in explaining differences in the distribution of wealth and observed levels of wealth inequality, we consider five separate factors: 1) age; 2) household structure; 3) educational attainment; 4) working status; and, 5) household income (net of capital income). Although differences in financial institutions could have an effect on personal decisions about household composition or educational attainment, we only consider first-order effects in this paper and therefore treat the socio-economic factors as exogenous.

Age, education and working status are all defined in relation to the household reference person (see Cowell *et al.*, 2013 for details on how this is defined in each data source).<sup>3</sup> The most notable differences are the substantially lower proportion of younger households in Italy; the lower proportion of older households and the higher proportion of lone-parent households in the U.S. and the higher proportion of more educated households in the U.S. and Sweden. As expected, differences in the level and the distribution of household disposable income are striking. The U.S. is the country with the highest mean income levels but also the most dispersed income distribution, followed by the U.K. By contrast Finland and Sweden have lower average income levels but also substantially lower income inequality. Mean income levels in Italy are similar to that of the two Nordic countries but levels of income inequality are similar to the U.K.

### 3. METHODOLOGY

Following DiNardo *et al.* (1996) (hereafter DFL) we use semi-parametric decomposition methods to estimate the portion of cross-country differences which is attributable to differences in the distribution of household characteristics.<sup>4</sup> Let  $w$  denote wealth and  $z$  a vector of wealth determinants. The distribution of wealth for each country  $i=1, \dots, 5$  is described by:

<sup>3</sup>Cross-country differences in the distribution of these characteristics and in mean and median net worth values according to these characteristics are shown in Tables A2 and A3 of the Appendix.

<sup>4</sup>As stressed by Bover (2010, p. 259) “An advantage of relying on conditional distributions is that one avoids having to choose a smoothing method. It is well known that density estimation is sensitive to the smoothing method adopted. This is particularly relevant in the case of wealth distributions, which often have a marked spike at zero because a non-negligible proportion of the population has no wealth. The presence of spikes increases the sensitivity of density estimations to the smoothing method used.”

$$(1) \quad F(w|i) = \int_z F(w, z|i) dz = \int_z F(w|z, i) dF_z(z|i)$$

The counterfactual distribution of interest can be thought of as the distribution that mixes the distribution of characteristics of country  $i$  with the wealth generating function from country  $j$ . Following DFL this can be written as:

$$(2) \quad \int_z F(w|z, j) dF(z|i) = \int_z F(w|z, j) \psi(z) dF(z|j)$$

where  $\psi(z) = \frac{dF(z|i)}{dF(z|j)}$  is a reweighting factor that can be estimated using standard methods such as probit or logit.

The basic idea of the DFL approach is to start with one country ( $i$ ) and then replace the distribution of  $z$ ,  $F(z|i)$ , with the distribution of characteristics in  $j$  ( $F(z|j)$ ) using the reweighting factor  $\psi(\cdot)$ :

$$(3) \quad \psi(z) = \frac{Pr(z|i)}{Pr(z|j)} = \frac{Pr(i|z)/Pr(j)}{Pr(j|z)/Pr(i)}$$

This reweighting factor is computed by estimating a probability model for  $Pr(z|i)$  and using the predicted probabilities to compute a value  $\hat{\psi}(z)$  for each observation. Following DFL we use a flexible probit model to derive the reweighting function  $\psi(z)$ . In principle the reweighted function could also be derived using non-parametric specifications (Barsky *et al.*, 2002; Bover, 2010; Sierminska *et al.*, 2010), but this is inappropriate here because of the large number of variables in  $z$ .

In addition to considering the aggregate compositional effect in our decompositions we also consider the effect of each covariate separately. The distribution of wealth<sup>5</sup> may be expressed as:

$$(4) \quad \int F(w|y, p, e, d, c, i) \cdot dF(y|p, e, d, c, i) \cdot dF(p|e, d, c, i) \\ \cdot dF(e|d, c, i) \cdot dF(d|c, i) \cdot dF(c|i)$$

which captures six conditional expectations: the first is the conditional expected wealth function given the wealth determinants ( $z$ ); the second is the conditional expected income function ( $y$ ) given working status ( $p$ ), education ( $e$ ), household structure ( $d$ ) and age composition ( $c$ ); the third is the conditional labor force participation function; similarly the fourth and the fifth functions capture the conditional expected education and household structure functions respectively while the final terms capture the age composition.

Following the methodology of Cobb-Clark and Hildebrand (2006) we can use (4) to define a series of counterfactual wealth distributions. Suppose we want to compare countries 1 and 2: to do this we can define the wealth distribution that would prevail if country 2 retained its own conditional wealth, working

<sup>5</sup>Cobb-Clark and Hildebrand (2006).

status, educational attainment, household structure and age composition but had the same conditional income functions as country 1,<sup>6</sup> namely

$$(5) \quad F^A(w) = \int F(w|y, p, e, d, c, j) \cdot dF(y|p, e, d, c, i) \cdot dF(p|e, d, c, j) \cdot dF(e|d, c, j) \cdot dF(d|c, j)$$

Comparing equation (5) with the actual distribution from country 2 we can isolate the effect of differences in conditional income distribution on cross-country differences in wealth. Similarly we can define the counterfactual wealth distribution  $F^B$  that would result if country 2 had the same income and working status distributions as country 1 but retained its own conditional wealth distribution and the distribution of the remaining characteristics. Similarly  $F^C$ ,  $F^D$ , and  $F^E$  are the counterfactual wealth distributions if in addition to income and working status, country  $j$  had the same education, household types and age distributions as country  $i$  respectively.

Based on these counterfactual distributions we can decompose differences in wealth across pairs of countries in the following way:

$$(6) \quad F^j - F^i = [F^j(w) - F^A(w)] + [F^A(w) - F^B(w)] + [F^B(w) - F^C(w)] + [F^C(w) - F^D(w)] + [F^D(w) - F^E(w)] + [F^E(w) - F^i(w)]$$

To estimate the counterfactual distributions described in equation (6) we use the DFL reweighting approach for each country in order for the distribution of characteristics to match that of our comparison country  $i$ . For example:

$$(7) \quad F^A(w) = \int \psi_{y,p,e,d,c} F(w|y, p, e, d, c, j) \cdot dF(y|p, e, d, c, j) \cdot dF(p|e, d, c, j) \cdot dF(e|d, c, j) \cdot dF(d|c, j) \cdot dF(c|j)$$

where

$$(8) \quad \psi_{y,p,e,d,c,i} = \frac{Pr(i|y, p, e, d, c, i) \cdot P(j|p, e, d, c, i)}{Pr(j|y, p, e, d, c, i) \cdot P(i|p, e, d, c, i)}$$

The difficulty with the decomposition is that the effect attributed to each factor would always depend on the sequence at which its effect is evaluated: Equation (6) is just one possibility. Using five components to decompose wealth differences leads to 120 relevant sequences. With no particular preference over the relevant sequence we follow Cobb-Clark and Hildebrand (2006) and calculate each in turn and present results of the simple average across all possible sequences.

<sup>6</sup>Note that Cobb-Clark and Hildebrand (2006) use the opposite operationalization to define the compositional effect i.e. they define the distribution that would prevail if group 2 (in their case) had retained their income function but had the same conditional wealth, income etc. function as the comparison group.



In all our decompositions we use the U.K. as our base country and compare it to each of the remaining four countries. Each of the counterfactual distributions is then constructed by reweighting the distributions of characteristics in each of the countries in order to mirror the distributions of characteristics in the U.K. With a number of potential countries that could be selected as the reference country in the decomposition analysis it is simply a matter of choosing a meaningful counterfactual case as there is no right answer to the question of which reference group to select (Fortin *et al.*, 2010). We choose the U.K. on the basis that it is generally regarded to hold a position between the U.S. and continental European countries in terms of inequality and institutional frameworks.<sup>7</sup> The difference in the observed and the counterfactual distribution in each of the countries captures the contribution of characteristics to the observed differences firstly in net worth and then for each of its subcomponents separately, considering both differences in the extent of ownership of different types of assets, the degree of indebtedness as well as levels of wealth holdings.

#### 4. ANALYZING CROSS-COUNTRY DIFFERENCES IN THE DISTRIBUTION OF NET WORTH

As an initial step we estimated wealth production functions for each country. These showed standard relationships between wealth holdings and age (initially increasing with age before declining), household composition (households with sole adults are associated with lower average wealth holdings), educational attainment (positive relationship) and household income (higher income households holding relatively higher levels of wealth). However, we find the “returns” to these characteristics vary by country and this coupled with differences in the distribution of characteristics could lead to cross-country variation in wealth inequality. The results from these regressions can be found in Tables 6 (standard OLS model) and A7 (Inverse Hyperbolic Sine transformation) of the Appendix.

##### 4.1. *Cumulative wealth distributions*

Figure 2 shows the actual and counterfactual net worth distributions for each pairwise comparison and Table A8 of the Appendix shows the detail for five quantile points in the distributions (P10, P25, P50, P90 and P95). For each country the figures show the actual difference with the U.K. and the counterfactual difference (assuming distribution of characteristics is the same as the U.K.). For Finland, for example, at the 10<sup>th</sup> percentile net worth is -€2,660, compared to -€290 in the U.K. meaning that net worth in Finland at P10 is €2,370 lower than in the U.K. The counterfactual estimate shows that 92 percent of this differential can be explained by differences in household characteristics between households at this point in the distribution in the U.K. and Finland. At the 25<sup>th</sup> percentile their contribution increases to more than 500 percent of the wealth difference (if

<sup>7</sup>We conduct some sensitivity analysis using US (SCF) as an alternative base country. There are some differences in the extent to which the distributions of characteristics account for cross-country variation in the distribution of wealth but the main conclusions are unchanged. Results are available in Tables A4 and A5 of the Appendix.

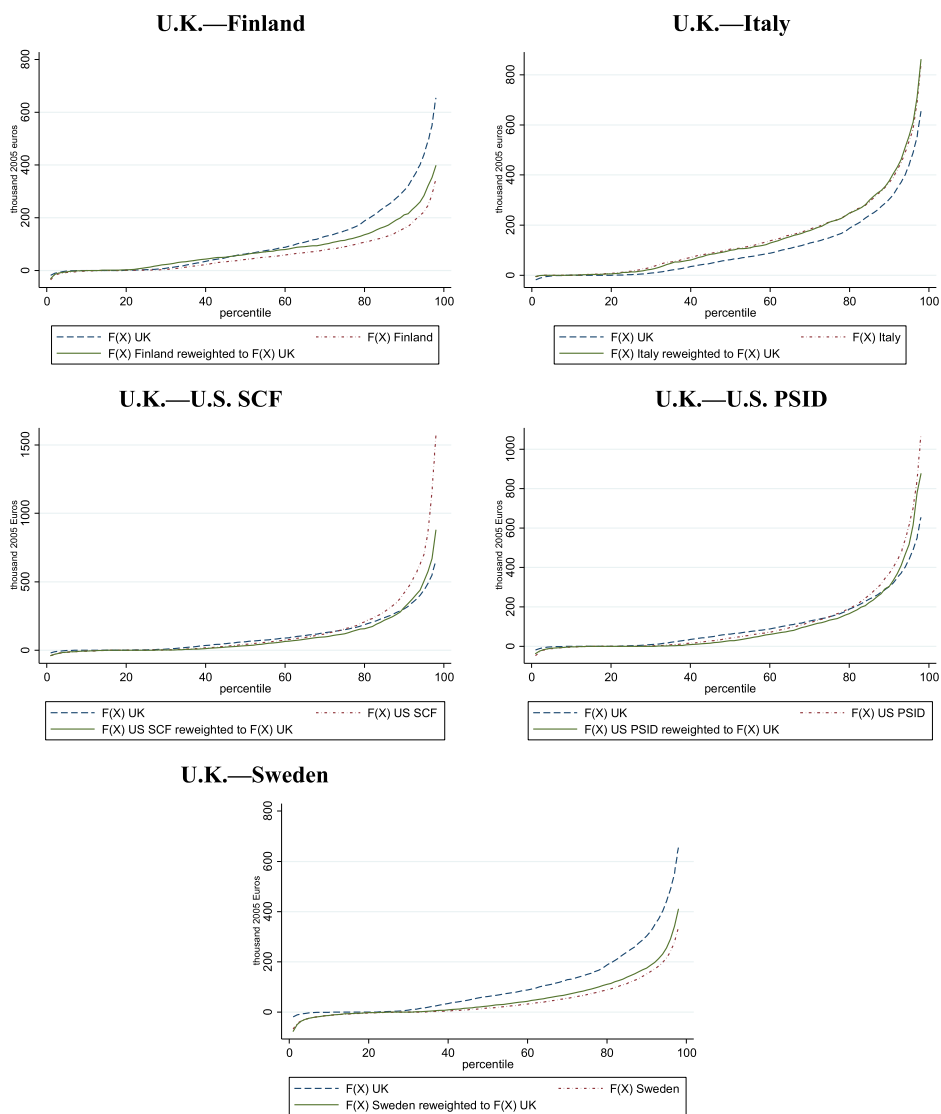


Figure 2. Actual and counterfactual net worth distributions [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

Finnish households had the same characteristics as U.K. households at P25 the difference would be 500 times greater). Some strong effects are also estimated for the U.S. where the effect of household characteristics operates towards reducing net worth at lower wealth percentiles and towards increasing it at mid and higher wealth percentiles. On the other hand, the characteristics play a very small role in explaining differences in net worth holdings in Sweden relative to the U.K., even at the lower end of the distribution where we might expect to find stronger effects. Similarly, household characteristics appear to play a very small role in explaining differences between U.K. and Italian households' wealth holdings.

TABLE 2

DETAILED DECOMPOSITIONS: DIFFERENCES IN SELECTED PERCENTILES OF NET WORTH DISTRIBUTION  
(FIGURES IN THOUSAND 2005 EUROS)

	P10		P25		P50		P90	
	$\beta$ s	%	$\beta$ s	%	$\beta$ s	%	$\beta$ s	%
<b>U.K.-Finland</b>								
<b>Unadjusted difference</b>	-2.4***		-1.5*		-21.3***		-143.0***	
<b>Compositional effect</b>	-2.2***		-9.2**		-18.9***		-50.5***	
Income	-1.1***	50	-4.4**	48	-10.9***	58	-34.0***	67
Working status	0.2	-9	-0.1	1	-0.2	1	-7.9**	16
Education	-0.2*	9	-0.3	3	-0.2	1	-0.1	0
Household structure	0.0	0	-1.8*	20	-3.9**	21	-6.6*	13
Age	-1.0***	45	-2.5**	27	-3.7***	20	-1.9	4
<b>U.K.-Italy</b>								
<b>Unadjusted difference</b>	0.3		13.7***		41.7***		66.5***	
<b>Compositional effect</b>	-0.3		3.2		5.0		-6.9	
Income	-1.0***	333	-7.7***	-241	-15.3***	-306	-54.2***	786
Working status	0.0	0	0.8*	25	0.4	8	-5.9	86
Education	0.1	-33	1.3	41	6.0***	120	16.1**	-233
Household structure	0.3**	-100	4.1***	128	7.5***	150	19.8***	-287
Age	0.3*	-100	4.6***	144	6.3***	126	17.4***	-252
<b>U.K.-U.S. SCF</b>								
<b>Unadjusted difference</b>	-6.0***		-2.0**		-19.9***		115.8***	
<b>Compositional effect</b>	-0.1		0.2		10.4***		105.7***	
Income	1.0***	-1000	0.2*	100	8.5***	82	54.7***	52
Working status	-0.2	200	0.1	50	0.0	0	-9.9	-9
Education	0.6*	-600	0.2**	100	8.4***	81	67.6***	64
Household structure	0.1	-100	0.1	50	3.1*	30	30.5***	29
Age	-1.6***	1600	-0.4*	-200	-9.5***	-91	-37.1***	-35
<b>U.K.-U.S. PSID</b>								
<b>Unadjusted difference</b>	-3.6***		-2.0**		-21.4***		65.5***	
<b>Compositional effect</b>	-0.5		0.2		12.7***		65.4**	
Income	1.3***	-260	0.4***	200	19.2***	151	59.0***	90
Working status	-0.2	40	0.0	0	-0.1	-1	-3.7	-6
Education	-0.3	60	0.1*	50	4.7***	37	44.2***	68
Household structure	0.0	0	0.0	0	-0.9	-7	2.3	4
Age	-1.3***	260	-0.3***	-150	-10.2***	-80	-36.4***	-56
<b>U.K.-Sweden</b>								
<b>Unadjusted difference</b>	-12.8***		-2.9***		-46.3***		-151.2***	
<b>Compositional effect</b>	-0.4		-0.6**		-8.4***		-24.2***	
Income	-0.7**	175	-0.5***	83	-5.7***	68	-22.1***	91
Working status	0.7**	-175	0.5***	-83	2.0***	-24	1.3**	-5
Education	-0.6**	150	0.1	-17	3.2***	-38	13.6***	-56
Household structure	0.8**	-200	-0.2*	33	-5.0***	60	-13.1***	54
Age	-0.6**	150	-0.5***	83	-2.9***	35	-3.9***	16

*Note:* Counterfactual distributional statistics ( $\beta$ s) are estimated using the DFL decomposition re-weighting procedure. The explanatory variables included in the reweighting function include age, education and working status of the household head, household structure, and household income net of capital gains and interest payments. All counterfactual distributions are estimated using the U.K. as a base country i.e. they represent the distribution that would prevail in each of the countries if the distribution of characteristics was similar to the U.K. The sample is restricted to households with non-missing data on wealth and key variables that are required to estimate the weighting function. Standard errors (se) based on 50 replications.

Detailed decomposition analysis allows us to identify which characteristics are contributing to cross-country differences in wealth holdings at different points in the distribution of wealth. In each panel of Table 2, the first row shows the

total differences in net worth with the U.K., the second row shows the total compositional effect (i.e. the part of the difference which can be explained by differences in the distribution of characteristics) while rows 3–7 divide the compositional effect into the contribution of the five main factors.

In Finland the level and distribution of income contributes to increasing the difference with the U.K. (lower net wealth across the distribution). The distribution of education does not significantly contribute to differences in the distribution of wealth, and working status only plays a small role at the top of the distribution; widening the gap with the U.K. The distribution of age and household structure play a small role, to varying degrees across the distribution, to widen the gap with the U.K.

In Italy, the distribution of age, educational attainment and household structure all contribute to the higher levels of net worth across the distribution relative to the U.K. while income works in the opposite direction.

In the U.S. (SCF), the distribution of income, educational attainment and household structure all contribute to higher net wealth holdings at the top of the distribution (P90) relative to the U.K., while the distribution of age works in the opposite direction. Wealth holdings at P10, P25 and P50 are lower in the U.S. than in the U.K. The distribution of age in the U.S. augments to this difference, while the distribution of educational attainment and income reduces the difference. The distribution of working status is not a significant factor in explaining any of the difference between the U.S. and the U.K.

In Sweden the level and distribution of income, particularly at the top of the wealth distribution, age and household structure increase the difference with the U.K. and contributes to observed lower wealth holdings in Sweden. On the other hand, the distribution of working status and educational attainment work in the opposite direction, reducing the difference with the U.K.

However, despite some important individual effects, household characteristics account for only part of the cross-country variation in household wealth and its distribution. The largest share of the differences remain largely unexplained: country-specific effects appear to be the main determinant of cross-country variation in wealth distributions.

#### 4.2. *Wealth Inequality*

To estimate the role of household characteristics in accounting for cross-country differences in wealth inequality, we use these counterfactual distributions to compute measures of inequality. For each country we report actual wealth inequality and the counterfactual estimate that would prevail if each country had the same distribution of household characteristics as the U.K. (Table 3). The distribution of characteristics explains a large share of the higher net worth inequality in Finland (relative to the U.K.); inequality in Finland would be lower with the same distribution of characteristics as the UK for all measures apart from P25/P50 and top 1 percent share. For Italy, the distribution of characteristics appears to have an equalizing effect for all net-worth inequality measures. Net wealth inequality would be higher with the same distribution of characteristics as the U.K., although inequality would remain below the U.K., Italy along with

TABLE 3  
DFL DECOMPOSITION OF NET WORTH INEQUALITY

	P90/P50	P25/P50	Gini	Top 10%	Top 5%	Top 1%
<b>U.K.</b>						
Actual	4.86	0.04	0.66	45.36	29.83	9.98
<b>Finland</b>						
Actual	3.90	0.02	0.68	45.34	31.19	13.03
Counterfactual	3.51	0.17	0.62	41.20	28.05	11.28
<b>Italy</b>						
Actual	3.55	0.15	0.60	42.07	28.64	10.76
Counterfactual	3.80	0.13	0.62	43.88	29.70	11.58
<b>U.S. SCF</b>						
Actual	9.88	0.01	0.83	70.30	57.31	32.68
Counterfactual	9.78	0.00	0.81	64.40	49.75	27.26
<b>U.S. PSID</b>						
Actual	9.00	0.00	0.80	63.47	48.61	25.24
Counterfactual	10.72	0.00	0.81	64.27	49.42	25.94
<b>Sweden</b>						
Actual	9.51	-0.04	0.89	58.10	40.53	17.52
Counterfactual	7.22	0.00	0.85	56.04	40.10	17.77

*Note:* See Table 2 (notes).

Finland remain the lowest net-wealth inequality countries in this group. So, for the counterfactual net worth distribution, Italy ranks first or second as the least unequal country for all inequality measures; the U.K. is positioned between U.S./Sweden and Italy.

The distribution of characteristics in the U.S. explain some of the higher net wealth inequality relative to the U.K. but, for all measures of inequality with the exception of the Gini coefficient, inequality remains the highest in the U.S. out of these five countries. Similarly for Sweden the distribution of characteristics explains some of the higher net wealth inequality with the exception of the top 1 percent share measure. With the exception of the Gini coefficient net wealth inequality is lower in Sweden than in the U.S. (SCF and PSID) but higher than in Italy, Finland and the U.K. (except for dispersion in the lower half of the distribution measured by P25/P50).

## 5. ANALYSIS BY WEALTH COMPONENT

### 5.1. *Levels Analysis*

A further understanding of the factors that shape cross-country differences in the distribution of household net worth can be gained from the analysis of cross-country differences in the composition and size of different types of asset holdings. We focus on two main components: net financial wealth and net non-financial wealth (i.e. principal home equity plus the net value of investment real estate) as well as their main subcomponents—financial assets, housing assets, financial debt and housing debt. For Sweden, we are unable to separately identify net financial and net housing wealth as it is not possible to separately identify housing debt and financial debt. We apply the counterfactual analysis to the role

TABLE 4  
DFL DECOMPOSITION OF DIFFERENCE IN ASSET AND DEBT OWNERSHIP AND THE EXTENT OF DIFFERENT  
TYPES OF INDEBTEDNESS

	Financial assets	Housing assets	Financial debt	Housing debt	Debt	NW1 < 0	NFA < 0	THSE < 0
<b>U.K.</b>								
Actual	0.803	0.699	0.462	0.395	0.595	0.117	0.252	0.003
<b>Finland</b>								
Actual	0.923	0.683	0.383	0.283	0.521	0.150	0.268	0.018
Counterfactual	0.931	0.768	0.339	0.295	0.497	0.105	0.221	0.013
<b>Italy</b>								
Actual	0.812	0.722	0.120	0.102	0.199	0.027	0.054	0.007
Counterfactual	0.826	0.693	0.118	0.103	0.199	0.024	0.042	0.006
<b>U.S. SCF</b>								
Actual	0.915	0.694	0.651	0.465	0.758	0.192	0.378	0.009
Counterfactual	0.907	0.674	0.634	0.379	0.708	0.195	0.401	0.009
<b>U.S. PSID</b>								
Actual	0.834	0.660	0.501	0.437	0.678	0.154	0.287	0.006
Counterfactual	0.775	0.622	0.442	0.311	0.574	0.160	0.276	0.007
<b>Sweden</b>								
Actual	0.789	0.575	n.a.	n.a.	0.706	0.274	n.a.	n.a.
Counterfactual	0.794	0.621	n.a.	n.a.	0.716	0.256	n.a.	n.a.

*Note:* See Table 2 (notes).

of household characteristics and country specific factors in explaining the variation in the distribution of different wealth components.

The actual shares of asset and debt ownership by type shows some interesting differences between the countries (Table 4). Home ownership is most prevalent in Italy (72 percent) and least prevalent in Sweden (58 percent). U.S. households are most likely to hold some form of debt (SCF 76 percent), followed closely by Swedish households (71 percent) while only a minority of Italian households (20 percent) hold any debt. The counterfactual debt ownership shares are lower than actual shares for the U.S. This means that if U.S. households had characteristics comparable with U.K. households then debt ownership rates would be reduced. Detailed decomposition analysis for debt levels (details not shown) reveals that differences in age and education drive the greater holding of financial debt in the U.S. relative to the U.K. and differences in the distribution of income and education characteristics drive the higher relative holding of housing debt. The decomposition analysis in Table 4 shows that, although the size and the direction of the contribution of characteristics differ across countries and across different debt types, a large share of cross-country differences remains unexplained.

The contribution of characteristics in explaining differences in asset ownership is rather small. The two main exceptions are Finland and Sweden where the distribution of characteristics is associated with lower rates of homeownership. The counterfactual homeownership rates show that Finland would have the highest homeownership rate and Sweden would still have the lowest homeownership rates. In terms of the effects household characteristics have on housing and financial debt, the counterfactual U.S. rates (PSID) are lower than in the U.K. (in contrast to the actual housing-related debt rankings).

TABLE 5

DFL DECOMPOSITIONS OF CROSS-COUNTRY DIFFERENCES IN THE DISTRIBUTION OF DIFFERENT WEALTH COMPONENTS—PERCENTILES (THOUSAND 2005 EUROS)

	Net financial wealth			Gross financial wealth			Financial debt		
	P25	P50	P90	P25	P50	P90	P25	P50	P90
<b>U.K.</b>									
Actual	-0.04	1.88	63.56	0.07	4.16	66.45	0.00	0.00	11.56
<b>Finland</b>									
Actual	-0.48	1.29	27.02	0.32	2.67	28.58	0.00	0.00	9.69
Counterfactual	0.00	2.66	38.50	0.65	4.36	40.94	0.00	0.00	9.69
<b>Italy</b>									
Actual	0.74	6.36	51.45	1.59	7.11	51.98	0.00	0.00	1.59
Counterfactual	1.17	7.10	52.12	1.82	7.43	53.04	0.00	0.00	1.33
<b>U.S. SCF</b>									
Actual	-4.30	0.97	150.67	0.94	5.80	155.95	0.00	1.80	25.28
Counterfactual	-5.11	0.34	99.34	0.55	3.51	102.08	0.00	1.17	23.18
<b>U.S. PSID</b>									
Actual	-0.97	1.46	121.74	0.39	3.90	126.61	0.00	0.06	14.61
Counterfactual	-0.49	0.39	97.39	0.04	1.95	100.31	0.00	0.00	11.69
<b>Sweden</b>									
Actual	-	-	-	0.14	4.69	53.12	-	-	-
Counterfactual	-	-	-	0.23	6.39	68.18	-	-	-
	Net housing wealth			Gross housing wealth			Housing debt		
	P25	P50	P90	P25	P50	P90	P25	P50	P90
<b>U.K.</b>									
Actual	0.00	54.89	245.57	0.00	86.67	288.90	0.00	0.00	86.67
<b>Finland</b>									
Actual	0.00	37.13	137.22	0.00	48.43	151.75	0.00	0.00	32.29
Counterfactual	6.46	51.82	177.58	16.14	64.57	193.72	0.00	0.00	37.13
<b>Italy</b>									
Actual	0.00	92.82	318.24	0.00	95.47	318.24	0.00	0.00	1.38
Counterfactual	0.00	84.86	318.24	0.00	90.17	319.30	0.00	0.00	2.12
<b>U.S. SCF</b>									
Actual	0.00	35.06	255.75	0.00	77.91	340.87	0.00	0.00	126.61
Counterfactual	0.00	29.22	194.79	0.00	66.81	251.27	0.00	0.00	93.50
<b>U.S. PSID</b>									
Actual	0.00	33.11	228.87	0.00	77.91	303.86	0.00	0.00	124.66
Counterfactual	0.00	23.37	194.79	0.00	53.57	243.48	0.00	0.00	77.91
<b>Sweden</b>									
Actual	-	-	-	0.00	19.39	149.43	-	-	-
Counterfactual	-	-	-	0.00	32.43	175.04	-	-	-

Note: See Table 2 (notes). P90 net and gross housing wealth (actual) are the same in Italy due to outright ownership.

The first panel of Table 5 shows results for net financial wealth and its two components (gross financial wealth and financial debt). Financial wealth in Finland is higher in the counterfactual than in the actual distribution at all points of the distribution, and especially at the middle and lower tail of the distribution where lower net wealth holdings can be explained by household characteristics: if Finnish households had the characteristics of U.K. households, net financial wealth at P25 and P50 would actually be higher than that observed in the U.K.

However, household characteristics in Finland only explain a small amount of the lower net financial wealth holdings at P90. The distribution of characteristics makes a small contribution to explaining the distribution of net financial assets in Italy relative to the U.K. Although the distribution of characteristics in the U.S. (SCF) plays no role in explaining the lower wealth levels at the bottom of the distribution (in fact they would be even lower if U.S. households had same distribution of characteristics as the U.K.), they do explain, to some extent, the higher wealth holdings in the upper tail of the distribution.<sup>8,9</sup> In all countries the contribution of characteristics is stronger for financial assets than for financial debt, suggesting the operation of stronger unobserved country effects in the distribution of financial debt; most likely due to institutional settings and cultural differences. Although household characteristics explain some of the observed variation in financial wealth across these five countries, it is predominantly unexplained country effects that drive cross-country differences, particularly for the distribution of debt.

The second panel of Table 5 shows results for housing equity and its components. In Finland, although differences in the distribution of characteristics explain a sizeable proportion of the lower housing equity levels, these effects are largely driven by the effect of characteristics on homeownership probability (see Table 4). Again the distribution of characteristics makes almost no contribution to explaining the differences in housing wealth and mortgage debt holdings in Italy relative to the U.K. The distribution of characteristics explains a large share of the substantially higher mortgage debt in the U.S. at P90.<sup>10</sup> Housing equity in the U.S. falls significantly at P50 and P90 when we reweight household characteristics to match the U.K.<sup>11</sup> Characteristics of U.S. households actually lead to a narrowing of the difference between the U.S. and the U.K. for net housing wealth. The counterfactual distribution estimates show that if U.S. households had similar characteristics to U.K. households, net housing wealth would be even *lower* than it actually is (P50 and P90). Detailed decomposition analysis (detail not shown) reveals that differences in the distribution of income and education contribute to this difference. In Sweden, although the distribution of characteristics explains a considerable share of the lower gross housing wealth holdings (principally through homeownership) housing wealth in Sweden is still substantially lower than in any of the other countries studied.

## 5.2. *Inequality*

Examination of the detailed decomposition results suggests that the contribution of characteristics in explaining cross-country differences in wealth inequal-

<sup>8</sup>Despite differences in the magnitude of the effects, household characteristics in the PSID also explain some of the higher wealth holdings in the upper tail but also some of the lower wealth holding in the lower tail.

<sup>9</sup>Detailed decomposition results for net and gross financial assets detailing the contribution of household characteristics reveals that higher shares of households with high income and high educational attainment at the top of the distributions in the U.S. contribute to the higher values of net and gross financial assets.

<sup>10</sup>PSID counterfactual values are lower than for the U.K. suggesting that the better coverage of wealthier households in the SCF includes households with more housing debt as well as wealth.

<sup>11</sup>U.S. households appear to invest less in housing wealth than either U.K. or Italian households at all points of the distribution and less than Finnish households up to about the 75<sup>th</sup> percentile.



TABLE 6

DFL DECOMPOSITIONS OF CROSS-COUNTRY DIFFERENCES IN INEQUALITY OF DIFFERENT WEALTH COMPONENTS

	Net financial wealth			Gross financial wealth			Financial debt		
	Top 10%	Top 1%	Gini	Top 10%	Top 1%	Gini	Top 10%	Top 1%	Gini
<b>U.K.</b>									
Actual	74.80	22.68	0.99	65.18	19.54	0.80	66.93	18.45	0.83
<b>Finland</b>									
Actual	93.50	38.88	1.39	66.35	26.93	0.79	72.88	28.83	0.86
Counterfactual	76.76	27.17	1.14	60.09	20.54	0.75	75.65	28.28	0.87
<b>Italy</b>									
Actual	66.53	28.93	0.81	64.34	27.89	0.77	98.11	33.27	0.94
Counterfactual	65.98	29.21	0.79	64.09	28.25	0.76	97.96	34.59	0.94
<b>U.S. SCF</b>									
Actual	91.12	51.38	1.02	83.76	47.14	0.90	57.15	22.53	0.76
Counterfactual	93.08	44.35	1.08	81.32	38.68	0.88	53.97	14.58	0.75
<b>U.S. PSID</b>									
Actual	88.43	41.65	1.02	80.77	38.21	0.88	69.07	26.37	0.83
Counterfactual	91.30	45.40	1.02	85.11	42.15	0.91	72.24	25.74	0.85
<b>Sweden</b>									
Actual	–	–	–	62.47	23.29	0.78	–	–	–
Counterfactual	–	–	–	62.62	24.17	0.81	–	–	–
	Net housing wealth			Gross housing wealth			Housing debt		
	Top 10%	Top 1%	Gini	Top 10%	Top 1%	Gini	Top 10%	Top 1%	Gini
<b>U.K.</b>									
Actual	43.85	9.95	0.65	38.59	8.77	0.58	50.87	11.90	0.76
<b>Finland</b>									
Actual	42.42	11.59	0.64	39.02	10.35	0.59	66.39	13.43	0.84
Counterfactual	39.96	10.92	0.59	37.23	9.67	0.55	73.38	13.59	0.83
<b>Italy</b>									
Actual	41.28	10.09	0.61	40.70	9.93	0.60	99.95	32.29	0.95
Counterfactual	43.12	10.33	0.63	42.45	10.11	0.62	99.90	27.76	0.95
<b>U.S. SCF</b>									
Actual	61.22	25.17	0.76	54.12	20.94	0.70	55.61	17.01	0.77
Counterfactual	55.45	21.02	0.73	48.64	17.49	0.67	57.11	14.65	0.80
<b>U.S. PSID</b>									
Actual	56.27	20.54	0.74	47.43	15.61	0.67	50.09	10.89	0.75
Counterfactual	54.09	17.80	0.74	47.51	14.35	0.68	60.41	11.47	0.81
<b>Sweden</b>									
Actual	–	–	–	47.73	12.78	0.70	–	–	–
Counterfactual	–	–	–	46.83	13.76	0.68	–	–	–

Note: See Table 2 (notes).

ity within the components of net worth is small (Table 6).<sup>12</sup> Imposing a common distribution of characteristics does not result in any change in the inequality rankings for net financial or net housing wealth; except Finland swaps places with Italy and becomes the least unequal in net housing wealth (Gini coefficient, top 10 percent share and top 1 percent net financial wealth). For net financial wealth the most sizeable effects are found for Finland, where the Gini coefficient is reduced by 25 points and

<sup>12</sup>Additional tables reporting the results for the decomposition results conditional on households being owners of the different types of holdings are available in Tables A9 and A10 of the Appendix.

the top 1 percent and 10 percent wealth shares by 65 and 77 percent respectively when the distribution of characteristics is reweighted to resemble the U.K. According to the SCF, the distribution of characteristics in the U.S. has an equalizing effect in terms of the Gini coefficient for net financial wealth and the top 10 percent share but a disequalizing effect in terms of the top 1 percent.<sup>13</sup> Comparisons of the two housing equity components show that although the effects in Finland and Italy are exclusively related to gross housing assets, in the U.S. sizeable effects are estimated for both housing assets and debts. The effects of characteristics have a rather small effect in accounting for the higher degree of inequality observed in Sweden.

## 6. THE UNEXPLAINED COUNTRY EFFECTS

Differences in the distributions of demographic and economic characteristics of households partially explain cross-country variation in wealth distributions but we have shown that a significant share remains unexplained by the household characteristics controlled for in the decomposition analysis. Some related empirical studies also identifying residual country effects have sought to identify country level characteristics that can account for this “unexplained” variation. Christelis *et al.* (2013) conduct a decomposition analysis examining cross-country variation in wealth participation rates and levels for those aged 50 or over between the U.S. and a number of European countries. They regress the unexplained component (coefficient effects) on a number of macro-level economic variables covering factors likely to affect stock ownership (e.g. market capitalization to GDP ratio), entrepreneurial activity and home ownership (e.g. house price index). They find that differences in economic environments captured by these variables explain much of the residual variation in wealth ownership and levels. Sierminska and Doorley (2013) examine differences in wealth ownership rates across a number of European countries, U.S. and Canada. They find that differences in household composition and income explain part of the differences between countries. They regress the unexplained wealth gaps on a set of country-level institutional indicators (such as financial development index, mortgage maturity, economic freedom). They find that wealth ownership is more sensitive to institutional settings among younger households (under 50) than older households and that different institutional settings are related to portfolios decisions. These macro level economic factors and institutional differences between countries will also account for some of the variation in the unexplained differences between countries highlighted in this study. We now examine in more detail the extent to which this unexplained component may be affected by three things: measurement issues, the role of wealth transfers, the role of education loans.

### 6.1. Measurement Issues

Despite the harmonization of key variables in LWS there remain some issues affecting data comparability that could contribute to the unexplained gaps between countries.<sup>14</sup> A feature of the Swedish household survey is that it does not

<sup>13</sup>Results from PSID suggest the opposite for the top 1 percent and the Gini coefficient is unchanged which is likely to be due to differences in the distribution of characteristics within the survey samples.

<sup>14</sup>A more complete discussion of the differences can be found in Cowell *et al.* (2012).

record deposit accounts unless interest payments from these assets exceed 100 SEK (approximately 10 € in 2002). Given that the interest rate was approximately 3.75 percent in 2002 this implies that accounts with less than 270 € were excluded.<sup>15</sup> This will lead to an underestimate of cash savings at the lower end of the distribution. To determine the importance of this restriction we apply a similar bottom coding in the deposit accounts in other countries. Although a small impact at the lower end of the distribution was found in all countries, its impact on overall net worth inequality is trivial. In the U.K. for example wealth inequality in terms of the Gini coefficient remains unchanged by the application of bottom coding.

Another feature of the Swedish wealth survey is that business debt cannot be disentangled from other components of debt. Net worth in Sweden includes business debt held by households, but for all other countries, the measure of net worth we use (NW1; LWS variable) does not include business debt as part of households' liabilities. Since business debt in NW1 is not offset by household held business assets, its inclusion in the Swedish wealth data will affect measured net worth inequality. The importance of this can be assessed by comparing differences in net worth inequality estimates based on NW1 and NW2. The latter is the LWS measure of net worth which includes business assets and liabilities. NW2 is available for only for a subset of countries (Italy, U.S. and Sweden). Estimates of net worth inequality based on these two measures are reported in the first four columns of Table 7. This shows that in all countries except Sweden the inequality of net worth excluding business equity (NW1) is lower than for net worth which includes it (NW2), implying that business equity has a disequalizing effect on net worth inequality. In Sweden inequality in net worth including business equity is lower than the measure of net worth which excludes it. This reflects the fact that the former measure (NW1) includes business debt but not business assets for Swedish households and NW1 wealth inequality in Sweden is over-inflated as a result.

The LWS has sought to harmonize wealth definitions and we apply household weights to adjust for non-random sampling and participant proportions, however the sampling frames vary between the datasets used in our study and may lead to differences in the estimated wealth distributions and inequality measures. In particular the fact that the SCF has better coverage of the top end of the wealth distribution and that the Swedish data is based on administrative records of wealth may lead one to suspect that estimates of inequality measured by the Gini will be higher where coverage of the top end is more complete (Alvaredo, 2011). It is reassuring to note that while the PSID (with similar population coverage as the survey data for the U.K. and Italy) produces lower wealth inequality estimates for the U.S. than estimates from the SCF, these are still higher than all other countries in our sample other than Sweden. Even though survey data for Sweden provides lower estimates of wealth inequality relative to registry based data (Bager-Sjögren and Klevmarken, 1998), it is also the case that survey data for Sweden finds high levels of inequality relative to other European countries

<sup>15</sup>Approximately 15–20 percent of total deposits have been excluded (see LWS survey information for Sweden <http://www.lisdatacenter.org/our-data/lws-database/by-country/swedenwealth/> last accessed 16/02/2016)

TABLE 7  
ACTUAL AND COUNTERFACTUAL INEQUALITY MEASURES FOR NW1 AND NW2 AND THE ROLE OF  
EDUCATIONAL LOANS

	NW1		NW2		NW1 Excluding educational loans		NW2 Excluding educational loans	
	Gini	Top 1%	Gini	Top 1%	Gini	Top 1%	Gini	Top 1%
<b>U.K.</b>								
Actual	0.66	9.98	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>Finland</b>								
Actual	0.68	13.03	n.a.	n.a.	0.67	12.92	n.a.	n.a.
Counterfactual	0.61	11.28	n.a.	n.a.	0.61	11.22	n.a.	n.a.
<b>Italy</b>								
Actual	0.60	10.76	0.62	12.26	n.a.	n.a.	n.a.	n.a.
Counterfactual	0.62	11.57	0.64	12.14	n.a.	n.a.	n.a.	n.a.
<b>U.S. SCF</b>								
Actual	0.83	32.68	0.85	37.46	0.82	32.43	0.85	37.25
Counterfactual	0.81	27.39	0.82	30.46	0.80	27.02	0.81	29.99
<b>U.S. PSID</b>								
Actual	0.80	25.24	0.82	30.33	n.a.	n.a.	n.a.	n.a.
Counterfactual	0.81	26.04	0.81	27.07	n.a.	n.a.	n.a.	n.a.
<b>Sweden</b>								
Actual	0.89	17.52	0.86	17.34	0.83	16.57	0.80	16.53
Counterfactual	0.85	17.77	0.82	17.31	0.80	17.12	0.79	16.76

*Note:* NW1 and NW2 are the two net worth measures which excludes and includes business equity respectively. NW2 measure is available only for a subset of datasets. All other notes as in Table 2.

(Skopek *et al.*, 2011). This suggests that the portrayal of the U.S. and Sweden as high wealth inequality countries is accurate.

A further issue which raises concerns about cross-country comparability relates to differences in the definition of household unit adopted in each survey. In most surveys a household is defined as a group of individuals who live together and share expenses; but the U.K. does not adopt the share of expenses restriction in its definition of household unit. This means that tenants renting a room in a shared house will be included as a member of the main household unit. Typically these tenants will have very few assets, if any, and therefore estimates of wealth inequality are likely to be lower where they are not identified as separate household units. In Sweden although the household unit definition is very close to the one adopted in the other surveys, for individuals in the registry data who did not respond to the telephone interview (around 30 percent), it was not possible to identify cohabiting adults without common children. In this case cohabiting adults are counted as two separate households and only the sample person was included in the survey. This means that in the Swedish survey the number of single person and single parent households is somewhat overestimated (Statistics Sweden, 2006). In our counterfactual analysis we reweight household type distributions to match the U.K. household type distribution which means we can account for the part of the bias related to family type distribution but not any bias that this causes to the wealth estimates themselves.

An important measurement issue is that the measure of household wealth is not comprehensive—it doesn't capture pension or business wealth. The extent to

which the size of missing components vary between countries and differ in terms of their distribution could contribute to the unexplained differences between countries. As noted earlier, the role the welfare state plays in terms of pension provision, subsidizing the costs of tertiary education and providing other in-kind benefits will affect individuals' motives and need to save and accumulate assets. One would expect that the effect of social security in crowding-out private savings would be stronger in the lower part of the distribution (as shown by Hubbard *et al.*, 1995 low wealth accumulation can be explained as a utility maximizing response to asset-based, means-tested welfare programmes and discussed in Davies *et al.*, 2011) which in turn may explain the high degree of wealth inequality in countries with more generous welfare systems and therefore cross-country differences in the wealth distribution in the lower part of the distribution. Therefore, the unexplained cross-country differences in the distribution of household wealth may reflect both the direct effect of the exclusion of social security wealth and its indirect effect through its effect on saving propensities.

Earlier in this section we examined the importance of the exclusion of business equity, highlighting that despite the disequalizing effect of business equity its exclusion from the wealth measure used in this paper does not account for a significant part of the unexplained country effects. We conducted some additional analysis to test the importance of restricting our measure of household wealth to financial and housing wealth by using the non-harmonized measure of household wealth supplied in LWS for the U.S. (SCF). This measure includes all wealth components that are available in SCF, including private pension wealth, life insurance, durables and collectibles, informal loans etc. (Sierminska *et al.*, 2006). The results from this analysis shows that, not surprisingly, wealth levels are higher across the distribution with the more comprehensive measure of wealth, inequality is reduced by a relatively small amount (approximately 4 Gini points) with the exception of the P25/P50 measure which is higher for the more comprehensive measure. Despite the reduced level, wealth inequality in the U.S. remains higher than in the U.K., Finland and Italy.<sup>16</sup> The implication is that our main findings would not be affected by this restriction unless their distribution across households diverge significantly from that observed in the U.S.

## 6.2. *The Role of Educational Loans*

Educational loans are unlike many other forms of debt which are often offset by the value of the asset they were used to fund; educational loans are offset by a future income stream.<sup>17</sup> Our analysis of LWS shows that there is considerable cross-country variation both in the size of educational loans and their take-up rates. Cowell *et al.* (2012) discusses in detail the institutional framework related to educational loans for the five countries. Here we mention the main cross-country differences and we discuss their implications on measured wealth inequality.

For Finland and Sweden the respective loan take-up estimates among eligible students stand at around 35 percent and 65 percent respectively while for the U.S.

<sup>16</sup>These results are available in Tables A11 and A12 of the Appendix.

<sup>17</sup>This is not always the case as the value of consumer durables, vehicles, collectibles and valuables are often not included in measures of wealth.

results from the National Longitudinal Study of Youth suggest that among young adults ever enrolled in college 46 percent have educational loans (Dwyer *et al.*, 2012). Analysis of LWS suggest that educational loans represent about 11 percent of overall financial debt holdings in Sweden and around 3 and 5 percent in Finland and the U.S. respectively. Although educational loan data in LWS are not available for either Italy or the U.K., in both countries the role of educational loans in supporting higher education at the time of the surveys was rather limited (this has changed rapidly in the U.K. during the last 10 years). The results in Table 7 suggest that the exclusion of educational loans from net worth (NW1) has an important effect on net worth inequality in Sweden—where the Gini coefficient falls from 0.89 to 0.83—but its effect is very small in Finland (Gini falls from 0.68 to 0.67) and in the U.S. (Gini falls from 0.83 to 0.82). The Gini coefficients of the counterfactual net worth distribution which exclude educational loans are significantly lower and educational loans explain all of the higher inequality in Sweden relative to the U.S. When we use the estimate of net worth which includes business equity and debt explicitly (NW2), actual and counterfactual inequality is higher in the U.S. than in Sweden when educational loans are excluded.

### 6.3. *The Role of Wealth Transfers*

Cross-country differences in the magnitude and distribution of inheritances, and in the strength of the bequest motives may contribute to the unexplained cross-country differences in the distribution of household wealth. Examining the importance of bequest motives in shaping the distribution of household wealth DiNardi (2004) found that the bequest motive can explain the high levels of wealth holdings and wealth inequality at the upper tail of the distribution in the U.S., Davies (1989) reached similar conclusions. To the extent that the bequest motive varies across the countries under consideration (and this will depend on the interaction of the nature of bequest motives and the extent of welfare state provisions) may explain part of the differences in the degree of wealth concentration at the upper tail of the distribution.

The magnitude and the distribution of inheritances and inter vivos transfers received may be another factor contributing to the unexplained cross-country differences in the distribution of household wealth. Although there is no cross-national study looking at how inherited wealth shapes the distribution of household wealth in different countries, comparisons of results from several country studies shows that despite some significant differences in the absolute level of wealth transfers, their contribution in the distribution of household wealth is similar across the four countries under consideration. Klevmarken (2000) gives estimates ranging from 10 to 19 percent of accumulated wealth stemming from inheritance in Sweden, Wolff and Gittleman (2014) a range from 19 to 35 percent in the U.S. Estimates for the U.K. suggests figures of around 16–28 percent (Karagiannaki and Hills, 2013). Despite these differences in the magnitude of inheritances, all studies find that while the absolute amounts of inheritances are larger for higher wealth households in proportionate terms they are higher for low wealth households (Klevmarken 2000; Wolff and Gittleman, 2011; Karagiannaki and Hills, 2013; Karagiannaki, 2015). Overall, one could expect that despite some country differences in the levels of

wealth stemming from inheritances, inheritance is not a major factor behind differences in the shape of the distribution of household wealth.

## 7. CONCLUSIONS

Obviously income plays a key role in wealth accumulation: but higher income inequality is *not* systematically related to higher wealth inequality. Although unequal income is related to unequal ability to save and accumulate assets, other factors prove to be more important in shaping the distribution of wealth.

The differences between countries' wealth distributions cannot be explained away by differences in age, working status, household structure, education and current income. Taking these factors into account, some wealth inequality comparisons turn out as one might have expected: the U.S. is unambiguously more unequal than the U.K. which is more unequal than Italy. By contrast the position of Finland in the ranking—between the U.K. and Italy—may come as a surprise. But perhaps the very high level of wealth inequality in Sweden (highest in terms of the Gini coefficient, second in terms of top 1 percent, top 5 percent, top 10 percent and P90/P50) seems most at odds with what one might predict given income inequality levels.

The high level of wealth inequality in Sweden may be partly affected by variable definitions but even when these factors are taken into account Sweden remains a country with relative wealth inequality at least on a par with the U.S. However, in interpreting the high relative level of wealth inequality it should be noted that average gross wealth is lowest in Sweden as are wealth levels at P50 and P25; P90 is second lowest after Finland. Also the absolute gap in wealth holding between P25 and P90 is much lower in Sweden than in the U.S. There are good reasons why wealth holdings are relatively low among Swedish households and wealth is unequally distributed in a relative sense even though absolute gaps are smaller. Home ownership is lower in Sweden and the need to hold assets in Sweden is greatly reduced by state provision of health, education, pensions and income replacement during periods of hardship. For many years the Swedish population has saved in the form of higher taxation and therefore private wealth holdings are likely to be less representative of Swedish households' standard of living than, say, for U.S. households. Since the 1990s changes to the Swedish welfare state have meant that Swedish households are increasingly expected to make their own provisions and this may mean that inequalities in private household wealth holdings will become increasingly important.

Housing is the largest physical asset that most households will ever hold. Homeownership rates are similar across four of the five countries at around 70 percent, but Sweden stands out as having relatively low rates (57 percent). Housing supply in Sweden is relatively constrained in large urban areas where there is high demand and the Swedish housing system is quite complex and idiosyncratic. Around one-third of owner-occupied homes (effectively all owner-occupied apartments) are in what is known as the tenant-owned co-operative sector which appears to create a number of market distortions (European Housing Review, 2011). The recently abolished wealth tax and a higher average property tax rate (Hilbers *et al.*, 2008) may have created some historical disincentives to acquire and accumulate housing assets.

Italy also stands out with much lower levels of housing debt, relative to gross housing assets, likely to be explained partly by cultural differences (later age of household formation, greater parental assistance with house purchase, multi-generational households, attitudes to debt) and institutional differences (credit and mortgage markets). This contributes to relatively high levels of net worth among Italian households particularly in the lower and middle parts of the net worth distribution.

Debt holdings lie at the heart of much of the wealth inequality differences across countries. Italy has lower financial debt as well as housing debt. U.S. households are the most likely to hold financial and housing debt and the average value of these debts is greater. In addition, debt-holding among US households is comparatively more common in later life (Cowell *et al.*, 2012; Christelis *et al.*, 2013). Cross-country differences in educational loans, both in their incidence and their average value, explain all of the difference in wealth inequality between the U.S. and Sweden. The contribution of characteristics in explaining cross-country differences is stronger for financial assets than for financial debt, suggesting the operation of stronger unexplained country effects in the distribution of financial debt.

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## SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's website:

**Appendix:** Accounting for cross-country differences in wealth inequality.

**Table A1:** Mean and various percentiles of household net worth by country, thousands 2005 Euros.

**Table A2:** Cross-country differences in the distribution of various demographic characteristics.

**Table A3:** Mean and median net worth by country and household characteristics (thousands 2005 Euros).

**Table A4:** DFL decomposition of the distribution of net worth (figures in thousands of 2005 Euros) - using US as a base country.

**Table A5:** DFL decomposition of net worth inequality - using U.S. as a base country.

**Table A6:** Wealth (level) OLS regressions (thousands 2005 Euros).

**Table A7:** Wealth (IHS transformation) regressions.

**Table A8:** DFL decomposition of the distribution of net worth (figures in thousands of 2005 Euros).

**Table A9:** DFL decomposition of difference in the distribution of different wealth components for owners only.

**Table A10:** DFL decomposition of difference in inequality of different wealth components for owners only.

**Table A11:** DFL decomposition of the distribution of net worth (figures in thousands of 2005 Euros) - including US-SCF all available wealth components.

**Table A12:** DFL decomposition of net worth inequality - including US-SCF all available wealth components.