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Mapping and Measuring the Distribution of
Household Wealth: A Cross-Country Analysis

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Abstract

In this paper we compare the level, composition and distribution of household wealth in five industrial countries: the UK, US, Italy, Finland and Sweden. We exploit the harmonized data within the Luxembourg Wealth Study, which we have extended to allow us to examine trends in the UK and the US between the mid-1990s and the mid-2000s. Remaining differences between surveys, variable definitions and coverage are highlighted to the extent that they impact on cross-country comparisons. We find that the Nordic countries have lower average wealth holdings, smaller absolute gaps between low wealth and high wealth households but high relative measures of wealth inequality. Italian households hold very little debt and are much more likely to own their homes outright, leading to relatively high median levels of wealth. In contrast American households tend to hold much more housing debt well into retirement. Increases in owner occupation and house prices 2000-05 in the UK has led to substantial increases in wealth, particularly median wealth holdings and this had led to falls in relative measures of wealth inequality such as the Gini coefficient even though absolute gaps between high and low wealth households have grown substantially. We show that there are underlying country differences in terms of distributions of age, household composition, educational attainment and income as well as wealth and debt portfolios. Educational loans are increasing in their size and prevalence in some countries and look set to create some marked differences in the distribution of wealth for different age cohorts.

Keywords: household wealth, wealth inequality, debt, housing assets, educational loans, age-wealth profiles

JEL codes: C81, D63, I24, I31

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1. Introduction

Inequality in wealth is considerably higher than inequalities in individual earnings or household income but has received much less attention until relatively recently, due in part to the lack of good quality comparative time series data. Concentration on inequalities in financial flows whilst ignoring inequality in the stock of wealth provides only a partial picture of the distribution of people's financial health. Not only is wealth more unequally distributed than income but it is also highly concentrated among the wealthiest households giving rise to a skewed distribution. This poses particular problems and challenges in the collection of representative data and the measurement of inequality.

While household income and individual earnings provide information on the current standard of living enjoyed by individuals and the households in which they live, household wealth provides additional information reflecting past financial well-being (to the extent that savings represents the excess of income over expenditure) and an indication of future financial health. This makes the study of wealth particularly interesting because wealth represents the cumulative effect of historical inequalities (in earnings, income, inheritance) and has a role in driving future inequalities, through the ability to invest in education and skills, housing, business enterprise, retirement income and bequests.

This paper provides a description of the distribution of private household wealth in five countries – the United Kingdom, the United States, Italy, Finland and Sweden. We examine in detail the relationship between wealth holding and demographic characteristics, looking at how these characteristics shape the distribution of wealth and help to explain differences between countries. We examine the different components of wealth including various forms of debt. Where possible, we compare the evolution of intra-country wealth holdings over time. The objectives of this paper are to gain a better understanding of cross country differences in the distribution of household wealth, variation in demographic and economic factors that underlie these differences and how survey design, variable definitions and coverage contribute to measures of wealth and wealth inequality. The analysis presented in this paper forms the foundation for a further two more analytical papers that explore the role of demography in explaining differences in the distribution of wealth across countries (Cowell, Karagiannaki and McKnight, 2012a) and between countries (UK and US) over time (Cowell, Karagiannaki and McKnight, 2012b).

Comparisons of wealth holdings and their distribution across countries have been greatly enhanced through the availability of harmonized data in the Luxembourg Wealth Study¹; although still below the reliability and quality of international income data series. We use micro data from this database to compare the distribution of household wealth in the five countries. It is known that average wealth holdings and wealth inequality vary between these countries (Sierminska, Brandolini and Smeeding, 2006; Klevmarken, 2006; Jäntti, 2006).

¹ Available through the LIS datacentre <http://www.lisdatacenter.org/>

Our selection of countries was motivated by an interest in understanding how the distribution of wealth varies between countries with different structures of public wealth holdings, demographic profiles and cultural attitudes to wealth and debt. In terms of public wealth holdings we are interested in understanding differences in State provision that affect the incentive for individuals to hold and accumulate assets. For example, in the coverage and generosity of the welfare state in terms of health care, education, housing, unemployment insurance, pensions, etc. In countries with more generous and inclusive welfare state provision there will not only be less incentive to accumulate private wealth holdings but as these services are funded through taxation this will reduce personal income, as taxation represents a form of compulsory saving, and therefore the ability to accumulate personal financial assets. This could lead to a distribution of wealth that is not be as closely aligned to a quality of life that it would appear to afford, compared with countries where the State plays a much less significant role. The five countries included in this study provide some interesting contrasts in terms of culture, household demographics and welfare state provision.

There are many reasons why individuals save and accumulate assets, and why they borrow and go into debt. Economic theory provides a useful starting point for thinking about why individuals and families choose to accumulate and hold financial assets and why we would expect to find an unequal distribution in relation to individual and household demographics within and between countries. Systematic disparities between levels of current income and current expenditure over the lifecycle informed the lifecycle hypothesis (Modigliani and Brumberg, 1954) and the permanent income hypothesis (Friedman, 1957). The concept behind these models and the empirical observation that in part motivated them is that people choose to smooth consumption over time. These theories state that through saving and dissaving individuals/households consume on the basis of their permanent income rather than their current income. While imperfect capital markets and imperfect foresight may prevent individuals from achieving this precisely, the general pattern of income, expenditure and savings is believed to be consistent with these hypotheses. The lifecycle model predicts that individuals/households will borrow during the early years of adult life to fund investments, for example in human capital and housing, then gradually accumulate wealth until retirement from when wealth is drawn down to fund retirement income and eventually any surplus is bequeathed to the next generation. This influence of the lifecycle on wealth holdings means that average wealth and inequality in wealth is likely to vary across countries depending on differences in the age profile of households: for example, between countries with ageing populations and those with relatively youthful populations or between countries with different cultural factors affecting the timing of household formation and the composition of households. The lifecycle dimension of savings and asset holdings plays an important role in understanding the distribution of wealth, both in terms of the gross value of assets and the portfolio of assets held. In addition, the extent to which households accumulate assets, for a given level of disposable income, is affected by cultural factors, tastes and preferences and the economic cycle.

However, disentangling these factors empirically clearly defined age-wealth profiles may simply reflect population (or household) heterogeneity rather than life-cycle factors.

The main routes through which individuals acquire and accumulate wealth are saving from current income, inheritance, inter-vivo transfers and entrepreneurial activity. The wealth can be held in cash, invested in a range of saving and investment financial vehicles, invested in the financial markets, invested in real estate or invested in valuables and collectibles². Financial assets can also generate income, investment in housing reduces long-run housing costs and changing asset prices can generate capital gains.

The comparative data we have available only cover private wealth holdings; we do not include the limited information on pension assets and we chose to exclude business equity which is not available for most countries included in our analysis. We use a concept of wealth known as net worth which is defined as the value of total financial and housing assets, including cash, minus all liabilities (financial and housing). See Sierminska (2005) for more information on how net worth is defined and operationalized in the LWS.

In the analysis we distinguish between two types of wealth – financial wealth and housing wealth. Housing wealth is usually the largest asset held by households. There are cross-country differences in home ownership rates and within country differences in homeownership across the income distribution which are in part influenced by housing policies (Norris and Winston, 2012a/2012b). This includes government support in the rental and owner-occupied housing sectors which could be in the form of direct provision of housing in the social rental sector, regulation of both sectors, amongst others.

Tenure patterns in Western Europe have changed radically since the 1980s towards homeownership as the norm but with elements of divergence particularly in terms of mortgage indebtedness, inequality in affordability and housing quality between Northern and Southern EU15 countries (Norris and Winston, 2012a and 2012b)

Financial wealth is typically less equally distributed than housing wealth with a much greater concentration of direct³ financial asset holding among households at the top of the income/wealth distributions. Cash savings and investments tend to be more equally distributed but stocks and bonds are disproportionately held by wealthier households.

On the other side of the balance sheet, individuals can borrow from financial institutions, family or friends. Access to credit has changed over time, generally increasing, but there remain cross-country differences in attitudes to credit and access to credit. The ‘real’ value of debts can vary over time depending on inflation rates and the value of debt repayment is also affected by interest rates. As with assets, we identify two main types of debt: housing debt and total financial debt including educational loans. Typically borrowing to finance house purchase and to finance education occur relatively early in individuals’ lives and are paid back gradually. In many countries the finance of higher education over the last 30 years has seen a significant shift away from the State (from general taxation) to being increasingly borne by individuals and their families. The major difference between housing and education loans when considering the measurement of

² Due to issues related to data availability we don’t consider the value of consumer durables, valuables or collectibles in this study.

³ Here we do not consider indirect financial asset holdings in pension funds etc.

wealth and its distribution is that housing debts are offset by housing assets (apart from the exceptional cases where negative equity exists) while educational investment generates a stream of income that can be used to generate wealth and therefore has a very different dynamic.

In this paper we contrast average wealth holdings and the distribution of wealth in the UK, US, Italy, Finland and Sweden. We look in detail at demographic differences, asset-ownership rates and differences in age-wealth profiles for different asset types. We examine wealth inequality within age groups and the differences in educational loans, and their evolution. Finally we examine the relationship between income and wealth.

2. Data

We draw our data from the Luxembourg Wealth Study (LWS) made available through the LIS datacentre. International wealth data, drawn from national surveys and in some cases administrative sources, held in this database have been harmonized as much as possible to allow for meaningful comparisons between countries. While a lot of effort has been put into this process it needs to be recognised that differences remain both in the way data have been collected, variable definitions and availability, coverage, coding and imputation which affects comparisons between countries and within countries over time. In this section we provide a description of the country datasets utilised in this study. The LWS currently covers twelve countries⁴ from which we have selected our sample of five (United Kingdom, United States, Italy, Finland and Sweden).

The UK data are drawn from the British Household Panel Survey (BHPS) carried out by the Institute for Economic and Social Research. It was designed to be representative of the British population rather than the UK, although a booster sample for Northern Ireland is available from 2001. This annual survey has followed a random sample of households since 1991. The original 1991 responding sample covered 5,050 households containing 9,092 adults. There have been a number of additions to the initial sample, booster samples etc., and in 2011 the BHPS was superseded by Understanding Society. Since 1991 some households/household members have been lost due to attrition⁵ and where younger original household members formed their own households or where original households have split, these additional households and household members have become part of the sample in their own right. The sample we utilise are all members of the original sample of responding households. Extensive information on financial assets is collected in the BHPS every five years. Where possible all adult household members are individually interviewed. Where this is not possible information from a proxy is permitted. Currently the LWS only includes one wave of the BHPS for 2000. We have undertaken our own harmonization of the wealth information in the BHPS and supplemented the 2000 wave with 1995 and 2005 to create a time series. We present some summary statistics for 2000 that show our harmonization leads to very similar point estimates to the LWS data but some differences remain. We believe that this is due to slight differences in imputation.

⁴ Austria, Canada, Cyprus, Finland, Germany, Italy, Japan, Luxembourg, Norway, Sweden, United Kingdom and the United States.

⁵ This may be non-response to a single annual survey or long-term and even permanent non-participation.

For the US we use data from two surveys: the Survey of Consumer Finances (SCF) and the Panel Study of Income Dynamics (PSID). The SCF is sponsored by the US Federal Reserve Board in association with the US Department of the Treasury. The survey covers around 4,500 families, collecting information on income and wealth. A booster sample, chosen on the basis of information contained in tax returns, is selected to disproportionately sample wealthy families⁶. Response rates are lower for this booster sample than for the main sample. The Panel Study of Income Dynamics has been run by the University of Michigan since 1968. The original sample of 5,000 US families (18,000 individuals) consisted of a nationally representative sample and a second sample of lower income families. These original families have been followed, with relatively low attrition rates, and where original family members form new households these households become part of the study. In addition some booster samples have been added (such as the Latino and immigrant samples). Due to its design the SCF has better coverage, particularly in terms of top wealth holders, while the coverage of the PSID is more similar to the other surveys included in this study so we have included both in our analysis. In the LWS information is available from the PSID for 2001 and for the SCF 2001, 2004 and 2007⁷. As part of the funding that supported this project, in collaboration with the LIS datacentre, we extended the SCF series by adding harmonized data from the 1995 and 1998 surveys.

For Italy, data from the Survey of Households Income and Wealth (SHIW) is used. This survey is conducted by Banca D'Italia and began in the 1960s. The original survey was designed to collect information on the incomes and savings of Italian households. It has since been extended to include wealth and other aspects of households' economic and financial behaviour. The sample has a combination of cross-sectional and panel members drawn from registry office records, and the survey is conducted on a biennial basis. In 2004 the survey covered 8,012 households containing 20,581 individuals, 3,604 of these households had previously been interviewed. The household head is interviewed, providing information for all household members. The LWS currently holds SHIW harmonised data for 2002 and 2004.

For Finland the Household Wealth Survey (HWS) combines information from interviews (assets, liabilities and inheritances along with household demographics) with that contained in administrative databases (most of the income data). Dwellings are priced at market value according to house price statistics. Information in LWS is currently available for 1994 (5,000 households) and 1998 (4,000 households) and is limited to private households permanently resident in Finland (i.e. excluding immigrant households). The wealth data have been collected using face-to-face interviews with the sampled household member who provides information on wealth for the whole household.

⁶ The wealthiest 400 families, defined by Forbes magazine, are excluded from this sample.

⁷ Here we use the convention of labelling SCF and PSID surveys according to the convention adopted by their depositors which refers to the year in which the survey took place. LIS/LWS use the convention of labelling the surveys in relation to the year in which the income data relates to (ie the previous calendar/financial year) but our focus is on wealth for which data is collected in the year of the survey. The PSID interviews take place between March and November and SCF interviews take place between May and December.

The Swedish data are drawn from the HINK/HEK population sample produced by Statistics Sweden, combined with interview survey data and administrative records. The annual survey of household finances (HEK) is based on a sample of Sweden's population. Data are collected partly by telephone interviews. Household composition is established during these interviews. The composition of households not responding to this interview is established using register data (tax assessments and population registration). However, the weakness with this method is that only parent/child relationships can be established. This means that individuals who are cohabiting but are not married and don't have/or haven't had children together, and do not respond to the interview (around 30 per cent), are considered single. This leads to an overestimate of single persons and single parent households. Data on property ownership and value are taken from tax records and real estate price indices. Estimated values for individual tenant-owned apartments is less straightforward and are typically computed on the basis of average values of transferring prices for sold tenant-owned dwellings, submitted by housing co-operatives in a particular location (depending on data availability this may be parish, municipality or even county level). The quality of information on the value of tenant-owned dwellings is questionable due to the imprecision of this method and the fact that no information is available on the size of dwellings and therefore the average value of sold dwellings may or may not be representative, particularly where few properties are sold (Statistics Sweden, 2006). In the 2002 LWS dataset information is available for 18,000 households containing 41,000 individuals. It is a stratified random sample drawn from the total population register.

3. Definitions

Wealth holdings are typically computed at the household level by summing all wealth (and debt) holdings across all members of a household. Households are then often described in terms of the characteristics of the household head. Normally, no equivalisation is made for household size or composition. This contrasts with earnings statistics which are usually presented (as they are paid) on an individual basis and income which is typically expressed at a household level and equivalised using a variety of scales that adjust for 'need' based on household size and composition to facilitate comparison on a like-for-like basis. There is no consensus on whether or how household wealth holdings should be equivalised. In our analysis we use unadjusted measures of household wealth.

The outcome of using raw household wealth data is that households are clearly not equal in their ability to accumulate wealth or their 'need' for wealth holdings. Households with more adult members are likely to have higher wealth than households with fewer adults and, arguably, larger households wealth needs are greater. Through using household level wealth measures there is an underlying assumption that this provides a good description of the wealth status of household members and against other alternatives this may well be the most realistic. However, it should be borne in mind that wealth ownership within a household can take various forms with some assets personally owned by individual members and some jointly owned between household members. Some assets may be jointly owned with other family members or individuals who are not household members. Similarly some debts may be viewed as personal (such as credit

card debt, personal loans, bank overdrafts, etc) while others are more likely to be joint (mortgage debt). As an example of the complexity of intra household asset ownership, legal ownership of household assets is frequently contested upon divorce/separation and settlements vary across different jurisdictions.

A further problem relates to differences in conventions for defining a household. A household can be defined as all individuals residing together who share living facilities, who are related, maybe eat together and who might share expenses. The UK (BHPS) defines a household as a group of people who simply live together. This can include extended family members and even lodgers. In the US (PSID) a household (family unit) is defined as a group of people who live together as a family, generally related by blood, marriage, or adoption or living together on a permanent basis and share both income and expenses. In the US (SCF) a slightly different definition is used, referred to as a Primary Economic Unity (PEU). In this survey a household is defined as a couple (married or living as partners) or an individual and everyone else who is financially dependent on that individual or couple and/or share expenses. In Italy (SHIW) a household is defined as all persons who normally live together related by blood, marriage or affection and who share finances. In Finland (HWS) the household is defined as all persons living together who have total or partial food economy or are otherwise spending their money together. While these four countries vary in the extent to which the definition of a household involves sharing expenses and resources they are broadly comparable. The definition of a household in Sweden (HEK) is somewhat different. Due to the fact that the sample is drawn from administrative registers which are typically based on tax units the definition of a household is not the same as that conventionally used in social surveys. The Family Unit definition in HEK classifies children over the age of 18 who reside with their parents as a separate family unit (household). The RTB (total population register) definition of a family unit includes all individuals with family ties that are registered at the same address, but cohabiting couples without dependent children are classified as two separate family units (no doubt a reflection of their tax status). It is our understanding that the household definition used in the LWS Swedish data is based on the Housekeeping Unit. The Housekeeping Unit includes all individuals living at the same property who have common “housekeeping”. Children aged 20 or older, and still living at home with their parents, are also included in the housekeeping unit. However we understand that for those not responding to the telephone interview (around 30 per cent), individuals who are cohabiting but are not married or, as noted above, do not have/have not had children together, are considered single. This has an impact on measures of wealth and its distribution across households and makes it difficult to compare Sweden in a consistent way.

In this paper we follow the convention of computing wealth holdings at the household level and the classification of households is defined by the characteristics of the household head. In addition to the definition of a household, there are differences in how household heads are defined in the different surveys. In the UK (BHPS) the household head is the person legally or financially responsible for the accommodation, or the older of the two people equally responsible. In the US (PSID/SCF) the household head is the male in a married or couple family or the older individual in the case of a same-sex couple and the single individual where there isn't a core couple. In Italy (SHIW) the household head is the major income earner. In Finland (HWS) the principal rule,

although there are some exceptions, is that the household head is the person with the highest income. In Sweden (HEK) the main income earner is designated as the household head, except where a household member has business income as a major source of income. In households where there is no earned income the oldest member is designated household head. So the main difference between these five countries is the fact that households in the US are more likely to be headed by a male, as the person legally or financially responsible for the accommodation is highly likely to be the highest earner.

Cultural differences in household composition as well as definitions imposed by survey administration may affect the extent to which the characteristics of the household head are a good characterisation of the household. For example, differences in the incidence of multi generation households will affect the extent to which different age heads represent different generations or even points in the lifecycle. Differences and changes over time in the average family size (number of children) will affect, among other things, the extent to which previous generations wealth is concentrated or dispersed. The extent to which students reside with their parents rather than forming their own households will affect the incidence of educational loans in households where the long term liability for these loans will not fall. Changes in life expectancy will affect the age at which the next generation will inherit and cultural differences in the practice of inheritance (concentration and dispersal of wealth) and the extent to which wealth is left to children, grandchildren or more widely. Inheritance tax rules will also have an impact.

The main measure of wealth used in this paper is an estimate of net worth. Net worth is defined as the sum of total financial assets less total non-housing debts and total housing assets less housing debt. This measure of net worth excludes estimates of business assets and debts, life insurance and pension assets, and durables or collectibles.

Financial assets are the sum of monies held in current accounts, deposit and savings accounts, bonds, stocks, mutual funds and other investment funds.

Non-housing debt is the sum of vehicle loans, total instalment debt (credit cards etc.), educational loans, loans from financial institutions, informal debt.

Housing assets are the total value of the principal residence and investment real estate. This can be estimated by the survey respondent (as in the UK) or computed from tax records and house price indices (as in Sweden).

Housing debt is principal residence outstanding mortgage, plus other property outstanding mortgage loans and other home secured debt.

A number of differences between the definitions across countries are worth highlighting. In the UK (BHPS) information is not collected on the value of cash held in current accounts (sometimes known as checking accounts). The implication is that for the UK there will be a lower estimate of money held in the form of cash savings. This is most likely to have an impact on estimates at the lower end of the wealth distribution. Prior to 2000 there is no information in the UK on educational loans or bank overdrafts. The omission of educational loans is likely to have a negligible effect because although they

were introduced in 1990 only a minority of households held them even in 2000 (more on this below). In the UK business property assets cannot be distinguished from housing property investment.

Savings accounts in Sweden are only recorded if the interest earned on the account was above 100 SEK per annum (equivalent to about 10 Euro in 2002). Given that the interest rate was approximately 3.75% in 2002 this implies that accounts with less than around 270 Euro were excluded. This will lead to an underestimate of cash savings in Sweden, most likely affecting the lower end of the wealth distribution. Also in Sweden we understand that there may be errors in the calculation of housing assets and debts for households living in tenant-owned dwellings (outlined above). In addition we are aware that debts are likely to be captured with great accuracy, since interest paid on debts leads to tax deduction and therefore there is a greater incentive to accurately report debt than to report assets. In the Swedish data it is our understanding that business debt cannot be separately identified and is included with financial and housing debt. This will lead to an overestimate of debt in Sweden in a comparative sense.

4. Household wealth and its distribution within and across countries

In this paper we use a number of different measures and methods to compare wealth across countries and over different time periods (see Jenkins, 1990 for a discussion of some of the issues in relation to the measurement of wealth and its distribution). Average levels of wealth are described using the mean and median which given the highly skewed nature of the distribution of wealth tend to diverge to a much greater extent than is observed for individual earnings or household income. We also look at the value of wealth, and its components, at different percentile points of the distribution.

For inequality measures we have a more limited choice of measures than for say earnings or income as net wealth can legitimately take values across the full real number line. Not all inequality measures can deal with zero or negative values. However, both the Gini coefficient and the General Entropy measure ($\alpha=2$), are defined and we adopt these two inequality indices in our analysis. In some cases we measure inequality in terms of percentile ratios but avoid percentiles towards the lower end of the distribution as percentile ratios are not defined over zero and negative values.

Where inequality is being measured over a variable which only takes positive values, for example earnings, the Gini coefficient is bounded by zero and one: where *zero* denotes complete equality where all members of a population hold equal shares of the variable of interest and *one* indicates the situation where one member of a population has everything. As noted above the Gini coefficient is also defined over zero and negative values and under these circumstances it is not limited to the unit interval. To understand how it behaves in general, notice that, for a vector of n observations (x_1, \dots, x_n) , we can write the Gini coefficient as

$$G = \frac{A}{\mu}$$

where A is the so-called absolute Gini, defined as

$$A = \frac{1}{2n^2} \sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|,$$

and μ is the mean:

$$\mu = \frac{1}{n} \sum_{i=1}^n x_i.$$

It is clear that the absolute Gini A could itself be used as an inequality measure: it is zero if there is perfect equality and is positive otherwise; a mean-preserving spread in the values of x_i and x_j will increase A , whether x_i and x_j are positive or negative; it is unaffected by replications of the distribution (doubling the population for example).⁸ It is also clear that the conventional Gini coefficient G is positive or negative as μ is positive or negative; if all the observations were negative or zero then G would lie between zero and -1 ; but if the mean is close to zero (because of the presence of both negative and positive x -values) then G can become infinitely large and it may be more illuminating to work with the absolute Gini.

Comparing the five study countries on the basis of mean household net worth reveals wide cross-country differences (Table 1). Throughout this paper wealth values are expressed in 2005 Euros (thousands) using the Euro 16 purchasing power of parity to improve comparability. Comparing countries as close to the year 2000 as possible, and using data from the SCF for the US, we would rank the US highest followed by Italy, the UK, then Finland and finally Sweden. However if we use the estimate of mean household wealth derived from the PSID for the US, Italy would move to the top spot. Mean household wealth in Sweden (and to a lesser extent Finland) is considerably lower than in the other countries, both these countries have a generous welfare state which affects the need for households to accumulate assets to privately fund, for example, education, health and pensions. Klevmarken (2006) notes that a generous system of public pension provision alongside relatively high taxation of the return to capital, on the stock of wealth and of gifts and bequests before the 1990s in Sweden are seen to have reduced the incentive to accumulate private wealth. Incentives increased from 1990 with the deregulation of financial markets, reductions in the tax of capital incomes and growing uncertainty of the future generosity of public pensions, but the statistics presented here suggest that average wealth holding in Sweden remained lower than many countries. However it is important to note that differences in the definition of households which result in a greater number of single headed households, the inclusion of business debt and the exclusion of some cash savings in the Swedish data are likely to affect these estimates. All countries have experienced growing mean household wealth over the time

⁸ However A does not have the scale independence property although it is translation invariant – it remains constant under uniform additions to all (x_1, \dots, x_n) .

series we have available, with a very large increase observed in the UK between 2000 and 2005 and the US over the period 1995 to 2001 (SCF).

Because wealth distributions are highly skewed estimates of median wealth are considerably lower than estimates of mean wealth. In Italy, Finland and the UK the median is between one-half and two-thirds of the value of the mean (in 2005 in the UK it increases to 70 per cent) but in the US it is only one-quarter (one-fifth in the SCF). Comparing mean wealth with the value of wealth held at the 75th percentile (P75) demonstrates very clearly just how skewed the distribution of wealth is, with mean wealth higher than P75 wealth in the US (SCF and PSID) it can hardly be representative of the ‘average’ value of wealth held by households.

Table 1: Mean and various percentiles of net worth by country and year, thousands 2005 Euros

	Mean	Median	P10	P25	P75	P90	P99
LWS datasets							
UK 2000	119.7	64.4	-0.3	2.7	153.4	310.4	882.1
Finland 1994	47.6	32.2	-4.5	0.3	70.7	124.4	313.2
Finland 1998	66.5	41.0	-2.7	0.7	89.4	159.7	505.8
Italy 2002	163.6	104.0	0.0	15.9	212.2	369.2	1179.6
Italy 2004	179.0	119.4	0.5	15.1	234.3	409.0	1185.7
US 1995 (SCF)	128.0	29.8	-6.0	0.0	106.4	254.6	1372.8
US 1998 (SCF)	157.9	35.4	-7.8	0.0	136.1	314.5	1961.8
US 2001 (SCF)	207.0	42.4	-6.3	0.3	155.6	418.4	2689.2
US 2004 (SCF)	228.6	43.4	-7.4	0.2	173.1	479.4	3011.5
US 2007 (SCF)	246.6	50.2	-9.4	0.1	189.9	483.3	3755.9
US 2001 (PSID)	154.3	39.0	-4.1	0.1	147.1	360.5	1572.9
Sweden 2002	50.6	15.5	-13.1	-0.7	69.4	151.1	456.0
BHPS (our estimates)							
UK95B	90.8	43.3	-0.2	1.5	114.7	231.2	749.2
UK00B	118.3	65.0	-0.1	2.9	152.3	313.5	805.3
UK05B	218.2	152.6	0.0	13.5	296.5	517.6	1232.3

1. Net worth (NW1) is equal to the sum of net financial assets (total financial assets (TFA1) minus financial debt (non-housing debt (NHD) in LWS wording)) and housing equity (equals to the sum of own principal residence, investment real estate (TNF1) minus mortgage debt).
2. All monetary values are expressed in 2005 Euros (Euro 16 ppp).

Source: LWS database and BHPS waves 5, 10 and 15.

If we compare the values of net worth at the top and bottom of the net worth distributions by looking at estimates at the tenth percentile (P10) and the ninetieth percentile (P90) we again see some interesting differences across these five countries⁹. With the exception of

⁹ 10 per cent of households hold net worth below the value defined at the tenth percentile. Where a number of households hold the same value of wealth (ties) we have introduced a tiny amount of random noise to the data so that all households are identified with a unique value of wealth and therefore a unique position in the ranked distribution. What this means is that households with the same value of wealth can appear in different deciles where the breakpoint divides households with tied wealth holdings.

Italy and the UK¹⁰, households at the tenth percentile of the distribution are in debt. The highest value of debt held at the tenth percentile is found in Sweden¹¹ followed by the US and in contrast to the other three countries the amount of debt held in the US by households at the tenth percentile has increased over the time period we observe. Looking at the top of the distribution, estimated by the value at the ninetieth percentile, we see that in most countries the value of net worth held is around four times the value held at the median. However, in the US the difference is much greater at around ten times the median value. Estimates of the 99th percentile (P99) show the minimum value of wealth held by the wealthiest 1% of households captured by the surveys. It is striking how much lower these values are in Sweden and Finland, particularly in relation to the very high values in the US. The better coverage of wealthier households in the SCF relative to the PSID is highlighted by the much higher P99 value recorded in the SCF2001 (2689.2) relative to the PSID2001 (1572.9).

What is also clear from Table 1 is the considerable difference in the absolute gaps between different points in the wealth distribution that exists between countries and how these have changes overtime within countries. The size of the absolute gaps is obviously lower in countries with lower average wealth holdings and have increased as average wealth holdings increased. Comparing countries around the year 2000, the gap between the wealth holding of the median household and a household at the 10th percentile is highest in Italy at 104,000 (in 2005 Euros) compared to 65,000 in the UK, 49,000 in the US (SCF), 44,000 in Finland and 29,000 in Sweden. The ranking in absolute gaps between the median household and the 10th percentile household changes to US highest gap, followed by Italy, UK, Sweden and Finland and, with the exception of Sweden and Finland swapping position, this ranking also holds for the gap between the 90th percentile household and the 10th percentile household. For the UK and the US where we have sufficient time series we find large increases in the size of the absolute gaps over time. Between 1995 and 2001 absolute gaps between these three percentile pairs increases nearly two-fold but the increase in median wealth holdings in the UK (1995-2000) leads to a more than three-fold increase in the size of the absolute gap between the median household and a household at the 10th percentile (from 44,000 to 153,000).

More detail on the description of the distribution of wealth can be found in Table 2, which shows the concentration of wealth, for positive values of net worth, and the percentage of households reporting zero or negative values for net worth, net financial wealth and net housing wealth. As our data do not capture the wealthiest households, even the SCF sample excludes members of the Forbes 400 (a list of the wealthiest 400 Americans), our top wealth share are likely to underestimate the true extent of wealth concentration such as that shown by Atkinson (2006). As we noted earlier the incidence of zeros and negative values affect our estimates of wealth inequality. Firstly if we compare the concentration of wealth across countries we observe the much higher levels of concentration in the US; about three times as high in terms of the top 1% share in comparable years. This is found for estimates using the PSID as well as the SCF so is not solely due to the greater coverage of high wealth holders in the SCF.

¹⁰ Our estimates of the tenth percentile in the BHPS in 2000 show negative net worth, positive in 2005.

¹¹ We suspect that the high value of debt shown for Sweden is affected by the inclusion of business debt.

In the US the wealthiest 1% of households hold nearly 30 per cent of total positive net worth, the wealthiest top 5% hold around half of all positive net worth and the wealthiest half of all households hold around 95 per cent of all positive net worth. In terms of the time series we have available we observe the greatest increase in concentration between 1995 and 1998, a further smaller increase between 2001 and 2004 and, if anything, a slight fall between 2004 and 2007. The other four countries share similar magnitudes of concentration: with the top 1% holding around 10 per cent of total positive net worth, the top 5% holding 28 per cent and the top 50% holding around 90 per cent. Out of these four countries (UK, Finland, Italy and Sweden), Sweden has marginally higher concentrations and the UK (taking 2000 as the comparison year) the least concentrated in terms of the share of wealth held by the top 1%. Between 1994 and 1998 we observe increases in concentration in Finland. Where time series are available, the UK is the only country that records notable falls in concentration for each of the shares between 1995-2000 and 2000-2005. In 2004/05 concentration among the top 1% was four times higher in the US compared with the UK, while in 1995 it was 'only' twice as high in the US.

The second panel showing the shares of households reporting zero or negative values reveals some interesting differences between our five study countries. The figures in this table show that a sizeable share of households report zero or negative values for net worth and its components and this needs to be born in mind when interpreting inequality estimates. The main features are:

- A relatively low share of Finnish households report zero net worth;
- The very low share of Italian households with negative net worth is evident but also a relatively high share of Italian households report zero net financial wealth;
- Although the estimates of negative housing wealth should be treated with caution we note that the highest shares are found in Finland (particularly 1994)¹²;
- The much higher share of Swedish households reporting negative net worth is evident;
- Increases in the share of UK households holding either zero or negative values of net financial wealth and falls in the shares reporting zero or negative net housing wealth.

¹² In the early 1990s Finland suffered an economic recession along with a housing market crisis, so while the estimates of negative equity using LWS data are unlikely to be very accurate the higher incidence of negative equity in Finland is likely to be real.

Table 2: Top wealth shares, zero wealth and negative wealth (percentages)

	Net worth (positive values)				Net worth		Net financial wealth		Net housing wealth	
	Top 1%	Top 5%	Top 10%	Top 50%	zero	negative	zero	negative	zero	negative
LWS datasets										
UK 2000	9.2	27.7	42.2	90.4	6.3	11.5	12.4	24.9	30.2	0.3
Finland 1994	7.4	22.9	35.7	86.3	2.8	18.4	8.5	31.5	30.2	3.2
Finland 1998	11.5	27.8	40.5	88.0	2.1	15.0	4.7	26.8	31.3	1.8
Italy 2002	10.7	28.2	41.4	89.2	7.4	2.7	17.4	5.4	27.4	0.7
Italy 2004	9.9	26.8	39.9	89.1	6.1	3.3	15.6	6.3	27.9	0.8
US 1995 (SCF)	23.4	44.9	58.6	95.3	4.9	20.9	6.4	41.7	32.8	0.8
US 1998 (SCF)	29.2	50.4	62.2	94.5	4.2	20.4	5.6	37.6	31.8	1.3
US 2001 (SCF)	28.7	50.8	62.7	94.9	4.0	19.2	5.2	37.8	30.9	0.9
US 2004 (SCF)	29.7	53.2	65.3	95.6	3.5	19.0	4.9	41.0	29.4	0.3
US 2007 (SCF)	28.5	52.2	64.8	95.8	3.5	20.2	4.6	42.2	29.7	0.5
US 2001 (PSID)	27.6	53.3	65.2	95.4	7.6	15.9	11.7	29.3	35.0	0.5
Sweden 2002	13.5	31.2	44.9	91.5	5.0	27.4				
BHPS (our estimates)										
UK 1995	10.7	30.4	45.2	92.2	4.7	11.9	6.8	22.0	29.4	1.6
UK 2000	8.4	26.6	41.3	90.5	4.7	10.9	8.5	23.7	26.5	0.2
UK 2005	7.1	23.1	36.0	86.3	5.2	9.3	9.1	24.4	22.8	0.1

Source: LWS database and BHPS waves 5, 10 and 15.

These simple descriptive statistics give an impression of the distribution of wealth and inequalities in wealth holding, more formally we can look at inequality measures such as the Gini coefficient and percentile ratios (Table 3). Looking first at the Gini coefficients we see that the US not only has the highest mean wealth but also has the highest level of inequality according to this measure. However, while Sweden has by far the lowest mean wealth and relatively low values of wealth held by the wealthiest households, inequality of wealth, measured by the Gini, is higher than in the UK and Italy. In Finland we find evidence of a fall in inequality between 1994 and 1998. This is inconsistent with Statistics Finland's assessment of inequality in gross and net wealth between these two surveys (Statistics Finland, 2000) and Jäntti (2006) who both show increases in wealth inequality based on the same surveys. It is possible that this is due to some differences in the definition of wealth but most likely due to the fact that Jäntti's estimates are for individuals and not households and household wealth has been equalised. The estimates of the Gini coefficient of net wealth in Jäntti (2006) are considerably lower than our estimates of inequality of net worth using LWS data derived from the same surveys.

In the US we find inequality in net worth, according to the Gini coefficient, remains fairly stable (1995-2007), but in the UK we observe large falls in wealth inequality between 1995 and 2005, particularly between 2000 and 2005. The two observations we have for Italy are too close together to assess any trend over time. Table 3 also includes an alternative measure of inequality drawn from the General Entropy class of inequality measures. The GE(2) measure of inequality ($\alpha=2$) is relatively sensitive to changes at the top of the distribution, and therefore more sensitive to outliers, relative to the Gini which is more sensitive to changes around the mean. When we use this measure of inequality to compare countries, inequality in Finland in 1994 is roughly the same as in the UK in 1995 and we identify an increase between 1994 and 1998. We see falling wealth inequality in the US particularly between 2001 and 2007, in contrast to stability in the Gini coefficient, and falling inequality in the UK.

The final four columns of Table 3 show measures of inequality based on ratios of different percentiles in the wealth distribution. The lowest percentile we consider is the 25th percentile to avoid percentiles with negative or zero wealth values. The 90/50 ratio and the 75/50 ratio provide estimates of the dispersion of wealth above the median. Both measures show a similar pattern. Between 1995 and 2005 we observe a fall in dispersion above the median in the UK. In the US above median dispersion measured by the 75/50 ratio rises 2001-2004 and then falls between 2004 and 2007, but including changes further up the distribution captured by the 90/50 ratio shows an increase 1995-2004 and then a narrowing 2004-2007. Inequality above the median, 90/50 ratio, is higher in the US than in the other four countries demonstrating higher wealth inequalities at the top of the wealth distribution among US households, although inequality measured by the 75/50 ratio is highest in Sweden this is driven by the very low median value (Table 1). Dispersion below the median shows a different picture. The 25/50 ratio shows very little difference between the value of wealth held by households at the median and those at the first-quartile. The highest ratio is found in Italy which no doubt reflects greater positive values of net worth lower down the wealth distribution than in the other three countries (this ratio and the 75/25 is not defined for Sweden due to negative net worth at P25). Dispersion in the lower half of the distribution is also relatively high in the UK and

increased between 1995 and 2005, no doubt influenced by the large increase in the median shown in Table 1. The 75/25 ratio (interquartile range) gives an estimate of the broader distribution of wealth. The multiples of wealth holdings between these points in the distribution are higher in the US than in the other three countries, considerably greater compared with Italy. We also observe big increases in this ratio in the US between 2001 and 2007, in contrast to the UK where the ratio has fallen between 1995 and 2005.

Table 3: Gini, GE(2) and estimates of percentile ratios by country and year

	Gini	GE(2)	P90/P50	P75/P25	P75/P50	P25/P50
LWS datasets						
UK 2000	0.665	1.198	4.822	55.895	2.383	0.043
Finland 1994	0.707	1.152	3.864	219.053	2.196	0.010
Finland 1998	0.683	1.613	3.895	123.111	2.182	0.018
Italy 2002	0.602	1.157	3.551	13.333	2.041	0.153
Italy 2004	0.596	1.106	3.426	15.467	1.963	0.127
US 1995 (SCF)	0.830	20.985	8.539	*	3.567	0.000
US 1998 (SCF)	0.835	16.465	8.876	3255.150	3.841	0.001
US 2001 (SCF)	0.834	15.233	9.876	570.600	3.673	0.006
US 2004 (SCF)	0.834	13.952	11.045	759.200	3.987	0.005
US 2007 (SCF)	0.836	13.505	9.630	2281.000	3.783	0.002
US 2001 (PSID)	0.806	10.159	9.254	1006.667	3.775	0.004
Sweden 2002	0.893	5.322	9.723	*	4.466	*
BHPS (our estimates)						
UK 1995	0.687	1.523	5.343	76.761	2.649	0.034
UK 2000	0.655	1.099	4.822	52.732	2.343	0.044
UK 2005	0.587	0.810	3.391	21.950	1.942	0.088

Note: Net worth (NW1) is equal to the sum of net financial assets (=TFA1-NHD) and housing equity which is equal to the sum of own principal residence, investment real estate (TNF1) minus mortgage debt of all household members. * denotes ratios that are not defined due to negative values of net worth at P25.

Source: LWS database and BHPS waves 5, 10 and 15.

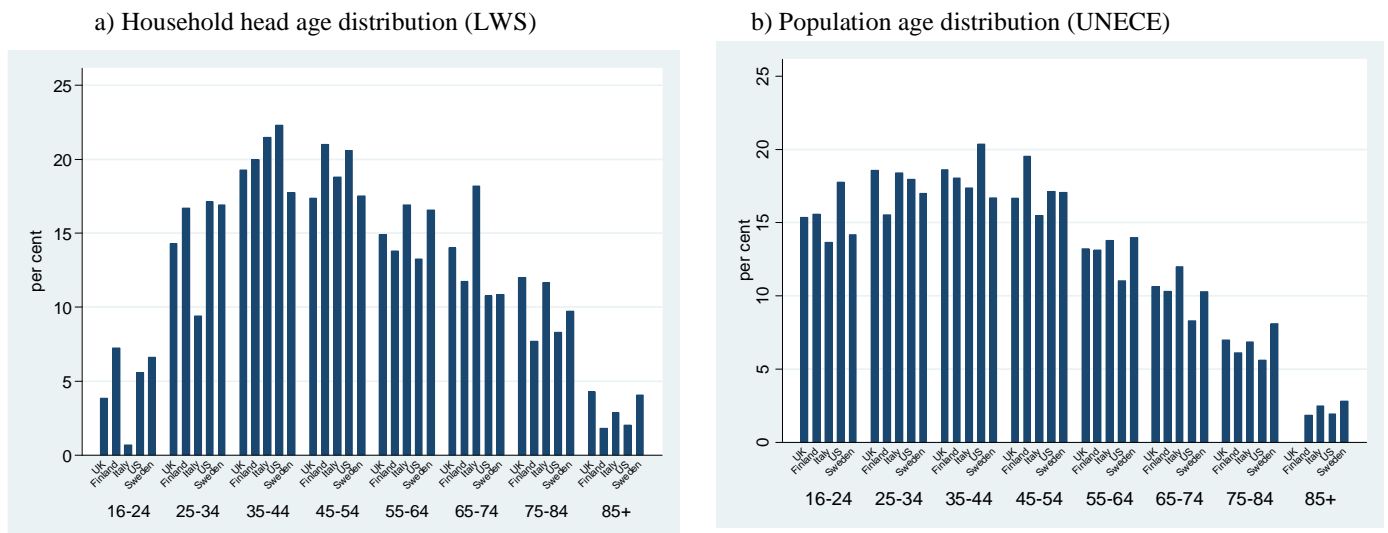
5. Household demography

These substantial cross country differences could result from a number of factors. Some appear to be due to differences in the data collection, survey design and population coverage. However, not all of the cross-country differences can be explained by these factors. Economic theory tells us that wealth holding will typically vary over the lifecycle and therefore population differences in the age profile of individuals/household heads could lead to different average wealth holdings between countries and different distributions of wealth within countries over time. For example, relatively youthful or ageing populations could explain some of these cross country differences. Given that we are looking at household wealth the age composition of adult household members is also important. In this section we provide a description of the differences between countries and over time for a number of key demographic variables. Cowell, Karagiannaki and McKnight (2012a) goes further in terms of seeking to understand the extent to which differences in the distribution of wealth between countries can be explained by demographic differences.

Figure 1 shows the age distribution of household heads across the five countries in the LWS (1a). There are clearly some differences between these five countries. Finland has

higher proportions of household heads that are in the younger age groups and Italy's household heads are skewed more to the older age groups, particularly relatively higher share in the 65-74 age category and lower shares in the 16-24 and 25-34 categories. When we compare these distributions with population distributions, rather than household heads, from an international comparable source (1b) we see that the age distributions across these countries are much more similar than those for household heads; although the relatively older Italian and Swedish populations are evident. However, it does also show a relatively youthful population in the US and a more pronounced elderly population in Sweden. This comparison tells us that there are clear cultural (or at least country specific) differences in the age of household formation and household configuration. For example, the much later age of household formation in Italy relative to the other four countries is clear. As our wealth estimates measure wealth at a family/household level these differences will have an effect on average measures of wealth and the distribution of wealth across households.

Figure 1: The age distribution of household heads in LWS surveys compared to the age distribution of the population aged 15+



Note: The UNECE statistical database does not include statistics for the population aged over 85 for the UK and the population aged over 90 for the US. *Source:* LWS (left hand-side figure) and UNECE Statistical Division Database (<http://w3.unece.org/pxweb>), compiled from national and international (Eurostat and UNICEF TransMONEE) official sources (UNECE statistics refer to 2000). LWS data refer to 2000 for the UK, 1998 for Finland, 2001 for the US SCF, 2002 for Sweden and 2002 for Italy.

Another factor that can affect cross country variations in the level and distribution of wealth is household size and composition. As wealth is typically measured at the household level without any form of equivalisation, household size and composition, particularly in terms of the number of adults living in a household, will affect measures of the distribution of wealth. Table 4 shows the within-country distribution of household types across the five countries in the LWS for the survey year closest to 2000. We find some variation in the shares of households headed by single males and single females across countries. Sweden stands out as a country with a much higher share of single

male/female household heads and a relatively low share of couples with dependent children (see earlier note). Smaller shares of households headed by a lone parent or single males and females are observed in the Italian data than in the other four countries and a higher share of couples with children. The greater incidence of multigenerational families and adult children living with their parents in Italy can be seen in the higher share of couples and singles living with other adults. The relatively high share of singles living with other adults in the UK is likely to be due to the definition of a household in the UK data which extends to include tenants (see earlier note). To varying degrees, in all five countries, there are more households headed by single females than single males which is most likely due to the fact that women have a longer life expectancy than men. The UK estimates using the LWS data and our own estimates from the BHPS show very similar household type distributions. The PSID and SCF estimates for the US do show some differences, mainly higher shares of couple households in the SCF data which could be related to the fact that the SCF has better coverage of higher wealth households which are most likely to be couple households.

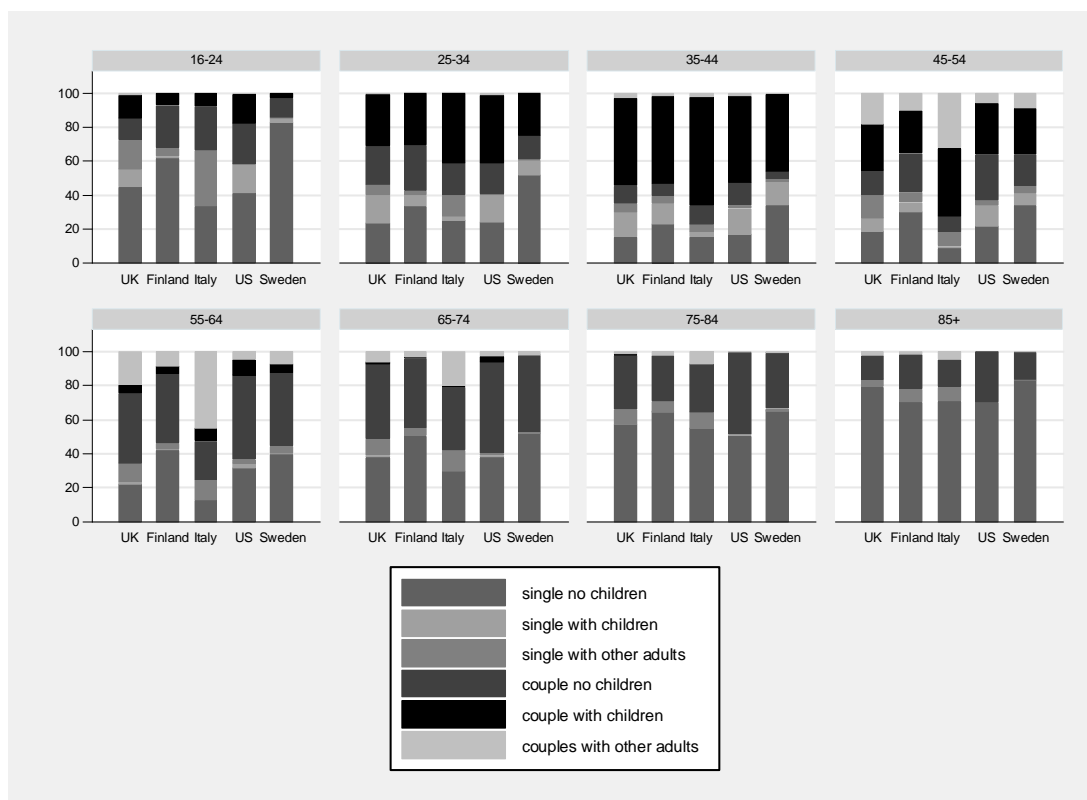
Table 4: Distribution of household type: percentage of households

	UK 2000	UK ¹ 2000	Fin 1998	Italy 2002	US 2001 (PSID)	US 2001 (SCF)	Swe 2002
Single male	12	12	16	8	14	12	23
Single female	20	20	23	15	19	16	25
Lone parent	6	8	5	1	8	10	6
Couple no children	25	24	26	20	23	30	23
Couple with children	20	20	22	26	25	27	18
Couple with other adults	7	8	4	19	6	3	3
Single with other adults	9	10	4	10	5	2	2
Number of households	4,867	4,867	3,893	8,011	6,090	4,442	17,954

Notes: (1) Own estimates from the BHPS.

Figure 2 shows how the distribution of household composition varies within age groups across countries. For these charts we have chosen the year closest to 2000 for which data are available to compare countries. We see some interesting differences that could affect the distribution of wealth. In the UK and the US we observe higher shares of households in the younger age groups (16-24 and 25-34 years) headed by lone parents than in Finland or Italy. The higher share of couples with children in Italy is evident in the 35-44 and 45-54. We find substantially higher shares of single headed households in Sweden in the 16-24, 25-34 and 45-54 age groups, we believe this can be explained by the way households are defined in Sweden (see earlier note). The greater shares of couples with other adults and single headed households in the 45-54, 55-64 and the age groups 65 plus among Italian households reflects the greater incidence of multigenerational households and children leaving the parental home at a relatively older age.

Figure 2: The distribution of marital status and presence of dependent children by age of household head



Note: Figures for the UK refer to 2000, Finland 1998, Italy 2002, US(SCF) 2001 and Sweden 2002.

Another important factor that has been shown to be important in previous studies is ethnic background (see, for example, Altonji and Doraszelski (2005) who examine the wealth gap between Black and White Americans). Unfortunately there is limited information in LWS. For the UK, the BHPS representative of ethnic minorities is known to have declined in later waves of the survey¹³ as due to its longitudinal nature the large influx of new migrants cannot enter the panel unless they enter one of the BHPS households formed by the original sample. This means that the representativeness of the BHPS, in terms of ethnicity, will fall over period of increasing immigration. The information we have available for 2000 only records 3 per cent of household heads in the UK classified as non-White, which is a considerable underestimate and leaves a sample too small for any meaningful analysis by ethnic groups. There is no information on ethnicity for Finland or Italy in the LWS. The Swedish data records that 95.3 per cent of the sample are Swedes, and of the remaining 4.7 per cent 1.6 per cent are Finnish, Norwegian or Danish; again leaving a very small ethnic minority sample. The US, which is the most ethnically diverse of the five countries, does have good information on ethnicity (typically referred to as race in the American literature). Table 5 shows the distribution of race in the US 1995-2007. The figures in this table show the clear increases in the share of Hispanic/Latino household heads in the US, increasing from 5.3

¹³ The original BHPS sample was drawn to be representative of the British population in 1991 but small sample sizes make detailed analysis by ethnic groups problematic.

per cent in 1995 to 9.4 per cent in 2007 and the fall in the share of households headed by 'White' Americans from 75.7 per cent in 1995 to 73.9 per cent in 2007.

Table 5: The distribution of race and ethnicity in US (SCF)

	1995	1998	2001	2004	2007
White-include Middle Eastern/Arab with white	75.68	76.38	76.23	73.53	73.87
Black/African-American	14.51	13.5	13.04	13.67	12.66
Hispanic/Latino	5.3	6.72	7.95	9.16	9.41
Other	4.51	3.4	2.78	3.65	4.06

Source: LWS SCF

Table 6 shows racial differences in median values of net worth and inequality measured by the Gini coefficient for the US. We observe substantially lower median values of net worth for the non-White groups and although there are large percentage increases observed over this time period this is only relative to a much lower starting point and overall they have hardly improved their relative position, for example, median wealth among the 'white group' increased by 26,900 (in 2005 Euros) between 1995 and 2007 while median wealth among Black/African-Americans increased by only 1,700. Estimates of Gini coefficients show higher levels of inequality within households headed by non-White Americans but inequality among Black/African-American households has fallen over this time period but still remains substantially above that found among White Americans.

Table 6: Median values and inequality of net worth by race in US (SCF)

	1995	1998	2001	2004	2007	Change 1995- 2007 %
	Median					
White-include Middle Eastern/Arab with white	45270	51782	63597	66750	72099	59
Black/African-American	170	1009	974	2305	1831	977
Hispanic/Latino	158	1275	853	2134	2081	1217
Other	8601	23455	25517	57938	77826	805
	Gini					
White-include Middle Eastern/Arab with white	0.815	0.816	0.809	0.812	0.818	0.37
Black/African-American	0.961	0.934	0.951	0.957	0.902	-6.14
Hispanic/Latino	0.908	0.959	0.917	0.893	0.918	1.10
Other	0.913	0.770	0.803	0.751	0.769	-15.77

3. Net worth (NW1) is equal to the sum of net financial assets (total financial assets (TFA1) minus financial debt (non-housing debt (NHD) in LWS wording)) and housing equity (equals to the sum of own principal residence, investment real estate (TNF1) minus mortgage debt).
4. All monetary values are expressed in 2005 Euros (Euro 16 ppp).

Source: LWS SCF

6. Asset and debt ownership

An additional factor that can affect cross-country differences in the distribution of wealth is the tendency to hold different types of assets and debts which could be determined by a number of factors including cultural differences (for example in relation to home ownership, use of credit cards, inheritance) and differences in state provision and policies (educational loans, access to credit markets, tax incentives, etc). Figure 3a shows age ownership profiles by asset and debt components for observations closest to the mid-1990s (comparative data is not available for Italy or Sweden), Figure 3b for observations closest to the year 2000 and Figure 3c for observations in mid-2000 for the US¹⁴, UK and Italy (comparative data is not available for Finland or Sweden). In general the different components of wealth have quite marked age-ownership profiles the shapes of which are broadly common across countries but there are some clear differences in ownership rates.

While the overall shape of the age-profiles may reflect an underlying lifecycle pattern both time and cohort effects, and possibly an interaction between the two, are likely to have an effect. It is not possible for us to disentangle these effects. For example, a cultural shift in one country towards homeownership could increase ownership rates among younger age cohorts and this could give the impression that homeownership rates are relatively high for young age-groups in this country but without longitudinal data it is not possible to see whether this leads to sustained higher homeownership rates at later ages or whether it is sustained in later cohorts. Similarly a recession, for example, could affect a particular age group for a specific age cohort hard leading to higher than average financial debt for this group. This could lead to higher debt for this cohort as they age or debt levels could return to the average after the recession. Overall this means that cross-sectional age-wealth profiles may not reflect true lifetime profiles of wealth ownership. In addition population (and household) heterogeneity could explain some of the differences in ownership profiles between age groups and countries.

Before examining in detail the profiles we observe in individual countries and time periods, we look at the general age-ownership profiles for different wealth components. We find that the majority of households hold savings accounts across all age groups leading to fairly flat age-ownership profiles. In contrast, investments (the sum of bonds, stocks and mutual funds) are more likely to be held by households where the household head is aged 35-65 than younger and older household heads. Ownership of housing and investment real estate increases steeply with age but is lower among older household heads. Stocks and mutual funds followed by bonds have the lowest ownership rates among the assets types we consider and their ownership rates increase somewhat with age, falling back after around age 65. On the other side of the balance sheet, financial debt shows a distinctly different age-profile from that observed for assets. Consistent with the lifecycle theory, a higher share of households with younger household heads hold financial debt and this share falls with age. The share of households with mortgage debt increases with household heads' age in line with housing assets and falls after around 45 as mortgages are paid off.

¹⁴ The PSID does not disaggregate between savings accounts, bonds, stocks and mutual funds so in this section we only include data from the SCF for the US.

For the mid-1990s we have information for the UK, US and Finland (Figure 3a). We observe lower shares of household heads in the UK with savings accounts in the younger age groups which is most likely to be explained by the fact that cash held in current accounts are not included in the UK figures. Households in Finland are least likely to hold investments particularly among older (over 55) household heads. Households in the UK are more likely to hold bonds¹⁵, particularly among households with older household heads. This may be related to the popularity of premium bond holdings among these household which are often of low value. There are very low rates of bond ownership in Finland across the age range. It is noticeable that higher shares of US households hold financial debt.

Figure 3b shows ownership rates for financial assets and debts for the information we have closest to the year 2000 for all five countries. We find that savings accounts are prevalent in all five countries, lower in the UK as in the mid-1990s and households in Sweden are substantially less likely to have savings accounts particularly among household with young household heads. However, as noted above, a cut-off is applied whereby savings in Sweden which earn less than 100 SEK interest per annum are excluded. The result of this is that the share of households with savings accounts is underestimated in Sweden. In contrast only a minority of households hold Bonds, Stocks and Mutual funds, with the exception being Sweden with much higher shares of households holding stocks and mutual funds across all age groups. We observe a fall in Bond ownership in the UK some of which appears to be real but some is likely to be due to a change in survey categories that led to an overestimate in 1995¹⁶. There is very little Bond ownership in Finland and Italians are the least likely to hold Stocks and Mutual funds. Share and mutual fund ownership in Finland increased between 1994 and 1998, a period over which there were large increases in share values in Finland. We observe falls in ownership rates of stocks and mutual funds in the UK and the US which is likely to be the effect of the stock market crash in 2000 following the ‘dotcom bubble’. The timing of the observations for Finland, the US and the UK are important in regard to relating changes in ownership and stock market events. We find very similar homeownership rates across the UK, Italy, Finland and the US but lower rates in Sweden. The rates are higher in the younger age groups and lower in the older age groups in the UK compared to the other three countries but this may be due to time and cohort effects. The relatively high home ownership rates among young Italian headed households are likely to be affected by the fact that the number of Italians household heads aged 16-24 is very small and this is a very select group (see Figure 1a).

In the LWS Swedish data it is not possible to separately identify financial and housing debt so data on debt for Sweden is not included in these charts. We find that over 60 per cent of households in the UK, US and Finland whose household head is aged 25-34 years

¹⁵ In the BHPS 2000 and 2005 we classify as bonds the following investment categories: National Savings Certificate (nvesta), Premium Bonds (nvestb) and National Savings Bonds (nvestf). As stocks we classified the following categories: Shares (nveste), PEP (nvestd), Unit Investment Trusts (nvestc), Other (nvestg). There was some change over time which may have led to an overestimate of bond ownership in 1995.

¹⁶ In 1995 households were asked if they held any investments in National Savings/Building Society/Insurance Bonds. Although the category was meant to capture investments in Bonds we suspect that some households reported on savings. In 2000 and 2005 the category was redefined as National Savings Bonds.

hold some financial debt. Consistent with the findings above on net assets at the 10th percentile in Italy, very few Italian households hold financial or mortgage debt. Use of credit cards and bank loans are significantly lower in Italy than in many countries. Low rates of ownership of mortgage debt is not because home ownership rates are lower in Italy which does suggest that Italians are more likely to own their homes outright. Possible explanations for this are greater financial assistance from family members, inheritance, smaller family size leading to wealth becoming concentrated moving down generations and the Italian tradition of young people leaving the parental home later than in many other industrialised countries giving a greater opportunity for young people to build up savings for a deposit. In addition mortgage loan repayment terms are typically 10 years in Italy which is significantly lower than the norm of 25-30 years elsewhere. Higher shares of American households with heads over the age of 25 have some financial debt and although the share of households with financial debt declines with age, as in other countries, as much as one-fifth of American households with a head over 85 years of age have some financial debt. The share of households with mortgage debt reaches its peak in the 35-44 age group, US households are much more likely to have mortgage debt among older household heads than in the UK, Finland or Italy. Around half of American households with a head aged 55-64 have mortgage debt compared to 30 per cent or less in the UK, Finland and Italy. About one-third of American households with a head aged 65-74 still hold housing debt while the comparable figure for the UK, Finland and Italy is less than 10 per cent. It would appear that the US credit market allows Americans to take out mortgages which require repayment post retirement age. Another difference we observe is that in the UK households with heads under the age of 45 are more likely to have mortgage debt than in the other three countries. This may be related to a variety of factors including different styles of homeownership (buying properties with friends/other family members) and the design of mortgages (size of deposit, length of repayment period).

Figure 3c shows ownership rates for the UK, US and Italy in mid-2000s (we don't have an observation for Finland or Sweden). We note that by and large the patterns we observe in the mid-1990s and 2000 are stable over time. Comparing the charts in 3a with those in 3c we note that in the UK homeownership rates have increased overall from 65 per cent to 72 per cent and there are greater percentage point increases among households with heads aged 55-64 (72 per cent to 84 per cent) and aged 75-84 (52 per cent to 69 per cent). Interestingly the overall share of households with mortgage debt actually fell slightly between 1995 and 2005 from 39 per cent to 38 per cent, indicating a small increase in outright ownership. The only age group where there is an increase in mortgage rates is found in the 55-64 age group – 31 per cent in 1995, 29 per cent in 2000 and 33 per cent in 2005. In the US we observe falls in mortgage debt rates between 1995 and 2001 (67 per cent to 47 per cent) and then an increase up to 2007 (50 per cent) but increases are observed between 2001 and 2007 for households with heads over the age of 55.

Figure 3a: Proportion of owners by age of household's heads (mid 1990s)

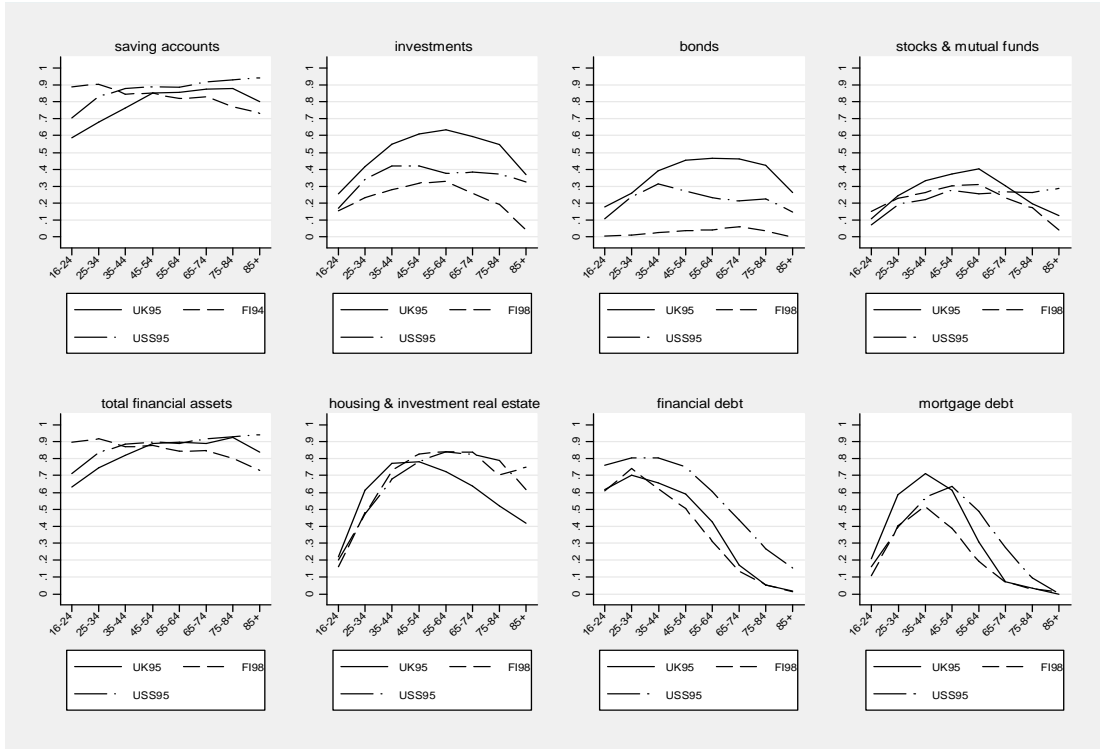
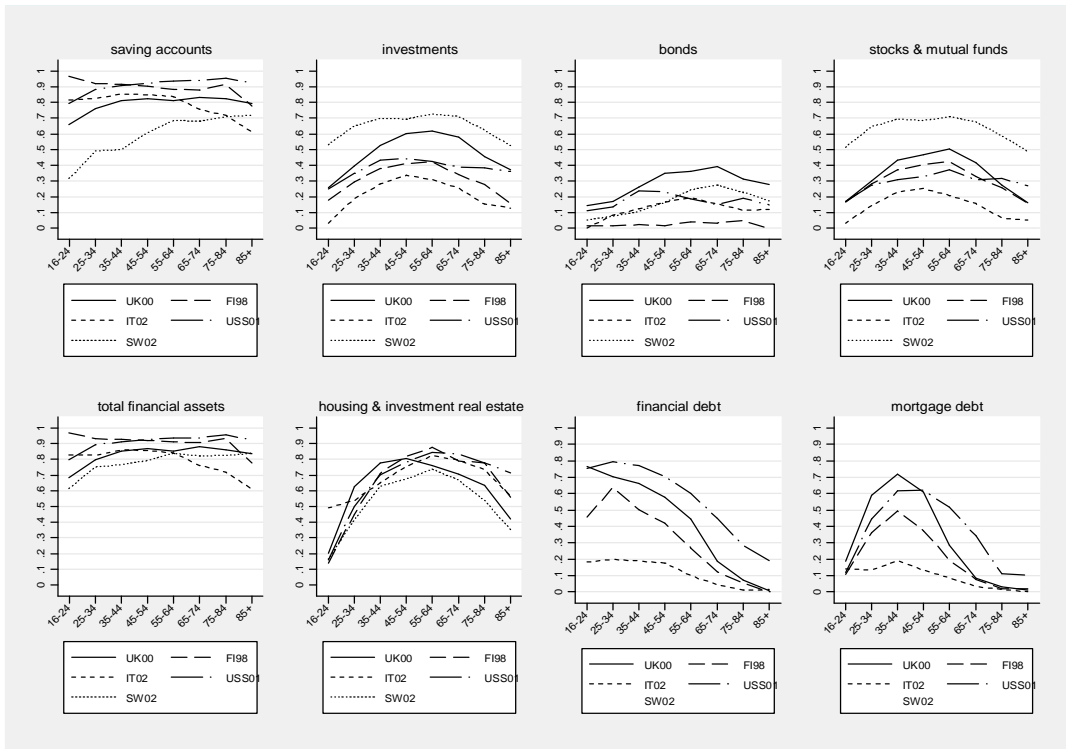
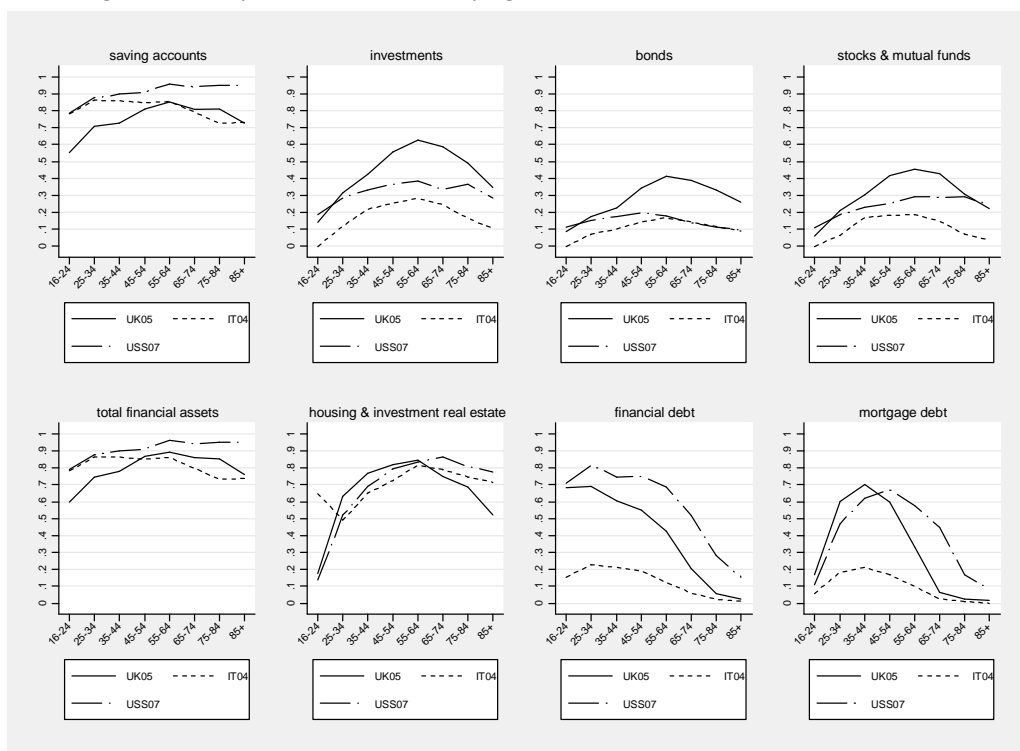


Figure 3b: Proportion of owners by age of household's heads (early 2000s)



Note: LWS database and BHPS wave 10. UK 2000, Finland 1998, Italy 2002, US 2001 and Sweden 2002.

Figure 3c: Proportion of owners by age of household's heads (mid 2000s)



Note: LWS database and BHPS wave 15.

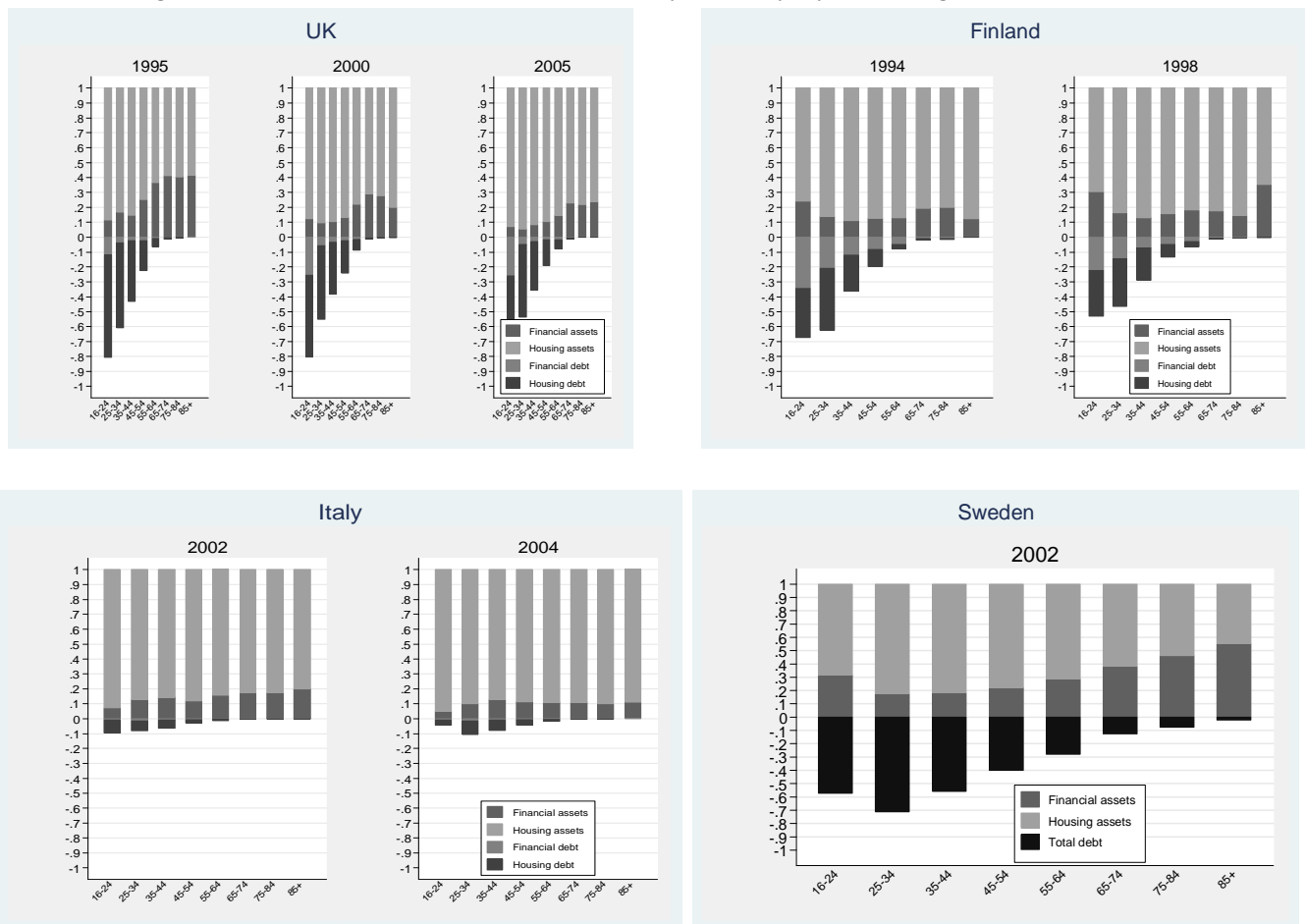
7. Constituent components of wealth over the lifecycle

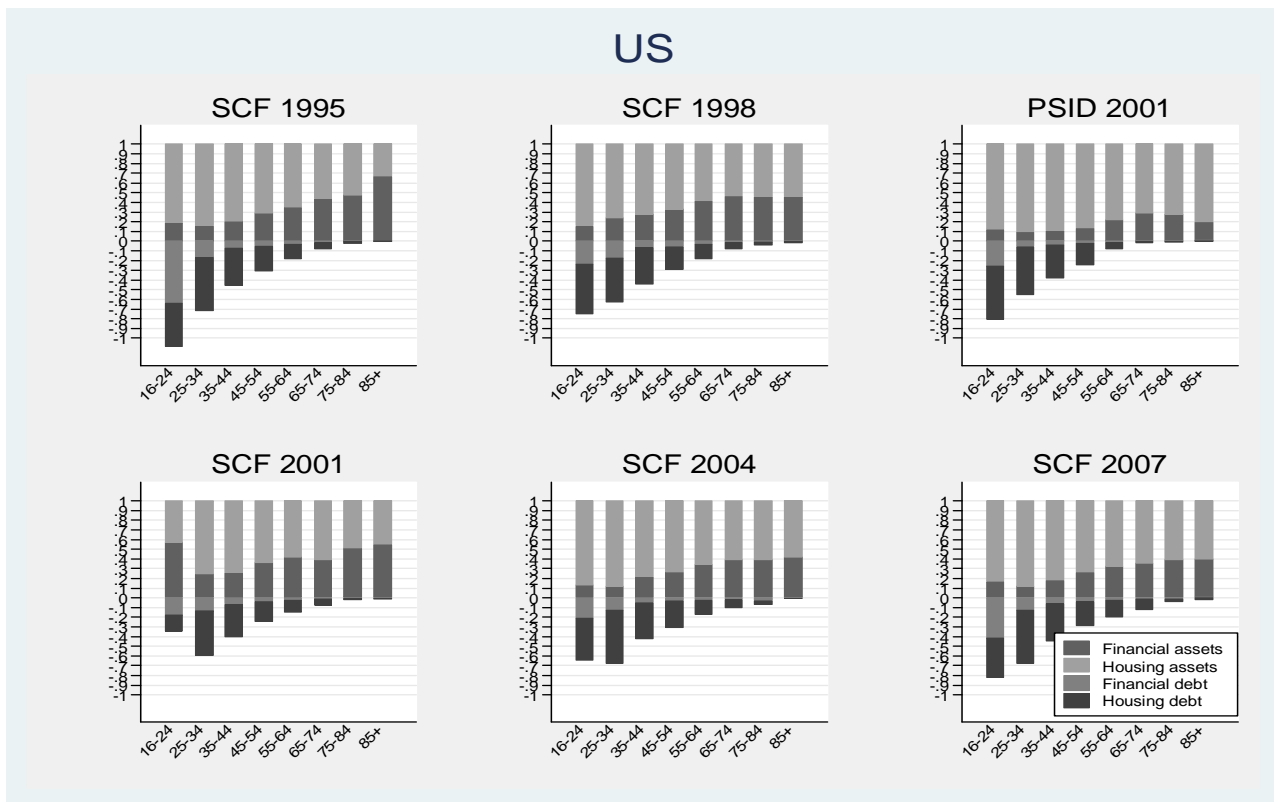
Ownership rates only provide a partial picture as they do not inform us of the value or concentration of different assets held. The share of different components of wealth at different age groups and between countries adds to this picture. In Figure 4 we show wealth component shares in overall gross wealth within age groups. For example, in the UK 1995 10 per cent of gross wealth in the 16-24 age group consisted of gross financial assets and 90 per cent gross housing assets. The information on debt shows that housing debt represented 68 per cent of gross wealth (for example, for every 1,000 euros of gross wealth held by these households there is 680 euros of housing debt) and a further 12 per cent is financial debt leaving an overall positive value of average net worth for this age group (net wealth is 20 per cent of gross wealth).

In all countries and time periods the majority of gross wealth is made up of gross housing wealth. In the UK, US and Sweden the share of housing wealth tends to fall with the age of the household head as the share of gross financial assets increases. In Finland and Italy much flatter age-profiles are observed with gross housing wealth making up around 80-90 per cent of gross wealth for most age-groups and years. The exceptions are found in Finland for the youngest age group (16-24) in 1994 and in 1998 where gross financial assets make up 30 per cent of gross wealth for this age group and in the over 85 age group in 1998 (34 per cent). This may be due to increases in share ownership, at least among the older group, and big increases in share values over this period.

Over time in the UK we see that by 2000 and 2005 housing wealth's share increases among most groups and particularly among older households (heads over 65 years) to around 80 per cent from about 60 per cent. This is partly due to increases in home-ownership among these households but also, and more importantly, because house prices increased. In the US we find increases over time in the share of wealth made up of housing wealth. Relative to the other countries in this study US households have the highest share of wealth comprising of financial assets. The PSID data in 2001 shows a lower share of financial assets than the SCF, demonstrating the better coverage of the SCF for financial assets. The results for SCF2001 do look a little out of line with other years, with lower shares of housing wealth for all age groups, in particular the 16-24 age group, we don't yet have an explanation for this.

Figure 4: Wealth share of different wealth components (proportion of gross wealth)





8. Age wealth profiles

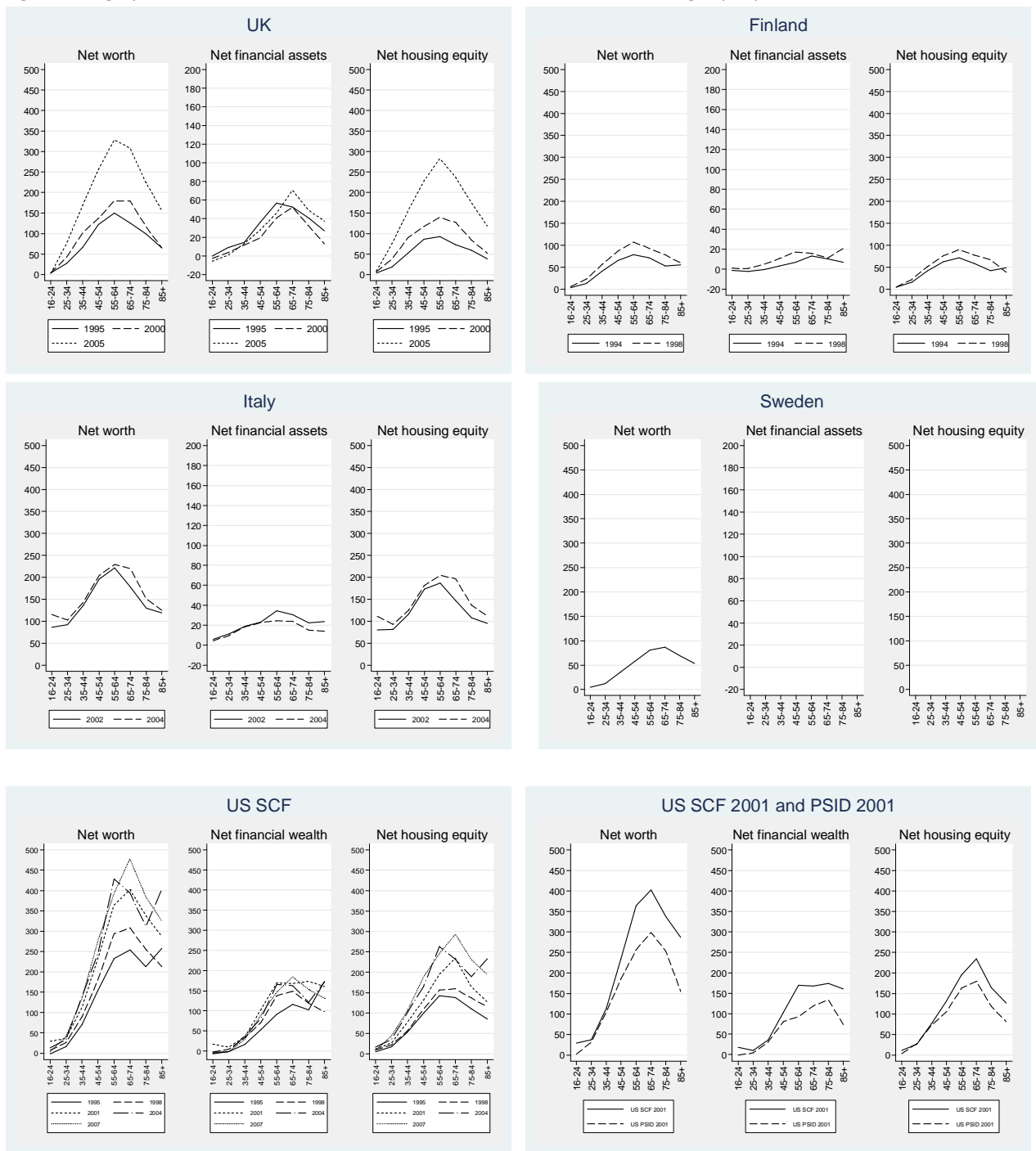
Figure 5 shows the mean wealth age profiles for countries and time periods for which we have comparable data. The first vertical panel contains age profiles for mean total net worth, the middle panel contains the age profiles for mean net financial assets and the final panel mean net housing equity. In the UK we observe real increases in average net worth for all age groups, except for the 16-24 age group, and this is driven by increases in net housing equity particularly between 2000 and 2005. There is no systematic change over time in the real value of mean net financial assets although we do find an increase among households with heads over the age of 65 between 1995 and 2005 but also a reduction in households with younger heads and 2000 values are always at or below 1995 values. This may partly be explained by an increase in the incidence and value of student loans (not recorded in 1995) and the recording of bank overdrafts from 2000. For Finland, we observe a small increase in mean net worth for most age groups between 1994 and 1998 in both net financial assets and net housing equity. In Finland the lower average levels of net worth relative to the UK, US and Italy is very clear and this is true for net financial assets and net housing equity. In Italy the two data points are only two years apart so it is not possible to analyse meaningful changes over time. As in the UK and Finland the shape of the mean net worth age-profile in Italy is largely shaped by net housing equity.

For the US we present two figures, one showing the time series from the SCF data and the second comparing SCF and PSID data for 2001. As noted earlier the SCF has better coverage of the wealthiest households, so, as expected, we find much lower mean values for net worth, net financial assets and net housing equity in the PSID data. It is very clear that while the PSID underestimates the mean value of net housing wealth to some extent relative to the values recorded in SCF, the greatest difference between the two surveys is in the estimates of mean net financial assets for household heads over 45. The value of mean net financial assets recorded in the PSID for household heads aged 55-64 is half the value recorded in the SCF (80,000 Euro compared with 160,000 Euro). In the US (SCF) we find strikingly different age profiles for mean net financial assets compared with the other countries. The average value of net financial assets held by households in the US with heads over the age 35 is much higher than in Italy, Finland or the UK. We particularly find much higher mean values of net financial assets in US households with heads aged 45 and over. As shown above, mean values of net financial assets make up a much larger share of net worth than in the UK, Italy or Finland.

Overall we find that net housing equity shapes the mean net worth profiles. In the UK and particularly the US, households hold much larger values of net financial assets after the age of 45 compared with Italy and Finland. The US stands out in terms of holdings of mean net financial assets. This is not just due to the better coverage of financial assets in the SCF as it is also evident in the PSID which is more comparable with some of the other surveys in LWS (eg BHPS) in terms of coverage. Different time periods covered by the surveys and the limited time series in Italy and Finland limits the extent to which we can make across-time comparisons. In the US we observe similar increases in age specific mean net housing equity 1995-2007 as that observed in the UK 1995-2005 but a greater share of the increase occurred between 1995 and 2001 compared to the UK where the main increase took place between 2000 and 2005. Both the UK and the US had big increases in average net housing equity over the 1995-2005/07 period. Trends in net financial assets in the UK and US have clearly been affected by stock market trends, with UK age specific means in 2000 at or below 1995 values (ie fall in the real value of mean net financial assets) and the big increase between 1995 and 2001 in the US which was followed by falls in 2004 and in 2007. In 2007 only US households with heads aged 65-74 had mean net financial assets above the real value held by their 2001 counterparts.

We are only able to show the age profile for mean net worth for Sweden in 2002 as we are unable to compute net financial assets or net housing equity due to the fact that we are unable to separately identify financial and housing debt. This profile is similar to that observed for Finland but shows the lowest mean values for similar years across countries.

Figure 5: Age profiles in mean net worth, net financial assets and housing equity - thousand Euros (2005)



Source: LWS database and BHPS waves 5, 10 and 15. Household weights are used.

Note: All monetary values are expressed in 2005 thousand Euros (Euro 16 ppp).

The mean is sensitive to outliers and as we know that the wealth distribution is highly skewed towards high wealth holdings, it is informative to examine different points in the distribution of wealth. Within each age group (defined by age of household head) households are ranked by net worth and the different wealth components (net financial assets and net housing equity) and these rankings are used to estimate the value of wealth at different percentiles shown in Figure 6. The first vertical panel shows the age specific values at the 10th percentile (P10). Negative values of total net worth (ie debt) at the tenth percentile are found in the younger age groups. The exception being Italy where at the 10th percentile of net worth, no value is below zero for any age group. After around age 45 in Finland and 35 in the UK net worth at P10 rises to approximately zero. In Italy positive values of net worth are estimated at P10 from age 35 onwards. For the US we find that negative values of net worth at P10 are recorded further up the age distribution to around age 55. Negative values at the 10th percentile of net financial assets are greater and reach much further up the age distribution than for net worth. At the 10th percentile of the net housing equity distribution the value is zero for all ages as non-homeowners are included in the distribution.

We observe a fall in the value of net financial assets at the 10th percentile (ie an increase in debt) in the UK between 1995 and 2000 for households with heads up to the age of 55, but as overdrafts and student loans were not recorded in the 1995 survey but were recorded in the 2000 survey it is not possible to say if this represented an increase in debt for these age groups or just a change in the coverage of the survey. As noted earlier this is unlikely to be due to omission of student loans in the 1995 survey as these didn't really take off until 1998/99 after the introduction of top-up tuition fees and the replacement of maintenance grants, except for students from low income families, with student loans. The further fall between 2000 and 2005 cannot be explained by these two factors as there was no change in the coverage of debt components between the 2000 and 2005 surveys. However, there was an increase in student loans over this time period (we shall return to this point in Section 10 below). Negative net financial assets (debt) at the 10th percentile are found higher up the age distribution in 2005 compared with 2000. In Finland, between 1994 and 1998 we observe an increase in net financial assets (fall in debt) at the 10th percentile for households with heads aged between 25 and 55. In the US we see quite large falls in net financial assets (increases in debt) at the 10th percentile. Not only did US household debt increase within age groups but debt at the 10th percentile extended further up the age range so that by 2007 all but the oldest households headed by those 85 years and older had negative net financial assets.

The middle panel of Figure 6 (P50) shows the age profiles for median net worth and the medians within the distributions of net financial assets and net housing equity. Not surprisingly the shape of these profiles is similar to those shown in Figure 5 for mean values. As the distribution of wealth is skewed towards high wealth holders, median values are (typically) below mean values (note difference in y-axis scale in Figures 5 and 6). This is most pronounced in the US data, both median net financial and net housing equity age-profiles are much flatter than their mean equivalents shown in Figure 5. It is evident from this comparison that high value net financial assets, and financial assets in general, are held by households above the median. The increases in net housing equity in the UK between 2000 and 2005 is nearly as much pronounced, albeit at lower values, at the medians as at the means, showing how increasing housing equity benefited

households in the middle of the distribution and was not concentrated among the wealthiest households. This is in contrast to the US. Focusing on the 55-64 age group we find that in 1995 mean net housing equity was much higher in the US than in the UK (142,000 euro compared with 93,000 euro) while median values were higher in the UK (73,000 euro compared with 65,000 euro) but the increases in mean and median values between 1995 and 2005/06 were much greater in the UK (204 per cent increase in the mean and 197 per cent increase in the median) than in the US (73 per cent increase in the mean and 52 per cent increase in the median). The result was that by 2005/06 both mean and particularly median values of net housing equity were much higher in the UK than in the US and this is true for the full population of households not just this age group.

The concentration of net financial assets among the wealthiest households is evidenced in the final vertical panel of Figure 6 (P90). The concentration is greatest in the UK and US, with much smaller differences between age-specific median and P90 values in Finland and Italy. P90 values of net housing equity are higher than P90 values in the age-specific net financial wealth distributions, although in the UK in 1995 the two values for households with heads over the age of 45 are very similar. The growth in net housing equity in the UK was even more pronounced at P90 than at the median (note differences in the y-axis scale) and it is noticeable that while the main increase at the median occurred between 2000 and 2005 net housing equity at the ninetieth percentile also increased, fairly substantially, between 1995 and 2000 for households with heads in the 25-75 age range. This growth seemed to have occurred at the expense of growth in financial assets at the P90. Age-specific net financial asset values at the 90th percentile in 2000 are always at or below 1995 values. This could be due to investors shifting financial assets towards property where returns were greater or the result of what has become known as the dotcom crash. Between 1995 and 2000 a speculative 'bubble' in internet related stock occurred in stock markets across industrialised countries leading to rapid increases in stock market equity. This reached a peak in March 2000 followed by a collapse between 2000 and 2001. We would expect to observe an increase in the real value of financial assets, particularly at P90, between 1995 and 2000. The fact that we don't observe such an increase in the BHPS data could be that by the time the 2000 survey interviews were conducted (September to November of that year) stock market losses had already occurred. Net financial assets at P90 in the UK only increased in real terms between 1995 and 2005 among households with heads over the age of 65.

In the US, the difference between PSID¹⁷ and SCF at the P90 is much greater than at points further down the wealth distribution. This confirms the better coverage of wealthier households in SCF and suggests how BHPS might also underestimate the top of the wealth distribution for the UK. The five observations we have for SCF (1995, 1998, 2001, 2004, 2007) show a very clear upward trend in the real value of net worth held by the wealthiest 10 per cent of. The biggest increases are found for households with heads over the age of 45, particularly large for households with heads aged 65-74. Examination of the two components of net worth (net financial assets and net housing equity) shows that in contrast to the other countries the 90th percentile of the net financial assets distribution and the 90th percentile of the net housing equity profile are more equal.

¹⁷ We don't include the figures for PSID in these charts to aid clarity but comment on the differences in the text.

Although computed within different distributions the figures suggest that the increase in real net worth in the US was driven by increases in net financial assets and net housing equity, in contrast to the housing led growth in the UK. In addition, the overall trends for net worth mask differences between the two components with fairly consistent upward trends in net housing equity at P90 over this period but a peak in 2001 for net financial assets (relating to stock market prices associated with the dotcom bubble), followed by falls for the 65-85 age groups in 2001-2004 and some consolidation up to 2007 but still below 2001 real values (although similar value are found for the 75-84 age group).

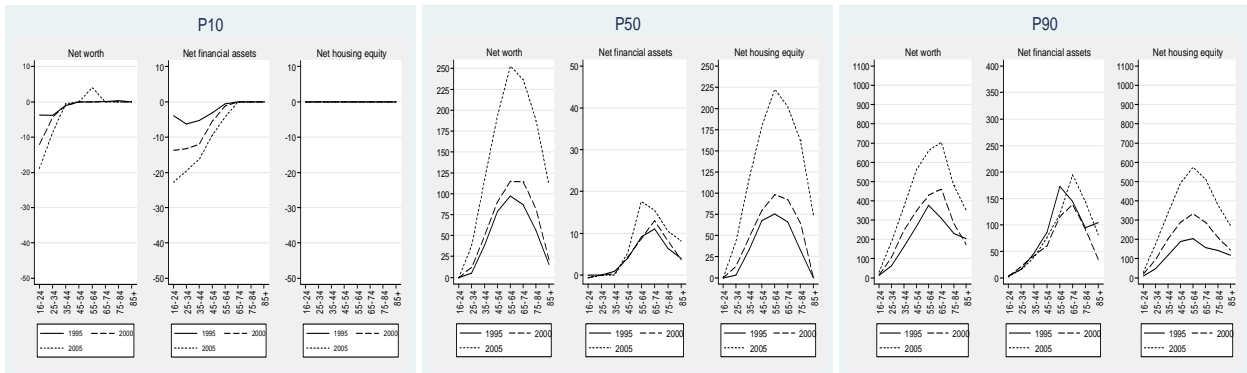
In Italy and Finland the two observations we have are very close together making it difficult to observe meaningful changes over time. For Finland, the values of net worth in 1994 and 1998 at the 90th percentile are lower than in the UK, Italy and particularly the US in comparable years. We find a small real increase in net worth at the 90th percentile across the age range and greatest for households with heads aged between 55 and 75. This would appear to have been driven by changes in net housing equity and is consistent with other studies that have found substantial increases in housing wealth and income from property among the highest income households (Jäntti, 2006). In Italy P90 net housing equity is considerably greater than P90 financial assets. Although the two observations we have for Italy are very close (2002 and 2004), and we do have to be concerned about measurement error, the figures show a fall in the real value of net financial assets at P90 and an increase in P90 values of net housing assets.

At the ninetieth percentile (P90) net financial assets particularly in the UK and the US play a much more dominant role in shaping the net worth age-profiles. The age-specific profiles of P90 net financial assets in the US are different than those in Italy, Finland and the UK. In the US not only are values of net worth at P90 higher for age groups after age 35 but the peak is much later. As mentioned above it is not possible to disentangle cohort and time effects so this could be as much to do with population heterogeneity as lifecycle factors. One possible explanation is that in the US individuals hold a broader portfolio of financial assets to fund their retirement income than those contained in pure pension assets (state or private) which are not included in these measures of wealth. If this hypothesis is true then older US households will hold relatively large financial assets, particularly in and as they approach retirement.

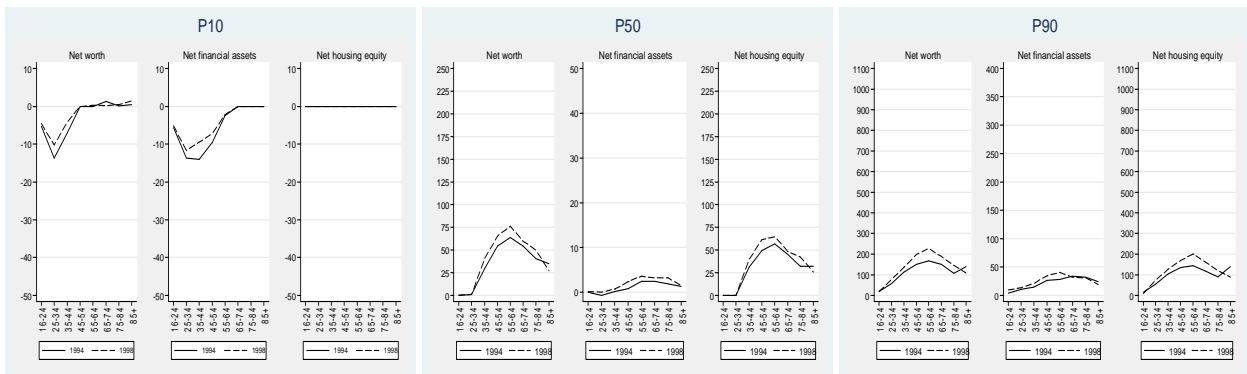
For completeness we have included the charts for Sweden but we are unable to compute profiles of net financial assets or net housing equity because we cannot separate financial and housing debt.

In Sweden (2002) we find greater negative values of net worth at the 10th percentile than in the other four countries and the lowest values of net worth at the median across the age range. Net worth at the 90th percentile is also relatively low, comparable to the values observed in Finland in 1998.

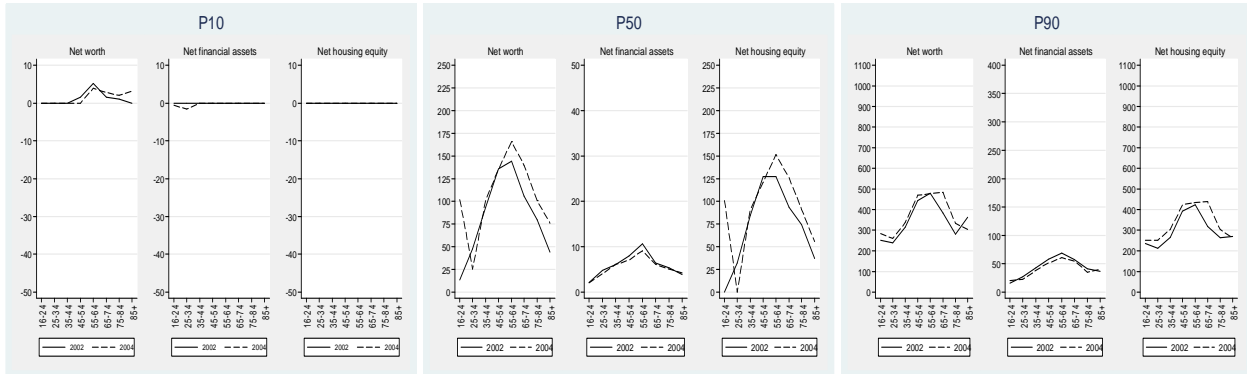
Figure 6: Age profiles in various percentiles of net worth, net financial assets and housing equity UK (BHPS 1995, 2000 and 2005)



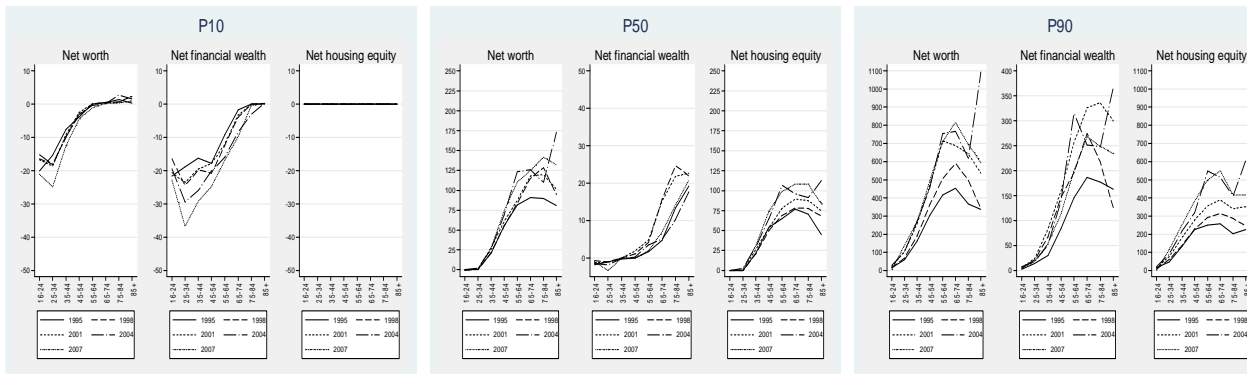
Finland (HWS 1994, 1998)



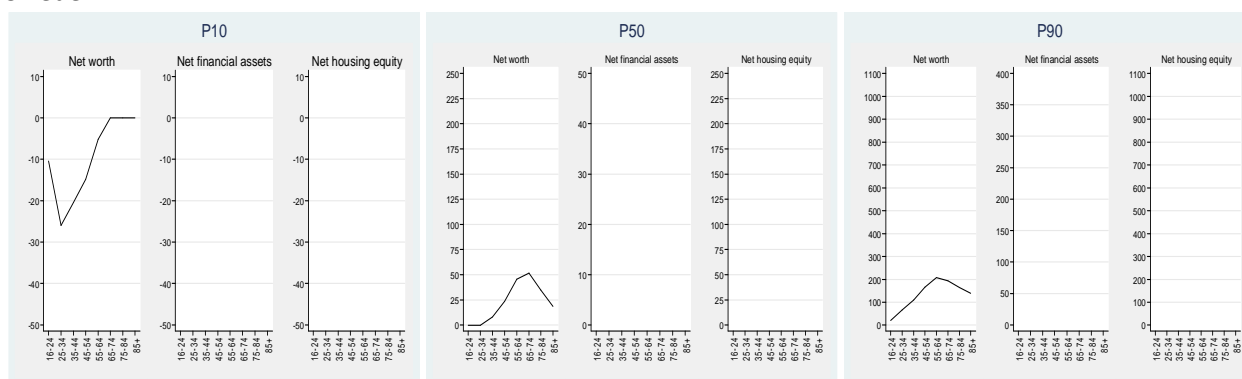
Italy (SHIW 2002, 2004)



United States (SCF 1995, 1998, 2001, 2004, 2007)



Sweden



Source: LWS database and BHPS waves 5, 10 and 15. Household weights are used.

Note: All monetary values are expressed in 2005 thousand Euros (Euro 16 ppp).

As our interest is in comparing the distribution of wealth across countries and across time, an alternative presentation of the data contained in Figures 5 and 6 is shown in Figure 7 (a, b and c). The data are organised into three time periods: mid 1990s (Figure 7a), late 1990s-early 2000s (Figure 7b) and mid 2000s (Figure 7c). In each time period we show age profiles for mean, median, P10 and P90 net worth for all countries for which we have data available.

In the mid-1990s (Figure 7a) we can compare distributions in the UK, US and Finland. There is a clear ranking between these three countries in terms of mean net worth, with a lower flatter age profile observed in Finland and the highest in the US. The gap with the US widens considerably for households over the age of 55. Median values are more similar. Median values in Finland and the US are very close up to the age of 45 and the UK has higher median net worth for heads under the age of 65 (pre-retirement) but then consecutively lower values are found among older households so that households with heads 85 years and older have the lowest median net worth. At the bottom of the distribution, the P10 values show the much higher values of debts held by US households and highlight the fact that older US households hold debt at the 10th percentile; positive values of net worth are not reached at the 10 percentile until age 55-64 compared with 45-54 in Finland and the UK. In retirement very low values of net worth were held at P10, if any, in all three countries. At the top of the distribution (P90) the higher values of net worth held by households in the UK and US compared with Finland are evident. The gap really begins to emerge in households where the head is over the age of 45. The UK and US values are very similar up to retirement age after which US values are much higher. Unfortunately we are not able to separate time and cohort effects.

In the middle period, which is centred on the year 2000 and for which we have data for all five countries, the results can be found in Figure 7b. In this figure we have included the profiles drawn from the PSID and the SCF for the US so that we can contrast the evidence from these two sources. Looking first at the mean profiles, although there has been some growth at the means in Finland, the UK and particularly the US, the shape of the age wealth profiles and the relationships between these three countries is similar to those observed in the mid-1990s. To this picture we add Sweden and Italy. The age profile of mean net worth in Sweden lies beneath those of all the other four countries but

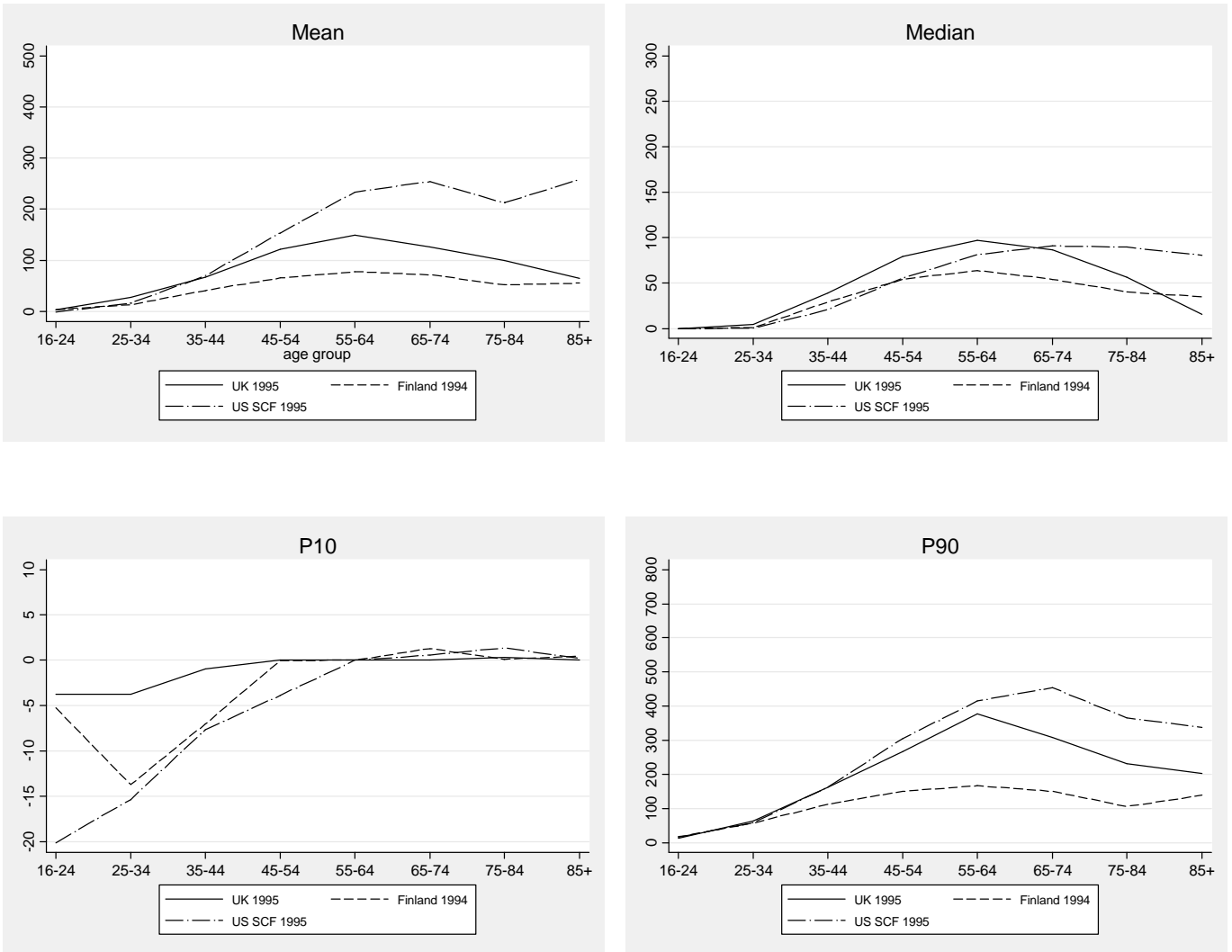
only marginally below Finland. The profile for Italy is quite different, with the highest mean values of net worth up to the age of 45 (age of household head), after which only the US curve lies above it. The higher values of net worth recorded in the SCF in contrast to the PSID for the US is very clear. Across all five countries the median profiles are much closer together than those for means. Similar country rankings can be observed although there are some differences. The higher relative value of net worth in Italy extends further up the age groups (to age 65) and we observe a greater gap between Sweden and Finland between 35 and 55. Median values of net worth in the US are considerable lower than mean values, to the extent that US median values are only highest for households with heads 65 years and over. At the bottom of the distributions, the P10 values highlight the much higher values of debt in this part of the distribution recorded in Sweden and the extent to which this extends up the age range to retirement (note different y-axis scale compared with 7a to accommodate Sweden). As shown previously, Italy has no negative age-specific values of net worth at the 10th percentile in contrast with the other four countries. There appears to have been a small decrease in debt at P10 of the US 16-24 age group compared with the mid 1990s and falls in the value of debt held at P10 among Finnish households with heads aged between 25-34 and 35-44¹⁸. With the exception of the UK, the 25-34 age group (age of household head) has the lowest value of net worth (highest value of debt) at the 10th percentile. Contrasting the values recorded in the PSID with those in the SCF shows that the 10th percentile of the SCF distribution is lower than that measured in the PSID.

In the final period – mid 2000s – we have observations for Italy, the UK and the US (Figure 7c). Turning first to the mean values we see that the increase in net worth in the UK has changed the rankings between these three countries with the UK decisively overtaking Italy among households headed by those over the age of 35. After the age of 35 the gap between the US and the UK household mean net worth has narrowed in absolute terms between 2000 and 2005 (2001 and 2007 for the US). The findings at the median are even more striking. The relationship between Italy and the US is largely unchanged but the large growth in median net worth across the age range places the UK curve clearly above Italy and the US, apart from for the very youngest age group (16-24) and the very oldest (85+). At the bottom of the distribution higher positive values of net worth at the 10th percentile among Italian households are enjoyed by older households and positive values of net worth at P10 are found in UK households where the head is aged 55-64. We observe an increase in debt in US households at P10 and the extension of debt up to age 65 compared with 2001. There is also an increase in debt at P10 among UK households under the age of 35 (household heads). Debt virtually doubles in value for households with heads aged 16-24 and 25-34. At the top of the distribution (P90) we observed some increases in net worth among Italian households and among older US households (over the age of 65). The greatest increases at P90, out of these three countries, seem to have occurred among UK households. For example, P90 net worth among households with heads aged 35-44 increased from 225,000 euro in 2000 to around 375,000 euro in 2005 and from 475,000 euro among households headed by a 65-74 year old in 2000 to 700,000 euro in 2005.

¹⁸ Jäntti (2006) shows falling mean value of mortgages and study loans between these two dates.

Figure 7a: Mean, median and various percentiles of net worth by age of the household's head, in 2005 Euros

Mid 1990s

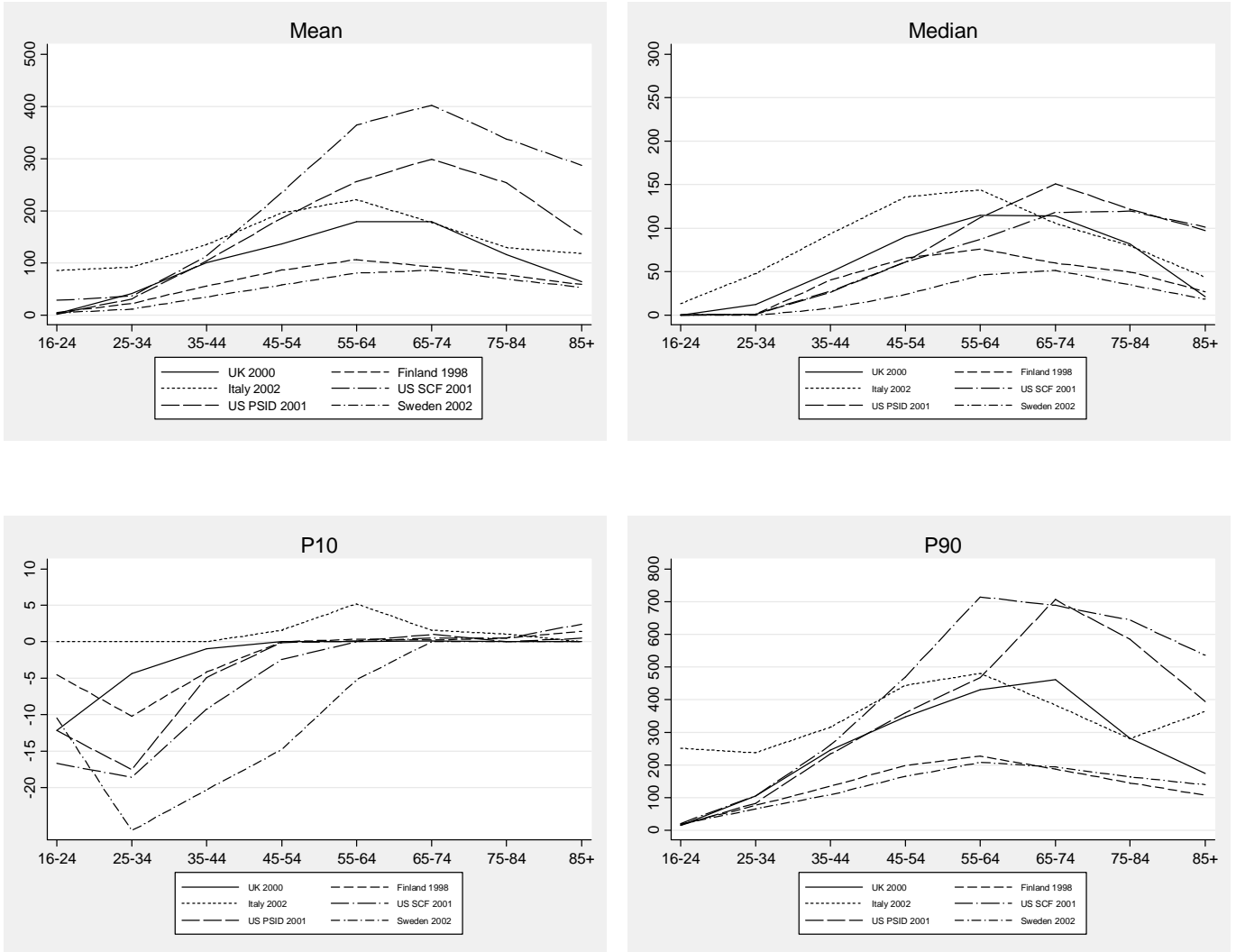


Source: LWS database and BHPS wave 5. Household weights are used.

Note: All monetary values are expressed in 2005 thousand Euros (Euro 16 ppp).

Figure 7b: Mean, median and various percentiles of net worth by age of the household's head, in 2005 Euros

Late 1990s-early 2000s

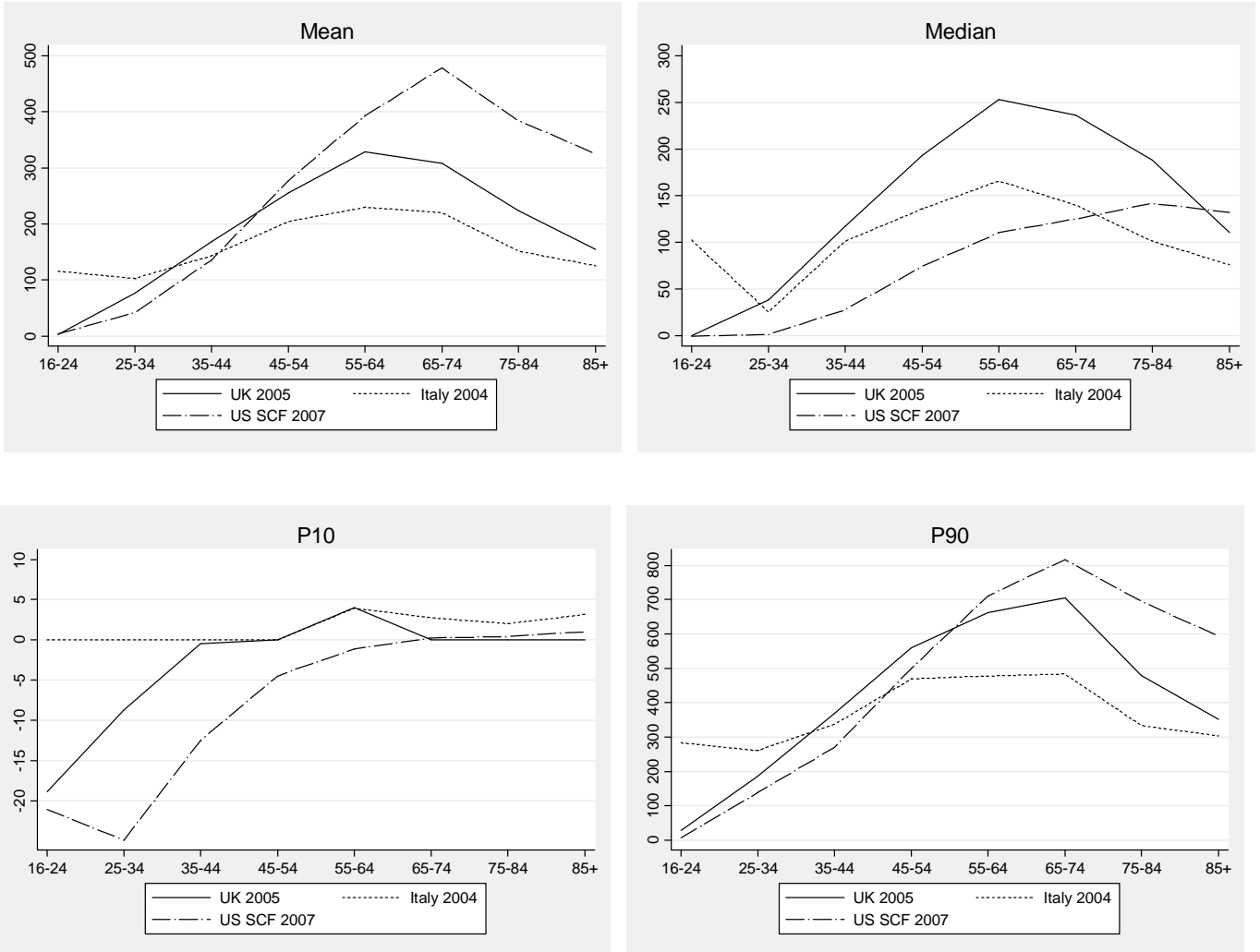


Source: LWS database and BHPS wave 10. Household weights are used.

Note: All monetary values are expressed in 2005 thousand Euros (Euro 16 ppp).

Figure 7c: Mean, median and various percentile of net worth by age group of the household's head (in 2005 Euros)

2004-2007



Source: LWS database and BHPS wave 15. Household weights are used.

Note: All monetary values are expressed in 2005 thousand Euros (Euro 16 ppp).

9. Wealth inequality within age groups

The estimates of different points in the wealth distribution give an impression of the distribution of net worth and its components within age groups. A more formal way is to measure inequality within age groups, and we do this estimating household head age-specific Gini coefficients and the results can be found in Table 7. We look at age-specific inequality in total net worth, net financial assets and net housing equity. As noted earlier as wealth can take values across the whole real number line, the Gini coefficient is not bound by zero and one as is the case where inequality is being measured from a set of strictly positive values. In this case the Gini coefficient can take values greater than one and in cases where the mean is negative the Gini coefficient is also negative. We also examine age group specific inequality in gross financial assets which by definition cannot take negative values.

Looking first at total net worth we find that inequality is highest among the younger age groups, falls with age and then increases again among the older age groups. Inequality tends to be lowest in the pre-retirement age group (55-64 year old heads). However in the US inequality is lowest in households where heads are aged 85 or older. This pattern is similar for net financial assets and net housing equity.

With the exception of the youngest age group (16-24) which experienced rising inequality in total net worth between 1995 and 2005, the overall fall in inequality observed in the UK over this period is found within all age groups. However this has largely been driven by falls in the inequality of net housing equity with evidence of increasing inequality in net financial assets in the younger age groups. The increasing inequality in net financial assets may in part be due to the fact that bank overdrafts and educational loans were not recorded in 1995 and the incidence and the size of educational loans increased after 2000.

Table 7: Inequality in net worth and its components by age of household head (Gini coefficient)

	Fi94	Fi98	It02	It04	USP00	USS94	USS97	USS00	USS03	USS06	SE02	UK95	UK00	UK05
Total net worth														
16-24	2.11	1.48	0.69	0.58	3.84	-7.53	2.14	1.28	1.60	4.06	1.99	1.78	2.38	4.57
25-34	1.33	1.09	0.65	0.69	1.17	1.28	1.30	1.09	1.11	1.15	1.94	0.89	0.80	0.73
35-44	0.76	0.67	0.61	0.60	0.83	0.82	0.86	0.83	0.87	0.85	1.10	0.65	0.69	0.59
45-54	0.59	0.56	0.57	0.59	0.78	0.77	0.79	0.80	0.79	0.79	0.87	0.59	0.56	0.51
55-64	0.52	0.54	0.55	0.53	0.71	0.76	0.78	0.79	0.77	0.78	0.75	0.57	0.56	0.48
65-74	0.51	0.59	0.60	0.59	0.63	0.74	0.73	0.75	0.76	0.78	0.65	0.60	0.58	0.52
75-84	0.56	0.58	0.60	0.58	0.67	0.70	0.67	0.71	0.73	0.72	0.66	0.68	0.57	0.52
85+	0.55	0.63	0.72	0.61	0.58	0.77	0.66	0.68	0.66	0.71	0.69	0.68	0.66	0.63
All	0.71	0.68	0.60	0.60	0.806	0.83	0.83	0.83	0.83	0.84	0.89	0.69	0.65	0.59
Net financial assets														
16-24	-3.48	4.57	0.74	0.97	-6.73	-1.10	-3.09	1.61	-2.67	-1.41		-42.82	-1.64	-1.03
25-34	-2.91	13.11	0.80	0.88	3.98	-13.62	4.35	2.23	-11.56	-11.35		1.29	2.56	13.00
35-44	-16.82	2.28	0.82	0.81	1.18	1.48	1.27	1.22	1.32	1.47		1.02	1.39	1.65
45-54	3.77	1.36	0.76	0.79	1.00	1.13	1.08	1.02	1.06	1.11		0.92	0.92	0.98
55-64	1.62	1.03	0.78	0.72	0.94	0.99	0.96	0.95	0.95	1.01		0.78	0.80	0.85
65-74	0.84	0.86	0.82	0.77	0.84	0.92	0.88	0.88	0.93	0.95		0.78	0.75	0.78
75-84	0.81	0.75	0.83	0.75	0.81	0.86	0.82	0.84	0.95	0.88		0.80	0.76	0.77
85+	0.73	0.88	0.86	0.75	0.76	0.88	0.84	0.86	0.81	0.83		0.77	0.74	0.79
All	2.99	1.39	0.81	0.78	1.03	1.10	1.06	1.02	1.07	1.10		0.89	0.94	0.99
Housing equity														
16-24	0.98	1.02	0.70	0.58	-6.73	0.91	1.01	0.97	0.94	0.98		1.25	0.92	0.91
25-34	0.90	0.84	0.68	0.71	3.98	0.80	0.84	0.81	0.80	0.82		0.84	0.74	0.66
35-44	0.63	0.61	0.62	0.61	1.18	0.71	0.73	0.73	0.78	0.76		0.63	0.65	0.55
45-54	0.50	0.52	0.58	0.60	1.00	0.67	0.70	0.71	0.72	0.71		0.54	0.56	0.49
55-64	0.49	0.51	0.55	0.54	0.94	0.68	0.69	0.71	0.71	0.70		0.54	0.55	0.47
65-74	0.49	0.58	0.59	0.59	0.84	0.65	0.67	0.73	0.71	0.72		0.56	0.58	0.50
75-84	0.58	0.60	0.60	0.59	0.81	0.64	0.64	0.65	0.66	0.68		0.67	0.58	0.52
85+	0.60	0.57	0.72	0.63	0.76	0.67	0.63	0.59	0.67	0.72		0.69	0.71	0.64
All	0.63	0.64	0.61	0.61	1.03	0.74	0.749	0.76	0.77	0.76		0.66	0.64	0.57
Gross financial assets														
16-24	0.83	0.77	0.60	0.64	0.94	0.83	0.82	0.96	0.79	0.79	0.80	0.82	0.86	0.82
25-34	0.74	0.80	0.69	0.68	0.85	0.80	0.87	0.87	0.81	0.83	0.76	0.88	0.81	0.81
35-44	0.78	0.76	0.73	0.72	0.76	0.87	0.88	0.86	0.90	0.89	0.80	0.79	0.80	0.84
45-54	0.77	0.77	0.70	0.73	0.70	0.89	0.86	0.90	0.89	0.91	0.78	0.81	0.71	0.75
55-64	0.73	0.77	0.76	0.69	0.66	0.89	0.89	0.89	0.88	0.90	0.73	0.75	0.74	0.68
65-74	0.77	0.80	0.81	0.75	0.60	0.88	0.85	0.86	0.89	0.90	0.73	0.77	0.74	0.75
75-84	0.76	0.70	0.83	0.75	0.62	0.84	0.81	0.83	0.86	0.87	0.68	0.79	0.76	0.77
85+	0.73	0.88	0.86	0.75	0.63	0.88	0.84	0.85	0.79	0.83	0.71	0.77	0.74	0.79
All	0.78	0.79	0.77	0.73	0.75	0.90	0.89	0.90	0.90	0.91	0.78	0.82	0.79	0.79

10. Household debt and educational loans

In previous sections we have examined cross-country differences in debt and, where possible, how the distribution of debt within countries has changed over time, mainly in the context of how debt contributes to measures of net worth. The key findings from this analysis are that:

- Italy stands out as the country where households hold the least amount of financial debt and consequently we find positive values of net worth lower down the wealth distribution;
- Higher proportions of US households report financial debt right across the age range;
- Mortgage debt is most likely to be held by households headed by those aged under 45;
- US households hold mortgage debt beyond retirement age and in general higher shares of older US households hold mortgage debt;
- In the UK and the US, where we have sufficient across time observations, we observe increases in debt holdings and more debt being held further up the age distribution;
- We are not able to make direct comparisons with Sweden as we are not able to separately identify financial and housing debt. In addition, business debt held by households is included in personal household debt. This leads to an overestimate of debt in Sweden (in a comparative sense) and consequently an underestimate of net worth for some households.

In this section we explore in a bit more detail the issue of debt, and then we focus on debt resulting from educational loans.

Housing debt is usually the largest debt held by households but it is usually more than offset by housing assets, so aside from the exceptional circumstances where households hold negative equity in their housing (ie where the value of housing is less than outstanding mortgage, or more generally housing debt) net housing equity is positive. Negative equity in housing most commonly occurs where house prices crash which normally affects households who have most recently purchased a property with loan values closest to the value of their property. A fall in house prices leaves this group vulnerable to negative equity. As housing is generally a long term investment and house prices generally recover, negative equity is normally a problem for only a minority of households. Most households can choose not to sell their property while house prices are low but for some this is not a choice. These households may find themselves in a position where they are unable to meet their mortgage repayments, through a fall in income such as that resulting from unemployment or an increase in repayments due to increases in interest rates, and are forced to sell their property. Regulation of mortgage and financial markets vary across countries and across time within countries in terms of the amount households are able to borrow in relation to their income. House price bubbles have historically occurred alongside more relaxed regulation allowing greater loan to value mortgages with lower multiples of income used to calculate the allowable value of a mortgage and/or smaller, and in some cases no, deposits required. The general

trend in house prices is upwards and therefore for most households this means that the value of their mortgage relative to the value of their property falls protecting them from the risk of negative equity. It is hard to measure with any degree of accuracy the amount of negative equity in the LWS data, although Table 2 does show estimates of the proportion of households with negative housing equity.

Another factor that affects cross-country and across time housing debt, and therefore housing equity, is the configuration and regulation of mortgages. A variety of mortgage products exist in the market ranging from interest only mortgages, flexible mortgages (where repayment can vary month to month usually above a minimum amount) and the more common capital and interest repayment mortgages. In the UK a further type of mortgage which was popular in the 1980s and 1990s was the endowment mortgage. This type of mortgage had two components: an interest only mortgage loan and an endowment policy, or policies. An insurer held the endowment policy and the borrower (homeowner) made payments into the policy with the objective that the fund would be sufficient to pay off the capital at the end of the mortgage loan term. During the 1990s concern grew about the sufficiency of funds to pay-off the capital at the end of the loan period and many households found themselves in a position of owing a large amount of outstanding mortgage debt. Later it was found that endowment mortgages had systematically been mis-sold. These mortgage types are very uncommon today. It is clear that outstanding mortgage debt will vary depending on the type of mortgage with many mortgages paying off very little, if any, of the capital debt until towards the end of the mortgage term (early payments go towards interest costs). This contributes to a situation where large increases in net housing equity occur in older age groups reaching retirement and at the end of their mortgage loan term. There are also differences across countries in the typical length of a mortgage loan and these have changed over time. This will affect the accumulation of wealth for different cohorts with older cohorts accumulating net housing equity at a faster rate than younger cohorts. In Italy the typical mortgage loan term is ten years.

Other loans recorded in our calculation of net worth are not offset. Consumer durables (vehicles, appliances, etc), collectibles and valuables have a value but this is not included in our calculation of net worth and therefore loans taken out to fund their purchase is not offset by the value of these possessions. Education loans are different from other types of loans in that they are offset by a future income stream rather than a capital asset. Education loans for the purpose of financing a higher education, and in some cases training and post-secondary education, have become more widespread over the last 20 years. As participation in higher education has expanded, governments have sought to shift the burden of higher education funding from general taxation to individual students and their families. These loans are used to finance students' maintenance costs (housing costs and general living expenses) and in some cases tuition fees. Their use varies across countries and within countries over time.

Table 8 shows the proportion of households reporting educational loans and the mean value of these loans. No educational loans are reported in the SHIW Italian survey. The SHIW does not explicitly ask Italian households to report outstanding educational loans, although they may be recorded in the 'other' category. This is not a glaring omission. Although student loans have been available in Italy since 1991 and provision was

increased in 2003 student loan take up was estimated to be less than 1 per cent of the eligible population in 2008/09. A number of reasons for this low take up have been suggested. These include: Italians are culturally adverse to debt; there is a high degree of government subsidy and tuition fees are low and regarded as affordable (approximately 1,000 euro per year) with full and partial exemptions available for low income families (around 15 per cent of students); cultural tradition of families providing financial support for education and many students reside with their families; concern about repayment given low rates of return to higher education (Perali and Brazi, 2011). Finnish students studying for a higher education full time (and in some other forms of education), can qualify for financial aid. This includes study grants, housing supplements and government guarantees for student loans¹⁹. Tuition is free for students in Finland. Student loans are granted by Finnish banks and guaranteed by the government. Take up rates for student loans among eligible Finnish students is low at around 35 per cent which could be explained by the relatively generous system of grants (OECD, 2008). In the LWS data for Finland we find that 14 per cent of households hold educational loans in 1994 falling to 13 per cent in 1998. These loans are concentrated among households with heads in the 16-24 and 25-34 age groups. This reflects the fact that it is young people who take out these loans to fund education after leaving school and they tend to be of relatively short duration (compared to mortgages²⁰). Out of the three countries for which we have information on the mean value of loans - Finland, Sweden and the US – Finnish households hold the lowest mean value. Finland is the only country, for which we have information, where the mean value of loans declined, and this decline is observed in younger age groups so it is not about repayment, and this was accompanied by a fall in the share of households with educational loans.

The highest mean value of loans is recorded in households with heads aged 25-34. In Sweden there is a long standing system of student grants and loans which are used to cover students' housing and living costs (Strömquist, 2006). Universities do not charge tuition fees in Sweden. The Swedish study support scheme is available to all adults regardless of the level of study and is available to students studying full and part time. Student loans make up around two thirds of the package and take-up is high with more than two-thirds of students taking up the loan options²¹. Repayment of the loan usually takes 25 years. In the LWS we find that Swedish households, on average, are the most likely to hold educational loans (25 per cent). As in Finland, households with heads in the 16-24 and 25-34 age groups are the most likely to hold educational loans, with nearly half of these households holding educational loans in 2002. Higher shares of older Swedish households hold educational loans compared with Finland; 10 per cent of households with a head aged between 55 and 64 hold an educational loan in Sweden in 2002 compared with only 2 per cent in Finland in 1998. This is no doubt a reflection of the fact that student loans in Sweden are designed to assist lifelong learning and not simply to assist undergraduate students and the fact that loans are repaid over many

¹⁹ Information on financial aid for Finnish students can be found at <http://www.kela.fi/in/internet/english.nsf/NET/081001132858IL?OpenDocument> (last accessed 20/08/2012).

²⁰ Although there is a move towards mortgage style educational loans in some countries.

²¹ Information on Student loans and take up in Sweden can be found at <http://www.sweden.gov.se/sb/d/2098/a/69849> (last accessed 20/08/2012).

years. In Sweden (2002) the mean value of educational loans was nearly four times greater than in Finland (1998). The high incidence and size of educational loans contributes to the higher value of financial debt among Swedish households²².

In the UK student loans in relation to higher education were formally introduced in 1990 as the value of many student grants were eroded, but take-up and the average value of these loans were low. The introduction of tuition top-up fees and the replacement of most student maintenance grants with student loans in 1998/99 in England marked the point at which take-up and loan values increased²³. Previously tuition for domestic students was free and a means tested system of student grants was in place. In the BHPS we find that only around 1 per cent of households in the UK held educational loans in 2000, this figure increased to 6 per cent in 2005. While this share is comparatively low, the breakdown by age groups (Table 8) shows how widespread educational loans had become among younger households. 15 per cent of households with heads aged 25-34 and 32 per cent for those with heads aged 16-24 held educational loans in 2005. As we have already noted, educational loans are not recorded in 1995 for the UK and the value of loans is not captured separately from other financial debts in the BHPS, therefore no information is available on the size of these loans. In 2012 a large increase in tuition fees has been introduced in England (devolved administrations in Scotland, Wales and Northern Ireland have their own more generous support for domestic students). Most universities from September 2012 will charge students around 11,400 euro per year and student loans have been modified to look like mortgage style loans. This means that while there is no upfront fees a typical graduate will leave university with debts of around 34,200 euro in addition to those acquired to fund housing and living costs. See Hills and Richards (2012) for details on the complexity of student costs and finances this new system of fees and grants coupled with university based grants and bursaries gives rise to. This has had an immediate effect of reducing applications by 10 per cent for the 2012/13 academic year entry among English applicants (falls for Wales, Northern Ireland and Scotland were 2.9 per cent, 4.5 per cent and 2.1 per cent respectively²⁴).

In the US students pay for their tuition, although a minority of students qualify for student bursaries, and the direct costs of higher education are by far the largest in the OECD area (OECD, 2011). Government backed student loans have been more widely available in the US since the 1950s for select groups of students but became available more broadly in the 1960s. In addition to the government backed loans there is a system of private student loans. In the US we have the longest series covering the period 1995 to 2007²⁵. Over this time period there has been a small increase in the overall share of households with educational loans; 12 per cent in 1995 increasing to 15 per cent in 2007. The increase has been concentrated among households in the 16-24 and 25-34 age groups, from around one-quarter in 1995 to about one-third in 2007. The average value of educational loans are lower in the US than in Sweden (this can be seen if you compare

²² In Cowell, Karagiannaki and McKnight (2012a) we conduct further analysis on educational loans, in particular the extent to which they contribute to cross country differences in wealth inequality.

²³ Official statistics on take-up and loan values can be found at www.slc.co.uk

²⁴ www.ucas.ac.uk/about_us/media_enquiries/media_releases/2012/20120709 (last accessed 16 September 2012)

²⁵ The PSID does not separately identify debts arising from student loans, although respondents are asked to include student loan debts in their calculation of any outstanding debts held within the family.

Sweden 2002 with US 2004) but have increased quite considerably over time. In 1995 average educational loans were 1,065 euro but had increased to 2,718 euro by 2007 (an increase of 155 per cent). The average value of educational loans held by older households (heads aged 55-64) was highest in the US (we are not sure if this is to do with adult children living with parents, long payback periods or the fact that educational loans have been available in the US for some time).

Table 8: Proportion of households reporting educational loans and mean value of educational loans

	Finland 1994	Finland 1998	US 1995	US 1998	US 2001	US 2004	US 2007	Sweden 2002	UK 1995	UK 2000	UK 2005
Proportion with educational loans											
All	0.14	0.13	0.12	0.11	0.12	0.13	0.15	0.25		0.01	0.06
16-24	0.40	0.33	0.23	0.21	0.26	0.27	0.31	0.47		0.03	0.32
25-34	0.36	0.39	0.25	0.24	0.26	0.29	0.35	0.49		0.09	0.15
35-44	0.12	0.14	0.13	0.13	0.12	0.15	0.15	0.40		0.02	0.04
45-54	0.07	0.05	0.11	0.10	0.11	0.13	0.15	0.26		0.03	0.07
55-64	0.02	0.02	0.04	0.06	0.05	0.09	0.11	0.10		0.02	0.05
65-74	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01		0.00	0.00
75-84	0.00	0.01	0.02	0.00	0.00	0.01	0.01	0.01		0.06	0.00
85+	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00		0.00	0.00
Mean value of educational loans											
All	751	608	1,065	1,534	1,554	2,055	2,718	2,952			
16-24	1,606	1,133	2,294	2,335	2,830	2,656	4,045	3,584			
25-34	2,480	2,156	2,203	4,007	3,167	4,789	7,517	7,943			
35-44	538	615	1,006	1,315	2,391	2,518	2,312	4,876			
45-54	215	125	1,258	1,332	1,051	1,833	2,502	2,015			
55-64	63	81	368	896	766	1,152	1,606	802			
65-74	31	22	84	68	9	20	281	164			
75-84	0	33	26	12	1	438	80	37			
85+	0	0	5	0	0	0	0	5			

Notes: There is no information available on educational loans in the Italian data set. US data are from the SCF. All monetary values are expressed in 2005 Euros (Euro 16 ppp)

11. The relationship between income and wealth

In this final section we look at the relationship between income and wealth both in terms of the relationship between income distributions and wealth holdings and the relationship between the income distribution and income from wealth.

We begin by looking at the distribution of income across countries where the income measure used is equivalised household disposable income²⁶ excluding income from wealth (rental income, income from investments, interest payments). Table 9 shows average measures of annual household income, income inequality and median income by income decile. It is worth bearing in mind that annual income data in some surveys relate

²⁶ Income was equivalised using the square root of household size.

to the year of the survey or the 12 months prior to the interview date (BHPS), and in other surveys, such as the SCF, relate to the previous calendar/financial year. This means that there will be some differences between countries in terms of the year for which the value of wealth is reported (which is typically collected at the point of interview) and the reference period for the income data.

We find that both mean and median income increased in all countries where we have time series with the exception of Finland between 1994 and 1998 and the US between 2004 and 2007. With the exception of Finland 1994 to 1998, we find that median income in the bottom decile increased in real terms for all countries where time series are available. Between 1994 and 1998 in Finland median income in every decile fell in real terms. The only other country to experience falling income was the US between 2004 and 2007 where median income fell in every decile except the very top and the bottom two.

In summary we find that consistent with previous research using conventional measures of income, we find that out of these five countries income inequality is lowest in Finland and Sweden and highest in the US. The top half of the income distribution is wider than the bottom half in all these countries. Between 2004 and 2007 most measures of inequality show inequality of household income in the US either falling or unchanged. Decile ratios show falling inequality in Italy 2002-2004 but Gini and GE(2) measures record increases in inequality. The UK is the only country out of these five that experienced increasing mean and median real household income *and* increasing median income within each decile but falling income inequality 1995 to 2000 and 2000 to 2005, with the exception of the P10/P50 ratio which shows an increase in the dispersion in the bottom half of the distribution.

When we contrast these statistics with those where our income measure includes income from wealth (rental income, income from investments and interest payments²⁷) – the more conventional measure of income – this provides an indication of which households benefit from income from wealth and how this affects income inequality (Table 10). Once again Finland 1994-1998 and the US 2004-2007 are the only countries that record decreasing mean and median income²⁸. What we find when we include income from wealth is that, as you would expect, there is an increase in mean and median income but this is not uniformly the case across the income distribution. Income from wealth has a small positive affect on income inequality (90/10, Gini, GE(2)) in Finland and Italy, and to some extent the UK but has very little effect in the US and, perhaps surprisingly, in 1998 and particularly 2001 income inequality measured by the Gini, P90/P10 and P75/P25 ratios is lower when income from wealth is included. The influence of income from wealth in increasing the dispersion in the top half of the distribution is more uniform across all five countries, reflecting the fact that as asset holding is skewed towards the top of the distribution so too is income from wealth. For example, the 90/50 ratio in Finland in 1998 is estimated to be 1.71 when income from wealth is excluded

²⁷ This does not include income from capital gains which are known to make a difference to estimates of wealth, particularly in the top 1% (For example, see Roine and Waldenström, 2012, for Sweden).

²⁸ Mean disposable equivalised household income measured at an individual level is shown to increase in Finland 1994-1998 in Jänntti (2006).

increasing to 1.78 when it is included. In Finland it is noteworthy that this difference is much greater in 1998 than in 1994 indicating that property income increased wealth inequality in the top half of the distribution between these two dates. The exception is the US where the P90/P50 ratio is higher when income from wealth is included in 2001 and, in particular, 2004. However, the fact that income from wealth also benefits low income households (shown in Table 10 by the higher median income in the bottom decile compared to Table 9), this limits the extent to which income from wealth increases income inequality.

Comparing the estimates for the US in 2001 for PSID and SCF, we find that PSID estimates higher average values of household income, and medians within income deciles for incomes that exclude and include income from wealth. In addition, estimates of income inequality are lower using the PSID estimates compared to the SCF estimates, with the exception of the P10/P50 ratio.

Table 9: Summary statistics describing the distribution of equivalised household disposable income (LIS disposable income measure excluding rental income and income from investments and savings)

	Finland	Finland	Italy	Italy	US-SCF	US-SCF	US-SCF	US-PSID	US-SCF	US-SCF	Sweden	UK	UK	UK
	1994	1998	2002	2004	1995	1998	2001	2001	2004	2007	2002	1995	2000	2005
Mean	15722	13511	14739	15720	22066	23431	25644	29248	33182	30443	15421	14417	17139	20035
Median	14399	12709	12495	13125	17308	17916	18617	23922	20012	19473	14225	12050	14629	17613
P90/P10	3.11	3.17	4.23	4.14	8.11	7.31	6.80	6.08	6.94	6.79	3.26	4.61	4.32	3.82
P90/P50	1.69	1.71	2.00	1.98	2.29	2.32	2.39	2.19	2.43	2.43	1.74	2.13	2.04	1.93
P10/P50	0.54	0.54	0.47	0.48	0.28	0.32	0.35	0.36	0.35	0.36	0.53	0.46	0.47	0.50
P75/P25	1.74	1.91	2.18	2.12	2.75	2.67	2.77	2.44	2.71	2.70	1.89	2.37	2.17	2.05
Gini	0.25	0.27	0.33	0.34	0.47	0.47	0.49	0.41	0.57	0.57	0.27	0.34	0.32	0.30
GE(2)	0.13	0.14	0.28	0.55	3.18	7.25	3.42	0.56	72.09	24.42	0.15	0.25	0.29	0.18
Median income by income decile														
Bottom decile	6151	5522	4351	4828	1689	2513	4192	5504	4403	4689	5463	4587	5445	6914
2	9221	7615	6895	7171	6771	7494	8339	10493	8637	8670	8698	6145	8014	10193
3	10928	8887	8412	8837	9673	10444	11125	14600	11695	11367	10219	7794	9892	12220
4	12371	10418	9962	10352	12519	13390	13916	18396	15218	14103	11720	9423	11797	14237
5	13721	11938	11669	12120	15476	16312	16830	21918	18426	17550	13398	11121	13638	16324
6	15234	13372	13535	14139	18823	19664	20506	25762	21893	21452	15126	13220	15752	18607
7	16934	15024	15621	16033	22075	23486	24665	29900	26229	25682	17031	15633	18457	21471
8	18962	16943	18343	18684	26648	27823	30730	35660	31670	30691	19355	18479	21425	25019
9	22029	19855	22064	22724	33763	35297	37649	45502	41454	39497	22348	22640	26162	29950
10	28522	25228	31504	32622	53972	54304	60370	67200	65340	68860	28786	31816	36003	41270

Note: Income deciles are defined based on the equivalised household disposable income excluding rental income and income from investments and savings.

Income was equivalised using the square root of household size. All monetary values are expressed in 2005 Euros (Euro 16 ppp).

Source: LWS database and BHPS waves 5, 10 and 15.

Table 10: Summary statistics describing the distribution of equivalised household disposable income (LIS disposable income including rental income and income from investments and savings)

	Finland	Finland	Italy	Italy	US-SCF	US-SCF	US-SCF	US-PSID	US-SCF	US-SCF	Sweden	UK	UK	UK
	1994	1998	2002	2004	1995	1998	2001	2001	2004	2007	2002	1995	2000	2005
Mean	16390	14966	15396	16219	24294	25386	27784	32364	34924	32381	16091	15296	18331	21166
Median	14801	13254	12890	13247	18394	18829	19846	25502	20850	20089	14684	12911	15438	18246
P90/P10	3.11	3.32	4.41	4.26	7.91	7.10	6.71	6.00	6.92	6.74	3.22	4.77	4.37	3.89
P90/P50	1.71	1.78	2.07	2.05	2.30	2.35	2.36	2.22	2.42	2.48	1.75	2.14	2.06	1.98
P10/P50	0.55	0.54	0.47	0.48	0.29	0.33	0.35	0.37	0.35	0.37	0.54	0.45	0.47	0.51
P75/P25	1.74	1.92	2.21	2.13	2.70	2.63	2.73	2.40	2.68	2.71	1.90	2.38	2.20	2.04
Gini	0.26	0.28	0.34	0.35	0.47	0.46	0.40	0.40	0.56	0.57	0.27	0.34	0.33	0.30
GE(2)	0.14	0.25	0.30	0.54	8.56	7.15	3.20	0.58	67.03	24.18	0.18	0.25	0.30	0.19
Median income by income decile														
Bottom decile	6515	5863	4533	4910	2659	3608	4934	6279	4722	5085	5920	4828	5929	7359
2	9483	7874	7010	7286	7090	7995	8759	11493	9036	8928	9007	6568	8471	10627
3	11248	9329	8598	9056	10329	11058	11806	15884	12234	11736	10453	8145	10340	12815
4	12624	11026	10277	10529	13388	14038	14763	19690	15785	14525	12093	9937	12356	14744
5	14032	12554	11944	12325	16494	17124	17979	23514	19026	18106	13813	11738	14319	17094
6	15645	14029	13874	14332	19601	20642	21779	27322	22687	22239	15560	14016	16672	19508
7	17384	15790	16132	16405	23099	24505	26036	31923	27004	26544	17545	16468	19482	22626
8	19557	17924	18999	19257	27911	29096	32173	37973	32746	31782	19903	19341	22783	26180
9	22882	20960	23076	23461	35572	36988	39598	48538	43160	41402	23117	23932	28169	31442
10	30229	28093	33689	34899	57733	60016	66747	74503	69290	74040	30397	33755	38208	44716

Note: Income deciles are defined based on the equivalised household disposable income excluding rental income and income from investments and savings.

Income was equivalised using the square root of household size. All monetary values are expressed in 2005 Euros (Euro 16 ppp).

Source: LWS database and BHPS waves 5, 10 and 15.

We now turn to the relationship between household income (excluding income from wealth) and household wealth holdings. To do this we adopt a methodology used by Banks, Blundell and Smith (2000) which compares net worth across income deciles for our country observations centred on the year 2000. In each figure we show net worth by income percentile for the UK and contrast this distribution with one other country. In the left-hand panel we show median net worth within income percentiles and in the right-hand panel net worth at the 90th percentile. We also show net worth in our comparison countries where income percentiles are matched to UK percentiles. In this case the values of percentile break points are set to those recorded in the UK and no longer represent fixed proportions of the populations. Note that we allow y-axis scales to vary.

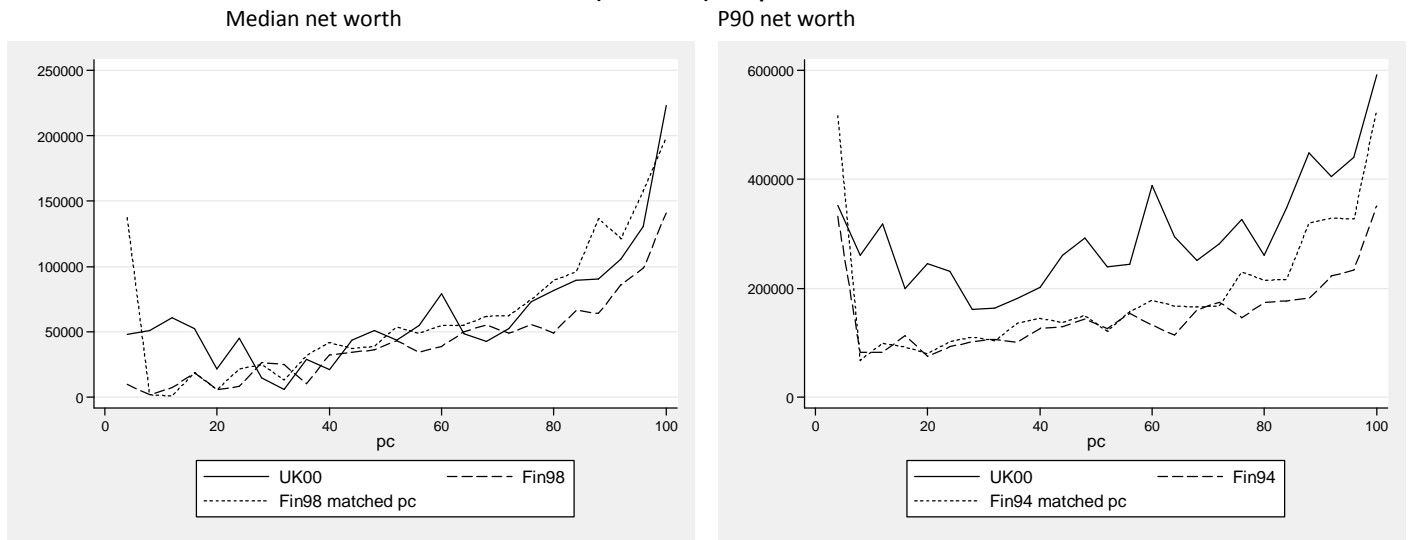
The top two figures compare the UK (2000) with Finland (1998). Looking first at the results for the UK we find median net worth within income percentiles tends to increase with income. However, we find a group of households at the bottom of the income distribution who have relatively high median net worth compared to those with a little higher income (particularly the lowest 15 percentiles). In contrast we do not find a similar group of income-poor/asset-rich households in Finland where median net worth within income percentiles fairly uniformly increases with income (ignoring the very high value recorded at the very lowest percentiles which look like outliers²⁹). Over a large part of the income distribution (P30-P70) median values of net worth within income percentiles are very similar in the UK and Finland. The figure for P90 values of net worth highlights the greater wealth inequality and higher wealth holdings in the UK within income deciles relative to Finland. When we superimpose the UK income distribution on to Finland by defining the percentiles in terms of the level of income at UK percentile break points we observe that the lower values of median net worth within income percentiles in Finland can largely be explained by the lower value of incomes at percentiles above the 75th percentile (associated with the more compressed income distribution in Finland relative to the UK) but this does not explain the difference observed at the lower end of the income distribution. The second pair of charts compares Italy with the UK. Quite a different picture emerges. Apart from the lowest two income deciles, where we find relatively asset-rich UK households, median net worth within income percentiles is higher in Italian households compared with UK households. P90 net worth within income percentiles on the other hand, is very similar between these two countries. When we match Italian income percentiles to UK income values we find this has very little effect at the median or the 90th percentile, if anything it increases the difference between the two countries. We next compare the UK with the US. The first pair of charts compares the UK with the US SCF2001 and the second pair with US PSID2001. At lower and middle incomes UK households hold higher median net worth than US households (SCF and PSID), although values are very similar apart from for the very highest income households where US households hold *much* higher median net worth than their equivalents in the UK (note different y-axis scales for SCF to accommodate higher wealth values recorded in this survey). PSID values are more similar to UK values compared with SCF values. P90 values are also very similar with the exception of highest income households. If we superimpose the UK distribution of income on to the US (SCF and PSID) we find that median values of net worth are typically lower in the US for the same level of income, quite substantially lower among higher income percentiles.. This is not the case at the 90th percentile. The final pair of charts compares the UK with Sweden. Here we find that within each income percentile median and P90 net worth holdings are higher in the UK. The differences are greater at the 90th

²⁹ This is likely to be due to the fact that there are very few observations in the Finnish data for these very low levels of household income.

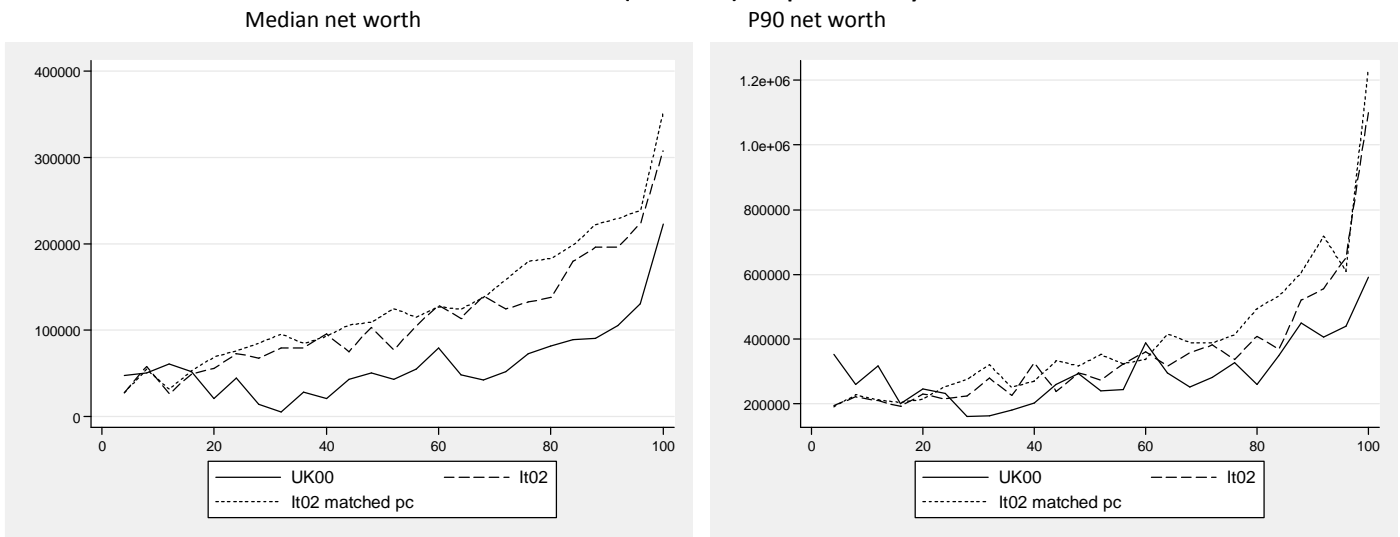
percentile than at the medians. Superimposing the UK income distribution on Sweden, i.e. the fact that income values at different break points vary between the two countries, explains some of the difference for median and P90 net worth values in the top two thirds of the income distribution. This means that higher values of household income in the top third of the income distribution in the UK partly explains the higher values of median and P90 net worth in the UK within these income percentiles.

Figure 8: Median and 90th percentiles of total net worth within each income percentile (country specific and matched to UK income percentiles)

UK 2000 (BHPS LWS) compared to Finland 1998

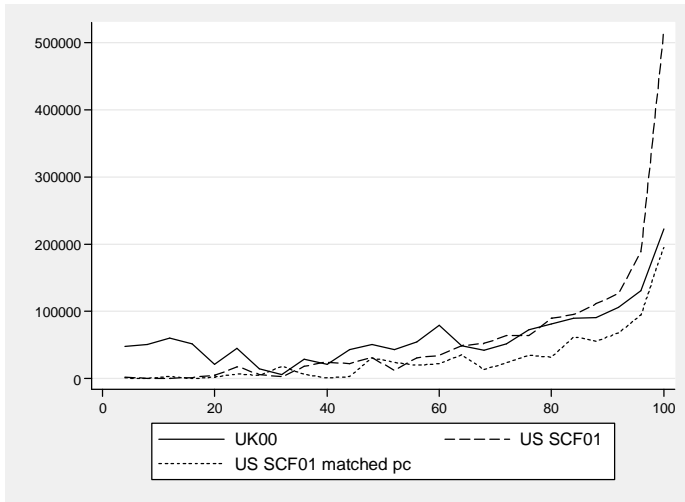


UK 2000 (BHPS LWS) compared to Italy 2002

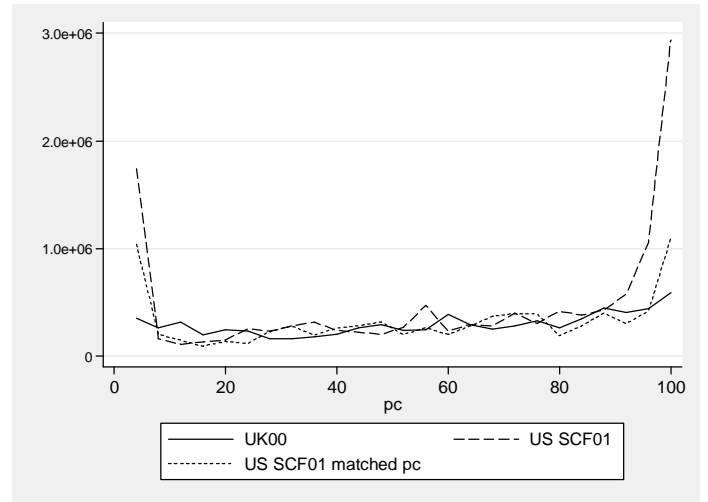


UK 2000 (BHPS LWS) compared to US 2001 (SCF)

Median net worth

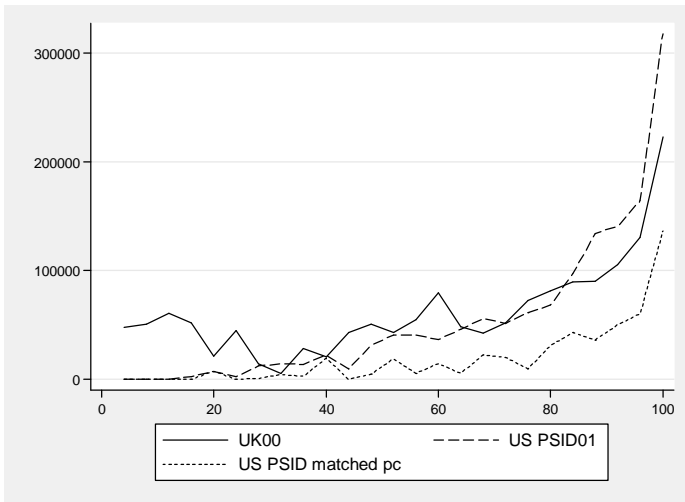


P90 net worth

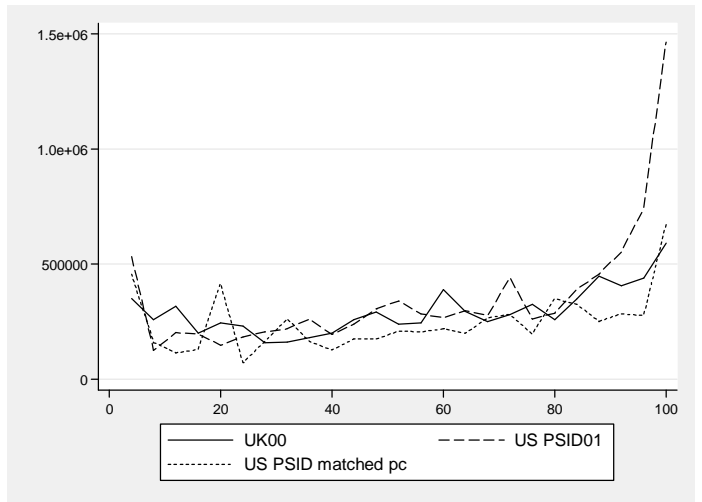


UK 2000 (BHPS LWS) compared to US 2001 (PSID)

Median net worth

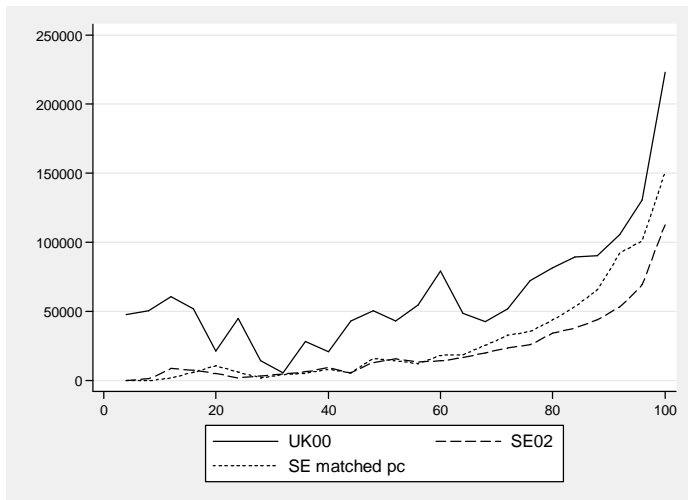


P90 net worth

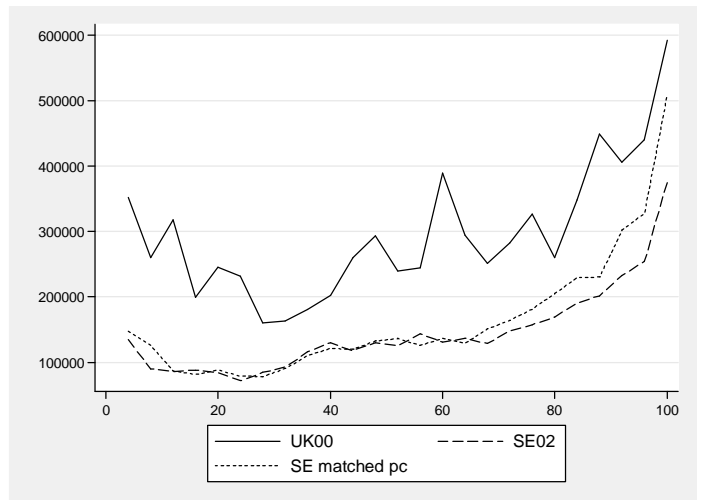


UK 2000 (BHPS LWS) compared to Sweden (HINK 2002)

Median net worth



P90 net worth



Note: All monetary values are expressed in 2005 Euros (Euro 16 ppp).

12. Summary

Private wealth's most simple function is a store of money that can be converted and spent during times of hardship or when there is need for large scale expenditure to provide financial security. Home ownership provides families with the freedom to create their own space, a secure home for children and the opportunity to avoid the precarious nature of some forms of rental tenures. Once mortgage loans have been repaid, typically during the working life, home ownership provides free accommodation during retirement, aside from maintenance costs, and by advanced buying of housing services people insulate themselves against risk in the housing market. Housing equity can be converted into income through downsizing or equity release schemes, to provide an income in retirement, to pay for care or bequests to the next generation.

Wealthier households also hold large financial assets such as stocks, bonds and mutual funds and while holdings have become more widespread they remain more concentrated among high wealth households. At the other end of the distribution are households whose net wealth is negative, some quite substantially so. These debts are mainly from credit cards, instalment loans for the purchase of large items, or educational loans. Some households are in the unfortunate position of holding negative equity in their homes. While access to credit has increased substantially in many countries allowing individuals and their households to smooth their income and wealth over the lifecycle, it is perhaps the increased participation in higher education and the shift from State funding of higher education to a system where individuals and their families increasingly bear the cost through educational loans that has led to the most dramatic change in the distribution of debt and the profile of households holding these debts.

Household characteristics play a part in explaining average values of wealth held at a point in time and wealth holdings over the lifecycle. Public sector provision and taxation policies affect incentives to acquire, draw down and bequeath wealth. Asset prices, particularly stock prices and housing prices, affect the value of assets held. The economic cycle and changes in incomes affect the extent to which households can save, need to borrow or draw down on assets. Interest rates affect income from investments and the cost of borrowing.

We are able to compare wealth holdings in five countries around the year 2000, and for some countries (UK, US, Finland) in the mid-1990s and mid-2000s (UK, US, Italy). This has been made possible through the harmonization of national data sources as part of the Luxembourg Wealth Study. In the process of conducting this analysis we have come across inconsistencies in the way some variables are defined, such as the definition of a household in Sweden, the coverage of wealth components, such as the omission of current accounts in the UK, and debt components, such as the omission of bank overdrafts in the UK and the inclusion of business debt in Sweden. Some surveys included in the database are clearly better at capturing high wealth households and the assets that they hold, such as the SCF for the US. Despite these differences we are able to make some meaningful comparisons between countries. In fact understanding differences between surveys strengthens our understanding of differences between countries and more generally about the distribution of household wealth.

The key findings are:

- Average wealth holdings are lowest in countries with generous welfare states (Sweden and Finland) and highest where individuals are expected to a greater extent to fend for themselves (US);
- The skewed nature of the wealth distribution leads to large differences between mean and median wealth values. In the US mean wealth is above the 75th percentile.
- There was a large increase in average household wealth holdings in the UK between 2000 and 2005 and as average wealth increased wealth inequality fell;
- Despite low average wealth holdings in Finland and Sweden, inequality of wealth is relatively high. Sweden is the most unequal country out of these five, but this may be overestimated due to the definition of households in the Swedish data and the inclusion of business debt. A generous welfare states means that an unequal wealth distribution in these countries may not result in less equal overall welfare;
- High values of mean and median wealth in Italy are driven by the absence of debt which is particularly noticeable lower down the wealth distribution. Italy is the only country to record positive values of net worth at the 10th percentile. A tiny minority of young Italian households hold financial debt;
- Cross-country differences in household wealth holdings are affected by demographic differences. Italian households have an older age profile associated with an ageing population and cultural factors that result in a typically later age of household formation;
- Country age-profiles in ownership of wealth (and debt) components show similar rates of households with savings accounts (at around 80 per cent) having fairly flat age-profiles. Differences in Sweden and the UK can be explained by coverage of wealth components. There are quite large differences between countries in age-profiles of investment ownership. US households are most likely to hold financial debt and this extends in to older households headed by individuals over the age of 65. While home ownership rates are very similar across countries, Italian households are much less likely to hold mortgage debt;
- The share of gross wealth made up of financial assets is greatest in the US and lowest in Italy. As house prices and home ownership rates increased the share of gross wealth made up of housing wealth increased in the UK 1995-2000-2005;
- Age profiles show that mean net worth increases with age, peaking just before typical retirement ages. These profiles are flatter in Sweden and Finland. There have been increases across the age range in the UK and the US, driven by net housing equity (particularly in the UK);
- Age profiles in various percentiles show increases in the value of debts held at the 10th percentile in the UK 1995-2005 and the US 1995-2007 and reach further up the age distribution over time. The crash of the dotcom market in early 2000 affected net financial assets at the 90th percentile in the UK and the US (the two countries where we have a long enough time series to observe this event).
- In Finland, financial debt at the 10th percentile fell between 1994 and 1998 among working age households, reflecting wider economic changes in the Finnish economy.
- Net housing equity increased across the age range in the UK 2000-2005 at the median, and 1995-2000 at the 90th percentile as well as between 2000 and 2005. Increases in net housing equity in the US were also large between 1995 and 2007, although a greater proportion of the change occurred in the second half of the 1990s and overall the increases in average values were not as great;

- Inequality within age groups, defined in terms of the age of the household head, falls with age and then increases again among older age groups. Some of this may be due to heterogeneity;
- Policy and cultural differences have led to cross country differences in the incidence and average value of educational loans. Italian households do not usually hold educational loans because of low tuition fees and cultural factors such as aversion to debt and families financially supporting students. Sweden has the highest share of households with educational loans and the greatest mean value. These loans are designed to cover lifelong learning not just higher education, have been available for some time and have a long pay-back period. The US has also had educational loans, public and private, for some time and unlike Sweden where tuition costs are paid through general taxation, tuition fees are high and are borne by the student. Between 1995 and 2007 the incidence of US student loans and their average value increased. In Finland, tuition is free and there is a system of student grants and loans. Although the overall incidence of loans is similar to the US the average value of loans is much lower. Between 1994 and 1998 there is evidence of falling loans in Finland, particularly in the 16-24 age group. Large scale student loans have only fairly recently been available in the UK but by 2005 nearly one-third of households in the 16-24 age group held loans, and major reforms introduced in 2012 are likely to result in increases in the incidence of loans and substantial increases in the average value of these loans;
- Income from wealth disproportionately benefits higher income households and increases inequality in the top half of the income distribution. There are many similarities in the median and P90 values of wealth held within income percentiles between the five study countries. However, some interesting differences have emerged. In the UK we find a group of asset-rich/income-poor households. Lower and middle income UK households typically hold higher median net worth than US households but higher income US households hold much greater values of median wealth than their UK counterparts. At the 90th percentile of net worth within income percentiles wealth is much higher in the UK compared with Sweden and Finland. Only some of which can be explained by higher values of income held. Italian households enjoy higher median net worth than UK households above the 25th income percentile but much more similar 90th percentile values.

While coverage and methodological differences exist between the data sources these are now better understood and only partly explain cross-country differences in household wealth and its evolution over time.

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