



# COMPARING WEALTH DISTRIBUTION ACROSS RICH COUNTRIES: FIRST RESULTS FROM THE LUXEMBOURG WEALTH STUDY<sup>1</sup>

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## Abstract

The new Luxembourg Wealth Study (LWS) creates for the first time a harmonized cross national database on household assets and liabilities. This paper describes the project, outlines conceptual and practical issues that need to be addressed in preparing harmonized and comparable wealth data across countries, and summarizes the initial results for the eight countries participating in the initial phase: Canada, Cyprus, Finland, Germany, Italy, Norway, Sweden, the United Kingdom and the United States.

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## 1. Introduction

The study of the distribution and composition of household wealth is a flourishing research field. Empirical analysis must, however, cope with considerable weaknesses in the available data. Household surveys of assets and debts, for instance, typically suffer from large sampling errors due to the high skewness of the wealth distribution as well as from serious non-sampling errors. In comparative analysis these problems are compounded by differences in the methods and definitions used in various countries. Indeed, in introducing a collection of essays on household portfolios in five countries, Guiso, Haliassos and Jappelli mention “definitions” as the “initial problem” and warn the reader that “the special features and problems of each survey ... should be kept in mind when trying to compare data across countries” (2002, pp. 6-7). Likewise, Davies and Shorrocks conclude their extensive survey on the distribution of wealth by remarking that: “Adoption of a common framework in different countries, along the lines that have been developed for income distributions, would improve the scope for comparative studies” (2000, p. 666).

The contrast with income is an apt one. By now, also thanks to the endeavor of the Luxembourg Income Study (LIS), we have a good idea of the income inequality ranking of OECD countries (e.g., Brandolini and Smeeding, 2005; 2006). At the turn of the century, income inequality was least in Nordic countries. The Benelux countries, France, Germany and other Central and Eastern European countries came next, preceding most Anglo-Saxon nations and the Southern European countries. The United States, Estonia, Mexico and Russia exhibited the highest degree of inequality. While we can draw this income inequality picture with some confidence, our knowledge is far more uncertain on the country ordering in terms of wealth inequality. A recent compilation of data for nine nations around the beginning of this decade shows that Sweden, not the United States, leads the ranking (Brandolini, 2006, figure 2, p. 48). This evidence not only runs counter to that based on income, but also to

earlier evidence. According to the figures assembled by Davies and Shorrocks (2000, table 1, p. 637) for 11 nations, in the mid 1980s wealth inequality was among the lowest in Sweden and greatest in the United States. Does this different ranking reflect true changes during the 1990s, or are we reacting to some statistical artifact? If one leans toward the latter explanation, we might turn to the results obtained by Klevmarken, Lupton and Stafford (2003), showing the much higher inequality of the U.S. wealth distribution in the 1980s and 1990s.<sup>2</sup> This is a clear warning that before making cross-country comparisons and investigating the causes of different patterns, we must carefully understand the extent to which data are comparable.

These and similar questions have led researchers and institutions from a number of countries to join forces to launch the Luxembourg Wealth Study (LWS) – an international project to assemble existing micro-data on household wealth into a coherent database. As the LIS experience has clearly shown, the availability of such database is likely to spur comparative research on household net worth, portfolio composition, and wealth distributions, and to stimulate a process of harmonization of definitions and methodologies. The purpose of this paper is to sketch the main features of the project and to present the first preliminary results, in order to show the potential of the LWS database. While we take full responsibility of what is written here, it is important to recognize from the outset that we owe a great debt to all sponsoring institutions and participants in the LWS project. In a sense, this paper is a collective effort much more than is revealed by the names of the authors of this paper alone.

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<sup>2</sup> Klevmarken (2006, pp. 30-1) reports that, in 2003, the inequality of net worth was in Sweden somewhat below the average, and lower than in France, Germany and Italy, according to the evidence of the Survey of Health Ageing and Retirement in Europe (SHARE) – an international project for the collection of data standardised from the outset on the living conditions and health status of the households with at least one member aged 50 and more.

The paper is organized as follows. The next Section describes the genesis and structure of the project. Sections 3 to 5 summarize the main features of data sources and discuss the classification of wealth variables and some comparability issues. Preliminary results from the  $\beta$ -version (test version) of the LWS database are discussed in Section 6. Section 7 concludes.

## **2. Genesis, goals and participants**

The idea of the Luxembourg Wealth Study originated at the 27th General Conference of the International Association for Research in Income and Wealth, held in Djurhamn, Sweden in August 2002. Following the discussion in a session on the size distribution of wealth, it was apparent that data on household net worth were far behind those on income in terms of international comparability. It was then recognized that the time was ripe for the creation of a cross-country comparable wealth database. The LIS successful experience, begun almost two decades earlier (Smeeding, 2004), suggested the way forward: a cooperative project gathering producers of wealth micro-data in countries where these data were available. After two more meetings of wealth and data collection experts in 2003, one at LIS offices in Luxembourg in July and one at the Levy Economics Institute in New York in October, the LWS was officially launched in March 2004 as a joint project of LIS and institutions from nine countries: Canada, Cyprus, Finland, Germany, Italy, Norway, Sweden, the United Kingdom, and the United States. Austria has also joined in spring 2006, making LWS a ten nation enterprise at present.

The primary goal of the project is to assemble and to organize existing micro-data on household wealth into a coherent database, in order to provide a much more sound basis for comparative research on household net worth, portfolio composition, and wealth distributions. The ex post harmonization of existing data is seen as the first stage of the project. The establishment of a network of producers and experts of data on household net worth aims at

promoting a process of ex ante standardization of definitions and methodologies. The elaboration of guidelines for the collection of household wealth statistics, as done for income by the Expert Group on Household Income Statistics–The Canberra Group (2001), is an important task for the foreseeable future. In light of these goals the first workshop on the “Construction and Usage of Comparable Microdata on Wealth: the Luxembourg Wealth Study” was organized by Banca d’Italia in Perugia, Italy in January, 2005. The outcome of this conference was a series of technical papers available on the LWS website, which provide the basis for future discussions in constructing comparable wealth survey data.

Participants in the LWS project are a varied group. Sponsoring institutions include statistical offices (Statistics Canada, Statistics Norway), central banks (Central Bank of Cyprus, Banca d’Italia, Österreichische Nationalbank), research institutes (Deutsches Institut für Wirtschaftsforschung–DIW, U.K. Institute for Social and Economic Research–ISER, through a grant awarded by the Nuffield Foundation), universities (Åbo Akademi University), and research foundations (Finnish Yrjö Jahnsson Foundation, Palkansaajasäätiö –Finnish Labour Foundation, Swedish Council for Working Life and Social Research–FAS, U.S. National Science Foundation). Representatives from several other public institutions (Statistics Sweden, Banco de España, De Nederlandsche Bank, U.S. Federal Reserve Board, U.S. Internal Revenue Service, U.K. Department for Work and Pensions, Organisation for Economic Co-operation and Development, World Bank) as well as researchers from many universities have taken part in different stages of the project.

The partnership with the LIS is a strong asset, as it allows the LWS project to take advantage of the 20-year LIS experience in harmonizing household survey data and making them accessible to researchers world-wide through an innovative remote access system (see <http://www.lisproject.org> for further details). The same access rules will be followed by the LWS. The  $\beta$ -version (test version) of the database has been released and is being tested by

researchers participating in the project. The comparison of the  $\beta$ -version of the database with the original national sources will be the object of a technical workshop planned for December 2006. The test phase will lead to the preparation of the final  $\alpha$ -version of the database that is expected to be made public sometime in 2007. The release of the  $\alpha$ -version to the research community will mark the end of the first stage of the LWS project. Afterwards, the maintenance and updating of the dataset will be part of the regular LIS activities, as decided by the board of LIS country members in July 2005 and to be discussed again in July 2007. As for LIS, participation in the LWS work will be open to any country that has the relevant information and wants to join the project.<sup>3</sup>

### **3. A sketch of data sources**

The data sources included in the LWS database and some of their characteristics are listed in Table 1. (The Austrian survey is covered here for sake of completeness but no further comments will be made in the paper, as the work to include this survey in the LWS database has just started.) Although all countries rely on sample surveys among households or individuals, there are differences in collection methods across surveys. For example, in two Nordic countries the data are supplemented with information from administrative records (mostly wealth tax registers). Some income information is also supplemented by tax registers in Canada and Finland. Sample sizes are widely different, ranging from 895 households in Cyprus to 22,870 units in Norway.

The surveys also differ by purpose and sampling frame (see Sierminska, 2005, for further details). Certain surveys have been designed for the specific purpose of collecting wealth data (CA-SFS, CY-SCF, IT-SHIW, US-SCF), whereas others cover different areas and

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<sup>3</sup> Participation in the LWS project has already been discussed with the Netherlands, New Zealand, Spain, and other similar nations.

have been supplemented with special wealth modules of longitudinal household panel surveys (GE-SOEP, UK-BHPS, US-PSID). Some surveys over-sample the wealthy and provide a better coverage of the upper tail of the distribution (CA-SFS, CY-SCF, GE-SOEP, US-SCF), but at the cost of higher non-response rates. Others ask only a small number of broad wealth questions, but achieve good response rates (e.g., US-PSID). Germany applies a special case of “bottom-coding,” because financial assets, durables and collectibles, and non-housing debt are only recorded when their respective values exceed 2,500 euros. Tax registers may contain more precise estimates, but they suffer from underreporting due to tax evasion and tax exemptions, or to valuation criteria based on fiscal or administrative rules rather than market prices (see below).

Definitions are also not uniform across surveys. In general, the *unit of analysis* is the household, but it is the individual in Germany, and the nuclear family (i.e. a single adult or a couple plus dependent children) in Canada. A household is defined as including all persons living together in the same dwelling, but sharing expenses is an additional requirement in Cyprus, Italy, Finland, Norway, Sweden and the United States. This implies that demographic differences reflect both the definition of the unit of analysis and true differences in the population structure.

The *household's head* is defined as the main income earner in most surveys, but it is defined as the person most knowledgeable and responsible for household finances in Germany, Italy and the United Kingdom. The United States is the only country where the head is taken to be the male in a mixed-sex couple. Multiple household's heads are allowed in Norway wherever the partners in a couple are not married or cohabiting, or adult children are present, since the head is defined with reference to each nuclear family within the household. As in the LWS database the unit is taken to be the household, in these cases the household's head has been identified with the main income earner.

The surveys included in the LWS archive differ in many other respects, and some more closely related to wealth variables are discussed in the next Section. Full documentation of each survey's features will be an important constituent of the LWS archive. The LWS documentation will also report which of these differences in the original surveys were corrected for in the harmonization process, and which were not.

#### **4. LWS variables and wealth classification**

The number and definition of recorded wealth variables vary considerably across surveys. As shown in Table 1, the number of wealth categories ranges from a minimum of 7 in the UK-BHPS to 30 or more in the IT-SHIW, the NO-IDS and the US-SCF. This number compounds with the detail of the questions: in some surveys, there are few simple summary questions; in other surveys, the very high level of detail leads to a considerable multiplication of the number of separate recorded items. The US-SCF is by far the most detailed wealth survey of those included in the LWS database: checking accounts, for instance, are first separated into primary and secondary accounts, and then distinguished according to the type of bank where they are held.

The great variation in the amount of recorded information makes the construction of comparable wealth aggregates a daunting task. This problem has been approached by defining an ideal set of variables to be included in the LWS database. This starts with a general classification of wealth components, from which totals and subtotals are obtained by aggregation. This set is then integrated with demographic characteristics (including health status) and income and consumption aggregates, plus a group of variables particularly relevant in the study of household wealth: realized lump-sum incomes (e.g., capital gains, inheritances and *inter-vivo* transfers) and “behavioral” variables such as motives for savings, perceptions about future events (e.g., bequest motivation), attitude towards risk, and so forth.

This ideal list has been pared down after a comparison with the information actually available in the LWS surveys. With regards to wealth, this process has eventually led to identify the following categories:

- *Financial assets*: Transaction and savings accounts, CDs; Total bonds; Stocks; Mutual and investment funds; Life insurance; Pension assets; Other financial assets.
- *Non-financial assets*: Principal residence, Investment real estate; Business equity; Vehicles; Durables and collectibles; Other non-financial assets.
- *Liabilities*: Home secured debt, which is the sum of Principal residence mortgage, Other property mortgage, and Other home secured debt (including lines of credit); Vehicle loans; Installment debt (including credit card balance); Educational loans; Other loans from financial institutions; Informal debt.
- *Net worth*: Financial assets plus Non-financial assets less Liabilities.

Crossing this classificatory grid with the information available in each LWS survey gives rise to the matrix of Table 2. This Table illustrates the difficulty of transforming the original sources into a harmonized database: coverage and aggregation of wealth items vary widely across surveys. An acceptable degree of comparability can be obtained for four main categories of financial assets: deposit accounts, bonds, stocks, and mutual funds – with the partial exception of Germany which does not record information on checking deposits. The remaining financial components are available only for some countries. For non-financial assets the greatest comparability is obtained for principal residence and investment real estate. Liabilities are present in all surveys, though with a varying degree of detail. Applying the minimum common denominator criterion to this matrix, the following four LWS aggregates are defined: total financial assets, including deposit accounts, stocks, bonds, and mutual funds; non-financial assets, including principal residence and investment real estate; total debt; and net worth, i.e. the sum of financial and non-financial assets net of total debt.

Business equity is not available for all nations, but is comparable for at least seven nations. If one is willing to focus on a smaller subset of nations, more complete definitions are possible.

These LWS aggregates, on which we focus in the next Sections, are broadly comparable, but fall far short of perfect comparability, since underlying definitions and methods vary across surveys. Moreover, these aggregates fail to capture important wealth components, such as business equity and pension assets. As their importance differs across countries, cross-national comparisons are bound to reflect these omissions. Some indication is provided by the comparison between the LWS definitions and the national definitions of net worth. The LWS database includes the variables which are part of the national concept but are excluded from the LWS definition. This allows users to reconcile the different definitions, as shown in Table 3 for five countries. The first message of Table 3 is reassuring: once the missing items are included back in net worth, the LWS figures closely approximate those released in official publications. On the other hand, more worryingly, the weight of these omissions is significant and varies considerably across countries: it goes from about a half in the two North-American nations to less than a fourth in the three European nations of Table 3. This evidence is a salutary warning of the currently high cost of cross-country comparability using current survey practices: until a greater standardization of wealth surveys is achieved *ex ante*, we have to trade off higher comparability against a somewhat incomplete picture of national wealth.

## **5. Further comparability issues**

Other methodological differences, in addition to those concerning definitions, affect comparability. Some relate to the way assets and liabilities are recorded (as point values, by brackets, or both) and to their accounting period. Wealth values generally refer to the time of the interview, but in four countries end-of-year values are registered (Table 1). Moreover, in

half of the surveys included in the LWS database the reference period for income differs from that for wealth.

The criteria to value assets and liabilities may differ too (see Atkinson and Harrison, 1978, pp. 5-6). In most cases, wealth components are valued on a “realization” basis, or “the value obtained in a sale on the open market at the date in question” (Atkinson and Harrison, 1978, p. 5), as estimated by the respondent. But there are important exceptions, the most relevant being the valuation of real property in Sweden and Norway on a taxable basis. Statistics Sweden calculates the ratios of purchase price to tax value for several types of real estate and geographical locations, and then use them to inflate the tax values registered in the survey. This procedure is however not applied to Norwegian data, although Statistics Norway estimated that in the 1990s the taxable value of houses was less than a third of their market value (see Harding, Solheim and Benedictow, 2004, pp. 15-6, fn. 10). These diverse choices are likely to affect comparisons between the two Scandinavian countries as well as between them and the other countries relying on valuation at market prices as estimated by respondents.

Lastly, there are different patterns of non-response and different imputation procedures. For instance, the CY-SCF has a rather detailed set of questions, but the number of missing values is very high: only 349 households, out of 895, provided enough information to estimate the LWS net worth concept (Table 4). The overall response rate of the IT-SHIW is rather low, about 36 per cent in the 2002 wave, net of units not found at the available address, but item non-responses are few. LWS net worth cannot be derived for 14 per cent of the households in the UK-BHPS. Banks, Smith and Wakefield (2002) have applied a “conditional hot-deck” imputation method at the benefit unit level to alleviate the missing information problem, but it is still to be determined whether LWS will follow the same methodology. In the US-PSID financial assets as well as housing equity are imputed. Discussions are under

way whether this imputation method can be followed to obtain values for the principal residence and mortgages that would reduce the overall proportion of missing values. In the US-SCF item non response is tackled by using a sophisticated multiple imputation program (Kennickell, 2000), while in the GE-SOEP it is currently treated by simply replacing missing values with the overall mean (a complex imputation procedure is under study).

A synthetic assessment of the information contained in the LWS database is provided by the comparison of LWS-based estimates with their aggregate counterparts in the national balance sheets of the household sector (which include non-profit institutions serving households and small unincorporated enterprises). This comparison is presented in Table 5, where all variables are transformed into euro at current prices by using the average market exchange rate in the relevant year, and are expressed in per capita terms to adjust for the different household size. The aggregate accounts provide a natural benchmark to assess the quality of the LWS database, but a proper comparison would require a painstaking work of reconciliation of the two sources, as discussed at length by Antoniewicz et al. (2005). The aim of Table 5 is more modestly to offer a summary view of how the picture drawn on the basis of the LWS data relate to the one that could be derived from the national balance sheets or the financial accounts. LWS estimates seem to represent non-financial assets and, to a lesser extent, liabilities better than financial assets. In all countries where the aggregate information is available, the LWS wealth data account for between 40 and 60 per cent of the aggregate wealth. Note that these discrepancies should not be attributed to the deficiency of the LWS data, since they reflect not only the under-reporting in the original micro sources, but also the dropping of some items in the LWS definitions to enhance cross-country comparability as well as the different definitions of micro and macro sources.

To sum up, despite the considerable effort put into standardizing wealth variables, there remain important differences in definitions, valuation criteria and survey quality that

cannot be adjusted for at this time. Moreover, the degree to which LWS-based estimates match aggregate figures varies across surveys. These observations have to be borne in mind in reading the results discussed in the next Section.

## **6. First results from the LWS database**

In this Section we present some descriptive evidence on household wealth for the nine countries included in the  $\beta$ -version of the LWS database. We focus on asset and debt participation, portfolio composition, and the distribution of net worth. As wealth accumulation patterns vary over the life-cycle, it is useful to portray the demographic structure in each country before reviewing this evidence (Table 6). The average household size ranges from 1.96 persons in Sweden to 2.65 in Italy and 3.35 in Cyprus. Italy stands out as the country with the most pronounced ageing process. On average, the age of household's heads is 55 years in Italy, against 53 in the United Kingdom, 52 in Germany and 51 in Sweden; in all other countries, mean age is below 50, with a minimum 47 in Canada. Italy has both the lowest share of young household's heads (below 35 years) and the highest share of old heads (more than 64 years): 10 and 33 per cent, respectively. The United Kingdom and Germany follow at some distance. At the other extreme, 18 per cent of the Canadian households are headed by an old person, and 27 per cent of households in Norway are headed by a young one. In other countries, old household's head account for around 21-22 per cent of the total and young heads for about 23-24 per cent.

### *6.1. Asset and debt participation and portfolio composition*

Table 7 shows that in almost all LWS countries, over 80 per cent of households own some financial asset. In most countries this is a deposit account. Stocks are particularly spread in Cyprus, Finland and Sweden. Sweden and Norway have the highest diffusion of mutual

funds. 44 per cent of Cypriot households hold bonds. In the United States, according to the SCF, holders of stocks, bonds and mutual funds each account for about a fifth of the population. Over 60 per cent of households own their principal residence in all countries except in Germany and Sweden: the proportion is highest in Cyprus (74 per cent), and it falls just below 70 per cent in Italy, the United Kingdom and the United States (SCF). Owning a second home is most popular in Finland and Norway. There is substantial variation in debt holdings: from 22 per cent of households in Italy to 80 in Norway; from 10 per cent in Italy to 46 in the United States if only home secured debt is considered.

As noticed above, most of financial assets and non-housing debt are recorded in Germany only if they exceed 2,500 euros. The figures in the bottom panel of Table 7 are obtained by applying the same bottom coding to the data for six other countries, in order to put them on a comparable basis with the German data (something which LWS flexibility allows the user to accomplish). The share of households owning financial assets is now in Canada and Finland similar to the German one; it is 20 percentage points higher in Italy and Norway, with the two Anglo-Saxon countries in an intermediate position. The comparison between the top and bottom panel of the Table indicates that a large proportion of Canadian and Finnish households holds very little in reported financial assets.

One of the advancements allowed by the availability of the LWS database is, however, in the demonstration of different patterns of comparative wealth holding among households. The age profiles for the possession of financial assets, principal residence, debt and positive net worth are significantly different across countries (Figure 1). Italy, again, stands out as an outlier. On the one hand, intergenerational differences appear to be dissimilar, since the hump-shape of debt-holding and home-ownership is much flatter than in the other countries. On the other hand, the low propensity to borrow and the parallel high proportion of positive net worth holders, already noted for the average, are common across all age classes. Norway

and Finland show a remarkable diffusion of financial wealth in all cohorts, including the young. In Germany and Sweden the share of home-owners tends to be lower than in other countries, and it is markedly so among the elderly.

Table 8 shows a considerable variance in portfolio composition.<sup>4</sup> The United States exhibits the highest preference for financial assets: around 35 per cent of total assets, over two thirds of which are held in risky instruments like stocks and mutual funds. Sweden and Canada follow, with proportions of 28 and 22 per cent, respectively. Financial instruments account for only 15-16 per cent of total assets in Finland and Italy. The principal residence represents 60 per cent or more of the value of total assets in all countries except the United States, where it accounts for close to 50 per cent. The ratio of debt to total assets ranges from a very low 4 per cent in Italy to 35 per cent in Sweden. Comparing the household portfolio composition as measured in the LWS database with the composition emerging from aggregate data is an important topic for future research.

## *6.2. The distribution of net worth: means, medians and inequality*

Figure 2 indicates that country ranking differs between net worth and income, and also that it matters which measure of central tendency of the wealth distribution is chosen: mean or median. All values are expressed in international 2002 U.S. dollars by using the purchasing power parities and consumer price indices estimated by the OECD. Both with the mean and the median income, the United States is the richest country followed by Canada and the United Kingdom, then Germany and Sweden, and lastly Finland and Italy. This is not the case for net worth. The United States and Italy are the richest nations according to mean net worth,

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<sup>4</sup> Note that figures are not reported for Cyprus, owing to the many missing values, and for Norway because of the inconsistency stemming from valuing real estate on a taxable basis and debt at market prices. Also, the German data are biased by the fact that small holdings of some financial assets and debt are not recorded.

and Sweden and Finland are at the poorest ones. Once we switch to the median, the United States fall toward the middle and are surpassed by Finland and the United Kingdom. Italy and the United Kingdom show by far the highest median net worth, almost twice the corresponding values for the other countries.

Median wealth holdings by age of the household's head in Figure 3 exhibit a similar hump-shaped pattern, although at different levels of net worth, in most countries. The young have less, the middle aged have the most, and the older have less than the middle-aged but more than the young. The richest young are found in Cyprus and Italy, but their share in population is small, suggesting that only those with enough wealth leave their parents' house (see also Martins and Villanueva, 2006, Table 1). In the United States, Canada, the United Kingdom and Italy the older headed households are also quite well-off. The patterns for financial assets are quite varied for those aged 50 and over. In all countries, the young have little debt, while those aged 35-44 are the most indebted. Unsurprisingly, indebtedness is low among the older age classes: indeed, over half of the elderly have no debt in all countries. In Germany and Italy, over half of the households have no debt at all ages.

The LWS database allows us to shed new light on international differences in wealth concentration. There are very few international comparisons of wealth distribution based on micro-data reclassified to account for differences in definitions. Kessler and Wolff (1991), Klevmarken, Lupton and Stafford (2003) and Faiella and Neri (2004) are among the few examples of bilateral comparisons but, to our knowledge, the LWS project is the first attempt to extend such comparisons to more than two countries. Table 9 shows statistics on the distribution of net worth in seven countries. The caveats exposed in previous Sections must be borne in mind: in particular, the bottom-coding implemented in the German survey is likely to overstate measured inequality. According to the  $\beta$ -version of the LWS database, the highest Gini index is found in Sweden. The United States closely follow, and Germany and Canada

come next. Finland, the United Kingdom and Italy exhibit a more equal distribution of net worth. Hence, also the LWS data put Sweden at the top of the ranking. In accounting terms, part of the explanation rests on the very high proportion of Swedish households with nil or negative net worth: 32 per cent against 23 per cent, at most, in the other countries (excluding Germany, whose figure is probably overstated by bottom-coding). When the share of net worth held by top population percentiles is considered, the United States regain the lead: the richest one per cent of U.S. households controls 33 per cent of total wealth, according to the SCF, or 25, according to the PSID, and the next four per cent controls another 25 per cent.<sup>5</sup> These proportions are far higher than in all other countries, Sweden included. Understanding the extent to which these results are affected by the different measurement methods or the different comprehensiveness of the wealth definition is an important question left for future LWS research. For instance, counting pension rights as an asset might matter more for Sweden, resulting in much greater equality than found in the figures of Table 9.<sup>6</sup>

## 7. Conclusions

Reliable statistics on the composition and distribution of private wealth is a pre-requisite for the study of the well-being of households and their consumption and financial behavior. As stressed by John Campbell in his Presidential Address to the American Finance Association early this year, “measurement” is a “challenge” faced by researchers studying household finance:

“Positive household finance asks how households actually invest. *This is a conceptually straightforward question, but it is hard to answer because the necessary data are hard to obtain.* In the United States, households guard their financial privacy jealously: in fact, it may be more unusual today for people to reveal intimate details of

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<sup>5</sup> The over-sampling of the wealthy in the US-SCF but not in the US-PSID is a plausible reason for the difference in the estimated shares of the richest households.

<sup>6</sup> On measuring pension wealth see Brugiavini, Maser and Sundén (2005).

their financial affairs than to reveal details of their intimate affairs. In addition, many households have complicated finances, with multiple accounts at different financial institutions, having different tax status, and including both mutual funds and individual stocks and bonds. Even households that wish to cooperate with researchers may have some difficulty answering detailed questions accurately.” (2006, p. 3, italics added).

The challenge of measurement is stretched to the limit when we move to comparative analysis, since the difficulties in collecting data on household finances are compounded by the need to standardize these data across countries. Yet, the exercise is very well worth taking.

In the first place, in a number of countries there are enough data which, once they are properly treated, could shed light on cross-national differences in household finances. The detailed work on the single items recorded in each of the surveys included in the LWS database has allowed us to construct a set of variables and wealth aggregates which are broadly comparable across countries. Researchers must be aware that many problems remain and that comparative results must be taken with some caution. But the LWS project has shown that cross-national analysis of household wealth holding is indeed feasible. This paper has only given a flavor of the variance of wealth patterns across countries and raised further research questions. Why is indebtedness so low among Italians and Germans at all ages? Why are Italian and British households so much richer, on average, than Swedish and Finnish households? Does this reflect differences in the asset valuation criteria, or a diverse balance between public and private provision of life security? Is wealth inequality really higher in Sweden than in the United States?

There is, however, a second important reason for the LWS endeavor. Comparing micro and macro sources on household wealth across countries is an effective way to learn about relative weaknesses and methodological differences; it is instrumental in defining an internationally agreed frame for the collection and classification of household wealth at the individual level – as done in the past by LIS for income statistics. Cross-national differences

will never be eliminated entirely, and perfect comparability is hardly achievable. But the LWS project provides a starting point for a much needed process of ex ante standardization of methods and definitions. The release of the  $\alpha$ -version of the LWS database to the scientific community will allow a considerable progress in substantive research on household wealth on a comparative basis, but it must also be seen as a first step toward the construction of better cross-country comparable wealth data.

At this state, the LWS project is similar to where the LIS project was 20 years ago. Definitions have been suggested, patterns have been identified and explanations are still to emerge. But a sense of excitement is in the air. We know that LIS has paved the way to a whole range of comparative cross-national studies by increasing the ratio of “signal” to “noise” in comparative studies of income distribution, poverty, and inequality more generally (Butz and Torrey, 2006). We can only hope that LWS can achieve similar status in comparisons of wealth and net worth in decades to come.

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Table 1. LWS household wealth surveys

Country	Name	Agency	Wealth year (1)	Income year	Type of source	Over-sampling of the wealthy	Sample size	No. of non-missing net worth	No. of wealth items
Austria	Survey of Household Financial Wealth (SHFW)	Österreichische Nationalbank	2004	2004	Sample survey	No			10
Canada	Survey of Financial Security (SFS)	Statistics Canada	1999	1998	Sample survey	Yes	15,933	15,933	17
Cyprus	Cyprus Survey of Consumer Finances (SCF)	Central Bank of Cyprus and University of Cyprus	2002	2001	Sample survey	Yes	895	349	24
Finland	Household Wealth Survey (HWS)	Statistics Finland	End of 1998	1998	Sample survey	No	3,893	3,893	23
Germany	Socio-Economic Panel (SOEP)	Deutsches Institut Für Wirtschaftsforschung (DIW) Berlin	2002	2001	Sample panel survey	Yes	12,692	12,129	9
Italy	Survey of Household Income and Wealth (SHIW)	Bank of Italy	End of 2002	2002	Sample survey (panel section)	No	8,011	8,010	34
Norway	Income Distribution Survey (IDS)	Statistics Norway	End of 2002	2002	Sample survey plus administrative records	No	22,870	22,870	35
Sweden	Wealth Survey (HINK)	Statistics Sweden	End of 2002	2002	Sample survey plus administrative records	No	17,954	17,954	26
United Kingdom	British Household Panel Survey (BHPS)	ESRC	2000	2000	Sample panel survey	No	4,867 (2)	4,185	7
United States	Panel Study of Income Dynamics (PSID)	Survey Research Center of the University of Michigan	2001	2000	Sample panel survey	No	7,406	7,071	14
	Survey of Consumer Finances (SCF)	Federal Reserve Board and U.S. Department of Treasury	2001	2000	Sample survey	Yes	4,442 (3)	4,442 (3)	30

Source: LWS database. (1) Values refer to the time of the interview unless otherwise indicated. (2) Original survey sample. Sample size can rise to 8,761 when weights are not used. (3) Data are stored as five successive replicates of each record that should not be used separately; thus, actual sample size for users is 22,210. The special sample of the wealthy includes 1,532 households.

Table 2. Wealth classification matrix in LWS

Asset or liability	LWS acronym	Canada SFS 1999	Cyprus SCF 2002	Finland HWS 1998	Germany SOEP 2002	Italy SHIW 2002	Norway IDS 2002	Sweden HINK 2002	United Kingdom BHPS 2000	United States PSID 2001	United States SCF 2001		
<b>FINANCIAL ASSETS</b>													
Total	TFA	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ		
Deposit accounts: transaction, savings and CDs	DA	Y	Y	Y	Y (1)	Y	Y	Y	Y (2)	Y	Y		
Total bonds: savings and other bonds	TB	Y	Y	Y		Y	Y	Y	Y		Y	Y	
Stocks	ST	Y	Y	Y		Y	Y	Y		Y		Y	Y
Mutual funds and other investment funds	TM	Y	Y	Y		Y	Y	Y	Y (2)		Y (4)		Y
Life insurance	LI	-	Y	Y	Y (3)	-	Y	-		-		Y	Y
Other financial assets (exc. pension)	OFA	Y	Y	Y		Y	Y	Y	Y (5)	-	Y	Y	
Pension assets	PA	Y	Y	Y		-	Y	-	-	-	Y	Y	
<b>NON-FINANCIAL ASSETS</b>													
Total	TNF	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ	Σ		
Principal residence	PR	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Investment real estate	IR	Y	Y	Y	Y	Y	Y	Y	Y (6)	Y (7)	Y		
Business equity	BE	Y	Y	-	Y (6)	Y	Y (6)	Y (6)		Y	Y	Y	
Vehicles	VH	Y	Y	Y	Y (8)	Y	Y	-	Y (9)	Y (9)	Y		
Durables and collectibles	DRCL	Y	-	Y	Y	Y	Y	-	-	-	Y		
Other non-financial assets	ONF		-	-	-	-	-	-	Y (5)	-	-	Y	
<b>LIABILITIES</b>													
Total	TD	Σ	Σ	Σ	Σ	Σ	Y	Y	Σ	Σ	Σ		
Home secured debt	HSD	Σ	Σ	Y	Σ	Y	-	Y (10)	Y	Σ	Σ		
Principal residence mortgage	MG	Y	Y		Y		Y	Y (11)		-	Y	Y	Y
Other property mortgage	OMG	Y	Y		Y		Y	Y		-	Y	Y (7)	Y
Other home secured debt (incl. line of credit)	OHSD	Y	-		-		-	Y		-	-	-	Y
Vehicle loans	VL	Y	Y	Y	Y	Y	Y (11)	Y (10)	Y (9)	Y (9)	Y		
Installment debt (incl. credit card balance)	IL	Y	Y			Y	Y	Y	Y	Y	Y (12)	Y	
Educational loans	EL	Y	Y	Y	Y	-	Y	Y	Y	Y			
Other loans from financial institutions	OL	Y	Y	Y	Y	-	Y	Y	Y	Y			
Informal debt	ID		Y	Y	-	Y	Y	-	Y	Y		Y	

Source: LWS database, β-version (July 15, 2006). “Y” denotes a recorded item; “-” denotes a not recorded item; “Σ” indicates that the variable is obtained by aggregation of its components. (1) Excludes checking deposits. (2) DA and LI recorded together. (3) Includes only some pension assets. (4) Includes collectibles and some mutual funds not included in TB. (5) OFA and ONF recorded together. (6) Business assets only. (7) IR recorded net of OMG. (8) As recorded in the 2003 wave. (9) VH recorded net of VL. (10) HSD, VL and IL recorded together. (11) MG, OMG, VL and IL recorded together. (12) Includes also VL, which implies a double-counting.

Table 3. Reconciling the LWS and national net worth concept (averages in thousands of national currencies)

Wealth variable	Canada SFS 1999	Finland HWS 1998	Italy SHIW 2002	Sweden HINK 2002	United States SCF 2001
LWS net worth	102.5	69.3	154.2	537.8	213.1
+ pension assets	83.0	0.6	–	–	74.4
+ other financial assets	2.5	1.6	0.3	24.5	13.1
+ business equity	26.9	–	23.5	80.0 (1)	74.7
+ other non-financial assets	28.5	6.5	24.4	17.8	20.6
LWS adjusted net worth	243.4	78.0 (2)	202.4	660.1	395.9
<i>LWS coverage ratio</i> (3)	<i>42.1</i>	<i>88.8</i>	<i>76.2</i>	<i>81.5</i>	<i>53.8</i>
National source net worth	249.3	79.8	204.4	660.0	395.5

Source: LWS database,  $\beta$ -version (July 15, 2006) and country sources: Statistics Canada (2006a); Finnish data provided by Markus Säylä; Brandolini et al. (2006); Statistics Sweden (2004); Aizcorbe, Kennickell and Moore (2003). Household weights are used. (1) Business assets only. (2) It does not include other debts. (3) Percentage ratio of LWS net worth to LWS adjusted net worth.

Table 4. Share of missing values in major components of LWS net worth (per cent)

Wealth variable	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Non-financial assets	–	25	–	3	0.0001	–	–	2	2	–
Financial assets	–	21	–	4	–	–	–	9	-	–
Debt	–	43	–	3	–	–	–	7	3	–
Net worth	–	61	–	4	0.0001	–	–	14	5	–
Sample size	15,933	895	3,893	12,692	8,011	22,870	17,954	4,867	7,406	4,442

Source: LWS database,  $\beta$ -version (July 15, 2006).

Table 5. Per capita household wealth in LWS database and national balance sheets (euros and per cent)

Wealth variable	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
<i>LWS database</i>										
Non-financial assets	28,237	32,763	31,920	53,507	50,965	14,605	33,132	61,436	63,170	77,686
Financial assets	8,018	6,294	6,181	7,971	8,913	22,066	12,943	11,036	31,332	47,059
Debt	9,577	3,719	6,032	11,202	2,590	29,561	16,159	13,572	20,857	26,707
Net worth	26,678	35,339	32,069	50,276	57,288	7,110	29,916	58,901	73,646	98,037
<i>National balance sheet</i>										
Non-financial assets	32,492	–	–	69,234	78,417	–	–	67,728	–	66,679
Financial assets	51,157	38,099	20,317	44,731	48,780	42,268	40,927	87,199	–	123,768
Debt	13,813	15,825	7,147	18,750	7,089	33,629	16,577	20,471	–	31,003
Net worth	69,836	–	–	95,215	120,108	–	–	134,457	–	159,444
<i>Ratio of LWS to NBS</i>										
Non-financial assets	87	–	–	77	65	–	–	91	95	117
Financial assets	16	17	30	18	18	52	32	13	25	38
Debt	69	23	84	60	37	88	97	66	67	86
Net worth	38	–	–	53	48	–	–	44	46	61

Source: LWS database,  $\beta$ -version (July 15, 2006) and country sources: Eurostat (2006) for financial assets and debt of European countries; personal communication by Ulf von Kalckreuth, Brandolini et al. (2006) and Office for National Statistics (2006) for non-financial wealth in Germany, Italy and the United Kingdom, respectively; Statistics Canada (2006b); Board of Governors of the Federal Reserve System (2006). LWS figures are given by the ratios between wealth totals and number of persons in each survey; household weights are used. National balance sheets (NBS) figures are obtained by dividing total values for the sector “Households and non-profit institutions serving households” by total population. All values are expressed in euros at current prices by using the average market exchange rate in the relevant year.

Table 6. Demographic structure

Household characteristic	Canada	Cyprus	Finland	Germany	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Mean household size	2.43	3.35	2.16	2.14	2.65	2.14	1.96	2.35	2.38	2.43
Mean age of the household's head	47	49	49	52	55	49	51	53	48	49
Age composition of household's head (%)										
24 or less	5.9	1.0	7.3	3.7	0.7	7.2	6.6	3.8	5.3	5.6
25-34	19.6	21.3	16.7	15.2	9.4	19.3	16.9	14.3	18.6	17.1
35-44	24.7	24.7	20.0	20.6	21.5	19.4	17.7	19.3	22.2	22.3
45-54	19.6	16.9	21.0	17.5	18.8	18.0	17.5	17.4	22.4	20.6
55-64	11.9	15.4	13.8	16.5	16.9	14.1	16.6	14.9	12.5	13.3
65-74	10.4	15.0	11.7	14.9	18.2	9.8	10.9	14.0	10.9	10.7
75 and over	7.9	5.7	9.5	11.6	14.5	12.2	13.8	16.3	8.1	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.

Table 7. Household asset participation (per cent)

Wealth variable	Canada	Cyprus	Finland	Germany (1)	Italy	Norway	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
<i>All assets as recorded</i>										
Non-financial assets	64	76	68	43	72	72	57	70	65	70
Principal residence	60	74	64	39	69	64	53	69	64	68
Investment real estate	16	17	27	13	22	30	14	8	–	17
Financial assets	90	86	92	50	81	99	79	80	83	91
Deposit accounts	88	78	91	–	81	99	59	76	82	91
Bonds	14	44	3	–	14	–	16	–	–	19
Stocks	11	40	33	–	10	22	36	–	30	21
Mutual funds	14	1	3	–	13	38	58	–	–	18
Debt	68	65	52	30	22	80	70	59	68	75
Home secured debt	41	–	28	–	10	–	–	39	–	46
<i>Only financial assets and non-housing debt exceeding 2,500 euros</i>										
Non-financial assets	64	–	68	43	72	72	–	70	65	70
Financial assets	48	–	53	49	70	70	–	58	56	60
Total debt	58	–	45	30	17	74	–	49	59	65

Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros.

Table 8. Household portfolio composition (percentage share of total assets)

Wealth variable	Canada	Cyprus (1)	Finland	Germany (2)	Italy	Norway (3)	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Non-financial assets	78	–	84	87	85	–	72	83	67	62
Principal residence	64	–	64	64	68	–	61	74	52	45
Real estates	13	–	20	23	17	–	11	9	14	17
Financial assets	22	–	16	13	15	–	28	17	33	38
Deposit accounts	9	–	10	–	8	–	11	9	10	10
Bonds	1	–	0	–	3	–	2	–	–	4
Stocks	7	–	6	–	1	–	6	–	23	15
Mutual funds	5	–	1	–	3	–	9	–	–	9
Total assets	100	–	100	100	100	–	100	100	100	100
Debt	26	–	16	18	4	–	35	21	22	21
<i>of which: home secured</i>	22	–	11	–	2	–	–	18	–	18
Net worth	74	–	84	82	96	–	65	79	78	79

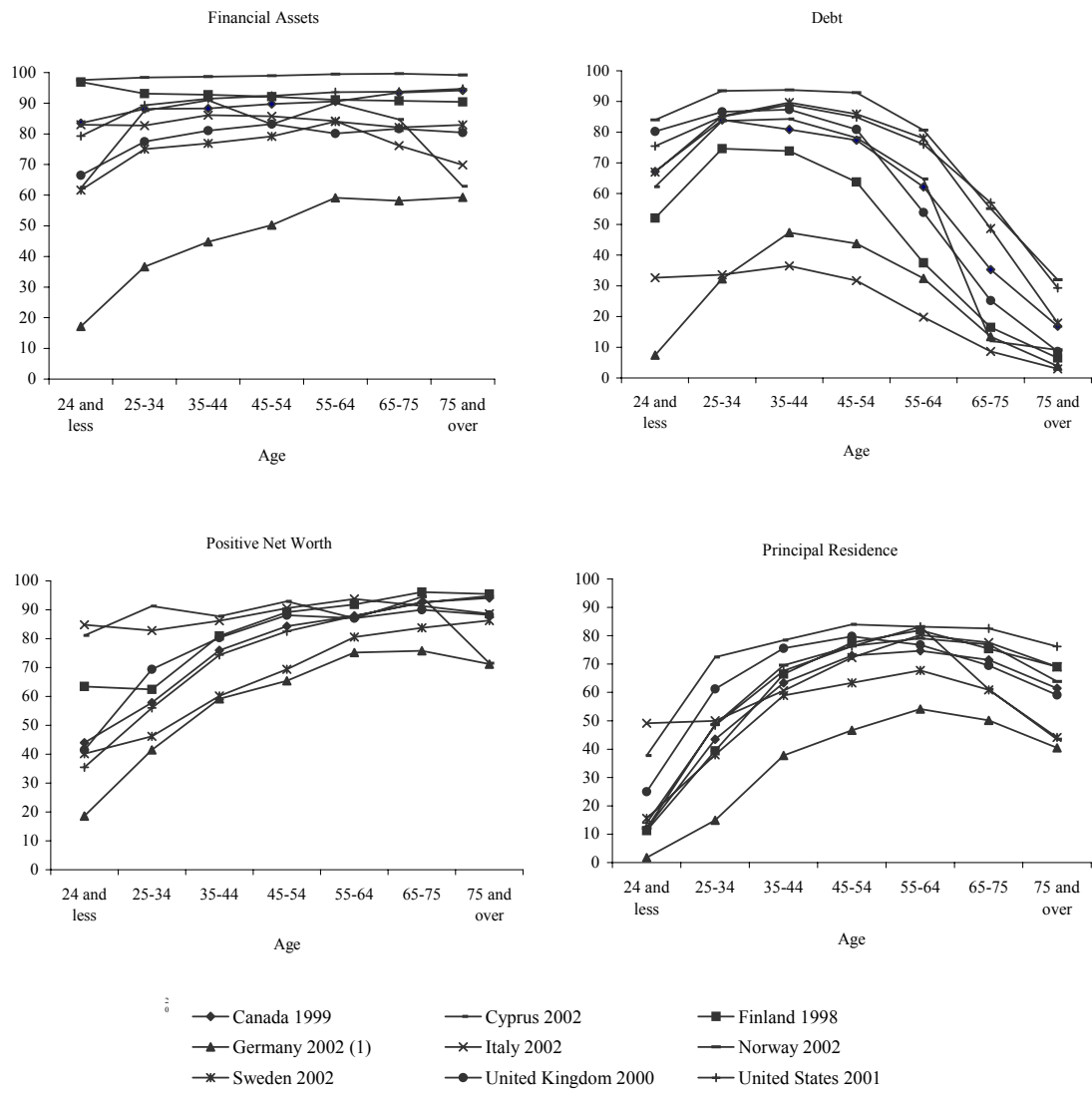
Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. Shares are computed as ratios of means. Figures may not add up because of rounding. (1) Figures not reported, because over 60 per cent of values for net worth are missing. (2) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros. (3) Figures not reported because valuing real estate on a taxable basis and debt at market prices causes a major inconsistency (indeed, the majority of households have non positive net worth).

Table 9. Distribution of household net worth (per cent)

Statistics	Canada	Cyprus (1)	Finland	Germany (2)	Italy	Norway (3)	Sweden	United Kingdom	United States	United States
	SFS 1999	SCF 2002	HWS 1998	SOEP 2002	SHIW 2002	IDS 2002	HINK 2002	BHPS 2000	PSID 2001	SCF 2001
Positive net worth	77	–	83	63	89	–	68	82	77	77
Nil net worth	3	–	2	29	7	–	5	6	8	4
Negative net worth	20	–	15	9	3	–	27	11	16	19
Quantile/median ratios										
10 <sup>th</sup> percentile	-17	–	-6	0	0	–	-84	0	-11	-15
25 <sup>th</sup> percentile	0	–	1	0	8	–	-1	2	0	0
75 <sup>th</sup> percentile	350	–	218	886	209	–	447	238	378	368
90 <sup>th</sup> percentile	708	–	390	1,818	359	–	972	482	925	980
Wealth shares										
Top 10%	53	–	45	54	42	–	58	45	64	71
Top 5%	37	–	31	36	29	–	41	30	49	58
Top 1%	15	–	13	14	11	–	18	10	25	33
Gini index	75	–	68	78	61	–	89	66	81	84

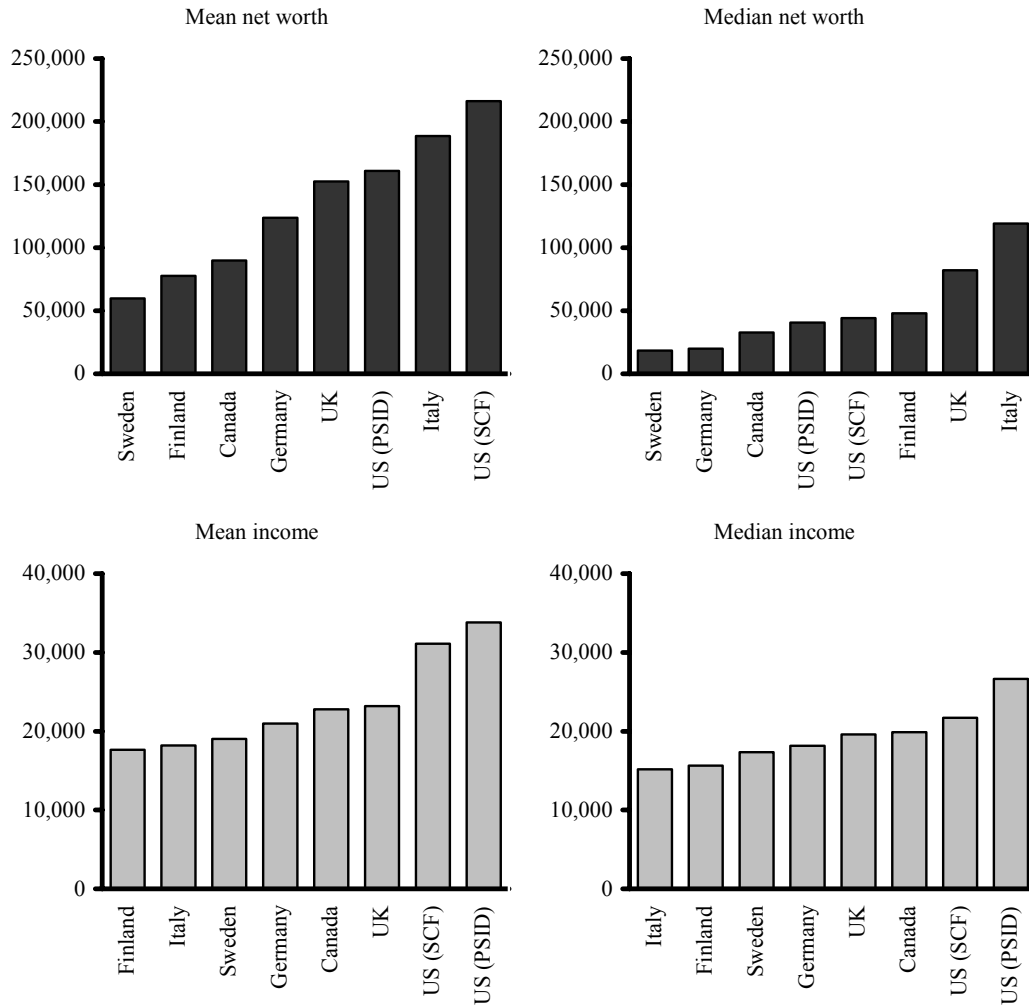
Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Figures not reported because over 60 per cent of values for net worth are missing. (2) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros. (3) Figures not reported because valuing real estate on a taxable basis and debt at market prices causes a major inconsistency (indeed, the majority of households have non positive net worth).

Figure 1. Fraction of holders, by age of the household's heads (per cent)



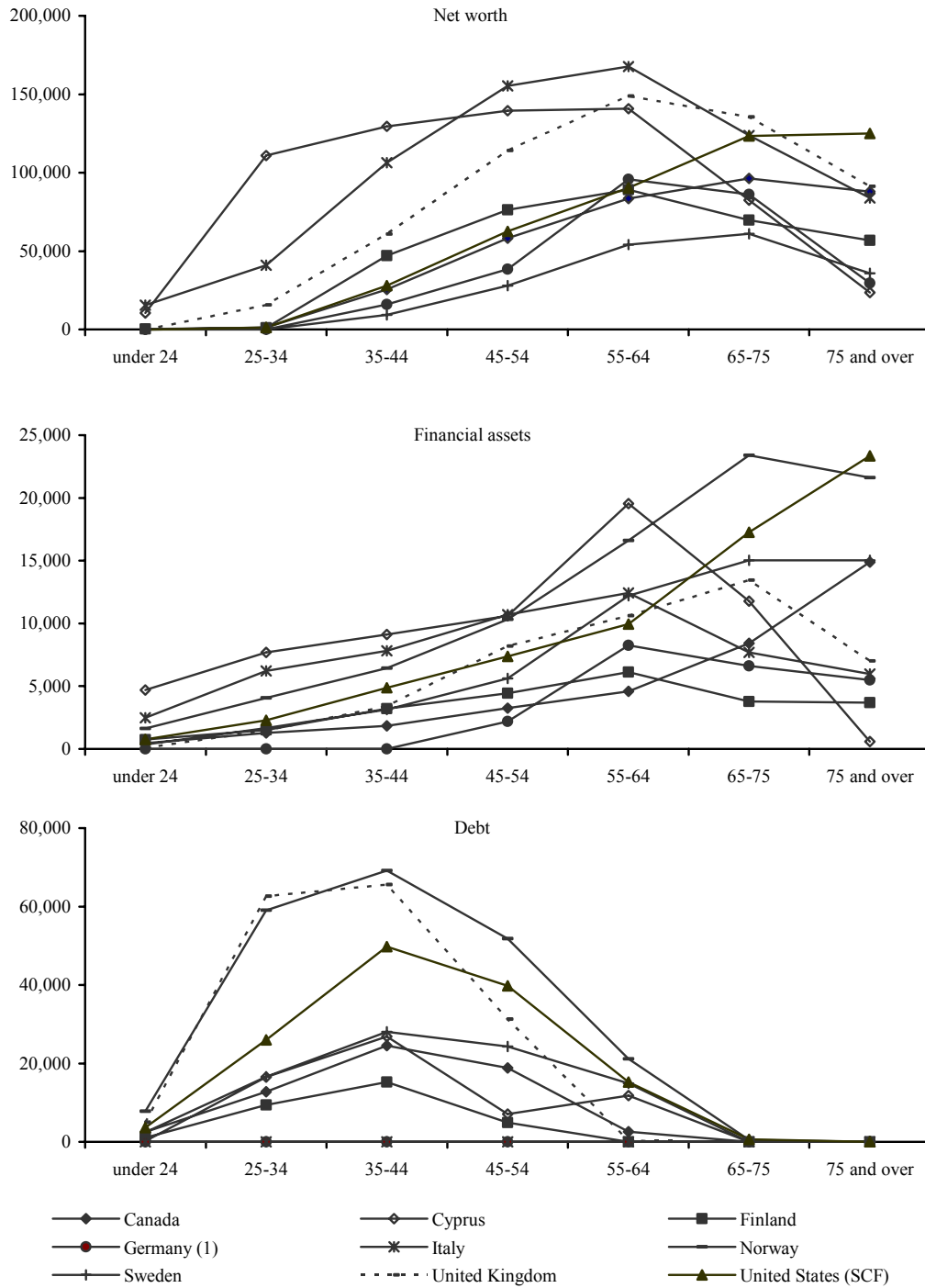
Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used. (1) Most of financial assets and non-housing debt are recorded only for values exceeding 2,500 euros.

Figure 2. LWS country rankings by mean and median of net worth and income (2002 U.S. dollars)



Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.

Figure 3. Median wealth holdings by age of the household's head (2002 U.S. dollars)



Source: LWS database,  $\beta$ -version (July 15, 2006). Household weights are used.