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**Integrating Micro and Macro Accounts – The Linkages between  
Euro Area Household Wealth Survey and Aggregate Balance Sheets  
for Households**

Ilja Kristian Kavonius and Veli-Matti Törmälehto

For additional information please contact:

Name: Ilja Kristian Kavonius  
Affiliation: University of Helsinki

Email Address: Ilja\_Kristian.Kavonius@ecb.int

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*Ilja Kristian Kavonius and Veli-Matti Törmälehto*

For additional information please contact:

*Ilja Kristian Kavonius*

*European Central Bank*

*University of Helsinki*

*E-mail: [Ilja\\_Kristian.Kavonius@ecb.int](mailto:Ilja_Kristian.Kavonius@ecb.int)*

*Tel.: +49-69-1344 8417*

*Veli-Matti Törmälehto*

*European Central Bank*

*E-mail: [Veli-Matti-Toermaelehto@ecb.int](mailto:Veli-Matti-Toermaelehto@ecb.int)*

*Tel.: +49-69-1344 8040*

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## **Abstract:**

This paper examines the linkages between household wealth surveys and National Accounts' household balance sheets, in particular the conceptual linkages between two ECB statistics: the household sector of the integrated Euro Area Accounts (EAA) and the balance sheet variables of the forthcoming euro area Household Finance and Consumption Survey (HFCS).

Although the wealth survey data are not yet available, the conceptual linkage is worth examining for various reasons. The conventional motivation for comparisons of wealth survey estimates to balance sheet counterparts is assessment of quality of the survey estimates. At the moment there is an increasing interest of breaking down National Accounts and have distributional information (Stiglitz, Sen & Fitoussi, 2009; IMF/FSB, 2009). Additionally, the current financial crisis even has emphasised the need for micro and macro linkages as it can be possibly used for instance in the analysis of transmission of macro economic shocks and risks.

This paper may be seen as the very first step towards building and investigating a link between these two data sets. This paper finds, however, that there are many complications of building this kind of linkage. Several of these complications are related to different viewpoints of the two statistics.

**JEL-codes:** D30, D31, E01 and E21

# 1 Introduction

This paper examines the linkages between household wealth surveys and National Accounts' household balance sheets, in particular the conceptual linkages between two ECB statistics: the household sector of the integrated Euro Area Accounts (EAA) and the balance sheet variables of the forthcoming euro area Household Finance and Consumption Survey (HFCS). The latter is a recently established effort to conduct ex-ante harmonised household wealth surveys in all euro area countries. Within few years, it is expected to provide, among others, structural micro-level information on euro area households' assets and liabilities.

Although the wealth survey data are not yet available, the conceptual linkage is worth examining for various reasons. At the moment, there is again wide interest in breaking down the household sector figures from National Accounts using distributional information, and in general on household perspective and distributional aspects of wealth, consumption and income (Stiglitz, Sen & Fitoussi, 2009; IMF/FSB, 2009)<sup>2</sup>. The conventional motivation for comparisons of wealth survey estimates to balance sheet counterparts is assessment of quality of the survey estimates. It may prove useful to check for consistency the results of the forthcoming euro area survey with the euro area aggregate household balance sheets before publishing the survey results. Additionally, the current financial crisis has emphasised the need of household data and preferably data with clear links between micro and macro level as for instance the financial stability analysis focuses increasingly on the transmission mechanism of shocks and risks between the different agents in the economy (see: Castrén and Kavonius 2010). This paper may be seen as the very first step towards building and investigating a link between these two data sets.

We first review potential error sources in sample surveys and aggregate balance sheets, and then examine the conceptual link between the EAA and the HFCS definitions of assets and liabilities. We also look at other potential sources of discrepancy such as sector delineation, time of recording and reference periods and valuation of euro area aggregates. Before concluding the paper, we discuss the steps that would have to be taken to eventually reconcile the EAA and the HFCS estimates.

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<sup>2</sup> IMF/FSB report to the G-20 Finance Ministers and Central Bank Governors ([http://www.financialstabilityboard.org/publications/r\\_091107e.pdf](http://www.financialstabilityboard.org/publications/r_091107e.pdf)). Recommendation 16 reads as follows: "As the recommended improvements to data sources and categories are implemented, statistical experts to seek to compile distributional information (such as ranges and quartile information) alongside aggregate figures, wherever this is relevant. The IAG is encouraged to promote production and dissemination of these data in a frequent and timely manner. The OECD is encouraged to continue in its efforts to link national accounts data with distributional information."

## 2 Differences between the euro area Household Finance and Consumption Survey and the Integrated Euro Area Accounts

Before turning to potential sources of error and discrepancies in the two systems, we briefly describe the two statistical systems.

*The Household Finance and Consumption Survey* has been set up as a decentralised ex-ante harmonised multi-national survey to collect micro data on household finances in the euro area. The target survey frequency is two/three years, and the first round of data collection is currently taking place in euro area countries with the survey spread out to different reference years ranging from 2008/2009 to 2011. While the co-existence of different fieldwork periods across countries triggers obvious comparability issues, it should ensure a continuous flow of new information to the euro area data pool at the ECB.

The survey has a focus on household finances, including detailed information on assets and liabilities, as described later in this paper. The survey also covers income, few variables on consumption, demographics, inheritances/gifts and employment. Each euro area country (National Central Bank together with a survey agency or National Statistical Institute) is expected to conduct their own survey and transmit the micro data to the European Central Bank. The achieved sample size in the euro area is expected to be around 50,000 households. While the survey is in principle output harmonised (defining target variables rather than questions) there is a common blueprint questionnaire in English on the basis of which countries are expected to elaborate their national questionnaires<sup>3</sup>.

*The Euro Area Accounts* constitute a quarterly integrated accounting system, which encompasses non-financial accounts and financial accounts, including financial balance sheets covering other changes (i.e. price changes and in some rare cases classification changes). Additionally, the dataset covers currently on experimental basis non-financial assets. The accounts are integrated encompassing the transaction accounts and the balance sheet including the other sheets. The accounts are reconciled and only household sector and non-financial corporations' sector show small discrepancies. The EAA is compiled according the European System of Accounts (ESA95), which is the European application of the System of National Accounts 1993 (SNA93)<sup>4</sup>. The underlying data are a combination of national contributions, i.e. sector accounts data compiled at the level of euro area countries, and euro area aggregate statistics. These data are produced in collaboration with the national central banks, Eurostat and national statistical institutes, and start in the first quarter of 1999. The data become available approximately four months after the end of the reference quarter.

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<sup>3</sup> Further information on the survey (including the blueprint questionnaire) and the network conducting it is available on the ECB website: [http://www.ecb.europa.eu/home/html/researcher\\_hfcn.en.html](http://www.ecb.europa.eu/home/html/researcher_hfcn.en.html).

<sup>4</sup> Additionally the following handbook advises in the compilation of the household accounts: Household Accounting: Experience in Concepts and Compilation, Studies in Methods, Series F, No. 75/Vol.2. Handbook of National Accounting, United Nations, New York 2000.

## 2.1 *The potential sources of error in micro and macro statistics*

Household surveys on income, consumption and wealth describe in principle the same reference population and often aim at the same concepts as systems of National Accounts. There are, however, a number of differences between the two statistics, related to their operational concepts and production methods.

Comparisons between micro and macro statistics such as the HFCS and the EAA are often viewed as a way to assess bias in the survey estimates, i.e. in this case to assess the quality of the HFCS estimates. Since both sources in fact are estimates subject to various types of errors, the difference between the estimates tells about discrepancy in (point) estimates rather than about absolute bias in either of the sources. Because EAA (and National Accounts in general) estimates are built from individual data sources which are confronted, and the system aims to provide a complete description in compliance with a coherent standard (SNA), it may have less bias than any single source statistic. Consequently, it may be reasonable to assume that the bias in macro estimates of balance sheet total amounts should be smaller than in surveys. An important reservation to this is that aggregate household sector balance sheets often are not drawn up directly and independently of other sector accounts. Furthermore, household wealth surveys are very difficult surveys because the objective is to collect sensitive information and derive estimates from often very skewed distributions.

The quality of the estimates based on a household sample survey may be thought of in terms of *errors of measurement* and *errors of estimation* (Verma, 2010). We find this typology of error sources more useful than the traditional dichotomy between sampling and non-sampling errors and use it in the following section. For macro statistics, there is no similar framework for assessing bias as there is for sample surveys. If surveys are used as data sources for macro statistics, each of the surveys contributes to the bias through its own errors of measurement and errors of estimation. The extent of this bias is practically impossible to quantify.

### **HFCS**

In a sample survey, *Errors in measurement* occur when the value that is recorded for a household in the sample departs from the actual true value for the household. A trivial and common example is respondent error wherein household misinterprets the question or cannot recall the exact value of the asset. Errors of measurement may result from errors in theoretical and operational concepts in the questionnaire design<sup>5</sup> and fieldwork operations (e.g. interviewer training), from response bias, and also from processing errors after the primary data collection.

A typical error source in wealth surveys is response error resulting in item non-response, i.e. that respondent is not able or is unwilling to provide an answer to a specific question (e.g. does not know whether it possesses certain type of asset). The operational concepts in household wealth surveys are very difficult even after careful formulation of the questions and use of commonly understood language. The questions may not be understood in the first place, or they may be understood in a wrong way, leading to item non-response and other measurement

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<sup>5</sup> Or from mismatch between administrative and theoretical concept if administrative data are used.

errors. Both respondent and interviewers may misunderstand questions, so in addition to questionnaire formulation, proper training of interviewers has a high priority in wealth surveys.

The problem of item non-response seems to affect particularly the provision of information on financial assets. To allow complete case analysis, the missing balance sheet, income and consumption variables need to be imputed in the Household Finance and Consumption Survey, and this should be done stochastically five times, i.e. using multiple rather than single imputations<sup>6</sup>. The use of multiple imputation seems to be a feature more common in wealth surveys than e.g. income or consumption surveys, reflecting the expected higher level of item non-response as well as the importance of harmonised treatment of missing data for cross-country analysis.

In contrast to evident item non-response (i.e. “don’t know/no answer” replies), the extent of under-reporting or non-reporting (“non-visible item non-response”, i.e. when a respondent denies to possess a particular asset, which he actually holds, or under-estimates the value of the asset) of balance sheet items is not generally known as it would require matching of external information to the survey respondents. There are no standard solutions within a standard survey process framework to cope with such measurement errors. We discuss under- and non-reporting later in connection to adjustments of survey data in the reconciliation to aggregate balance sheets.

*Errors in estimation* are errors in the extrapolation from the households enumerated in the survey to the entire population of private households for which estimates are required (Verma, 2010). These result from coverage errors, sample selection and implementation, unit non-response, sampling errors and estimation errors.

Unit non-response rates in wealth surveys vary substantially but seem to be generally at the same level as in consumptions surveys and higher than in income surveys varying in Europe from around 40 percent to around 70 percent (Pérez-Duarte et al, 2010). Rather than the level of unit non-response in itself, the correlation of non-response patterns with survey variables (assets and liabilities) may bias the results of wealth surveys, exacerbated by the fact that wealthy households have significant influence on the estimates of the aggregate values. Unit non-response may be more significant problem with wealthy households than item non-response. In this sense, the problem with the wealthy households may be more related to errors in estimation than to errors in measurement. Once wealthy respondents are convinced to participate in the survey, evidence does not point to a higher item non-response rate, even though such households may have larger number of balance sheet items to report. They may in fact provide rather more accurate information, possibly because they also tend to be more careful in taking care of their finances.

The HFCS surveys should use probability sampling, and consequently the aim is to have the target population of private resident households correctly represented in the national sampling frames. Regarding sample selection, proportional samples may not be satisfactory when the aim is to have good estimates of the upper part of the wealth distribution and consequently of the total wealth. Stratified samples, i.e. over-sampling of the wealthy, is recommended for

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<sup>6</sup> The recommended strategy is to use the broad conditioning approach rather than structural modelling in the imputations (Biancotti et al, 2009). A common SAS-based tool “EMIR” has been developed for this purpose to reduce country variation in imputation strategies.



the HFCS surveys as an important way to address possible non-response bias and to improve accuracy of the estimates, including total sums which are disproportionately affected by sample values in the upper tail<sup>7</sup>.

A classic example of over-sampling is the US Survey of Consumer Finances (Kennickell, 2007). In the euro area countries, national sampling frames may not always allow over-sampling<sup>8</sup>. Nevertheless, in the existing wealth surveys some euro area countries have been able to pre-stratify their samples to do such over-sampling, for instance France and Spain using wealth tax data and Finland using income data. Table 2.1 shows an example of the over-sampling rate<sup>9</sup> in three wealth surveys from the euro area, two of which purportedly over-sample upper tail of wealth or income distribution.

**Table 2.1: The degree of over-sampling in the final sample: Spain, Italy and Finland**

	Net worth quintiles					Sample size, net
	Bottom 50 %	50 % to 90 %	90 % to 95 %	95 % to 99 %	Top 1 %	
Spain	0.75	0.85	1.61	2.83	8.99	5,962
Italy	0.94	1.06	1.08	1.07	1.16	7,768
Finland	0.83	1.07	1.49	1.67	1.59	3,455

Table reproduced from Pérez-Duarte et al (2010). Original sources: Bover (2008), Statistics Finland (2007), SHIW data 2006; authors' own calculations. Note: Spain oversamples based on wealth tax records, Italy does not over-sample, and Finland over-samples high income households.

Regarding estimation itself, this in practice means adjusting design weights in two steps so that finite population estimates can be computed. First, weights are adjusted for unit non-response based on sample-level information (typically using homogenous response groups or logistic regression) and then further adjusted so that final estimation weights reproduce external benchmarks (with minimum distance methods such as calibration or using post-stratification cells). Effective calibration or re-weighting scenarios use auxiliary information which is highly correlated with the main survey variables. In the existing euro area wealth surveys, it has been common to adjust the weights at least for age and sex distributions, household size, and geographical information. The extent of auxiliary information varies across countries but the resulting errors in estimation may not be very important for cross-country comparability of the results (Pérez-Duarte et al, 2010).

<sup>7</sup> The critical role of oversampling for precision of the estimates is demonstrated in Bover (2010), showing the precision of wealth distribution measures under oversampling and random sampling in the United States and Spain. For example, in the Spanish wealth survey (EFF) from 2005, the share of net worth held by the top 1 % of households was 13.2 %. The standard error under oversampling was estimated to be 1.6 %-points while under random sampling it would have been 5.3 %-points. In view of comparisons to aggregate sources, it however is accuracy rather than precision that is more important.

<sup>8</sup> If over-sampling indeed results in estimates with less bias and variance, it should be used by as many countries as possible, otherwise cross-country comparability is not optimized. Thus for the euro area survey, it would be desirable to have as many countries as possible to stratify their samples so that wealthy households or at least households in wealthy neighbourhoods have higher inclusion probabilities.

<sup>9</sup> The oversampling rate is the number of responding households in the wealth range divided by the number of households one would expect if the sample was randomly drawn from the population (Bover, 2008).

To conclude, we summarise the main ex-ante harmonisation tools for reducing both the level within countries and variation across countries in the above mentioned errors in the HFCS:

- 1) Common blueprint questionnaire to foster a degree of input harmonisation
- 2) Stochastic multiple imputation for missing data (item non-response)
- 3) Over-sampling of wealthier households whenever feasible
- 4) Adjustment of weights for unit non-response and calibration to external information (e.g. population distributions).
- 5) Recommendations and sharing of good practices on contact and incentive strategies to reduce unit non-response and on data collection to reduce item non-response

The first two target reducing errors in measurement while the third and fourth one aim to reduce errors in estimation. The last one encompasses a mixture of the two sources of survey error. The common questionnaire and other material prepared for the HFCS includes for instance technical definitions and survey definitions of the concepts and collecting data also in brackets to reduce item non-response.

## **EAA**

The financial balance sheets of EAA are based on national contributions to financial accounts and euro area statistics. The household sector is based fully on the national contributions or counterpart information. The national household sectoral balance sheets are generally compiled using counterpart information and residual estimations as there are not many direct sources concerning households available. The accounting data are typically balanced at the level of the whole economy. In the balancing three dimensions can be found: First, total financial assets equal total financial liabilities for each financial balance sheet category, when summed over all institutional sectors and rest of the world. This is so called horizontal consistency. Second, the change in financial balance sheet for each balance sheet category equal to the sum of the financial transactions and other changes, like revaluation of assets. This is called stock-flow consistency. Similarly, total non-financial assets equal to the sum of non-financial transaction and consumption of fixed capital.<sup>10</sup> Third, for each sector and rest of the world, the balance of all current and capital transactions should be equal to the balance of financial transactions and this is called vertical consistency.

The balancing, i.e. the process, which aims to reach this consistency in the accounting system, has actually a twofold effect on the accounts. On the one hand, the accounting system forces to cross-check different data sources and gets them as comparable and consistent as possible before the balancing. From this point of view alone it can be argued that national accounts data provide more reliable estimates than data retrieved from an individual data source. On the other hand, as in this balancing process the inconsistencies or discrepancies are distributed through the accounts according to relative weights of the items, it is possible that errors in measurement from other sources or sectors balance out and eventually contribute to “correct the data” to a certain extent (if one relies on simplified processes or uninformed integrators). However, it should be emphasized that these

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<sup>10</sup> At the country level, however, household wealth data are currently often not calculated as part of the core system and therefore, the data are not necessarily consistent with the core system.

kinds of balancing adjustments are typically very small. Typically, if the size of total balancing adjustment is known, it can be considered as an error margin for the estimations.

In a sense, National Accounts may need to allow some bias in the household sector to satisfy the balancing constraints, i.e. the ultimate aim is not to minimize bias in the household sector; rather there is the dual objective to minimize bias in the estimates for the economy as a whole and to minimize statistical discrepancies within the system. The latter may result in bias within sectors, for instance, certain economic transactions for the household sector may be derived as residual, by subtracting from the estimated total the estimates of other institutional sectors.

As otherwise national accounts are typically based on other statistical sources and the validation of the used sources, the possible other errors are inherited from source statistics. The errors in estimation can be of course caused by two reasons: either statistics used in the national accounts estimation are compiled according to a different methodology than the national accounts (and this is not corrected when they are incorporated to the national accounts) or there is a measurement error in the source statistics. However, as mentioned due to confrontation of different sources in a coherent framework, the data are automatically checked and errors are therefore minimized.

## ***2.2 The concept of net worth in the EAA and in the HFCS***

This section focuses on the different concepts of wealth in the two statistics and on comparability of asset categories and transactions. For various reasons, the concept of wealth in National Accounts is somewhat different from that employed in wealth surveys such as the HFCS. A fundamental reason is related to the data collection method. Since the survey data mainly come directly from the survey respondents, the surveys need to collect the data in a way that households can understand, which may imply a certain degree of approximation. In other words, the operational concepts have precedence over theoretical concepts in the design of the survey contents (questions).

The wealth concept of the EAA is based on the ESA95 and thus, the underlying logic of the wealth concept (including households' net worth) applied in the EAA is defined by the logic of consistent recording of transactions within the whole system of national accounts. In the HFCS, the concepts need to apply only to households without taking into account balance sheets of other institutional sectors. This is often the underlying reason between the differences in these two statistics.

As of the writing of this paper, the euro area Household Finance and Consumption Survey (HFCS) does not yet have an established concept of wealth to be used in reporting the results. Rather, we consider here the contents of the euro area survey in terms of survey variables on assets and liabilities, which may potentially lead different concepts of net worth. Currently, there are no similar guidelines for wealth surveys as for National Accounts or household income and consumption surveys. The international guidelines on micro statistics, such as the Canberra Group recommendations (2001), focus on income with only limited attention to wealth.

An overview of the wealth concepts in the EAA and the HFCS is shown in table 2.2. The integrated accounts comprise two elements of wealth: financial wealth which is part of the financial accounts and non-financial wealth, which is

part of the non-financial balance sheets. For the household sector both components are available at the euro area level in the EAA although the non-financial balance sheets are currently compiled on an experimental basis. Most of the euro area Member States compile only financial accounts and do not have non-financial assets. Therefore, complete comparisons at country level between the integrated euro area accounts balance sheets and household wealth surveys are not usually possible.

In the euro area HFCS the basic breakdown of net worth comprises 1) financial assets, 2) properties, 3) business wealth, 4) vehicles and valuables, 5) pensions and whole life insurance and 6) liabilities. The overview table shows business wealth in non-financial assets but we categorize later only self-employment business wealth as tangible wealth and a part of non-financial assets, and investment business equity as financial wealth. Furthermore, pensions and whole life insurance is included as an extension of wealth concept but we discuss it under financial wealth.

**Table 2.2: Overview of the balance sheets in the HFCS and the EAA. The EAA assets and liabilities are shown only at the first-digit level. The items which are “not valid” cannot be applied to the household sector.**

THE HFCS BALANCE SHEET	THE EAA BALANCE SHEET
<b>+ FINANCIAL ASSETS</b>	<b>+ FINANCIAL ASSETS</b>
Deposits	
Bonds and other debt securities	F2 Currency and deposits
Mutual Funds	F3 Securities other than shares
Shares, publicly traded	F4 Loans
Other financial assets	F5 Shares and other equity
	F6 Insurance technical reserves
<b>+ NON-FINANCIAL ASSETS</b>	F7 Other accounts
Household’s main residence	
Other properties	<b>- LIABILITIES</b>
Business wealth	F4 Loans
Vehicles and valuables	F5 Shares and other equity
	F6 Insurance technical reserves
<b>- LIABILITIES</b>	F7 Other accounts
Mortgages and loans	
Outstanding debts on credit cards, credit lines and overdraft balances	<b>FINANCIAL NET WORTH</b>
<b>NET WORTH (excluding pensions)</b>	<b>+ NON-FINANCIAL ASSETS</b>
<b>+ Pensions and whole life insurance</b>	
<b>EXTENDED NET WORTH</b>	<b>NET WORTH</b>

The following sections will describe and compare the sub-components in more detail.

### 2.2.1 Financial assets

As shown in table 2.2.1, the HFCS includes as financial assets deposits, bonds, mutual funds, listed shares, pensions and whole life insurance, managed accounts,

money owned to household, and other financial assets. Furthermore, we consider business wealth of investors/silent partners (mostly holdings of non-listed equity) as financial wealth.

**Table 2.3: Financial assets in the HFCS and in the EAA.**

Household wealth survey		Euro area accounts		Comment
Variables	ASSETS	Code	ASSETS	
	Financial assets	F	Financial assets	
		F21	Currency	Currency not explicitly included in the HFCS. Only covered if reported by survey respondents as remaining assets in “any other financial assets”.
HD1100	Sight accounts	F2M	Deposits	In the EAA, there is no further breakdown for deposits available.
HD1200	Saving accounts			
HD1420	Bonds and other debt securities	F33	Securities other than shares except financial derivatives	
HD1320	Mutual funds	F52	Mutual fund shares	
HD1510	Shares, publicly traded	F511	Quoted shares	
HD1010	Net wealth in business, non self-employment and not publicly traded	F51M	Unquoted equity	There is a convention in the EAA that financial derivatives are recorded always on the liability side. This practically means that the financial derivatives which are owned by the households are recorded as a negative liability. The parentheses around HFCS items indicate that these link only partially to the EAA concepts (for instance options, futures and index certificates).
HD1920	Value of any other financial asset	F34	Financial derivatives	
HD1710	Amount owed to household	F4	Loans	In the EAA, these are practically loans to non-financial corporations. These are usually from households to small family business. This item appears for instance in the Italian, French and Maltese have this item in their accounts.
HD1620	Assets in managed accounts	F2-F5,F7	Corresponding financial instruments (of the risk is carried by the investor)	
HD1920	Value of any other financial asset	F7	Other accounts	In the EAA, these include interest accruals (interest not yet received or paid) and other accounts payable/receivable. These items are mainly counterparts of the other liabilities/transitory items of corporations. In the HFCS, this item includes miscellaneous assets not reported elsewhere, some of which are in the EAA

				included in F34.
-	Pensions and whole life insurance policies	F6	Insurance technical reserves	Insurance technical reserves can be divided into two parts in the EAA: the accumulated assets of the life insurance and pension funds (F61) and the prepayments of insurance payments (F62).
PF0510	Public pension plans	F61	Accumulated assets of life insurance and pension funds	
	Public or social security account with account balance			
PF0710	Occupational pension plans with account balance			
PF0920	Voluntary non-occupational pension/whole life insurance schemes			

In the HFCS, **deposits** are separated into sight and savings accounts although the distinction between the two may sometimes be difficult. The EAA does not distinguish different kind of deposits. The ESA95 divides, however, deposits into transferable deposits and other deposits<sup>11</sup>. The HFCS sight accounts are equivalent to transferable deposits (ECB, 2010). In the HFCS, the target variable on savings accounts covers non-transferable savings and time deposits and certificates of deposit.

The HFCS concept of **bonds and other debt securities** covers any type of government or corporate bonds, bills or notes. The concept corresponds to securities other than shares excluding financial derivatives in the EAA. In the EAA, securities other than shares excluding financial derivatives can be divided to long- and short-term securities<sup>12</sup>.

The HFCS defines **mutual funds** as an overall category which can be further disaggregated into mutual funds investing predominantly in money market instruments, bonds and shares. This corresponds to the mutual fund shares in the EAA which is defined as all transactions in mutual funds shares that are shares issued by a specific type of financial corporation, whose exclusive purpose is to

<sup>11</sup> Transferable deposits cover all the deposits in national or in foreign currency which are immediately convertible into currency or which are transferable by cheque, banker's order, debit entirely or the like, both without any kind of significant restriction or penalty. The ESA95 sub-category other deposits are deposits which are not covered by the concept of transferable deposits and cannot be used to make payments at any time and they are not convertible into currency or transferable deposits without any kind of significant restriction or penalty. (ESA95 5.42-5.45.)

<sup>12</sup> The short-term securities cover: (1) treasury bills and short-term paper issued by general government; (2) negotiable short-term paper issued by financial and non-financial corporations; (3) short-term securities issued under long-term underwritten note issuance facilities; and (4) bankers' acceptances. The long-term securities cover: (1) bearer bonds; (2) subordinated bonds; (3) bonds with optional maturity dates; (4) undated or perpetual bonds; (5) floating rate notes; (6) index-linked securities; and (7) deep-discount bonds and zero-coupon bonds. (ESA95 5.58 and 5.62)

invest the funds collected on the money market, the capital market and/or in real estate.<sup>13</sup>

The concept of **listed shares** in the HFCS covers shares owned by households which are publicly traded in a stock exchange. This corresponds to the concept of quoted shares in the EAA which is defined as quoted shares excluding mutual fund shares and sub-positions unquoted shares excluding mutual fund shares. Shares cover beneficial interest in the capital of corporations in the form of securities which in principle are negotiable.<sup>14</sup>

The value of **unquoted shares and other equity** is not a separate asset type in the HFCS, rather, it is covered under private wealth in businesses which are not publicly traded, including both participations in businesses in which at least a household member is self-employed as well as other passive investments in businesses in which household members are just silent partners – see discussion on business wealth in this paper. In the EAA, unquoted shares consist of all transactions in unquoted shares which represent property rights on limited liability corporations and share their net assets in the event liquidation. Other equity, which is the equity of incorporated partnerships, limited companies and quasi-corporations whose partners or owners are not share holders.<sup>16</sup>

The HFCS further has wealth items assets in managed accounts, money owed to the household, and a mop-up category any other financial asset. In the EAA, there is no concept of managed accounts. Managed accounts are typically arrangements where a household trusts e.g. investment company to manage the household's investments<sup>17</sup>. In the National Accounts, the essential criterion is based on the legal ownership. Typically the money is invested by the investment bank in the name of the investor, that is the household is the legal owner and economic owner (carries the profits and losses directly) is carried by the investor, then the investor also directly owns the corresponding instruments and the owner is paying only a service fee to the investment bank.<sup>19</sup>

The money owed to the household is included as an asset in both statistics, in the case of EAA in loans on the asset rather than liability side. However, loans between the households are not recorded in the EAA.

In the EAA, financial derivatives are financial assets based on or derived from a different underlying instrument is usually another financial asset, but also may be a commodity or an index.<sup>20</sup> The EAA has a convention that financial derivatives are always recorded on liabilities side and therefore, financial derivatives owned by households are recorded as a negative liability. In the HFCS, the variable on any

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<sup>13</sup> ESA95 5.96.

<sup>14</sup> ESA95 5.90

<sup>16</sup> ESA95 5.90 and 5.95.

<sup>17</sup> The blueprint questionnaire of the HFCS asks: "Some people deposit money at a bank or investment company for a person specialised in investment to manage for them. The manager may make most of the day-to-day decisions or consult more closely with the account owner. Such accounts may also be trust accounts. Aside from pensions or insurance contracts, (do you/does anyone in your household) have any such managed accounts?"

<sup>19</sup> By contrast if a bank carries the risk, then investor owns only securities issued by the investment bank and the actual investments are on the balance sheet of the investment bank.

<sup>20</sup> ESA95 5.65 and 5.88

other financial assets should cover also financial derivatives such as options, futures or index certificates, among other assets not included elsewhere<sup>21</sup>.

In the EAA, transaction other accounts is a similar type of residual asset category as “any other financial assets” in the HFCS, albeit with different content. It is included mainly for accounting reasons. In the case of the household sector, these are mainly interest accruals. Additionally, some other liabilities of financial corporations are counter-parted to this transaction.

### **Life insurance and pension wealth**

Pension wealth is a major component of household wealth, and because of institutional differences between the countries, complete measurement would be essential for cross-country comparisons. The HFCS includes a full section on life insurance and pension wealth, and thus in principle the data source may allow using the extended concept of net worth, including accumulated assets in defined contribution life insurance schemes and accumulated pension rights in public and private pension schemes. In the EAA, the concept of insurance technical reserves may be interpreted as the functional equivalent of the HFCS pensions and whole life insurance variables. Insurance technical reserves constitute one of the largest components of households’ financial assets in the EAA.

To some extent, pension wealth is different from other wealth components as it by and large is not liquid before old-age and cannot be bequeathed. These arguments alone may merit including it only to an extended concept of net worth in the HFCS. Besides, the measurement of pension wealth in household surveys is highly complicated and prone to measurement errors. Households are likely to have difficulties to know their accumulated pension savings and complete measurement, including defined benefit schemes, requires a lot of questions. The respondents simply may not be aware of their pension entitlements, particularly in case of statutory or compulsory schemes. In the course of developing the HFCS, the difficulty of collecting data on pension wealth from households has been fully recognized.

The questions in the HFCS common questionnaire aim at measuring current termination value (“accrued-to-date liability”) of pension and whole life insurance assets. Entitlements to non-life insurance, including term life insurance, are not considered as household wealth. The HFCS target variables on pension wealth are broken down into public pension plans, public or social security account with account balance, occupational pension plans, and voluntary non-occupational pension/whole life insurance schemes, this breakdown being in line with the National Accounts classification (see: ECB, 2008, for details).

In case of public plans (i.e. defined benefit schemes), the common questionnaire for evident reasons does not ask about the amounts but rather about the percentage of gross earnings going into the scheme and the number of years the beneficiary has been contributing to the scheme, as well as the expected retirement age. With this information, the current termination value of entitlements may be estimated.

For other pension plans, the target variable is the amount currently in the pension account or the value of the pension plan at the moment of interview.

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<sup>21</sup> This variable should cover any other substantial assets not recorded elsewhere, such as options, futures, index certificates, precious metals, oil and gas leases, future proceeds from a lawsuit or estate that is being settled, royalties, or something else.



However, the blueprint questions are only indicative (except those on voluntary pensions) and NCBs should adapt them to the characteristics of the specific plans in place in their respective countries. The data should be collected at personal level from household members aged 16 years or older.

The data from the first wave are best viewed as experimental, and the concept of net wealth to be used when releasing the results from the first wave of the HFCS is likely to exclude pension wealth, or to only include defined contribution and voluntary schemes.

In the EAA, insurance technical reserves practically cover the accumulated claims vis-à-vis life insurance and pension funds and the prepayment of insurance payments. The treatment of pension depends in the SNA93 on the type of pension plan. Pension plans can be divided to defined contribution plans and defined benefit plans. The future pensions of defined contribution plan are depended on the contribution and thus, these has to be funding systems. Therefore, the current system includes defined contribution pension plans. Additionally, defined benefit plans can be divided to collective and individual. The individual systems are private and they are also funded and thus, they also currently included into the system. The private pension systems have an obligation to households and this promised benefit has to be presented at its present value. Public collective defined benefit plans are usually part of social security. Therefore, the future pension plans can be changed by political decision. Therefore, these kinds of systems are not included in household assets.

This is a typical asset category which needs to be counter-parted from the financial corporations. These are the technical reserves held by insurance enterprises of actuarial reserves against outstanding risk in respect of life insurance policies, including reserves for with-profit policies which add to the value on maturity of with-profit endowments or similar policies, prepayment and reserves against outstanding claims. Although held and managed by insurance enterprises, the technical reserves are allocated beneficiary sector.<sup>22</sup>

Currently, the revision of the SNA93 is taking place and it will also affect on the treatment of pension liabilities will practically mostly affect on the concept of household net wealth.

The SNA2008 recognizes that employment-related pension entitlements are contractual arrangements that are expected or likely to be enforceable. They should be recognised as liabilities towards households, irrespectively of the necessary asset exist in segregated schemes or not. Practically, this means that the new system will also cover the collective employment-related defined benefit plans.<sup>23</sup>

Additionally, the SNA93 stated that the actual social contributions by employer or employee in a period should be the amount actually paid into a pension fund. For a defined contribution, this is correct since the eventual payment depends only on the amounts set aside in a pension fund. For a defined pension fund, however, there is no guarantee that the amounts set aside will exactly match the liability of employer to the pension entitlements of employees. The SNA2008 recommends changes to this treatment of defined pension plans. First, the level of the employer's contribution should be determined by assessing the increase in the net present value of the pension entitlement the employee has

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<sup>22</sup> SNA93 7.123.

<sup>23</sup> SNA2010, Annex 3: Changes from the 1993 System of National Accounts.

earned in the period in question. Second, this amount should be determined actuarially, taking into account only the life expectancy of the employee and not any future earnings or the impact of any future pay increases on the ultimate pension benefit. Third, the assets of the fund are then to be regarded as belonging to the fund and not as belonging to the employee. Similarly, an explicit liability of the pension fund to the employee should be shown in the balance sheet.<sup>24</sup>

### **2.2.2 Non-financial assets**

As mentioned earlier in this paper real assets are not a established part of the EAA but these are available on an experimental basis. In the HFCS, real or non-financial assets comprise the value of households' main residences, other properties<sup>25</sup> owned by the households, and vehicles and valuables. We categorize HFCS net wealth in self-employment business as non-financial wealth here regardless the capital structure of the business, under the assumption that this wealth should be largely tangible wealth because it is used in production by the household. Business wealth is discussed separately below.

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<sup>24</sup> SNA2010, Annex 3: Changes from the 1993 System of National Accounts.

<sup>25</sup> In the common questionnaire, the filtering question is "(Do you/Does your household) own any (other) properties, such as houses, apartments, garages, offices, hotels, other commercial buildings, farms, land, etc.?" Only the values of maximum of three such properties are taken into account.

**Table 2.4: Non-financial assets in the HFCS and experimental-basis non-financial assets in the EAA.**

Household wealth survey		Euro area accounts		Comment
Variables	ASSETS	Code	ASSETS	
	Non-financial assets	N11	Fixed assets, gross	
HB0900	Household's main residence	N1111	Dwellings, gross	EAA do not separate main residence from other residences.
		N2111	Land underlying buildings and structures, gross	
HB280	Other properties (leisure, investment real estate)	N1111	Dwellings, gross	
		N2111	Land underlying buildings and structures, gross	
HD080	Net wealth in business related to self-employment	N1112	Other buildings and structures, gross	Business wealth is not separated in financial accounts from the other wealth. Fixed assets of entrepreneurs are classified in the EAA as a part of the real assets. However, it is possible also that the business is allocated in the EAA to the non-financial corporations. Then household owns other equity (unquoted shares in some cases) of the corporation.
		N1113	Machinery and equipment, gross	
		N1114	Cultivated assets and Intangible fixed assets, gross	
	Vehicles and valuables		NOT INCLUDED	
HB4400	Cars		NOT INCLUDED	Consumer durables in EAA
HB4600	Other vehicles		NOT INCLUDED	Consumer durables in EAA
HB4710	Valuables		NOT INCLUDED (excluded for practical reasons)	Non-financial assets (in theory)

In the HFCS, **properties** include both the value of buildings and structures and the land underneath them. The value of household's main residence is one of the most important variables of the survey; other properties can be further separated into those a) for household's own use, such as secondary and leisure homes b) for business use and c) properties that are leased or rented to others, and finally d) any other properties.

The EAA and the ESA95 classifications distinguish dwellings from other buildings and structures, as well as land underneath buildings and structures (including dwellings). This means that households' main residences, rental apartments and secondary homes are allocated as a part of dwellings and land underlying buildings and structures. Consequently, the main drawback for comparisons is that residential wealth cannot be directly compared, as the EAA sums up values of all dwellings (owner or leased) and separates values of plots from the values of buildings and structures.

The EAA estimates are based on the country data and therefore, the non-financial capital stock is not estimated by using a systematic method. In general four methods can be distinguished to estimate the capital stock at national level. In the *survey method* households are asked to report the values of these assets in use. Capital stock and households' housing wealth can also be estimated using *administrative records*. When direct information on the other stocks than land assets is not available the *Perpetual Inventory Method (PIM)* is used. The PIM is commonly used by statistical offices and is also recommended in the ESA95 whenever direct information of the stock of fixed capital is not available. The PIM is based on the assumption that today's value of capital stock is equal to the accumulation and revaluation of past gross fixed capital formation, minus the "the wear and tear", i.e. the retirement of assets that have reached the end of their service lives and the depreciation. Finally, households' housing wealth estimation methods use information on *rents, house prices and number of dwellings*.

In the estimation of non-financial balance sheet as well households' housing wealth the data for all the countries are not available and therefore, the capital stock can not be estimated by simple summation of the countries. The part accounted for by the missing countries is estimated on the basis of information from the available countries by using *capital accumulation equations*.<sup>26</sup>

The HFCS collects data on cars and other **vehicles** (motorbikes, boats etc.) Cars and other vehicles are considered in the EAA as durable goods which are not part of the national accounts' wealth concept. It should be noted that the concept of durable goods is much broader as it covers all the goods which can be used repetitively, and for longer than one year. Durable goods are classified in the national accounts as consumption expenditures and therefore, these are actually diminishing saving.<sup>27</sup>

The national accounts manuals define that **valuables** should be included as part of the household non-financial wealth but these are not in practice included in the estimates. The reason is a lack of source data. Additionally, the inventories of self employed should be included in the estimations but these are also not covered by the EAA non-financial assets. However, these are assumable very small in relation to the other wealth components.

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<sup>26</sup> As the country data are published only at annual frequency, the euro area estimate is also at annual frequency. Therefore, for the EAA, which is published at quarterly frequency, the estimates are quartilised by using Chow-Lin procedure. In the case households' housing wealth the used quarterly indicator is residential property price index.

<sup>27</sup> This is, however, debated topic and for instance alternative saving measures are calculated where durable goods are accounted as investments. (See for instance: Jalava and Kavonius 2009. Reindorf and Yan 2002.) The reason for this treatment in the national accounts is that durable goods owned by households and household work do not belong to the production boundary of the SNA93. As the SNA93 states the inclusion of durable goods in the balance sheet would be appropriate if the system postulated that the durables gradually used up in the production processes whose outputs consist of services. This is not the case. However, the SNA93 also mentions that durable goods owned by owners of unincorporated enterprises may be used partly by the enterprise for production and partly members of the households for final consumption. The values shown in the balance sheet for the enterprise should reflect the proportion of the use that is attributable to the enterprise. As the core of the national accounts do not include in practise durable goods to the concept of wealth, these are excluded also from this comparison. Moreover, the EAA does not include any stock information on the durable goods.

## Business wealth

The HFCS uses the concept of *private business wealth* and distinguishes as basic breakdowns business assets related to self-employment (when at least one member of the household works in the business) and assets of sleeping partners or investors, i.e. investments in businesses which are not publicly traded and do not involve work input from any household member<sup>28</sup>. The self-employment concept is defined as net of liabilities rather than gross, in contrast to non-corporate business equity of investors and sleeping partners and other asset types

For sleeping partners and investors, the value of household's share in the not publicly traded business is collected, and consequently unquoted business equity is included in non self-employment business wealth.

The EAA does not recognise the concept of business wealth and the treatment of the corresponding items to business wealth is in the EAA and more broadly in National Accounts depended on the type of enterprise. Three possibilities exist: First, the enterprise can be classified as unincorporated enterprise in the national accounts, which means that it does not have book-keeping or own legal status. Practically, household wealth is at risk if the enterprise goes bankrupt.<sup>29</sup> In this case it cannot be separated from the household and it is a part of household sector. This also means that the "balance sheets" of unincorporated enterprises are merged with the balance sheet of household sector, i.e. the wealth items of the enterprise are distributed to each individual balance sheet item of household sector.

The second possibility is that the enterprise is classified as a quasi-corporation or incorporated partnership. In this case the enterprise is allocated to either non-financial or financial corporations. Its wealth items are recorded on the balance sheet of corresponding sector. Additionally, the enterprise has other equity on the liability side of its balance sheet and this is recorded as an asset of the household.

The third possibility is that corporation is a limited liability company. In this case, it is recorded in financial or non-financial corporation sector and its wealth is recorded on the balance sheet of corresponding sector. The enterprise then also records its unquoted shares on the liability side of its balance, which are correspondingly recorded on asset side of household's balance sheet.

It is not possible to decompose the HFCS private business wealth into any of its constituent components (e.g. buildings and structures, machinery and equipment, land, financial assets of the enterprise, or other assets). The number of people working in the business and the legal form of the business are included as core variables in the HFCS partly because they may help in making adjustments with respect to National Accounts. The number of employees or legal status in itself does not affect data collection, the filtering criterion in the blueprint questionnaire is whether the business is publicly traded or not.

In conclusion, the conceptual differences in the measurement of business wealth discussed above must alone result in differences between the two sources

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<sup>28</sup> For self-employment business wealth, the values are collected by asking "What is the net value of (your /your household's) share of the business? That is, what could you sell it for, taking into account all (remaining) assets associated with the business and deducting the (remaining) liabilities?" Remaining means excluding assets and/or liabilities previously reported as owned by the household to avoid any double counting.

<sup>29</sup> SNA2010, 4.156.

because of sector delineation in the EAA and because the concept of “business wealth” exists only in the survey and the values are recorded into individual wealth components in the EAA, and finally because the business wealth in the survey is a net concept, i.e. net equity in not publicly traded businesses. However, it should be noted that this difference should affect on the concept of net wealth, only its components.

### **2.2.3 Liabilities**

Table 2.5 shows the typologies of liabilities in the HFCS and EAA. In the HFCS, liabilities consist of mortgages and loans, credit lines, overdraft balances, and outstanding credit card balances. The EAA covers also these balance sheet items and on top of this some other small balance sheet items which are either related to accounting conventions or in some country-specific cases.

**Table 2.5 Typology of liabilities in the HFCS and EAA.**

Household wealth survey		Euro area accounts		Comment
Variable	LIABILITIES	Code	LIABILITIES	
	<b>Mortgages or loans</b>	<b>F4</b>	<b>Loans</b>	
HB170\$x	Mortgages or loans using HMR as collateral	F41 F42	Loans, short-term Loans, long-term	In the EAA, loans can split into short and long term loans.  In the HFCS, the split may be based on collateral but also on maturity.
HB370\$x	Mortgages or loans using other properties as collateral	F41 F42	Loans, short-term Loans, long-term	
HC080\$x	Non-collateralised loans	F41 F42	Loans, short-term Loans, long-term	
	<b>OTHER LIABILITIES</b>			
HC0220	..outstanding credit line or overdraft balance	F4	Loans, short-term	
HC0320	..outstanding credit cards balance			
	NOT INCLUDED	F34	Derivatives	This is a convention in the EAA. Negative balances may be generated out of options and futures sold by entities included in the household sector, but typically the HH sector will tend to hold a total positive balance in financial derivatives (i.e. a negative liability).
	NOT INCLUDED	F51	Quoted and unquoted shares and equity	
	NOT INCLUDED	F61	Net equity of households in life insurance reserves and in pension fund reserves	Small enterprises in Italy, which are classified to the household sector, have direct pension commitments and this item covers only those.
	NOT INCLUDED	F7	Other accounts receivable/payable	This can be for instance late payments of households. This can also be counterpart for the other assets of financial corporations.

For a more efficient data collection (i.e. to minimise recall bias), in the HFCS loans are collected in connection to the assets which collateralise them (i.e. the household's main residence (HMR) and other real estate properties) as shown in the table. However, breakdowns by type of interest, purpose of loan or by maturity are also possible. The EAA splits the loans according to their maturity, i.e. to short-term loans and long-term loans. The borderline between these two maturities is one year.<sup>30</sup> As noted, the HFCS variables also allow splitting loans by maturity.

<sup>30</sup> This could also be broken down by credit for consumption, lending for house purchase and other lending by using the money and banking statistics. The financial corporations in the EAA, which is counter-part sector for these transaction in national accounts, is consistent with the money and banking

Loans are created when creditors lend funds to debtors, either directly or through brokers, which are either evidenced by non-negotiable documents or not evidenced documents.<sup>31</sup> The concept corresponds to the concept of HFCS.

Additionally, the EAA has on the liability side derivatives, quoted and unquoted shares and equity, net equity of households in life insurance reserves and other accounts receivable/payable which do not appear in the HFCS. As mentioned earlier, there is a convention in the EAA that all the derivatives are recorded on liability side and therefore, assets of households appear as a negative liability. In the HFCS, these should be included in any other financial assets.

The quoted and unquoted shares on the liability side are some rare cases in European country where due to the national convention household enterprise can issue unquoted shares. The net equity of households in life insurance reserves and in pension fund reserves is created by small enterprises in Italy, which are classified to the household sector. This item covers the direct pension commitments of enterprises. The other accounts receivable/payable on the liability side are in practise late payments of households. There can also be some counterpart assets for the other assets of financial corporations.

## **2.3 Other conceptual differences**

### **2.3.1 Household sector definition**

The EAA is divided by institutional sectors and households are one of the sectors in the EAA.<sup>32</sup> In this context in the EAA, the household sector can be defined as all resident households<sup>33</sup>. These also include institutional households made up of persons staying in hospitals, retirement homes, convents, prisons etc. for long period of time. In the HFCS and in household sample surveys in general, the target population excludes institutional households and covers only resident population in private households. Particularly elderly institutionalised households may have significant wealth possessions so the discrepancy due to this exclusion may not be entirely negligible<sup>34</sup>.

Currently, the EAA is not able to separate the non-profit institutions serving households (NPISH) from the household sector. It is difficult to quantify the effect of NPISH as also most of the countries are not able to make distinction in the financial accounts and therefore, the data available in the international databases

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statistics. See further: Regulation (EC) No 25/2009 of the European Central Bank of December 2008 concerning the balance sheet of monetary financial institutions sector (Recast), ECB/2008/32).

<sup>31</sup> ESA95 5.69

<sup>32</sup> The coverage of household sector is the same in the SNA93 and in the SNA 2008. However, a new chapter "The households sector" has been introduced in the SNA 2008, which looks more in detail into this sector.

<sup>33</sup> Surveys such as the Household Finance and Consumption Survey describe households as individual units, with the purpose of recording correct values for the units in the sample and to generalise these into subgroup and population level. One particular question is the definition of household, i.e. clustering of individuals into economic households (housekeeping households), same addresses (dwelling units), or families. The EAA describes household sector, and essentially has no need to pay attention to how individuals cluster together or to variation of values among household beyond what is needed to estimate total sums for all households in the euro area.

<sup>34</sup> Kavonius & Törmälehto (2003) examined incomes of institutionalised population in Finland and found out that they received fairly small but non-negligible amounts of capital income (mainly rental income), which is indirect evidence of their asset holdings.



do not also include this split<sup>35</sup>. However, it is obvious that the NPISH make a difference in the case of financial accounts because among the NPISH there are several institutions which might invest in financial instruments and have considerable wealth like foundations and churches. As can be seen in table 2.6, in Finland this difference is around seven per cent on asset side and around two per cent on liability side. There is also quite some variation in the NPISH share depending on asset category.

**Table 2.6: Finnish households' and NPISHs' assets liabilities in 2009**

		Asset		Liability	
		EUR million	Distribution	EUR million	Distribution
All assets/liabilities (AF)	Households (S14)	200.975	93,1	113.441	98,3
	NPISHs (S15)	14.849	6,9	1.998	1,7
Currency and deposits (AF.2)	Households (S14)	75.336	95,9	.	.
	NPISHs (S15)	3.205	4,1	.	.
Debt securities and derivatives (AF.3)	Households (S14)	3.374	78,4	.	.
	NPISHs (S15)	930	21,6	.	.
Loans (AF.4)	Households (S14)	92	59,7	104.771	98,2
	NPISHs (S15)	62	40,3	1.893	1,8
Shares and other equity (AF.5)	Households (S14)	74.729	87,7	.	.
	NPISHs (S15)	10.500	12,3	.	.
Insurance technical reserves (AF.6)	Households (S14)	41.974	99,9	.	.
	NPISHs (S15)	47	0,1	.	.
Other accounts receivable/payable (AF.7)	Households (S14)	5.470	98,1	8.670	98,8
	NPISHs (S15)	105	1,9	105	1,2

Source: Statistics Finland

Household sector can be divided to two main functions: (1) final consumption and accumulation of wealth; and (2) production of goods and services. Especially concerning the production of goods and services, the borderline between non-financial corporations and households is especially difficult.

In the EAA, an unincorporated enterprise owned by a household is treated as integral part of the latter except when the enterprise qualifies as quasi-corporation.<sup>36</sup> The concept used in the HFCS is consistent in this sense with the concept of the EAA. For production units that are not legally separate from the owning household(s) the national accounts manuals recognise quasi-corporations as separate statistical units, to be classified in the non-financial corporations sector. The ESA95 mentions that one way of making this distinction is that quasi-corporations keep a complete set of accounts and have no independent legal status.<sup>37</sup> The SNA further specifies: "[a quasi-corporation] must have its own value added, saving, assets, liabilities, etc. It must be possible to identify and record any flows of income and capital that are deemed to take place between the quasi-corporation and its owner."<sup>38</sup> Additionally, the SNA points out that the size should not affect on the classification of an enterprise as "it is not useful to introduce additional criteria, such as size, into the definition of quasi-corporations owned by households. If an enterprise is not in fact operated like a corporation and does not have a complete set of accounts of its own, it cannot and should not be treated as a quasi-corporation however large it may be."<sup>39</sup>

<sup>35</sup> Antoniewicz et al (2005) report that the share of institutional assets was 14 % of total household sector assets in Italy in 2002 and 12 % in the US in 2001.

<sup>36</sup> SNA93, 4.11.

<sup>37</sup> ESA95 2.13

<sup>38</sup> SNA 2008 4.45

<sup>39</sup> SNA 2008 4.46

From the household sector point of view, what remains within the household sector are production activities that cannot be separated from the households, because they are unincorporated, no separate accounts from the households accounts are maintained, or because it is not possible to separate the factors of production into labour and entrepreneurial inputs.

The complexity of defining household sector in the EAA is further increased by different practical thresholds between non-financial corporations and households. There are naturally large structural differences between different countries which cause differences to the share of entrepreneurial activities in the household sector. For instance in Italy there are many small enterprises when in Finland there are typically few large enterprises. However, on top of these actual differences in the economy, there are large differences in the practical application of the sector delineation. In practise enterprises which have less than two working year input are classified to household sector in Finland as for instance in Belgium the defining criterion is that unit is having “physical person status”.<sup>40</sup>

As discussed in connection to business wealth, in the HFCS the concept of private business wealth aims at capturing wealth of producer households and investors in businesses partly or completely owned by a household. Such businesses should not be publicly traded but are not restricted by their legal form or number of employees<sup>41</sup>. This implies that wealth held in publicly traded corporations should be recorded in listed shares whereas wealth in non-publicly traded enterprises (unincorporated or not) should go under private business wealth.

As mentioned earlier in this paper, this sector delineation has an indirect effect on the differences between the HFCS and the EAA, as the EAA classifies the assets and liabilities of enterprises which belong to the household sector under each individual instrument and if an enterprise belongs to non-financial corporations, then the household owns only the equity of these enterprises.

### **2.3.2 Reference periods, consolidation and country aggregation**

Reference periods are a fundamental issue in comparing the EAA and the HFCS. The HFCS country surveys are conducted in different years and the data mainly will relate to years from 2009 to 2011. For instance, it is expected that data from Spain will relate to 2008/2009 and from Germany to 2010. The time of recording in the HFCS is, as a rule, the time of the interview with the fieldwork periods varying across countries but usually limited to a few months<sup>42</sup>.

Ex-ante evaluation of the effects different reference years/periods on micro-macro comparisons is hardly possible but the impact of financial crisis on asset

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<sup>40</sup> Task Force on Quarterly European Accounts by Institutional Sector: Sector delineation – Results of the Questionnaire, TF-QSA-0310-04, not printed.

<sup>41</sup> Both the legal form and the number of employees are included as required variables in the HFCS, also to help in reconciliation with National Accounts. The HFCS legal forms are 1) sole proprietorship/independent professionals 2) partnership 3) limited liability companies 4) co-operative societies and 5) non-profit making bodies.

<sup>42</sup> The values may also refer to the end-of-year values in some cases, for instance when other data sources than interviews are used (such as registers in Finland).

values suggests that the effect is not negligible<sup>43</sup>. Furthermore, the annual changes in asset values are likely to be more substantial than for instance in the case of income and consumption. Some options for adjusting for different reference years is presented later in connection to reconciliation of the two sources.

In the EAA, stocks are recorded at exchange value (often market price) at the last day of each reference quarter. The data are quarterly but is naturally possible aggregate at annual frequency simply by summing up the corresponding quarters.

Regarding *country aggregation*, the euro area aggregates in the HFCS can be computed either by summing up point estimates of countries or by treating the dataset as of describing the entire euro area (supranational approach). For non-linear indicators the consequence is that results are different depending on which method is applied. For linear indicators such as estimates of total sums, the sum of country estimates and the supranational estimate are the same. Given the differences in country data sets, the issue of comparability of the surveys (including different reference years) must be addressed before country aggregation..

The EAA is compiled on the basis of several data sources including for instance national contributions to financial accounts and euro area statistics like banking statistics. The household sector data, concerning financial and non-financial assets as well as liabilities, are based on the aggregation of country data. As all financial assets and liabilities are counter-parted to other sectors, some stock items are affected by counter-part estimations. The data are not consolidated, however the between household positions are not generally observed in the source data.

### 2.3.3 Valuation of the assets and liabilities

The valuation principles of assets and liabilities may cause discrepancy to the estimates. Regarding the valuation principles in general, the valuation of the net worth components in the euro area survey should be based on current market values. This is the case for properties, business wealth, vehicles and valuables, and also for financial assets<sup>44</sup>. Bonds should also be reported based on current market values. Whether respondents are able to report the current market value of their bonds (i.e. including the accrued interest) or whether they actually report only face values (i.e. the principal value) is uncertain.

In the EAA, stocks are recorded at exchange value, i.e. the value at which the assets are created, liquidated, exchanged or assumed between institutional units. Especially, when the exchange is or can be made through a market, the ESA95 recommends market prices as general reference for valuation.

Valuation issues may not generally be a major issue in the comparisons (see Antoniewicz et. al., 2005), but the source of the data may be important as the values in the surveys are typically estimated by the respondents. The respondents view about the current market price may be different from the actual current

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<sup>43</sup> The possible adjustments are briefly discussed in section 2.5.

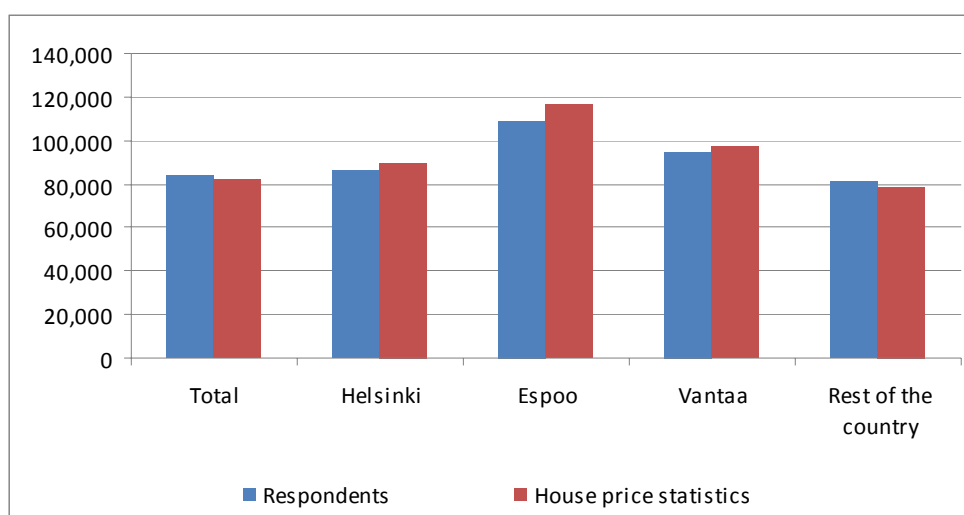
<sup>44</sup> For instance, the value of the main residence is sought for by asking: “What is the value of this property, i.e. if you could sell it now how much do you think would be the price of it”. For mutual funds, current market values are sought for by asking it directly, for instance “What is the current market value of your household’s investment in each type of fund?”.

market price which could be achieved in the markets, and the response contain measurement error and may contain lots of don't knows and refusals.

Residential wealth is a major component of household wealth, and there is some empirical evidence suggesting that the market values of residential wealth that the respondents report match quite well the values derived from external sources. Cannari and Faiella (2002) examined house prices in Italy based on respondents estimates in the household wealth survey (SHIW 2002) and external source (survey of real estate agents), and concluded that the survey estimates are very close to the market values, after making some necessary adjustments to the external data.

Figure 2.4 provides evidence from the Finnish Wealth Survey 2004, comparing self-reported estimates of current market value of the main residence to the values derived for the same sample households from housing price statistics<sup>45</sup>. The latter take the form of average price per square meter at a fairly detailed geographical level. On the average, the values are surprisingly close to each other.

**Figure 2.1: Average value of the main residence (euro/household) based on self-reported values and external house price statistics in Finland 2004, main cities in the capital region. Source: Statistics Finland, Wealth Survey 2004.**



## ***2.4 Integration of balance sheets and wealth surveys: is it feasible?***

Wealth surveys and balance sheets are perhaps primarily compared to assess bias of the survey estimates. Beyond a crude overview, such comparisons require adjustments: at minimum reconciliation of concepts, and usually adjustments of macro aggregates and maybe also adjustments of individual survey values for under- and non-reporting or calibration of the estimates for better coherence. One view may be that the two sources are used for different purposes, and discrepancies can be downplayed or even ignored as long as they provide a reasonably coherent view of the overlapping domains. Nevertheless, there

<sup>45</sup> The data were kindly provided by Mr. Markku Säylä from Statistics Finland.

currently is again interest in breaking down the household sector figures from National Accounts using distributional information (Stiglitz, Sen & Fitoussi, 2009). For such attempts, the coherence of survey information is important.

To our knowledge, there is relatively scarce published evidence on comparing the estimates of household wealth surveys to National Accounts, and even less comparative information as the only internationally comparable micro database on household wealth seems to be the Luxembourg Wealth Study.

Sierminska (2006) reports results from the LWS database and finds that the unadjusted estimates of total net worth compared to national balance sheets varied from around 40 to 60 percent. In table 2.7 we complement the LWS information from results from Antoniewicz et al (2005), Coimbra et al (2008), and Brandolini (2004). In general, the estimates of non-financial assets and liabilities perform better compared to financial assets which may have very low unadjusted coverage rates. Another point worth mentioning is that there are less figures available for non-financial assets (owing to gaps in aggregate balance sheet data), and that there seems to be significant variation of coverage rates of liabilities. Further indirect evidence on coverage rates may be obtained from comparison of in income surveys wherein property and self-employment incomes typically suffer from low coverage rates compared to other types of income components (Törmälehto, 2009)

**Table 2.7. A summary of existing comparisons of unadjusted wealth survey estimates with National Accounts counterparts, unadjusted for errors of measurement and estimation. (Survey values as percentage of national balance sheet data)**

	Germany	Italy	Italy	Portugal	United States	United States	Finland
	2002	2002	2002	2000	2001	2001	1998
	SOEP	SHIW	SHIW	IPEF	SCF	SCF	HWS
<i>Source</i>	(1)	(1)	(3)	(2)	(1)	(3)	(1)
Non-financial assets	77	65	Na	Na	117	na	na
Financial assets	18	18	31.1	26.5	38	na	30
Liabilities	60	37	44	27.5	86	89	84

Sources: (1) Sierminska (2006), table 5 ; (2) Coimbra et al (2008), table 1 ; (3) Antoniewicz et al (2005), table 4.

The underlying reason for such low coverage rates of financial assets may be related to difficulty of the concepts and the ensuing respondent errors bias, as well as errors in estimation resulting from concentration of asset holdings to the upper part of the distribution. In contrast, the largest component non-financial assets, residential wealth, is far less skewed as the home ownership rates are high, particularly in Southern Europe.

After this indicative evidence, we next review a possible reconciliation process between the HFCS and the EAA.

### **Reconciliation of the concepts and adjustments for sector delineation**

The reconciliation of the EAA and HFCS concepts might begin by introducing some adjustments of the balance sheet items for comparison purposes. To start

with, as the HFCS does not explicitly collect currency (it may or may not be reported as any other financial asset) and the EAA includes vehicles in households' final consumption and not in assets, currency needs to be excluded from the EAA figures and cars and other vehicles should be either excluded from the HFCS estimates or reallocated in the EAA from households' final consumption to assets. In addition, given the likely difficulties with estimating pensions and whole life insurance in the HFCS, the safest strategy for comparison purposes may be to exclude completely insurance technical reserves from the EAA and pensions and whole life insurance from the HFCS.

The HFCS concept of private business wealth does not exist in the EAA and the HFCS estimates cannot be broken down to individual asset categories, so adjustment for concept is practically impossible. Therefore, the correctness and plausibility of this asset type can only be checked on the level of total net worth (because the HFCS measures net rather than gross equity in self-employment businesses). Regarding definition of "producer households", the HFCS estimates of business wealth could be restricted based on legal form and number of employees, trying to adjust the survey estimates for the country-by-country conventions of the EAA in the delineation of enterprises to household sector and to non-financial corporations.

The assets and liabilities of non-profit institutions serving households should be removed from the EAA figures for comparisons. Roughly speaking, the NPISH assets are less than ten per cent of total assets. As seen earlier, in Finland for instance the share was 7 per cent of financial assets. The reconciliation would require an estimate of the NPISH share for each transaction. Likewise, adjustment for the share of assets held by institutionalised population should be conducted, although there may be little empirical basis for this adjustment.

The estimated value of managed accounts in the HFCS is recorded in the EAA under the relevant transactions categories, e.g. in listed shares, bonds or deposits. In the case of the EAA, there is no directly way separating those from the core accounts.

On the liability side, the EAA items that are not included in the HFCS should be adjusted for. Derivatives which appear as negative liability in the EAA could be moved as a positive entry to other financial assets to slightly improve comparability. Quoted and unquoted shares as households' liabilities should be either be excluded from the comparison, or moved to a relevant asset category. However, this item appears only in one country and is therefore a small item. Practically, it does not affect on this comparison.

Table 2.8 shows the size of all the asset and liabilities of households as absolute numbers and as share of total assets/liabilities in the EAA. Looking at the estimated EAA portfolio structures, some of the differences are quite negligible while some are of great magnitude. The share of asset types that we suggest may eventually need to be excluded (subject to an analysis of the first survey results) from the comparison from the EAA side (insurance technical reserves, currency) comprises 14.3 percent of total assets. There are no euro area estimates of the exclusions from the HFCS side (pension and whole life insurance, cars and other vehicles).

With regard to the remaining financial assets, it can be seen in the table that on the asset side it would be important to have coherent estimates of deposits, long-term debt securities, and shares. However, highly important for comparison would be non-financial assets given their large share of total assets, and in particular the

estimates of residential housing wealth. On the liability side loans represent the essential part of household liabilities.

**Table 2.8: Household assets and liabilities for euro area**

	assets		liabilities	
	EUR million	distribution	EUR million	distribution
Total financial assets/liabilities	17,858,538	43.16	6,431,272	100
Currency (AF.21)	522,737	1.26		
Deposits (AF.22+AF.29)	5,782,595	13.98		
Short-term debt securities (AF.331)	34,302	0.08		
Long-term debt securities (AF.332)	1,445,018	3.49		
Derivatives (AF.34)		0.00	-13,151	-0.20
Short-term loans (AF.41)	17,408	0.04	359,260	5.59
Long-term loans (AF.42)	57,978	0.14	5,403,629	84.02
Quoted and unquoted shares (AF.51)	2,767,209	6.69	6,564	0.10
Mutual fund shares (AF.52)	1,376,749	3.33		
Insurance technical reserves (AF.6)	5,383,557	13.01	33,901	0.53
Other accounts receivable/payable (AF.7)	470,986	1.14	641,070	9.97
Non-financial assets	23,515,748	56.84		
Total assets/ liabilities	41,374,286	100	6,431,272	100

Sources: ECB and Eurostat

### Adjusting the survey data

The standard survey process includes phases which aim at adjusting ex-post for the known imperfections in the data collected or in the sample, in other words, to compensate for the errors of measurement and errors of estimation. In the HFCS, such adjustments include multiple imputation and adjustment of sample design weights to external marginal distributions to deal with non-response. Nevertheless, wealth survey estimates typically fall short of aggregate counterparts even after careful data collection, processing, ex-post adjustments, and reconciliation of concepts. To improve coherence, further adjustments may be considered. Such adjustments mainly attempt to cope with suspected under-reporting or non-reporting by further imputing values to sample households using external information or modelling, or attempt to further modify the sampling weights so that the estimates are more coherent with the aggregate counterparts.

To correct for errors of estimation, the sampling weights (non-response adjusted inverses of inclusion probabilities) may be calibrated so that aggregate amounts better match the known totals. This calibration method requires that there is external information on variables recorded in the sample for the responding households, i.e. that the definitions of calibration variables and their reference populations perfectly match to the external benchmarks. The calibration approach may be particularly effective when register-based information which is highly correlated with the survey variables is available<sup>46</sup>.

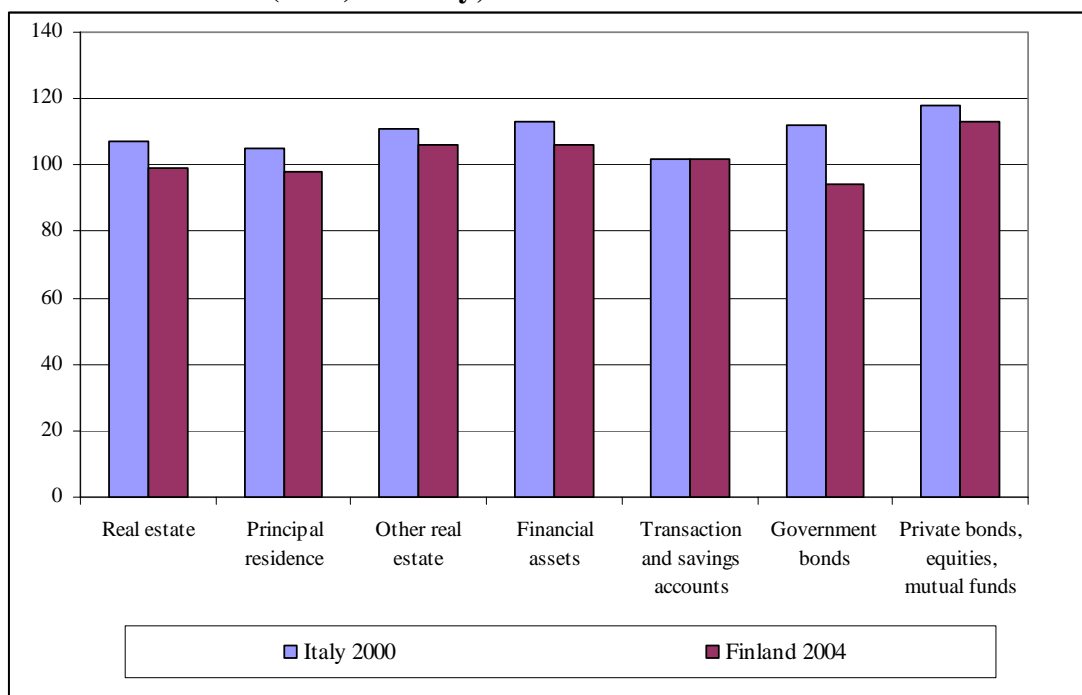
Figure 2.2 gives some evidence on the effect of weighting adjustments for non-response in two countries, Italy and Finland. In these cases, the adjustments work to increase equities and mutual funds more than other components, and transaction savings accounts having somewhat lesser effect. In Finland, the re-weighting scenario reduces real estate wealth and increases financial assets while in Italy all estimates are inflated due to non-response adjustment. The adjustments

<sup>46</sup> This is the case particularly in some income surveys (Törmälehto, 2009).

are conducted in a different way, in Italy using contact attempt information<sup>47</sup> and in Finland extensive register information, including taxable wealth. The differences in the auxiliary information may partly explain the results.

**Figure 2.2: The effect of non-response adjustments on wealth components in Italy (SHIW 2000) and Finland (HWS 2004), % of unadjusted figures.**

**Source: Brandolini (2004) for Italy; authors' calculations for Finland.**



Re-weighting methods may be used as a tool for improving survey estimates with respect to external totals, although measurement and conceptual issues prevent direct use of aggregate data in calibration of the weights. Coimbra et al (2008) apply GREG-estimation to the Portuguese wealth survey 2000 to adjust the survey estimates, using external information on a) 2001 Census data on age, education, household size, geographical location b) national accounts data on disposable income c) BdP data on credit to households, by region.

The adjustment of individual values of observations is needed to correct for errors in measurement. Typically, it is assumed that the wealth survey estimates are biased downwards because of misreporting and non-reporting. In the case of item non-response, the missing data will have to be imputed mainly based on what is known on the observations which have no missing values, but may have misreported values.

If the values are observed but suspected to be misreported (under-reported), a relationship to true values could be estimated and revaluation coefficients used to correct for misreporting. The misreporting factors are not known, so these have to be estimated or assumed. A crude but practical strategy would be proportional correction for each asset type based on the ratios of survey estimates to the EAA counterparts, an approach similar as applied for instance by Wolff (1994) in the

<sup>47</sup> It is assumed that households requiring at least two visits before conceding the interview are representative of non-responding units as a whole (Brandolini, 2004).



case of the US Survey on Consumer Finances. This method practically assumes that there is only under-reporting but no non-reporting.

To deal with under-reporting, or more generally with mis-reporting, in a more serious way one needs external data or very strong assumptions. If external data is available, as for example in Cannari and D'Alessio (1993), *and* assumed to be free of measurement errors, linear regression may be used to estimate household-specific correction factors.

One way to deal with non-reporting would be to impute values to households with non-zero amounts (after missing values in the data have been imputed), i.e. to correct for non-reporting wherein households have failed to report ownership of an asset type. One such method is proposed by Cannari and D'Alessio (1993) and applied for the Italian data by Brandolini et al (2004).

As was noted, one feasible solution would be to construct revaluation coefficients by asset types if the aim is to align the survey estimates to the adjusted EAA aggregates. Even when the aim is to reconcile estimates at euro area level, an intermediate national level adjustment step may be necessary. The construction of revaluation coefficient matrix may be best performed using first national annual data of the survey reference year as they may be more detailed national information to allow for bridging different concepts in the micro and macro sources. For instance, some countries may have separate balance sheets for household sector and NPISHs although this information is lacking in the EAA.

While the instrument-specific scaling may bring the survey estimates conveniently in line with macro aggregates, the ultimate question is how this changes the distribution of wealth among the sample households. In the circumstance of the very sizable differences between NA balance sheets and wealth survey results quoted earlier in the LWS, this may amount to applying brute force and result in biased distributional measures while the result should be the opposite, i.e. correction for distributional information for under-reporting and other imperfections.

### **Other reconciliation**

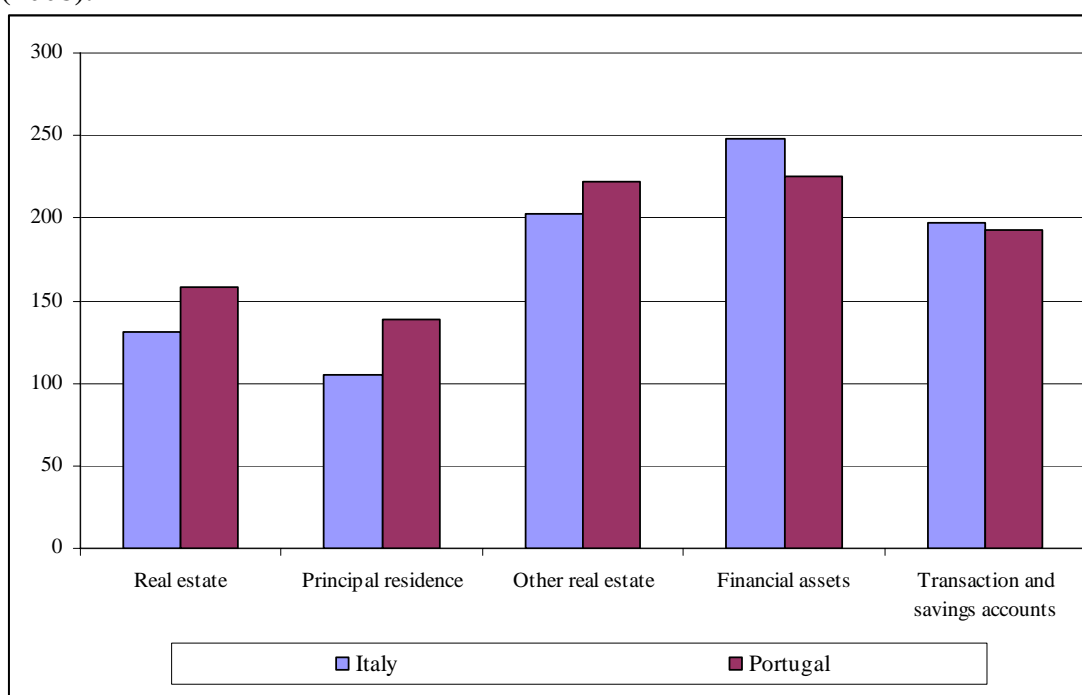
As was already noted, the HFCS has surveys from different years and proper euro area micro-macro reconciliation should try to deal with this. A comprehensive adjustment of survey data which would also aim at updating the distributions could in principle be conducted with methods used to update static microsimulation models, by first index updating data values and the re-weighting the data with minimum distance calibration methods to cope with changes in demographics and employment (see e.g. Immervoll et al, 2005). Any such reconciliation would however be highly model dependent and very laborious to conduct, even for a single country let alone for 16 euro area countries.

Since the micro-macro comparison and the adjustments in the first place aim at aligning estimates of total sums, a crude but feasible solution would be to update the estimates of total sums to a common reference year, for instance using national balance sheet data or even the EAA year-on-year changes in balance sheet items. The adjustment for reference years could also be combined with the revaluation matrix approach outlined above.

### **The magnitude of adjustments**

In practise, the adjustments should try to deal simultaneously with measurement errors (item non-response, under-reporting and non-reporting) and estimation errors. Full scale adjustments may lead to quite dramatic increases in the estimated total amounts, but without reaching the levels in the aggregate balance sheets. Figure 2.3 reproduces the effects of GREG-adjustments for Portugal (Coimbra et al, 2008) and Italian adjustments for non-response, non-reporting and under-reporting (Brandolini, 2004). Particularly in the case of financial assets, the increases are very substantial, with the estimated amounts more than doubling in both countries.

**Figure 2.3. The effects of adjustments of survey data in Portugal and Italy (% of unadjusted figures). Source: Brandolini (2004) and Coimbra et al (2008).**



### 3 Conclusions

Besides the Luxembourg Wealth Study, comparative micro-level evidence on households' assets and liabilities has been nearly non-existent. The launch of the euro area Household Finance and Consumption Survey (HFCS) therefore has a substantial informational gap to fill in. While the dataset may find its main use as a research dataset on household finances, it may also create new opportunities to complement National Accounts with important distributional information. This topic is highly relevant at the moment after revitalized interest in distributional breakdowns of macro data following the GDP and beyond initiatives (Stiglitz, Sen & Fitoussi, 2009). Additionally, this linkage between micro and macro statistics might help in the future to analyse transmission processes of financial shocks and risks as increasingly done in the current financial risk analysis.

In view of this, this paper reviewed the conceptual linkages between the Euro Area Accounts (EAA) of the ECB and the forthcoming euro area wealth survey.

This paper is the first step towards better understanding the possibilities to integrate information from these two sources. Beyond this, the HFCS may also provide a comparison point for aggregate balance sheets, typically subject to various adjustments in the National Accounts, and provides additional evidence for the household sector in items for which current information sources are scarce. The concept of net worth is more extensive in the HFCS, comprising both non-financial and financial assets, and can be extended to include pension and whole life insurance. The EAA basically aims at financial net worth although non-financial balance sheets are currently compiled on experimental basis.

The paper also discussed some options for possible reconciliation of the two sources. If a reconciled concept were created, we have suggested to possibly start with a restricted concept by excluding pension wealth/insurance technical reserves from the comparison. A reconciled concept would also require re-allocation or exclusion of some items, for instance in the case of business wealth. Furthermore, to adjust for household sector definition some approximations of the NPISH share of different balance sheet items and estimates of the share of institutionalized population would be needed.

Accurate measurement of households' balance sheet components is challenging both in aggregate statistics and sample surveys. From the aggregate point of view, the main complication may be the partial treatment of household sector as a residual sector in financial accounts which implies unknown degree of measurement error with likely variation among different balance sheet items although usually the available sources are confronted and thus, the estimates are considered pretty reliable. From the survey point of view, the main challenge is the level of accuracy from deriving estimates of total amounts given the "leverage" of observations in the top of the distribution, and expected measurement errors, particularly non-reporting and under-reporting. An additional complication is that the HFCS surveys are from different years, and full reconciliation would require harmonisation to cope with this.

Since the survey estimates are likely to fall short of EAA figures even after reconciliation for concepts and adjustments routinely included in the survey process, further steps may be considered to adjust for under-reporting and non-reporting in the survey. The relatively scarce evidence suggests that coverage rates of financial assets are particularly low while the match in non-financial assets seems better. In a large scale multinational survey like the HFCS, elaborate country-specific solutions which require exactly or statistically matched information for the sample households may not be feasible. A feasible option and starting point for further empirical work could be to construct a revaluation coefficient matrix based on adjusted EAA asset types and using more detailed national information whenever available. Since the main objective of the survey and the integrated use with aggregate sources is to provide distributional information and not to reproduce aggregate amounts of the EAA, the consequences of such adjustments procedure for distributional breakdowns would need to be carefully evaluated in the future work.

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