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SAVING BEHAVIORS OF LOW-INCOME HOUSEHOLDS IN EUROPE

Final Report

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1 Introduction

Households are faced with various types of uncertainties (risks) in their daily lives. These risks can change the household's consumption level over time, which can be fulfilled if households have suitable access to saving or credit facilities. However, previous studies show that the low-income households among others are more likely to have limited saving and have less access to credit markets, therefore, they are more likely to be affected by any unexpected shocks to their income and asset values. For example, a report of Dutch households' net wealth and saving patterns by Warnaar, Gaalen and Schors (2012) reveals that around 20% of the Dutch households have no saving or any financial buffer. Cole, Shawn, et al. (2013) also show that low-income households have less limited financial literacy and less access to credit facilities. Hence, understanding the nature of the underlying risks faced by low-income households should ultimately help financial intermediaries and policymakers to evaluate existing policies targeting poverty, and to design better financial services for this segment. For this reason, in this project, we empirically investigate the key risk drivers and challenges in mitigating risks at the low-income household level.

As a first step of analyzing the financial behavior of households, we use an accounting framework to create the households' financial statements. We impose this modified accounting framework onto an integrated European household survey and construct the main household financial statements accordingly: the balance sheet and the cash flow statements. It is worth mentioning that almost all transactions by households are in the form of cash or short-term credit. Furthermore, some main items like repayment of principle of mortgagee are not reflected in income statement while they must be shown in the cash flow statement. Therefore, the cash flow statements can perfectly reflect the household's financial turnover and it is preferred to income statement. For this, we have concentrated on cash flow statement instead of income statement. We then illustrate the use of the accounts for the analysis of household finance. In that way, we are able to borrow risk measurement techniques from both financial regulations and the existing literature and amend them to the situation of the low-income household.

Constructing household financial statements is not the only method that can be used to study financial situations of low-income households. There are other studies on consumption

smoothing and financing of household investment that are not based on an accounting framework but as Krislert and Townsend (2010) discussed, using corporate financial accounting for an analysis of household finance does have several advantages as follow:

First, corporate financial accounts allow us to clearly define financial variables for households. It also clarifies the distinction between household assets, household liability and various cash flows that household creating or spending. Financial accounting also allows us to categorize several sub-items of the main variables in each account. For example, total assets of a household consist of total real assets like value of household's main residence and total financial assets like cash deposits or any investment of household in financial markets. Liabilities also include account payables and other borrowings. Moreover, the cash flow statement of households can be divided into two main sections; household cash inflows like total revenue and cash outflows like total expenses.

Second, as Krislert and Townsend (2010) mentioned, another advantage of corporate financial accounts is that, by definition, financial statements must reconcile across accounts to confirm that the accounts are constructed correctly. For example, in the balance sheet, household total assets must equal the sum of household total liabilities and household net wealth. With these balanced accounts, we do not have a problem commonly encountered in the household's surveys, that a variable generated from one set of questionnaire responses yields a different value when computed from an alternative set of responses. The robust accounting framework guarantees that various ways to compute the same variable give us identical result or makes clear that they are not the same variable after all.

Third, financial accounts provide us with a simple way to apply the standard financial accounting analysis to the study of household finance. In addition, for economic modeling, financial accounts allow us to apply theories and empirical strategies in the finance literature to the study of parallel issues for households. These theories can include risk management, portfolio allocation, and performance of assets.

After constructing the financial statements of low-income households, we apply the risk management theory to these households to show how they can survive against shocks to income

and asset values. More specifically, we define a financial buffer (as a precautionary saving) for low-income household's budget to protect them against unexpected shocks to their balance sheets and the cash flows statements. It is worth mentioning, utilizing accounting framework and financial literature mean households have the same degree of economic rationalities as companies have.

The external shocks to the low-income households can be related to changes in global stock markets, real estate prices, inflation, interest rate, unemployment rate etc. Although lack of considerable investment in the listed shares by low-income households immunize them against changes in global stock markets, if the shock is large enough it can lead to higher unemployment rate which will affect this class of households more severely. The financial buffer can be considered as a state-contingent saving and because low income households with limited funds may not want to save and hence may choose to have a low buffer or not have it at all, it is relevant to policymakers to be aware of the buffer level for this group of households.

To calculate the financial buffer for low-income household, we use the Solvency Capital Requirement (SCR) model, which is defined in our case as the amount of money (saving) that a household is required to hold in order to have a 99.5% confidence it could survive the most extreme expected losses over the course of a year.

The goal of this research is to increase awareness among policymakers of how the risk profile of low-income households has possibly changed with respect to various shocks and how low-income households can protect themselves by a right financial buffer. The rest of the research is divided into two sections. Section 2 describes the data and Section 3 presents the results and discussion for the full sample and subsamples of our data.

2 Data

Household surveys have been promoted by governments, international organizations, academics, and survey groups in many countries, providing useful data for research into various aspects of household finance. In Europe, the Household Finance and Consumption Survey (HFCS) collects information on the assets, liabilities, income and consumption of European households. The dataset provides insights into their economic behavior and financial situation – highly relevant

factors in terms of monetary policy and financial stability. The survey (second wave) is based on 84,000 interviews conducted in 20-euro area countries (EU) such as Austria (AT), Belgium (BE), Cyprus (CY), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungry (HU), Ireland (IE), Italy (IT), Latvia (LV), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Slovakia (SK), Slovenia (SI) and Spain (ES). The datasets from the first and second wave were released respectively in April 2013 and December 2016. In this research we use the second (the latest available data) of the HFCS database for our analysis.

The HFCS dataset includes two main aspects of the household information;

(i) Individual households as a member (demographic information, employment, future pension entitlements and income.)
(ii) Household (real assets, liabilities and credit constraints, private businesses, financial assets, intergenerational transfers and gifts, and consumption and saving)

Moreover, to complete our data, we also use the Eurostat database.

Table 2-1 shows the main statistic of European households based on different European countries. Table 2-1 includes total sample size, family size, housing status, quantile of income and quantile of the wealth per country. Table 2-2 shows the household characteristics like Table 2-1, in a percentage, and shows some more characteristics of households like age and education statuses. The quantile of income and quantile of net wealth in Table 2-2 shows that what percentage of households in different countries stand in different quantile in comparison with the whole of Europe. As Tables 2-1 and 2-2 show, the income and wealth of households do not distribute equally among households in different countries and within countries. For example, in France around 8% of the household in our sample have lower income than the first income quantile of the whole sample, however this number for Greece is around 35%. The same result shows for the net wealth, for example 30% of households in Greece (in our sample) have lower net wealth in comparison with the European households as total.

As it is highlighted by Jérusalmy (2017), most of the time homeless people or people living in collective dwelling or in institutions are excluded from the sample. This means only legally registered people are taken into account during sampling process which can lead to underrepresentation of this group of households.

Table 2-1- Data description, households characteristics

		AT	BE	CY	DE	EE	ES	FI	FR	GR	HU	IE	IT	LU	LV	MT	NL	PL	PT	SI	SK	Total
All		2,997	2,238	1,289	4,461	2,220	6,106	11,030	12,035	3,003	6,207	5,419	8,156	1,601	1,202	999	1,284	3,455	6,207	2,553	2,135	84,597
Family Size	1	1,199	676	167	1,053	492	1,186	2,596	3,411	687	1,878	1,365	2,394	331	367	193	385	823	1,082	408	576	21,269
	2	1,016	833	315	2,070	770	2,171	4,486	4,282	925	2,090	1,605	2,588	461	389	315	551	1,116	2,022	776	685	29,466
	3	341	300	215	614	410	1,263	1,600	1,698	604	1,054	842	1,500	285	221	196	130	655	1,549	583	377	14,437
	4	301	269	307	518	372	1,060	1,513	1,757	594	764	917	1,222	349	151	207	152	513	1,158	504	282	12,910
	5 or more	140	160	285	206	176	426	835	887	193	421	690	452	175	74	88	66	348	396	282	215	6,515
Housing Status	Owner-outright	892	1,043	487	1,594	1,269	4,180	4,268	5,766	1,752	4,163	1,937	5,226	628	756	662	262	2,303	2,835	1,731	1,605	43,359
	Owner-with Mortgage	392	574	533	1,027	509	1,168	4,258	2,711	312	1,099	1,866	649	547	213	122	647	375	2,218	224	245	19,689
	Renter-other	1,713	621	269	1,840	442	758	2,504	3,558	939	944	1,616	2,281	426	233	215	375	777	1,154	598	285	21,548
Quantile Income	I (low-income)	292	152	273	402	1,076	1,291	630	998	1,063	4,730	692	1,745	49	610	324	82	2,213	2,282	937	1,341	21,182
	II	846	545	326	708	597	1,705	1,755	2,742	1,212	1,206	1,167	2,838	99	316	304	182	967	2,067	929	603	21,114
	III	1,159	708	393	1,324	414	1,623	3,344	3,915	602	213	1,565	2,356	304	219	275	473	239	1,322	544	158	21,150
	V (high-income)	700	833	297	2,026	133	1,487	5,301	4,380	126	54	1,995	1,217	1,149	57	96	547	36	536	143	33	21,146
Quantile Net Wealth	I (low-wealth)	1,186	414	232	1,115	709	583	2,361	2,302	914	2,851	1,874	1,845	215	698	143	318	959	1,312	530	545	21,106
	II	567	248	204	762	985	890	2,031	1,998	1,271	2,830	1,003	1,375	131	380	138	276	1,600	2,030	1,050	1,337	21,106
	III	564	594	344	989	376	1,696	3,359	3,158	644	428	1,382	3,065	173	92	399	402	726	1,718	780	217	21,106
	V (high-wealth)	680	982	509	1,595	150	2,937	3,279	4,405	174	96	1,160	1,871	1,082	32	319	288	170	1,147	193	36	21,105

Table 2-2- Data description2, household characteristics in percentage

		AT	BE	CY	DE	EE	ES	FI	FR	GR	HU	IE	IT	LU	LV	MT	NL	PL	PT	SI	SK	Total
All		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Family Size	1	40%	30%	13%	24%	22%	19%	24%	28%	23%	30%	25%	29%	21%	31%	19%	30%	24%	17%	16%	27%	25%
	2	34%	37%	24%	46%	35%	36%	41%	36%	31%	34%	30%	32%	29%	32%	32%	43%	32%	33%	30%	32%	35%
	3	11%	13%	17%	14%	18%	21%	15%	14%	20%	17%	16%	18%	18%	18%	20%	10%	19%	25%	23%	18%	17%
	4	10%	12%	24%	12%	17%	17%	14%	15%	20%	12%	17%	15%	22%	13%	21%	12%	15%	19%	20%	13%	15%
	5 or more	5%	7%	22%	5%	8%	7%	8%	7%	6%	7%	13%	6%	11%	6%	9%	5%	10%	6%	11%	10%	8%
Housing Status	Owner-outright	30%	47%	38%	36%	57%	68%	39%	48%	58%	67%	36%	64%	39%	63%	66%	20%	67%	46%	68%	75%	51%
	Owner-with Mortgage	13%	26%	41%	23%	23%	19%	39%	23%	10%	18%	34%	8%	34%	18%	12%	50%	11%	36%	9%	11%	23%
	Renter-other	57%	28%	21%	41%	20%	12%	23%	30%	31%	15%	30%	28%	27%	19%	22%	29%	22%	19%	23%	13%	25%
Quantile Income	I	10%	7%	21%	9%	48%	21%	6%	8%	35%	76%	13%	21%	3%	51%	32%	6%	64%	37%	37%	63%	25%
	II	28%	24%	25%	16%	27%	28%	16%	23%	40%	19%	22%	35%	6%	26%	30%	14%	28%	33%	36%	28%	25%
	III	39%	32%	30%	30%	19%	27%	30%	33%	20%	3%	29%	29%	19%	18%	28%	37%	7%	21%	21%	7%	25%
	V	23%	37%	23%	45%	6%	24%	48%	36%	4%	1%	37%	15%	72%	5%	10%	43%	1%	9%	6%	2%	25%
Quantile Net Wealth	I	40%	18%	18%	25%	32%	10%	21%	19%	30%	46%	35%	23%	13%	58%	14%	25%	28%	21%	21%	26%	25%
	II	19%	11%	16%	17%	44%	15%	18%	17%	42%	46%	19%	17%	8%	32%	14%	21%	46%	33%	41%	63%	25%
	III	19%	27%	27%	22%	17%	28%	30%	26%	21%	7%	26%	38%	11%	8%	40%	31%	21%	28%	31%	10%	25%
	V	23%	44%	39%	36%	7%	48%	30%	37%	6%	2%	21%	23%	68%	3%	32%	22%	5%	18%	8%	2%	25%
Age	16-34	26%	23%	36%	22%	29%	22%	27%	26%	27%	25%		20%	30%	26%		19%	29%	24%	29%	26%	23%
	35-44	14%	13%	19%	12%	18%	12%	15%	17%	17%	16%		12%	19%	15%		17%	15%	18%	15%	15%	14%
	45-54	18%	17%	19%	20%	17%	17%	20%	21%	18%	14%		18%	21%	20%		13%	16%	18%	19%	18%	17%
	55-64	17%	19%	13%	19%	16%	17%	20%	20%	15%	19%		17%	16%	19%		19%	19%	17%	17%	20%	17%
	65-74	15%	16%	9%	17%	10%	17%	13%	13%	12%	15%		16%	8%	11%		21%	13%	12%	11%	13%	13%
	75+	10%	13%	4%	11%	10%	16%	6%	10%	11%	10%		16%	5%	9%		10%	8%	11%	9%	8%	10%
Education Status	Primary	1%	7%	11%	3%	3%	29%	1%	10%	23%	1%	10%	22%	17%	2%	22%	6%	15%	42%	3%	1%	13%
	Lower Secondary	18%	18%	11%	9%	17%	15%	24%	11%	15%	20%	18%	30%	13%	13%	35%	27%	6%	19%	21%	17%	18%
	Upper Secondary	64%	34%	50%	51%	48%	21%	40%	39%	46%	49%	39%	35%	36%	46%	28%	29%	58%	19%	56%	63%	40%
	First Stage Tertiary	17%	41%	28%	37%	32%	34%	34%	39%	16%	30%	34%	12%	35%	39%	14%	39%	21%	20%	19%	19%	28%

3 Summary Statistics and discussion

The study of the household financial behavior occupies a large share of the growing literature on empirical development economics in the past few decades. Some part of the household literature focus on the low-income household's financial behavior and their mistakes. For example, Campbell (2006) mentions that "…many households are reasonably effective investors, but a minority make significant mistakes and this minority appears to be poorer and less well educated than the majority of more successful investors". For this, Campbell argues that low-income households should be central to the field of household finance. One of these mistakes, as previous literature has shown, is that households rarely consider the risks in their financial decisions.

Unlike previous theoretical studies on the household risk management and household saving behavior (e.g., Lusardi and Mitchell 2007 and Warnaar, Gaalen and Schors 2012), we contribute to the literature by using a novel approach of quantifying the risk level of low-income households. With this purpose, after constructing the financial statements of households, the balance sheet and the cash flow statements, we identify the main items in the portfolio of households that are exposed to the systematic and idiosyncratic risks. Then we use a quantitative method to measure the risks and aggregate it to show what the reasonable buffer for the household budget is.

3.1 Financial statement of households on average

Using an accounting framework, we create households' financial statements. We construct the main household financial statements accordingly: the balance sheet and the statement of cash flows. In the next section, we first show the financial statements of European households in the aggregated level, and then we show these results for each country.

3.1.1 Balance sheet

The household balance sheet is divided to total assets, total liabilities and net wealth. In the balance sheet of household, we divide the total assets into real assets and financial assets.

The real assets include the household's main residence (house), any other real estate property, vehicles, Valuables and self-employment businesses. The financial assets include deposits, mutual funds, bonds, the value of non-self- employment private business, publicly traded shares, managed accounts, money owed to households, other assets and voluntary pensions.

The liability part of the balance sheet is related to outstanding balance of Household Main Residence (HMR) mortgages, the outstanding balance of mortgages on other properties, the outstanding balance of mortgages debt, the outstanding balance of other debt (non-mortgage debt). The last part of the household balance sheet is the Net Wealth, which is assets minus the total liabilities.

We now summarize the balance sheets and the cash flow statements of the European households based on the information in the 2016 Survey of the Household Finance and Consumption Survey (HFCS). Table 3-1 presents the average value of the sub-items in households in three classes such as low-income household classes, high-income household classes and the aggregated level in euro. The last columns of Table 3-1 show the same results with the percentage of the balance sheet items based on the total assets in the three classes.

Table 3-1 reports that the asset allocation decision of households. For example, this table shows that in the aggregated level, 72% of total assets of households is related to the real assets and only 28% of their assets is associated with the financial assets. The household's main residence is the main asset in the household's portfolio, which is 47% of the low-income household's total assets and 49% of the high-income household's total assets. However, the value of houses for these two income classes is different. For example, the low-income households have 55,070 euros as the main residence, while this number for high-income family is 242,528 euros.

In the liability side of the household's balance sheet, Table 3-1 shows that in the aggregated level, the total outstanding liabilities of households is around 316% of the total assets. The difference between the liabilities of low-income households and high-income household is enormous. For example, the outstanding liabilities of low-income households is 384% of the total assets and this number for high-income households is only 25% of their total assets.

More interestingly, Table 3-1 shows that the net wealth of low-income households in Europe is -284% of the total assets and this number for the high-income households is 75% of the total assets.

Table 3-1- The household's balance sheet

	Balance Sheet (€) EU Households based on Level of TGI*			Balance Sheet (%TA) EU Households based on Level of TGI		
	Q1	**Aggregate**	**Q4**	**Q1**	**Aggregate**	**Q4**
Value of household's main residence	55,070	119,920	242,528	47%	46%	49%
Value of other real estate property	12,037	42,883	122,505	6%	8%	12%
Value of household's vehicles	2,018	6,826	14,343	8%	10%	7%
Valuables	1,147	4,324	7,959	6%	5%	2%
Value of self-employment businesses	4,289	23,536	80,423	2%	3%	4%
Total real assets 1 (incl. business wealth, vehicles and valuables)	**74,561**	**197,488**	**467,758**	**70%**	**72%**	**74%**
Deposits	6,049	18,511	43,822	23%	19%	13%
Mutual funds, total	853	3,754	12,730	1%	1%	2%
Bonds	255	1,908	5,604	0%	0%	1%
Value of non-self-employment private business	44	1,970	9,429	0%	0%	0%
Shares, publicly traded	433	2,911	11,068	0%	0%	1%
Managed accounts	32	307	1,212	0%	0%	0%
Money owed to households	549	1,043	2,042	2%	1%	1%
Other assets	141	1,006	3,055	0%	0%	1%
Voluntary pension/whole life insurance	1,660	10,108	32,069	4%	5%	7%
Total financial assets 1 (excl. public and occupational pension plans)	**10,018**	**41,517**	**121,031**	**30%**	**28%**	**26%**
Total assets 1, excl. public and occupational pension plans	**84,579**	**239,006**	**588,789**	**100%**	**100%**	**100%**
Outstanding balance of HMR mortgages	3,096	17,647	46,785	3%	7%	13%
Outstanding balance of mortgages on other properties	810	5,262	17,435	0%	1%	2%
Outstanding balance of mortgage debt	3,906	22,888	64,122	3%	9%	15%
Outstanding balance of other, non-mortgage debt	1,069	3,774	7,846	380%	308%	9%
Total outstanding balance of household's liabilities	**4,974**	**26,650**	**71,913**	**384%**	**316%**	**25%**
Net wealth	**79,588**	**211,796**	**514,576**	**-284%**	**-216%**	**75%**

* Total Gross Income (TGI)

3.1.2 Balance sheet of low-income households

Since the focus of this research is about the low-income households, and because the house is the main assets of the households in the portfolio, we divide this group into three sections; total, homeowners, and renters.[1]

Table 3-2 shows that the total real assets of the low-income homeowners are 93% of the total assets and only 7% of the assets is related to the financial assets. However, the results for the low-income renters is different, they have 38% of their assets as real assets and 62% of their assets as financial assets. Once again, the main asset in the portfolio of the low-income homeowner is houses, which is 82% of the total assets and for the low-income renters, the main asset is their deposit, which is 48% of the total asset.

It is worth mentioning that the low-income homeowners have only 5% of their assets as a deposit, which shows that they have a very illiquid assets in the portfolio.

[1] The total is related to the average low-income households as Table 3-1 shows.

Table 3-2- Balance sheet of low-income households

	Balance Sheet (€) Low income EU Homeowner Vs Renter*			Balance Sheet (%TA) Low income EU Homeowner Vs Renter		
	Total	**Homeowner**	**Renter**	**Total**	**Homeowner**	**Renter**
Value of household's main residence	55,070	98,498	0	47%	82%	0%
Value of other real estate property	12,037	15,686	7,221	6%	6%	5%
Value of household's vehicles	2,018	2,584	1,247	8%	2%	15%
Valuables	1,147	1,159	1,200	6%	1%	15%
Value of self-employment businesses	4,289	6,398	1,296	2%	2%	2%
Total real assets 1 (incl. business wealth, vehicles and valuables)	**74,561**	**124,326**	**10,964**	**70%**	**93%**	**38%**
Deposits	6,049	7,339	4,445	23%	5%	48%
Mutual funds, total	853	1,006	826	1%	0%	1%
Bonds	255	416	53	0%	0%	0%
Value of non-self-employment private business	44	69	4	0%	0%	0%
Shares, publicly traded	433	659	217	0%	0%	1%
Managed accounts	32	56	5	0%	0%	0%
Money owed to households	549	529	312	2%	0%	5%
Other assets	141	104	255	0%	0%	0%
Voluntary pension/whole life insurance	1,660	1,808	1,725	4%	1%	7%
Total financial assets 1 (excl. public and occupational pension plans)	**10,018**	**11,987**	**7,841**	**30%**	**7%**	**62%**
Total assets 1, excl. public and occupational pension plans	**84,579**	**136,312**	**18,805**	**100%**	**100%**	**100%**
Outstanding balance of HMR mortgages	3,096	5,459	0	3%	5%	0%
Outstanding balance of mortgages on other properties	810	982	632	0%	0%	1%
Outstanding balance of mortgage debt	3,906	6,441	632	3%	5%	1%
Outstanding balance of other, non-mortgage debt	1,069	935	1,287	380%	4%	1086%
Total outstanding balance of household's liabilities	**4,974**	**7,376**	**1,919**	**384%**	**9%**	**1087%**
Net wealth	**79,588**	**128,906**	**16,886**	**-284%**	**91%**	**-987%**

* Number of Households in each category: Total Observations (20,166), Homeowners (13,323) and Renter (4,110)

3.1.3 Cashflow statement

The cash flow statement of households is divided into two parts; cash inflows and cash outflows. The cash inflows include the employee income, Self-employment income, Income from pensions, Regular social transfers (except pensions), Income from regular private transfers, gross rental income from real estate property, gross income from financial investments, gross income from private business other than self-employment and gross income from other sources.[2]

The cash outflows is equal to the total expenses of the households which include the Payments for mortgages (flow), Payments for non- collateralized debt (flow), Payments for household's total debt (flow), amount of rent paid for partially owned household main residence, amount paid as rent, monthly leasing payments, amount spent on food at home, amount spent on food outside home, amount given as private transfers, amount spent on utilities and amount spent on consumer goods and services.

Table 3-3 shows the cash flow statements for low-income households, high-income households and in the aggregated level based on euros and based on the percentage of total gross income. For example, this table shows that in the aggregate level, 48% of total cash inflows is related to the employee income. However, this number for the low-income households is 25% and for the high-income households is 66%. Table 3-3 also shows that the main expenditure cost of households in the aggregated level is related to the amount spent on utilities, which is 124% of total gross income of households.

The net decrease of cash flow for low-income households is -14,375% of the gross income, while this is by far different for high-income households, which is 51% of the gross income.

[2] ECB has reported only gross amount. We have reported the same numbers here. However, for calculation of buffer we have converted all of them to net amount by using relevant tax rate.

Table 3-3- Cash flow statements

	Cash Flow Statement (€) EU Households based on Level of TGI			Comparative Cash flow (% of TGI) of EU Households based on TGI		
	Q1	Aggregate	Q4	Q1	Aggregate	Q4
Cash inflows						
Employee income	2,335	20,931	59,024	25%	48%	66%
Self-employment income	405	3,792	13,718	7%	7%	11%
Income from pensions	3,882	8,205	11,489	47%	32%	14%
Regular social transfers (except pensions)	1,151	1,720	2,066	14%	8%	3%
income from regular private transfers	181	181	148	3%	1%	0%
gross rental income from real estate property	15	835	3,159	0%	1%	3%
gross income from financial investments	110	874	3,038	2%	2%	3%
gross income from private business other than self-employment	5	65	291	0%	0%	0%
gross income from other sources	58	362	1,401	1%	1%	1%
Total household gross income	**8,140**	**36,964**	**94,333**	**100%**	**100%**	**100%**
Payments for mortgages (flow)	342	1,949	5,389	6%	5%	6%
Payments for non-collateralized debt (flow)	201	686	1,360	12%	4%	2%
Payments for household's total debt (flow)	541	2,586	6,598	18%	9%	7%
amount of rent paid for partially owned household main residence	11	8	9	0%	0%	0%
amount paid as rent	1,186	1,585	1,451	104%	28%	2%
monthly leasing payments	21	91	277	1%	0%	0%
amount spent on food at home	2,915	4,694	6,893	431%	108%	8%
amount spent on food outside home	390	925	1,860	58%	15%	2%
amount given as private transfers	125	355	938	15%	4%	1%
amount spent on utilities*	2,337	3,049	4,057	519%	124%	5%
amount spent on consumer goods and services	5,259	11,030	19,144	391%	114%	23%
Total Expenses**	**12,785**	**24,324**	**41,227**	**1537%**	**402%**	**49%**
Net Increase/Decrease in Cash	**(4,645)**	**12,640**	**53,106**	**-1437%**	**-302%**	**51%**

* This item includes electricity, water, gas, telephone, internet and television.

** From accounting perspective this item includes both expenses and expenditures, however, for referring purposes we use the term “expenses” and “expenditure” interchangeably.

3.1.4 Cashflow statement of low-income households

As before, we divide the low-income households into three parts, total, the homeowners and renters. Table 3-4 shows that the main cash inflows of the low-income homeowners are related to the income from pensions, which is around 57% of their total gross income. However, the main cash inflows of the low-income renters are related to the regular social transfer, which is around 31% of the total gross income.

From the cash outflows section of Table 3-4, we argue that the maximum expenditure of the low-income homeowners is related to the utility cost, which is around 858% of their gross income. However, the low-income renters, spent the maximum of their gross income on consumer goods and services, which is around 493% of their gross income. All in all, the total expenditure of the low-income homeowner is 1,776% of their total gross income and for the low-income renters, the total expenditure is around 1,270% of the gross income, which far from their total cash inflows fr both two groups. For this reason, the total net cash flows for low-income households in two groups are enormously negative.

It is worth mentioning that although the ratio of net decrease in cash flow to total gross income is relatively similar for homeowner and renter, in terms of absolute number the net decrease in cash flow for homeowner is EUR 3,619 which is far from EUR 7,045 for renter. This means the latter group of low-income households are more vulnerable to financial shocks.

Table 3-4- Cashflow statement of low-income households

	Cash Flow Statement (€) Low Income EU Households			Cash Flow Statement (% of TGI) Low Income EU Households		
	Total	**Homeowner**	**Renter**	**Total**	**Homeowner**	**Renter**
Cash inflows						
Employee income	2,335	2,264	2,467	25%	22%	29%
Self-employment income	405	491	244	7%	9%	4%
Income from pensions	3,882	4,627	2,569	47%	57%	28%
Regular social transfers (except pensions)	1,151	538	2,465	14%	7%	31%
income from regular private transfers	181	92	337	3%	2%	5%
gross rental income from real estate property	15	40	4	0%	0%	0%
gross income from financial investments	110	137	79	2%	2%	2%
gross income from private business other than self-employment	5	9	1	0%	0%	0%
gross income from other sources	58	39	74	1%	1%	2%
Total household gross income	8,140	8,236	8,238	100%	100%	100%
Payments for mortgages (flow)	342	555	64	6%	10%	1%
Payments for non- collateralized debt (flow)	201	198	200	12%	7%	25%
Payments for household's total debt (flow)	541	749	264	18%	17%	26%
amount of rent paid for partially owned household main residence	11	0	0	0%	0%	0%
amount paid as rent	1,186	0	3,736	104%	0%	332%
monthly leasing payments	21	22	21	1%	1%	0%
amount spent on food at home	2,915	3,000	2,854	431%	586%	233%
amount spent on food outside home	390	326	500	58%	55%	61%
amount given as private transfers	125	117	156	15%	3%	17%
amount spent on utilities	2,337	2,645	1,862	519%	858%	108%
amount spent on consumer goods and services	5,259	4,997	5,892	391%	257%	493%
Total Expenses	**12,785**	**11,855**	**15,283**	**1537%**	**1776%**	**1270%**
Net Increase/Decrease in Cash	**(4,645)**	**(3,619)**	**(7,045)**	**-1437%**	**-1676%**	**-1170%**

3.2 Financial statements of households per country

Previous tables show the results of the household's financial statements in the whole Europe on average, in this section, we discuss the most important items per country with more details.

3.2.1 Houses

Housing is an asset class of dominant importance for middle-class homeowners and some low-income households. But houses are illiquid assets, so homeowners find it costly to adjust their consumption of housing services in response to economic shocks. An increase in house prices may lead to an increase in consumption not because of a wealth effect, but because it allows borrowing constrained homeowners to smooth consumption over the life cycle (Ortalo-Magne´ and Rady, 2006; Lustig and Van Nieuwerburgh, 2006).

On the other hand, if we define financial wealth as the sum of liquid financial assets and the value of real estate minus debt outstanding, an increase in house prices leads to an increase in homeowners' financial wealth. But this does not necessarily mean that their real wealth is also higher. For example, over the last decade, the real estate price in Europe has boosted and any correction in the house prices, lead European homeowner to enter to the phase of debt boosting. At the end of this wave, when real estate prices start to decrease, they will face with reduction in their real estate prices while their level of debt remains unchanged. This represents a restructuring of the balance sheet because liability is still remaining high and the value of asset decreases

We summarize the value of houses for low-income and high-income households in Figure 3-1 and Figure 3-2 in each country. Figure 3-1 compares the value of houses in euro between low-income versus high-income households and Figure 3-2 shows the same statistics based on the percentage of total assets of households.

Figure 3-2 shows that in some countries like Cyprus, Estonia, Malta and Slovenia, the percentage of the value of houses as total assets of households is quite similar between low-income households and high-income households and even in several countries like Spain, Greece, Hungry, Latvia, Poland and Slovakia the low-income households have higher percentage of the house value as total assets than high-income households.

To compare each country with the whole Europe, Figure 3-2 shows that the percentage of the value of houses as the total assets of low-income households in some countries like Austria, Belgium, Germany, Finland, France, Italy, Luxembourg and Netherlands is lower than the average of the whole Europe and some other countries like Cyprus, Estonia, Spain, Greece, Hungry, Ireland, Latvia, Malta, Poland, Portugal, Slovenia and Slovakia this percentage is higher than the whole Europe. This figure also illustrates that the minimum percentage of the value of houses as the total assets of low-income households is related to Germany and the maximum belongs to Slovakia.

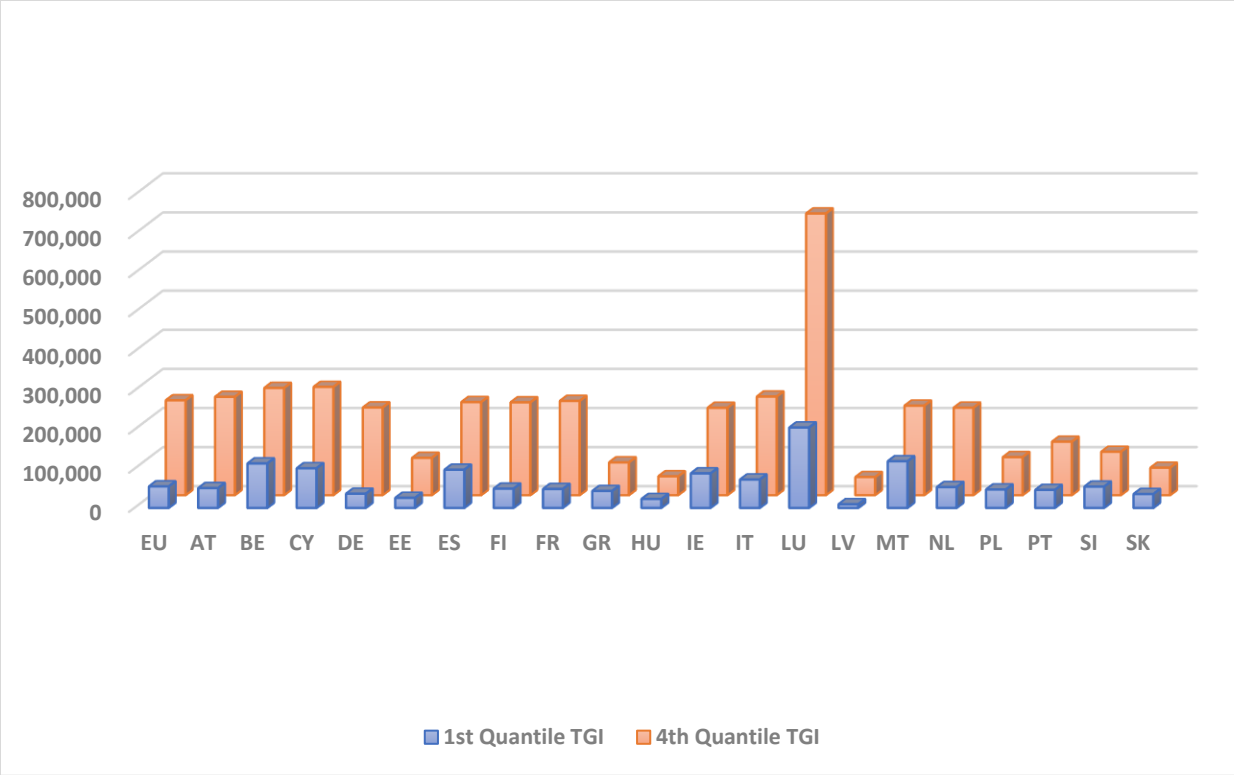

Figure 3-1- Value of household's main residence (euro)

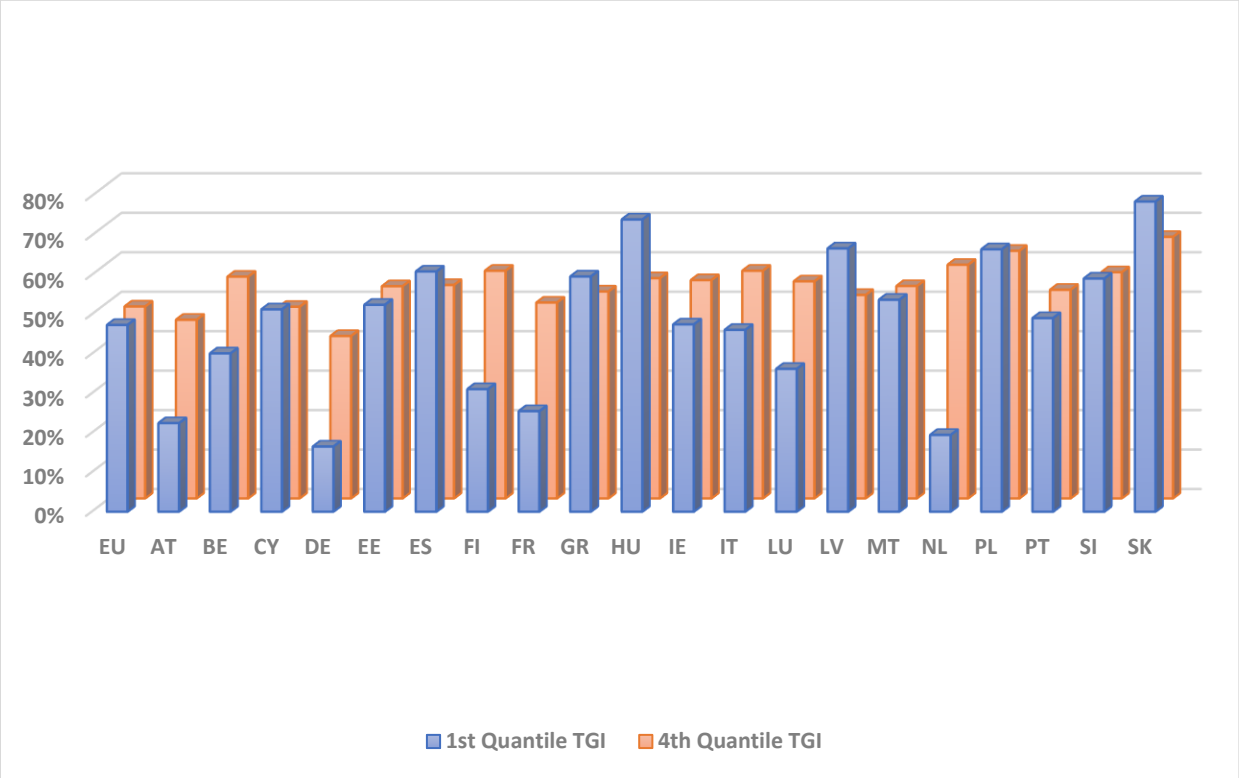

Figure 3-2- Value od household's main residence as percentage of the total assets

3.2.2 Financial assets

Financial assets are divided into only three broad categories corresponding roughly to cash, bonds, and stocks (Mankiw and Zeldes 1991, Banks, Blundell, and Smith 2005).[3]

According to the IMF report (2005) household financial assets over the last several decades have shifted away from bank and savings deposits to more market sensitive assets in most countries. The report shows that the bank deposits represented close to 60 percent of German household financial assets until the beginning of the 1980s. The deposit share moved below 48 percent at the beginning of the 1990s and has stabilized around 33 percent since 1999. In France, savings accounts and bank deposits in 2003 represented about 30 percent of household financial assets, down from about 60 percent in the early 1980s.

Non-listed equities represent a large proportion of total equity holdings in some countries. Non-listed equities are estimated to represent about 50 percent of all equity holdings in the United States, and more than 66 percent in France (estimates based on flow of funds and national accounts data).

Based on our sample, we summarize the total financial assets of the households for low-income and high-income households in Figure 3-3 in each country. More specifically, Figure 3-4 shows the value of the household's deposits for two groups in each country. Figure 3-5 shows that except for the Hungry, in other European countries, the financial assets of low-income households as their total assets is higher than the high-income households. This can be because of the low-income renters keep more deposits than other households or because of lower value of house in their portfolio of assets.

Moreover, to compare the results within Europe, Figure 3-3 shows that the percentage of total financial assets as the total assets of low-income households in some countries like Cyprus, Spain, France, Greece, Hungry, Ireland, Italy, Latvia, Poland, Slovenia and Slovakia is lower than the average of the whole Europe and in some other countries like Austria, BE, Germany, Estonia, Finland, Luxembourg, Malta, Netherlands and Portugal this percentage is higher than the whole

[3] Campbell (2006) shows that the median American household has financial assets of only $35,000, net worth of $86,000, and total assets of $135,000.

Europe. This figure also illustrates that the minimum percentage of total financial assets as the total assets of low-income households is related to Slovakia (12%) and the maximum belongs to Germany (67%).

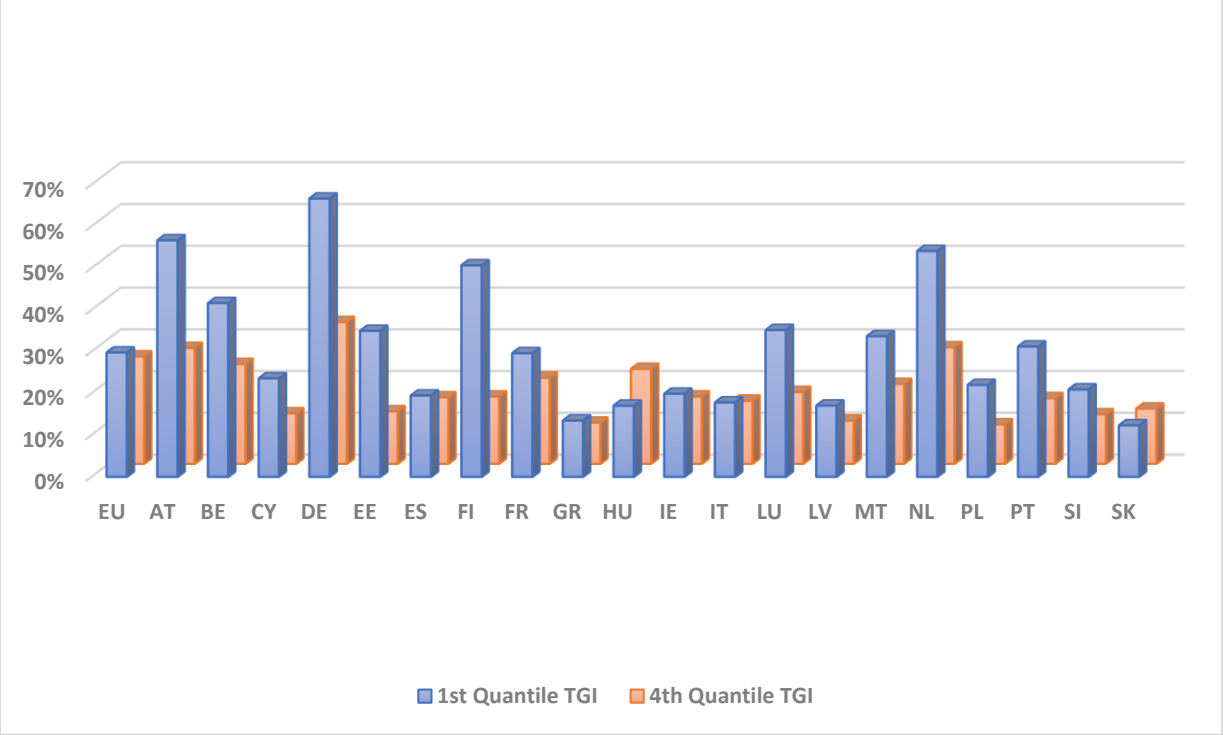

Figure 3-3- Financial Assets as a percentage of the total assets

According to the value of household's deposit, Figure 3-5 also reports that the percentage of deposit as the total assets of low-income households in some countries like Cyprus, Spain, Greece, Hungry, Ireland, Italy, Latvia, Poland, Slovenia and Slovakia is lower than the average of the whole Europe and in some other countries like Austria, Belgium , Germany, Estonia, Finland, France, Luxembourg, Malta, Netherlands and Portugal this percentage is higher than the whole Europe. This figure also illustrates that the minimum percentage of percentage of deposit as the total assets of low-income households is related to Slovakia (11%) and the maximum belongs to Austria (51%).

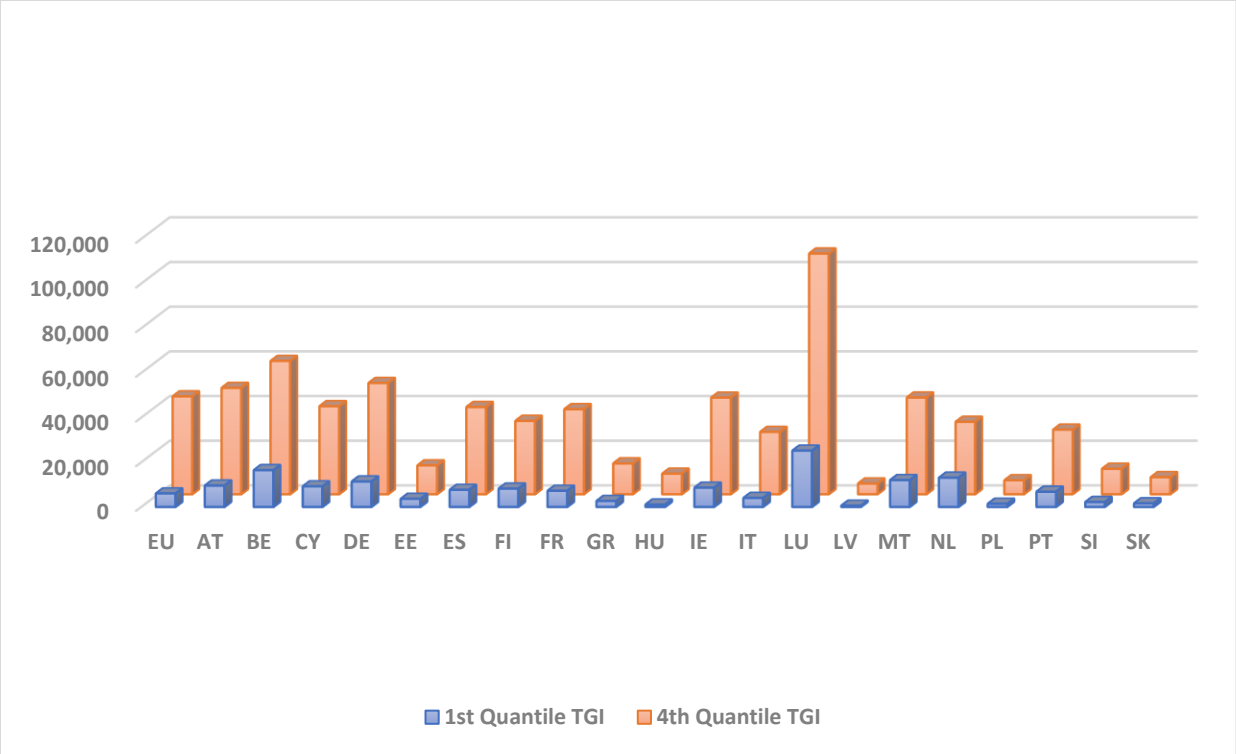

Figure 3-4- Value of household's Deposits (euro)

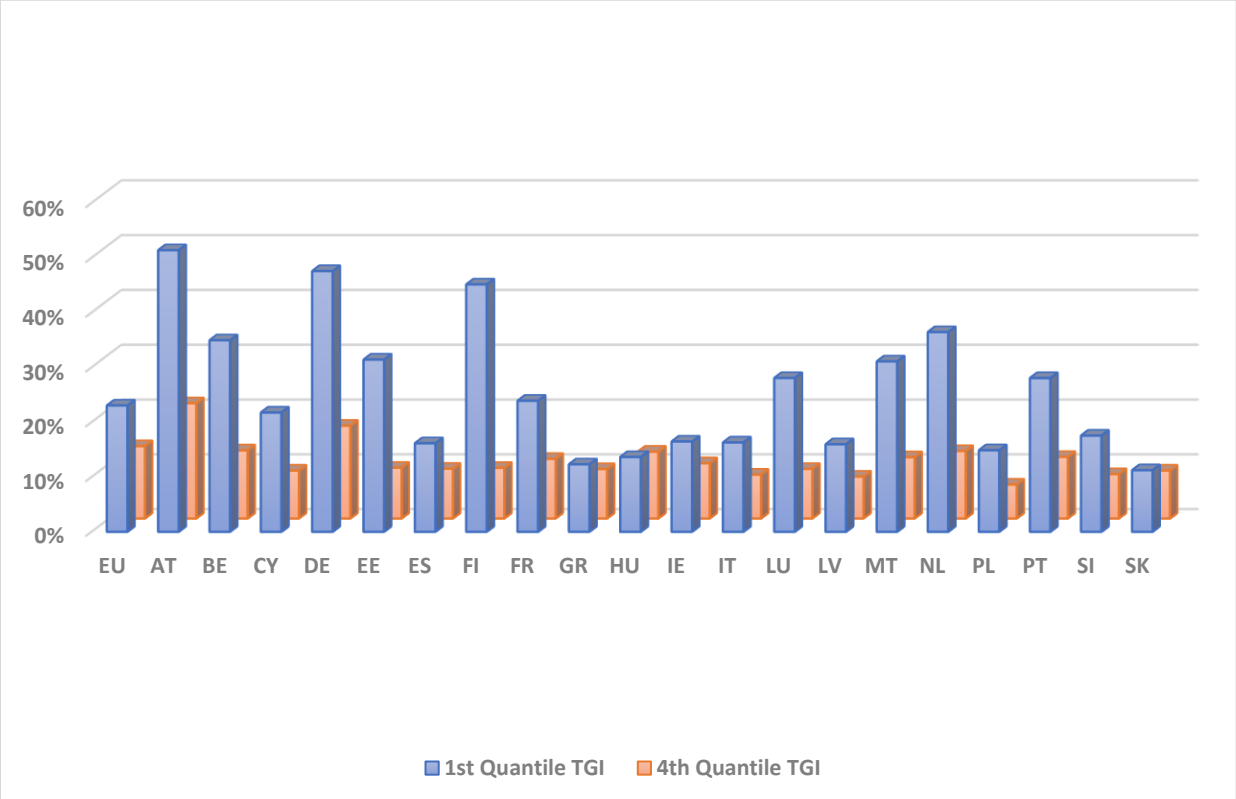

Figure 3-5- Value of household's Deposits as a percentage of total assets

3.2.3 Cash inflows (Income)

There is a debate in the literature about the risk properties of labor income. Some literature find that labor income is similar to an implicit holding of safe assets (Cocco, Gomes, and Maenhout 2005); others argue that the volatility of idiosyncratic labor income risk covaries negatively with stock returns (Storesletten, Telmer, and Yaron 2004), in which case labor income crowds out stock market investments.

The main items of the household cash inflows are the labor income and income form pensions. Figure 3-6 shows employee income in different countries in Europe for low-income households versus high-income households in euro. Figure 3-7 shows the income from pensions for these two groups in different countries in euro and Figure 3-8 shows the income from pensions of households based on their total gross income. From these figures, we argue that low income households are highly dependent on this source of income.

With regard to the employee income, the percentage of employee income as the total gross income of low-income households in some countries like Austria, Belgium , Cyprus, Germany, Estonia, Spain, Finland, France, Greece, Hungry, Ireland, Latvia, Malta, Netherlands, Poland, Portugal, Slovenia and Slovakia is lower than the average of the whole Europe and only in two countries; Italy and Luxembourg this percentage is higher than the whole Europe. The minimum percentage of employee income as the total gross income of low-income households is related to Slovenia (3%) and the maximum belongs to Luxemburg (48%).

On the other hand, according to income from pension, Figure 3-8 shows that the percentage of income from pensions as the total gross income of low-income households in some countries like Cyprus, Germany, France, Ireland, Luxembourg and Netherlands is lower than the average of the whole Europe and in some other countries like Austria, Belgium , Estonia, Spain, Finland, Greece, Hungry, Italy, Latvia, Malta, Poland, Portugal, SY and Slovakia. this percentage is higher than the whole Europe. The minimum percentage of income from pensions as the total gross income of low-income households is related to Luxemburg (35%) and the maximum belongs to Estonia (74%).

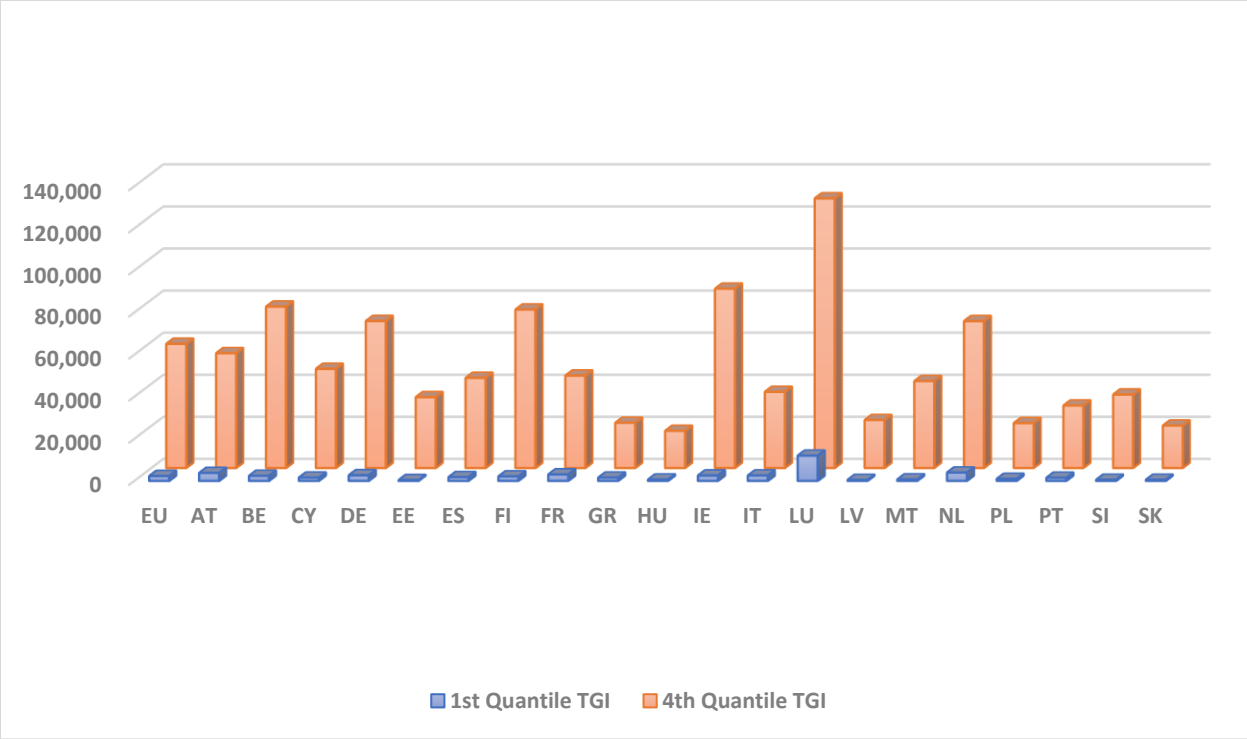

Figure 3-6- Employee income(euro)

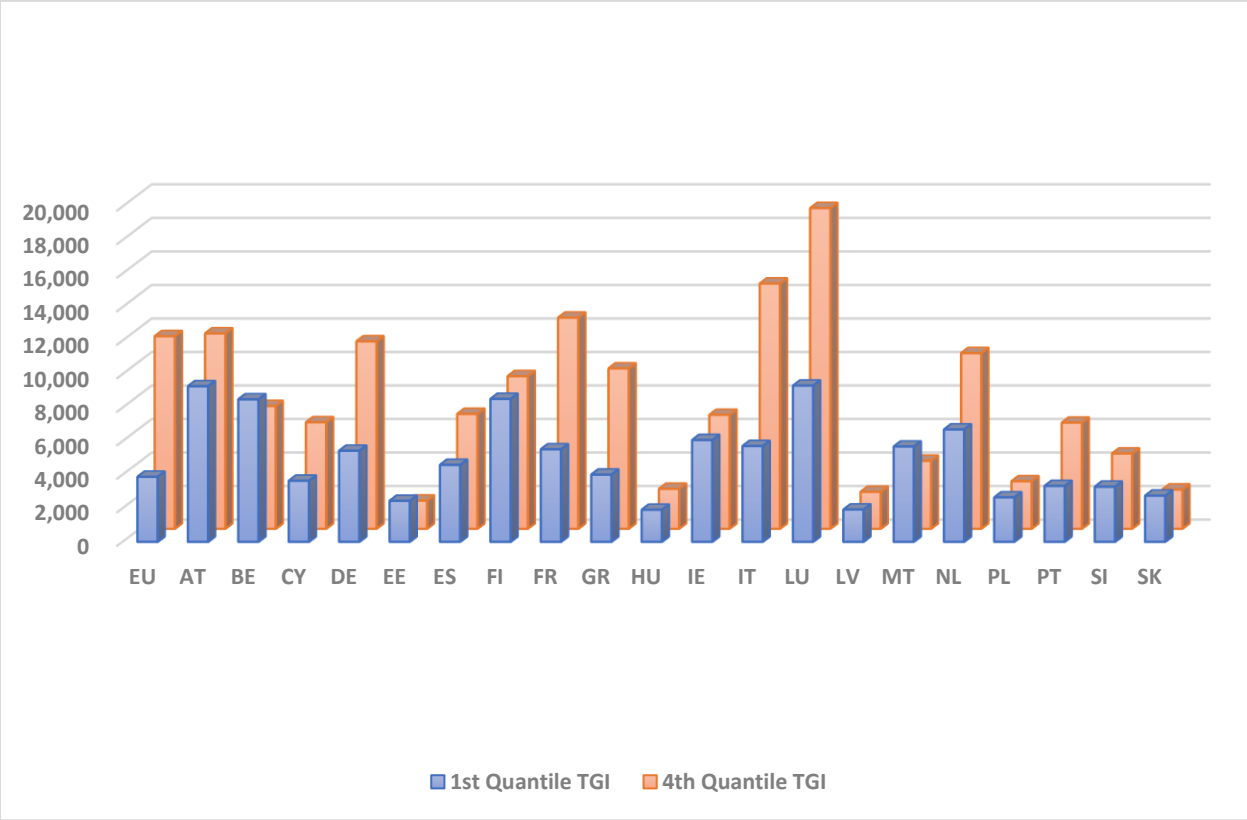

Figure 3-7- Income from pensions (euro)

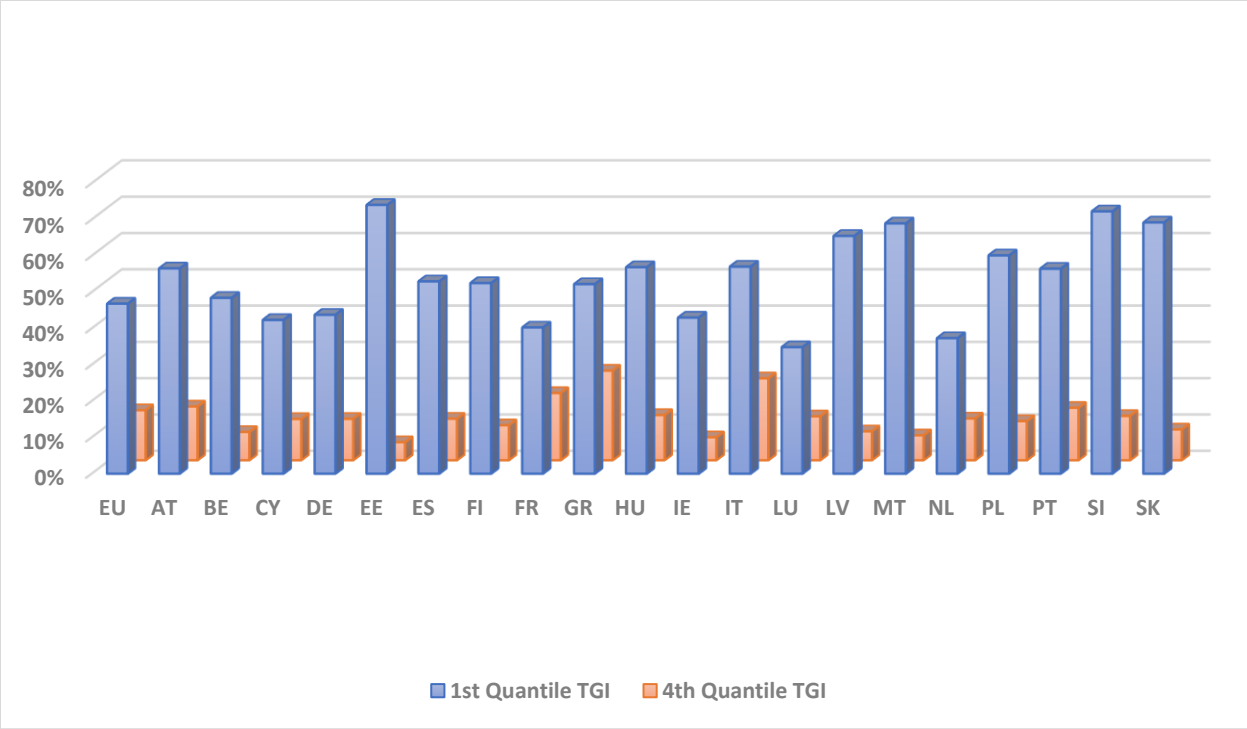

Figure 3-8- Income from pensions as percentage of total gross income

3.2.4 Cash outflows (Consumption)

The household outflows are related to the amount of final consumption expenditure made by households to meet their everyday needs, such as food, clothing, housing (rent), energy, transport, durable goods (notably cars), health costs, leisure, and miscellaneous services. Figure 3-9 shows the payment for the mortgages in euro for low-income and high-income households in different countries. Figure 3-10 shows the same statistics as Figure 3-9 but based on the total gross income of households. Figure 3-11 shows the rent for these two groups and Figure 3-12 shows the expenditure of households on consumer goods.

Finally, Figure 3-13 shows the last 12-month[4] expenses of low-income households in comparison with their income. We divide all low-income households based on their expenses in comparison to their income into three classes ; households with expenses greater than their income, households with expenses about the same as their income and households with expenses less than their income. The main finding is that except for France and Luxembourg, the main part of low-income

[4] Last 12 months before interview date. For full description of interview data please see the appendix

households in Europe could not have any saving or even they have negative saving during year. This means they could not rely on internal resources for covering unexpected shocks to their costs or income.

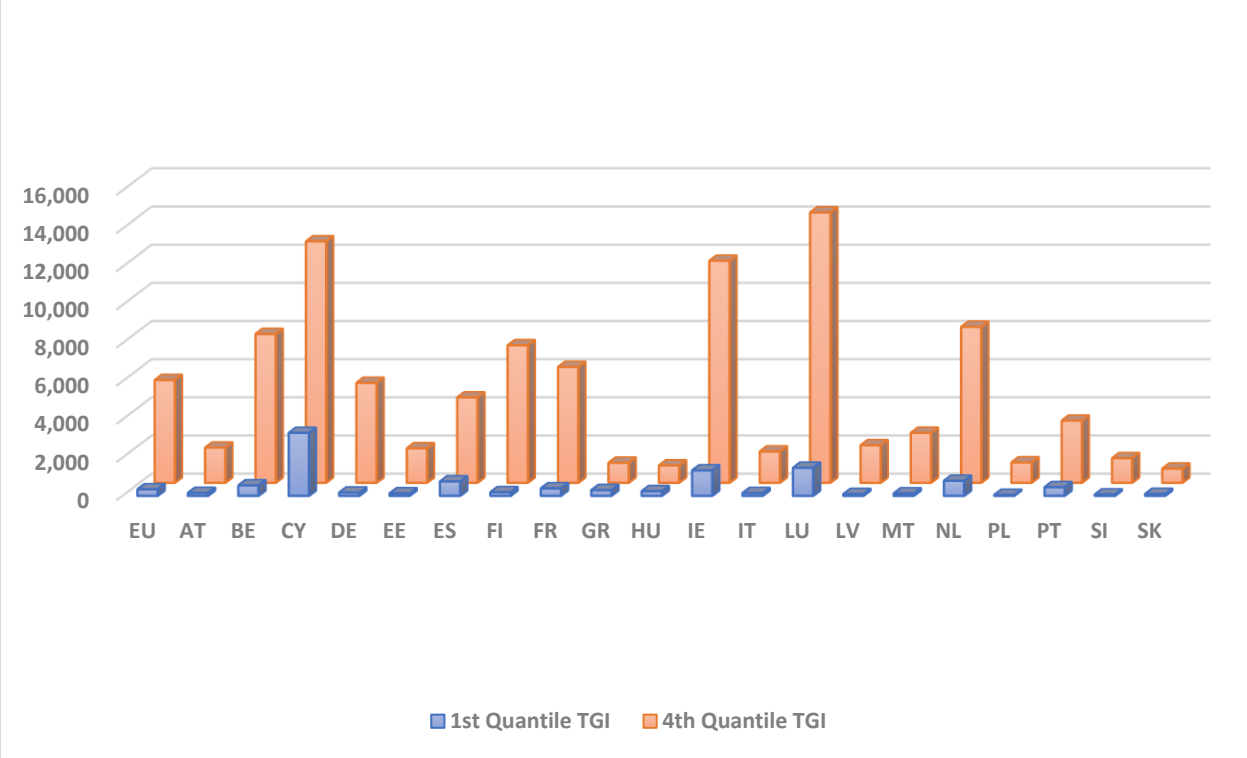

Figure 3-9- Payments for mortgages (flow)(euro)

According to the mortgage payment, Figure 3-11 shows that the percentage of mortgage payment as the total gross income of low-income households in some countries like Austria, Belgium, Germany, Estonia, Finland, France, Ireland, Italy, Malta, Poland, Slovenia and Slovakia is lower than the average of the whole Europe and in some other countries; Cyprus, Spain, Greece, Hungry, Luxembourg, Latvia, Netherlands and Portugal this percentage is higher than the whole Europe. The minimum percentage of mortgage payment as the total gross income of low-income households is related to Germany (~ 0%) and the maximum belongs to Cyprus (151%).

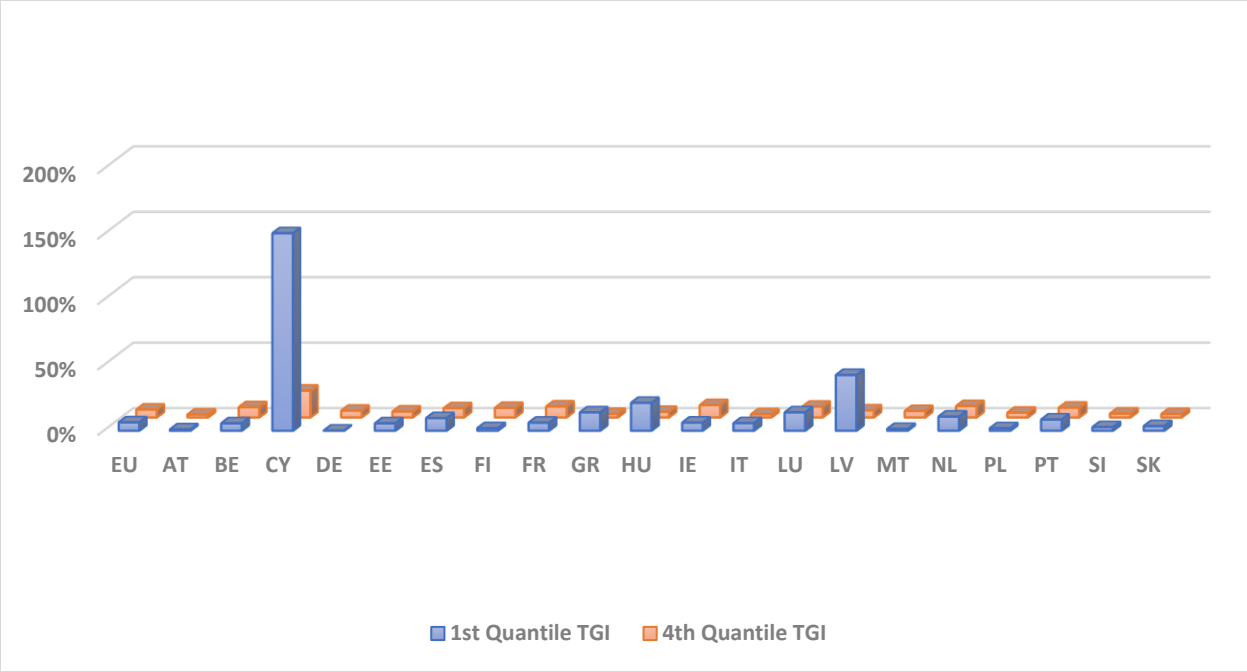

Figure 3-10- Payments for mortgages (flow) as percentage of total gross income

With respect to the rent, Figure 3-11 shows that the percentage of rent as the total gross income of low-income households in some countries like : Austria, Cyprus, Germany, Estonia, Spain, Finland, Greece, Hungry, Ireland, Luxembourg, Latvia, Malta, Netherlands, Poland, Portugal, Slovenia and Slovakia is lower than the average of the whole Europe and in some other countries; Belgium, France and Italy. this percentage is higher than the whole Europe. The minimum percentage of rent as the gross income of low-income households is related to Latvia (1%) and the maximum belongs to France (259%).

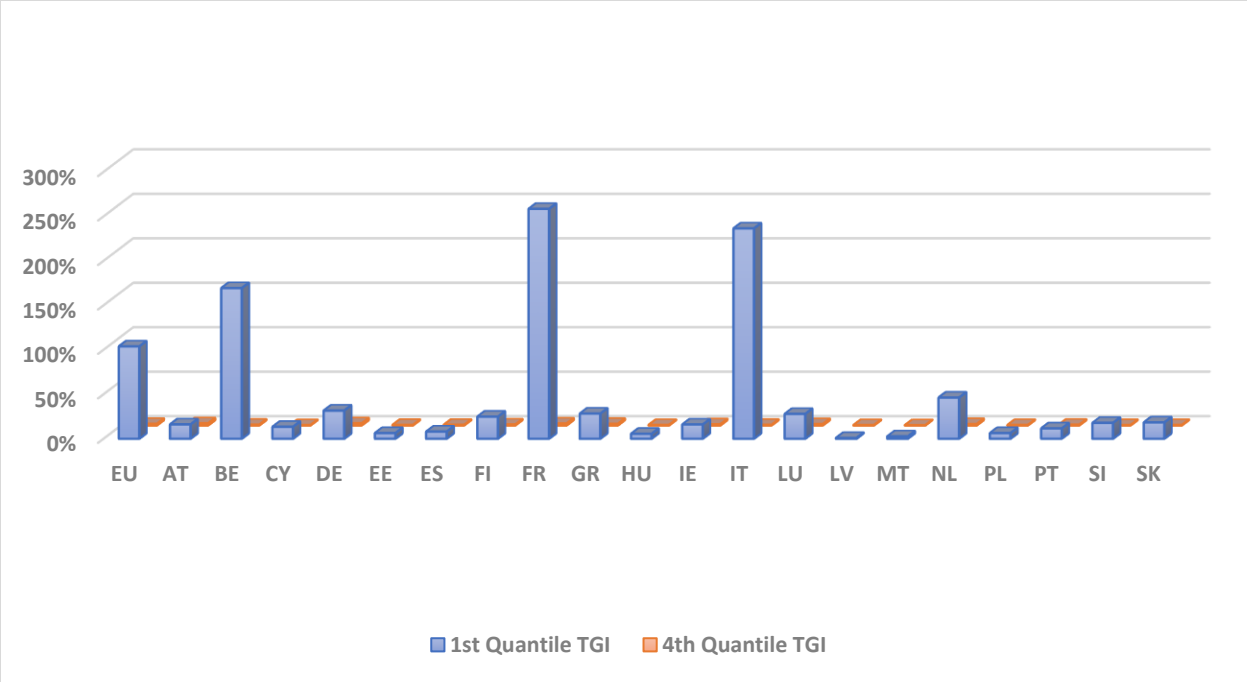

Figure 3-11- rent as percentage of total gross income

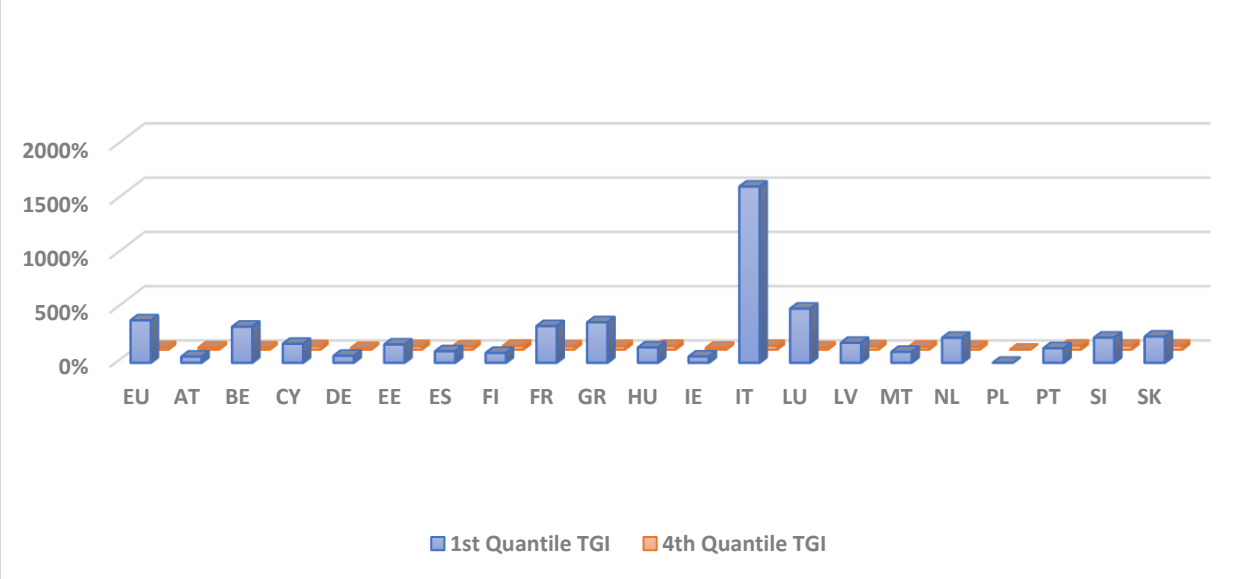

Figure 3-12- Amount Spend on Consumer Goods as percentage of total gross income

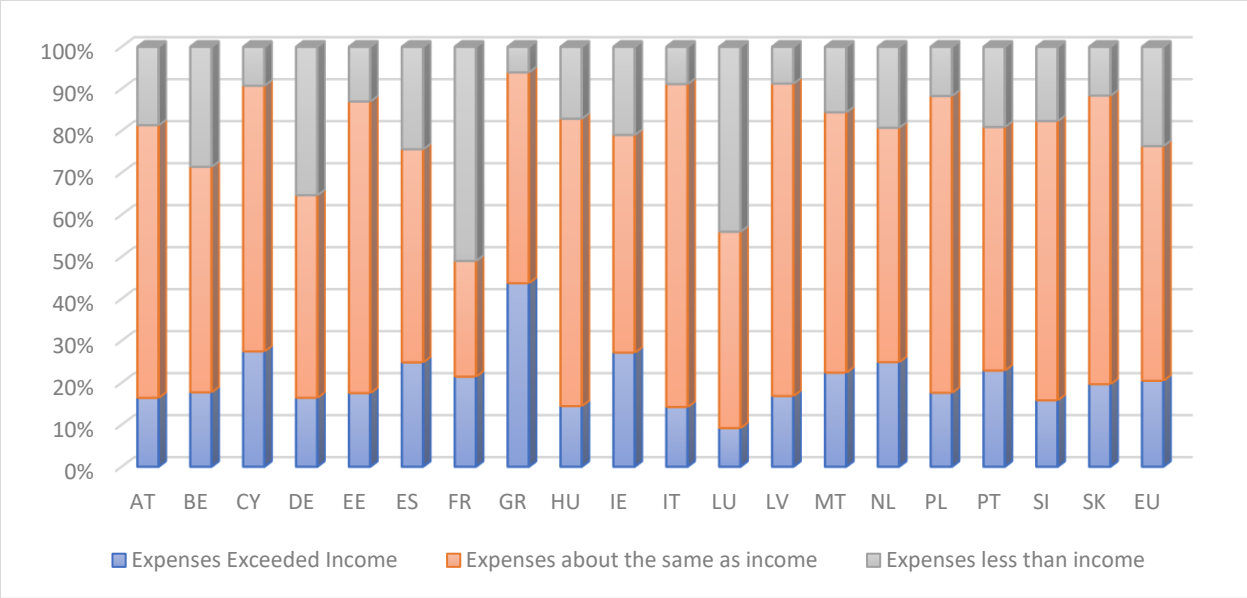

Figure 3-13- Last 12 Months Expenses compare to Total Income for 1st Quartile of households

All in all, the previous figures show that on average 20% of low-income households in our sample have negative saving and around 56% of them have their income almost equal to their expenses. Therefore, in total we can argue that around **76%** of low-income European households do not have any financial buffer to be safe against any unexpected financial shocks to the income or to the assets. The worst situation is in Greece, where 44% of households have reported their incomes is not even enough to cover their costs.

3.2.5 Debt and Mortgage

Household debt in most advanced economies has increased significantly since the 1980s and accelerated in the years before the Great Recession that started in 2007-2008. In fact, since 2000, rapid debt growth has allowed consumption to grow faster than income.

Prinsloo (2002) finds that the growing popularity of mortgage debt can be attributed to an increase in the use of mortgage equity withdrawals, facilitated by the more flexible mortgage advance procedures created by the banks. Besides this, the financial deregulation of the early 1980s and low levels of interest rates, both in nominal and real terms, are likely to be drivers of increased household indebtedness (Debelle (2004)). The low-interest rate increased the demand for loans, mainly mortgage loans. Besides, the situation within the housing market, where housing prices were growing at high rates contributed to a further increase in debt. The increase in housing prices leads to more valuable collateral and increases households' net worth, which results in taking on

additional debt and characterizes the upswing of the financial cycle. This could potentially be critical for the economy as a whole, as when the downswing of the financial cycle begins, the balance sheet recession will occur with a prolonged period of deleveraging as households will try to reduce their indebtedness what will lead to low demand and the slow recovery of the economy.

The paper of Simigiannis (2007) examines the distribution of debt in relation to household wealth in Greece and concludes that on average, the level of households' debt increases with the increase of wealth. In line with this, Sugawara and Zalduendo (2011) in the analysis of the Croatian households find that the household debt is concentrated in the hands of few households and mostly in upper-income quintiles, i.e., 14 percent of households in the lowest quintile have debt compared to 47 percent of households in the highest quintile. Furthermore, in comparison of households with and without debt, the former seems to have higher income and expenditure levels, reflecting the concentration of debt among wealthy households. Heads of households among those that have debt are more likely to be educated, highly-skilled, and young.

Figure 3-14 shows the outstanding balance of mortgage debt for low-income and high-income of European households. Figure 3-15 illustrates the same statistics as a percentage of the total assets. This figure shows that the percentage of outstanding balance of mortgage as the total assets of low-income households in some countries like : Austria, Belgium, Germany, Estonia, Finland, France, Italy, Malta, Poland, Slovenia and Slovakia is lower than the average of the whole Europe and in some other countries; Cyprus, Spain, Greece, Hungry, Ireland, Luxembourg, Latvia, Netherlands and Portugal this percentage is higher than the whole Europe. The minimum percentage of outstanding balance of mortgage debt as the total assets of low-income households is related to Poland (1%) and the maximum belongs to Cyprus (15%).

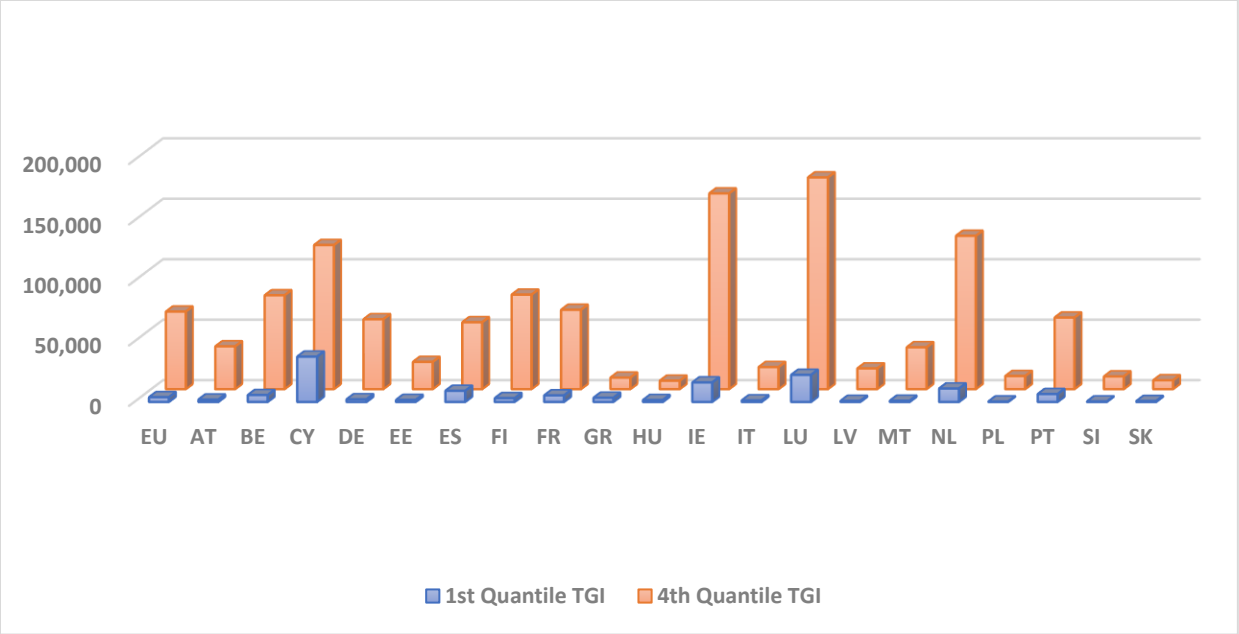

Figure 3-14- Outstanding balance of mortgage debt (euro)

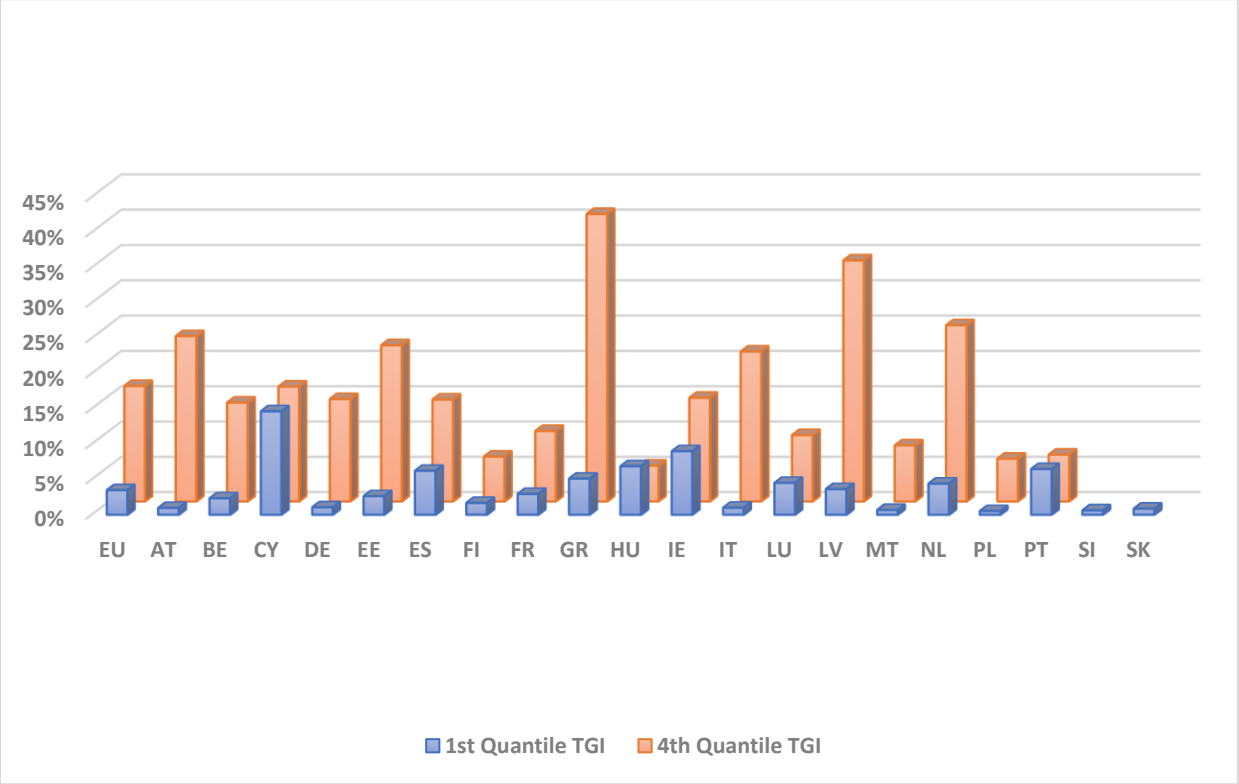

Figure 3-15- Outstanding balance of mortgage debt as percentage of total assets

Moreover, Figure 3-16 and 3-17 show the outstanding balance of non-mortgage debt in euro and as a percentage of the total assets respectively.

Figure 3-17 shows that the percentage of outstanding balance of non-mortgage debt as the total assets of low-income households in some countries like : Spain, France, Greece, Hungry, Ireland, Italy, Latvia, Malta, Netherlands, Poland and Slovakia is lower than the average of the whole Europe and in some other countries; Austria, Belgium, Cyprus, Germany, Estonia, Finland, Luxembourg, Portugal and Slovenia. this percentage is higher than the whole Europe. The minimum percentage of outstanding balance of non-mortgage debt as the total assets of low-income households is related to Malt (3%) and the maximum belongs to Austria (6,966%).

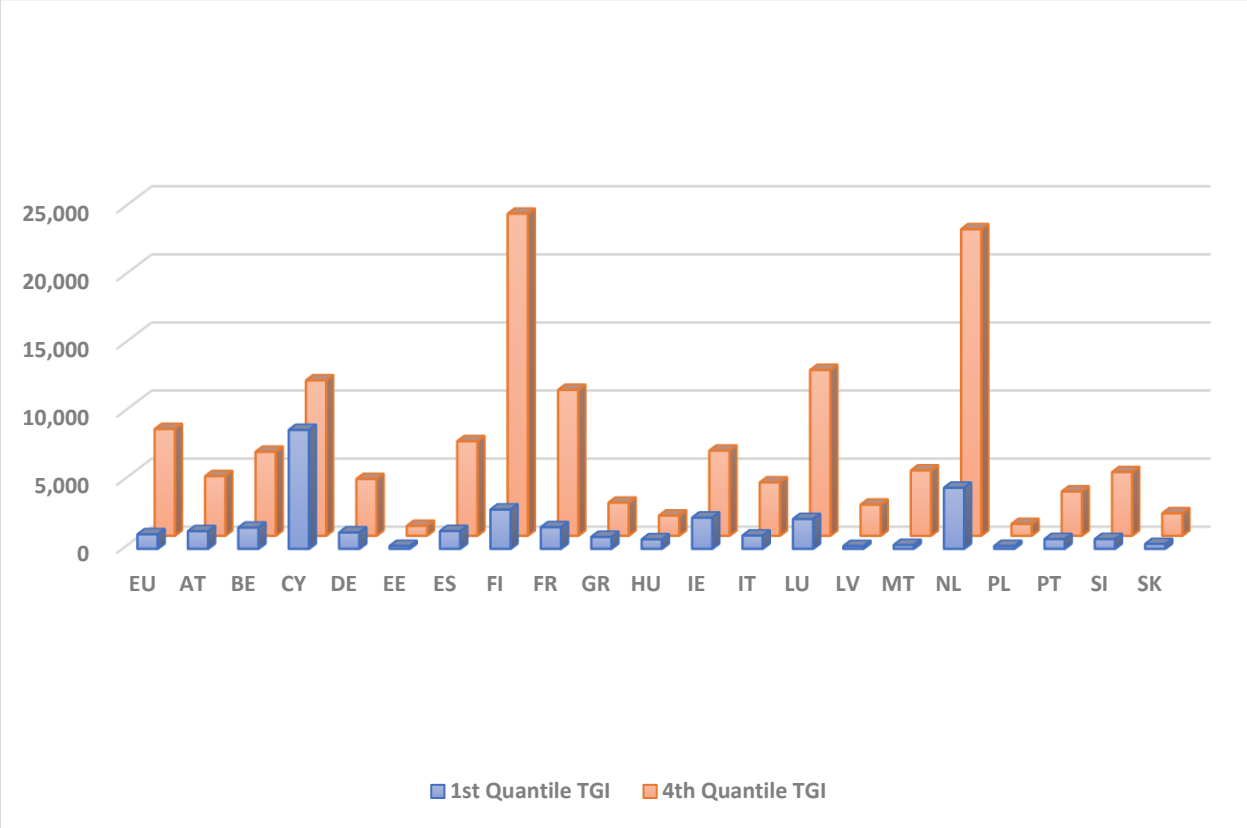

Figure 3-16- Outstanding balance of other, non-mortgage debt (euro)

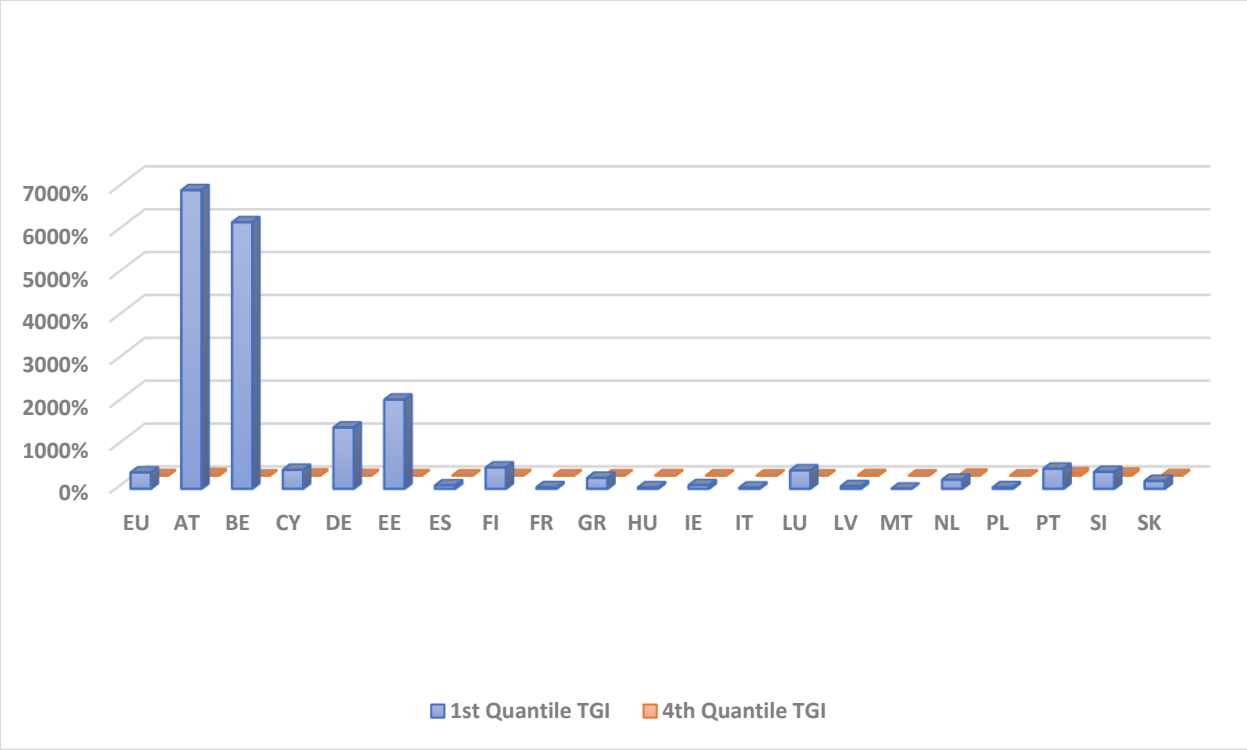

Figure 3-17- Outstanding balance of other, non-mortgage debt as percentage of total assets

3.2.6 The way of financing

The way of financing for households include (i) selling assets (ii) getting a credit card (iii) getting a loan (iv) using the saving account (v) asking financial aid from relative (vi) leaving some bills unpaid and some other methods.

We summarize the ways of financing for low-income households in Figures 3-18 and Figure 3-19. Based on Figure 3-18, except for Belgium, spent out of saving, ask for help from relatives and left some bills unpaid are the main methods used by low-income households to meet their expenses. Methods 2 and 3 can be considered as external financing, which result in higher debt in their balance sheet while method 1 can be considered as internal financing which result in shrinkage of their balance sheets. Considering the fact that most of low-income households do not have any saving, method 4 could not be a stable source of financing for this group and in the long run they do not have any other option except using methods 2 and 3. Excessive use of these two methods will result in accumulation of debt in low income households' balance sheet and more vulnerability to income/cost shocks.

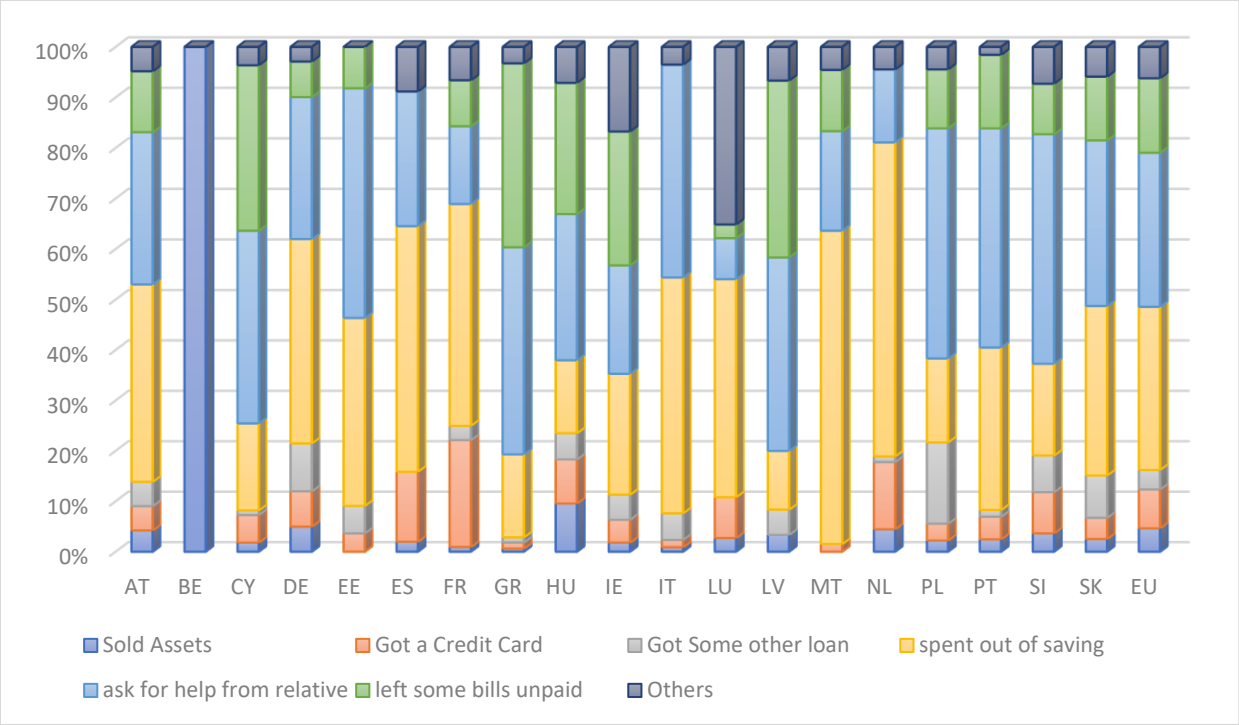

Figure 3-18- Financing Methods to Meet Expenses for 1st Quartile of households

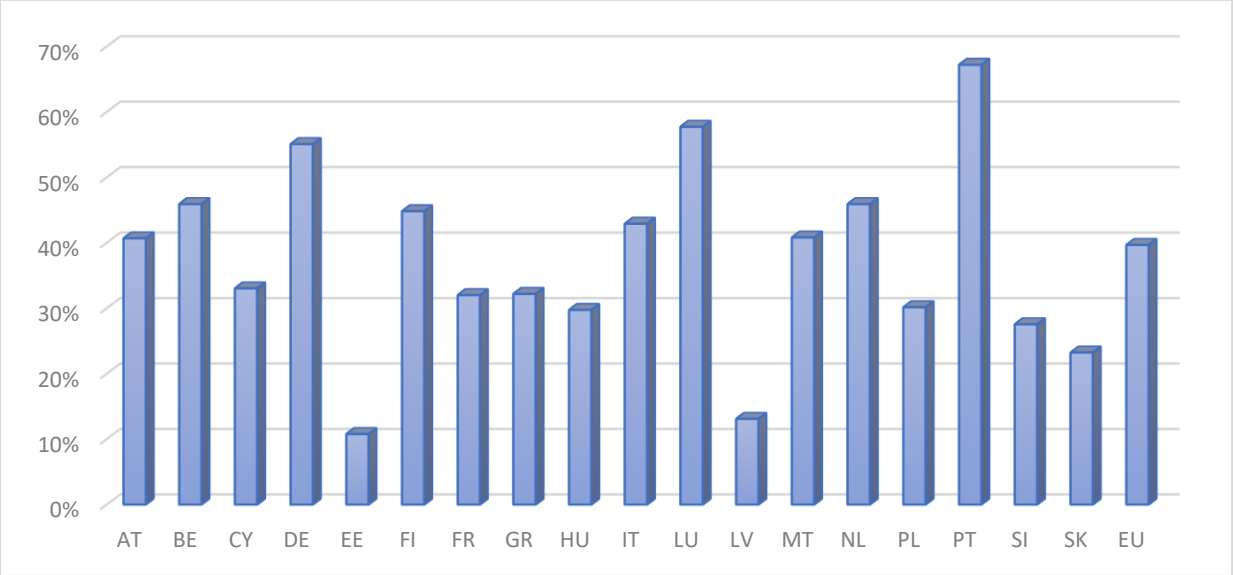

Figure 3-19- Ability to get EUR 5,000 Financial Assistant

4 Methodology

Constructing the balance sheet and cash-flow statement of low-income households in the previous section allows us to apply the risk management theory to the targeted group of households. In this section, we define a financial buffer (as a precautionary saving) for low-income household's budget, which protects them against unexpected shocks to their income and assets.

To calculate the financial buffer of low-income household, we use the Solvency II Capital Requirement (SCR) framework. The aim of choosing this approach is to ensure that low-income households have enough capital available to meet their future requirements under a range of adverse scenarios.

In general, the SCR needs to cover the loss in available capital of 1 in 200-year evet (the 99.5^{th} percentile on a loss distribution) calibrated on a one-year horizon. Next to the SCR, a so-called Minimum Capital Requirement (MCR) will be calculated, which shows the critical threshold below the SCR and represents amount of capital that households needs to cover the loss in available capital of 1 in around 6.5-year (the 85^{th} percentile on a loss distribution). Therefore, low-income households can fall into the following categories based on the status of their available capital, SCR and MCR:

1- Solvent zone: If the available capital of households is greater than SCR.
2- Warning zone: If the available capital of household is in between of SCR and MCR.
3- Insolvent zone: If the available capital of household is lower than MCR.

4.1 Risk Management of Households

Based on the risk management life cycle, in the next sections, we first identify the specific risks that the low-income households are exposed to. Second, we assess and measure the risks identified and finally we show the process of calculation of capital requirement for covering all types of risks.

4.1.1 Risks Identification

Households should be aware of all the material risks that they are exposed to or may be exposed to in future. There are a broad range of risk which may contribute to or threaten the financial status

of low-income households. Without monitoring and active management, these risks may push households to the insolvent zone.

The range of risk varies across households, but as Section 3 suggested based on the balance sheet and income statement of the households, the following risks should be included:

1. Inflation risk: the risk is related to rise of inflation which influences the consumption and spending of low-income households.
2. Property risk: the risk arising from fluctuation of house prices, which volatile the consumption level of low-income households.
3. Interest rate risk: this risk is related to any fluctuation on interest rate of the loan or mortgages that hold by low-income households. Households in countries with predominantly variable-interest rate mortgages suffer (benefit) from higher (lower) interest rates as their portfolios are composed of sticky deposits on the asset side and variable-rate loans on the liability side.
4. Market risk: the risk arising from the value of investments on different assets due to changes in market conditions. For example, this risk can include reducing the value of real assets or financial assets. As Table 3-2 shows, the low-income households have 38% of their assets as real assets and 62% of their assets as financial assets.

4.1.2 Risks Assessment

The risks identified need to be assessed and measured. The methods used vary and depend on the nature of the risk. Solvency II uses a "total balance sheet" approach, which means for every identified risk type, all assets and liabilities are assessed in terms of impact of an applied stress on the balance sheet value. Not all assets and liabilities may react to every stress, in which case the change in value is zero. For example, the real assets of households like gold will not change due to a change income of households.

In this study, based on the adverse scenario analysis, we assess the impact of identified risks in different items of the financial statement of households and then by consolidation of these impacts, we compute the minimum capital requirement as a financial buffer for the low-income households. Therefore, the minimum capital requirement includes individual stresses of various identified risks and correlation assumption in order to aggregate the results of the individual stresses.

In conclude, the minimum capital requirement is enough to ensure that the household remain solvent if, during the next year, an adverse event occurs like unemployment, or financial crisis.

The detailed methodology of SCR and MCR is described as following steps:

a. Constructing the Balance Sheet and Cash Flow Statement of Households.

b. Determining different quantile of Total Gross Income (TGI) for each country. TGI is defined as sum of the following items:
   - Employee income
   - Self-employment income
   - Income from pensions
   - Regular social transfers (except pensions)
   - income from regular private transfers
   - gross rental income from real estate property
   - gross income from financial investments
   - gross income from private business other than self-employment
   - gross income from other sources

c. Categorizing households in different buckets based on the Total Gross Income (TGI) level. Low income households are defined as the households located in the first quantile of TGI while high income households are households in the fourth quantile of income.

d. Composition of Balance sheet and Cash flow statement of low-income households reveals that their main risk factors are related to inflation risk, property risk, interest rate risk, and market risk.

e. Determining proxies for each risk factor as Table 4-1 shows:

Table 4-1 Risk Factors and the proxies

Risk Factor	Proxy	Period
Market risk	Stock price, Stoxx 600 index	2003-2019
Commodity risk	ETF Gold price tracker	2003-2019
Inflation rate	The Harmonized Index of Consumer Prices (HICP) 2015=100	2003-2019
Interest rate risk	Short term treasury- MLEGB	2003-2019
Real estate Price	MLEJRE	2003-2019
Mortgage rate	Euro-denominated loans for house purchase	2003-2019

The source of proxies for the market risk, commodity risk, inflation rate, interest rate risk and real estate price is FactSet and for the Mortgage rate is European Central Bank.

f. Creating adverse scenarios for each risk factors based on the Geometric Brownian Motion (1000 paths for next year equal to 252 working days).

g. Creating adverse scenarios for the employee income and self-employment income by simulation:
Employee income and self-employment income are simulated based on the probability of death for each adult member of household. We assume no reduction or no loss of job during year. To be more precise, we calculate expected number of deaths in 1000 scenario based on mortality table for 2014 for EU28 and then randomly chose some scenarios and set their value to zero.

h. Creating adverse scenarios for expenditure:
    i. For mortgages we have used exactly reported number as payment for next period by households
    ii. For rent, completely or partially, we use mean of each simulated paths for changes in hour prices during a year as adjustment factor
    iii. For spending on food and other cost we have used mean simulated inflation rate for next year as adjustment factor.

i. Converting Scenarios from the Gross income to the Net income:
To calculate the net income, considering that ECB does not report the net incomes, we use the tax rate for the first quintile of income extracted from Eurostat for conversion.

Table 4-2 risk factors and adjustment factor per scenario

Items (Balance Sheet/Cashflow Statement)	**Risk Factor**	**Adjustment Factor per Scenario**
Value of household's main residence	Real estate	EOP*
Value of other real estate property	Real estate	EOP
Valuables	Gold	EOP
Deposits	Short term	EOP
Mutual funds, total	Bond rate Share	EOP
Bonds	Short term Bond rate	EOP
Shares, publicly traded	Share	EOP
Outstanding balance of HMR mortgages	Mortgage	Revaluation
Outstanding balance of mortgages on other properties	Mortgage	Revaluation
Employee income	Mortality rate	Expected Number of Death in 1000 Scenarios
Self-employment income	Mortality rate	Expected Number of Death in 1000 Scenarios
gross rental income from real estate property	Real estate	AOP**
amount of rent paid for partially owned household main residence	Real estate	AOP
amount paid as rent	Real estate	AOP
amount spent on food at home	Inflation	AOP
amount spent on food outside home	Inflation	AOP
amount given as private transfers	Inflation	AOP
amount spent on utilities	Inflation	AOP
amount spent on consumer goods and services	Inflation	AOP

*EOP: End of period simulated path assuming initial value of 100 EUR
** AOP: Mean of simulated Path

j. Computing the effect of each scenarios on the financial statement items and calculating the loss distribution based on the differences between the shocked value of the financial items and their base value (unshocked).

k. For computing the SCR, which is defined as 99.5th percentile of the loss distribution, changes in NAV of each households (Delta NAV) under Scenario i is calculated as follow:

$$\Delta BS_i + Retained\ Earnings_i$$

i. ΔBS_i is calculated as:

$$\Delta BS_i = \sum \frac{(EOP_{i,c} - 100)}{100} * Asset_{c,t=0} - \left(\sum libaility_{\ c,i,t=1} - libaility_{c,t=0}\right)$$

Where ΔBS_i is the changes of balance sheet value under scenario i and the $EOP_{i,c}$ shows the end of period simulated amount of relevant risk factor for asset class c under scenario i. $libaility_{c,i,t=1}$ shows simulated amount of liability c under scenario i for relevant risk factor at the end of year.

ii. and $Retained\ Earnings_i$ is
$= \sum_{c=1}^{C} \sum_{m=1}^{M} Simulated\ Income_{c,i,m} - \sum_{c=1}^{C} simulated\ cost_{c,i} - \sum_{c=1}^{C} simulated\ Expnediture_{c,i}$

Where, c is indicator of category of income/cost/expenditure, m indicates members per each household, i is indicator of scenario

l. We also define the Minimum Capital Requirement (MCR) in the same way but at 85th percentile of Delta NAV.

4.1.3 Risk assessment and household characteristics

After computing the SCR and the Minimum Capital Requirement (MCR) for the low-income households in each EU country, we then show the relation between different household characteristics and the level of SCR and MCR. This relation can help us to understand what kind of households fall in different solvency range like: Solvency zone, Warning zone, and Insolvency zone.

For this regression we follow the below steps for aggregated EU and per country:

i. Calculation of the Median SCR for low-income households by considering their net wealth.

ii. Running a quantile regression to determine the relation between level of SCR and household's characteristics as below. (Regarding EU regression, we have done two regressions: one of them with country as a fixed effect and in the other one we have not included country.)
    1. Country
    2. Number of household's member
    3. Number of household's member in employment
    4. Education of main person
    5. Main labor status of main person
    6. Investment Attitude
    7. Comparison of last year income with average
    8. Comparison of last year expense with the income
    9. Ability to get financial assistance from relative or friends
    10. Net financial assets (which is equal to total financial assets minus outstanding balance of non-mortgage debt)

After these steps, we do the same regression analysis for the MCR.

5 Results

The results of the Solvency Capital requirement (SCR) based on the 99.5th percentile of the loss distribution for Europe and for each European country are shown in Table 5-1.

In this table, we divide the low-income households into four quantiles based on their net wealth from the low to high net wealth households respectively. Therefore, the first quantile shows the extremely poor low-income households and the fourth quantile shows the low-income households who are wealthier than other quantiles. The table repots four statistics like: the absolute value of SCR, standard deviation of SCR, Gross income and the Net wealth of households.

As we discussed in section 4, low-income households need to have at least the Euro amount of SCR to be able to cover the upcoming losses in the next year based on the adverse scenarios. As Table 5-1 shows, for the first quantile, extremely poor family, on average the net wealth of family is lower than the SCR. Furthermore, some countries like Netherlands, Luxembourg, Cyprus, Spain, and Malta have respectively the highest SCR among other European countries and some other countries like Latvia, Poland, Austria, Germany, and Ireland have the lowest SCR. However, when we move from the first quantile to the fourth quintile, the SCR of these countries change significantly. In the second, third and fourth quantile, on average low-income households have enough net wealth to cover all possible future shocks. For example, the net wealth of low-income household in the second quantile, on average, in Europe, is 17,046 euro which is higher than the average SCR, which is 10,750. Therefore, we can consider the first quantile as an extreme group of low-income households that they need more attention and support from the government.

Moreover, the standard deviation (std) of the SCR for different quantile is also reported in this table. The table shows that the standard deviation of the SCR for all different quantiles, is relatively high, which means the heterogeneity in each class of low-income households is high. However, due to limited number of observations, we are not able to divide these groups into the subgroups.

Table 5-1 Solvency Capital Requirement of the European households

Country	Median	Quantile of Net Wealth for Low-income households			
		1st quantile	2nd quantile	3rd quantile	4th quantile
Europe (aggregated level)	SCR	4,812	9,302	22,528	57,327
	std (SCR)	12,908	12,500	25,781	269,181
	Gross Income	7,204	8,382	9,881	9,950
	Net Wealth	3,017	56,709	173,504	487,072
Austria (AT)	SCR	3,104	10,750	18,021	39,674
	std (SCR)	6,398	11,109	24,119	74,691
	Gross Income	14,502	17,801	15,857	17,030
	Net Wealth	1,259	17,046	142,500	391,195
Belgium (BE)	SCR	9,131	23,601	48,827	116,977
	std (SCR)	14,978	30,340	54,805	230,032
	Gross Income	16,029	17,933	19,450	17,700
	Net Wealth	3,102	174,359	350,700	769,000
Cyprus (CY)	SCR	11,036	22,138	44,846	98,741
	std (SCR)	75,952	51,805	42,755	61,243
	Gross Income	9,600	11,045	11,760	7,500
	Net Wealth	2,050	133,638	304,008	759,339
Germany (DE)	SCR	3,372	18,792	43,469	98,519
	std (SCR)	8,674	29,700	55,374	136,771
	Gross Income	15,600	20,070	21,000	21,300
	Net Wealth	1,600	73,600	275,500	645,000
Estonia (EE)	SCR	4,170	8,210	12,174	30,299
	std (SCR)	4,990	7,533	15,159	27,665
	Gross Income	3,771	3,948	4,148	4,537
	Net Wealth	1,730	32,074	68,430	172,551
Spain (ES)	SCR	9,913	23,101	49,005	166,781
	std (SCR)	19,265	23,546	52,532	889,691
	Gross Income	9,768	10,766	11,319	9,209
	Net Wealth	42,866	185,182	446,529	1,658,934
Finland (FI)	SCR	5,434	13,763	29,633	65,887
	std (SCR)	11,903	17,492	36,755	120,621
	Gross Income	17,662	21,398	23,301	25,231
	Net Wealth	1,337	102,794	235,302	481,353
France (FR)	SCR	6,349	15,033	29,414	67,650
	std (SCR)	14,141	25,604	33,090	365,251
	Gross Income	16,140	17,730	19,035	16,275
	Net Wealth	6,113	119,864	284,425	686,975
Greece (GR)	SCR	7,504	7,295	11,899	26,839
	std (SCR)	6,669	7,404	18,039	18,657
	Gross Income	6,410	8,647	8,642	9,357
	Net Wealth	236	40,000	83,881	206,372

Country	Median	Quantile of Net Wealth for Low-income households			
		1st quantile	2nd quantile	3rd quantile	4th quantile
Hungry (HU)	SCR	3,762	4,951	7,111	12,398
	std (SCR)	4,493	3,517	5,238	27,026
	Gross Income	3,300	3,643	3,701	3,575
	Net Wealth	2,523	18,893	39,207	83,275
Ireland (IE)	SCR	3,761	9,148	19,826	50,320
	std (SCR)	21,321	15,160	24,178	81,429
	Gross Income	14,557	13,876	13,642	14,792
	Net Wealth	500	49,000	160,800	427,048
Italy (IT)	SCR	7,496	13,444	23,762	42,747
	std (SCR)	6,939	11,059	13,344	34,672
	Gross Income	9,538	10,440	11,341	11,374
	Net Wealth	2,100	101,350	204,725	400,000
Luxembourg (LU)	SCR	15,452	47,452	86,240	277,367
	std (SCR)	26,480	59,360	159,609	323,558
	Gross Income	32,000	36,000	38,037	35,525
	Net Wealth	9,888	401,759	759,925	1,911,391
Latvia (LV)	SCR	2,185	3,204	5,036	9,677
	std (SCR)	3,142	6,114	4,723	16,896
	Gross Income	3,093	3,493	3,440	4,658
	Net Wealth	100	10,308	29,129	66,805
Malta (MT)	SCR	9,173	22,733	33,972	68,080
	std (SCR)	14,438	19,487	11,428	46,520
	Gross Income	7,915	8,654	9,234	8,874
	Net Wealth	8,252	160,300	266,940	524,371
Netherlands (NL)	SCR	15,528	33,407	39,862	81,017
	std (SCR)	26,177	31,366	47,274	176,719
	Gross Income	20,197	22,269	21,140	24,019
	Net Wealth	3,561	72,174	200,960	433,000
Poland (PL)	SCR	2,540	4,602	9,168	16,923
	std (SCR)	5,575	4,134	4,646	18,561
	Gross Income	3,746	4,458	4,300	4,617
	Net Wealth	239	37,163	80,112	169,906
Portugal (PT)	SCR	5,911	12,009	21,083	52,629
	std (SCR)	8,144	12,386	17,693	55,628
	Gross Income	6,477	7,130	7,446	7,530
	Net Wealth	1,700	67,190	149,810	403,635
Slovenia (SI)	SCR	6,800	11,189	16,821	33,002
	std (SCR)	7,370	8,463	12,945	38,023
	Gross Income	6,314	6,330	6,144	6,310
	Net Wealth	1,588	62,581	116,290	242,689
Slovakia (SK)	SCR	3,837	6,790	10,641	19,093
	Gross Income	3,635	4,242	4,224	3,150
	Net Wealth	6,260	37,472	64,923	104,000

Since the total gross income and the net wealth of European households are significantly diverse among countries, the Euro amount of SCR may not be the best reference for comparison of households' financial buffer in different countries. Therefore, we define the solvency capital ratio as the ratio of net wealth on the SCR for each net wealth quantile. In other words, the solvency ratio is the size of the net wealth relative to all risks that can happen during next year. This ratio is scale-less, and it might be a better benchmark than SCR for the comparison purposes.

Figures 5-1 to 5-4 show the results of solvency ratios for each country and each quantile. As the Figure 5-1 shows, most of the low-income households in the first quantile, extremely poor family, except in the Spain, and Slovakia have a SCR ratio of less 100%, which means they are not able to cover all the future risks even if they use all their net wealth! Moreover, on average, the extremely poor households in Europe, have the SCR ratio of 63%, which means that their total net wealth is not enough to cover the total financial shocks in future.

However, Figures 5-2, 5-3, and 5-4 show that the European households in the second, third and fourth quantiles of net wealth respectively, on average, have enough net wealth to cover the future financial risks, which means the SCR ratio is higher than 100%.

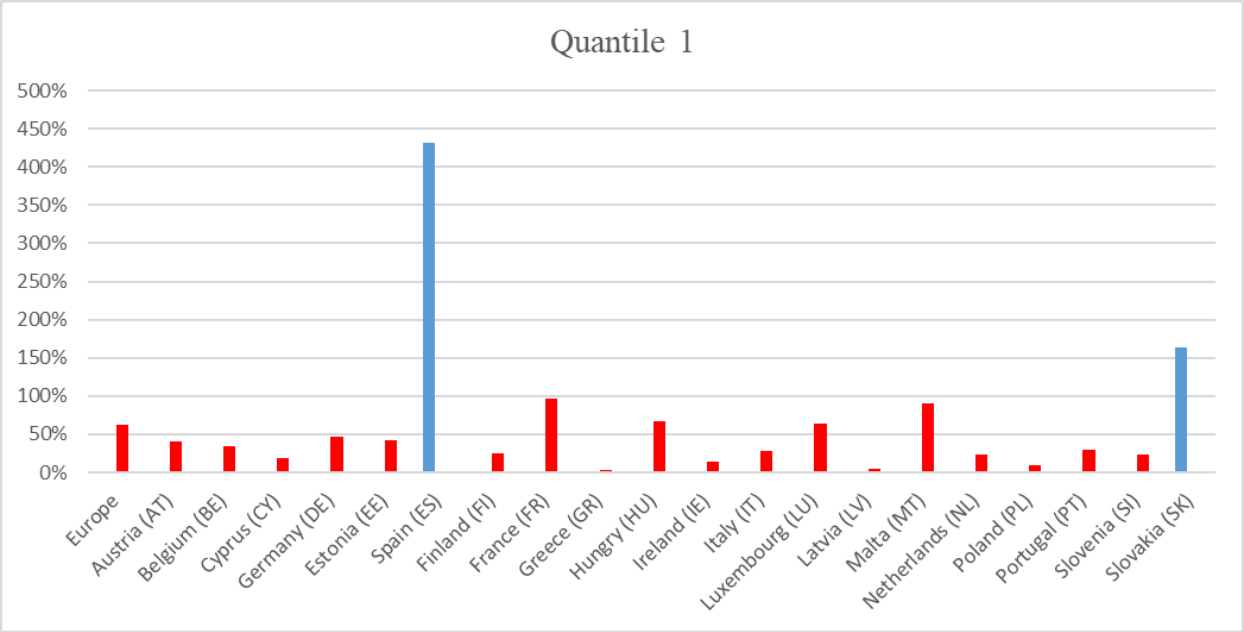

Figure 5-1 SCR ratio on the first net wealth quantile

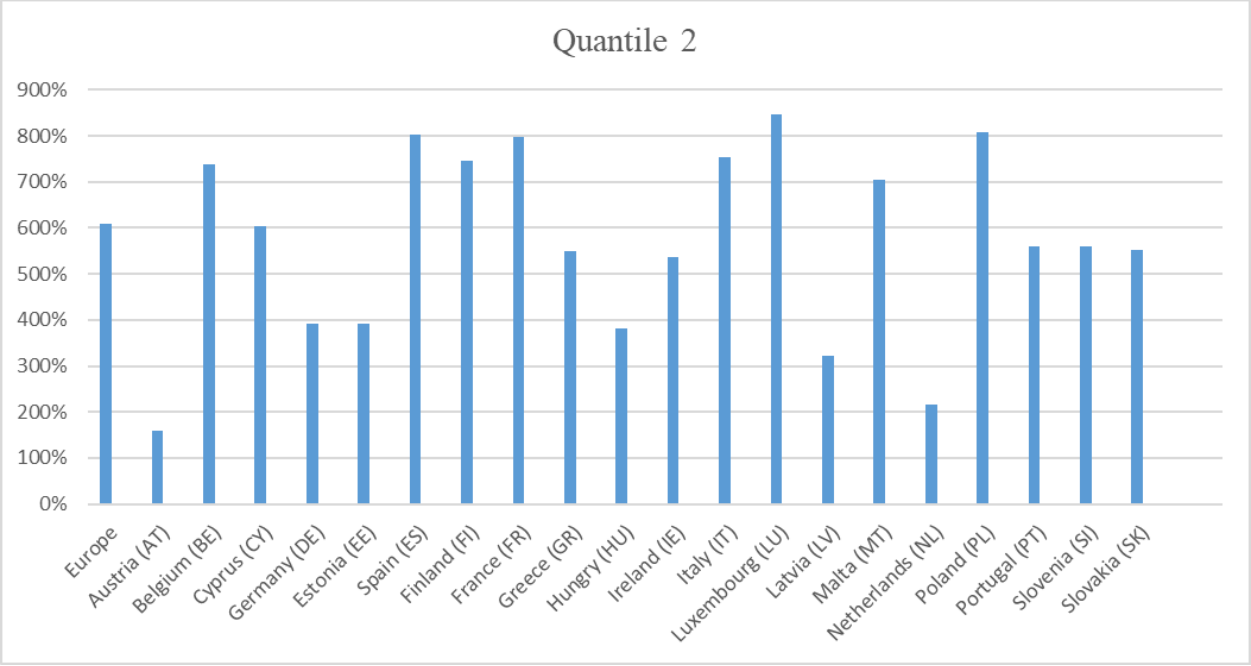

Figure 5-2 SCR ratio on the second net wealth quantile

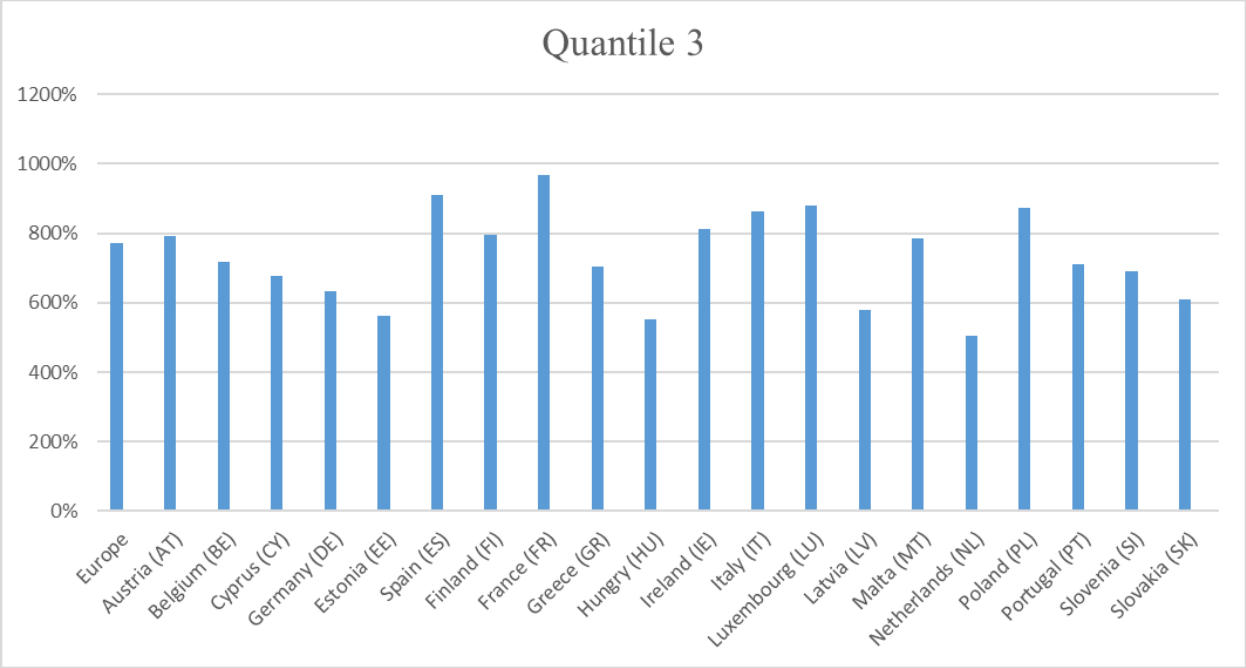

Figure 5-3 SCR ratio on the third net wealth quantile

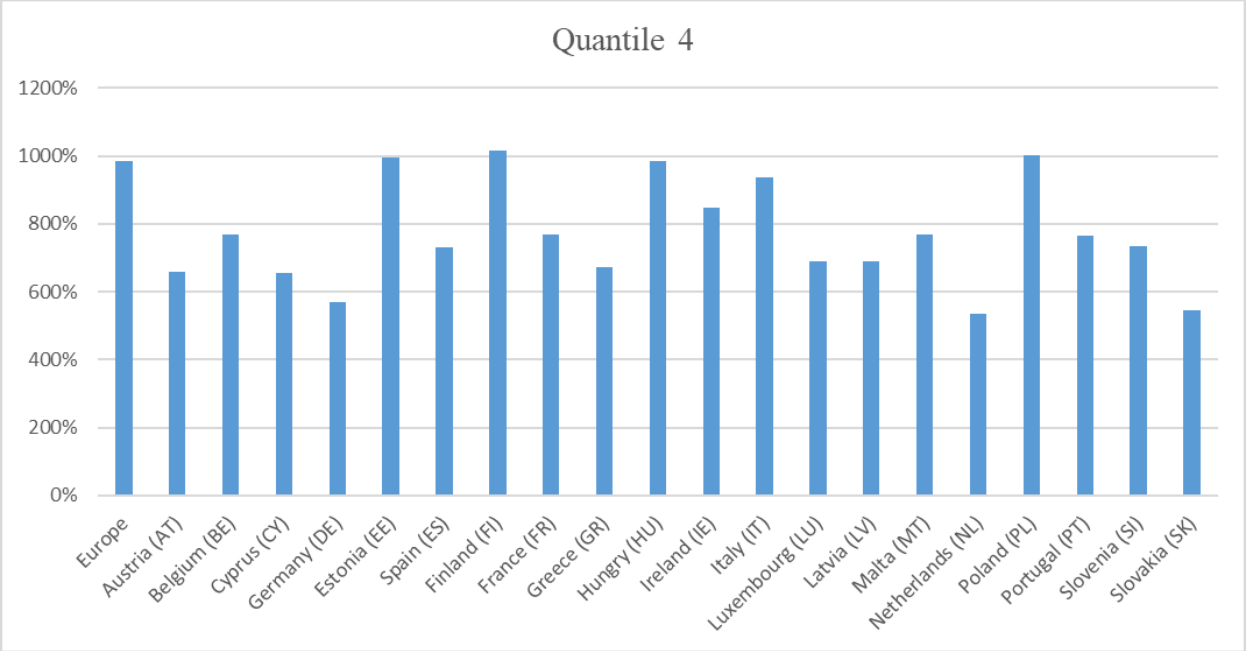

Figure 5-3 SCR ratio on the fourth net wealth quantile

Furthermore, as Section 4 discussed, the SCR shows the amount of capital that a household needs to cover the losses in available capital of 1 in 200-year evet calibrated on a one-year horizon and MCR represents amount of capital that households needs to cover the loss in available capital of 1 in around 6.5-year. Hence, we categories the low-income households based on the status of their available capital, SCR and MCR into the Insolvent zone, which is related to those low-income households that they have a net wealth lower than MCR, and the Warning zone, which is related to those low-income households that they have net wealth in between of SCR and MCR.

Table 5-2 reports, the frequency of low-income households in the Europe and separately for each country, that they fall into the insolvent zone. On average in Europe, around 17% of low-income households have lower net-wealth than their MCR limit, which means this group of households are not able to cover all their possible risks in future even if they use all the net wealth. However, the variation of this value among countries is high, for example, Spain has the lowest number of these households (around 9%) and Austria has the highest number (around 31%).

Table 5-2 Frequency of Households in Insolvent Zone (Households with Net wealth lower than MCR)

	Number of Households in Insolvent Zone	Total number of households	Percentage	Median (SCR)	Median (Gross income)	Median (Net wealth)	Median (MCR)
EU	2,916	17,396	17%	7,062	7,124	1,192	6,029
AT	134	430	31%	7,724	12,109	1,515	6,644
BE	102	438	23%	10,527	12,950	1,625	9,593
CY	41	262	16%	11,578	10,000	2,000	10,514
DE	148	639	23%	6,784	9,820	800	5,538
EE	116	497	23%	4,652	3,474	326	4,150
ES	117	1,335	9%	6,780	8,580	1,300	5,985
FI	422	1,670	25%	8,810	14,277	1,130	7,508
FR	462	2,073	22%	10,608	11,915	2,837	9,040
GR	129	630	20%	9,468	5,923	1,040	8,515
HU	186	1,364	14%	5,006	3,137	776	4,139
IE	182	854	21%	9,671	13,680	1,763	8,956
IT	418	1,779	23%	8,504	8,555	1,737	6,854
LU	49	308	16%	20,144	23,000	3,986	16,512
LV	58	241	24%	2,590	3,364	371	2,524
MT	27	225	12%	5,926	6,606	1,425	4,501
NL	61	238	26%	35,087	16,934	5,550	29,682
PL	119	707	17%	3,445	3,734	358	3,035
PT	242	1,372	18%	6,029	6,350	561	5,163
SI	110	551	20%	7,396	6,100	1,094	6,759
SK	47	464	10%	6,016	3,360	1,663	4,329

Table 5-3 shows the frequency of low-income households in Europe and separately for each country, who fell into the warning zone. On average in Europe, around 4% of low-income households have net-wealth between SCR and MCR limit. Among all European countries, Austria has the highest number of these households (around 16%).

Table 5-3 Frequency of Households in Warning Zone (Households with Net wealth lower than SCR and greater than MCR)

	Number households in Warning Zone	Total number of households	Relative percentage	Median (SCR)	Median (Gross income)	Median (Net wealth)	Median (MCR)
EU	780	17,396	4%	10,466	8,659	8,110	4,224
AT	70	430	16%	8,294	15,323	6,120	3,155
BE	29	438	7%	16,276	18,800	12,000	6,234
CY	13	262	5%	15,416	9,300	12,000	5,433
DE	65	639	10%	16,777	11,100	11,240	6,507
EE	33	497	7%	9,427	3,917	7,470	2,787
ES	32	1,335	2%	14,687	9,768	11,286	4,725
FI	133	1,670	8%	13,197	15,927	9,540	5,328
FR	173	2,073	8%	14,496	14,890	10,520	6,369
GR	14	630	2%	10,941	7,845	8,086	6,016
HU	31	1,364	2%	4,611	3,463	3,313	2,497
IE	34	854	4%	11,570	14,132	10,100	6,798
IT	111	1,779	6%	10,467	11,034	8,500	4,797
LU	21	308	7%	34,589	25,600	22,100	14,870
LV	4	241	2%	3,720	3,435	3,348	2,724
MT	34	225	15%	11,879	8,122	9,203	4,808
NL	16	238	7%	28,791	21,768	18,963	11,136
PL	22	707	3%	10,538	4,206	7,726	3,173
PT	62	1,372	5%	12,130	7,227	9,700	4,151
SI	14	551	3%	11,346	7,128	10,224	5,418
SK	8	464	2%	9,920	3,759	7,300	3,478

Risk assessment and household characteristics

To draw a relation between the SCRs & MCRs and the households' main characteristics, considering existence of several outliers in the database, we use a quantile regression analysis.

Following previous research by Kelly (1995), Shum and Faig (2006), Bianchi (2017) and Von Gaudecker (2015), ten variables have been identified as the regressors (independent variables). List of these variables and their description is presented in Table 5-4.

Table 5-4 The independent variables in the Quantile Regression

Variable	Description
Homeowner/renter	Homeowner without mortgage
	Homeowner with mortgage
	Renter
Education of households (Canberra definition)	No education
	Lower secondary school
	Upper secondary school
	Post-secondary school
	College education
	University education
Main labor status of households (Canberra definition)	Employee
	Self-employed
	Unemployed
	Retired
	Other
Risk attitudes	Take substantial financial risks
	Take above average financial risks
	Take average financial risks
	Not willing to take any financial risk
Comparison of last year expenses with the average	Higher than average
	Lower than average
	Just about average
Comparison of last year expenses with the income	Expenses exceeded income
	Expenses about the same as income
	Expenses less than income

The quantile regression analysis is applied both, at the EU level and at the country level. Considering differences in characteristics of households across EU countries, we control the country fixed effect. The results of the quantile regression at the EU level is presented in Table 5-5. Based on our findings at the EU level, there is a positive relation between SCR &MCR and the family size (number of household members). In addition, the SCR and MCR level is higher for households that they are renter, or they have a house with a mortgage, in comparison with homeowners without mortgage.

Moreover, the SCR and MCR level are higher for the self-employed households in comparison to employed counterparts. Furthermore, there is no significant relation between the investment (risk) attitude and the SCR level for the European households. Our results show that for the households with an income level around their expenses level, the SCR and MCR level is lower in comparison with the households with higher expenses than their level of income. Consistent with our finding in table 5-5 strong positive relation between level of net wealth and SCR is detectable. This shows that low income households with high level of net wealth are more vulnerable to financial risk and so their needs more attention in the case of financial turbulent. The result of regression analysis at country level is consistent with our findings for the EU.

Table 5-5 Regression output for EU level analysis

Households characteristics	SCR	MCR
Number of household members	0.06***	0.08***
	(0.01)	(0.01)
Number of household members in employment	-0.06	-0.07**
	(0.03)	(0.04)
Homeowner with a mortgage	0.33***	0.37***
	(0.04)	(0.05)
Renter	0.23***	0.39***
	(0.04)	(0.05)
Lower secondary school	-1.33	-0.90
	(1.00)	(1.20)
Upper secondary school	1.11	1.57
	(0.82)	(0.98)
Post-secondary school	1.14	1.66
	(0.82)	(0.98)
College education	1.07	1.53
	(0.82)	(0.98)
University education	1.15	1.62
	(0.82)	(0.98)
Self-employed	0.10*	0.18***
	(0.06)	(0.07)
Unemployed	0.06	0.13*
	(0.06)	(0.07)
Retired	-0.07	-0.06
	(0.05)	(0.06)
Other types of careers except being employee	-0.03	-0.05
	(0.07)	(0.08)
Take above average financial risks	0.25	0.20
	(0.15)	(0.19)
Take average financial risks	0.23*	0.15
	(0.12)	(0.16)
Not willing to take any financial risk	0.06	-0.03
	(0.12)	(0.15)
Expenses level is lower than average	-0.09***	-0.11***
	(0.04)	(0.05)
Expenses level is about average	-0.05	-0.07
	(0.04)	(0.04)
Expenses is about as income	-0.07***	-0.12***
	(0.03)	(0.04)
Expenses less than income	0.01	-0.01
	(0.05)	(0.06)
No financial aid from family or friends	-0.12***	-0.13***
	(0.03)	(0.04)
The 2nd Quantile Net Wealth	0.63***	0.51***
	(0.03)	(0.07)
The 3rd Quantile Net Wealth	1.38***	1.12***
	(0.03)	(0.07)
The 4th Quantile Net Wealth	2.27***	1.86***
	(0.09)	(0.11)
The net Financial Assets (bps)	-0.01***	-0.03***
	(0.00)	(0.00)
Constant	7.43***	6.66***
	(0.80)	(1.00)

The dependent variables in this regression are the logarithm of SCR and MCR and the number of observations is 2,964. The country fixed effect is considered. The Pseudo R-square is 0.28.

6 Conclusion

A general knowledge about the household risk management is very limited, especially for low-income households, who are more likely have limited precautionary saving and have less access to credit markets. Hence, these group of households are more likely to be affected by future financial shocks. Simultaneously, the households risk management is complex because it contains many dimensions of risks like uncertainty in inflation and interest rates, uninsurable risk in labor income, borrowing constraints, property price risk, and the market risk.

In this report, by constructing and analysing the financial statements of the households and identifying and assessing several types of risks that they are face to, we offer scientifically grounded risk management advice to the low-income European households.

From the Balance sheet of the European households, we show that on average in Europe, 72% of total assets of households is related to the real assets and only 28% of their assets is associated with the financial assets. More specifically, the balance sheet of the low-income households, also shows that the main asset in the portfolio is houses, which is 82% of the total assets and for the low-income renters, the main asset is their deposit, which is 48% of the total asset. Moreover, it is worth mentioning that the low-income homeowners have only 5% of their assets as a deposit, which shows that they have a very illiquid assets in the portfolio.

From the Cash flow statements, we show that in the aggregate level, 48% of total cash inflows is related to the employee income. However, the main cash inflows of the low-income renters are related to the regular social transfer, which is around 31% of the total gross income.

After constructing the financial statements of low-income households, we define a financial buffer (as a precautionary saving) for low-income household's budget to protect them against unexpected shocks to their balance sheets and the cash flows statements. To calculate the financial buffer for low-income household, we use the Solvency Capital Requirement (SCR) model, which is defined, in our case, as the amount of money (saving) that a household is required to hold in order to be able to cover the upcoming losses in the next year based on the adverse scenarios

The results of SCR calculation for four groups of low-income households, based on the net wealth, show that for the extremely poor family, the net wealth of family is lower than the SCR level,

which means that these households are not able to cover all the future risks even if they use all their net wealth! However, the results also show that the low-income households in higher bucket of wealth, have sufficient net wealth to cover all the potential risks.

The last part of this research shows the relation between the level of SCR and MCR with the household's characteristics. Our results show that the SCR (MCR) level is positively related to the homeowners with a mortgage and renters and it is negatively related to expenditure and financial assets of households.

All in all, our results call for more monitoring of the extremely poor European households and the low-income homeowners with a mortgage in a case of financial recession in future.

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8 Appendix

In this appendix, we summarize the balance sheets and the cash flow statements of low-income and high-income European households per country.

	Balance Sheet (%Total Assets) Low income Households																				
	EU	**AT**	**BE**	**CY**	**DE**	**EE**	**ES**	**FI**	**FR**	**GR**	**HU**	**IE**	**IT**	**LU**	**LV**	**MT**	**NL**	**PL**	**PT**	**SI**	**SK**
Value of household's main residence	47%	22%	40%	51%	17%	52%	61%	31%	25%	60%	74%	47%	46%	36%	67%	54%	19%	67%	49%	59%	79%
Value of other real estate property	6%	3%	3%	12%	4%	6%	10%	7%	5%	10%	4%	8%	3%	7%	12%	4%	2%	3%	9%	8%	4%
Value of household's vehicles	8%	14%	12%	11%	10%	6%	7%	11%	9%	13%	3%	11%	15%	19%	2%	6%	22%	4%	9%	11%	4%
Valuables	6%	3%	2%	1%	2%	0%	2%	0%	29%	0%	0%	13%	15%	2%	1%	3%	1%	2%	1%	0%	1%
Value of self-employment businesses	2%	1%	1%	2%	1%	1%	1%	0%	2%	4%	1%	1%	3%	0%	1%	1%	2%	2%	1%	1%	0%
Total real assets 1 (incl. business wealth, vehicles and valuables)	**70%**	**43%**	**58%**	**76%**	**33%**	**65%**	**81%**	**49%**	**70%**	**87%**	**83%**	**80%**	**82%**	**65%**	**83%**	**66%**	**46%**	**78%**	**69%**	**79%**	**88%**
Deposits	23%	51%	35%	22%	48%	31%	16%	45%	24%	12%	14%	16%	16%	28%	16%	31%	36%	15%	28%	18%	11%
Mutual funds, total	1%	1%	1%	0%	2%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Bonds	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%
Value of non-self-employment private business	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Shares, publicly traded	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	0%	1%	0%
Managed accounts	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Money owed to households	2%	3%	2%	1%	6%	3%	2%	0%	1%	1%	2%	2%	0%	2%	1%	0%	1%	1%	2%	1%	1%
Other assets	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Voluntary pension/whole life insurance	4%	1%	3%	1%	9%	0%	1%	1%	4%	0%	1%	1%	0%	2%	0%	0%	13%	6%	1%	1%	0%
Total financial assets 1 (excl. public and occupational pension plans)	**30%**	**57%**	**42%**	**24%**	**67%**	**35%**	**19%**	**51%**	**30%**	**13%**	**17%**	**20%**	**18%**	**35%**	**17%**	**34%**	**54%**	**22%**	**31%**	**21%**	**12%**
Total assets 1, excl. public and occupational pension plans	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Outstanding balance of HMR mortgages	3%	1%	2%	10%	1%	2%	5%	1%	2%	5%	6%	8%	1%	4%	3%	1%	4%	0%	6%	0%	1%
Outstanding balance of mortgages on other properties	0%	0%	0%	5%	0%	0%	1%	0%	1%	0%	1%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Outstanding balance of mortgage debt	3%	1%	2%	15%	1%	3%	6%	2%	3%	5%	7%	9%	1%	5%	4%	1%	4%	1%	6%	1%	1%
Outstanding balance of other, non-mortgage debt	380%	6966%	6217%	442%	1429%	2080%	79%	494%	35%	255%	33%	84%	28%	428%	61%	3%	210%	35%	468%	393%	183%
Total outstanding balance of household's liabilities	**384%**	**6967%**	**6219%**	**457%**	**1430%**	**2082%**	**85%**	**496%**	**38%**	**260%**	**40%**	**93%**	**29%**	**433%**	**65%**	**4%**	**215%**	**35%**	**475%**	**394%**	**184%**
Net wealth	**-284%**	**-6867%**	**-6119%**	**-357%**	**-1330%**	**-1982%**	**15%**	**-396%**	**62%**	**-160%**	**60%**	**7%**	**71%**	**-333%**	**35%**	**96%**	**-115%**	**65%**	**-375%**	**-294%**	**-84%**

	Balance Sheet (%Total assets) High income Households																				
	EU	**AT**	**BE**	**CY**	**DE**	**EE**	**ES**	**FI**	**FR**	**GR**	**HU**	**IE**	**IT**	**LU**	**LV**	**MT**	**NL**	**PL**	**PT**	**SI**	**SK**
Value of household's main residence	49%	45%	56%	49%	41%	54%	54%	58%	50%	52%	56%	55%	58%	55%	52%	54%	59%	63%	53%	57%	66%
Value of other real estate property	12%	9%	11%	27%	11%	16%	19%	15%	13%	20%	10%	18%	13%	20%	20%	15%	4%	11%	15%	14%	7%
Value of household's vehicles	7%	10%	5%	5%	9%	10%	6%	8%	6%	11%	6%	6%	6%	5%	12%	5%	7%	7%	8%	12%	9%
Valuables	2%	1%	0%	0%	1%	1%	1%	0%	6%	1%	0%	3%	2%	1%	0%	1%	1%	1%	1%	0%	1%
Value of self-employment businesses	4%	7%	3%	7%	4%	7%	4%	3%	4%	6%	5%	2%	6%	2%	5%	6%	1%	10%	8%	4%	4%
Total real assets 1 (incl. business wealth, vehicles and valuables)	**74%**	**72%**	**76%**	**88%**	**66%**	**87%**	**84%**	**84%**	**79%**	**90%**	**77%**	**84%**	**85%**	**83%**	**90%**	**81%**	**72%**	**91%**	**84%**	**88%**	**87%**
Deposits	13%	21%	12%	9%	17%	9%	9%	9%	11%	9%	12%	10%	8%	9%	8%	11%	12%	6%	11%	8%	9%
Mutual funds, total	2%	2%	4%	0%	2%	0%	1%	2%	1%	0%	3%	1%	2%	2%	0%	1%	1%	1%	0%	1%	0%
Bonds	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	3%	0%	3%	1%	0%	2%	0%	0%	0%	0%	0%
Value of non-self-employment private business	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Shares, publicly traded	1%	1%	1%	0%	1%	0%	1%	2%	1%	0%	0%	1%	0%	1%	0%	1%	0%	0%	0%	1%	0%
Managed accounts	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Money owed to households	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	0%	0%	1%	1%	0%	1%	0%	1%	1%	1%
Other assets	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%
Voluntary pension/whole life insurance	7%	3%	5%	2%	11%	2%	3%	2%	6%	0%	4%	3%	1%	3%	1%	3%	12%	2%	2%	2%	3%
Total financial assets 1 (excl. public and occupational pension plans)	**26%**	**28%**	**24%**	**12%**	**34%**	**13%**	**16%**	**16%**	**21%**	**10%**	**23%**	**16%**	**15%**	**17%**	**10%**	**19%**	**28%**	**9%**	**16%**	**12%**	**13%**
Total assets 1, excl. public and occupational pension plans	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Outstanding balance of HMR mortgages	13%	7%	14%	19%	11%	15%	11%	21%	11%	6%	9%	35%	5%	11%	18%	7%	31%	7%	23%	4%	6%
Outstanding balance of mortgages on other properties	2%	1%	2%	4%	3%	1%	3%	1%	3%	1%	1%	6%	0%	3%	3%	2%	3%	1%	2%	2%	1%
Outstanding balance of mortgage debt	15%	8%	16%	23%	14%	16%	14%	22%	14%	6%	10%	41%	5%	15%	21%	9%	34%	8%	25%	6%	7%
Outstanding balance of other, non-mortgage debt	9%	32%	2%	23%	11%	7%	3%	13%	4%	5%	7%	5%	2%	2%	10%	2%	18%	1%	54%	42%	13%
Total outstanding balance of household's liabilities	**25%**	**40%**	**18%**	**46%**	**25%**	**23%**	**18%**	**35%**	**19%**	**11%**	**17%**	**45%**	**7%**	**17%**	**31%**	**11%**	**52%**	**9%**	**79%**	**48%**	**19%**
Net wealth	**75%**	**60%**	**82%**	**54%**	**75%**	**77%**	**82%**	**65%**	**80%**	**89%**	**83%**	**55%**	**93%**	**83%**	**69%**	**89%**	**48%**	**91%**	**21%**	**52%**	**81%**

	Cash Flow Statement (%Total Gross Income) Low Income Households																				
	EU	**AT**	**BE**	**CY**	**DE**	**EE**	**ES**	**FI**	**FR**	**GR**	**HU**	**IE**	**IT**	**LU**	**LV**	**MT**	**NL**	**PL**	**PT**	**SI**	**SK**
Cash inflows																					
Employee income	25%	21%	16%	18%	20%	17%	20%	13%	17%	23%	21%	15%	25%	48%	17%	7%	20%	21%	22%	3%	13%
Self-employment income	7%	3%	2%	12%	4%	0%	5%	2%	12%	11%	3%	5%	5%	2%	3%	3%	4%	5%	4%	9%	2%
Income from pensions	47%	57%	48%	42%	44%	74%	53%	53%	40%	52%	57%	43%	57%	35%	66%	69%	37%	60%	56%	72%	69%
Regular social transfers (except pensions)	14%	13%	29%	21%	22%	7%	15%	30%	27%	9%	14%	34%	3%	10%	7%	15%	31%	6%	12%	13%	11%
income from regular private transfers	3%	5%	2%	2%	5%	1%	3%	1%	1%	2%	3%	1%	2%	1%	5%	1%	4%	6%	2%	2%	2%
gross rental income from real estate property	0%	0%	1%	2%	1%	0%	0%	0%	-3%	1%	0%	1%	1%	1%	0%	0%	0%	0%	1%	0%	0%
gross income from financial investments	2%	1%	2%	1%	2%	0%	2%	1%	6%	1%	1%	1%	4%	2%	0%	4%	3%	1%	2%	0%	1%
gross income from private business other than self-employment	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
gross income from other sources	1%	0%	0%	2%	2%	0%	1%	0%	0%	1%	0%	0%	3%	0%	2%	0%	2%	0%	0%	0%	1%
Total household gross income	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Payments for mortgages (flow)	6%	1%	6%	151%	0%	6%	10%	2%	6%	14%	21%	6%	6%	14%	43%	1%	11%	2%	9%	3%	4%
Payments for non-collateralized debt (flow)	12%	1%	191%	9%	1%	4%	6%	2%	7%	1%	6%	4%	10%	364%	2%	0%	7%	4%	3%	7%	3%
Payments for household's total debt (flow)	18%	2%	196%	160%	1%	10%	16%	4%	12%	15%	27%	10%	16%	378%	45%	2%	17%	6%	12%	10%	6%
amount of rent paid for partially owned household main residence	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
amount paid as rent	104%	16%	169%	13%	32%	6%	8%	25%	259%	28%	6%	16%	237%	28%	1%	3%	46%	6%	12%	18%	18%
monthly leasing payments	1%	0%	0%	7%	0%	2%	0%	0%	0%	0%	2%	0%	0%	0%	118%	0%	0%	0%	2%	1%	5%
amount spent on food at home	431%	22%	93%	103%	38%	78%	59%	29%	168%	165%	64%	45%	644%	295%	87%	62%	54%	3119%	60%	94%	110%
amount spent on food outside home	58%	6%	23%	10%	7%	8%	0%	4%	42%	68%	30%	7%	137%	52%	13%	6%	15%	260%	7%	7%	14%
amount given as private transfers	15%	1%	3%	1%	1%	1%	2%	0%	17%	2%	2%	1%	52%	1%	2%	2%	38%	3%	1%	2%	1%
amount spent on utilities	519%	14%	74%	61%	27%	51%	0%	13%	84%	101%	65%	19%	246%	125%	62%	24%	42%	5225%	32%	93%	94%
amount spent on consumer goods and services	391%	57%	333%	175%	65%	169%	106%	91%	339%	373%	141%	58%	1624%	499%	184%	101%	231%	0%	134%	232%	242%
Total Expenses	**1537%**	**118%**	**892%**	**530%**	**171%**	**325%**	**191%**	**168%**	**921%**	**752%**	**336%**	**156%**	**2955%**	**1378%**	**512%**	**201%**	**443%**	**8621%**	**259%**	**457%**	**491%**
Net Increase/Decrease in Cash	**-1437%**	**-18%**	**-792%**	**-430%**	**-71%**	**-225%**	**-91%**	**-68%**	**-821%**	**-652%**	**-236%**	**-56%**	**-2855%**	**-1278%**	**-412%**	**-101%**	**-343%**	**-8521%**	**-159%**	**-357%**	**-391%**

	Cash Flow Statement (%Total Gross Income) High Income Households																				
	EU	**AT**	**BE**	**CY**	**DE**	**EE**	**ES**	**FI**	**FR**	**GR**	**HU**	**IE**	**IT**	**LU**	**LV**	**MT**	**NL**	**PL**	**PT**	**SI**	**SK**
Cash inflows																					
Employee income	66%	69%	76%	74%	70%	84%	66%	75%	61%	52%	75%	74%	54%	71%	72%	76%	74%	72%	66%	78%	69%
Self-employment income	11%	11%	8%	7%	10%	3%	12%	6%	6%	21%	7%	10%	20%	8%	6%	9%	7%	16%	13%	6%	17%
Income from pensions	14%	15%	8%	11%	11%	5%	11%	10%	19%	25%	12%	6%	23%	12%	8%	7%	11%	11%	14%	12%	8%
Regular social transfers (except pensions)	3%	3%	3%	1%	3%	4%	2%	4%	4%	0%	2%	4%	0%	2%	3%	2%	4%	0%	2%	2%	3%
income from regular private transfers	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
gross rental income from real estate property	3%	1%	3%	3%	4%	0%	2%	1%	3%	1%	1%	2%	1%	4%	1%	1%	1%	0%	2%	0%	0%
gross income from financial investments	3%	1%	1%	1%	1%	0%	2%	3%	7%	0%	2%	1%	1%	2%	1%	3%	3%	0%	1%	1%	0%
gross income from private business other than self-employment	0%	1%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	0%	0%	2%	0%	1%
gross income from other sources	1%	0%	1%	0%	0%	1%	4%	0%	0%	0%	1%	2%	0%	1%	6%	1%	1%	0%	1%	0%	0%
Total household gross income	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Payments for mortgages (flow)	6%	2%	8%	20%	5%	4%	7%	7%	8%	3%	4%	9%	2%	8%	5%	5%	9%	4%	7%	3%	3%
Payments for non-collateralized debt (flow)	2%	0%	1%	2%	1%	1%	3%	4%	4%	1%	1%	1%	1%	2%	1%	1%	2%	2%	1%	3%	1%
Payments for household's total debt (flow)	7%	2%	9%	22%	6%	5%	10%	11%	11%	3%	5%	11%	3%	10%	7%	6%	11%	5%	9%	6%	4%
amount of rent paid for partially owned household main residence	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
amount paid as rent	2%	2%	1%	0%	2%	1%	1%	1%	2%	2%	1%	1%	1%	2%	0%	0%	2%	1%	1%	0%	1%
monthly leasing payments	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	2%	0%	1%	1%	2%
amount spent on food at home	8%	8%	8%	13%	7%	14%	14%	8%	10%	13%	15%	8%	11%	7%	14%	14%	7%	17%	12%	13%	17%
amount spent on food outside home	2%	3%	3%	3%	2%	3%	0%	2%	3%	5%	4%	2%	3%	3%	3%	5%	2%	2%	4%	2%	4%
amount given as private transfers	1%	1%	1%	2%	1%	2%	1%	0%	1%	2%	1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	0%
amount spent on utilities	5%	5%	4%	7%	6%	7%	0%	4%	6%	7%	12%	3%	5%	3%	8%	5%	5%	37%	7%	11%	11%
amount spent on consumer goods and services	23%	20%	21%	31%	15%	33%	30%	36%	30%	33%	35%	17%	35%	20%	30%	27%	26%	0%	37%	37%	38%
Total Expenses	**49%**	**41%**	**46%**	**79%**	**39%**	**66%**	**55%**	**63%**	**63%**	**65%**	**73%**	**44%**	**59%**	**46%**	**64%**	**57%**	**56%**	**63%**	**71%**	**73%**	**77%**
Net Increase/Decrease in Cash	**51%**	**59%**	**54%**	**21%**	**61%**	**34%**	**45%**	**37%**	**37%**	**35%**	**27%**	**56%**	**41%**	**54%**	**36%**	**43%**	**44%**	**37%**	**29%**	**27%**	**23%**

Age	Prob Death (Male)	Prob Death (Female)	Age	Prob Death (Male)	Prob Death (Female)
<1	0.3370%	0.4020%	43	0.1040%	0.2000%
1	0.0250%	0.0290%	44	0.1120%	0.2190%
2	0.0150%	0.0170%	45	0.1250%	0.2440%
3	0.0110%	0.0140%	46	0.1400%	0.2690%
4	0.0100%	0.0110%	47	0.1510%	0.2910%
5	0.0080%	0.0100%	48	0.1670%	0.3220%
6	0.0080%	0.0100%	49	0.1860%	0.3560%
7	0.0080%	0.0100%	50	0.2090%	0.3980%
8	0.0070%	0.0080%	51	0.2290%	0.4380%
9	0.0080%	0.0100%	52	0.2530%	0.4930%
10	0.0060%	0.0090%	53	0.2750%	0.5480%
11	0.0080%	0.0100%	54	0.3040%	0.6190%
12	0.0070%	0.0100%	55	0.3360%	0.6810%
13	0.0100%	0.0130%	56	0.3670%	0.7480%
14	0.0110%	0.0170%	57	0.3960%	0.8260%
15	0.0120%	0.0190%	58	0.4340%	0.9000%
16	0.0150%	0.0260%	59	0.4800%	0.9930%
17	0.0160%	0.0330%	60	0.5200%	1.0730%
18	0.0190%	0.0450%	61	0.5630%	1.1670%
19	0.0190%	0.0530%	62	0.6030%	1.2650%
20	0.0200%	0.0540%	63	0.6580%	1.3520%
21	0.0180%	0.0550%	64	0.7120%	1.4520%
22	0.0200%	0.0580%	65	0.7740%	1.5420%
23	0.0230%	0.0590%	66	0.8270%	1.6510%
24	0.0220%	0.0620%	67	0.9060%	1.7930%
25	0.0230%	0.0630%	68	0.9870%	1.8820%
26	0.0250%	0.0640%	69	1.0850%	2.0550%
27	0.0240%	0.0680%	70	1.2240%	2.2880%
28	0.0280%	0.0680%	71	1.3060%	2.4110%
29	0.0300%	0.0720%	72	1.4450%	2.6380%
30	0.0300%	0.0790%	73	1.5480%	2.8430%
31	0.0330%	0.0820%	74	1.7820%	3.2000%
32	0.0350%	0.0840%	75	1.9950%	3.4570%
33	0.0400%	0.0870%	76	2.2740%	3.8220%
34	0.0420%	0.0950%	77	2.5420%	4.2220%
35	0.0440%	0.1020%	78	2.8730%	4.6880%
36	0.0520%	0.1040%	79	3.3430%	5.2520%
37	0.0550%	0.1140%	80	3.8220%	5.8520%
38	0.0630%	0.1280%	81	4.3250%	6.4340%
39	0.0680%	0.1350%	82	4.9230%	7.2810%
40	0.0730%	0.1480%	83	5.6660%	8.1670%
41	0.0860%	0.1610%	84	6.4520%	9.0810%
42	0.0910%	0.1770%	>=85	100%	100%

Reference periods of the 2nd wave

Country	Fieldwork	Assets & Liabilities	Income
Belgium	06/2014 - 01/2015	Time of interview	2013
Germany	04/2014 - 11/2014	Time of interview	2013
Estonia	03/2013 - 06/2013	Time of interview*	2012
Ireland	03/2013 - 09/2013	Time of interview	Last 12 months
Greece	06/2014 - 10/2014	Time of interview	Last 12 months
Spain	10/2011 - 04/2012	Time of interview	2010
France	10/2014 - 02/2015	Time of interview	2014
Italy	01/2015 - 06/2015	31/12/2014	2014
Cyprus	02/2014 - 07/2014	Time of interview	Last 12 months
Latvia	04/2014 - 09/2014	Time of interview	2013
Luxembourg	04/2014 - 12/2014	Time of interview	2013
Hungary	10/2014 - 11/2014	30/09/2014	1/10/2013 - 30/09/2014
Malta	01/2014 - 06/2014	31/12/2013	2013
Netherlands	04/2014 - 03/2015	31/12/2013	2013
Austria	06/2014 - 02/2015	Time of interview	2013
Poland	01/2014 - 02/2014	Time of interview	2013
Portugal	03/2013 - 07/2013	Time of interview	2012
Slovenia	09/2014 - 12/2014	Time of interview	2013
Slovakia	02/2014 - 04/2014	Time of interview	2013
Finland	01/2014 - 05/2014	31/12/2013	2013

Source: HFSC metadata

Response behavior indicator in HFCS

Country	Gross sample size	Net sample size	Response rate*	Response rate** (including panel)	Refusal rate	Cooperation rate	Contact rate	Eligibility rate
Belgium	7,265	2,238	30.0	38.4	45.2	40.8	94.2	80.2
Germany	16,221	4,461	19.0	29.0	57.0	31.0	93.0	94.4
Estonia	3,594	2,220	63.9		23.5	70.0	91.2	96.7
Ireland	10,522	5,419	59.7		36.9	66.6	89.7	86.2
Greece	7,368	3,003	40.8		50.6	41.7	97.7	100
Spain	13,442	6,106	31.7	48.1	46.0	49.6	97.0	94.4
France#	20,272	12,035	65.0		11.9	76.3	85.2	91.8
Italy	16,100	8,156	43.3	53.0	29.9	61.4	86.4	95.5
Cyprus	1,874	1,289	60.4	70.0	23.2	72.5	96.5	98.3
Latvia	2,405	1,202	52.9		27.4	65.1	81.2	94.5
Luxembourg	7,300	1,601	23.4		66.8	25.6	91.4	91.2
Hungary	17,985	6,207	38.5		14.8	40.3	95.6	89.9
Malta	2,035	999	35.4	51.0	30.3	61.7	82.7	96.2
Netherlands	2,562	1,284	32.0	50.1	49.9	50.1	100	100
Austria	6,308	2,997	49.8		44.1	51.2	97.3	95.5
Poland	7,000	3,483	54.2		32.1	55.6	97.5	91.8
Portugal#	8,000	6,207	84.8		5.1	92.2	91.9	91.5
Slovenia	6,519	2,553	40.5		41.8	46.7	86.7	96.6
Slovakia	4,202	2,136	53.4		32.0	61.8	86.3	95.2
Finland	13,960	11,030	64.1	80.1	13.7	83.5	95.9	98.6

Source: ECB – HFCS metadata.

Gross sample includes panel households that have responded to previous waves of the same survey.

In France and Portugal, survey participation is compulsory for households.

* For comparability, response rates are shown for households interviewed for the first time.

** Response rates for the whole sample in countries that have a panel component. In Finland, the panel