

Unclassified

COM/STD/DAF(2013)1

Organisation de Coopération et de Développement Économiques  
Organisation for Economic Co-operation and Development

30-Aug-2013

English - Or. English

Directorate for Financial and Enterprise Affairs  
Statistics Directorate

## Working Party on Financial Statistics

### LINKING MICRODATA AND MACRODATA ON AUSTRIAN HOUSEHOLD FINANCIAL WEALTH USING HFCS AND FINANCIAL ACCOUNTS DATA

To be held on 30 September - 1 October 2013  
OECD Conference Centre  
Beginning at 10 a.m. on the first day

*This document has been prepared by Michael Andreasch, Pirmin Fessler and Peter Lindner (Osterreichische Nationalbank - Austria) and will be presented under item 4 of the draft agenda*

JT03343823

Complete document available on OLIS in its original format  
*This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.*

COM/STD/DAF(2013)1  
Unclassified

English - Or. English

## LINKING MICRODATA AND MACRODATA ON AUSTRIAN HOUSEHOLD FINANCIAL WEALTH USING HFCS AND FINANCIAL ACCOUNTS DATA

*Michael Andreasch,  
Pirmin Fessler,  
Peter Lindner<sup>1</sup>*

### 1. Background<sup>2</sup>

In recent years, researchers have been relying increasingly on survey data for economic analyses, also for the purpose of assessing wealth and debt distribution. Micro-level survey data often constitute the only pool of data on household assets that are collected systematically. In this respect, one innovative feature of the Eurosystem Household Finance and Consumption Survey (HFCS) is that it provides a harmonized euro area framework for collecting and analyzing information on euro area households' financial and nonfinancial assets and liabilities. We used the micro-level data provided by the HFCS in Austria to cross-check the corresponding macro-level data from the financial accounts. We can connect the dots between the two sets of data above all by comparing the participation rates of households in the individual financial instrument categories.

### 2. Sampling Unit and Definition of Financial Assets: The HFCS versus the Financial Accounts

#### 2.1. The HFCS in Austria

The sampling unit of the HFCS was the household. With all households in Austria being part of the target population, irrespective of their nationality (except institutionalized households living e.g. in a monastery, military compound, or prison), all households had a positive probability of being selected for the HFCS sample. The HFCS is the most comprehensive survey on household assets and debt ever conducted in Austria. Out of a stratified cluster random sample of 4,436 households that were approached for the survey, 2,380 households agreed to participate in computer-assisted personal interviews. One purpose of the interviews was to establish the structure of households' assets and liabilities. The field phase was conducted from the third quarter of 2010 to the second quarter of 2011. Most of the information not provided by respondents was subsequently imputed using a Bayesian-based multiple imputation procedure. On the basis of sample design weights and after nonresponse adjustment, the final household weights used in the evaluations in this analysis were post-stratified both by regional distribution of the households and by distribution of household size. In particular, the weights were aligned neither with the aggregates nor

---

<sup>1</sup> Oesterreichische Nationalbank, External Statistics, Financial Accounts and Monetary and Financial Statistics Division, michael.andreasch@oenb.at; Economic Analysis Division, pirmin.fessler@oenb.at, peter.lindner@oenb.at.

<sup>2</sup> This article is largely based on a forthcoming paper by Andreasch and Lindner (2013) and is published in "Sector Accounts for Austria 2012, Integrated Presentation of Financial and Nonfinancial Accounts for Households, Nonfinancial Corporations, General Government and the Financial Sector".

with the structure of the asset and liability positions of the financial accounts. Hence, we must expect the two data sources to yield diverse findings; misalignments have not been diminished or ruled out ex ante.<sup>3</sup>

## 2.2. The Financial Accounts for Austria

The financial accounts<sup>4</sup> are an integral part of the national accounts and as such compiled in accordance with the rules of ESA 95, based on data derived from a number of sources, such as MFI balance sheet statistics, insurance company statistics, securities holding reports, corporate balance sheets as well as the balance of payments, including international investment position data. The target population of the financial accounts are individuals as classified in the economic sector of households and self-employed individuals resident in Austria. In other words, the data on the household sector refer to the assets and liabilities of consumer households as well as self-employed individuals and sole proprietorships with and without employees. In addition, these assets and liabilities are not netted. The format of accounting for the assets of self-employed individuals and sole proprietorships differs in two aspects in the HFCS: First, these assets are classified as investments in self-employment businesses and collected on a net basis, offsetting assets against the corresponding liabilities. Second, they are not classified as financial assets.

See table 1 for an overview of the definitions for the individual financial instruments used in the HFCS and the financial accounts.<sup>5</sup>

Table 1

Definition of Financial Instruments in the HFCS and in the Financial Accounts

Financial instrument	HFCS	Financial accounts
Deposits	Deposits are broken down by sight accounts and savings accounts; the data do not comprise deposits of self-employed individuals and sole proprietorships <sup>1</sup>	Deposits are broken down by demand deposits and deposits other than demand accounts; information on the size of sight accounts and savings deposits can be provided
Bonds/debt securities	Market value including interest earned <sup>1</sup>	Market value including interest earned
Shares (publicly traded) and other equity	Limited to publicly traded shares and other interests in business enterprises (unless household members are involved in running the business) <sup>1</sup>	Shares and other equity, irrespective of whether household members are involved in running the business; in the case of other equity the assumption is that households will be actively involved because such interests typically relate to limited liability companies
Mutual funds/mutual fund shares	Market value including interest earned (or reinvested in the case of automatic reinvestment plans) <sup>1</sup>	Market value including interest earned (or reinvested in the case of automatic reinvestment plans)
Whole life insurance/life insurance technical reserves	Cumulative gross premiums	Insurance technical reserves including price changes and valuation effects in the case of unit-linked and index-linked contracts
Voluntary private pension/funded pension plans	Private and corporate pension plans	Funded pension plans (typically savings plans with domestic pension funds)
Other financial assets	Other financial claims (such as wages earned but not yet received)	Other accounts receivable, including rights to severance benefits accrued with staff provision funds

Source: OeNB (HFCS Austria 2010, financial accounts).

<sup>1</sup> The different treatment of the financial assets of self-employed individuals and sole proprietorships also extends to debt securities, shares and mutual funds.

<sup>3</sup> For an overview of the methodological details of the HFCS 2010 in Austria, see the OeNB's publication Monetary Policy & the Economy Q3/12 – Addendum: [http://oenb.at/en/img/mop\\_2013\\_q3\\_methodenband\\_gesamt\\_tcm16-255048.pdf](http://oenb.at/en/img/mop_2013_q3_methodenband_gesamt_tcm16-255048.pdf).

<sup>4</sup> See the section entitled “Methods, Definitions and Sources” for more details.

<sup>5</sup> See Kavonius and Törmälehto (2010) for a detailed documentation of the link between the HFCS variables and the ESA definitions.

### 3. Cross-Checking Results for Austria for 2010

#### 3.1. Structure and Size of Financial Assets in the HFCS and in the Financial Accounts

The HFCS data may be used to estimate aggregates that correspond to the major financial asset positions of the financial accounts. The definitions underlying the two datasets are broadly comparable for many components. Table 2 provides an overview of the similarities and differences. The top part of the table shows those positions which are comparable, including their share of total comparable financial assets. The bottom part shows those positions which are covered either only by the HFCS or only by the financial accounts.

Table 2

#### Linking HFCS and Financial Accounts Data on Household Financial Wealth<sup>1</sup>

Reference year: 2010

HFCS data					Financial accounts data				
	Value	Share of total financial assets	Participation rate	Median value		Value	Share of total financial assets	HFCS coverage ratio	
	EUR billion	%	%	EUR		EUR billion	%	%	
<b>Financial instruments with comparable definitions</b>					<b>Financial instruments with comparable definitions</b>				
Sight accounts	12	7	99	707	Sight accounts	17	4	72	
Savings accounts	60	34	87	11657	Other deposits including saving deposits	187	47	32	
Bonds	14	7	4	13832	Debt securities	42	10	33	
Shares (publicly traded) and other equity <sup>2</sup>	8	4	5	7086	Shares	22	5	35	
Mutual funds	21	12	10	11248	Mutual fund shares	41	10	51	
Whole life insurance	39	22	38	11137	Life insurance technical reserves	68	17	57	
Voluntary private pension	21	11	23	7075	Funded pension plans	16	4	130	
Other financial assets	2	1	2	4722	Other accounts receivable	9	2	19	
					of which: severance entitlements	4	1		
<b>Comparable financial wealth aggregates</b>	<b>175</b>				<b>Comparable financial wealth aggregates</b>	<b>400</b>		<b>44</b>	
					Adjusted for deposits and marketable securities of self-employed individuals and sole proprietorships	381			46
<b>Other financial wealth not covered by the financial accounts</b>					<b>Other financial wealth not covered by the HFCS</b>				
Loans granted to other households	6		10	2620	Cash holdings	17			
					Short-term loans other than loans to households	0			
					Other equity <sup>3</sup>	39			
					Nonlife insurance technical reserves <sup>4</sup>	10			
<b>Total</b>	<b>6</b>				<b>Total</b>	<b>65</b>			
<b>Memorandum items</b>					<b>Memorandum items</b>				
Business equity (net worth) of households that are involved in running the respective companies	258		9	180603	Benefits under funded pension plans, entitlements to severance payments from staff provision funds, and provisions for severance and pension payments <sup>4</sup>	31			

Source: OeNB (HFCS Austria 2010, financial accounts)

1 Table adapted from Andreasch and Lindner (2013, forthcoming).

2 Excluding business equity where members of the household are involved in running the business.

3 Essentially, limited liability shares as well as business equity held abroad, including ownership of foreign real estate property.

4 Provisions made for severance and pension payments were estimated on the basis of available corporate balance sheets.

Comparing estimated aggregates with available data is a common tool for identifying differences and similarities between microdata and macrodata. As in other countries, cross-checks between the HFCS and financial account aggregates indicate that the comparable household financial assets were underreported in the HFCS in Austria. For instance, table 2 shows that the estimated HFCS aggregate for household financial wealth in Austria covers about 44% of the comparable financial accounts aggregate. To a large extent, this gap can be explained with the fact that the survey is characterized by underreporting of the most affluent part of the population (top 1%). Nonetheless, a measure of 44% is fairly high in comparison with surveys in other countries.<sup>6</sup> When the financial accounts data are adjusted for the financial assets of self-employment businesses, the HFCS coverage ratio rises to 46%. In other words, the survey captured less than half of the comparable financial instruments. At the same time, table 2 indicates that the allocation of financial wealth reflected by HFCS data broadly mirrors the financial accounts patterns.

For the financial accounts aggregate on deposits other than sight accounts (including savings deposits), the HFCS coverage ratio runs to 32%. This position thus captures close to 60% of the gap between the HFCS data and the financial accounts data on financial assets. It must be noted, though, that the financial accounts aggregate for deposits also include the deposits of self-employed individuals and sole proprietorships, which the HFCS classifies as net investment in self-employed businesses. The deposits of self-employed individuals other than sight deposits totaled around EUR 6.9 billion at the end of 2010, which means that the HFCS coverage ratio of the adjusted financial accounts figure was 33%. With regard to shares and debt securities, the HFCS data likewise covered about one-third of the values captured by the financial accounts.<sup>7</sup> Furthermore, the HFCS covered around 50% of the volume of mutual fund shares<sup>8</sup> as well as 57% of life insurance reserves. At the same time, the pension wealth component is overcounted in the HFCS (HFCS coverage ratio of 130%). This partly stems from the definition of pension wealth in the financial accounts, which treat pension wealth as benefits under funded pension plans (run by single-employer or multi-employer occupational pension funds) including entitlements to OeNB pensions, but exclude provisions made in corporate balance sheets for pension payments (some EUR 12 billion) and entitlements to severance payments from staff provision funds (some EUR 3.5 billion). In the financial accounts, these amounts are shown under other accounts receivable. If these amounts are added to pension wealth as shown in the financial accounts, the ratio decreases to 65%. Additionally, respondents in the HFCS can also be expected to have encountered difficulties in categorizing certain asset components as pension wealth.

Certain subcomponents are not covered by either of the two data sources. For instance, the financial accounts do not cover financial wealth resulting from loans granted to other households because such data are not compiled. Here, the results from the HFCS show that the corresponding sums are nonnegligible, though. Another case in point is cash holdings, which were not part of the HFCS questionnaire, as this question was considered too sensitive to be posed during a personal interview. In the financial accounts, cash holdings constitute a separate category (separate from deposits) that is not subsumed under other accounts receivable. Another category not covered by the HFCS is that of agreed nonlife insurance claims that have not been paid out yet. Finally, the financial accounts distinguish between holdings of stocks (quoted and unquoted) and other equity. With respect to business equity held by a household member, the

---

<sup>6</sup> Table 5 in Sierminska et al. (2006) shows ratios ranging from 13% (United Kingdom, BHPS 2000) to 52% (Norway, IDS 2002). The Survey of Consumer Finances (United States), which is considered the highest-quality survey of household finance, gives a ratio of 38% for 2001. Mathä et al. (2012) indicate a ratio of 35% for the HFCS in Luxembourg (Table 18 in this publication).

<sup>7</sup> The financial accounts show self-employed individuals and sole proprietorships to hold about EUR 3.5 billion in custody accounts.

<sup>8</sup> The financial accounts show self-employed individuals and sole proprietorships to hold about EUR 2.1 billion in mutual fund shares.

data do not provide any information on whether equity ownership means that household members are also involved in running the business. For the purpose of cross-checking, we assumed that limited liability shares imply such involvement. To bring the equity data in line with the definitions underlying the HFCS, we therefore adjusted the financial accounts positions for such assets.

Overall, the two data sources are broadly consistent when it comes to the distribution of those financial wealth aggregates that are comparable. For example, the share of sight accounts in total comparable financial wealth is 7% on the basis of the HFCS and 4% in the financial accounts. In the case of investment in shares, the respective ratios are 3% (HFCS) and 5% (financial accounts). The relative shares of the categories debt securities and mutual funds are also very similar in both data sources. The biggest discrepancy arises with respect to pension wealth, which accounts for 12% of financial assets in the HFCS and 4% in the financial accounts. This discrepancy is the result of the difficulty described above in capturing pension assets both in the HFCS and in the financial accounts.

### **3.2. Participation Rate-Based Analysis**

The following analysis is based on the participation rates (including “conditional” participation, see below) of households in the individual financial instrument categories and the portfolio allocation dependent on households’ financial wealth.

To the extent that it is comparable with HFCS data, household financial wealth totaled about EUR 400 billion at the end of 2010 (or EUR 381 billion when adjusted for the financial assets of self-employed individuals). The traditional view of a capital-weighted allocation to financial instruments as reflected by the financial accounts shows a dominance of savings accounts, including other deposits (share of 47%), followed by life insurance reserves (17%).

As a cross-check with HFCS data shows, the allocation to individual financial instruments is heavily dependent on the size of individual households’ financial assets. According to the HFCS, the median of financial assets was about EUR 14,000 for all households. For households below this median value, financial assets averaged EUR 4,400, and for households above this median value, they averaged EUR 86,000. For households’ savings deposits, the median value was approximately EUR 11,600. Households with average financial assets of EUR 4,400 (below the median financial assets) had put approximately EUR 2,800 or almost two-thirds of their financial assets (63%) in savings accounts. The corresponding share of households whose financial assets were above the median, while significantly lower (one-third) in percentage terms, amounted to as much as EUR 29,200 in absolute terms. The high capital-weighted share of savings accounts in the financial accounts (47%) reflects the high participation rate established for savings accounts in the HFCS (87%). The case of sight accounts is completely different. Sight accounts had a capital-weighted share of 4% of the comparable financial wealth captured by the financial accounts, and a participation rate of almost 100% based on the HFCS data. The median value of all households’ sight deposits was EUR 707. At the same time, households whose financial assets fell short of the median value held 18% of their financial assets, or EUR 791, on sight accounts. Conversely, households whose financial assets exceeded the median value had put only some 6% of their financial assets on sight accounts; here, the amount came to EUR 5,490. The opposite pattern emerged for marketable securities.<sup>9</sup> Households whose financial assets exceeded the median had a significantly higher exposure to this financial instrument than other households.

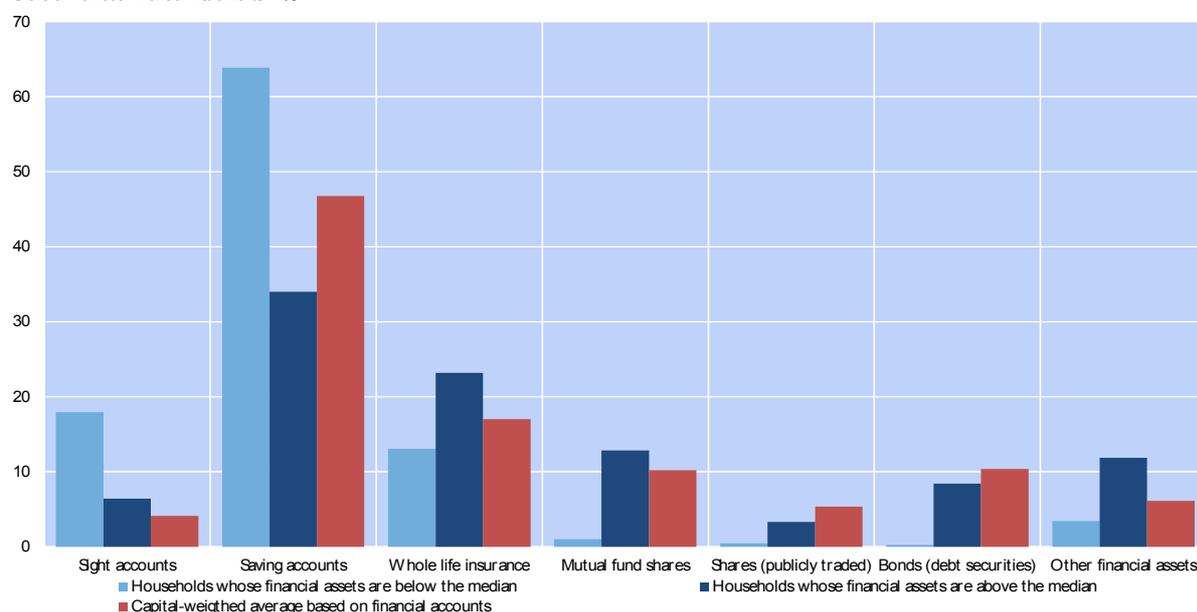
---

<sup>9</sup> Debt securities, quoted stocks and mutual fund shares.

Chart 1

### Average Portfolio Allocation of Household Financial Wealth

Share of individual financial instruments in %



Source: OeNB (HFCS 2010, financial accounts).

Furthermore, the HFCS data provide insights into the more complex investment patterns in households' portfolios, i.e. investment in a particular financial instrument can be seen as being "conditional" on investment in another instrument. Thus we find households with savings accounts (87% of all households) to have a 43% chance of holding life insurance plans and a 56% chance of holding real estate property. For marketable securities, the conditional participation pattern (table 3) shows that 44% of all shareholders (while accounting for just 5% of all households) have also invested in mutual funds. In turn, one-quarter of all mutual fund share holders (10% of all households) also hold stocks. This pattern is relevant for judging which households have suffered securities price effects since the onset of the financial crisis, subject to the caveat that diverging diversification strategies of individual households may lead to different results.

Table 3

### Concurrent Investment in Selected Financial Instruments

Financial investment and debt	Participation rate	Conditional participation rate						
		Savings accounts	Whole life insurance	Mutual funds	Bonds	Shares (publicly traded)	Real estate property	Mortgage loans on the household's main residence
	%							
Savings accounts	87,1		43,6	11,3	4,0	5,9	56,2	18,2
Whole life insurance	38,0	100,0		17,7	4,7	7,7	62,5	26,6
Mutual funds	10,0	98,4	67,2		13,0	23,5	73,6	28,3
Bonds	3,5	98,1	50,4	37,0		37,8	84,2	22,8
Shares (publicly traded)	5,3	96,6	55,0	44,2	25,0		78,1	29,8
Real estate property	52,2	93,9	45,5	14,1	5,7	7,9		31,9
Mortgage loans on the household's main residence	16,6	95,4	60,6	17,0	4,8	9,5	100,0	

Source: OeNB (HFCS Austria 2010).

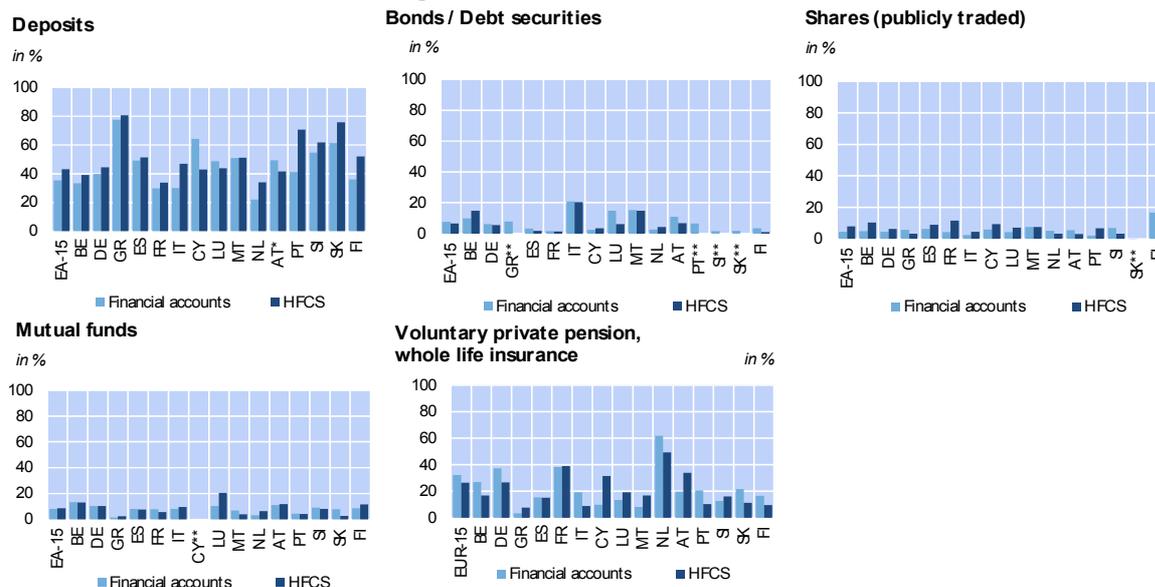
Measured for the period from mid-2007 to end-2012, the cumulative – net – negative price effect resulting from ownership of listed shares totaled EUR 9 billion for the household sector as a whole, while it added up to EUR 3.7 billion for mutual fund shares. The HFCS-based participation matrix shows that shareholders suffered cumulative price losses of EUR 10.6 billion on account of their concurrent investment in mutual funds over the 22-quarter period.<sup>10</sup> This loss is equivalent to one-quarter of the combined stock and mutual fund share portfolio value as at June 30, 2007. Vice versa, holders of mutual fund shares suffered price losses of close to EUR 6 billion, as much as 12% of the portfolio value of their stocks and mutual fund shares in mid-2007. The message is driven home even more forcefully when it comes to the indirect participation in capital market developments for bond investors. According to the HFCS, fewer than 4% of all Austrian households have invested in bonds. At the same time, around 37% of bond investors hold stocks and mutual fund shares. This means that about 1% of households have suffered significant price losses from stocks and mutual funds. On top of that, table 3 shows that households holding securities (around 15% of all households) also tend to own real estate property. Here, the conditional participation rate was more than 70%.

### 3.3. Cross-Checking HFCS and Financial Accounts Data for Other Euro Area Countries

Euro area-wide cross checks of HFCS data with the available national financial accounts data show that the patterns reflected by HFCS data broadly mirror the financial account patterns (not only in Austria).

Chart 2

#### Allocation of Financial Assets according to Microdata and Macrodata



Source: Eurostat, financial accounts data 2010; Eurosystem HFCS Table D3.

Note: \* excluding life insurance contracts \*\* not available in the HFCS

EA = Euro Area, BE = Belgium, DE = Germany, GR = Greece, ES = Spain, FR = France, IT = Italy, CY = Cyprus, LU = Luxembourg, MT = Malta, NL = Netherlands, AT = Austria, PT = Portugal, SI = Slovenia, SK = Slovakia, FI = Finland

<sup>10</sup> This is a simplified view which starts from the assumption that shareholders owned their portfolios already in mid-2007 and typically increased their portfolios – in line with the financial accounts data – with further acquisitions in the 22-quarter period. Moreover, the assumption is that participation rates remained broadly unchanged in the period under review. This assumption is based on the participation rate derived from the HFCS 2010 and the 2004 survey on household financial wealth.

The data on the 15 countries that participated in the HFCS for deposits, debt securities, shares, mutual funds and private pension reserves as well as life insurance reserves show that deposits had a share of more than 30% in almost all countries in the capital-weighted values of total financial assets as disclosed in the HFCS as well as in the equivalent financial accounts aggregates. Deposits typically exceeded the value of the marketable securities. Moreover, the data show that instruments employed to finance private pension plans account for a substantially higher share of total financial assets (both in the microdata and the macrodata) in countries with a solid private pension pillar – like in the Netherlands – than in countries with a comparatively higher share of pay-as-you-go pension systems. Overall, the uniform structural framework of financial assets in the HFCS and in the financial accounts implies that macro analyses lend themselves to meaningful cross-checks with HFCS data not only in Austria.

#### **4. Summary and Outlook**

In recent years, economists have been relying increasingly on survey data for economic analysis, also for the purpose of assessing wealth and debt distribution. One innovative feature of the Eurosystem Household Finance and Consumption Survey (HFCS) is that it provides a highly harmonized framework for data collection that enables researchers to analyze data that cover the entire balance sheet of euro area households, i.e. their financial and nonfinancial assets and liabilities. The purpose of the analysis published here was to compare HFCS data in a first step with the structural information on financial assets as captured by the financial accounts, i.e. to cross-check newly available microdata with the relevant macrodata. Despite some differences in the underlying definitions and delineation rules, we found the structural information provided by the two datasets to be compatible. In other words, the HFCS data lend themselves to meaningful cross-checks with the financial accounts data, even though the HFCS covered only roughly half of the assets and liabilities captured by the financial accounts. Thus, the financial accounts data allow us to attribute, for instance, the price losses identified in recent years for stock investors to those 5% of households that typically hold financial assets beyond the median value for all Austrian households. Further analyses, above all analyses of macrodata time series with survey-based information on households from repeated waves, will follow.

## 5. References<sup>11</sup>

- Albacete, N., P. Lindner, K. Wagner and S. Zottel. 2012.** Eurosystem Finance and Consumption Survey 2010. Methodological Notes for Austria. In: Monetary Policy & the Economy Q3/12 – Addendum.
- Andreasch, M. and P. Lindner. 2013.** Micro and Macro Data: A Comparison of the Household Finance and Consumption Survey with Financial Accounts in Austria. Forthcoming.
- ECB. 2013a.** The Eurosystem Household Finance and Consumption Survey. Methodological Report for the First Wave. ECB Statistics Paper Series 1. April. [www.ecb.int/pub/pdf/other/ecbsp1en.pdf](http://www.ecb.int/pub/pdf/other/ecbsp1en.pdf)
- ECB. 2013b.** The Eurosystem Household Finance and Consumption Survey. Results from the First Wave. ECB Statistics Paper Series 2. April. [www.ecb.int/pub/pdf/other/ecbsp2en.pdf](http://www.ecb.int/pub/pdf/other/ecbsp2en.pdf).
- Fessler, P., P. Mooslechner and M. Schürz. 2012.** Eurosystem Household Finance and Consumption Survey 2010. First Results for Austria. In: Monetary Policy & the Economy Q3/12. [http://oenb.at/en/img/mop\\_2012\\_q3\\_in\\_focus\\_tcm16-251583.pdf](http://oenb.at/en/img/mop_2012_q3_in_focus_tcm16-251583.pdf).
- Kavonius, I. K. and V.-M. Törmälehto. 2010.** Integrating Micro and Macro Accounts – The Linkages between Euro Area Household Wealth Survey and Aggregate Balance Sheets for Households. Prepared for the 31<sup>st</sup> General Conference of the International Association for Research on Income and Wealth. St. Gallen. August 18–22. [www.iariw.org/papers/2010/7aKavonius.pdf](http://www.iariw.org/papers/2010/7aKavonius.pdf).

---

<sup>11</sup> As retrieved on May 14, 2013.