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Working Paper

EWIGE 2 – Update and Extension of the EUROMOD Wealth Taxation Project

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EWIGE 2 – Update and Extension of the EUROMOD Wealth Taxation Project

*JRC Working Papers on
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Boone, Jonas
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EWIGE 2 – Update and Extension of the EUROMOD Wealth Taxation Project

Final Report

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This report makes use of EUROMOD version H0.34 and microdata from the Eurosystem Household Finance and Consumption Survey (HFCS) and from the EU Statistics on Income and Living Conditions (EU-SILC). The results published and the related observations and analysis may not correspond to results or analysis of the data producers.

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Abstract

Taxing wealth has received increased attention in both the academic and political debate, as a way to reduce inequality of both income and wealth. However, analytical tools are still underdeveloped when it comes to empirical analyses of different types of wealth-related taxes and policies. New household surveys as those developed as part of the Eurosystem Household Finance and Consumption Survey (HFCS) represent a milestone for this purpose. Yet, distributional analysis of income and wealth requires information on disposable income and wealth which are not available, as the new Eurosystem data includes only gross income values. Moreover, in order to simulate the effects of wealth taxes and (budget neutral) reforms to the current direct taxes a microsimulation model such as EUROMOD is needed. Integrating the HFCS data in EUROMOD makes it possible to assess the effect of different current and hypothetical wealth taxes and policies on the distribution of income and wealth. In this report we build further on a pilot study (see Kuypers et al., 2017), in which the HFCS data have been converted into a EUROMOD database for six countries that were part of the first wave of the HFCS. More specifically, the HFCS-EUROMOD combination is applied for the second wave of the HFCS data and the scope has been broadened to 17 EU countries (6 original from the pilot study and 11 new ones). We discuss the process of how the HFCS data have been transformed to fit the EUROMOD context, how the simulation of wealth taxes and policies has been added to the EUROMOD country files and we assess how the simulation results compare with other available sources. Finally, we also briefly discuss an example of a simulation that can be performed by using the new tool.

Introduction

Taxing wealth has received increased attention in both the academic and political debate, as a way to reduce inequality of both income and wealth. However, analytical tools are still underdeveloped when it comes to empirical analyses of different types of wealth-related taxes. This underdevelopment mainly relates to the fact that wealth data at the micro-level were until recently relatively scarce, especially for cross-country studies. New household surveys as those developed as part of the Luxembourg Wealth Study (Jäntti et al. 2013) and the Eurosystem Household Finance and Consumption Survey (HFCS) developed by the European Central Bank (HFCN, 2013) represent a milestone for this purpose. Yet, distributional analysis of income and wealth requires information on disposable income and wealth which are not available, as the new Eurosystem data includes only gross income values. Moreover, in order to simulate the effects of wealth taxes and (budget neutral) reforms to the current direct taxes a microsimulation model such as EUROMOD is needed. Integrating the HFCS data in EUROMOD makes it possible to assess the role of the different wealth components across countries, in order to set appropriate tax-free allowances and concentrate the tax burden on the wealthy part of the population, given the increasing role of housing assets in the household's portfolio along the entire income distribution (Figari, 2013). We build further on a pilot study (see Kuypers et al., 2017), in which the HFCS data have been converted into a EUROMOD database for six countries that were part of the first wave of the HFCS.

The aim of this project is to further broaden the policy scope of EUROMOD in order to allow for simulations covering current and alternative systems of wealth taxation for 17 countries that participated in the second wave of the HFCS. These include the six countries that were in the pilot study and eleven additional countries.

This modelling tool will have the potential for analysing current wealth taxes and wealth tax reforms and their impact on household income and wealth and inequalities therein in EU countries, covering:

1. Analyzing existing wealth tax systems;
2. timely analyses of wealth tax policy reforms that might actually come into force in the years to come;
3. analyses of potential alternative wealth tax policy reforms;
4. analyses of the joint effect of wealth tax policy reforms and other tax-benefit reforms affecting households' disposable income and net worth.

The remainder of this report is divided into five chapters. In the first chapter we discuss i) how the HFCS data has been transformed into a EUROMOD input database, ii) how we account for growth rates of monetary variables in the microsimulation model such that we are able to use input data from the income reference year for the 2017 policy systems and iii) how outcomes of simulated income concepts compare between EM-HFCS and EM-SILC. Subsequently, we pay attention to the different wealth(-related) policies in EUROMOD in chapter 2. More specifically, we provide a brief overview of the existing wealth(-related) policies in Europe and indicate whether or not these policies are simulated and/or refined. In chapter 3, we turn to the macro-validation of the simulated wealth taxes. We present the number of eligible cases and final taxpayers per tax for each country and we compare our simulated wealth tax revenues with external figures to assess the accuracy of the simulations. In chapter 4 we present a descriptive analysis of the distributive outcomes of the simulated wealth taxes. Finally, in chapter 5 we briefly discuss an example of a simulation that can be performed by using the new tool.

1. Data preparation: transforming HFCS data into a EUROMOD input database

1.1 Background information on the “Household Finance and Consumption Survey”

The Eurosystem Household Finance and Consumption Survey (from now on HFCS) is the result of a cooperation between the European Central Bank and national banks and statistical institutions throughout the Eurozone (HFCN, 2013). It contains information on a wide variety of demographic variables, income variables (e.g. incomes, pensions) and wealth variables (e.g. inheritances, gifts) for households in 20 European member states (European Central Bank, 2016)¹. As noted by Figari et al. (2007) a database must fulfil certain requirements in order to be used as input data base in EUROMOD: (a) the database must be a recent, representative sample of households, large enough to support the analysis of small groups and with weights to apply to population level and to correct for non-response; (b) the database must contain information on primary gross incomes by source and at the individual level, with the reference period being relevant to the assessment periods for taxes and benefits; (c) the database must contain information about individual characteristics and within-household family relationships; (d) the database must contain information on housing costs and other expenditures that may affect tax liabilities or benefit entitlements; (e) specific other information on characteristics affecting tax liabilities or benefit entitlements is also necessary; (f) the same reference period(s) should apply to personal characteristics and income information corresponding to it and (g) there should be no missing information from individual records or for individuals within households. As shown by Kuypers et al. (2016b) the HFCS fulfils the majority of these criteria such that it can be used in a sensible way as input data in EUROMOD.

A significant advantage of HFCS is that in most countries the wealthy population is oversampled: households that are situated at the higher end of the income and/or wealth distribution are more accurately covered in the input data sample. As argued by Davies et al. (2011) this matters because those households are less likely to participate in surveys and more likely to underreport when it comes to (financial) assets. Table 1 provides an overview of the oversampling criteria in each of the 17 countries and the final oversampling rates according to wealth and income deciles. A final oversampling rate of 0 means that the share of 10% richest households in the net sample is equal to 10%. When the share of households in the wealthiest decile is equal to 20% the effective oversampling rate is 100, i.e. there are 100% more (or twice as much) wealthy households in the sample than would be the case if all households would receive the same weight in the input sample. In the opposite case the effective oversampling rate is negative, i.e. there are fewer wealthy households in the sample than would be the case if all households had the same weights (HFCN, 2013). Effective oversampling rates are considerable in France, Germany and Spain. In 7 out of the 17 countries effective oversampling rates are higher for gross income than for net wealth.

¹ The Netherlands, Malta and Latvia have not been included in this study due to insufficient sample size.

Table 1 Overview of oversampling criteria and effective oversampling rates of the wealthy.

Country	Oversampling the wealthy	Oversampling top 10% wealth	Oversampling top 10% income	Oversampling criteria
Austria	No	-6.7	-8.1	n/a
Belgium	Yes	59.2	17.4	Regional taxable income and housing prices
Cyprus	Yes	67.3	104.3	Top 10% of electricity consumption
Estonia	Yes	30.6	48.6	Highest deciles based on income
Finland	Yes	80.0	80.0	Average taxable income
France	Yes	132	191.2	Wealth (e.g. real property-based)
Germany	Yes	141	117	Taxable income in small municipalities or street sections in larger municipalities
Greece	Yes	-1.8	11.0	Average incomes and housing prices
Hungary	Yes	1.5	0.2	Average personal income taxes
Ireland	Yes	10.2	19.4	Deprivation/affluence indicator and top 10%
Italy	No	8.0	4.2	n/a
Luxembourg	Yes	57.5	94.6	Average incomes (of reference person)
Poland	Yes	9.5	-18.7	Average income taxes and property sizes
Portugal	Yes	53.1	51.7	Floor space of owned property
Slovakia	Yes	5.0	22.1	Regional average incomes
Slovenia	No	21.1	-12.0	n/a
Spain	Yes	234	113.5	Taxable wealth

Source: The Household Finance and Consumption Survey (2016). *Cross-country metadata information. Wave 2*, European Central Bank. Oversampling top 10% income own calculations.

1.2 Do-files preparation input data for EUROMOD

We have integrated the HFCS data in EUROMOD. EUROMOD is a static model covering all EU-28 countries that provides measures of direct taxes, social insurance contributions, cash benefits as well as market incomes in a comparable way across EU countries. EUROMOD simulates cash benefit entitlements and direct tax and social insurance contribution liabilities on the basis of the tax-benefit rules in place and information available in the underlying datasets. Instruments which are not simulated, as well as market income are taken directly from the data. For further information, see Sutherland and Figari (2013). The standard input database for EUROMOD is the European Union Statistics on Income and Living Conditions (EU-SILC).

In line with previous work that has been done for the first wave of HFCS, we created a EUROMOD input database that is directly derived from the HFCS dataset. To do so, we have started from the same do-files that were used for the creation of the input data for the countries that were part of the first HFCS wave such that the content and imputations are largely the same (see Kuypers et al., 2017). A major advantage of using HFCS data is that – with the exception of Italy, Ireland and Finland – it applies a multiple imputation technique (5 times) to deal with selective item non-response. In order to utilize this advantage to its fullest, we have created five different EM-HFCS input databases, each one of them containing information on one of the imputations.

Table 2 provides an overview of the income reference years of the respective countries. For most years it is 2013, or one year before or after 2013. For Spain it is 2010.

Table 2 Overview of income reference year for each country, HFCS second wave.

Income reference year			
2010	2012	2013	2014
ES	EE, PT, IE	BE, DE, CY, LU, AT, PL, SL, SK, FI, GR	FR, IT, HU

Source: The Household Finance and Consumption Survey (2016). *Cross-country metadata information. Wave 2*, European Central Bank.

In Table 3 we present sample size and mean weights of the HFCS data in EUROMOD (EM-HFCS). Following common EUROMOD conventions, children that were born after the end of the income reference period are deleted from the sample in the input database. We only know the age of the individuals at the time of the interview, not the year in which they were born. Therefore, we assume all individuals younger than one year old to be born after the income reference period. The outcomes of applying this procedure to the HFCS input data for each of the separate countries is presented in the column 'Restricted individuals'. We compare these with the corresponding numbers in the EUROMOD SILC data (EM-SILC).

Table 3 Sample characteristics of EUROMOD input data, EM-HFCS vs. EM-SILC, income reference year.

		Households	Original individuals	Restricted individuals	Mean weight
Austria	EM-HFCS	2,997	6,189	6,168	1,335
	EM-SILC	5,909	-	12,945	647
Belgium	EM-HFCS	2,238	5,200	5,187	2,143
	EM-SILC	5,817	-	13,896	781
Cyprus	EM-HFCS	1,289	4,223	4,214	198
	EM-SILC	4,294	-	12,000	71
Estonia	EM-HFCS	2,220	5,709	5,650	225
	EM-SILC	5,433	-	14,210	93
Finland	EM-HFCS	11,030	27,142	27,142	198
	EM-SILC	11,030	-	27,142	198
France	EM-HFCS	12,035	28,845	28,577	2,229
	EM-SILC	11,390	-	26,558	2,342
Germany	EM-HFCS	4,461	10,201	10,160	7,833
	EM-SILC	12,744	-	26,438	3,015
Greece	EM-HFCS	3,003	7,744	7,741	1,386
	EM-SILC	14,096	-	34,380	311
Hungary	EM-HFCS	6,207	14,623	14,473	663
	EM-SILC	7,770	-	18,668	519
Ireland	EM-HFCS	5,419	14,546	12,906	317
	EM-SILC	4,592	-	11,794	386
Italy	EM-HFCS	8,156	19,366	19,290	3,131
	EM-SILC	17,985	-	42,791	1,413
Luxembourg	EM-HFCS	1,601	4,444	4,400	115
	EM-SILC	5,802	-	15,462	32
Poland	EM-HFCS	3,455	9,035	8,952	4,212
	EM-SILC	12,978	-	35,991	1,045
Portugal	EM-HFCS	6,207	16,513	16,404	634
	EM-SILC	6,257	-	15,926	660
Slovakia	EM-HFCS	2,135	5,433	5,378	959
	EM-SILC	5,490	-	15,681	332
Slovenia	EM-HFCS	2,553	7,245	7,204	285
	EM-SILC	9,205	-	28,034	71
Spain	EM-HFCS	6,106	15,852	15,788	2,892
	EM-SILC	13,597	-	36,992	1,244

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

With respect to the countries that were part of the first HFCS wave (i.e. Belgium, Finland, France, Italy, Germany and Spain) some minor² and major differences are worth mentioning.

² First, “post-secondary education” was not considered as a separate category for the variable on “highest education achieved” in the first HFCS wave. More precisely, this category was taken together with “upper secondary education”. In the second wave of HFCS these categories are considered separately. Therefore we had to add a line of imputation for “Post-secondary education” in the creation of the EUROMOD educational variables, i.e. “dew” and “dey”. Second, the variable that includes whether other real properties are rented, is covered in the second wave in variable “HB260\$x”, which also includes other uses of real property properties and a ranking among these uses, while in the first wave the different uses were reported in separate yes/no variables (“HB260\$x” to “HB263\$x”).

During the preparation of the input data we faced several problems that occurred in most (or all) countries. These major, common issues were mainly related to missing values in the original input data files. We briefly summarize them here; for details we refer to the country notes in the respective Annexes.

- *Cadastral variables ("kho*")*: The cadastral value of a property is not available in HFCS. Yet, in some countries it is necessary for the calculation of the real property (transfer) tax. To solve this issue, we approximate the cadastral values by first calculating a ratio between the total market value of properties and the total cadastral values if possible (e.g. Spain). This ratio is then multiplied by the reported current value of a property (also taking into account the % ownership of the individual/household). For some countries we were not able to find the relevant information to calculate the ratio between the total market value and cadastral values (e.g. Luxembourg). In such cases the ratio was determined in line with policy parameters, e.g. for Luxembourg cadastral values are approximated to be around 0.5% of market values.

- *Purchase year of main residence/ other properties ("amryp", "aobyp01-03")*: The purchase year of a property is needed for the calculation of the real property transfer tax in the majority of the countries. Thus, all missing values are approximated by the year of mortgage if available. We assume that when there are no outstanding mortgages or loans that use the property as collateral it was not purchased recently and therefore we assume that the policy does not apply.

- *Purchase value of main residence/ other properties ("amrpv", "aobpv01-03")*: The purchase value of a property is based on the variable "property value at the time of its acquisition". For some households this variable is missing. We then approximated the purchase value of the property by its current value as this should be more or less the same for recently purchased buildings.

- *Way of acquiring main residence/ other buildings ("amrwa", "aobwa01-03")*: The way in which a property is acquired is important to determine whether the real property transfer tax or inheritance & gift tax is applicable. We assume that properties for which this information is missing are purchased, since this is the most common way of acquiring.

- *Inheritances and gifts ("aih*", "agi*")*: Inheritances and gifts are observed at the household level in the HFCS, while they are taxed at the individual level. In our implementation we assign the inheritance/gift to the household head and in case there are two or more inheritances/gifts received in the same year, the most important one is assigned to the household head, the second one to the partner and so on. As the applicable tax rate in most countries depends on the relationship between the donor/deceased and the beneficiary, we use the information stored in the variable "gift/inheritance: from whom received?". When this variable is missing we assume the inheritance/gift to be received from parents as it is the most common relationship. Finally, many countries grant tax exemptions, deductions or preferential tax rates to certain types of assets (i.e. mostly main residence and business wealth). In the HFCS we observe the total amount of inheritance/gift as well as which types of assets are received, but not the amount for each asset type. We imputed these amounts based on the information on the stock variables observed in the survey.

- *Financial income*: In several countries not all types of financial income (i.e. interests, rents, dividends, ...) are treated equally by the tax system. Some countries levy lower tax rates on certain types of financial income (i.e. Belgium, Italy, ...), while others have a specific tax in place on specific financial income (i.e. Cyprus, Luxembourg). In the HFCS only an aggregate amount of financial income is observed. We impute the separate amounts based on this total, the stock variables from which the income is generated and average national interest rates/rates of return.

- *Net wealth*: In the HFCS wealth variables refer to the situation at the time of the interview. For the implementation of the net wealth tax in both France and Spain we need the owned net wealth on January 1st of the income reference year (i.e. 2014 for France and 2010 for Spain). In order to get an approximation of this we subtract from wealth at the time of the interview the value of real estate purchased and inheritances/gifts received in the policy and survey year and financial income received in the policy year as an estimate of the growth of financial assets.

1.3 Uprating of monetary variables

To be able to run the income reference year input data on the 2017 policy system in EUROMOD uprating indices need to be applied (“Uprate_cc”). In other words, we take into account the “growth rate” of monetary variables over the years by uprating these variables in the model with the corresponding price and income indices as reported by external sources (for more information on the general uprating procedure, see EUROMOD Country Reports). In what follows we will briefly discuss the example of Germany. More specific information on the uprating procedure for each of the countries can be found in Annex.

For Germany, we used the same uprating indices as those used for EM-SILC data, with some modifications. For the original EUROMOD variables we had to define an uprating index for “bot” (benefit – other) as in HFCS all benefits are taken together, whereas in EU-SILC these are covered separately. We used the uprating index \$f_cpi to uprate “bot” given that this index is also used to uprate the separate benefit variables in the case of EM-SILC. Furthermore, variables “pdi” and “poa” (disability and old-age pensions) are uprated for SILC as the sum of its parts. Since in EM-HFCS we do not have information on these separate parts, we immediately uprate the aggregate variable using the same uprating index as originally used for all parts (i.e. again “\$f_cpi”).

In addition, we also have to define uprating indices for the new wealth-related variables. The real property tax and inheritance & gift tax are for 2013 only simulated for those properties purchased and inheritances/gifts received in the respective year. Since we do not have any information on the purchases of properties and inheritances/gifts in 2017 we used the same as those of 2013 (see Figure 1) such that we can simulate the wealth taxes of the income reference year in the 2017 policy system.

Figure 1 Example of uprating year variables.

uprate_de		on	DEF: UPRATING FACTORS
fix	Uprate	on	Update SILC data
fix	BenCalc	on	
	Comp_Cond	1	{amryp=2013}
	Comp_perTU	1	2017
	Comp_Cond	2	{amryp!=2013}
	Comp_perTU	2	amryp
	Output_Var		amryp
	TAX_UNIT		tu_individual_de

Source: Screenshot from EUROMOD model H0.34+.

An overview of how the monetary variables are uprated is presented in Table 4. First, the main asset variables are uprated based on their respective aggregates in the national accounts which were taken from the Federal Statistical Office Germany (2018a; 2018b) and the Deutsche Bundesbank (2018). For self-employment business we used the categories “machinery & equipment” and “intellectual property rights” from the national accounts as a proxy. For the HFCS asset categories “managed accounts” and “money owed to households” there was no information available in the national

accounts. For managed accounts we applied the same uprating index as for mutual funds and for money owed to the household we just used the default, i.e. the price index. The aggregate wealth variables “ape”, “ara” and “ato” are uprated as the sum of their uprated components. Second, the variables related to inheritances and gifts are uprated using the total amount of inheritances and gifts larger than 0 euro, also taken from the Federal Statistical Office Germany (2018c). The variable “xhcobmomi” (mortgage interests for rented properties) is uprated using the index “\$f_housingrents”, which is also used for the mortgage interests for the main residence (“xhcmomi”). Finally, we chose to not uprate cadastral values (“khoo”, “kho01” and “kho02”) as they are already a very rough approximation and relevant information for an uprate index was not found.

Table 4 Overview of uprating indices used for wealth variables in EUROMOD, Germany.

Uprate index	Variables uprated by the index	Value 2013	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	7160.327	8328.779	Gross stock of buildings and structures, in billion euro (1)
\$f_avh	avh	302.188	328.754	Stock of personal transport equipment, in billion euro (2)
\$f_avl	avl	157.937	175.883	Stock of other durables, in billion euro (2)
\$f_asb	asb	317.296	332.387	Stock of machinery & equipment and intellectual property products, in billion euro (1)
\$f_adp	adp	1798.8	2119.6	Stock of transferable & other deposits, in billion euro (3)
\$f_amf	amf, ama	398.3	576.2	Stock of investment fund shares, in billion euro (3)
\$f_abd	abd	179	120.5	Stock of debt securities, in billion euro (3)
\$f_apb	apb	264.4	314.7	Stock of unlisted shares and other equity, in billion euro (3)
\$f_ash	ash	223.2	327.4	Stock of listed shares (domestic & other), in billion euro (3)
\$f_app	app	1555.6	1826	Stock of life insurance and pension entitlements, in billion euro (3)
\$f_aot	aot	328	384.8	Stock of non-life insurance technical reserves and other accounts, in billion euro (3)
\$f_adb	adb	1565.1	1727.5	Stock of total liabilities, in billion euro (3)
\$f_aih	aihvr, aihrvr, aihsvr, aihvlvr	17348.752	23277.162	Total amount of inheritances > 0 euro, in million euro (4)
\$f_agi	agivr, agibsvr, agivlvr	11506.631	11176.946	Total amount of gifts > 0 euro, in million euro (4)
\$f_anw	anw	11920.678	13876.691	Stock of net wealth (sum of fixed assets, consumer durables and financial assets less liabilities), in billion euro (1,2 and 3)

Note: All stock variables refer to the situation at the end of the year.

Source: (1) National Accounts, Fixed assets by sector (Federal Statistical Office Germany, 2018a); (2) National Wealth Accounts, consumer durables (Federal Statistical Office Germany, 2018b); (3) Financial Accounts (Deutsche Bundesbank, 2018); (4) Finanzen und Steuern, Erbschaft- und Schenkungsteuer (Federal Statistical Office Germany, 2018c).

1.4 Using the HFCS input data for standard simulations in EUROMOD

In this paragraph we provide details on simulating standard EUROMOD policies based on the HFCS input dataset. With standard EUROMOD policies we refer to all policies which are part of the original EUROMOD spine. Overall, the majority of policies can be simulated similarly as for EU-SILC, but there are some exceptions. Sometimes small adaptations are made to run certain policies. For Spain, for instance, the contributory old-age pension complement ('poacm_s') and the non-contributory old-age pension ('poanc_s') are simulated standardly only for those who are eligible in the input data (i.e. a positive amount of this benefit is observed in the input data). As we do not observe this eligibility in the HFCS data we decided to switch on the alternative eligibility simulation provided in the policy spine. Even after the adaptations there are, however, certain policies which remain not simulated and Table 5 presents an overview for each country of the involved output variables. There may be different reasons why a variable cannot be simulated; some output variables cannot be simulated due to insufficient information in the underlying dataset, others because there are no eligible cases in the input dataset and there are also policies which are already not simulated in the standard version of EUROMOD (i.e. there simulated is 'switched off'). As these situations do not all have the same effect on the simulation results, we present these different cases in separate columns in Table 5.

The first column refers to the situation which likely has the highest effect on the results. Indeed, the policies which cannot be simulated based on the HFCS data (due to insufficient information), but which can be simulated based on EU-SILC are the most important ones. These mostly refer to policies related to unemployment (although these are often also only partially simulated for EU-SILC). For Poland among others the personal income tax and social insurance contributions levied specifically on farmers cannot be simulated due to missing information on specific details of farmland on which the simulation relies. For Spain it mainly reflects the regional policies which cannot be simulated because the HFCS does not cover this information. The second column lists the output variables for which the simulation is currently also zero for everyone, but this is due to the fact that there are simply no eligible cases in the dataset. In other words, if there were eligible cases present in the sample, the simulation would be possible. This is for instance the case for the output variable containing the simulated birth grant. Since we make the assumption for HFCS that all children under the age of 1 are born after the income reference period they are not included in the input data and hence we have no children in the dataset eligible for a birth grant. The third column lists the variables which are already not simulated in the standard version of EUROMOD, so they are also not simulated for HFCS. In some cases, however, it may be possible to simulate these if they were switched on (the social assistance benefit for the elderly in Belgium is an example of that).

The fact that variables cannot be simulated often means that they cannot be taken into account when calculating disposable incomes. The main exception are the unemployment benefits, which are often not simulated but taken directly from the data so that they are included in disposable income even when not simulated. Since the data do not allow to make a distinction between contributory and non-contributory unemployment benefits, we label all unemployment benefits as contributory.

As is clear from Table 5 non-simulated variables refer mainly to social benefits, so that simulations based on the HFCS input data might (slightly) underestimate disposable incomes at the bottom of the distribution. In case the total amount of social benefits are correctly observed in HFCS, but not all separate benefits can be simulated they are, however, still included in disposable income. Indeed, the difference between the amount observed in HFCS and the sum of the simulated benefits is added to disposable income. Only when the observed total amount of social benefits is not correctly captured in HFCS (due to for instance underreporting) and not all social benefits can be simulated in EUROMOD, disposable incomes are (slightly) underestimated.

Table 5 Overview of non-simulated EUROMOD output variables

Country	Policies which cannot be simulated specifically with HFCS data	Policies for which there are no eligible cases in HFCS	Simulation already switched off in standard version of EUROMOD
Austria	<ul style="list-style-type: none"> - 'bunct_s': Unemployment benefit (taken directly from input data) - 'bunnc_s': Unemployment assistance - 'bunmt_s': Family supplement in unemployment assistance 	<ul style="list-style-type: none"> - 'bcctu_s': Supplement for child care benefit - 'pcstu_s': Minimum pension top-up for civil servants 	<ul style="list-style-type: none"> - 'pch00_s': Child bonus for pensioners (included in poa00) - 'pchcs_s': Child bonus for civil servant pensioners (included in poacs)
Belgium		<ul style="list-style-type: none"> - 'bchba_s': Birth grant 	<ul style="list-style-type: none"> - 'bsaoa_s': Income support for the elderly - 'bun_s': Unemployment benefit (taken directly from input data) - 'byr_s': Early retirement benefit (taken directly from input data)
Cyprus	<ul style="list-style-type: none"> - 'bunct_s': Unemployment benefit (taken directly from input data) 	<ul style="list-style-type: none"> - 'bchba_s': Birth grant 	
Estonia	<ul style="list-style-type: none"> - 'bunnc_s': Unemployment assistance 	<ul style="list-style-type: none"> - 'bchba_s': Birth grant 	
Finland			
France		<ul style="list-style-type: none"> - 'bchba_s': Birth grant 	<ul style="list-style-type: none"> - 'bsuwd_s': Means-tested benefit for widows/widowers (taken directly from input data)
Germany	<ul style="list-style-type: none"> - 'bunct_s': Unemployment benefit (taken directly from input data) - 'pdiac_s': Long-term care benefits from statutory accident insurance 	<ul style="list-style-type: none"> - 'bhl_s': Sickness benefit 	
Greece	<ul style="list-style-type: none"> - 'bunnc_s': Unemployment assistance 		<ul style="list-style-type: none"> - 'tinwh_s': Withholding tax on benefits - 'bched_s': Income support to families with children in compulsory education (for SILC taken from input data, no such information in HFCS)
Hungary		<ul style="list-style-type: none"> - 'bmanc_s': Maternity grant 	<ul style="list-style-type: none"> - 'bfaot_s': Other family benefit (for SILC included in input data, no such information in HFCS)
Ireland	<ul style="list-style-type: none"> - 'bma_s': Maternity benefit - 'bsa00_s': Basic supplementary welfare allowance - 'bhl_s': Injury benefit - 'bdict_s': Illness benefit - 'bdinc_s': Disability allowance - 'bunnc_s': Jobseeker allowance - 'tpceepi_s': Superannuation employee social 	<ul style="list-style-type: none"> - 'tsceepb_s': Public sector pension related deduction 	

	insurance contributions (Compulsory pension contribution)		
Italy	- 'tinsv_s': Tax on arrears and severance pay	- 'bfacc_s': Mother bonus	
Luxembourg	- 'bunss_s': Unemployment benefit (taken directly from input data)		- 'bched04_s': Education allowance (taken from input data for SILC, no such information in HFCS, policy no longer exists in 2017) - 'bmals_s': Maternity allowance (taken from input data for SILC, no such information in HFCS, policy no longer exists in 2017)
Poland	- 'bchba01_s': Parental allowance - 'bho_s': Housing benefit - 'bchlp00_s': Supplement for lone parent - 'bcrdi_s': Nursing allowance - 'bsatm_s': Temporary social assistance - 'tag_s': Agricultural tax - 'tfrhl_s': Health contribution farmers - 'tscfr_s': Social insurance contribution farmers - 'tscmaee_s': Social insurance contribution maternity leave recipients - 'tscmaer_s': Social insurance contribution employers of maternity leave recipients	- 'bchba_s': Supplement for child birth	
Portugal	- 'bunnc_s': Unemployment assistance		- 'poact_s': Contributory old-age pension (taken directly from input data)
Slovakia		- 'bchba_s': Birth grant	
Slovenia	- 'bmact_s': Maternity benefit - 'bmanc_s': Parental allowance	- 'bchba_s': Birth grant	
Spain	- 'bchucrg_s': Regional universal child benefit - 'bchbaucrg_s': Regional universal birth or adoption benefit - 'bchbamtrg_s': Regional means-tested birth or adoption benefit - 'bchlgurcg_s': Regional universal large family benefit - 'bchlgmtrg_s': Regional means-tested large family benefit - 'bchmtrg_s': Regional means-tested child benefit - 'bunct_s': Unemployment benefit (taken directly from input data) - 'bunnc_s': Unemployment assistance	- 'bchbamtna_s': National means-tested birth or adoption benefit - 'bchbaucna02_s': National multiple birth or adoption benefit	- 'bunct02_s': Unemployment benefit for self-employed (included in bunct) - 'bunmt_s': Temporary unemployment protection program (included in bunnc_s for SILC, bunct for HFCS) - 'bsa_s': Social assistance (taken from data for SILC, no such information in HFCS)

	- 'psuwpcm_s': Contributory widow pension complement		
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1.5 Micro-validation of income concepts

In this paragraph we validate the standard EUROMOD outcomes for a number of income concepts, i.e. without taking into account the wealth-related policies. The validation is based on a comparison with results of EUROMOD simulations based on EU-SILC input data, for which the income reference period and policies also refer to the income reference year of EM-HFCS. We only show the results for the income reference year since the comparison for 2017 would be exactly the same, given that the uprating factors applicable to the standard EUROMOD variables are the same for EM-HFCS and EM-SILC. Consequently, the validation would show the same trends as for the income reference year policies. The results for EM-HFCS are the result of taking the mean over the five imputations.

Table 6 presents summary statistics of original & pension income and disposable income between EM-HFCS and EM-SILC. On top of that, it also displays the Gini-coefficients of the respective income concepts. A comparison of the mean values indicates that there is a wide variety between countries in the level of correspondence between EM-HFCS and EM-SILC. In the majority of the countries original & pension income is (slightly) higher in EM-HFCS, which might be due to the oversampling of the wealthy applied in HFCS. Although the analysis of the summary statistics indicates a reasonable correspondence between EM-HFCS and EM-SILC, we also take a look at the distribution of the income concepts. In most countries the income distribution is more unequal in EM-HFCS. Again, this may be due to the HFCS oversampling.

Table 6 Comparison of overall EUROMOD equivalised income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year.

Country	Original & pension income				Disposable income				Gini-coefficients			
	Mean		Median		Mean		Median		Original income		Disposable income	
	HFCS	SILC	HFCS	SILC	HFCS	SILC	HFCS	SILC	HFCS	SILC	HFCS	SILC
Austria	27,274	32,553	24,575	28,198	21,627	25,185	20,174	22,519	0.288	0.364	0.200	0.250
Belgium	30,623	26,686	27,227	24,206	21,623	21,023	19,863	20,038	0.374	0.396	0.250	0.221
Cyprus	16,098	18,652	12,600	14,229	15,404	19,100	12,790	15,115	0.404	0.412	0.324	0.338
Estonia	10,353	8,112	7,869	6,727	9,345	7,502	7,291	6,356	0.468	0.381	0.401	0.317
Finland	31,601	30,329	27,736	26,760	26,359	25,573	23,962	23,211	0.364	0.379	0.233	0.241
France	22,079	28,914	19,138	24,485	20,033	23,994	17,467	20,802	0.401	0.371	0.260	0.276
Germany	31,375	28,600	24,222	24,379	23,852	22,061	19,641	19,526	0.431	0.378	0.318	0.280
Greece	11,859	11,161	10,372	8,990	10,525	9,886	9,467	8,549	0.346	0.409	0.296	0.330
Hungary	6,225	5,889	4,998	5,199	4,897	4,429	4,067	4,030	0.412	0.355	0.329	0.286
Ireland	28,790	22,744	21,886	18,134	24,531	22,156	21,145	19,573	0.493	0.518	0.331	0.275
Italy	20,137	22,020	16,290	18,338	15,484	22,021	13,340	15,557	0.407	0.388	0.340	0.314
Luxembourg	48,971	44,526	36,800	37,039	39,801	37,874	33,225	33,816	0.424	0.385	0.296	0.242
Poland	8,898	7,434	7,410	6,309	6,978	6,040	5,956	5,265	0.378	0.367	0.333	0.304
Portugal	11,693	11,903	8,725	8,960	10,395	10,501	8,582	8,726	0.433	0.438	0.330	0.319
Slovakia	7,841	7,933	7,046	7,105	6,945	7,026	6,277	6,461	0.352	0.322	0.252	0.236
Slovenia	11,436	14,731	9,650	12,988	9,587	12,648	8,580	11,728	0.388	0.363	0.264	0.241
Spain	16,883	15,651	13,043	13,067	16,495	14,714	13,186	13,384	0.451	0.400	0.383	0.313

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

2. Wealth-related policies in EUROMOD

In this chapter we provide an overview of the existing wealth-related policies in Europe and whether or not these policies are simulated in the respective country in the income reference year and/or 2017 policy system. “Wealth-related policies” refer to policies that use information on (income from) wealth. We briefly discuss the wealth taxes that have been newly integrated in the model, and point out some of the main similarities between the different countries. In the next section we present how policies that were already in the EM-SILC version have been refined on the basis of HFCS. A more detailed description per country can be found in Annex.

2.1 New EUROMOD policies

Tables 7 and 8 present the existing wealth taxes in Europe and summarize which taxes are included in the model. Overall, these taxes can be divided into three categories, namely *inheritance and gift taxes*, *real property taxes & taxes on transfers of property* and *taxes on the ownership of net wealth*. In our tables we make a distinction between taxes that exist in a given country and that were added to EUROMOD (ES), taxes that exist in a given country but that were not added (ENS) and taxes that do not exist in a given country (N). In general, the majority of the taxes below were not yet simulated in EUROMOD due to data limitations. There are however some exceptions. In Greece, for example, the real property tax is already simulated to a certain extent based on EM-SILC data.

Table 7 Overview of new wealth policies in EUROMOD, income reference year.

	Real property tax	Real property transfer tax	Inheritance tax	Gift tax	General net wealth tax	Specific net wealth tax
Austria	ES	ES	N ¹	N ¹	N	N
Belgium	ES	ES	ES	ES	N	N
Cyprus	ES	ES	ES ²	ES ²	N	N
Estonia	ES	N	N	N	N	N
Finland	ES	ENS	ENS	ENS	N	N
France	ES	ES	ES	ES	ES	N
Germany	ES	ES	ES	ES	N	N
Greece	ES	ES	ES	ES	N	N
Hungary	ENS	ES	ES	ES	N	N
Ireland	ES	ES	ES	ES	N	N
Italy	ES	ES	ES	ES	N	ES
Luxembourg	ES	ES	ES	ES	N	N
Poland	ES	ES	ES	ES	N	N
Portugal	ES	ES	ES ³	ES ³	N	N
Slovakia	ES	ENS ⁴	N	N	N	N
Slovenia	ES	ES	ES	ES	N	N
Spain	ES	ES	ES	ES	ES ⁵	N

Note: ES= exists & simulated; ENS= exists & not simulated; N= does not exist. ¹The inheritance & gift tax was abolished in 2008. A provision for inheritances and gifts still exists under the real property transfer tax. ²Inheritance & gift tax was abolished in 2000 and thereafter included in the legislation of the real property transfer tax. ³Inheritance & gift tax was abolished in 2004 and thereafter included in the stamp duty. ⁴In Slovakia there is a real property transfer tax provision. We are not able to simulate this provision since it requires specific information. However, the budgetary impact of the tax is very limited. ⁵The general net wealth tax was abolished in Spain between 2008 and 2011 and was reintroduced thereafter.

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

Table 8 Overview of new wealth policies in EUROMOD, 2017 policy system.

	Real property tax	Real property transfer tax	Inheritance tax	Gift tax	General net wealth tax	Specific net wealth tax
Austria	ES	ES	N ¹	N ¹	N	N
Belgium	ES	ES	ES	ES	N	N
Cyprus	ES	ES	ES ²	ES ²	N	N
Estonia	ES	N	N	N	N	N
Finland	ES	ENS	ENS	ENS	N	N
France	ES	ES	ES	ES	ES	N
Germany	ES	ES	ES	ES	N	N
Greece	ES	ES	ES	ES	N	N
Hungary	ENS	ES	ES	ES	N	N
Ireland	ES	ES	ES	ES	N	N
Italy	ES	ES	ES	ES	N	ES
Luxembourg	ES	ES	ES	ES	N	N
Poland	ES	ES	ES	ES	N	N
Portugal	ES	ES	ES ³	ES ³	N	N
Slovakia	ES	ENS ⁴	N	N	N	N
Slovenia	ES	ES	ES	ES	N	N
Spain	ES	ES	ES	ES	ES ⁵	N

Note: ES= exists & simulated; ENS= exists & not simulated; N= does not exist. ¹The inheritance & gift tax was abolished in 2008. A provision for inheritances and gifts still exists under the real property transfer tax. ²Inheritance & gift tax was abolished in 2000 and thereafter included in the legislation of the real property transfer tax. ³Inheritance & gift tax was abolished in 2004 and thereafter included in the duty. ⁴In Slovakia there is a real property transfer tax provision. We are not able to simulate this provision since it requires too specific information. However, the budgetary impact of this tax is very limited. ⁵The general net wealth tax was abolished in Spain between 2008 and 2011 and was reintroduced thereafter.

Source: Cross country-review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

Real property tax: Ownership of real property is taxed in all HFCS countries. The tax base differs between the different countries but can be divided into three separate categories. Most countries use the cadastral value of the property/(ies) as tax base for the calculation of the property tax (Austria, Belgium, Estonia, Finland, France, Germany, Italy, Luxembourg, Portugal and Spain). Other countries use the market value (Cyprus, Hungary³, Ireland and Slovenia) or the property size in m² (e.g. Hungary², Poland and Slovakia) as tax base. In some countries there exist exemptions from the real property tax. Note that the Hungarian real property tax cannot be simulated since it requires detailed information that is not available in HFCS (for more information see Annex).

Real property transfer tax: Transfers of real property are subject to a transfer tax that is payable by the buyer of the property in all countries. A “transfer of property” refers to either the purchase of immovable property or the sale of owned immovable property. The purchase of immovable property is often preceded by taking out a mortgage. In most countries, this is also subject to taxation and is known primarily as the so-called “mortgage registration duties” (see further). With the exception of Italy, all countries levy the transfer tax on the price of the property (i.e. its fair market value), while in Italy the cadastral values are used as tax base. In general, there are no exemptions from this tax, although transfers of properties between lineal heirs or properties held by the government are exempt from taxation in some countries (e.g. Germany, Portugal, Spain ...). For Finland and Slovakia we are not able to simulate the transfer tax. In Finland this has to do with the use of register data, whilst in case of the latter specific information is needed.

³ In Hungary, either the property size or adjusted market value can be used as tax base, depending on the municipality.

Inheritance & gift tax: Apart from Austria, Estonia and Slovakia inheritances and gifts are subject to taxation in all countries and are due by the beneficiary of the inheritance/gift. Overall, the value of the inheritance/gift is used as tax base. The tax rates vary between countries mostly according to the kinship between the beneficiary and the deceased/donee (e.g. Greece, Ireland, Italy, Spain). A few countries levy a flat tax rate instead of taking into account the relationship between the beneficiary and the deceased/donee (e.g. Hungary, Portugal). Countries such as Belgium, France, Italy and Spain exempt certain amounts or types of inheritances/gifts from taxation. These exemptions mainly depend on the kinship between the beneficiary and the deceased/donee.

General net wealth tax: The general net wealth tax only exists in France⁴ and Spain. In both countries the tax is levied on the net wealth (i.e. real and financial assets minus liabilities). To be more precise, the tax is levied on individuals who own a “high share of net wealth”, i.e. at least €1,300,000 in France and €700,000 in Spain. Both countries make a distinction between residents and non-residents, i.e. residents are taxed on their worldwide assets, whilst non-residents are only taxed on their assets located in the respective country. Apart from the tax-free threshold, both countries have additional exemptions from the wealth tax included in their tax legislation. Tax rates are progressive in both France and Spain. Italy levies a “specific net wealth tax”, which more precisely entails the taxation of bank accounts and financial assets.

2.2 Refinement of existing EUROMOD policies

Tables 9 and 10 present a brief overview of the existing wealth-related policies in the selection of HFCS countries.

Table 9 Overview of refined wealth-related policies in EUROMOD, income reference year.

	Taxation of income from financial assets	Taxation of income from real property	Tax relief for mortgage repayment	Tax relief for contributions made to private pension funds	Asset-test for social benefits	Country specific tax
Austria	ESR ¹	ES	ESR ²	ESR ³	ESR	n/a
Belgium	ES	ESR	ESR	ES	ESR	ESR ⁴
Cyprus	ES	ES	EN ⁵	ES	ESR	ESR ⁶
Estonia	ESR	ES	ES	ES	EN	n/a
Finland	ES	ES	EN	ES	ES	n/a
France	ESR	ESR	ESR	ES	N	n/a
Germany	ES	ES	ESR	EN	ESR	n/a
Greece	ESR	ESR	N	N	ES	n/a
Hungary	ESR	ES	N	ES	ESR	n/a
Ireland	ES	ESR	ESR	ES	ESR	n/a
Italy	ES	ES	ES	ES	ES	n/a
Luxembourg	ES	ES	ESR	ES	ESR	n/a
Poland	ES	ES	ES	ESR	ES	n/a
Portugal	ES	ES	ESR	ES	ESR	n/a
Slovakia	ES	ES	EN ⁷	ES	ES ⁸	n/a
Slovenia	ESR	ESR	N	ES	EN	n/a
Spain	ES ⁹	ES	ES	ES	ES	n/a

Note: ES = exists & simulated; ESR = exists, simulated & refined; EN = exists & not simulated; N = does not exist. ¹ Tax on capital gains. ² Included under the tax allowance for cost of earnings and tax allowance for exceptional deductions. ³ Included under the tax allowance for exceptional deductions. ⁴ Tax on long term saving & tax deduction for long term saving. ⁵ No specific information was found online such that we cannot implement this tax. ⁶ Special contribution to defense. ⁷ Not yet applicable in 2013 and 2017. ⁸ Social assistance is the only means-tested benefit which is simulated for Slovakia and we did not find any applicable asset-test. ⁹ Exemption for dividends.

⁴ Replaced by a tax levied only on real estate wealth since 1st of January 2018.

For each country we indicate whether the policy exists in a given country and is simulated without improvements (ES), the policy exists in a given country, is simulated and refined (ESR), the policy exists but is not simulated (EN) or the policy does not exist (N). In general, most taxes and policies that exist are already accurately simulated based on the EU-SILC data or refined by using information from HFCS. By “refined” we mean that we were able to improve the accuracy of the simulations by, for example, adding an additional eligibility condition. Changes in tax rates, tax brackets... between the income reference year and 2017 policy system are not classified as a refinement. Taxes that were not yet included in the model due to limitations of previous input data are classified as “ES”.

Table 10 Overview of refined wealth-related policies in EUROMOD, 2017.

	Taxation of income from financial assets	Taxation of income from real property	Tax relief for mortgage repayment	Tax relief for contributions made to private pension funds	Asset-test for social benefits	Country specific tax
Austria	ESR ¹	ES	ESR ²	ESR ³	ESR	n/a
Belgium	ES	ESR	ESR	ES	ES	ESR ⁴
Cyprus	ES	ES	EN ⁵	ES	ESR	ESR ⁶
Estonia	ESR	ES	ES	ES	EN	n/a
Finland	ES	ES	EN	ES	ES	n/a
France	ESR	ESR	ESR	ES	N	n/a
Germany	ES	ES	ESR	EN	ESR	n/a
Greece	ESR	ESR	N	N	ES	n/a
Hungary	ESR	ES	N	ES	ESR	n/a
Ireland	ES	ESR	ESR	ES	ESR	n/a
Italy	ES	ES	ES	ES	ES	n/a
Luxembourg	ES	ES	ESR	ES	ESR	n/a
Poland	ES	ES	ES	ESR	ES	n/a
Portugal	ES	ES	ESR	ES	ESR	n/a
Slovakia	ES	ES	EN ⁷	ES	ES ⁸	n/a
Slovenia	ESR	ESR	N	ES	EN	n/a
Spain	N ⁹	ES	ESR ¹⁰	ES	ES	n/a

Note: ES = exists & simulated; ESR = exists, simulated & refined; EN = exists & not simulated; N = does not exist. ¹ Tax on capital gains. ² Included under the tax allowance for cost of earnings and tax allowance for exceptional deductions. ³ Included under the tax allowance for exceptional deductions. ⁴ Tax on long term saving & tax deduction for long term saving. ⁵ No specific information was found online such that we cannot implement this tax. ⁶ Special contribution to defense. ⁷ Not yet applicable in 2013 and 2017. ⁸ Social assistance is the only means-tested benefit which is simulated for Slovakia and we did not find any applicable asset-test. ⁹ Exemption for dividends was abolished in 2015. ¹⁰ Since 2013 the mortgage tax credit is no longer in effect for individuals who bought their residences after 1st of January of that year.

3. Macro-validation of new EUROMOD policies

In this chapter we turn to the macro-validation of the newly added and refined wealth(-related) policies in EUROMOD that were described above. First, we present an overview of the number of eligible cases and taxpayers for each of the separate taxes (Table 11). Then, we compare the simulated tax revenues with figures from external sources to assess the accuracy of the simulations (Table 12).

3.1 Overview of eligible cases and taxpayers of the simulated wealth taxes

Table 11 shows for each of the taxes the total number of *eligible cases* and the final number of *taxpayers*. By “eligible cases” we refer to cases that could be theoretically taxed, i.e. without taking into account the current tax legislation of a given wealth tax. This number does not necessarily correspond to the number of actual taxpayers since units may not pay a tax several reasons (e.g. missing input data, exemption foreseen in tax legislation). The final “taxpayers” are those cases that eventually pay a positive tax after taking into account the tax rules (weighted population is presented between brackets).

The number of eligible cases in the input data is determined in the same way across all countries, namely:

- *Real property tax*: households are considered eligible if they (partially) own at least one property.
- *Real property transfer tax*: households are considered eligible if they bought at least one property in the respective policy year.
- *Inheritance tax*: individuals are considered eligible if they received a positive inheritance in the respective policy year.
- *Gift tax*: individuals are considered eligible if they received a positive gift in the respective policy year.
- *Mortgage registration duties*: households are considered eligible if they took out at least one mortgage in the respective policy year.
- *Net wealth tax*: individuals are considered eligible if they possess positive net wealth.

Table 11 Number of eligible cases and taxpayers for each of the simulated wealth taxes, income reference year and 2017.

Country	Wealth tax	Eligible cases	Taxpayers	
			Income reference year	2017
Austria	Real property tax	1,412	1,412 (2,033,783)	1,412 (2,033,783)
	Real property transfer tax	27	27 (37,195)	27 (37,195)
Belgium	Real property tax	1,689	1,686 (3,531,695)	1,686 (3,531,695)
	Real property transfer tax	28	27 (75,842)	25 (68,577)
	Inheritance tax	49	42 (74,564)	45 (75,363)
	Gift tax	15	14 (45,970)	14 (45,970)
	Mortgage registration duties	40	40 (119,424)	40 (119,424)
	Tax on long-term saving	44	44 (66,663)	44 (66,663)
	Cyprus	Real property tax	1,098	1,098 (250,309)
	Real property transfer tax	5	5 (688)	5 (688)
	Mortgage registration duties	77	77 (13,824)	77 (13,824)
	Gift provision	27	22 (3,620)	0
Estonia	Real property tax	1,801	0	0
Finland	Real property tax	8,536	8,536 (1,775,911)	8,536 (1,775,911)
France	Real property tax	8,983	7,357 (13,944,202)	7,355 (13,935,691)
	Real property transfer tax	288	270 (507,207)	270 (507,207)
	Inheritance & gift tax	436	136 (237,780)	147 (252,843)
	Net wealth tax	19,262	1,072 (295,666)	1,155 (342,915)
Germany	Real property tax	2,895	2,894 (19,830,502)	2,894 (19,830,502)
	Real property transfer tax	92	89 (628,066)	89 (628,066)
	Inheritance & gift tax	363	22 (115,354)	27 (119,988)
Greece	Real property tax	3,003	982 (1,438,851)	1,793 (3,038,838)
	Emergency property tax	3,003	33 (47,370)	n/a
	Real property transfer tax	11	11 (3,326)	11 (3,326)
	Inheritance & gift tax	13	4 (4,134)	5 (4,134)
Hungary	Real property transfer tax	69	69 (42,300)	69 (42,300)
	Inheritance tax	47	5 (3,514)	5 (3,514)
	Gift tax	28	1 (224)	1 (224)
Ireland	Real property tax	3,968	3,938 (1,226,062)	3,917 (1,221,527)
	Real property transfer tax	79	36 (9,153)	36 (9,153)
	Inheritance & gift tax	96	13 (3,184)	17 (4,273)

Country	Wealth tax	Eligible cases	Taxpayers	
			Income reference year	2017
Italy	Real property tax	6,070	6,070 (17,577,593)	1,880 (5,693,335)
	Real property transfer tax	77	77 (300,929)	77 (300,929)
	Inheritance & gift tax	204	30 (86,236)	30 (86,236)
	Net wealth tax	8,156	8,156 (24,694,121)	8,156 (24,694,121)
Luxembourg	Real property tax	1,295	1,295 (157,609)	1,295 (157,609)
	Real property transfer tax	41	41 (5,700)	41 (5,700)
	Inheritance tax	37	8 (1,048)	8 (1,048)
	Gift tax	10	1 (76)	1 (76)
Poland	Real property tax	3,436	3,428 (13,375,016)	3,428 (13,375,016)
	Real property transfer tax	51	50 (231,159)	50 (231,159)
	Inheritance & gift tax	85	1 (1,785)	1 (1,785)
Portugal	Real property tax	5,269	4,754 (2,697,611)	4,770 (2,704,456)
	Real property transfer tax	25	21 (8,976)	21 (8,976)
	Inheritance & gift tax (stamp duty)	158	57 (33,037)	57 (33,037)
	Mortgage registration duties	59	59 (29,484)	59 (29,484)
Slovakia	Real property tax	1,879	1,863 (1,594,174)	1,863 (1,594,174)
Slovenia	Real property tax	2,066	206 (74,469)	224 (79,900)
	Real property transfer tax	15	15 (4,350)	15 (4,350)
	Inheritance & gift tax	49	2 (305)	2 (305)
Spain	Real property tax	5,586	5,586 (15,234,706)	5,586 (15,234,706)
	Real property transfer tax	77	77 (236,799)	77 (236,799)
	Inheritance tax	150	110 (237,503)	112 (240,448)
	Net wealth tax	10,150	n/a	1,133 (313,698)

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table 11 points out that the number of eligible cases and taxpayers differs strongly between the different wealth taxes. In general, the number of eligible cases and taxpayers is highest for the *real property tax*. Consequently, the real property tax is on average the most accurately simulated wealth tax. In comparison, the number of eligible cases/taxpayers for the inheritance & gift tax, real property transfer tax and mortgage registration duties are considerably lower. This is one of the main reasons for the low(er) accuracy of the simulated revenues of these taxes (see next section).

3.2 Validation of simulated wealth tax revenues

Table 12 presents for the simulated wealth taxes a comparison of tax revenues with external figures that were retrieved among others from the OECD Tax Revenue Database (2017a). On average, we find relatively large differences between the simulated outcomes and external sources, but in general these can be explained. First of all, it must be noted that external statistics are not always available at a detailed level, such that these figures may not be fully comparable to our simulations. Second, we simulate wealth taxes for households, but external figures often do not make a distinction between taxes paid by households versus other economic actors. Third, in some cases the number of eligible cases and/or final taxpayers is very limited such that the simulated revenues are underestimated. Fourth, an overestimation of taxes can sometimes be attributed to a very limited number of taxpayers that pay a considerable high tax (this probability increases due to oversampling of the wealthy).

Table 12 Simulated wealth tax revenues (in million euro per year), income reference year and 2017.

Country	Wealth tax	Income reference year			2017		
		Simulated revenue	External figure	Ratio	Simulated revenue	External figure	Ratio
Austria	Real property tax	617.10	736.0 (1)	83.85%	617.10	771.0 (1)	80.04%
	Real property transfer tax	272.20	790.0 (1)	34.46%	142.40	1,118 (1)	12.74%
Belgium	Real property tax	3,218	3,478 (1)	92.52%	3,254	3,775 (1)	86.20%
	Real property transfer tax	1,987	3,452 (3)	56.10%	1,977	4,065 (3)	48.63%
	Inheritance tax	1,142	2,634 (3)	43.36%	1,035	2,365 (3)	43.76%
	Gift tax	103.8	463.0 (3)	22.42%	83.49	567.0 (3)	43.76%
	Mortgage registration duties	241	244.0 (4)	98.77%	233	122.0 (4)	190.98%
	Tax on long-term saving	197.7	207.0 (3)	95.51%	158.2	382.0 (3)	41.41%
Cyprus	Real property tax	94.49	100.8 (2)	93.74%	22.52	16.50 (2)	136.48%
	Real property transfer tax, gift provision and mortgage registration duties	39.93	79.70 (2)	50.10%	22.28	99.0 (2)	22.51%
Estonia	Real property tax	0	59.0 (1)	0%	0	59.0 (1)	0%
Finland	Real property tax	718.40	623.0 (1)	115.31%	858.20	811.0 (1)	105.82%
France	Real property tax	14,390	17,003 (1)	84.63%	15,470	18,465 (1)	83.78%
	Real property transfer tax	6,088	10,143 (1)	60.0%	5,916	12,644 (1)	46.79%
	Inheritance & gift tax	6,644	10,300 (1)	64.50%	8,533	12,188 (1)	70.01%
	Net wealth tax	6,807	5,377 (1)	126.59%	8,148	4,837 (1)	168.45%
Germany	Real property tax	6,795	4,951 (1)	137.2%	7,199	5,586 (1)	128.9%
	Real property transfer tax	5,181	8,394 (1)	61.7%	6,899	13,139 (1)	52.5%
	Inheritance & gift tax	1,496	4,633 (1)	32.3%	2,548	6,114 (1)	41.7%
Greece	Real property tax & Emergency property tax	415.93	2,619 (2)	15.88%	1,042	3,095 (2)	33.67%
	Real property transfer tax	37.77	275.0 (2)	13.73%	50.92	181.0 (2)	28.13%
	Inheritance & gift tax	2.53	99.0 (2)	2.56%	6.63	115.0 (2)	5.77%
Hungary	Real property transfer tax	54.52	265.23 (1)	20.56%	73.87	419.91 (1)	17.59%
	Inheritance tax	4.49	16.14 (1)	27.82%	6.27	26.40 (1)	23.75%
	Gift tax	0.13	3.87 (1)	3.36%	0.13	3.97 (1)	3.27%
Ireland	Real property tax	172.6	1,478 (1)	11.70%	483.9	463.0 (2)	98.03%
	Real property transfer tax	56.6	105.0 (2)	53.90%	68.8	301.0 (2)	22.86%
	Inheritance & gift tax	191.4	282.0 (1)	67.87%	341.1	411.0 (1)	82.99%
Italy	Real property tax	19,113	17,900 (5)	106.77%	15,675	14,400 (5)	108.85%
	Real property transfer tax	504	n/a	n/a	507	n/a	n/a
	Inheritance & gift tax	398	622 (5)	63.98%	404	557 (5)	72.53%
	Net wealth tax	1,402	2,743 (5)	51.11%	1,412	2,743 (5)	51.47%

Country	Wealth tax	Income reference year			2017		
		Simulated revenue	External figure	Ratio	Simulated revenue	External figure	Ratio
Luxembourg	Real property tax	15.62	33.0 (1)	47.33%	15.62	38.0 (1)	41.11%
	Real property transfer tax	72.97	164.0 (1)	44.49%	89.90	319.0 (1)	28.18%
	Inheritance & gift tax	17.62	71.80 (2)	24.54%	22.96	85.90 (2)	26.73%
Poland	Real property tax	1,578	4,428 (2)	35.64%	1,583	4,916 (2)	32.2%
	Real property transfer tax	232	115 (2)	201.74%	238	101 (2)	235.64%
	Inheritance & gift tax	167	1,093 (1)	15.3%	178	1,183 (1)	15.05%
Portugal	Real property tax	1,452	1,140 (1)	127.37%	1,443	1,630 (1)	88.53%
	Real property transfer tax	69.44	417.0 (1)	16.65%	68.98	841.0 (1)	8.20%
	Inheritance & gift tax (stamp duty)	100.90	1,407 (2)	7.17%	320.40	1,430 (2)	22.41%
	Mortgage registration duties	14.95	31.80 (1)	47.01%	14.95	32.28 (1)	46.31%
Slovakia	Real property tax	39.96	105.0 (1)	38.06%	36.31	115.0 (1)	31.57%
Slovenia	Real property tax	38.56	199.0 (1)	19.38%	41.86	211.0 (1)	19.84%
	Real property transfer tax	34.98	23.0 (1)	152.09%	34.96	32.0 (1)	109.25%
	Inheritance & gift tax	0.86	7.0 (1)	12.29%	0.94	8.0 (1)	11.75%
Spain	Real property tax	10,780	9,685 (1)	111.31%	10,780	13,045 (1)	82.64%
	Real property transfer tax	2,979	8,228 (1)	36.21%	4,826	8,585 (1)	56.21%
	Inheritance tax	3,237	2,425 (1)	133.48%	3,732	2,709 (1)	137.76%
	Net wealth tax	n/a	n/a	n/a	1,490	1,348 (1)	110.53%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a); (2) Taxes in Europe Database (European Commission, 2018); (3) Received taxes and actual social insurance contributions by type (National Bank of Belgium, 2017b); (4) Recent figures concerning the federally collected tax revenues (Federal Public Service Finance, 2017); (5) Italian Ministry of Economy and Finance, various sources.

4. Distributive outcomes of wealth-related taxes

In this chapter we give a selection of distributive outcomes of the simulated wealth-related taxes in our set of countries. First, we give the distribution over quintiles, while the next section looks at the impact on inequality. The results presented are for the income reference year.

4.1 Distribution of wealth taxes across quintiles of net wealth and disposable income

We first give the distribution of wealth taxes over quintiles. We present both income quintiles and wealth quintiles. For the income, resp. wealth quintiles, individuals are ranked from low to high equivalised disposable income, resp. net wealth, and then divided in five equally sized groups. We then show the average wealth tax paid per quintile for the different types of wealth taxes (all eligible cases are included). We show the quintile distribution for all simulated wealth taxes, but in the text we only discuss those types where there are at least 30 eligible cases (see Table 11 for the number of cases).

In general, the amount of real property taxes is an increasing function of both income and wealth. For instance in France, the lowest quintile pays around €450, while the highest quintile around €1,400. In France, the distribution of income and wealth quintiles is rather similar. In Austria, on the contrary, the average amount in the lowest income quintile is much higher than that of the lowest wealth quintile, while the reverse applies at the top of the two distributions. There are also some exceptions to this general pattern of increasing real property taxes. In Belgium, the lowest income quintile pays more real property taxes than the middle quintiles. In Ireland, the average amount is rather similar across quintiles.

For the real property transfer taxes, we only have more than 30 eligible cases in Hungary (69), Luxembourg (41) and Spain (77). In Hungary and Luxembourg, the average amount tends to rise with wealth (and to a lesser extent with income). In Spain the pattern is not so clear-cut.

For the mortgage registration duties, the average amount has a tendency to rise with income/wealth in Portugal, while this is not the case for Cyprus (77 cases) where the pattern is mixed.

The inheritance and gift taxes in general suffer from a limited number of cases. In Spain, the average amount of inheritance and gift taxes tends to increase with wealth and income. In Luxembourg, these taxes are clearly concentrated at the top of the distribution, while in Hungary, the pattern is not clear (note however the very low number of actual tax payers in these two countries).

Finally, the net wealth tax in France is very much concentrated at the top of both the income and the wealth distribution.

Figure 2 Simulated wealth taxes by quintiles of net wealth and disposable income (in € per year), income reference year.

Panel a: Austria.



Panel b: Belgium.



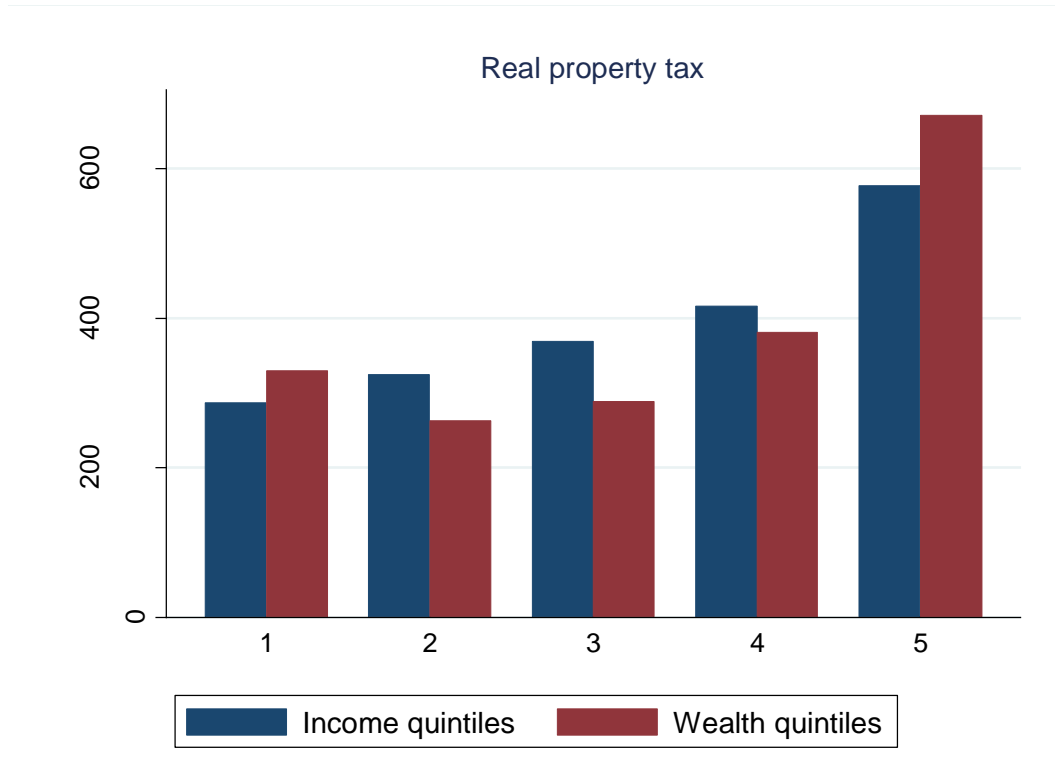
Panel c: Cyprus.



Panel d: Estonia.

Property tax results in zero simulation.

Panel e: Finland.



Panel f: France.



Panel g: Germany



Panel h: Greece.



Panel i: Hungary



Panel j: Ireland



Panel k: Italy



Panel l: Luxembourg



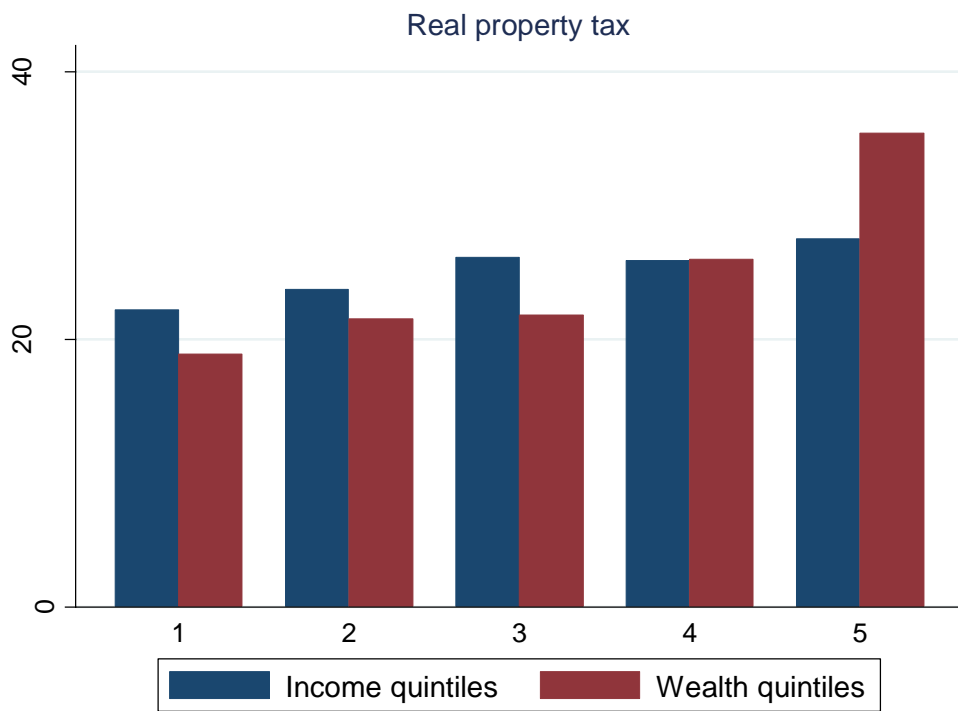
Panel m: Poland.



Panel n: Portugal.



Panel o: Slovakia.



Panel p: Slovenia.



Panel q: Spain



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

4.2 Redistributive effect of wealth policies

We now calculate the impact on inequality of wealth taxes and put them in perspective with a comparison of the combination of personal income taxes and social insurance contributions ('income taxes'). The redistributive effect is given by the difference in Gini coefficients; the redistributive effect of personal income taxes and social insurance contributions (SICs) (together representing 'income taxes') is given by the Gini of income before taxes minus the Gini of income after deduction of personal income taxes and SICs, while the redistributive effect of wealth taxes is given by the Gini of income after deduction of personal income taxes and SICs minus the Gini of income after deduction of both personal income taxes and wealth taxes. We express them both in absolute (i.e. as the difference between the two Gini's) and in relative terms (the absolute redistributive effect divided by the Gini before the respective tax(es)). A positive sign of the redistributive effect means that inequality is reduced through taxes, while a negative sign indicates an increase in inequality (Table 13).

Table 13 Redistributive effect (RE) of wealth policies, income reference year.

Country	Income	Gini-coefficient	RE (absolute)	RE (relative)
Austria	Pre-Income/Wealth Tax	0.255		
	Post Income Tax Pre-Wealth Tax	0.200	0.055	21.6%
	Post Tax	0.200	0.000	0.0%
Belgium	Pre-Income/Wealth Tax	0.317		
	Post Income Tax Pre-Wealth Tax	0.250	0.067	21.1%
	Post Tax	0.265	-0.015	-4.7%
Cyprus	Pre-Income/Wealth Tax	0.354		
	Post Income Tax Pre-Wealth Tax	0.324	0.030	8.5%
	Post Tax	0.326	-0.002	-0.6%
Estonia	Pre-Income/Wealth Tax	0.426		
	Post Income Tax Pre-Wealth Tax	0.402	0.024	5.6%
	Post Tax	0.413	-0.011	-2.7%
Finland	Pre-Income/Wealth Tax	0.284		
	Post Income Tax Pre-Wealth Tax	0.233	0.051	18.0%
	Post Tax	0.233	0.000	0.0%
France	Pre-Income/Wealth Tax	0.302		
	Post Income Tax Pre-Wealth Tax	0.260	0.042	15.2%
	Post Tax	0.262	-0.002	-0.7%
Germany	Pre-Income/Wealth Tax	0.375		
	Post Income Tax Pre-Wealth Tax	0.318	0.057	14.4%
	Post Tax	0.318	0.000	0.0%
Greece	Pre-Income/Wealth Tax	0.317		
	Post Income Tax Pre-Wealth Tax	0.296	0.021	6.6%
	Post Tax	0.297	-0.001	-0.3%
Hungary	Pre-Income/Wealth Tax	0.357		
	Post Income Tax Pre-Wealth Tax	0.329	0.028	7.8%
	Post Tax	0.330	-0.001	-0.3%
Ireland	Pre-Income/Wealth Tax	0.412		
	Post Income Tax Pre-Wealth Tax	0.331	0.081	19.7%
	Post Tax	0.334	-0.003	-0.7%
Italy	Pre-Income/Wealth Tax	0.388		
	Post Income Tax Pre-Wealth Tax	0.340	0.048	14.11%
	Post Tax	0.338	0.002	0.59%
Luxembourg	Pre-Income/Wealth Tax	0.363		
	Post Income Tax Pre-Wealth Tax	0.296	0.067	18.5%
	Post Tax	0.297	-0.001	-0.3%
Poland	Pre-Income/Wealth Tax	0.338		
	Post Income Tax Pre-Wealth Tax	0.333	0.005	1.5%
	Post Tax	0.337	-0.004	-1.2%

Country	Income	Gini-coefficient	RE (absolute)	RE (relative)
Portugal	Pre-Income/Wealth Tax	0.379		
	Post Income Tax Pre-Wealth Tax	0.330	0.049	12.9%
	Post Tax	0.332	-0.002	-0.5%
Slovakia	Pre-Income/Wealth Tax	0.289		
	Post Income Tax Pre-Wealth Tax	0.252	0.037	12.8%
	Post Tax	0.252	0.000	0.0%
Slovenia	Pre-Income/Wealth Tax	0.324		
	Post Income Tax Pre-Wealth Tax	0.264	0.060	18.5%
	Post Tax	0.265	-0.001	-0.3%
Spain	Pre-Income/Wealth Tax	0.397		
	Post Income Tax Pre-Wealth Tax	0.383	0.014	3.5%
	Post Tax	0.390	-0.007	-1.8%

Note: Absolute redistributive effect refers to absolute difference between Gini-coefficients. Relative redistributive effect is the relative decline in inequality in comparison to the respective pre-tax income concept.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

In all countries income taxes reduce income inequality more than wealth taxes do. It is striking how small the inequality impact is of wealth taxes. Income taxes reduce inequality between 1.5% (Poland) and 22% (Austria and Belgium). Wealth taxes, on the contrary, either have no impact at all on inequality, or increase inequality. In for instance Belgium, inequality increases with up to 5% because of wealth taxes. In most other countries the effect is very small.

The size of the redistributive effect depends on vertical equity and on reranking of income units (see e.g. Lambert 2001). Reranking may counteract the vertical equity effect, which is a function of the degree of progressivity and the level of taxes. Table 14 gives on the one hand the average tax rate expressed over pre-tax income (PTI) as a measure for the level of taxes and on the other hand the Kakwani index as a measure for progressivity. The Kakwani is calculated as the difference between the concentration coefficient of taxes with individuals ranked on the basis of their pre-tax equivalised income (PTI). We have used PTI as the ranking variable for both personal income taxes and SICs and wealth taxes in order to be able to make the indices comparable across the two types of taxes. A negative Kakwani means that the tax is regressive, a Kakwani close to zero indicates proportionality, while a positive Kakwani points to a progressive tax (or put differently, a tax rate that on average increases with income).

In all countries the average tax rate of wealth taxes is substantially lower than that of personal income taxes and SICs. The average tax rate of personal income taxes & SICs amounts from 0.1 (Spain) to 0.35 (Belgium), while that of wealth taxes lies between 0.001 (Hungary, Slovakia) and 0.035 (Estonia). Not only the average tax rate, but also the progressivity as measured by the Kakwani index is much lower for wealth taxes. In most of the countries, wealth taxes are regressive (negative Kakwani); this regressivity is especially strong in Estonia, Greece and Slovakia. The Kakwani is positive but small (close to proportionality) in Austria, while it is somewhat more progressive in France, Germany and Luxembourg. Hence, the low redistributive effect of wealth taxes can thus be explained by both the low level and low degree of progressivity (or even regressivity) of this type of taxes.

Table 14 Progressivity of income and wealth tax policies, income reference year.

Country	Type of tax	Average tax rate	Kakwani progressivity index
Austria	Income taxes	0.254	0.172
	Wealth tax(es)	0.006	0.049
Belgium	Income taxes	0.350	0.138
	Wealth tax(es)	0.028	-0.095
Cyprus	Income taxes	0.112	0.247
	Wealth tax(es)	0.015	-0.102
Estonia	Income taxes	0.158	0.133
	Wealth tax(es)	0.035	-0.227
Finland	Income taxes	0.264	0.150
	Wealth tax(es)	0.005	-0.040
France	Income taxes	0.210	0.171
	Wealth tax(es)	0.030	0.199
Germany	Income taxes	0.293	0.149
	Wealth tax(es)	0.007	0.121
Greece	Income taxes	0.150	0.141
	Wealth tax(es)	0.005	-0.135
Hungary	Income taxes	0.285	0.089
	Wealth tax(es)	0.001	-0.051
Ireland	Income taxes	0.231	0.279
	Wealth tax(es)	0.005	-0.065
Italy	Income taxes	0.248	0.148
	Wealth tax(es)	0.025	0.090
Luxembourg	Income taxes	0.256	0.200
	Wealth tax(es)	0.005	0.117
Poland	Income taxes	0.263	0.025
	Wealth tax(es)	0.009	-0.074
Portugal	Income taxes	0.170	0.251
	Wealth tax(es)	0.018	-0.081
Slovakia	Income taxes	0.204	0.180
	Wealth tax(es)	0.001	-0.245
Slovenia	Income taxes	0.223	0.225
	Wealth tax(es)	0.005	-0.033
Spain	Income taxes	0.100	0.134
	Wealth tax(es)	0.029	-0.045

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

5. Illustration of a simulation: tax shift from labour to wealth

The broadening of the EUROMOD policy scope allows for the simulation of potential wealth tax reforms and their impact on among others household disposable income, wealth and inequality within and between European member states. In this final chapter, we present an example of such a reform by introducing a tax shift in all 17 HFCS countries. The hypothetical tax shift entails a decrease in the burden on labour by lowering the amount of social insurance contributions for employees and self-employed and increasing the burden on wealth by introducing a new net wealth tax (also for those countries that do already have a wealth tax in place). To be more specific, we lower the amount of social insurance contributions by five percent. The results of doing so represent the budgetary loss in the revenue from social insurance contributions and are presented in Table 15. In order to compensate for this loss, we introduce a new wealth tax. The tax rate is set such that the simulated wealth tax revenue corresponds with the amount of social insurance contributions that has to be compensated for. Subsequently, we pay attention to the redistributive effect of this measure by comparing the Gini-coefficient of two income concepts, i.e. pre-tax income (PTI) and post-tax income (PWTI). We also present the average tax rates and Kakwani indices of the total of income and wealth taxes, such that we can gauge whether this newly added wealth tax enhances progressivity or not.

Table 15 gives the total budget of social insurance contributions (excluding employer contributions), which is then reduced with 5%. The revenue, which is then compensated for through a tax on net wealth, is given in the last column of the Table. We have introduced here a proportional tax on net wealth, with a tax rate ranging from 0.0191% in Cyprus up to 0.1693% in Slovakia. This indicates that even with a very small tax rate, a substantial amount of revenue could be raised (*ceteris paribus*, so without taking account of possible behavioural effects). The size of the tax rate depends on the importance of social contributions and the net wealth level in the countries. It is for instance relatively high in Germany, which is characterized by high social contributions and low net wealth (as compared to other countries).

In terms of inequality reduction, hardly anything changes when shifting taxes from social insurance contributions to net wealth (see Table 16). Also, in terms of progressivity we see no big changes (note, however, that progressivity is expressed here on the basis of income). These outcomes show that a larger and/or different reform is needed in order to have a sizeable impact on inequality.

Table 15 Budget (in million euro) and average tax rate of the hypothetical tax shift, income reference year.

Country	Total social insurance contributions	Total net wealth	Net wealth tax rate (%)	Revenue net wealth tax
Austria	21,489	998,100	0.1077	1,074
Belgium	24,656	1,592,778	0.0774	1,233
Cyprus	450	118,003	0.0191	22
Estonia	251	55,466	0.0227	13
Finland	6,737	381,662	0.0883	336.80
France	96,201	7,110,382	0.0677	4,810
Germany	236,105	8,508,584	0.1388	11,805
Greece	3,293	445,570	0.037	165
Hungary	6,346	211,700	0.1492	317
Ireland	1,801	366,422	0.0246	90
Italy	62,973	5,597,000	0.0560	3,149
Luxembourg	1,657	166,900	0.0497	82.9
Poland	26,156	1,296,088	0.1009	1,308
Portugal	6,378	628,100	0.0508	318
Slovakia	4,160	122,800	0.1693	208
Slovenia	2,542	113,140	0.1124	127
Spain	27,280	4,769,000	0.0286	1,364

Note: Net wealth tax revenue equals 5% of social insurance contributions budget.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table 16 Redistributive effect, progressivity and inequality consequences of the new wealth tax.

Country	Income	Baseline				Reform			
		Gini-coefficient	Redistributive effect	Average tax rate	Progressivity	Gini-coefficient	Redistributive effect	Average tax rate	Progressivity
Austria	PTI	0.255				0.255			
	PWTI	0.200	0.055	0.259	0.169	0.200	0.055	0.259	0.170
Belgium	PTI	0.317				0.317			
	PWTI	0.265	0.052	0.378	0.121	0.266	0.051	0.377	0.119
Cyprus	PTI	0.354				0.354			
	PTWI	0.326	0.028	0.127	0.206	0.326	0.028	0.127	0.205
Estonia	PTI	0.426				0.426			
	PWTI	0.413	0.013	0.1933	0.064	0.414	0.012	0.193	0.063
Finland	PTI	0.284				0.284			
	PWTI	0.233	0.051	0.269	0.146	0.233	0.051	0.269	0.145
France	PTI	0.302				0.302			
	PWTI	0.262	0.040	0.239	0.175	0.262	0.040	0.239	0.176
Germany	PTI	0.375				0.375			
	PWTI	0.318	0.057	0.300	0.148	0.317	0.058	0.300	0.150
Greece	PTI	0.317				0.317			
	PWTI	0.296	0.021	0.155	0.132	0.297	0.020	0.155	0.131
Hungary	PTI	0.357				0.357			
	PWTI	0.330	0.027	0.287	0.080	0.331	0.026	0.286	0.085
Ireland	PTI	0.412				0.411			
	PWTI	0.334	0.078	0.235	0.252	0.336	0.075	0.230	0.251
Italy	PTI	0.387				0.387			
	PWTI	0.337	0.050	0.273	0.144	0.337	0.050	0.273	0.143
Luxembourg	PTI	0.363				0.363			
	PWTI	0.297	0.066	0.261	0.198	0.297	0.066	0.261	0.199
Poland	PTI	0.338				0.338			
	PWTI	0.337	0.001	0.272	0.022	0.338	0.000	0.272	0.019
Portugal	PTI	0.379				0.379			
	PWTI	0.332	0.047	0.188	0.218	0.333	0.046	0.188	0.216
Slovakia	PTI	0.289				0.289			
	PWTI	0.252	0.037	0.206	0.177	0.253	0.036	0.205	0.169
Slovenia	PTI	0.324				0.324			
	PWTI	0.265	0.059	0.220	0.233	0.268	0.056	0.211	0.232
Spain	PTI	0.397				0.397			
	PWTI	0.390	0.007	0.130	0.093	0.390	0.007	0.129	0.094

Source: Own calculations based on EURMOOD and micro-data from EM-HFCS.

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Annex

A.1 Austria

A.1.1 Description of wealth taxes

A.1.1.1 New EUROMOD policies

Real property tax (“Grundsteuer”)

Description:

Real property taxes are due on any immovable property located in Austria, payable by the owner of the real property and levied on the assessed standard value of real property (cadastral value). The default federal rate on this tax base is generally 0.2% and the municipal coefficients levied on top can range up to 500%. De facto this threshold is exhausted by all municipalities (see https://www.parlament.gv.at/PAKT/VHG/XXIV/AB/AB_11732/fnameorig_265711.html). While the municipal coefficients remain unaffected, reduced federal rates are applied according to asset characteristics and tax brackets. More specifically, for owner occupied single family houses the reduced rate of 0.05% is applied on the first € 3,650 and 0.1% on the next €7,300 of the assessed standard value. The first €3,650 of agricultural property and vacant land respectively are taxed by 0.16% and by 0.1% respectively. On any other property a 0.1 % marginal tax rate is applied on the first €3,650 and 0.15% on the next €3,650. The share of property exceeding the asset specific thresholds is taxed by the default marginal rate of 2%.

Assumptions:

- In order to assess the cadastral value we refer to the most recent estimation of the underlying ratio between market value and assessed standard value (9:1 in 2006) based on a ruling of the constitutional court in 2006 (Rechtsinformationssystem Des Bundes, 2009).

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Land value tax (“Bodenwertabgabe”)

Description:

In addition to the real property tax another levy is due on vacant undeveloped land not used agriculturally. In absence of a municipal coefficient the federal tax rate of 1% is applied on the assessed standard value exceeding the tax exemption of € 14,600.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Real property transfer tax (“Grunderwerbsteuer”)

A real property transfer tax is levied on all property transactions (in return for – or without payment). A major policy change in 2016 affected both the tax base and rate and therefore we subsequently describe the policy separately (before and after the legislative change).

Real property transfer tax (before 2016)

Description:

The default tax rate is equal to 3.5%. Transfer of ownership among immediate family members (in return for – or without payment), however, is subject to a reduced rate of 2%. The tax base is subject to the way of acquiring the asset. In case of a purchase the taxable amount is constituted by the value of consideration. If the property transaction is either a bequest or gift (donated by a benefactor at least 55 years old) the appropriate tax rate is applied on three times the assessed standard value. In case of an agricultural property the tax base is further reduced to the single assessed standard value.

On any tax base the default exemption of € 1,100 is applied. Considerably larger exemptions are taken into account for business and agricultural assets, in each case €365,000.

Assumptions:

- Properties, be it the main residence or any other property that are received as a bequest or gift, are assumed to be inherited by family members.
- In case of a gift, the giving individual is assumed to have reached 55 years.

Aspects of the policy that were not implemented: n/a

Real property transfer tax (after 2016)

Description:

The most far reaching amendment concerns the tax base. While for agricultural property the taxable amount is defined by three times the assessed standard value, the tax base of any other non-agricultural property (in return for – or without payment) is the market value (“Grundstückswert”). If there is no cash consideration and hence the actual market value remains unobserved, the tax base must be assessed by the taxpayer either via a suitable real property price index (Immobilienpreisspiegel or a so called “flat-rate-value model” (“Pauschalwertmodell”). For the latter the market value is the sum of land – and building value, particularized by the following equations:

$$\text{land value} = \text{area} \times 3 \times \frac{\text{assessed standard value}}{\text{m}^2} \times (\text{local grossing up factor})$$
$$\text{building value} = (\text{floor area}) \times (\text{regional construction cost factor}) \\ \times (\text{building's age \& type discount})$$

Also, some tax exemptions are adjusted. While the general exemption of €1,100 remains the same, the asset specific tax exemptions are accordingly adopted: agricultural property remains tax free up to € 365,000 whereas the business assets exemption is increased up to € 900,000. The tax rate is amended insofar as transactions without payment are taxed at the marginal rate of 0.5% for the first €250,000, then at 2% marginal tax rate in the second bracket up to €400,000 and finally any share of the market value exceeding €400,000 is taxed at the standard rate of 3.5%. For any transaction with payment the standard flat rate of 3.5% is applied.

Assumptions:

- We follow legislator’s intention that even for transactions without payment the tax base is represented by properties actual market value. In practice some assessments based on flat-rate-value model or a suitable real property price index might yield lower (or higher) values.

Aspects of the policy that were not implemented: n/a

A.1.1.2 Refinement of existing EUROMOD policies

Tax on capital gains (“Kapitalertragssteuer”)

Description:

Until 2016 capital gains from any source are identically taxed by a 25% flat rate. Since the 2016 tax reform the Austrian legislator differentiates between two categories of capital gains. Interest on bank deposits and miscellaneous loans are further on taxed by 25%, while dividends and paid-out profits of an enterprise are taxed by an increased rate of 27.5%. Contrary to the SILC- based EUROMOD implementation, the rich HFCS data allows us to take this differentiation into account.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Tax allowance for cost of earnings (“Werbungskosten”)

Description:

In Austria incurred costs related to any source of income are generally deductible. Because of data limitations the EU-SILC based EUROMOD implementation of this policy is limited to the yearly lump-sum allowance of €132 eligible to every employee (“Werbungskostenpauschale”). By adding rental income related costs to the input data and its respective deduction in the EUROMOD policy spine the HFCS data will improve the implementation of this policy in EUROMOD. Hereby building and maintenance costs of property rented out refer only to interest rates of mortgages (not the actual repayment) used to refurbish or renovate property that is rented out. Please note, such costs are only tax-efficient if they exceed the already granted lump-sum allowance.

Assumptions:

- We assume that in the HFCS the first (second/third) mortgage for other properties corresponds to first (second/third) other property, such that we can determine which mortgages correspond to refurbishment or renovation of property that is rented out.

Aspects of the policy that were not implemented:

- Tax allowances for cost of earnings comprise also other tax-effective expenses like education and training, working equipment, travel expenses, double-housekeeping, home offices and etc. that remain not included due to data limitations.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Tax allowances for exceptional deductions (“Sonderausgaben”)

Description:

The Austrian income tax provides tax allowances for exceptional deductions. So far the EU-SILC based EUROMOD implementation only takes account of the €60 lump sum part of the allowance (“Sonderausgabenpauschale”) already included in the payroll accounting. With the HFCS data we can disaggregate further and allow for the following specific tax-effective expenses: voluntary private pension plan contributions, building costs of owner-occupied housing and mortgages expenses (repayment & interests) for the provision or refurbishment of owner-occupied housing. Please note, building costs hereby refer to charges that arose in the actual “creation” of housing, not acquiring existing housing.

Generally, the tax allowance is restricted to a maximum of €2,920 yearly. This threshold is increased up to €5,840 if the tax payer is eligible for the single earner – or lone parent tax credit.

This threshold in mind, tax allowances for exceptional deductions are then first of all limited to only a quarter of it (“Sonderausgabenviertel”) and secondly, reduced by the €60 lump sum part already granted in the payroll accounting. Due to a major policy change in 2016 tax allowances for exceptional deductions are subsequently described separately (before and after the legislative change).

Tax allowance for exceptional deductions (before 2016)

The tax allowance maximum threshold of €2,929 (€5,840 if single earner or lone parent) furthermore depends on the number of dependent children

<i>Default</i>	€2,920
<i>At least three kids</i>	€2,920 + €1,460 per child
<i>Single earner or lone parent</i>	€5,840
<i>Single earner or lone parent and at least three kids</i>	€5,840 + €1,460 per child

Assumptions: n/a

Aspects of the policy that were not implemented:

Note that tax allowances for exceptional deductions also comprise other tax-effective expenses that are deductible in an unlimited amount. More specifically, consulting fees, annuities and first and foremost donations remain not included due to data limitations.

Changes after the income reference year (only those relevant for the 2017 policy):

Legislator’s intention was to abolish tax allowances for special deductions. However, in order to prevent a retroactive effect the previous deductibility is temporarily ensured for any contract made before 2016 and will finally expire in 2020. In other words, contributions for a private pension plan (mortgages for provision or refurbishment of owner-occupied housing) are only deductible if the pension plan (loan) agreement was signed in 2015 or earlier. Furthermore, the legislative change affects the maximum threshold and introduces an income dependent taper adjustment. The default (single earner or lone parent) maximum threshold is independent from the number of dependent children and fixed at €2,929 (€5,840). The introduction of an income dependent taper adjustment gradually reduces the deductible amount if individual yearly original income exceeds €36,400 with the tax allowance equal to zero if yearly income exceeds €60,000. Between €36,400 and €60,000 the deductible amount is reduced according to the following equation:

$$\frac{(\text{€60,000} - \text{total yearly income}) \times (\text{a quarter of total expenses})}{\text{€23,600}}$$

Asset-test for social benefits

Description:

Due to data limitations of EU-SILC the eligibility for the means-tested minimum benefit can only partly be taken account of in EUROMOD. The HFCS data will allow to factor in that the eligibility of this benefit is subject to a wealth test. In particular, in order to pass the wealth test no one in a “community of dependence” (“Bedarfsgemeinschaft”) must own net wealth (total assets less debts) that exceeds 5 times the monthly standard rate of minimum benefit (€794.91 in 2013). Any movable or immovable property exceeding €3,974.55 (in 2013) needs to be disposed of before being eligible to the

minimum benefit. The policy however stipulates some specific assets as “not realisable” (“nicht verwertbares Vermögen”). These encompass mainly household furniture, a reasonably-sized flat or house (only if used for owner occupied housing) and a reasonable car (only if disabled or necessarily required for occupational reasons).

Assumption:

- We follow jurisprudence of almost all Austrian regions when on the one hand we assume that any owner-occupied housing is “reasonable sized” and on the other hand de facto no vehicle is necessarily required for work reasons and vehicles are assumed to be realisable property if the owner is not disabled.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.1.2 Upgrading of monetary variables

An overview of how the amounts are updated is presented in Table A.1.1. First, the main asset variables are updated based on their aggregates as reported by Statistik Austria (2017). The variables “amr”, “aob”, “amrpv”, “aobpv01-03” are updated based on the gross stock of buildings and structures. Vehicles (“avh”) and valuables (“avl”) are both updated with the gross stock of personal transport equipment and gross stock of other durables, respectively. Self-employment business (“asb”) is updated with the gross stock of machinery & equipment. Second, financial assets are updated based on their size as reported by the Oesterreichische Nationalbank (2017a). Deposits (“adp”) are updated with the total stock of transferable and other deposits, mutual funds (“amf”) and managed accounts (“ama”) with the stock of investment fund shares, bonds (“abd”) with the stock of debt securities, non-self-employment private business assets (“apb”) with the stock of unlisted shares and other equity, shares (“ash”) with the stock of listed shares, private pension (“app”) with the stock of life insurance and pension entitlements, other assets (“aot”) with the stock of non-life insurance technical reserves and other accounts and debt (“adb”) with the total stock of liabilities. Net wealth (“anw”) is updated based on the reported stock of net wealth (Oesterreichische Nationalbank, 2017b). Finally, the variables financial assets (“ape”) and real assets (“ara”) are updated based on their separate components.

Table A.1.1 Overview of uprating indices used for wealth variables in EUROMOD, Austria.

Uprate index	Variables uprated by the index	Value 2013	Value 2017	Source
\$f_amr	Amr, aob, amrpv, aobpv01-03	34,949.6	40,089.7	Gross stock of buildings and structures, in million euro (1)
\$f_avh	avh	6,341.3	7,527.6	Stock of personal transport equipment, in million euro (1)
\$f_avl	avl	19,246	17,937	Stock of other durables, in million euro (1)
\$f_asb	asb	24,058	29,175	Stock of machinery & equipment and intellectual property products, in million euro (1)
\$f_adp	adp	82,377	137,801	Stock of transferable & other deposits, in million euro (2)
\$f_amf	amf, ama	42,578	59,517	Stock of investment fund shares, in million euro (2)
\$f_abd	abd	43,946	31,518	Stock of debt securities, in million euro (2)
\$f_apb	apb	3,176	2,719	Stock of unlisted shares and other equity, in million euro (2)
\$f_ash	ash	18,305	25,214	Stock of listed shares (domestic & other), in million euro (2)
\$f_app	app	105,675	123,586	Stock of life insurance and pension entitlements, in million euro (2)
\$f_aot	aot	11,188	4,440	Stock of non-life insurance technical reserves and other accounts, in million euro (2)
\$f_adb	adb	167,627	184,490	Stock of total liabilities, in million euro (2)
\$f_anw	anw	1,146,000	1,353,710	Stock of net wealth, in million euro (3)

Note: All stock variables refer to the situation at the end of the year.

Source: (1) National Accounts (Statistik Austria, 2017); (2) Economic sector breakdown of households (Oesterreichische Nationalbank, 2017a); (3) Sektorale Volkswirtschaftliche Gesamtrechnungen 1997-2017 (Oesterreichische Nationalbank, 2017b).

A.1.3 Comparison of socio-demographic characteristics

Table A.1.2 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Austria.

Variable	Category	EM-HFCS	EM-SILC	Census Data
		Proportion	Proportion	Proportion
Age	< 16	14.92	15.25	15.72
	16 - 29	15.80	17.75	17.57
	30 - 44	18.24	19.27	21.17
	45 - 64	30.16	29.82	27.79
	65 - 99	20.88	17.90	17.75
Gender	Female	52.30	51.04	51.27
	Male	47.70	48.96	48.73
Education	Not completed primary education	10.03	10.17	10.49
	Primary education	4.84	5.14	10.75
	Lower secondary education	16.40	19.27	17.56
	Upper secondary education	54.58	41.14	40.95
	Post-secondary (non-tertiary) education	0.0	1.60	7.58
	Tertiary education	14.15	22.67	12.68
Economic status	Pre-school	5.0	5.56	5.65
	Farmer	1.32	1.01	-.1
	Employer or self-employed	4.05	4.29	4.87
	Employee	39.75	38.53	42.50
	Pensioner	27.55	23.65	22.09
	Unemployed	2.67	4.82	3.00
	Student	15.61	15.08	13.22
	Inactive	0.29	5.89	
	Sick or disabled	0.46	0.81	8.20
	Other	3.26	0.36	
	Family worker	0.03	0.0	0.47
Marital status	Single (never married)	36.68	43.37	43.18
	Married	47.76	42.36	42.41
	Separated	0.76	1.35	-.1
	Divorced	8.32	7.0	7.59
	Widowed	6.48	5.92	6.82
Tenure status	Owner paying mortgage	21.70	25.43	-.1
	Outright owner	33.82	31.76	-.1
	Tenant or subtenant paying rent at prevailing or market rate	38.96	17.74	-.1
	Accommodation is rented at a reduced rate (below market price)	0.0 ¹	13.12	-.1
	Accommodation is socially rented	0.0 ¹	6.89	-.1
	Accommodation is rented for free	5.52	5.06	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Overall, the characteristics of the sample in both databases are highly similar, except for educational and tenure status. Whilst EM-SILC has a higher share of individuals that have achieved lower secondary or tertiary education, EM-HFCS has a higher number of individuals that completed upper-secondary education.

A.1.4 Micro-validation of income concepts

Table A.1.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Austria.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	27,274	15,540	-1,889	211,328
	EM-SILC	32,553	26,472	-2,132	628,372
Benefits	EM-HFCS	1,698	2,474	0	26,320
	EM-SILC	2,668	3,317	0	31,584
Taxes	EM-HFCS	3,555	4,777	-548	82,106
	EM-SILC	5,557	9,770	-532	292,204
Social insurance contributions	EM-HFCS	3,789	2,711	0	18,902
	EM-SILC	4,480	3,352	0	31,542
Disposable income	EM-HFCS	21,627	8,441	0.72	115,549
	EM-SILC	25,185	13,972	6,419	325,308

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

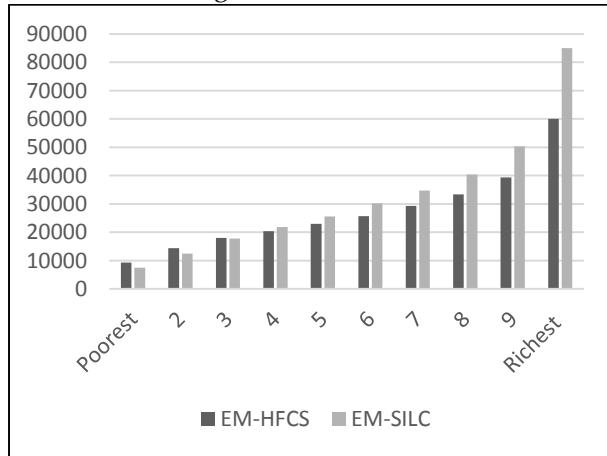
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

What stands out from Table A.1.3 is that original & pension income is considerably higher in EM-SILC in comparison to EM-HFCS. The difference equals approximately €5,200, but decreases to about €3,500 in disposable income. The amount of simulated benefits is higher in EM-SILC and can be explained by the fact that EM-SILC is more targeted towards lower income households. Additionally, benefits are captured in HFCS by one single variable while benefits are covered in more detail in EU-SILC. Taxes and social insurance contributions are also higher in EM-SILC, which is unsurprising given the higher average incomes.

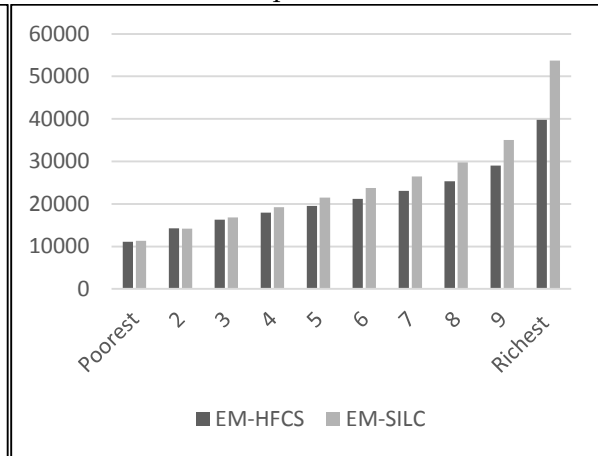
Next, we present the distribution of the income concepts from Table A.1.3 across disposable income deciles. Figure A.1.1 panel a and panel b present mean values of original and disposable income. The mean values of the income variables are quite similar between EM-HFCS and EM-SILC, except for the tenth decile where average incomes are considerably higher for EM-SILC. Figure A.1.1 panel c up to panel e show the distribution of benefits, taxes and social insurance contributions, respectively. The level of benefits simulated in HFCS differs strongly for EM-SILC simulations, with overall higher values for the latter. This can be explained by the fact that EM-SILC is more targeted towards lower income households and most social benefits are captured by one single variable in EM-HFCS. The distribution of taxes and social insurance contributions also differs between EM-HFCS and EM-SILC with higher values for EM-SILC, especially for the tenth decile.

Figure A.1.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Austria.

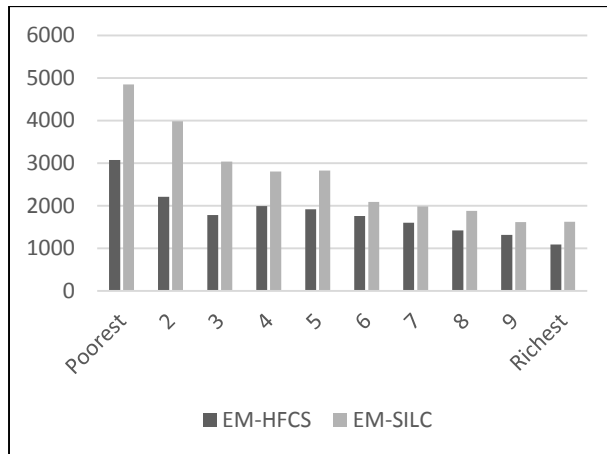
Panel a: Mean original income



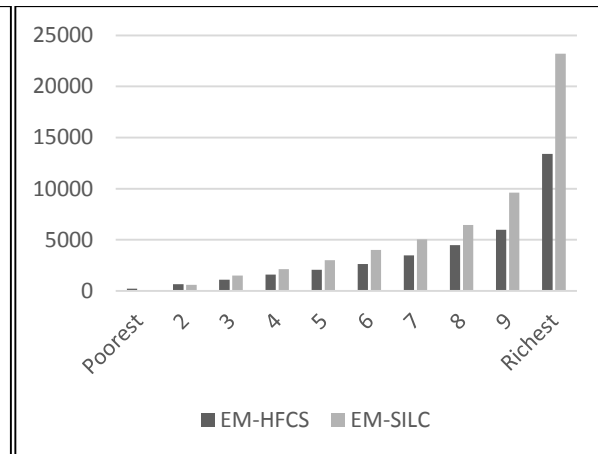
Panel b: Mean disposable income



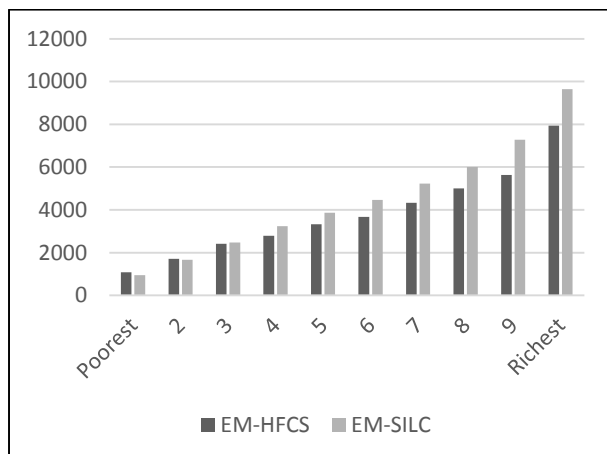
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.1.5 Macro-validation of new EUROMOD policies

Table A.1.4 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.1.5 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.1.4 Number of eligible cases for wealth taxes, Austria.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	1,412	1,412	2,033,783	1,412	2,033,783
Real property transfer tax	27	27	37,195	27	37,195

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.1.5 Validation of simulated wealth tax revenues (in million euro), Austria.

		EM-HFCS	External	Ratio
Real property tax ¹	2013	617.10	736.0 (1)	83.85%
	2017	617.10	771.0 (1) ²	80.04%
Real property transfer tax	2013	272.20	790.0 (1)	34.46%
	2017	142.40	1,118 (1)	12.74%

Note: ¹Includes also the "land value tax". ²Figure refers to 2016.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

A.2 Belgium

A.2.1 Description of wealth taxes

A.2.1.1 New EUROMOD policies

Real property transfer tax (“Registratierechten” – “Droits d’enregistrement”)

Description:

The tax involves registration duties on the transfer of real estate properties and is due by the buyer. The tax base is equal to the price of the property (at least the fair market value) plus burdens attached to the sale of the house. General tax rates are 10% in the Flemish region and 12.5% in the Walloon and Brussels Capital region. In the Flemish and Walloon region there are special rates for modest houses (5% and 6% respectively). When it involves the purchase of the own and only main residence an abatement (foot exemption) can be received equal to €15,000 in the Flemish region and €60,000 in the Brussels Capital Region. In the Flemish Region an additional abatement can be received if within 2 years after the purchase a mortgage is taken out on the property. It is equal to €10,000 if the normal rate applies and €20,000 if the reduced rate for modest houses applies. There are also special rates for the division of real estate properties (Ernst & Young, 2014; Federale Overheidsdienst Financiën, 2013).

Assumptions:

- In order to be eligible for the abatement, one of the requirements is that the household needs to officially move in the house within a certain period of time after the registration of the purchase. We assume this condition to be fulfilled.
- In the case when multiple parties buy a real estate property together, eligibility for the abatement requires that all parties fulfill the necessary conditions. We cannot check the conditions for other buying parties, so we assume them to comply if the party of our focus complies.
- The preferential tax rate for modest houses requires that you have to move into the dwelling within 3 years and you have to live there for 3 years. We assume that this condition is fulfilled.
- With regard to other buildings than the main residence:
 - o In the HFCS data, there is no information on the year of purchase of other buildings apart from the main residence, we assume the year of mortgage to be the same as the year of purchase (if it does not reflect the year of the refinancing of the loan). In line with this, we also need to assume that the first (second/third) mortgage in the HFCS coincides with the first (second/third) property. We assume that most households will have a mortgage because most will need it to be able to finance the purchase of a new building and because the fiscal advantages are considerable. When there is no mortgage it will likely be in their possession already for a longer time and we assume that the mortgage is already paid off. In other words, for those households in the HFCS that own other buildings without a mortgage, we assume them to be purchased before the policy year, which implies that the policy does not apply.
 - o There is no information on the purchase value of other properties. Because we only consider properties purchased recently before the survey we assume that the current value is the same as the purchase value.
 - o We do not know how other buildings were acquired. In case a gift/inheritance which covers a dwelling is received in the policy year and the main residence is not reported as inherited or received as gift and/or not acquired in the policy year, then the other real estate acquired in the policy year is assumed to be an inheritance/gift and not taxed in this policy. In all other cases, we assume that other real estate properties were purchased on the market.
 - o For the variables that only require information on the buildings which are intended for living, we base our assumption on property type. The following property types are assumed to be intended for living only: houses/flats, apartment buildings, and

additional buildings for which we do not know their type are also assumed to be intended for living.

- Possession of real estate is in the HFCS covered at the household level. We assume that other real estate is purchased by household heads. If it would be purchased by adult children of the household then they could apply for exemptions and reduced rates.

Aspects of the policy that were not implemented:

- Burdens attached to the sale of the house cannot be taken into account in the tax base.
- Tax on the division of real estate properties (no information in the HFCS).
- Several exemptions and reduced rates:
 - o In some cases, you can subtract registration duties paid on your 'old' property of the registration tax that you need to pay on the 'new' property (properties bought within 2 years of each other).
 - o For the purchase of a social property, the rate is 1.5% in the Flemish and Brussels Capital Region and 0% in the Walloon Region.
 - o In the Flemish Region, you can receive a tax exemption of €30,000 if you buy a property that needs to be renovated.
 - o In the Walloon Region, the tax rate is reduced to 10% (or 5% in case the reduced rate for modest houses is applicable) if a social mortgage is granted (no information in the HFCS).
 - o In the Brussels Capital Region, the exemption for main residences can be increased to €75,000 if it is located in a region of enlarged development of housing or urban renewal.
- On new buildings most of the time a VAT rate is applicable instead of registration duties (obliged if professional seller, otherwise choice by seller). In the HFCS we do not know if real estate is old or new at time of acquisition. Registration duties are applied to all real estate purchased and by own construction (because transfer tax is due on the land they build on).

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Registration duties on the creation of a mortgage (“Hypotheekrechten” - “Droits d’hypothèque”)

Description:

If a mortgage is taken out on a real estate property located in Belgium, the mortgage creation needs to be registered and is subject to a registration duty equal to 1% of the amount that is guaranteed by the mortgage. In the Walloon region, the duty is 0% if it is a social mortgage (Federale Overheidsdienst Financiën, 2013).

Assumptions:

- We approximate the amount that is guaranteed by mortgage by the initial amount that has been borrowed.

Aspects of the policy that were not implemented:

- Exemption for social mortgage in the Walloon region.

Changes after income reference year (only those relevant for 2017 policy): n/a

Inheritance tax (“Successierechten” - “Droits de succession”)

Description:

At death, an inheritance tax is levied on the value of the worldwide estate of the deceased. Equivalent to this is the transfer duty upon death which refers to the situation where no taxes were paid on gifts made by the deceased in the three years prior to his/her death. The legislation is determined by the

local governments of the Flemish, Walloon and Brussels Capital Region. Tax rates differ by relationship to the deceased and the net share that is received by each heir, where the rule applies that the further you are related the higher the taxes due. Depending on the region several exemptions apply for example, for inheriting the family business or the family's residence. Most of these exemptions are so-called "foot exemptions" which means that they apply to the lowest tax bracket and preserve the progressive character of the tax (Ernst & Young, 2014; Federale Overheidsdienst Financiën, 2013).

Assumptions:

- Conditions for preferential treatment of business assets are fulfilled.
- Conditions for preferential treatment of the main residence are fulfilled.
- Tax rates differ between brothers/sisters and aunts/uncles/nieces/nephews, while the HFCS covers both under one category of 'other relatives'. We assume that more inheritances are received from aunts/uncles than brothers/sisters because they are typically older, therefore we apply the aunts/uncles rate to the inheritances received by other relatives.
- For the inheritance tax of the Flemish region between direct relatives, we need to make a distinction between the value of movable and immovable assets. We made the following assumption for the categories of the HFCS variables on the type of property:
 - o Movable assets: money; securities & shares; jewelry, furniture & artwork
 - o Immovable assets: dwelling; use of a dwelling; land
 - o To be able to distinguish the share of each of the two, a similar procedure as for the separate asset types is applied to the immovable assets and the movable assets are then defined as the total value less the value corresponding to the immovable assets.
- For households for which the value of the inheritance is missing, we impute it based on a regression taking into account information on the year of inheritance, which types of assets are received and from whom the inheritance is received.
- In Flanders, certain business assets are taxed at a rate of 3% (lineal heirs) or 7% (other persons). This tax is only applicable on the assets of family businesses and shares of family companies. Because we only have information on the values of the business assets in the inheritances, we assume that all business assets are assets of family businesses or shares of family companies.

Aspects of the policy that were not implemented:

- HFCS does not cover inheritances between spouses or legal cohabitants.
- For inheritances in the Flemish region between other persons than ascendants/descendants /brothers/sisters, the rates and brackets are applicable on the sum of all shares in the inheritance. In the HFCS we do not know anything about other parts of the inheritance received by other people, rates are thus determined on the individual share.
- In case an inheritance is passed on again in the same year, inheritance taxes are reduced.
- Several exemptions and reductions:
 - o Flemish region: exemptions for service flats, lands that are classified as a forest or that lie in the Flemish Ecological Network.
 - o Walloon region: exemptions for the value of trees in woods.
- Gifts that are made during the three years prior to death and for which no gift taxes were paid are taxed under the inheritance legislation. We assume all gifts to be made before this period.
- For some aspects of the inheritance tax we need to know the division of the main residence, i.e. which parts are used professionally or privately.

Changes after the income reference year (only those relevant for the 2017 policy):

- In Flanders, business assets are now part of the tax base that is used to implement the tax abatement that disabled persons can make use of. At first, this abatement is allocated on the

tax base for immovable property, subsequently on the tax base for movable property and finally on the tax base for business assets.

- In the Brussels-Capital Region, we included in the 2017 policy system an extra taxation rate for business assets for other than linear heirs (at a rate of 7%).

Gift tax (“Schenkingsrecht” – “Droits de donation”)

Description:

A gift tax or registration duty is applicable to the donation of movable and immovable property. The tax base is determined on the sales value of the donated goods. While the tax is always levied on gifts of immovable property, it is only due on movable property if the gift is registered in Belgium. The legislation is determined by the local governments of the Flemish, Walloon and Brussels Capital Region. Tax rates differ by relationship to the deceased and the share that is received, where the rule applies that the further you are related the higher the taxes due. Depending on the region gifts of for example the family business or the family’s residence are subject to a preferential tax treatment (Ernst & Young, 2014; Federale Overheidsdienst Financiën, 2013).

Assumptions:

- Tax rates differ between brothers/sisters and aunts/uncles/nieces/nephews, while HFCS covers both under one category of ‘other relatives’. We assume that more gifts are received from aunts/uncles than brothers/sisters because they are typically older, therefore we apply the aunts/uncles rate to the gifts received by other relatives.
- Conditions for the preferential treatment of business assets are fulfilled.
- Conditions for the preferential treatment of the main residence in the Walloon and Brussels Capital region are fulfilled.
- Conditions for the preferential treatment of building plots in the Flemish region are fulfilled.
- HFCS does not distinguish between different purposes of land, we assume all land to be building plots
- If multiple gifts are given within three years between the same donor and receiver than the value of all these gifts are added to determine the progressive tax rate. We assume that this never happens.
- We need to make a distinction between the value of movable and immovable assets. We made the following assumption for the categories of the HFCS variables on type of property:
 - o Movable assets: money; securities & shares; jewelry, furniture & artwork
 - o Immovable assets: dwelling; use of a dwelling; land
 - o To be able to distinguish the share of each of the two a similar procedure as for the separate asset types is applied to the immovable assets and the movable assets are then defined as the total value less the value corresponding to the immovable assets.
- For households for which the value of the gift is missing, we impute it based on a regression taking into account information on the year of the gift, which types of assets are received and from whom the gift is received.

Aspects of the policy that were not implemented:

- HFCS does not cover gifts between spouses or legal cohabitants.
- For some aspects of the gift tax we need to know the division of the main residence in the part that is used professionally and the part that is used privately.
- Flemish region: exemption for real estate located abroad.
- Walloon region: exemption for the value of woods and forests.

Changes after the income reference year (only those relevant for the 2017 policy):

- In Flanders, there is now an extra abatement on the gift tax, for gifts allocated to persons that are disabled and for the part of the gifts that includes immovable property and/or building

land. The amount of this abatement depends on the connection between the two persons (lineal or others) and the age of the person who receives the gift.

- In the Brussels-Capital Region, there is no separate tax structure anymore for the gift of a house. These gifts are now covered under the tax structure of immovable assets.
- When certain conditions are fulfilled, the gift tax for business assets is 0% in the Brussels-Capital Region. Because there is no information available about those conditions, we assume that they are fulfilled.

Tax on long-term saving (“Taks op het langetermijnsparen” – “Taxe sur l’épargne à long terme”)

Description:

The tax on long-term saving is levied on the income received from private and collective pension programs and whole life insurance contracts. Currently, in EUROMOD this income is part of taxable income which is then taxed in the personal income tax. In reality, it is taxed separately and using the HFCS data we have enough information to implement this in EUROMOD. The tax is only applicable if you have received tax deductions for contributions to these long-term saving instruments (1 deduction is enough to be taxed). If the contract or fund was initiated before the age of 55 the tax is levied on the 60th birthday, if it was initiated after the age of 55 the tax is levied at the tenth anniversary of the start of the contract. The applicable tax rate is equal to 10%. When savings are withdrawn prematurely there are again several options. If your contract was initiated from the age of 55 onwards, you withdraw your savings before the tenth anniversary of the contract, but not before the age of 60. You are liable for the tax on long-term saving at the moment you make the withdraw. In case the withdraw is related to death or (early) retirement the applicable tax rate is the same as above (10), while it is equal to 33% when it is not related to any of these two events. However, when savings are withdrawn before the age of 60, irrespective of when the contract was initiated, it is taxed in the *personal income tax*. In the latter case, capital amounts are taxed as before (with the distinction between withdraw related to death or retirement), while rents are taxed at progressive rates.

Contributions made after the tax date are no longer subject to taxation (Federale Overheidsdienst Financiën, 2013; Fiscal Department of the Belgian Federal Government: <http://financien.belgium.be/nl/particulieren/belastingvoordelen/pensioensparen#q10>).

Assumptions:

- The input variables “appyp”, “app00”, “app01” and “appap” need to be imputed based on current value of account divided by quarterly contributions (assumption that these have not changed over time).
- We apply the age eligibility condition in EUROMOD as 61 years instead of 60 because age in the HFCS refers to the time of the interview and we need age in the policy year.
- Value of account refers to time of the interview, hence this is the amount already net of the tax on long-term saving. We need the gross amount in the policy year. We calculate in the input database net amounts back to gross amounts using the different applicable tax rates.
- We do not know whether individuals have received the tax deduction, which implies that we do not know whether they need to pay the tax. In case of the implementation of the tax deduction (see above) our assumptions are in line with most people receiving the deduction, therefore we also assume that all those eligible are subject to the tax.
- HFCS variable income from private pension covers both private and occupational pension funds, while their account value is covered separately. Those that earned an income from private or occupational pensions in the policy year and no longer have an outstanding amount on their private pension account in the next year (and who are not eligible for normal taxation) are assumed to have withdrawn their account prematurely. Hence, those with private pension income in the policy year, but positive balance in the next year are assumed to earn income from occupational pension scheme and are not included.

- For the premature withdrawal we cannot distinguish neither between the capital and rent part nor between savings from before and after 1993. We apply the tax rate applicable to the capital part for savings from after 1993 because these will likely represent the largest part.

Aspects of the policy that were not implemented:

- Tax on amounts in occupational pension funds because there is no information on the amount of contributions in HFCS so we cannot impute the year of purchase and the age at time of purchase. This aspect is also not covered in the implementation of the tax deduction (see above).

Changes after income reference year (only those relevant for 2017 policy):

- The main tax rate decreased to 8%.

A.2.1.2 Refinement of existing EUROMOD policies

Real property tax (“onroerende voorheffing” – “Précompte immobilier”)

Description:

In Belgium the ownership of real estate is taxed through an advance levy with cadastral income as the tax base. Currently the advance levy on immovable property is in EUROMOD only levied on the main residence. With HFCS data we also have information on other real estate properties, so that we can expand the policy to all real estate property. The condition to receive the reduction for modest houses is then also more correctly implemented because it requires that the sum of cadastral incomes of all real estate properties is not higher than the threshold. Moreover, we can add the additional reduction during the first 5 years for houses that were newly built.

Assumptions:

- The eligibility for the reduction for modest houses includes the sum of the cadastral incomes of all real estate properties located in Belgium in case you pay the advance levy in the Walloon or Brussels region and all real estate properties located in the Flemish region in case you pay the advance levy in Flanders. In the HFCS we do not know the location of real estate property and therefore assume that all of them are located in the relevant area (i.e. Belgium or Flanders).

Aspects of policy that are not implemented:

- Same as for the advance levy on the main residence (see EUROMOD Country report).
- Additional reduction for newly build houses can only be implemented for houses that the owners build themselves, not for those they purchased in new condition.

Changes after income reference year (only those relevant for 2017 policy):

- The tax reductions that depend on the number of children in the family change every year and are updated for 2017.

Advance levy on movable property (“roerende voorheffing” – “Précompte mobilier”)

Description:

The advance levy on movable property is a withholding tax on the income tax that is levied on income from movable property. The Belgian EUROMOD country report (Hufkens et al., 2017) describes that currently income from assets cannot be distinguished by source, i.e. there is no information on the share of dividends, interests on savings accounts, interests on bonds, etc. Therefore the EUROMOD code implements an average tax rate on all income. In the HFCS data income from assets is also

covered under a single variable, but we can impute separate amounts based on the asset stock and national interest rates. This allows us to tax the different income sources at their appropriate rate. We use 5 categories of income types: interests on current accounts, interests on savings accounts, interests on bonds, dividends on shares and other capital income. Moreover, we can include the tax exemption for interests received on savings accounts, which can currently not be taken into account.

Assumptions: n/a

Aspects of the policy that were not implemented:

- In some asset categories there are still further, more detailed, differences in applicable rates.

Changes after the income reference year (only those relevant for the 2017 policy):

- The general tax rate is raised from 25% in 2013 to 30% in 2017.

Taxation of income from immovable property

Description:

Real estate properties are besides the advance levy on immovable property also subject to taxation in the personal income tax. Since assessment year 2005 (income year 2004) the main residence is in principle exempted. The taxation of the main residence before 2005 is already implemented in EUROMOD, but the taxation of other real estate properties can be improved based on the HFCS input database. The tax base is cadastral income for properties that are rented to a private person or not rented, while the tax base is rental income if it is rented for professional purposes and when the real estate is located abroad. In EUROMOD currently rental income is part of taxable income because there is no information available on other real estate property. This implies that those properties that are not rented are currently not taxed, while properties that are rented to private persons are taxed on the wrong base (rental income instead of cadastral income).

Assumptions:

- We do not know whether real estate is located in Belgium or abroad, we assume all to be located in Belgium so that the tax base is only determined based on the purpose of rent (private vs professional).
- In the HFCS we can distinguish between buildings which are rented for private or professional purposes. The division is imputed based on the type of real estate. The assumption is that:
 - o Houses/flats, apartment buildings, building plots/estates and garages are rented to private persons.
 - o Industrial buildings/warehouses, shops, offices, hotels, farms and other types are rented for professional purposes.
 - o Additional buildings for which we do not know their type are assumed to be for private rent purposes.
- The HFCS covers all rental income under 1 variable. In case multiple buildings are rented for both private and professional purposes we impute this variable based on the relative values of the properties.

Aspects of the policy that were not implemented:

- If real estate is rented and it is used partly for private reasons and partly for professional reasons the tax base needs to be determined separately. We cannot implement this.

Changes after the income reference year (only those relevant for the 2017 policy):

- The formula that is used to calculate the maximum deduction costs of the tax on the income from immovable property changes every year. Therefore, we updated this formula for 2017.

Tax deductions for mortgage repayment

Description:

There are a number of aspects of the tax deduction for mortgage repayment in the personal income tax that cannot be implemented in EUROMOD with the EU-SILC data. With the HFCS as input database we can add some of these aspects to the EUROMOD code.

- Dwelling bonus and additional interest deduction: A condition for receiving the tax deduction is that the mortgage should have a minimum duration of 10 years. Currently the assumption is that this is fulfilled. With the HFCS data we can assess whether this condition is indeed satisfied.
- Dwelling bonus: Another condition is that in the year the mortgage is taken out, you cannot own another real estate property in order to apply. After this year it is allowed to become the owner of other real estate property, but then you lose the additional deductions above the basic amount. With HFCS we can check for this.

Moreover, we can add the tax deduction for other mortgages. Under the system of the 'normal interest deduction' interest payments on mortgages for purchasing or renovating a home can be deducted from income from immovable property. It can apply to all mortgages (also those on other real estate properties), but can only be used for loans for 1 real estate property. Hence, if this deduction is already used for the main residence mortgage then you cannot apply again for mortgages on other real estate property. Again, the condition is that the loan must have a duration of at least 10 years. The normal interest deduction cannot exceed income from all immovable property (Federale Overheidsdienst Financiën, 2013, http://www.triview.be/lexicon/lexicon_nl/wkp_fiscaliteit_gewone_interestaftrek.htm).

Assumptions:

- In the HFCS there is no information on the year of purchase of other buildings, we assume the year of mortgage to be the same as the year of purchase (if it does not reflect the year of the refinancing of the loan). We assume that most households will have a mortgage because most will need it to be able to finance the purchase of a new building and because of the significant fiscal advantages. When there is no mortgage it will likely be in their possession already for a longer time. In other words, for those households in the HFCS that own other buildings without a mortgage, we assume them to be purchased before the policy year and hence they are not eligible for additional deductions.
- There was a major reform in 2005. In principle we should assess the appropriate deduction for each mortgage separately. However, this makes the implementation in EUROMOD a lot more complicated. We take as year of loan and duration of loan the oldest one.

Changes after the income reference year (only those relevant for the 2017 policy):

- From 2017 onwards, the tax deduction for mortgage repayment is abolished in the Brussels-Capital Region.

Tax deduction for long term saving

Description:

Each taxable person can have a deduction from its income tax for long-term saving. We implement here the deduction for the contributions made to private pension and life insurance plans. That tax rate is fixed at 30% (Federale Overheidsdienst Financiën, 2013).

Assumptions:

- In Belgium life insurances can give right either to a tax deduction for the own and only main residence or to a deduction for long-term saving, which provide different advantages. Because the HFCS covers life insurances under the same variable as private pension saving we assume that they apply for the deduction for long-term saving.

- The input variable “appap” (age at time of purchase pension saving contract) needs to be imputed based on current value of account divided by quarterly contributions (assumption that these have not changed over time) taking into account the quarter they were surveyed.
- Eligibility for the tax deduction requires that the private pension plan or life insurance contract has a minimum duration of 10 years. We assume that this condition is fulfilled.

Aspects of policy that are not implemented:

- Deduction for contributions to occupational pension funds (no information on the amount of contributions in HFCS). This aspect is also not covered in the implementation of the tax on long-term saving (see above).
- Deduction for the purchase of employer’s shares (no information in HFCS). This deduction is not compatible with a deduction for private pension saving so the impact will probably be small.

Changes after income reference year (only those relevant for 2017 policy): n/a

A.2.2 Uprating of monetary variables

An overview of the uprating indices used for wealth-related variables is given in Table A.2.1. The main asset variables are uprated based on their respective aggregates in the national accounts as compiled by the National Bank of Belgium (2017a), and the available information in the database of Eurostat (2017a). For self-employed business, we used the categories “machinery, equipment and weapons systems” and “intellectual property products” from the national accounts as a proxy. For the HFCS asset category “managed accounts”, there is no information available in the national accounts. Therefore, we applied the same uprating index as for mutual funds. The variables related to inheritances and gifts are uprated using the tax revenues from the inheritance and gift taxes since there is no information on the total amount of inheritances and gifts available. There is also no information about consumer durables available for Belgium. Therefore, we calculated the stock of total wealth as the sum of the fixed assets with financial assets minus financial liabilities. We also did the same for “vehicles” and “valuables”, because the information about those variables is also missing. We used the uprating indices for “net wealth” for both categories, because we assume that it is a good indicator of both.

Table A.2.1 Overview of uprating indices used for monetary variables in EUROMOD, Belgium.

Uprate index	Variables uprated by the index	Value 2013	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	833.3	880.72 ¹	Gross stock of dwellings, in billion euro (1)
\$f_aob	aob	34.94	34.171	Gross stock of other buildings, in billion euro (1)
\$f_avh	avh	1,799.79	1999.64	Copy of the stock of net wealth (see last row) (1,2)
\$f_avl	avl	1799.79	1999.64	Copy of the stock of net wealth (see last row) (1,2)
\$f_asb	asb	24.44	24.45	Stock of machinery, equipment, weapons systems and intellectual property products, in billion euro (2)
\$f_adp	adp	311.32	346.4	Stock of transferable & other deposits, in billion euro (2)
\$f_amf	amf, ama	122	186.35	Stock of investment fund shares, in billion euro (2)
\$f_abd	abd	86	54.96	Stock of debt securities, in billion euro (2)
\$f_apb	apb	255.22	305.25	Stock of unlisted shares and other equity, in billion euro (2)
\$f_ash	ash	46.22	63.05	Stock of listed shares, in billion euro (2)
\$f_app	app	245.15	299.2	Stock of life insurance, annuity entitlements and pension entitlements, in billion euro (1, 2)
\$f_aot	aot	30	20.94	Stock of non-life insurance technical reserves and other accounts receivable / payable, in billion euro (2)
\$f_adb	adb	233.08	255.53	Stock of total liabilities, in billion euro (2)
\$f_aih	aihvr, aihmrvr, aihbsvr, aihvlvr	2.63	2.36	Taxes of capital transfers: death duties, in million euro (3)
\$f_agi	agivr, agibsvr, agivlvr	0.46	0.57	Taxes of capital transfers: gift taxes in million euro (3)
\$f_anw	anw	1799.79	1999.64	Stock of net wealth (sum of fixed assets and financial assets less liabilities), in billion euro (1,2)

Note: All stock variables refer to situation at the end of the year, value of 2017 for now refers to 2015, except where indicated. ¹ Value refers to 2016 .

Source: (1) National Accounts (National Bank of Belgium, 2017a); (2) Balance sheets for financial assets (Eurostat, 2017a); (3) Received taxes and actual social contributions by kind (National Bank of Belgium, 2017b).

A.2.3 Comparison of socio-demographic characteristics

Table A.2.2 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Belgium.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	17.7	18.3	18.09
	16 - 29	17.3	17.3	17.37
	30 - 44	20.0	20.7	20.49
	45 - 64	27.1	27.2	26.93
	65 - 99	17.9	16.5	17.10
Gender	Female	50.9	50.8	50.90
	Male	49.1	49.2	49.10
Education	Not completed primary education	13.8	17.6	23.81
	Primary education	9.6	12.6	13.16
	Lower secondary education	16.4	16.0	19.11
	Upper secondary education	30.1	25.2	22.05
	Post-secondary (non-tertiary) education	-.1	2.4	2.37
	Tertiary education	30.1	26.2	19.50
Economic status	Pre-school	6.3	7.5	7.00
	Farmer	0	0	-.1
	Employer or self-employed	4.2	4.1	5.68
	Employee	36.6	36.3	33.97
	Pensioner	20.3	18.9	18.25
	Unemployed	5.5	4.9	3.65
	Student	20.3	18.1	17.59
	Inactive	0.3	1.8	
	Sick or disabled	2.7	2.8	13.21
	Other	3.7	5.6	
	Family worker	0.1	0	0.65
Marital status	Single (never married)	47.7	45.6	42.87
	Married	38.7	39.8	42.67
	Separated	-.1	0.7	-.1
	Divorced	6.8	8.1	8.07
	Widowed	6.8	5.8	6.39
Tenure status	Owner paying mortgage	43.1	43.2	-.1
	Outright owner	33	29.3	-.1
	Tenant or subtenant paying rent at prevailing or market rate	21.2	18.5	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	7.7	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	2.7	1.3	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Overall, the proportions of the variables are similar between EM-HFCS and EM-SILC. Yet, some differences are worth mentioning. EM-HFCS, for example, has a higher proportion of individuals that achieved upper secondary education, whilst EM-SILC has a higher proportion of individuals that completed tertiary education. When looking at economic status, we can notice that also the share of pre-school is higher in EM-SILC.

A.2.4 Micro-validation of income concepts

The next step is to take a look at the summary statistics of the income variables, which are shown in Table A.2.3. A comparison of the mean values indicates a sufficient correspondence between EM-HFCS and EM-SILC. While the difference is equal to about €4,000 in original and pension incomes and about €2,000 in taxes, the gap diminishes to €600 in disposable income. Also social insurance contributions are strongly similar, while the mean of benefits is about €1,000 lower in EM-HFCS than in EM-SILC. The fact that the mean and maximum values for original and pension income and for taxes as well as the maximum value of disposable income are higher for EM-HFCS than for EM-SILC is likely due to the oversampling of the wealthy applied in HFCS. In contrast, the maximum value of benefits is higher in EM-SILC, which can be explained by the fact that EU-SILC is more representative for lower incomes and covers benefits in a more detailed manner.

Table A.2.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	30,623	23,732	-7,800	537,524
	EM-SILC	26,686	20,608	-9,043	432,671
Benefits	EM-HFCS	2,652	3,880	0	51,328
	EM-SILC	3,802	5,301	0	110,532
Taxes	EM-HFCS	8,293	9,268	-1,380	222,765
	EM-SILC	6,308	7,932	-1,274	205,622
Social insurance contributions	EM-HFCS	3,359	2,942	0	23,558
	EM-SILC	3,157	2,806	0	46,610
Disposable income	EM-HFCS	21,623	12,515	-6,476	525,266
	EM-SILC	21,023	9,121	-3,725	210,702

SILC, income reference year, Belgium.

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

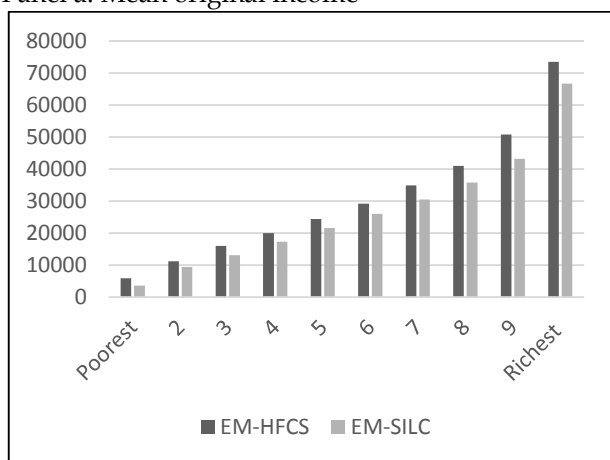
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Mean values of original (& pension) income and disposable income are shown in Figure A.2.1 panel a and panel b, respectively. For original and pension income, the mean values of EM-HFCS are systematically higher than those of EM-SILC. Disposable income does not show this trend. However, average income in the highest decile is here also clearly higher for EM-HFCS than for EM-SILC, which is likely due to the oversampling of the wealthy.

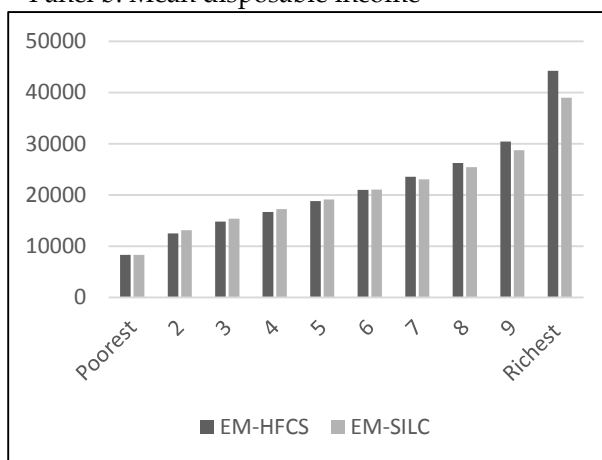
Figure A.2.1 panel c, d & e present the distribution of benefits, taxes and social insurance contributions by disposable income deciles. Up to the ninth decile, the mean value of benefits is much higher for EM-SILC than for EM-HFCS, which can be attributed to the fact that all social benefits apart from pensions and unemployment benefits are captured by a single variable in EM-HFCS, which likely results in underreporting. The mean values of taxes are systematically higher for EM-HFCS than for EM-SILC. Social contributions are higher somewhat for EM-HFCS than for EM-SILC, with the exception of the fifth and the highest decile, where the social contributions are slightly higher for EM-HFCS.

Figure A.2.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Belgium.

Panel a: Mean original income

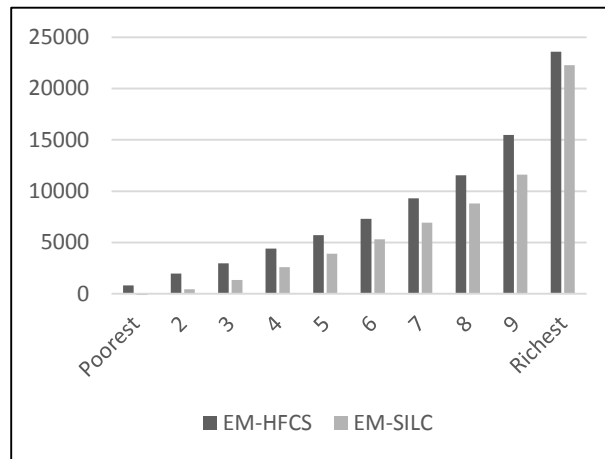
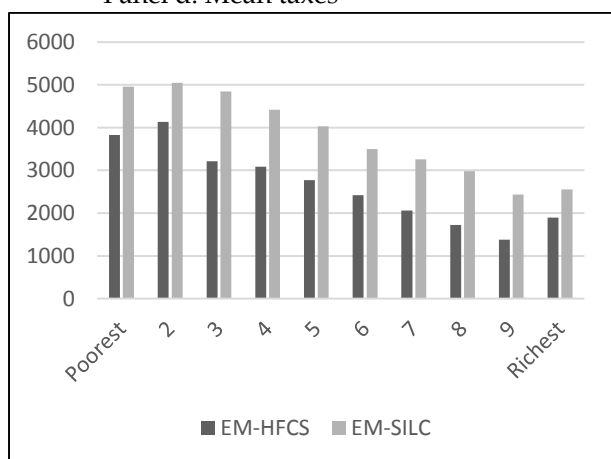


Panel b: Mean disposable income

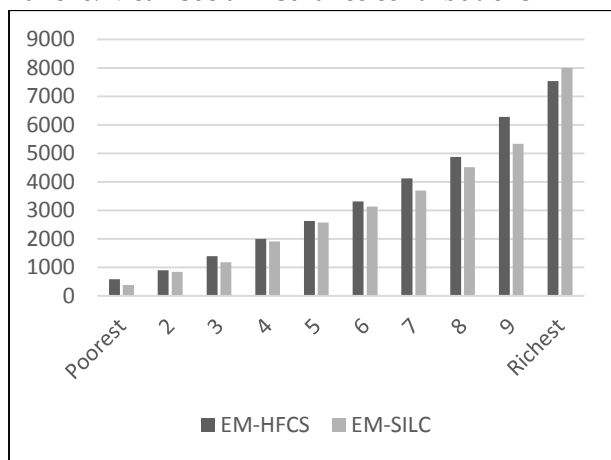


Panel c: Mean benefits

Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and input data from EM-HFCS and EM-SILC.

A.2.5 Macro-validation of new EUROMOD policies

Table A.2.4 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.2.5 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.2.4 Number of eligible cases for wealth taxes, Belgium.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	1,689	1,686	3,531,695	1,686	3,531,695
Real property transfer tax	28	27	75,842	25	68,577
Inheritance tax	49	42	74,564	45	75,363
Gift tax	15	14	45,970	14	45,970
Registration duties on mortgage creation	40	40	119,424	40	119,424
Tax on long-term saving	44	44	66,663	44	66,663

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.2.5 Validation of simulated wealth tax revenues (in million euro), Belgium.

	Year	EM-HFCS	External	Ratio
Real property tax	2013	3,218	3,478 (1)	92.52%
	2017	3,254	3,775 (1)	86.20%
Real property transfer tax	2013	1,987	3,542 (2)	56.10%
	2017	1,977	4,065 (2)	48.63%
Inheritance tax	2013	1,142	2,634 (2)	43.36%
	2017	1,035	2,365 (2)	43.76%
Gift tax	2013	103.8	463 (2)	22.42%
	2017	83.49	567 (2)	43.76%
Registration duties on mortgage creation	2013	241	244 (3)	98.77%
	2017	233	122 (3)	190.98%
Tax on long-term saving	2013	197.7	207 (2)	95.51%
	2017	158.2	382 (2)	41.41%

Note: External figures about 2017 refer to 2016. Only the external tax revenues about the real property tax are specifically about households, the other external information represents total tax revenues of the Belgium government.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (2017a); (2) The National Bank of Belgium (2017b); (3) Federal Public Service Finance (2017).

Table A.2.5 shows a comparison between the simulated wealth taxes and the tax revenues provided by external figures from the OECD Tax Revenue Database (2017a) and national documents. We find relatively large discrepancies, but in general there are good explanations for this. The external statistics are not always available at a detailed level, such that they may not be fully comparable to our simulations. Only for the advanced levy on immovable property we found external figures about the taxes paid by the households. For all the other taxes we used figures that represent the total tax revenues of the Belgium government. Second, for the inheritance and gift tax our simulated revenues are lower than official statistics mainly because the HFCS does not observe inheritances and gifts made between members of the same household, while especially those between spouses represent an important share of the total amount of transfers.

A.3 Cyprus

A.3.1 Description of wealth taxes

A.3.1.1 New EUROMOD policies

Real property tax (“Φόρος Ακίνητης Ιδιοκτησίας”)

Description:

Owners of real property in Cyprus are taxed with a real property tax. The market value of the property on January 1st 1980 is used as tax base⁵. If an individual’s total value of immovable property located in Cyprus does not exceed €12,500 the property is exempt from taxation. In addition, also properties such as public burial grounds, chapels and churches are exempt from taxation. In all other cases the following tax rates apply:

Table A.3.1 Real property tax rates, Cyprus.

Value	Tax rate
For every € between €0 - €40,000	0.6%
Then, for every € between €40,001 - €120,000	0.8%
Then, for every € between €120,001 - €170,000	0.9%
Then, for every € between €170,001 - €300,000	1.1%
Then, for every € between €300,001 - €500,000	1.3%
Then, for every € between €500,001 - €800,000	1.5%
Then, for every € between €800,001 - €3,000,000	1.7%
Finally, for every € equal to or higher than €3,000,001	1.9%

Source: Cross-country review of taxes on wealth and transfer of wealth (Ernst & Young, 2014).

In 2013, a special amendment was introduced that granted a tax reduction of 10% to the taxpayer if the real property tax was fully paid by no later than 5 November 2013 (European Commission, 2018).

Besides the “general real property tax” there are two additional property taxes that are levied in Cyprus, i.e. a *municipal immovable property tax* of 0.15% on property owners and a *communal immovable property tax* of at most 0.10% on property owners (Ernst & Young, 2014).

Assumptions:

- We do not know the market value of a property on January 1st 1980 if properties are bought on a later date. Therefore, we calculated a ratio between the purchase price of the property and its reported current value at the moment of the interview for all properties that were bought in 1980. This ratio equals 29% in the input data, which means that market values of houses increased approximately with 71% between 1980 and 2013. Then, in order to approximate the 1980 market value of properties that were bought on a later date, we subtracted 71% of the properties’ current value. We stored these values in the cadastral variables “khooo”, “kho01”, “kho02” and “kho03” which we then used as tax base. Since these market values were reassessed in 2013, we used the reported values of the properties for the policy year 2017.

⁵ These values were reassessed in 2013 and introduced in the tax year of 2015 (see <http://karitzis.com/%CF%86%CE%BF%CF%81%CE%BF%CE%BB%CE%BF%CE%B3%CE%AF%CE%B1-%CE%B1%CE%BA%CE%AF%CE%BD%CE%B7%CF%84%CE%B7%CF%82-%CE%B9%CE%B4%CE%B9%CE%BF%CE%BA%CF%84%CE%B7%CF%83%CE%AF%CE%B1%CF%82-%CE%B3%CE%B9%CE%B1-%CF%84/>).

- We assume that all households paid their real property tax before 5 November 2013 in order to receive the tax reduction of 10%.
- Due to insufficient information, we assume that all municipalities (communities) levy the maximum tax rate of 0.15% (0.10%).

Aspects of the policy that were not implemented:

- The list of exemptions.

Changes after the income reference year (only those relevant for the 2017 policy):

- Real property tax is abolished in 2017. The municipal tax rate equals 0.024% in 2017. We do not simulate the communal tax since we cannot find specific information online and simulating this tax results in a severe over simulation of the real property tax (Ernst & Young, 2014; see http://www.cylegalnews.com/2017/07/blog-post_78.html).

Real property transfer tax (Τέλη Κτηματολογίου)

Description:

A transfer tax is levied on the buyer in case of the acquisition of immovable property in Cyprus. The market value of the property (as estimated by the registry department) is used as tax base. The following rates apply:

Table A.3.2 Real property transfer tax rates, Cyprus.

Value	Tax rate
For every € between €0 - €85,000	3%
Then, for every € between €85,001 - €170,000	5%
Finally, for every € equal to, or exceeding, €170,001	8%

Source: Cross-country review of taxes on wealth and transfer of wealth (Ernst & Young, 2014).

Following the abolition of the inheritance and gift tax in Cyprus in the year 2000, a provision concerning gifts of immovable property is built into the transfer tax. The total value of the immovable property that is given within the context of an *inter vivos* gift is taxed at a rate of 4% if the gift occurs between parents and children, or taxed at 8% in case the gift occurs between spouses or other relatives up until the third degree of kinship.

Assumptions:

- We use the purchase value of the property as tax base.

Aspects of the policy that were not implemented:

- Gifts of immovable property between non-relatives (no information). However, this does not affect the results given that there are no eligible cases in the input data.

Changes after the income reference year (only those relevant for the 2017 policy):

Change in tax rates for gifts of immovable property⁶:

- Gifts of immovable property between parents and children are exempt from taxation.
- Gifts of immovable property between spouses and relatives up to the third degree of kinship are taxed at 0.001%.
- Gifts of immovable property between relatives other than the third degree of kinship and non-relatives are taxed at 3%, 5% or 8% similar to the property transfer tax.

⁶See <http://portal.dls.moi.gov.cy/en-us/Rights%20and%20Fees/PublishingImages/Pages/default/Rights%20and%20Fees.pdf>

Mortgage registration duties

Description:

The registration of a mortgage is taxed at a percentage of 1% on the amount advanced under the mortgage. In case of cancellation of an existing mortgage and the declaration of a new mortgage by the mortgagor in relation to the same property and for the same purpose, special rules apply (see <http://portal.dls.moi.gov.cy/en-us/Rights%20and%20Fees/PublishingImages/Pages/default/Rights%20and%20Fees.pdf>).

Assumptions: n/a

Aspects of the policy that were not implemented:

- Special rules in case of cancellation of a mortgage.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.3.1.2 Refinement of existing EUROMOD policies

Special contribution to defense (“Εκτακτη Εισφορά για την Άμυνα”)

Description:

A special contribution to defense is levied on income from financial assets earned by individuals and legal entities in Cyprus. The following rates apply (Ernst & Young, 2014; see <http://www.hmiaccountants.com/page.php?id=263>):

- 17% on income from dividends.
- 30% on income from interests (paid and credited), but individuals whose annual income does not exceed €12,000 are eligible to refund amounts withheld as contribution to defense on interest income above 3% of this income.
- 3% on income from Cypriot saving certificates, development bonds and interest from provident funds.
- 3% on gross rents decreased by 25%.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after income reference year (only those relevant for the 2017 policy): n/a

Asset-test for social benefits: student grant

Description

In order to receive a student benefit the total value of family assets may not exceed €1,200,000 per year. The total value of family assets consists of family financial assets (e.g. shares and bonds) and the total value of real property. This wealth-test is currently not simulated in EUROMOD, but with information from the HFCS we can include this in the simulation.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Asset-test for social benefits: guaranteed minimum income scheme

Description

In order to be eligible for the Guaranteed Minimum Income (GMI) scheme claimants must pass the means-test. More concretely, real property of the household may not exceed €100,000. In case the property size of the main residence is smaller than 300m², the value of the main residence is not taken into account for the calculation of the value of the immovable property. Value of deposits cannot exceed €5,000, increased with €1,000 for each additional person in the household. Finally, the total value of remaining financial assets cannot exceed €5,000.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.3.2 Uprating of monetary variables

An overview of how the amounts are uprated is presented in Table A.3.3. First, the main asset variables are uprated based on their aggregates as reported in the balance sheets for non-financial assets (Eurostat, 2017b). The variables “amr”, “aob”, “amrpv”, “aobpv01-03” are uprated based on the net stock of buildings and structures. Vehicles (“avh”) and valuables (“avl”) are both uprated with the gross stock of personal transport equipment due to insufficient information. Self-employed business assets (“asb”) are uprated with the gross of machinery & equipment and intellectual property. Second, financial assets are uprated based on their size as reported in the balance sheet for financial assets (Eurostat, 2017a). Deposits (“adp”) are uprated with the total stock of transferable and other deposits, mutual funds (“amf”) and managed accounts (“ama”) with the stock of investment fund shares, shares (“ash”) with the stock of listed shares, private pension (“app”) with the stock of life insurance and pension entitlements, other assets (“aot”) with the stock of non-life insurance technical reserves and other accounts and debt (“adb”) with the total stock of liabilities. Thirdly, due to missing information, we uprated the gift variable gifts of immovable property (“agiimvr”) with the uprate factor \$f_1\$. Fourthly, the variable net wealth (“anw”) is uprated with the stock of net wealth. We calculated this stock as the sum of total financial and non-financial assets minus liabilities. Finally, the variables financial assets (“ape”) and real assets (“ara”) are uprated based on their separate components.

Table A.3.3 Overview of uprating indices used for wealth variables in EUROMOD, Cyprus.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	44,547.3	43,866.9	Net stock of buildings and structures, in million euro (1) ^{3,4,5}
\$f_avh	avh	113,275.1	122,122.5	Gross stock of personal transport equipment, in million euro (2) ^{2,3,4}
\$f_avl	avl	113,275.1	122,122.5	Stock of other durables, in million euro (2) ^{2,3,4}
\$f_asb	asb	240,047.2	259,781.6	Stock of machinery & equipment and intellectual property products, in million euro (2) ^{2,3,4}
\$f_adp	adp	25,588.3	26,637.3	Stock of transferable & other deposits, in million euro (3)
\$f_amf	amf, ama	164.6	183.4	Stock of investment fund shares, in million euro (3)
\$f_abd	Abd	185.1	836.0	Stock of debt securities, in million euro (3)
\$f_apb	apb	9,749.0	8,148.3	Stock of unlisted shares and other equity, in million euro (3)
\$f_ash	ash	491.8	739.6	Stock of listed shares (domestic & other), in million euro
\$f_app	app	1,755.0	1,521.0	Stock of life insurance and pension entitlements, in million euro (3)
\$f_aot	aot	1,576.0	930.0	Stock of non-life insurance technical reserves and other accounts, in million euro (3)
\$f_adb	adb	26,427.2	24,640.9	Stock of total liabilities, in million euro (3)
\$f_anw	anw	26.12	25.08	Stock of net wealth, in billion euro

Note: All stock variables refer to the situation at the end of the year. ¹ Figures refer to 2016 unless otherwise indicated; ² Figures of Greece are used as proxy due to missing information for Cyprus; ³ Due to insufficient information on household level we use figures for the whole economy (s1); ⁴ Figures of 2017 refer to 2015; ⁵ Net stock is used instead of gross stock.

Source: (1) Balance sheet for non-financial assets (Eurostat, 2017b); (2) Annual National Accounts, Fixed assets by activity and by asset, ISIC rev4 (OECD, 2017b); (3) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a); (4) Tax Revenue Database (OECD, 2017a).

A.3.3 Comparison of socio-demographic characteristics

Table A.3.4 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Cyprus.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	19.05	17.63	17.29
	16 – 29	19.24	23.11	22.09
	30 – 44	23.82	22.15	22.78
	45 – 64	24.66	24.49	24.53
	65 – 99	13.22	12.62	13.30
Gender	Female	51.18	51.36	51.36
	Male	48.82	48.64	48.64
Education	Not completed primary education	13.65	16.91	17.80
	Primary education	20.55	14.57	15.77
	Lower secondary education	8.97	11.57	10.25
	Upper secondary education	38.70	30.69	30.59
	Post-secondary (non-tertiary) education	-.1	2.10	3.18
	Tertiary education	18.13	24.16	22.41
Economic status	Pre-school	6.16	6.96	6.41
	Farmer	-.1	-.1	-.1
	Employer or self-employed	7.16	4.63	5.12
	Employee	32.05	36.86	38.71
	Pensioner	14.07	14.54	14.96
	Unemployed	10.30	10.36	5.46
	Student	22.03	18.66	19.16
	Inactive	0.96	1.85	
	Sick or disabled	0.75	1.06	9.83
	Other	6.47	5.08	
	Family worker	0.05	-.1	0.19
Marital status	Single (never married)	44.58	41.99	41.77
	Married	45.89	48.59	50.0
	Separated	-.1	0.64	-.1
	Divorced	4.41	4.34	3.78
	Widowed	5.12	4.44	4.45
Tenure status	Owner paying mortgage	40.62	19.29	-.1
	Outright owner	38.80	53.70	-.1
	Tenant or subtenant paying rent at prevailing or market rate	6.83	11.48	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	0.87	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	13.75	14.67	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Overall, proportions are similar between EM-HFCS and EM-SILC. Yet, some differences are worth mentioning. EM-HFCS, for example, has a higher proportion of individuals that achieved primary and upper-secondary education, whilst EM-SILC has a higher proportion of individuals that completed tertiary education. When looking at economic status, we can notice that the share of employers is higher in EM-HFCS, while the number of employees is higher in EM-SILC. Marital status is highly resembling in the two datasets. Also note that there is a considerable difference in the tenure status of

individuals. Whilst EM-HFCS has a fairly higher share of individuals paying mortgage, EM-SILC has a higher number of individuals that own their property outright.

A.3.4 Micro-validation of income concepts

Table A.3.5 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Cyprus.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	16,098	13,879	-848	227,333
	EM-SILC	18,652	18,064	-7,200	375,025
Benefits	EM-HFCS	1,244	2,244	0	48,000
	EM-SILC	2,810	9,714	0	280,000
Taxes	EM-HFCS	1,081	3,012	0	59,331
	EM-SILC	1,393	3,126	0	69,557
Social insurance contributions	EM-HFCS	858	728	0	6,389
	EM-SILC	970	781	0	4,685
Disposable income	EM-HFCS	15,404	10,476	-277	208,291
	EM-SILC	19,100	18,083	317	361,012

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

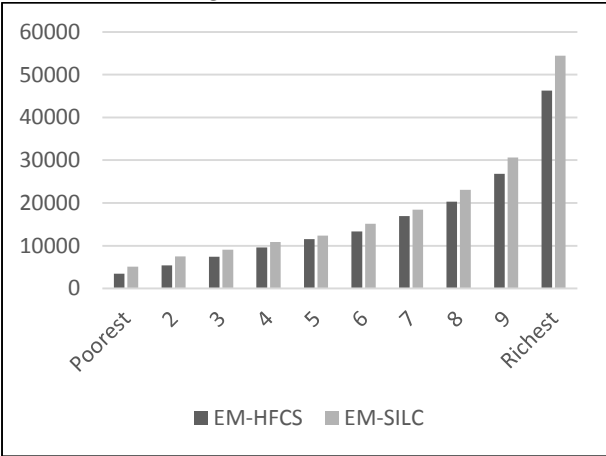
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

From Table A.3.5 emerges that original & pension income is considerably higher in EM-SILC. The difference between both datasets equals approximately €2,600. This gap increases to €3,700 in disposable income and can be mainly attributed to the relatively higher amount of benefits in EM-SILC. This should come as no surprise given that EM-SILC is more targeted towards lower incomes. Average taxes and social insurance contributions are also higher in EM-SILC, which is among other things the result of higher original incomes.

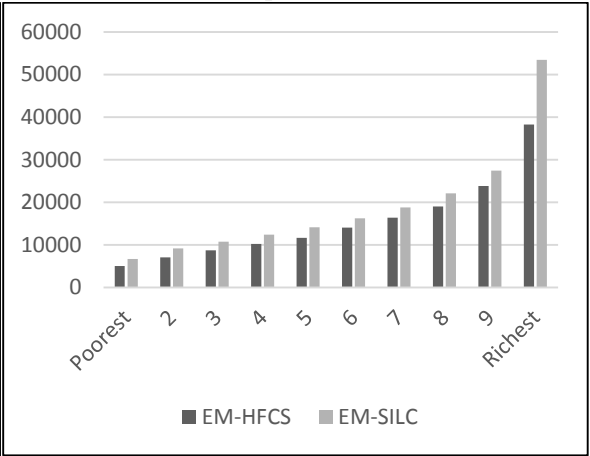
Next, we present the distribution of the income concepts from Table A.3.5 across disposable income deciles. Figures A.3.1 panel a and panel b present mean values of original and disposable income. Overall, the average incomes are quite similar between EM-HFCS and EM-SILC, except for the tenth decile. Figures A.3.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions, respectively. In general, EM-SILC simulates higher amounts of benefits, especially for the highest income decile. This is caused by the variable “bunot” (“other unemployment benefit”) which exceeds €6,000 for the wealthiest households and is almost zero for the other income groups. This is also the case for the original EU-SILC input data such that it has nothing to do with our simulations. Apart from that, EM-SILC simulates higher benefit amounts since the EU-SILC is more targeted towards lower incomes and EM-HFCS captures almost all social benefits by one single variable. Finally, the distribution of taxes and social insurance contributions is similar between both databases.

Figure A.3.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Cyprus.

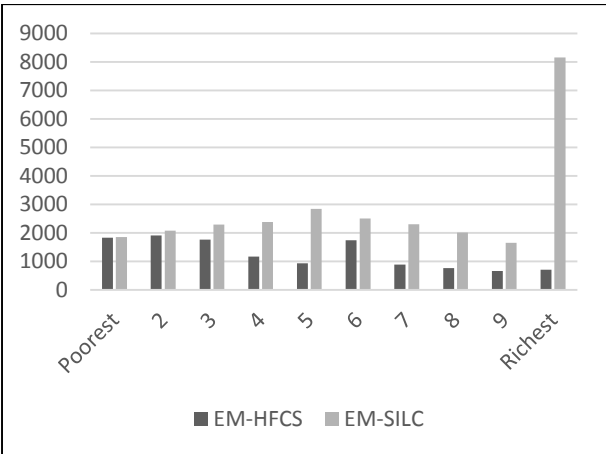
Panel a: Mean original income



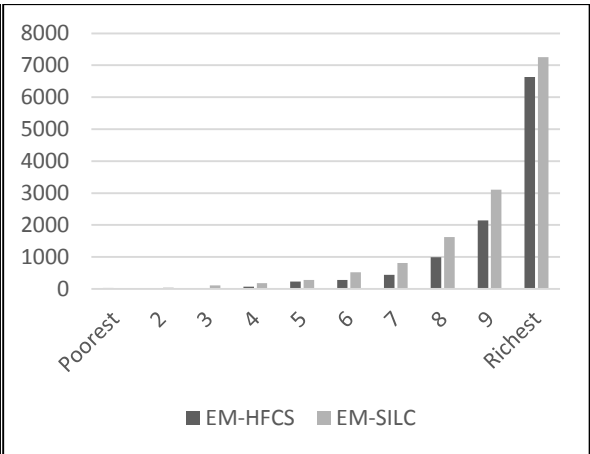
Panel b: Mean disposable income



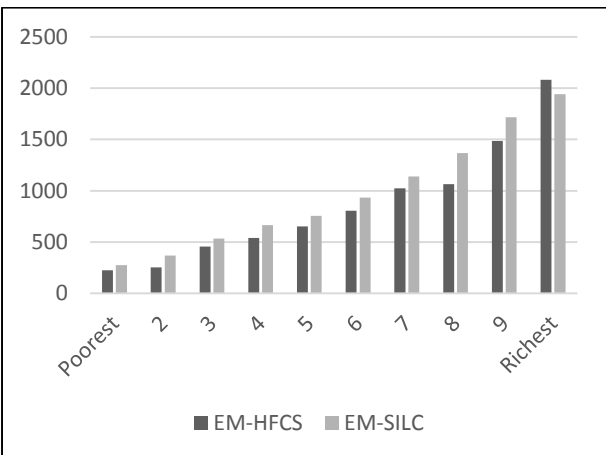
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.3.5 Macro-validation of new EUROMOD policies

Table A.3.6 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.3.7 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.3.6 Number of eligible cases for wealth taxes, Cyprus.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	1,098	1,098	250,309	1,098	250,309
Real property transfer tax	5	5	688	5	688
Gift provision	27	22	3,620	0	0
Tax on mortgage registration	77	77	13,824	77	13,824

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

The total number of eligible cases for the gift provision is higher in comparison to the final number of taxpayers. This can be explained by the fact that 5 cases did not receive immovable property as gift. Consequently, given that only gifts of immovable property are taxed in Cyprus, these cases are “exempt” from taxation. In 2017, gifts between parents and children and children are no longer subject to the gift tax provision which results in zero taxpayers.

Table A.3.7 Validation of simulated wealth tax revenues (in million euro), Cyprus.

		EM-HFCS	External	Ratio
Real property tax	2013	94.49	100.8 (1)	93.74%
	2017	22.52	16.50 (1)	136.48%
Real property transfer tax, gift provision & mortgage registration duties	2013	39.93	79.70 (1)	50.10%
	2017	22.28	99.0 (1)	22.51%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Taxes in Europe Database (European Commission, 2018).

The real property tax is slightly underestimated for the income reference year policy system. Ideally, we would use the market value of the property on January 1st 1980 as tax base for the calculation of the property tax. However, HFCS does not contain this information and we were unable to find the relevant information online. As such, we use an approximation of the market values (see description wealth tax) which results in less accurate simulations. In 2017, the real property tax is slightly overestimated.

The underestimation of the real property transfer tax and mortgage registration duties can be attributed to the low number of eligible cases in the input data (see Table A.3.6). On top, the reported tax revenue that we use from the Taxes in Europe Database (European Commission, 2018) includes multiple taxes such as the transfer tax, mortgage registration duties, tax on leases and so forth. Therefore, it might seem that our simulated transfer tax and mortgage registration duties are strongly underestimated, while in fact these external figures are not fully comparable to our simulations. From Table A.3.7 also emerges that there is a sharp decline in tax revenue in 2017. This can be attributed to a change in the tax law of the gift provision (included in the real property transfer tax). While gifts between lineal heirs (e.g. parents, children...) were still taxed in 2013, this is no longer the case in 2017. As a result, the number of taxpayers drops to zero. There are no changes in tax code for the mortgage registration which results in an unchanged sample and number of taxpayers. Since values of mortgages are not updated, the tax revenue between the income reference year and 2017 is identical.

A.4 Estonia

A.4.1 Description of wealth taxes

A.4.1.1 New EUROMOD policies

Real property tax (“maamaks”)

Description:

The land tax needs to be paid on all land and is based on the taxable value of the land. It ranges from 0.1% to 2.5% on the taxable value of the land. The tax needs to be paid by the owner or the user of the land, and it is fully received by the local municipalities (Deloitte, 2012; 2017a; Rahandusministeerium, 2018). The tax is paid twice a year (on March 31 and October 1).

Residential land is exempted from the tax to the extent of 0.15 hectares (1,500 m²) in a densely populated area and to the extent of 2 hectares (20,000 m²) elsewhere.

Recipients of pensions and persons who were repressed by Soviet authorities may be exempted from the obligation to pay land tax for up to 0.3 hectares (3,000 m²) in cities and 1 hectare (10,000 m²) in rural municipalities. They are only exempted when they use their land for living and does not receive rent on the basis of the right of use of land.

Assumptions:

- In HFCS there is no variable about the taxable value of the land on which is build. To make a simulation of the property tax possible, we made an imputation based on the current price of the households’ main residences (HFCS variable “HB0900”) and the current price of the building plots/estates that the households own (HFCS variables “HB250\$x” & “HB280\$x”). By calculating the ratio of the average current value of building plots/estates and the average current value of the main residences, we have an indication of the share of the value of the lands in the current value of the main residences. Subsequently, we applied this ratio to the current price of the households’ main residence. In this way, we created a variable about the value of the land that the households own (“ald”).
- Because the tax rates are chosen by the municipalities, an average of these tax rates is used in the simulated policy. For 2017, this average tax rate is equal to 2.18%. For 2012, there is no information available. Therefore, we used the average tax rate of 2015 (2.16%), the first year for which these separate tax rates of the municipalities are available on the website of the Estonian ministry of finance.

Aspects of the policy that were not implemented:

- The information about the area of the main building does only include the living area of the household’s main residence and not the surrounding land.
- We have no information about who were repressed by Soviet authorities, so we could not exempt them from taxation.
- For areas that are under cultivation and for natural grasslands, the tax ranges from 0.1% to 2%. Because we have no information about the areas where the main residences are located, we cannot include this different tax-rates into the policy simulation.
- Local municipalities have the right to exempt taxpayers from the obligation to pay the land tax – when certain conditions are fulfilled – for up to 0.3 hectares in cities and 1 hectare in rural municipalities on land in residential use.

- The land where economic activity is restricted by law is either completely exempted from tax or for 50% of the standard tax rate, depending on the nature of the restriction. Because we have no information regarding the economic activity of land, this is not included in the simulation.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.4.1.2 Refinement of existing EUROMOD policies

Taxation of income from financial assets

Description:

According to tax law (Riigi Teataja, 2014), all investment income except for dividend income is taxable in the personal income tax. Therefore “yiyit” (interest income) and “yiyot” (other investment income), is included in the income tax base of the income tax policy (“tin_ee”).

Assumptions: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.4.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.4.1. They are all uprated with figures from Eurostat (2017a, 2017b, 2017c, 2017d). For the non-financial variables, we used the following uprates: for the variables “amr” (main residence) and “ald” (land) we made use of the gross stock of dwellings, for other buildings (“aob”) we used the gross stock of other buildings than dwellings, vehicles (“avh”) are uprated with the financial consumption of the households on transport, valuables (“avl”) are uprated with the gross capital formation and “asb” (self-employed business assets) is uprated with the stock of machinery, equipment, weapons systems, and intellectual property products. The financial assets are uprated as follows: “adp” (deposits) with the stock transferable and other deposits, “amf” (mutual funds) and “ama” (managed accounts) with stock of investment fund shares, “abd” (bonds) with the stock of debt securities, “apb” (non-self-employment private business) with the stock of unlisted shares and other equity, “ash” (shares) with the stock of listed shares, “app” (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, “aot” (others) with the stock of non-life insurance technical reserves and other accounts receivable/payable and “adb” (debt) with the stock of total liabilities.

Table A.4.1 Overview of uprating indices used for wealth variables in EUROMOD, Estonia.

Uprate index	Variables uprated by the index	Value 2012	Value 2017 ¹	Source
\$f_amr	amr, ald	17.29	19.75	Dwellings, in billion euro (1) ²
\$f_aob	aob	1.08	1.24	Other buildings, in billion euro (1) ²
\$f_avh	avh	1.21	1.26	Financial consumption expenditure of households: transport (2)
\$f_avl	avl	5.22	5.83	Gross capital formation (3)
\$f_asb	asb	0.41	0.37	Machinery, equipment, weapons systems and intellectual property products, in billion euro (1) ²
\$f_adp	adp	4.66	6.21	Transferable & other deposits, in billion euro (4)
\$f_amf	amf, ama	0.16	0.2	Investment fund shares, in billion euro (4)
\$f_abd	abd	0.03	0.065	Debt securities, in billion euro (4)
\$f_apb	apb	9.65	11.93	Unlisted shares and other equity, in billion euro (4)
\$f_ash	ash	0.13	0.36	Listed shares, in billion euro (4)
\$f_app	app	0.39	0.47	Life insurance, annuity entitlements and pension entitlements, in billion euro (4)
\$f_aot	aot	0.56	0.6	Non-life insurance technical reserves and other accounts receivable / payable, in billion euro (4)
\$f_adb	adb	7.74	9.03	Total financial liabilities, in billion euro (4)

Note: All stock variables refer to the situation at the end of the year. ¹ Values of 2017 refer to 2016. All non-financial values are at household level (S14) unless otherwise indicated and all financial variables are about the total economy. ² Figures are about households and non-profit institutions serving households (S14_S15).

Source: (1) Annual Sector Accounts, Balance sheets for non-financial assets (Eurostat, 2017b); (2) Final consumption expenditure of households by consumption purpose (Eurostat, 2017c); (3) GDP and main components (output, expenditure and income) (Eurostat, 2017d); (4) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a).

A.4.3 Comparison of socio-demographic characteristics

Table A.4.2 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Estonia.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
<i>Age</i>	< 16	15.4	16.2	16.40
	16 – 29	18.4	19.8	18.73
	30 – 44	20.6	20.8	20.60
	45 – 64	27.14	26.2	26.55
	65 – 99	18.4	17.0	17.72
<i>Gender</i>	Female	53.6	54.0	53.61
	Male	46.4	46.0	46.39
<i>Education</i>	Not completed primary education	14.4	14.2	15.33
	Primary education	5	4.3	5.81
	Lower secondary education	13.8	14.7	12.97
	Upper secondary education	40.1	38.7	33.47
	Post-secondary (non-tertiary) education	-.1	2.6	6.18
	Tertiary education	26.7	25.5	26.44
<i>Economic status</i>	Pre-school	7.3	7.9	7.99
	Farmer	-.1	-.1	-.1
	Employer or self-employed	3.8	3.7	3.19
	Employee	39.9	41.5	39.77
	Pensioner	20.5	19.0	22.21
	Unemployed	5.3	5.1	5.33
	Student	15.4	14.8	13.76
	Inactive	0.3	0.3	
	Sick or disabled	4.2	4.0	7.37
	Other	3.2	3.7	
	Family worker	-.1	-.1	0.35
<i>Marital status</i>	Single (never married)	45.9	47.9	47.02
	Married	34.5	32.1	32.92
	Separated	-.1	1.7	-.1
	Divorced	9.6	8.9	11.47
	Widowed	10.0	9.4	8.59
<i>Tenure status</i>	Owner paying mortgage	25.1	17.9	-.1
	Outright owner	56.3	64.4	-.1
	Tenant or subtenant paying rent at prevailing or market rate	9.1	3.0	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	3.2	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	9.5	11.6	-.1

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

In table A.4.2 a comparison of the socio-demographic variables in EM-HFCS and EM-SILC is made. Overall, the characteristics of the sample in both databases are highly similar, except for the tenure status for which EM-HFCS has a higher share of individuals that are paying a mortgage. EM-SILC, on the other hand, has a higher share of individuals that own their property outright.

A.4.4 Micro-validation of income concepts

Table A.4.3 gives a comparison of the overall income concepts of EM-HFCS and EM-SILC. These income concepts are also highly similar. Only original & pension income and disposable income are considerably higher in EM-HFCS in comparison to EM-SILC. The difference is equal to €2,241 and €1,843, respectively.

Table A.4.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Estonia.

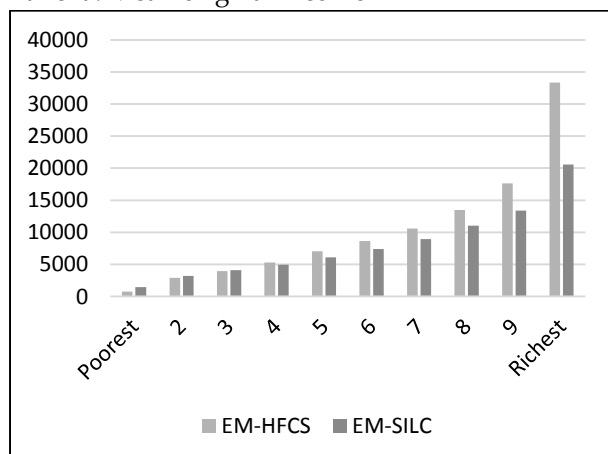
Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	10,353	11,374	-23,846	239,878
	EM-SILC	8,112	6,076	-678	78,706
Benefits	EM-HFCS	879	1,507	0	14,627
	EM-SILC	856	1,566	0	15,219
Taxes	EM-HFCS	1,454	1,882	0	27,946
	EM-SILC	1,173	1,239	0	15,682
Social insurance contributions	EM-HFCS	433	635	0	8,925
	EM-SILC	292	302	0	2,968
Disposable income	EM-HFCS	9,345	9,168	-24,775	207,001
	EM-SILC	7,502	4,697	-839	63,025

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

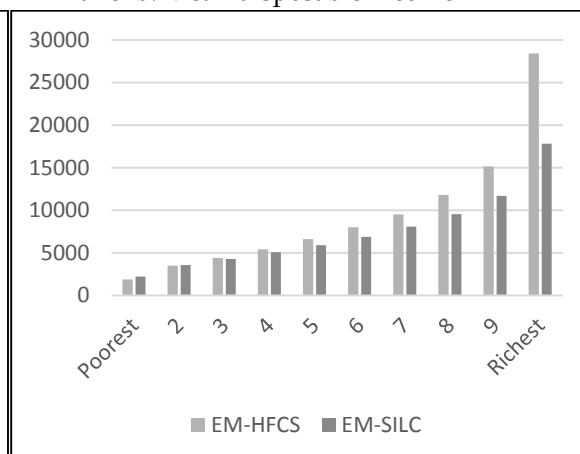
Next, we present the distribution of the income concepts from Table A.4.3 across disposable income deciles. Figures A.4.1 panel a and b present mean values of original and disposable income. The mean values of the income variables are quite similar between EM-HFCS and EM-SILC for the first five deciles in both income concepts. For the highest five deciles of both income concepts, EM-HFCS shows to have higher values than EM-SILC. Figure A.4.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions, respectively. The level of benefits simulated in EM-HFCS is highly similar to those from the EM-SILC simulations. The distributions of taxes and social insurance contributions show again higher values for the highest deciles from EM-HFCS than from EM-SILC.

Figure A.4.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Estonia.

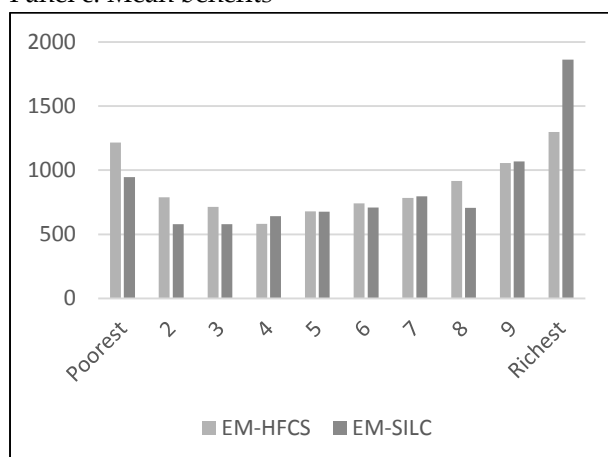
Panel a: Mean original income



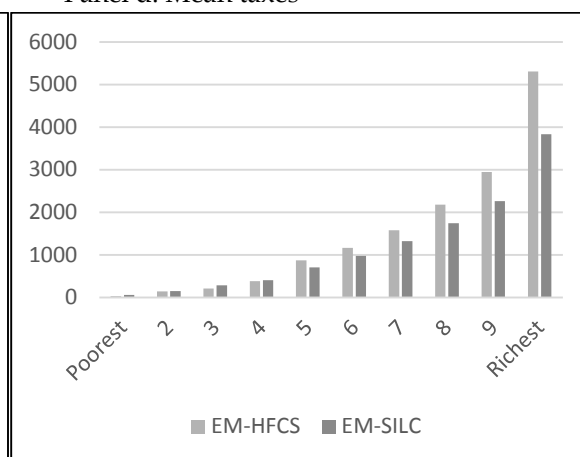
Panel b: Mean disposable income



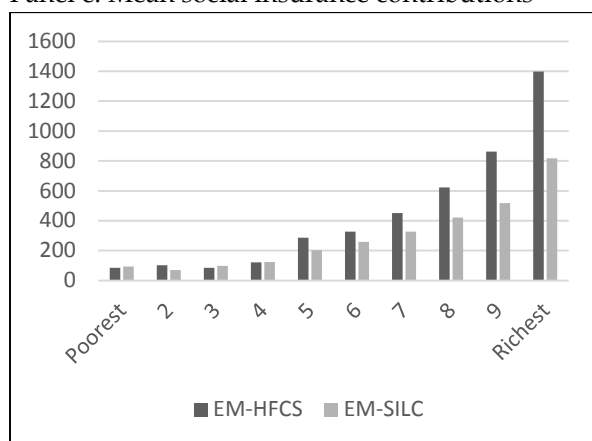
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-SILC and EM-HFCS.

A.4.5 Macro validation of new EUROMOD policies

Table A.4.4 summarizes the number of eligible cases in the sample and the final number of taxpayers for the simulated real property tax. Subsequently, Table A.4.5 presents a comparison of the simulated tax revenues with external figures.

Table A.4.4 Number of eligible cases for wealth taxes, Estonia.

	2013			2017		
	Eligible cases	Taxpayers	Population	Eligible cases	Taxpayers	Population
Real property tax	1,801	0	0	1,801	0	0

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Our simulation of the real property tax is equal to 0. This is due to the fact that for the simulations of the tax exemptions, which are based on the surface of the land, we only have information about the living area of the household's own dwelling and not about the surrounding land. The surfaces of the living areas of the dwellings are for all the households smaller than the surfaces for which they are exempted, with as a result a tax revenue of 0.

Table A.4.5 Validation of simulated wealth tax revenues (in million euro), Estonia.

	Year	EM-HFCS	External	Ratio
Real property tax	2012	0	59 (1)	0%
	2017	0	59 (1)	0%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

A.5 Finland

A.5.1 Description of wealth taxes

A.5.1.1 New EUROMOD policies

Real property tax (“Kiinteistöverolaki”)

Description:

Real property that is located in Finland is subject to a real property tax and is due by the owner of the property. The tax base is the taxable value as determined in the “Act on the Valuation of Assets for Taxation”. Tax rates can be chosen by municipalities within statutory limits and depend on the type of property:

Table A.5.1 Real property tax rates, Finland.

Type of property	Minimum rate	Maximum rate
General real property tax	0.60%	1.35%
Permanent residential buildings	0.32%	0.75%
Other residential buildings	0.60%	1.35%
Power plant	0%	2.85%
Vacant construction sites	1%	3%
Vacant construction sites within the greater metropolitan area around Helsinki	1.5%	3%

Source: Cross-country review of taxes on wealth and transfer of wealth (Ernst & Young, 2014).

Water areas, forests and agricultural land are the most important exemptions from the property tax. The tax revenues go to the municipality in which the property is situated (Ernst & Young, 2014; Kuypers et al., 2017).

Assumptions:

- The Finnish HFCS data covers the value of all other buildings other than the main residence in one variable, information on number and type of properties is missing. Hence, we cannot identify second residences so that we apply the general tax rate to all other buildings.
- Average municipal tax rates are implemented: 0.92% for the general tax rate and 0.41% for permanent residences (Veronmaksajat Puolenpitoa, 2018).
- Finnish HFCS have missing information for partial ownership of real property.

Aspects of the policy that were not implemented:

- Exemption for water areas, forests and so on.
- Special rates for power plants, etc.

Changes after the income reference year (only those relevant for the 2017 policy):

- Average tax rates have increased following an increase in the general tax rate and rate for permanent residences (Veronmaksajat Puolenpitoa, 2018).

A.5.1.2 Refinement of existing EUROMOD policies

Pensioner's housing allowance

Description:

The pensioner's housing allowance is a means-tested benefit that is paid out to pensioners with low incomes. 8% of net wealth is taken into account in the means-test of the benefit (assets minus debts, main residence included and €2,000 exemption for deposits). With HFCS data we can add this means-test in EUROMOD.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Change in assets limits for singles and couples (Kela, 2017).

A.5.2 Uprating of monetary variables

An overview of how the amounts are uprated is presented in Table A.5.2. First, the main asset variables are uprated based on their aggregates as reported by Statistics Finland (2017). The variables "amr", "aob", "amrpv", "aobpv01-03" are uprated based on the gross stock of buildings and structures. Vehicles ("avh") and self-employment business assets ("asb") are both uprated with the gross stock of machinery and equipment. This due to the fact that Statistics Finland includes "personal transport equipment" into the category "machinery & equipment". Second, financial assets are uprated based on their reported size in the balance sheet for financial assets (Eurostat, 2017a). Deposits ("adp") are uprated with the total stock of transferable and other deposits, mutual funds ("amf") and managed accounts ("ama") with the stock of investment fund shares, bonds ("abd") with the stock of debt securities, non-self-employment private business assets ("apb") with the stock of unlisted shares and other equity, private pensions ("app") with the stock of life insurance and pension entitlements, other assets ("aot") with the stock of non-life insurance technical reserves and other accounts and debt ("abd") with the total stock of liabilities. The variable capturing net wealth ("anw") is uprated based on the difference between the gross stock of non-financial & financial assets minus liabilities. Finally, the variables financial assets ("ape") and real assets ("ara") are uprated based on their separate components.

Table A.5.2 Overview of uprating indices used for wealth variables in EUROMOD, Finland.

Uprate index	Variables uprated by the index	Value 2013	Value 2017	Source
\$f_amr	Amr, aob, amrpv, aobpv01-03	254,917	288,508	Gross stock of buildings and structures, in million euro (1)
\$f_avh	avh	4,490 ¹	4,499 ¹	Stock of personal transport equipment, in million euro (1)
\$f_avl	avl	41,983	43,176	Stock of other durables, in million euro (1)
\$f_asb	asb	4,490 ²	4,499 ²	Stock of machinery & equipment and intellectual property products, in million euro (1)
\$f_adp	adp	79,811.0	86,082.0	Stock of transferable & other deposits, in million euro (2)
\$f_amf	amf, ama	16,424.0	24,329.0	Stock of investment fund shares, in million euro (2)
\$f_abd	abd	4,879.0	2,927.0	Stock of debt securities, in million euro (2)
\$f_apb	apb	62,771.0	79,201.0	Stock of unlisted shares and other equity, in million euro (2)
\$f_ash	ash	29,389.0	37,944.0	Stock of listed shares (domestic & other), in million euro (2)
\$f_app	app	43,880.0	52,768.0	Stock of life insurance and pension entitlements, in million euro (2)
\$f_aot	aot	12,343.0	9,698.0	Stock of non-life insurance technical reserves and other accounts, in million euro (2)
\$f_adb	adb	138,603.0	162,784.0	Stock of total liabilities, in million euro (2)
\$f_anw	anw	422,327.0	480,158.0	Stock of net wealth (sum of fixed assets and total financial assets minus total liabilities), in million euro (2)

Note: All stock variables refer to the situation at the end of the year at the household level, unless indicated otherwise. ¹ We use the gross stock of machinery, equipment & intellectual property products as a proxy for personal transport equipment since Statistics Finland include personal transport equipment in this category. ² Sum of machinery & equipment, intellectual property products and personal transport equipment.

Source: (1) Annual Financial Accounts, Non-financial assets by sector 1995-2017 (Statistics Finland, 2017); (2) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a).

A.5.3 Comparison of socio-demographic characteristics

Table A.5.3 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Finland.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	17.65	17.65	17.71
	16 - 29	17.09	17.09	17.52
	30 - 44	18.44	18.44	18.66
	45 - 64	27.56	27.56	28.61
	65 - 99	19.26	19.26	17.50
Gender	Female	50.94	50.94	50.92
	Male	49.06	49.06	49.08
Education	Not completed primary education	15.47	15.27	15.36
	Primary education	3.63	2.40	1.15
	Lowery secondary education	20.99	22.32	27.58
	Upper secondary education	33.20	32.71	32.32
	Post-secondary (non-tertiary) education	-1	0.45	0.39
	Tertiary education	26.71	26.85	23.20
Economic status	Pre-school	7.93	6.54	7.80
	Farmer	-1	-1	-1
	Employer or self-employed	5.57	5.67	4.46
	Employee	35.29	35.25	38.80
	Pensioner	21.21	21.23	-1
	Unemployed	5.52	5.51	4.99
	Student	17.62	19.02	-1
	Inactive	0.90	0.90	-1
	Sick or disabled	4.01	3.97	-1
	Other	1.90	1.90	-1
Family worker	0.05	0.0	-1	
Marital status	Single (never married)	47.29	47.33	47.38
	Married	37.84	37.82	37.46
	Separated	-1	-1	-1
	Divorced	9.87	9.85	9.69
	Widowed	5.01	5.01	5.48
Tenure status	Owner paying mortgage	43.46	43.05	-1
	Outright owner	31.16	30.14	-1
	Tenant or subtenant paying rent at prevailing or market rate	24.55	10.86	-1
	Accommodation is rented at a reduced rate (below market price)	-1	15.12	-1
	Accommodation is socially rented	-1	-1	-1
	Accommodation is rented for free	0.83	0.84	-1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Overall, sample characteristics are highly similar between EM-HFCS and EM-SILC. This relates to the fact that the Finnish authorities use the same sample of respondents for both the HFCS and EU-SILC. At first sight, there seems to be a minor difference in tenure status between the two surveys. This can be explained by the fact that HFCS only makes a distinction between renting and owning real property, while EU-SILC covers this more in depth by also taking into account renting at prevailing market rates or reduced rates. Nevertheless, the proportion of individuals that are renting is comparable between both EM-HFCS and EM-SILC.

A.5.4 Micro-validation of income concepts

Table A.5.4 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Finland.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	31,601	25,350	-4,990	2,156,512
	EM-SILC	30,329	25,544	-4,990	2,053,091
Benefits	EM-HFCS	4,192	4,510	0	36,852
	EM-SILC	4,373	5,312	0	58,083
Taxes	EM-HFCS	7,577	7,892	0	425,012
	EM-SILC	7,375	7,968	0	463,708
Social insurance contributions	EM-HFCS	1,857	2,195	0	98,720
	EM-SILC	1,754	1,946	0	68,996
Disposable income	EM-HFCS	26,359	15,180	1,461	1,731,306
	EM-SILC	25,573	15,477	276,40	1,589,188

Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

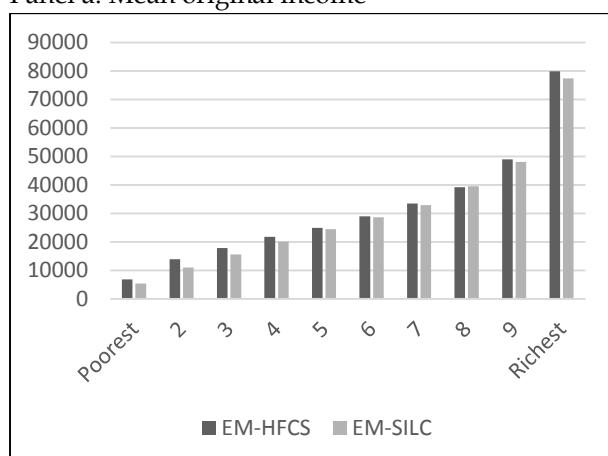
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Given that both the Finnish HFCS and EU-SILC are based on the same sample, the average income concepts are largely the same between EM-HFCS and EM-SILC. The difference in original & pension income is equal to about €1,300 but decreases to approximately €780 in disposable income.

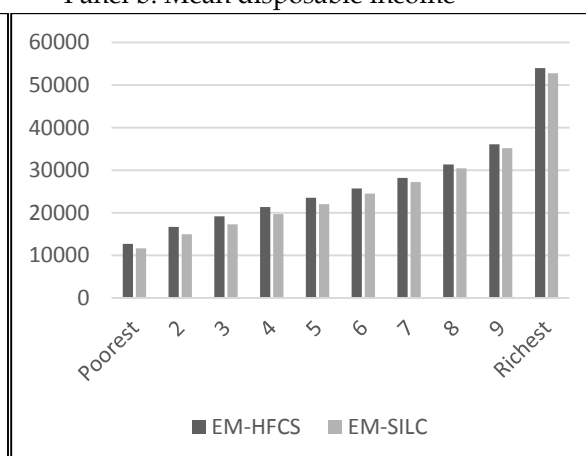
Next, Figures A.5.1 panel a and b present mean values of original and disposable income. These values are highly corresponding, with slightly higher values for EM-HFCS. Figures A.5.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions. The mean values of these income concepts do not vary widely between both surveys and are largely the same.

Figure A.5.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Finland.

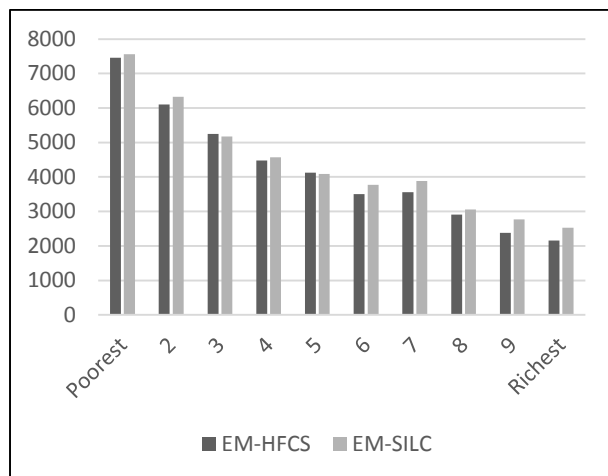
Panel a: Mean original income



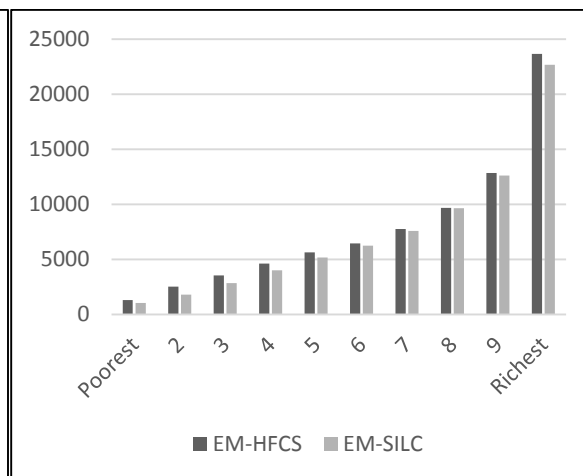
Panel b: Mean disposable income



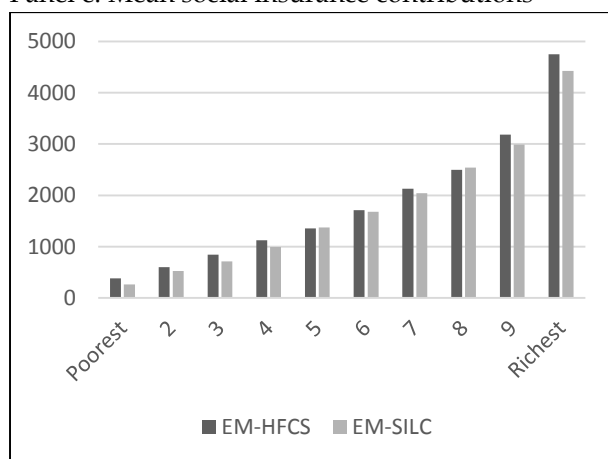
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.5.5 Macro-validation of new EUROMOD policies

Table A.5.5 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.5.6 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.5.5 Number of eligible cases for wealth taxes, Finland.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	8,536	8,536	1,775,911	8,536	1,775,911

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.5.6 Validation of simulated wealth tax revenues (in million euro), Finland.

		EM-HFCS	External	Ratio
Real property tax	2013	718.40	623.0 (1)	115.31 %
	2017	858.20	811.0 (1)	105.82 %

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1). Tax Revenue Database (OECD, 2017a).

A.6 France

A.6.1 Description of wealth taxes

A.6.1.1 New EUROMOD policies

Real property tax (“Taxe foncière & taxe d’habitation”)

Description:

In France there exist two separate taxes on the legal possession of real estate. The first is a tax on build property (“*Taxe foncière sur les propriétés bâties*”), while the second involves a tax levied on undeveloped land (“*Taxe foncière sur les propriétés non bâties*”). Furthermore, a third tax applies to the occupation of a dwelling (instead of possession) on January 1st of the relevant fiscal year. In other words, it is payable by owners as well as renters and rent-free occupiers. All three taxes are levied on the deemed rental value of the property as is determined by the local official land registry (“*valeur locative cadastrale*”). However, while the dwelling tax is levied on the full cadastral value, the tax on build property uses as tax base half of this value and the tax on undeveloped land 80 per cent of the cadastral value. In all cases the applicable tax rates are determined by the local government and the revenues of the taxes are also received at the local level. Exemptions mainly relate to public properties, but also those in ill health, disabled, old or with modest means might be eligible for exemptions in some cases (Ernst & Young, 2014; European Commission, 2018; see <https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069577&dateTexte=20090630,art.1380-1414>).

Assumptions:

- We need assumptions to impute cadastral values. The ratio that is applied on the values of the main residence, the other properties and additional properties to calculate the cadastral values, is equal to the ratio between the total market value and the total cadastral value for build properties, or to the ratio between the total market value and the total cadastral value for undeveloped land, depending on the type of property (Source for cadastral values: http://www2.impots.gouv.fr/documentation/statistiques/annuaire2014/pages_web/statistiques2014.htm).
- Since 2011 the local governments involved are the “départements”, “communes” and “groupements de communes”, while before the “regions” also voted on a tax rate. Due to the lack of regional information in the HFCS an average tax rate is implemented in EUROMOD. In 2014 we use 35.41% (see <https://www.collectivites-locales.gouv.fr/guide-statistique-fiscalite-directe-locale-2015>).
- We assume that other buildings for which we do not know the type of property are build property, not undeveloped land.
- The two-year exemption for new housing constructions can, based on the HFCS, only be implemented for main residences which are own construction of the household, because there is no information on the age of purchased real estate.
- Thresholds for determining modest means are different in the departments of Martinique, Guadeloupe, Réunion and Guyane. We have only implemented the thresholds applicable to the rest of France.

Aspects of the policy that were not implemented:

- Taxe d’habitation is not simulated because there is no information to impute cadastral values for non-owners and technically it can be regarded as a service tax instead of a wealth tax.

Changes after the income reference year (only those relevant for the 2017 policy):

- The average tax rate that is implemented in EUROMOD for 2017 is 38.08% (Barberet & Larquey, 2017, p.16).

Real property transfer tax

Description:

Real estate registration duties are due on all transfers of real estate located in France. The tax is payable by the buyer of the property and is based on the purchase price. The applicable tax rate set by the central government is equal to the sum of several tax rates; a departmental tax rate of 3.6%, a local tax of 1.2%, a levy for collection costs of 2.5% of the departmental duty and an additional state tax of 0.2%. This results in an overall tax rate of 5.09%. The departments have the possibility to modify the departmental rate which would increase the total tax rate to 5.8%. Since the majority of the departments made use of this possibility we implement this tax rate (Ernst & Young, 2014; European Commission, 2018; see <https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069577&dateTexte=20090630, Art.1594>)

Assumptions:

- With regard to main residence:
 - o There are 771 households with missing information on the year of purchase of the main residence. We have approximated it by year of mortgage if this information is available (55 households in this case). We assume that most households will need a mortgage to be able to finance the purchase of their residence. When there is no mortgage it will likely be in their possession already for a longer time and we assume that the mortgage is already paid off. In other words, for all households in the HFCS with missing year of purchase and without a mortgage we assume them to be purchased before the policy year, which implies that the policy does not apply.
 - o The purchase value is missing for all households. Because we only consider properties purchased recently before the survey, we assume that current value is the same as purchase value.
 - o Way of acquiring the main residence is also missing for all households. This is imputed as follows: if a household has received an inheritance/gift which involves the transfer of a dwelling, the main residence is assumed to be received as inheritance/gift. All remaining residences are assumed to be purchased.
- With regard to other buildings than the main residence:
 - o In the HFCS data there is no information on the year of purchase, we assume the year of mortgage to be the same as the year of purchase (if it does not reflect the year of refinancing of the loan). In line with this we also need to assume that the first (second, third) mortgage in the HFCS coincides with the first (second, third) property. We assume that most households will need a mortgage because most will need it to be able to finance the purchase of a new building and because the fiscal advantages are considerable. When there is no mortgage it will likely be in their possession already for a longer time and we assume that the mortgage is already paid off. In other words, for those households in the HFCS that own other buildings without a mortgage, we assume them to be purchased before the policy year, which implies that the policy does not apply.
 - o There is no information on the purchase value of other properties. Because we only consider properties purchased recently before the survey, we assume that current value is the same as purchase value.

- We do not know how other buildings were acquired. We assume them all to be purchased on the market.

Aspects of the policy that were not implemented:

- On new buildings VAT is applicable instead of transfer tax. In the HFCS we do not know the age of the purchased building so this cannot be taken into account. In our implementation all buildings not inherited or received as gift are subject to transfer tax.
- The general government foresees in its law the possibility for departments to provide an abatement for the own dwelling which can be set between €7,600 and €46,000 in fractions of €7,600. Since most departments have not introduced such an abatement (see http://www.impots.gouv.fr/portal/deploiement/p1/fichedescriptive_4417/fichedescriptive_4417.pdf, p.8-9) this is not implemented.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and gift tax (“Droits de mutation à titre gratuit par décès ou entre vifs”)

Description:

Any transfer as a consequence of either death or by inter vivos gifts is subject to inheritance and gift taxation in France if either the deceased/donor is a French tax resident or if the heirs/donees are French tax residents at the time of death and for at least 6 years during the 10 years prior the inheritance/gift. The tax is levied on the beneficiary of the inheritance/gift. Applicable tax rates are progressive and differ by relation between the deceased/donor and the beneficiary and the value of the transferred assets. For inheritances/ gifts between direct relatives and spouses tax rates range from 5% for amounts up till €8,072 to 45% for amounts above €1,805,677 (in between those two, tax rates are the same, but the tax brackets slightly differ between direct relatives on the one hand and spouses and legal partners on the other hand). Inheritances/ gifts between brothers and sisters are taxed at 35% for the assets below €24,430 and 45% above this amount. Finally, a general tax rate of 55% applies to the total value in case of inheritances/ gifts between relatives of the fourth degree and further, while it is equal to 60% for all other relations. The tax is assessed on the fair market value of the transferred assets after exemptions and reliefs. The most important exemptions (‘abatements’) mainly relate to the relationship between the deceased/donor and the beneficiary, disability and transfers of the main residence or a personal business. Moreover, beneficiaries with three or more children are eligible for a tax reduction of €610 per child for inheritance/gifts in direct line and €305 per child for other inheritances/ gifts (see <https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069577&dateTexte=20090630>, Art. 750-808; Ernst & Young, 2014; European Commission, 2018).

Assumptions:

- Different tax rates are applicable for brothers/sisters, relatives of the fourth degree and other relatives. In the HFCS this distinction cannot be made. Because they are typically older, we expect that most inheritances/ gifts are received by aunts and uncles so we apply the tax rate for fourth degree relatives to this category. The highest tax rate is only applied for non-relatives (in principle it should also apply to relatives beyond the fourth degree).
- The transfer of business assets is for 75% exempted only if a number of requirements are fulfilled. We assume that these conditions are satisfied.
- Hand gifts are not taxable unless they are declared. However, all gifts made during 6 years (15 years from 2013) prior to the death should be declared for the assessment of the inheritance tax. Because the considered period which is clawed back is relatively long, we assume that all gifts are declared and hence previous gifts should not be taken into account when an

inheritance is declared. Moreover, the tax is calculated based on the value of the gift at the time of revelation, not at the time of transfer. Since the value of assets tends to increase, it is in your own interest to declare the gift as early as possible (see <http://droit-finances.commentcamarche.net/contents/857-la-fiscalite-des-dons-manuels>).

Aspects of the policy that were not implemented:

- HFCS does not cover inheritances or gifts between spouses or legal cohabitants. (These kinds of inheritances are exempted for the total amount from 2008 onwards, gifts are still taxed.)
- It is possible to spread the payment of inheritance tax (or gift tax in case of transfer of a business) over a period of 5 years (10 years in some cases) which is subject the statutory interest rate. We assume that all liable tax payers make the full payment in the policy year.
- In case of gifts inter vivos a tax reduction of 50 per cent is granted if the donor is under 70 years old and of 30 per cent when the donor is over 65 and under 80 years old. In the HFCS we have no personal information on the donor so that this tax reduction cannot be implemented.

Changes after the income reference year (only those relevant for the 2017 policy):

- Since 2017 the tax credit for beneficiaries with three or more children is abolished.

Net wealth tax (“Impôt de solidarité sur la fortune”)

Description:

In France, an annual tax is levied on high net wealth levels, more specifically if net taxable assets are worth more than €1,300,000. However, for those households which are eligible for the wealth tax, their wealth is already taxed from €800,000. Taxation is assessed on a fiscal household basis, but also partners of a non-registered partnership are treated the same as a married couple for the purpose of this tax. French residents are liable for the wealth tax on their worldwide assets, while non-residents are only subject to the wealth tax for their assets located in France (except financial investments). The regulation and revenues are allocated to the central government. The most important exemptions are provided for business assets, forests, life annuities acting as retirement pensions and antiques, art objects and collectors’ items. Moreover, a 30 per cent relief is granted for the main residence and a tax credit is granted of €150 per dependent person (Ernst & Young, 2014; European Commission, 2018; see <https://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069577&dateTexte=20090630>, Art. 885).

A ‘smoothing mechanism’ exists for tax payers whose net wealth lies between €1,300,000 and €1,400,000. A tax credit is granted equal to €17,500 - 1.25% * P, where P is the tax payer’s net taxable wealth. At the same time there is also a cap, i.e. the combined personal income tax and wealth tax cannot be higher than 75% of income.

Table A.6.1 Tax brackets and tax rates of net wealth tax, France.

Tax bracket	Tax rate
€800,000 - €1,300,000	0.50%
€1,300,000 - €2,570,000	0.70%
€2,570,000 - €5,000,000	1.00%
€5,000,000 - €10,000,000	1.25%
> €10,000,000	1.50%

Source: Tax Legislation France.

Assumptions:

- In the HFCS wealth variables refer to the situation at the time of the interview (in the case of France between October 2014 and February 2015). For the implementation of the policy we

need net wealth on January 1st 2014. In order to get an approximation of this we subtract from wealth at the time of the interview any real estate purchased in 2014 or 2015, inheritances and gifts received in 2014 or 2015 and financial income as an estimate of the growth of financial assets throughout 2014.

- Several conditions need to be met in order to be eligible for the tax exemption for business assets. We assume that these conditions are fulfilled.

Aspects of the policy that were not implemented:

- The HFCS sample only includes French residents so the tax on assets held in France by non-residents cannot be implemented.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.6.1.2 Refinement of existing EUROMOD policies

Tax credit for mortgage interest repayment (“Crédit d'impôt au titre des intérêts d'emprunt supportés pour l'acquisition ou la construction de l'habitation principale”)

Description:

The tax credit for mortgage interests repayment was abolished since 2012, but was still grandfathered for those who were already eligible. For houses bought until 2009 the tax credit was equal to 20%, increased to 40% in the first year of the mortgage and limited at €3,750 for singles and €7,500 for couples. For houses bought in 2010 the applicable rates are 15% and 30%, while they are equal to 10% and 25% for houses bought in 2011. Since the tax credit can only be received during the first five years of the mortgage this implies that in 2014 only those who bought a house in 2009, 2010 or 2011 were still eligible for the tax credit and as they are not in the first year of their mortgage only the main percentage is included in EUROMOD.

Currently, EUROMOD implements a very rough approximation of this policy aspect; it assigns the tax deduction applicable in the first year to households with a household head younger or equal to 45 years. With the HFCS data we can check for the requirements related to the year the residence was purchased (Bouvard & Tammik, 2017; see <http://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT000006069577>, Art. 200 quaterdecies).

Assumptions:

- Disability status is only checked for head of household.
- There are 771 households with missing information on the year of purchase of the main residence. We have approximated it by year of mortgage if this information is available (55 households in this case). We assume that most households will need a mortgage to be able to finance the purchase of their residence. When there is no mortgage it will likely be in their possession already for a longer time and we assume that the mortgage is already paid off. In other words, for all households in the HFCS with missing year of purchase and without a mortgage we assume them to be purchased much longer than 5 years before the policy year, which implies that the policy does not apply.

Aspects of the policy that were not implemented:

- The tax credit is increased from 20% to 40% for residences which are more energy efficient than is legally foreseen in the law.

Changes after the income reference year (only those relevant for the 2017 policy):

- In 2017 the tax credit is no longer implemented as there are no longer eligible cases because it is longer than 5 years since the tax credit was abolished.

Tax deduction for rental income

Description:

With regard to taxable capital income, a tax allowance is granted for rental income. It is equal to 30 % if rental income is below €15,000 a year ("*Régime forfaitaire ou micro-foncier*"), while there are more complicated deductions in case rental income is higher than €15,000 a year ("*Régime reel*"). Currently only the tax deduction of 30 per cent is implemented in EUROMOD for all levels of rental income. As a consequence of among others the oversampling and the better coverage of capital income variables, the HFCS includes much more households with rental income above €15,000 a year. Therefore, the special deductions for these cases are added to EUROMOD. This is possible because the HFCS contains information on the real estate properties which are rented out (Bouvard & Tammik, 2017; see http://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT_000006069577, Art. 31-32).

Assumptions:

- The "*Régime reel*" implies that all costs actually made can be deducted from rental income. It involves costs related to the repair, improvement and maintenance of the property and all other costs related to the property actually born by the property owner, insurance payments, interest payments on mortgages concluded for the acquisition, preservation or renovation of the property, a management fee of €20 per room, remuneration for concierges, guards, ..., real estate taxes (taxes foncières), etc. We only take into account interest payments made on mortgages.
- We assume that in the HFCS the first (second/third) mortgage for other properties corresponds to first (second/third) other property, such that we can determine which mortgages correspond to a property that is rented and to those that are privately used.
- If rental income is below €15,000 it is also possible to voluntarily choose for the "*Régime reel*". We assume that this option is not chosen.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Tax deduction for dividends

Description:

In capital income taxation a tax deduction is granted for dividends received from companies subject to a corporation or similar tax and of which the headquarters are located in a country of the European Community or a country with whom France has a treaty to avoid double taxation. The deduction is equal to a deduction of 40 per cent. The current implementation in EUROMOD applies the tax deduction to all investment income ("*yiy*") instead of only dividends. (Bouvard & Tammik, 2017; see http://www.legifrance.gouv.fr/affichCode.do?cidTexte=LEGITEXT_000006069577, Art. 158).

Assumptions:

- Income from dividends is imputed based on total investment income, the stock of shares and the average rate of return on shares. For the latter no external information was found, we use the same rate used for Belgium (2%).

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.6.2 Uprating of monetary variables

The main asset and liabilities variables are uprated using information from national accounts, which is presented in Table A.6.2. For the non-financial variables, we used the following uprates: for the variables “amr” (the current value of the main residence), “amrpv” (the purchase value of the main residence), “aob01-03” (the current value of other buildings) and “aobpv01-03” (the purchase value of other buildings) we made use of the gross stock of dwellings, valuables (“avl”) are uprated with the stock of valuable objects, “asb” (self-employed business assets) is uprated with the stock of machinery & equipment, intellectual property products and inventories, and “ara” (real assets) and “avh” (vehicles) are uprated with the stock of total real assets. The financial assets are uprated as follows: “adp” (deposits) with the stock transferable and other deposits, “amf” (mutual funds) and “ama” (managed accounts) with stock of investment fund shares, “abd” (bonds) with the stock of debt securities, “apb” (non-self-employment private business) with the stock of unlisted shares and other equity, “ash” (shares) with the stock of listed shares, “app” (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, “aot” (others) with the stock of non-life insurance technical reserves and other accounts and “adb” (debt) with the stock of total liabilities. For “anw” (net wealth) the sock of total real and financial assets less the stock of liabilities is used.

We have not found information on the total amount of inheritances and gifts which would be the best approach to uprate the inheritance and gift variables (“aihvr”, “aihbsvr”, “agivr” & “agibsvr”). Instead we use information on the total tax revenue. In general, this approach is not ideal as evolutions in these numbers represent both changes in the total taxable base as well as policy changes. Yet, with the exception of the tax credit for beneficiaries with three or more children there have not been any policy changes in the French inheritance and gift tax between 2014 and 2017. Hence, we can assume relatively accurately that the evolution in tax revenues largely reflects evolutions in the total amount of inheritances and gifts, which makes this information suitable for the uprate index.

Table A.6.2 Overview of uprating indices used for wealth variables in EUROMOD, France.

Uprate index	Variables uprated by the index	Value 2014	Value 2017	Source
\$f_amr	amr, aob01-03, amrpv, aobpv01-03	285,688.2	277,639	Stock of dwelling and other buildings, in million euro (1)
\$f_avl	avl	133,136.4	128,090.9	Stock of valuable objects, in million euro (1)
\$f_asb	asb	57,153	56,147.5	Stock of machinery & equipment, intellectual property products and inventories, in million euro (1)
\$f_ara	ara, avh	7,142,301.9	7,441,926.9	Stock of total real assets, in million euro (1)
\$f_adp	adp	1,207,267	1,295,422	Stock of transferable and other deposits, in million euro (2)
\$f_amf	amf, ama	291,029	274,332	Stock of investment fund shares, in million euro (2)
\$f_abd	abd	77,073	62,270	Stock of debt securities, in million euro (2)
\$f_apb	apb	738,709	822,430	Stock of unlisted shares and other equity, in million euro (2)
\$f_ash	ash	188,646	237,005	Stock of listed shares, in million euro (2)
\$f_app	app	1,603,088	1,920,069	Stock of life insurance, annuity and pension entitlements, in million euro (2)
\$f_aot	aot	337,022	335,383	Stock of non-life insurance technical reserves and other accounts, in million euro (2)
\$f_ape	ape	4,538,202	5,028,204	Stock of total financial assets, in million euro (2)
\$f_adb	adb	1,362,551	1,444,266	Stock of liabilities, in million euro (2)
\$f_aih	aihvr, aihbsvr	8,925	10,736	Total tax revenue of tax on inheritances, in million euro (3)
\$f_agi	agivr, agibsvr	1,450	1,626	Total tax revenue of tax on gifts, in million euro (3)
\$f_anw	anw	10,317,952.9	11,025,864.9	Stock of total real and financial assets less stock of liabilities, in million euro (1, 2)

Note: All stock variables refer to situation at the end of the year, value of 2017 for now refers to 2016.

Source: (1) INSEE, Comptes de patrimoine non financier; (2) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a); (3) Tax Revenue Database (OECD, 2017a).

A.6.3 Comparison of socio-demographic characteristics

Table A.6.3 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, France.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	18.7	18.9	19.73
	16 - 29	16.3	16.5	17.32
	30 - 44	19.9	19.6	20.09
	45 - 64	27.0	26.7	26.07
	65 - 99	18.0	18.4	16.76
Gender	Female	51.6	51.6	51.59
	Male	48.4	48.4	48.41
Education	Not completed primary education	14.9	16.5	16.34
	Primary education	16.3	12.3	16.44
	Lower secondary education	14.4	14.0	15.33
	Upper secondary education	33.3	35.2	32.19
	Post-secondary (non-tertiary) education	0.2	0.1	-.1
	Tertiary education	20.8	21.9	19.70
Economic status	Pre-school	6.2	6.9	7.41
	Farmer	-.1	-.1	-.1
	Employer or self-employed	4.8	4	4.48
	Employee	34.3	37	35.71
	Pensioner	23	23.2	21.39
	Unemployed	7.0	5.3	4.32
	Student	18.9	17.5	17.77
	Inactive	2.4	1.2	
	Sick or disabled	0.0	1.9	7.77
	Other	3.2	2.9	
	Family worker	0.1	-.1	0.10
Marital status	Single (never married)	50.1	50.1	49.32
	Married	37.4	36.8	38.38
	Separated	-.1	-.1	-.1
	Divorced	6.4	7.3	6.08
	Widowed	6.1	5.8	6.23
Tenure status	Owner paying mortgage	25.9	30.9	-.1
	Outright owner	36	33.3	-.1
	Tenant or subtenant paying rent at prevailing or market rate	35.6	19.7	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	13.4	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	2.5	2.7	-.1

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.6.3 presents the proportion of the survey population in different categories of a selection of socio-demographic variables. In general, the percentages in EM-HFCS and EM-SILC correspond well. Yet, the share of individuals with primary education is higher in EM-HFCS than in EM-SILC, while EM-HFCS covers slightly less employees than EM-SILC. The proportions along tenure status reveal that compared to EM-SILC, EM-HFCS captures relatively more individuals that own their main residence outright, at the cost of owners with a mortgage. EM-SILC makes a distinction between private and social renters, while the HFCS does not.

A.6.4 Micro-validation of income concepts

In Table A.6.4 we show the summary statistics of the main income concepts. A comparison of the mean values indicates some serious discrepancies between EM-HFCS and EM-SILC. The difference is equal to about €7,000 in original and pension incomes, about €4,000 in disposable income and about €1,000 for the other income concepts. The fact that the maximum values for original and disposable income and for taxes are higher for EM-HFCS than for EM-SILC, is likely due to the oversampling of the wealthy applied in HFCS.

Table A.6.4 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, France.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	22,079	21,589	-417	3,019,600
	EM-SILC	28,914	26,888	-6,810	1,389,370
Benefits	EM-HFCS	3,265	4,455	-10,000	151,333
	EM-SILC	2,429	3,591	-9,913	54,833
Taxes	EM-HFCS	3,031	6,730	0	1,556,431
	EM-SILC	4,190	8,189	0	534,651
Social insurance contributions	EM-HFCS	2,281	2,678	0	85,760
	EM-SILC	3,161	3,665	0	57,176
Disposable income	EM-HFCS	20,033	12,724	-1,647	1,414,694
	EM-SILC	23,992	16,093	0	851,507

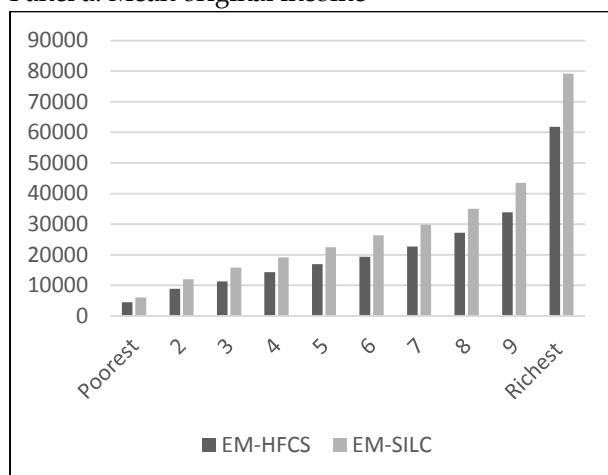
Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

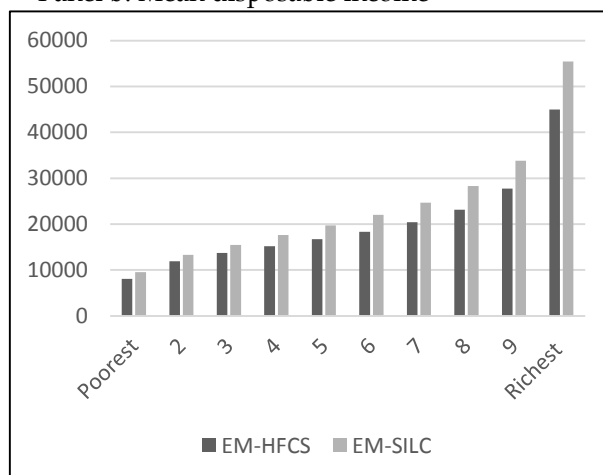
Next, we present the distribution of the income concepts from Table A.6.4 across disposable income deciles. Mean values of original (and pension) income and disposable income are shown in Figure A.6.1 panel a and b, respectively. Both figures show that the mean values are higher for EM-SILC than for EM-HFCS, and this for all of the deciles. Panel c, d and e present the distribution of benefits, taxes and social insurance contributions by disposable income deciles. The difference between the mean values of taxes and social insurance contributions show the same trend as we observed for original and disposable income; the mean values are higher for EM-SILC than for EM-HFCS. In comparison to these, EM-HFCS simulates higher amounts of benefits than EM-SILC, except for the lowest and the highest decile.

Figure A.6.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, France.

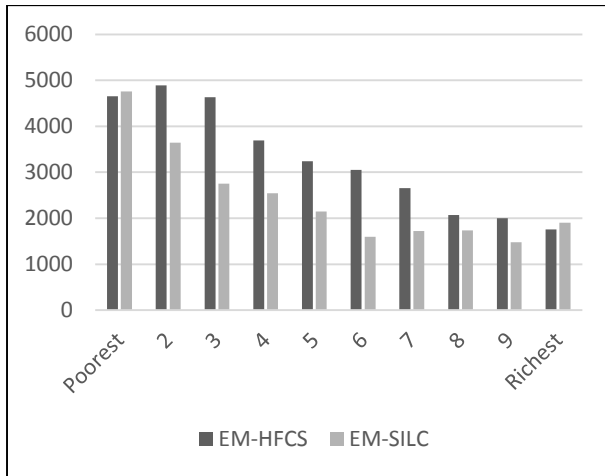
Panel a: Mean original income



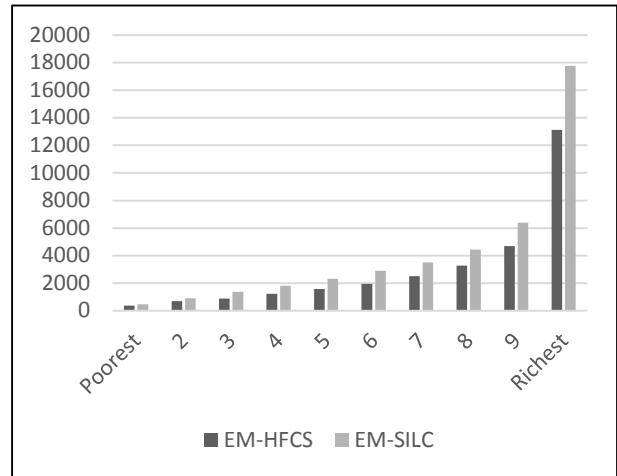
Panel b: Mean disposable income



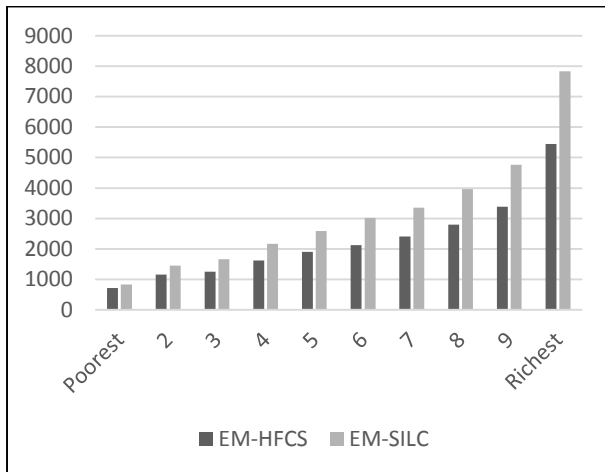
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.6.5 Macro-validation of new EUROMOD policies

Table A.6.5 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.6.6 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

We find relatively large discrepancies for some of the wealth taxes, but in general there are good explanations for this. The external statistics are not always available at a detailed level, such that they may not be fully comparable to our simulations. First, in EUROMOD we simulate the real estate transfer tax on real property owned by private households, while in the external figures there is no distinction made between taxes paid by households versus other agents. Second, for the inheritance and gift tax our simulated revenues are lower than official statistics mainly because the HFCS does not observe inheritances and gifts made between members of the same household, while especially those between spouses represent an important share of the total amount of transfers.

Table A.6.5 Number of eligible cases for wealth taxes, France.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	8,983	7,357	13,944,202	7,355	13,935,691
Real property transfer tax	288	270	507,207	270	507,207
Inheritance tax and gift tax	436	136	237,780	147	252,843
General net wealth tax	19,262	1,072	295,666	1,155	342,915

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

		EM-HFCS	External	Ratio
Real property tax	2013	14,390	17,003 (1)	84.63%
	2017	15,470	18,465 (1)	83.78%
Real property transfer tax	2013	6,088	10,143 (1)	60.00%
	2017	5,916	12,644 (1)	46.79%
Inheritance and gift tax	2013	6,644	10,300 (1)	64.50%
	2017	8,533	12,188 (1)	70.01%
General net wealth tax	2013	6,807	5,377 (1)	126.59%
	2017	8,148	4,837 (1)	168.45%

Table A.6.6 Validation of simulated wealth tax revenues (in million euro), France.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Taxes in Europe Database (European Commission, 2018).

A.7 Germany

A.7.1 Description of new wealth taxes

A.7.1.1 New EUROMOD policies

Real property tax (“Grundsteuer”)

Description:

Real property taxes are due on all real estate properties located in Germany and are payable by the owner of the real estate. The base on which the tax is levied is the assessed standard value of the property established under the Valuation Law in accordance with 1964 values (1935 values for real property other than agricultural and forestry in the new Länder). The tax rate differs between East and West Germany and depends on the nature of the property. In case of the latter two classes are distinguished: Class A covers agricultural and forestry real estate, while Class B covers all other real estate property. The calculation of the real estate tax requires 2 steps. First, a basic tax rate is levied on the assessed tax value, which is equal to 0.006% for Class A properties and between 0.0026-0.0035% for Class B properties in West-Germany and between 0.005-0.01% for Class B properties in East-Germany. For Class B properties rates differ by type (i.e. one-family houses, two-family houses, and others) (West-Germany) and by type and category of municipality (East-Germany). Second, each municipality then applies its own multiplier, resulting in very different tax burdens by municipality. Exemptions for the tax are limited to public authorities, churches and benevolent or welfare institutions (Ernst & Young, 2014; European Commission, 2018). This property tax is not simulated in the standard German EUROMOD, direct information from the data is used (“tpr”); no such information is available in the HFCS.

Assumptions:

- The HFCS does not cover regional information such that it is not straightforward to take into account differences between East and West Germany. However, as the differences are relatively substantial, we included an approximation by randomly assigning HFCS households to East and West Germany in relation to their respective population shares.
- For Class B properties in both East and West Germany we assume all main residences and other real estate properties that are of the type house/flat to be one-family houses and all other types of other real estate properties as being subject to the general tax rate (i.e. not a one-family or two-family house).
- In East-Germany tax rates also differ between buildings built before and after 31/03/1924 and by size of municipality. Here, we assume the majority of houses to be built after 1924 (European Statistical System, 2017) and the majority of tax payers to be living in the largest municipalities (as the number of inhabitants is used as parameter for municipal categories).
- With regard to the municipal multipliers we calculated an average multiplier across the *Länder* constituting East- and West-Germany respectively and weighted this average by the population share of each *Land*. The average municipal multipliers at the level of the *Länder* were taken from the Federal Statistical Office Germany (2018a). The resulting tax rates and multipliers are presented in Table A.7.1.

Table A.7.1 Tax rates and average municipal multipliers real property tax, Germany.

		2013	2017
Tax rate Class A	Germany (total)	0.0060	0.0060
Tax rate Class B – Main residence and other houses/flats	East Germany	0.0050	0.0050
	West Germany	0.0026	0.0026
Tax rate Class B – other property types	East Germany	0.0060	0.0060
	West Germany	0.0035	0.0035
Average municipal multiplier Class A	East Germany	295	309
	West Germany	301	319
Average municipal multiplier Class B	East Germany	426	441
	West Germany	441	471

Source: National Accounts, Fixed assets by sector, Working Document (Federal Statistical Office Germany, 2018a).

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

- Changes in applicable tax rates (see Table A.7.1)

Real property transfer tax (“Grunderwerbsteuer”)

Description:

A real estate transfer tax is levied on all transactions implying a change of owner of real estate property or transactions deemed to be equivalent. The basic tax rate is equal to 3.5%, but since 1 January 2007 the Länder can determine the rate themselves. The tax base is an agreed consideration such as the purchase price of the property; if there is no consideration in money a fictional consideration (*Grundbesitzwert*) is used as assessment basis. Tax exemptions include the purchase of real estate by spouses and persons related in a direct line, real property which is subject to inheritance or gift tax and the purchase of low value real estate (not higher than €2,500). The tax revenue is allocated to the Länder and municipalities (Ernst & Young, 2014; European Commission, 2018).

Assumptions:

- In 2013 all except 2 *Länder* (Bayern & Sachsen) had increased the tax rate. Therefore, we calculated an average tax rate of all *Länder* weighted by the population share of each *Länder*. The result is a tax rate of 4.63% for 2013 (See <http://www.juraforum.de/lexikon/grunderwerbsteuer>).

Aspects of the policy that were not implemented:

- Transactions which are deemed equivalent to the transfer of real estate property but which are not observed in the HFCS, such as the assignment of at least 95% of the shares of a German or foreign company that owns domestic real property (Ernst & Young, 2014).

Changes after the income reference year (only those relevant for 2017 policy):

- Average tax rate for 2017: 5.30% (source: <https://www.zinsen-berechnen.de/grunderwerbsteuer/bundeslaender.php>).

Inheritance and gift tax (“Erbschaft- und Schenkungsteuer”)

Description:

Any transfer of worldwide net wealth as a consequence of either death or by *inter vivos* gifts is subject to inheritance and gift taxation if either the deceased/donor or beneficiary resides in Germany. The tax is levied on the beneficiary of the inheritance/gift. Applicable tax rates differ by relation between

the deceased/donor and the beneficiary and the value of the transferred assets, which are shown in the table below. Class 1 beneficiaries include spouses and partners of a registered same-sex partnership, (step)children, grandchildren, parents and ancestors (the latter two only for transfers by reason of death). Class 2 covers parents and ancestors for *inter vivos* gifts, brothers and sisters, nieces and nephews, step-parents, children-in-law, parents-in-law and divorced spouses. Class 3 applies to all other beneficiaries. Tax rates are shown in Table A.7.2. Important to note is that they are not applied progressively, but the total value of the estate is compared with the tax brackets and the relevant tax rate is applied to the complete amount. The tax is assessed on the fair market value of the transferred assets after exemptions and reliefs. Regarding the latter the most important ones are the personal exemption (€ 500,000 for spouses, € 400,000 for children, € 200,000 for grandchildren, € 100,000 for other persons in Class 1, € 20,000 for persons in Class 2 and Class 3) and the exemptions for family homes, business assets and art objects and collections. The inheritance and gift tax is regulated at the federal level, but the revenues are allocated to the Länder (Ernst & Young, 2014; European Commission, 2018).

Table A.7.2 Tax rates (in %) inheritance and gift tax, Germany.

Bracket	Class 1	Class 2	Class 3
€ 0 - € 75,000	7	15	30
€ 75,000 - € 300,000	11	20	30
€ 300,000 - € 600,000	15	25	30
€ 600,000 - € 6,000,000	19	30	30
€ 6,000,00 - €13,000,000	23	35	50
€13,000,000 - €26,000,000	27	40	50
> € 26,000,000	30	43	50

Source: Taxes in Europe Database (European Commission, 2018).

Assumptions:

- Beneficiaries of the transfer of business assets can choose between 2 options:
 - Tax exemption of 85%, conditions: business needs to be retained for at least 5 years, sum of salaries after 5 years (all years combined) cannot be lower than 400% of the sum of salaries at the time of succession and the share of non-operative assets cannot be higher than 50%. There is an additional tax-exempt threshold of €150,000 for small businesses (with assets up to 1 million euros), which implies in practice a 100% tax exemption for these businesses. For business assets higher than 1 million euros the €150,000 exemption is decreased by half of the difference between €150,000 and the amount of assets remaining after the 85% exemption (i.e. business assets above €1,529,500 are no longer eligible for an additional exemption).
 - Tax exemption of 100%, conditions: business needs to be retained for at least 7 years, sum of salaries after 7 years (all years combined) cannot be lower than 700% of the sum of salaries at the time of succession and the share of non-operative assets cannot be higher than 20%.

The first option is assumed to form the rule as the conditions are very strict for the second option (<https://www.finanztip.de/erbschaftsteuer-betriebsvermoegen/>, Houben & Maiterth, 2009). Therefore, we implement the first option in EUROMOD. In practice, a 100% tax exemption is simulated for all business assets below €1 million and a 85% exemption for business assets above this amount (in the second HFCS wave there is only 1 inherited business above €1 million euro, and since the amount is €18 million there is no additional tax exemption). We assume all conditions required to receive the tax exemption to be fulfilled.

Aspects of the policy that were not implemented:

- The HFCS does not cover inheritances and gifts between spouses and legal cohabitants.

Changes after the income reference year (only those relevant for 2017 policy): n/a

A.7.1.2 Refinement of existing EUROMOD policies

Tax relief for mortgage repayment

Description:

In Germany interest repayments can only be deducted from actual property income that is received. In other words, there is only mortgage tax relief for real estate properties that are rented out, not for the main residence, nor any other privately used real estate properties. In EUROMOD rental income is currently included in taxable income, but the deduction for mortgage interests on the corresponding real estate properties is not implemented due to data limitations. Based on the HFCS this can be added to the simulations.

Assumptions:

- We assume that the first (second/third) mortgage for other properties observed in HFCS corresponds to the first (second/third) other property, which allows us to determine which mortgages correspond to a property that is rented.

Aspects of the policy that were not implemented:

- It is possible to deduct also all other expenses related to the rented properties, including renovation costs, advertising costs to find a tenant, etc. In the HFCS these costs are not observed, only the mortgage interest repayments.

Changes after the income reference year (only those relevant for 2017 policy): n/a

Asset test for social benefits

Description:

Eligibility for unemployment benefit 2 and social assistance benefits are subject to an income and wealth test. In particular, in order to pass the wealth test household's assets need to be zero after accounting for all wealth allowances. Education benefits are also subject to a wealth test, but instead of directly affecting eligibility it reduces the benefit amount. Assets which should not be taken into account in the wealth test are mainly household furniture, a reasonably-sized flat or house (except for education benefit) and a reasonable car for each economically active household member (only for unemployment benefit 2). The law on the wealth test is not clear what is meant by a 'reasonable' house or car. In arrests of 7/11/2006 and 7/9/2007 the German Federal Social Court has argued that it should be interpreted as follows (<http://www.hartziv.org/was-zaehlt-als-vermoegen.html>):

- o Reasonable car: max €7,500
- o Reasonable house or flat

Number of inhabitants	Flat	House
1-2	80 m ²	90 m ²
3	100 m ²	110 m ²
4	120 m ²	130 m ²
Each additional inhabitant	+ 20 m ²	+ 20 m ²

Because of data limitations of EU-SILC the EUROMOD implementation of these wealth tests is approximated by a concept of "household financial wealth" which is imputed based on financial income ("y_{iy}") and the average rate of return on financial assets. Since the rate of return is not equal for all assets and also differs across households the actually observed information of the HFCS will

improve the implementation of the policies in EUROMOD. Moreover, we can use information on all assets, not only financial assets.

Assumptions:

- The reference period for wealth variables in the German HFCS is the time of the interview (April 2014 – November 2014 for the second HFCS wave). For the implementation of the policy in EUROMOD we need the amount of net wealth held in the policy year (2013). In order to approximate this amount, we subtract from net wealth at the time of the interview real estate purchased in 2014, inheritances or gifts received in 2014 and financial income as an estimate of the growth of financial wealth in 2014.

Aspects of the policy that were not implemented:

- There are some other asset types which are also not taken into account in the wealth test, but for which we do not observe sufficient information in the HFCS: a plot/vacant land up to 500m² in urban areas and up to 800m² in rural areas, items necessary for employment, etc.

Changes after the income reference year (only those relevant for 2017 policy): n/a

A.7.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.7.3. First, the main asset variables are uprated based on their respective aggregates in the national accounts which were taken from the Federal Statistical Office Germany (2018a; 2018b) and the Deutsche Bundesbank (2018). For self-employment business we used the categories “machinery & equipment” and “intellectual property rights” from the national accounts as a proxy. For the HFCS asset categories “managed accounts” and “money owed to households” there was no information available in the national accounts. For managed accounts we applied the same uprating index as for mutual funds and for money owed to the household, we just used the default, i.e. the price index. The aggregate wealth variables “ape”, “ara” and “ato” are uprated as the sum of their uprated components. Second, the variables related to inheritances and gifts are uprated using the total amount of inheritances and gifts larger than 0 euro, also taken from the Federal Statistical Office Germany (2018c). The variable “xhcobmomi” (mortgage interests for rented properties) is uprated using the index “\$f_housingrents”, which is also used for the mortgage interests for the main residence (“xhcmomi”). Finally, we chose to not uprate cadastral values (“khooo”, “kho01” and “kho02”) as they are already a very rough approximation and relevant information for an uprate index was not found.

Table A.7.3 Overview of uprating indices used for wealth variables in EUROMOD, Germany.

Uprate index	Variables uprated by the index	Value 2013	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	7160.327	8328.779	Gross stock of buildings and structures, in billion euro (1)
\$f_avh	avh	302.188	328.754	Stock of personal transport equipment, in billion euro (2)
\$f_avl	avl	157.937	175.883	Stock of other durables, in billion euro (2)
\$f_asb	asb	317.296	332.387	Stock of machinery & equipment and intellectual property products, in billion euro (1)
\$f_adp	adp	1798.8	2119.6	Stock of transferable & other deposits, in billion euro (3)
\$f_amf	amf, ama	398.3	576.2	Stock of investment fund shares, in billion euro (3)
\$f_abd	abd	179	120.5	Stock of debt securities, in billion euro (3)
\$f_apb	apb	264.4	314.7	Stock of unlisted shares and other equity, in billion euro (3)
\$f_ash	ash	223.2	327.4	Stock of listed shares (domestic & other), in billion euro (3)
\$f_app	app	1555.6	1826	Stock of life insurance and pension entitlements, in billion euro (3)
\$f_aot	aot	328	384.8	Stock of non-life insurance technical reserves and other accounts, in billion euro (3)
\$f_adb	adb	1565.1	1727.5	Stock of total liabilities, in billion euro (3)
\$f_aih	aihvr, aihmrvr, aihbsvr, aihvlvr	17348.752	23277.162	Total amount of inheritances>0 euro, in million euro (4)
\$f_agi	agivr, agibsvr, agivlvr	11506.631	11176.946	Total amount of gifts>0 euro, in million euro (4)
\$f_anw	anw	11920.678	13876.691	Stock of net wealth (sum of fixed assets, consumer durables and financial assets less liabilities), in billion euro (1,2 and 3)

Note: All stock variables refer to the situation at the end of the year.

Source: (1) National Accounts, Fixed assets by sector (Federal Statistical Office Germany, 2018a); (2) National Wealth Accounts, consumer durables (Federal Statistical Office Germany, 2018b); (3) Financial Accounts (Deutsche Bundesbank, 2018); (4) Finanzen und Steuern, Erbschaft- und Schenkungsteuer (Federal Statistical Office Germany, 2018c).

A.7.3 Comparison of socio-demographic characteristics

Table A.7.4 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Germany.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
<i>Age</i>	< 16	14.76	14.39	14.44
	16 – 29	15.71	15.34	16.13
	30 – 44	19.26	19.96	19.75
	45 – 64	29.66	29.92	29.08
	65 – 99	20.61	20.39	20.57
<i>Gender</i>	Female	49.9	50.9	51.20
	Male	50.1	49.1	48.80
<i>Education</i>	Not completed primary education	9.77	8.22	8.62
	Primary education	4.81	4.11	7.87
	Lowery secondary education	14.67	14.21	17.44
	Upper secondary education	48.28	36.63	39.99
	Post-secondary (non-tertiary) education	0.03	9.07	4.48
	Tertiary education	22.43	27.75	21.68
<i>Economic status</i>	Pre-school	5.06	4.72	5.03
	Farmer	-.1	-.1	-.1
	Employer or self-employed	4.78	2.91	5.68
	Employee	44.21	42.45	44.24
	Pensioner	21.13	22.64	21.78
	Unemployed	3.36	3.94	2.71
	Student	15.42	16.96	13.08
	Inactive	0.22	1.23	
	Sick or disabled	1.67	1.80	7.04
	Other	3.96	3.34	
Family worker	0.20	-.1	0.52	
<i>Marital status</i>	Single (never married)	39.35	40.45	40.12
	Married	46.26	43.98	45.60
	Separated	-.1	1.19	-.1
	Divorced	8.06	8.99	7.01
	Widowed	6.33	5.39	7.27
<i>Tenure status</i>	Owner paying mortgage	22.05	26.68	-.1
	Outright owner	27.49	25.85	-.1
	Tenant or subtenant paying rent at prevailing or market rate	46.76	39.38	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	5.42	-.1
	Accommodation is socially rented	-.1	-	-.1
	Accommodation is rented for free	3.70	2.66	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.7.4 presents the proportion of the survey population in different categories of a selection of socio-demographic variables. In general, the percentages in EM-HFCS and EM-SILC correspond well. Yet, the share of individuals with tertiary education is lower in EM-HFCS than in EM-SILC, while EM-HFCS covers slightly more employers/self-employed than EM-SILC. The proportions along tenure status reveal that compared to EM-SILC the EM-HFCS captures relatively more individuals that own

their main residence outright, at the cost of owners with a mortgage. As before, EU-SILC makes a distinction between private and social renters, while the HFCS does not.

A.7.4 Micro-validation of income concepts

Table A.7.5 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Germany.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	31,375	34,754	-164,000	1,938,467
	EM-SILC	28,600	23,270	-5,126	621,333
Benefits	EM-HFCS	2,348	3,615	0	33,252
	EM-SILC	1,896	3,333	0	110,616
Taxes	EM-HFCS	5,755	13,620	0	896,224
	EM-SILC	4,302	7,569	0	236,823
Social insurance contributions	EM-HFCS	4,115	2,940	0	18,709
	EM-SILC	4,133	3,370	0	100,800
Disposable income	EM-HFCS	23,852	19,430	-181,199	1,040,964
	EM-SILC	22,061	13,230	-3,269	283,711

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

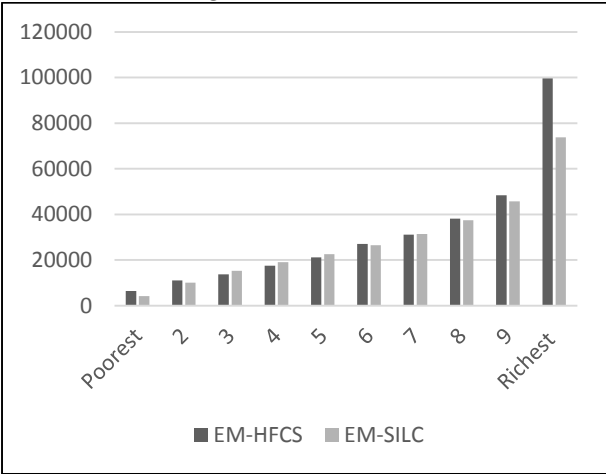
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A comparison of the mean values in Table A.7.5 indicates a sufficient correspondence between EM-HFCS and EM-SILC. While the difference is equal to about €2,700 in original and pension incomes, the gap diminishes to about €1,800 in disposable income. Social benefits and social insurance contributions are strongly similar, while the mean of taxes is slightly higher in EM-HFCS, which explains the decrease in difference between original and disposable income. The fact that mean and maximum values for original and disposable income and taxes are higher for EM-HFCS than for EM-SILC is likely due to the oversampling of the wealthy applied in HFCS (see Table 1). In contrast, the maximum value of social benefits is higher in EM-SILC, which can be explained by the fact that EU-SILC is more targeted towards lower incomes.

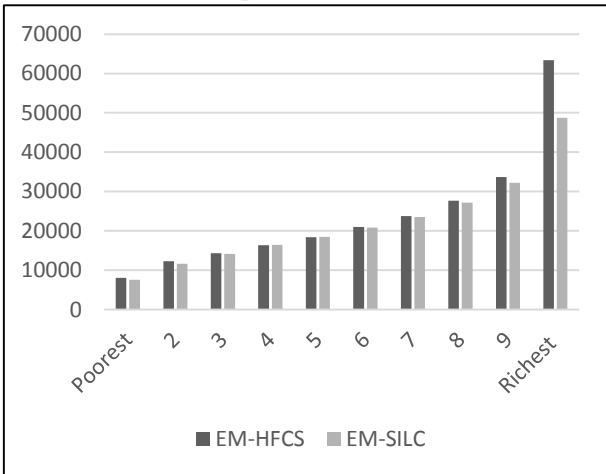
Mean values of original (& pension) income and disposable income across deciles are shown in Figure A.7.1 panel a and b, respectively. Up to the ninth decile, mean values are highly similar. However, average income in the highest decile is clearly much higher for EM-HFCS than for EM-SILC, which again is likely due to the oversampling of the wealthy. Figure A.7.1 panel c, d and e present the distribution of benefits, taxes and social insurance contributions by disposable income deciles. Overall, social benefits are distributed a bit differently across the two surveys. The distribution of taxes is very similar for EM-HFCS and EM-SILC, but higher in the top decile which is related to the higher original incomes and hence oversampling of the wealthy. Finally, also trends in the distribution of social insurance contributions largely coincide.

Figure A.7.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Germany.

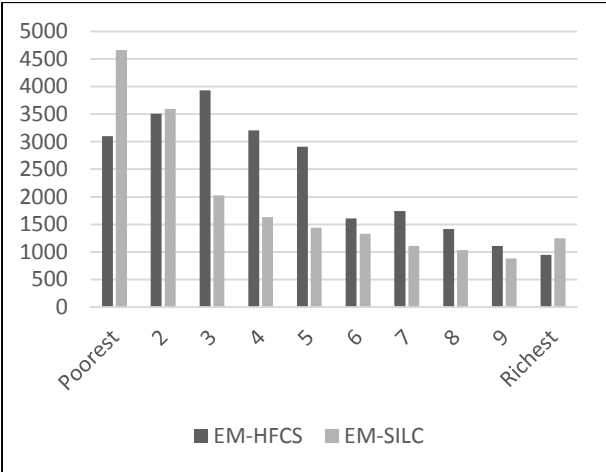
Panel a: Mean original income



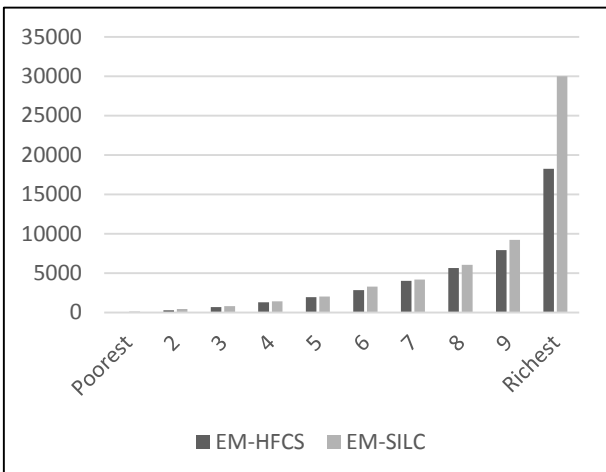
Panel b: Mean disposable income



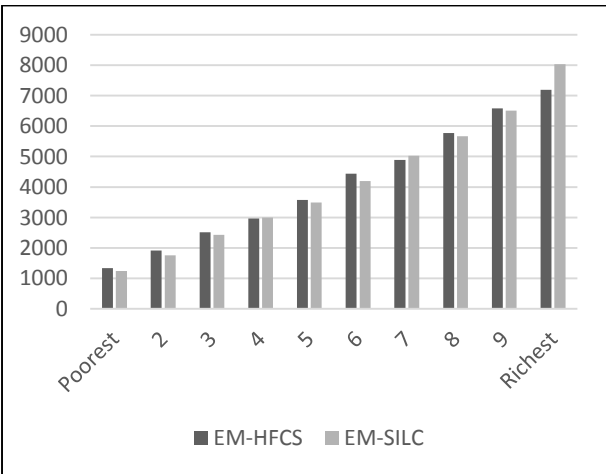
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.7.5 Macro-validation of new EUROMOD policies

Table A.7.6 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. The large difference between eligible cases and effective taxpayers for the inheritance and gift tax is due to the large exemptions that are granted for this tax. Subsequently, Table A.7.7 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

The real property tax is slightly over simulated which is likely due to the fact that we approximate cadastral values instead of directly observing them as well as the fact that average tax rates are applied. The simulated revenues of the real property transfer tax and the inheritance & gift tax, on the contrary are lower than those of administrative sources. For the first this relates to the fact that we only simulate transfers of real property among households, while the administrative data also covers transfers of financial property and transfers among other agents. In the case of the latter the lower simulated revenues might be explained by the non-observation of inheritances and gifts between members of the same household in HFCS as well as the large exemptions provided in the tax legislation such that the number of actual tax payers for which a tax is simulated is much smaller than the number of potential eligible cases (Table A.7.6).

Table A.7.6 Number of eligible cases for wealth taxes, Germany.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	2,895	2,984	19,830,502	2,984	19,830,502
Real property transfer tax	92	89	628,066	89	628,066
Inheritance & Gift tax	363	22	115,354	27	119,988

Source: Own calculations based on EUROMOD and micro-data from HFCS.

Table A.7.7 Validation of simulated wealth tax revenues (in million euro), Germany.

		EM-HFCS	External	Ratio
Real property tax	2013	6,795	4,951	137.2
	2017	7,199	5,586	128.9
Real property transfer tax	2013	5,181	8,394	61.7
	2017	6,899	13,139	52.5
Inheritance & gift tax	2013	1,496	4,633	32.3
	2017	2,548	6,114	41.7

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

A.8 Greece

A.8.1 Description of wealth taxes

A.8.1.1 New EUROMOD policies

Real property transfer tax (“φόρος μεταβίβασης ακινήτου”)

Description:

The real estate transfer tax is imposed on the value of transferred property at a flat rate of 2% (Ernst & Young, 2014; PWC, 2018).

Aspects of the policy that were not implemented:

- The exemptions from the real estate transfer tax⁷.

Changes after the income reference year (only those relevant for the 2017 policy):

- The real estate transfer tax is imposed on the value of transferred property at a flat rate of 3%.
- A municipality surcharge equal to 3% of this transfer tax also applies in 2017, i.e. the total rate is 3.09% in 2017.

Inheritance and gift tax (“φόρος κληρονομιάς”)

Description:

The inheritance and gift tax is calculated on the actual value of the inheritance or gift. Progressive tax rates are being used. The tax rates and tax brackets differ between three categories of beneficiaries: (1) close relatives, (2) relatives and (3) a category ‘others’ which includes non-relatives and any other relative not included in the first two categories. Close relatives are the spouse, cohabiting partner, children, grandchildren, and parents. Relatives are, amongst others, grandparents, brothers and sisters, and the children of the deceased’s spouse⁸ (Deloitte, 2018; Ernst & Young, 2012; 2017; Ernst & Young, 2014). The rates for close relatives range from 0 to 10%, those for relatives range from 0 to 20% and those for the remote category range from 0 to 40% (Ernst & Young, 2014; PWC, 2018).

Monetary donations are taxed at flat rates of 10% when the beneficiary is a close relative, 20% when it is a relative, and 40% when it is someone in the category ‘others’ (Ernst & Young, 2017).

The primary residence is fully or partly exempted from taxation, when the house/apartment or land plot is a gift or an inheritance from the parents, unless in the situation where the receiver of this gift or inheritance owns other real property suitable for housing or more generally, that may cover their housing needs. The degree to which this property suits housing needs are clearly defined and depends on its surface and on the composition of the household (married, children, number of children, etc.). Depending on these factors, the amount of the tax exemption is computed.

Tax exemptions that are in place:

- Non-adult children (under 18 years) have a tax exemption of €400,000 (only for the inheritance tax).

⁷ For a list of these exemptions, see: http://ec.europa.eu/taxation_customs/tedb/taxDetails.html?id=223/1514764800

⁸ Relatives are defined as (i) 3rd, 4th or higher degree descendants related by blood with the deceased, (ii) 2nd, 3rd and higher degree ascendants related by blood with the deceased, (iii) children recognized as such voluntarily or through Court proceedings, which are thus related to the deceased ascendant of their father, (iv) descendants of a child as defined above under point (iii), which are thus related to the recognizing father and his ascendants, (v) brothers and sisters, (vi) 3rd degree blood relatives being no direct descendants/ascendants of the deceased, (vii) spouse of a parent of the deceased, (viii) children of the deceased's spouse, (ix) son/ daughter in law, (x) ascendants (parents) of the deceased's spouse (European Commission, 2014).

- If the heir or the recipient of a gift is handicapped (67% or more), the inheritance/gift tax is reduced by 10% (European Commission, 2018).

Aspects of the policy that were not implemented:

- There is no information about inheritances and gifts between spouses in the HFCS. Therefore, the tax exemption of €400,000 for the spouse of the deceased is not included in the simulation if they were married for more than five years.
- The spouse, children, parents and brothers/sisters that are heirs of a deceased individual who was a member of the military service, if the death occurred due to the military service are for 100% exempted of the inheritance tax, and are exempted from €80,000 of the gift tax.
- Parents or heirs that inherit property that they had donated/granted for free to the deceased person are for 100% exempted of these taxes.
- The inheritance of (i) mutual fund units and/or (ii) monetary bank deposits in joint open accounts are, under certain conditions, for 100% exempted of taxation.
- The primary residence is fully or partly exempted from taxation when the house/apartment or land plot is a gift or an inheritance from the spouse.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.8.1.2 Refinement of existing EUROMOD policies

Emergency property tax (“ΕΕΤΗΔΕ”)

Description:

The emergency property tax is already simulated in EUROMOD for the year 2013 and was adapted to the HFCS variables.

Assumptions:

- Because not all variables that are used in this policy are also included in HFCS, we used similar variables instead or created the variables themselves, using external information or certain assumptions.
 - o Instead of “ddita” (disability status for taxation purposes), “ddi” (disability status; permanently or/and unfit to work) is used.
 - o In EU-SILC there are two variables about who’s responsible for accommodation (“HB080”: person 1 responsible for accommodation & “HB090”: person 2 responsible for accommodation). In HFCS, information about who’s responsible for accommodation is missing. Therefore, we made the assumption that the reference person and the spouse or partner of the reference person are both responsible for the accommodation (“RA0100” = 1 and/or 2). In this way, we created “dhr” and “dhr01”.
 - o Also, “drgur” (the level of urbanization) is missing in HFCS. Therefore, we assigned the degree of urbanization randomly to the households. The information about the degree of urbanization was taken from Eurostat (2013).

Changes after the income reference year (only those relevant for the 2017 policy):

- The emergency property tax was replaced by the joint tax on the ownership of real estate.

Property tax (“Ενιαίος Φόρος Ιδιοκτησίας Ακινήτων, ΕΝΦΙΑ”)

Description:

The property tax (the joint tax on the ownership of real estate; ENFIA) that was in place in 2017 was already simulated in EUROMOD and is adapted to the HFCS-variables. It applies to properties

located in Greece and owned by individuals or legal persons or legal entities of any kind on January 1st of each year.

The main tax on buildings is equal to the product of the surface area (in square meters) and a Base Tax Rate (BTR), the Building Age Coefficient (BAC), the Floor or House Coefficient (FC or HC), a Façade Coefficient (AC), an Auxiliary Spaces Coefficient (ASC), and an Incomplete Building Coefficient (IBC). This leads to the following calculation of the tax:

$$\text{tax} = \text{building surface area} \times \text{BTR} \times \text{BAC} \times \text{FC or HC} \times \text{AC} \times \text{ASC} \times \text{IBC}.$$

In HFCS, there is only information that makes it possible to include the surface area, BTR and BAC in the simulation. Therefore, the simulation of the main tax on buildings is equal to: building surface area \times BTR \times BAC. Table A.8.1 shows the Base Tax Rates and table A.8.2 the Building Age Coefficients that are used.

Table A.8.1 Base Tax Rates for the main tax on buildings, ENFIA, Greece.

	Zone price (€/m ²)		TB	Base Taks Rates (BTR) (€/m ²)
0	-	500	1	2.00
501	-	750	2	2.80
751	-	1,000	3	2.90
1,001	-	1,500	4	3.70
1,501	-	2,000	5	4.50
2,001	-	2,500	6	6.00
2,501	-	3,000	7	7.60
3,001	-	3,500	8	9.20
3,501	-	4,000	9	9.50
4,001	-	4,500	10	11.10
4,501	-	5,000	11	11.30
5,001	+		12	13.00

Source: https://www.kodiko.gr/nomologia/document_navigation/78526/nomos-4223-2013

Table A.8.2 Building Age Coefficients for the main tax on buildings, ENFIA, Greece.

Property's age	Building Age Coefficient (BAC)
Over 26 years	1.00
20 to 25 years	1.05
15 to 19 years	1.10
10 to 14 years	1.15
5 to 9 years	1.20
Up to 4 years	1.25

Source: https://www.kodiko.gr/nomologia/document_navigation/78526/nomos-4223-2013

A supplementary property tax on individuals is added both for 2013 and 2017. This tax was imposed on property with a value of more than €200,000 and was levied at progressive rates ranging from 0.2% to 1.15% (European Commission, 2018).

Assumptions:

- There is no information about the zone price and the construction year of buildings in HFCS. Therefore we assume that the zone price is equal to the market value of the building divided by its surface area and that the purchase year is the construction year.

Aspects of the policy that were not implemented:

- Due to a lack of information in HFCS, we could not include the following coefficients in the simulation of the main tax: The Floor or House Coefficient (FC or HC), the Façade Coefficient (AC), the Auxiliary Spaces Coefficient (ASC), and the Incomplete Building Coefficient (IBC).

- The main tax for plots and parcels of land (there is no information about plot surface in HFCS).
- We could not simulate the main tax of secondary residences because there is no information about the area of other buildings (“aobar”) in HFCS.
- Because not all variables that are used in the existing policy simulation of the joint tax on the ownership of real estate (ENFIA) are included in HFCS, we used similar variables instead:
 - o Instead of “ddita” (disability status for taxation purposes), “ddi” (disability status; permanently or/and unfit to work) is used.
 - o “Amr” (value of the main residence of the household) is used instead of the simulated value of the main residence “amrmv_s”.

Changes after income reference year (only those relevant for 2017 policy):

- The tax rates and tax brackets of the supplementary property tax are different in the two income years.

Taxation of income from financial assets

Description:

Interest income is taxed at a 15% flat rate. In 2013, dividend income was taxed at 10%. With SILC, different types of investment income cannot be disentangled, so all investment income is taxed at 15%. With HFCS, we added the differentiation between interest and dividend income.

Changes after income reference year (only those relevant for 2017 policy):

- Since 2016, dividend income is taxed at 15%, which means that there is no differentiation anymore between the tax rates on interest and dividend income.

Taxation of income from real property

Description:

Real property income is taxed separately. In 2013 the tax rate is 10% on income up to €12,000 and 33% above. In 2013, rental income was also subject to a 1.5% additional tax, increased to 3% for rentals exceeding 300 m² and for rentals belonging to corporations. The additional tax on rental income in 2013 is not correctly simulated as the size of the main residence is used, while it should be the size of the building from which rental income is received.

Assumptions:

- With HFCS we only have information on the size of the main residence, not on the size of other buildings. Therefore, we made the assumption that all rented buildings are smaller than 300 m².
- We still applied the 3% tax rate to corporate rentals, although in an approximate way, i.e. we assume that building types such as industrial buildings, shops, offices, hotels and farms are rented to corporations.

Changes after income reference year (only those relevant for 2017 policy):

- In 2017 the tax rate is 15% for income up to €12,000, 35% for income between €12,000 and €35,000 and 45% above €35,000.

A.8.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.8.3. They are all uprated with figures from Eurostat (2017a; 2017b; 2017c; 2017d; 2017e). For the non-financial variables, we used the following uprates: for the variables “amr” (the current value of the main residence) and

“amrpv” (the purchase value of the main residence) we made use of the gross stock of dwellings, for other buildings (“aob”, “aob01-03”, & “aobpv01-03”) we used the gross stock of other buildings than dwellings, vehicles (“avh”) are updated with the financial consumption of the households on transport, valuables (“avl”) are updated with the gross capital formation and “asb” (self-employed business assets) and “ydv” (dividend income) are updated with the stock of machinery, equipment, weapons systems, and intellectual property products. The financial assets are updated as follows: “adp” (deposits) with the stock transferable and other deposits, “amf” (mutual funds) and “ama” (managed accounts) with stock of investment fund shares, “abd” (bonds) with the stock of debt securities, “apb” (non-self-employment private business) with the stock of unlisted shares and other equity, “ash” (shares) with the stock of listed shares, “app” (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, “aot” (others) with the stock of non-life insurance technical reserves and other accounts receivable/payable and “adb” (debt) with the stock of total liabilities. For all the variables concerning inheritances and gifts (“aihvr”, “agimbvr” & “agivr”) the tax revenues of capital transfers are used for the updating.

Table A.8.3 Overview of uprating indices used for wealth variables in EUROMOD, Greece.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, amrpv	329.49	275.21	Dwellings, in billion euro (1) ²
\$f_aob	aob, aob01-03, aobpv01-03	85.55	24.86	Other buildings, in billion euro (1) ²
\$f_avh	avh	16.51	17.29	Financial consumption expenditure of households: transport, in billion euro (2)
\$f_avl	avl	20.96	20.84	Gross capital formation, in billion euro (3) ³
\$f_asb	asb	23.33	21.41	Machinery, equipment, weapons systems and intellectual property products, in billion euro (1) ²
\$f_adp	adp, ydv	138.67	125.58	Transferable & other deposits, in billion euro (4)
\$f_amf	amf, ama	5.88	8.88	Investment fund shares, in billion euro (4)
\$f_abd	abd	3.06	2.83	Debt securities, in billion euro (4)
\$f_apb	apb	5.69	4.6	Unlisted shares and other equity, in billion euro (4)
\$f_ash	ash	2.97	4.86	Listed shares, in billion euro (4)
\$f_app	app	8.08	9.69	Life insurance, annuity entitlements and pension entitlements, in billion euro (4)
\$f_aot	aot	17.9	13.87	Non-life insurance technical reserves and other accounts receivable / payable, in billion euro (4)
\$f_adb	adb	134.61	113.28	Total financial liabilities, in billion euro (4)
\$f_aih	aihvr	99.00	115.00	Tax revenues on capital transfers, in million euro (5) ³
\$f_agi	givr, agimbvr	99.00	115.00	Tax revenues on capital transfers, in million euro (5) ³

Note: All stock variables refer to situation at the end of the year. ¹ The values for 2017 are about 2016. All values are at household level (S14) unless otherwise indicated. ² Figures are about households and non-profit institutions serving households (S14_S15). ³ Figures are about the total economy.

Source: (1) Annual Sector Accounts, Balance sheets for non-financial assets (Eurostat, 2017b); (2) Final consumption expenditure of households by consumption purpose (Eurostat, 2017c); (3) GDP and main components (output, expenditure, and income) (Eurostat, 2017d); (4) Balance sheets for financial assets (Eurostat, 2017a); (5) Main national accounts tax aggregates (Eurostat, 2017e)

A.8.3 Comparison of socio-demographic characteristics

Table A.8.4 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Greece.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	15.1	16.3	15.48
	16 – 29	14.9	14.4	16.63
	30 – 44	21.7	22.4	22.82
	45 – 64	28.4	27.3	25.57
	65 – 99	19.8	19.7	19.47
Gender	Female	50.5	51.2	50.97
	Male	49.5	48.8	49.03
Education	Not completed primary education	9.8	15	17.26
	Primary education	21.9	20.3	23.78
	Lower secondary education	14.7	13.3	11.83
	Upper secondary education	39.7	27.2	25.76
	Post-secondary (non-tertiary) education	-.1	4.7	4.64
	Tertiary education	13.9	19.6	16.73
Economic status	Pre-school	4.6	4.3	5.92
	Farmer	-.1	-.1	-.1
	Employer or self-employed	8.4	10.9	10.26
	Employee	22.2	21.3	23.52
	Pensioner	22.4	21.5	22.47
	Unemployed	12.1	12.2	7.94
	Student	17.2	16.7	15.79
	Inactive	0.6	0.9	
	Sick or disabled	0.5	1.1	13.41
	Other	11.2	11.1	
	Family worker	0.8	-.1	0.48
Marital status	Single (never married)	37.7	38.0	39.08
	Married	50.8	50.7	50.26
	Separated	-.1	11.3	-.1
	Divorced	3.6	-.1	3.07
	Widowed	7.8	-.1	7.59
Tenure status	Owner paying mortgage	14.5	14.1	-.1
	Outright owner	59.6	61	-.1
	Tenant or subtenant paying rent at prevailing or market rate	20.1	19.8	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	0.5	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	5.8	4.6	-.1

Note: ¹ Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.8.4 provides a comparison of some socio-demographic characteristics of the EM-HFCS and EM-SILC sample. Overall, proportions are similar between EM-HFCS and EM-SILC. Yet, some small differences are worth mentioning. EM-HFCS, for example, has a higher proportion of individuals that achieved upper secondary education, whilst EM-SILC has a higher proportion of individuals that completed tertiary education. Information about who is separated is missing in EM-HFCS and about who is divorced and widowed in EM-SILC. However, the share of those in EM-SILC who are separated is as good as equal to the share of divorced people and widows in EM-HFCS.

A.8.4 Micro-validation of income concepts

Table A.8.5 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Greece.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	11,859	8,363	-3600	110,304
	EM-SILC	11,161	11,649	-5,969	545,549
Benefits	EM-HFCS	530	1,442	0	26,842
	EM-SILC	996	2,084	0	80,619
Taxes	EM-HFCS	1,411	1,963	0	33,029
	EM-SILC	867	2,618	-11,965	121,906
Social insurance contributions	EM-HFCS	452	426	0	3,572
	EM-SILC	1,404	1,324	0	14,635
Disposable income	EM-HFCS	10,525	6,379	-2,097	88,913
	EM-SILC	9,897	8,443	-972	419,463

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

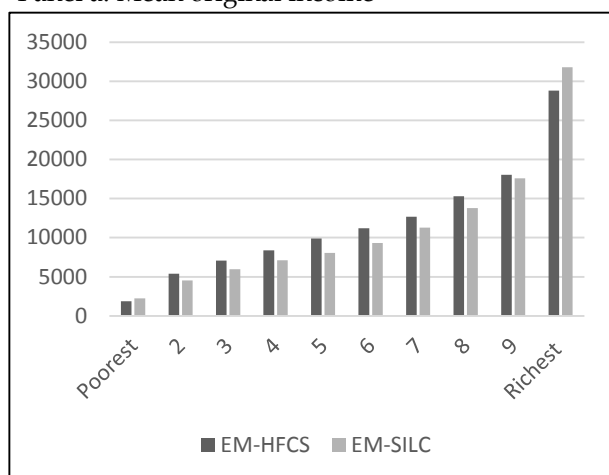
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

From Table A.8.5 emerges that original & pension income and disposable income is considerably higher in EM-HFCS. The difference between both datasets equals approximately €700 for both. Average benefits and social insurance contributions, on the other hand, are higher in EM-SILC.

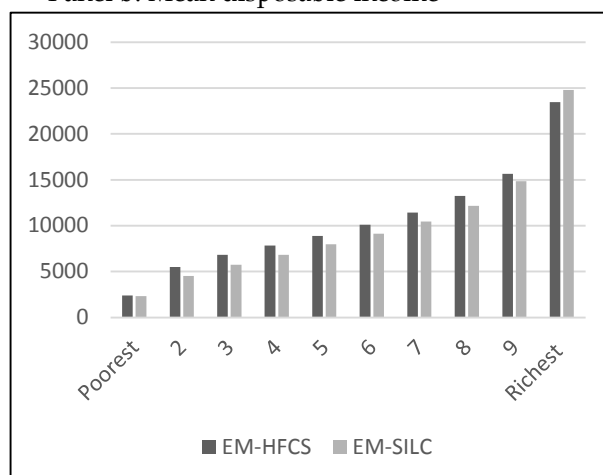
Next, we present the distribution of the income concepts from Table A.8.5 across disposable income deciles. Figures A.8.1 panel a, b and d show the distribution of original & pension income, disposable income, and taxes, respectively. The mean values of all these income concepts are higher in EM-HFCS than in EM-SILC for all deciles, except for the lowest decile about mean original income. Figure A.8.1 panel c shows the distribution of benefits. Except for the lowest two deciles, mean benefits are higher in EM-SILC than in EM-HFCS. Panel e shows very low social insurance contributions for EM-HFCS.

Figure A.8.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Greece.

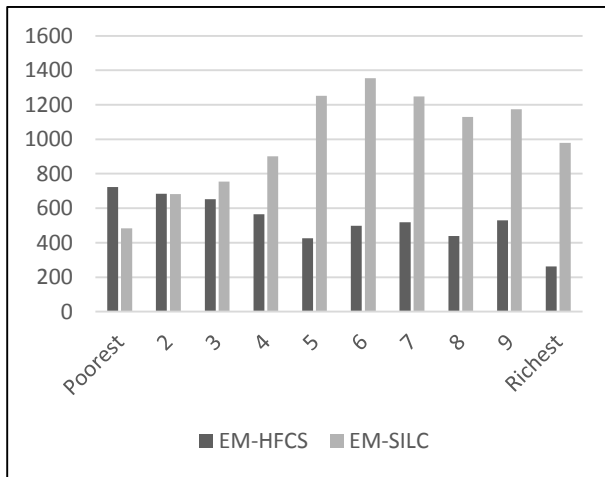
Panel a: Mean original income



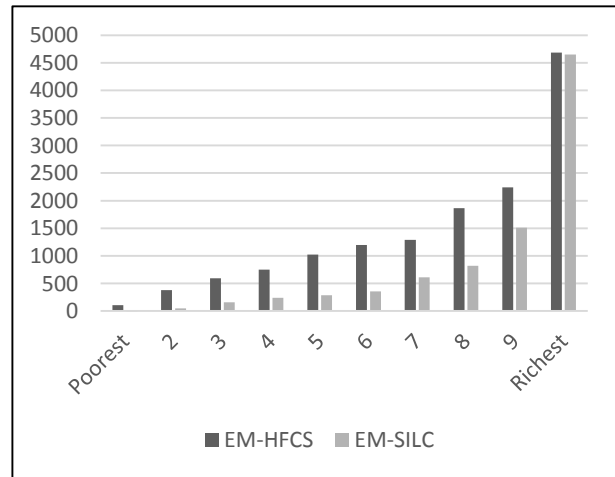
Panel b: Mean disposable income



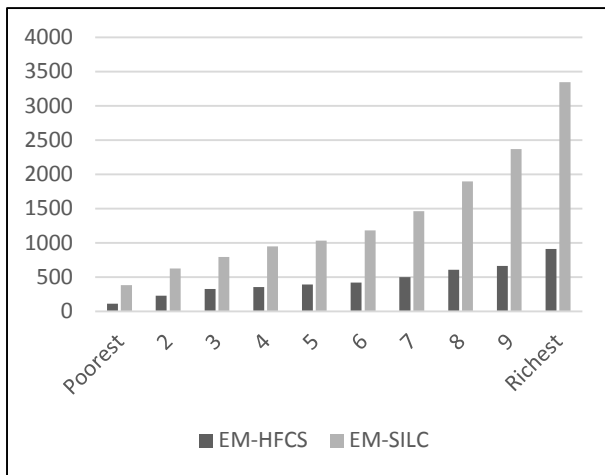
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.8.5 Macro-validation of new EUROMOD policies

Table A.8.6 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.8.7 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.8.6 Number of eligible cases for wealth taxes, Greece.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Emergency property tax/real property tax	3,003	33/982	47,370/1,438,851	1,793	3,038,838
Real property transfer tax	11	11	3,326	11	3,326
Inheritance/gift tax	13	4	4,134	5	4,134

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.8.7 Validation of simulated wealth tax revenues (in million euro), Greece.

		EM-HFCS	External	Ratio
Emergency property tax/real property tax	2013	415.93	2,619 (1)	15.88%
	2017	1,042	3,095 (1)	33.67%
Real property transfer tax	2013	37.77	275 (1)	13.73%
	2017	50.92	181 (1)	28.13%
Inheritance/gift tax	2013	2.53	99 (1)	2.56%
	2017	6.63	115 (1)	5.77%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Taxes in Europe Database (European Commission, 2018).

The emergency property tax and the main part of the real property tax are both only simulated for the main residence. This can be a possible explanation for the low ratios of these simulations (about 16% for 2013 and 34% for 2017).

The low ratios for the real property transfer tax can also be explained by the external figures we used. For this, we used the OECD tax revenues from the taxes on financial and capital transactions, which also contains revenues from other transaction taxes than those of the transaction of real property.

The overestimation of the inheritance/gift tax can be explained by the fact that for both years there are only a few cases on which these simulations are based (4 for 2013 and 5 for 2017).

A.9 Hungary

A.9.1 Description of wealth taxes

A.9.1.1 New EUROMOD policies

Real property tax (“Építményadó”) (not simulated)

Description:

Owners of real property are taxed with a real property tax in Hungary. Either the size of the property (in m²) or the adjusted market value (50% of the market value) is used as tax base. The applied tax rates are maximum HUF 1,821 per square meter or 3.6% on the adjusted market value. The municipalities can, however, adjust these tax rates within a certain range. On top of that, municipalities can introduce their own tax exemptions.

Important note:

For a number of reasons it is not possible to simulate the Hungarian real property tax in EUROMOD:

1. Municipalities can choose whether they use the property size in m² or the adjusted market value as tax base. HFCS does not include information on the property size of other owned buildings (apart from main residence). Hence, we cannot simulate the real property tax for these “other buildings”.
2. Municipalities can choose which tax rate they want to impose, varying between HUF 0/m² – HUF 1,821/m² or 0% - 3.6%. We were not able to find the relevant information online for all the different municipalities. We tried using the tax rules from Budapest as a proxy for the whole of Hungary, but since the authorities in Budapest use the property size in m² as tax base, we cannot use this approximation for “other buildings”. Furthermore, the average tax rate that we used (i.e. HUF 1,634/m²) for simulating the real property tax for main residences resulted in a severe overestimation, which made the real estate tax unusable.
3. Some municipalities apply a flat rate per m², whilst others apply varying tax rates depending on the categories a property belongs to (e.g. 0m² - 100m²; 100m²-500m², etc.).
4. Exemptions vary between the different municipalities. We cannot take these exemptions into account.
5. Tax rates also differ according to the type of building and/or the region where it situated. We cannot take this fully into account.

Land tax (“Telekadó”) (not simulated)

Description:

Owners of land are taxed with a land tax in Hungary. Either the size of the property (in m²) or the adjusted market value (50% of the market value) is used as tax base. The applied tax rates are maximum HUF 331 per square meter or 3% on the adjusted market value. The municipalities can, however, adjust these tax rates within a certain range. In order to avoid double taxation or unreasonable tax burdens the following cases are exempt from taxation:

- Land on which a building already stands;
- 50% of the land that is subject to building prohibitions

Important note:

In line with the “regular” real property tax it is not possible to simulate the land tax (see above).

Real property transfer tax (“Visszterhes vagyónátruházási illeték”)

Description:

Buyers of property have to pay a transfer tax on the market value of the property. Special rules apply in case of the purchase of motorized vehicles or for shareholders in a company. Immovable property is taxed at a rate of 4% on the market value up until HUF 1,000,000,000. The amount exceeding HUF 1,000,000,000 is taxed at a rate of 2%. The maximum total tax due is HUF 200,000,000 (Ernst & Young, 2014; European Commission, 2018; National Tax and Customs Administration Hungary, 2017).

The following cases are exempt from the transfer tax:

- Immovable property with a value lower than HUF 15,000,000 is exempt from taxation if it was built by an entrepreneur with the purpose of sale.
- Individuals that have not yet reached the age of 35 years old are entitled to a 50% tax reduction in case they acquire a first residential property of which the market value does not exceed HUF 15,000,000.
- Transfers of property are exempt from taxation between lineal heirs (i.e. parents, grandparents and children) and spouse.
- The purchase of ownership of a land property and rights in such property if the buyer builds a residential building on such bought land property within four years and the net floor space of the residential suite(s) in the building is at least 10% of the permissible building space fixed in the general zoning plan.

Assumptions: n/a

Aspects of the policy that were not implemented:

- List of exemptions, apart from the second and third ones.
- Taxation of the acquisition of motorized vehicles.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance tax (“Öröklési illeték”)

Description:

Assets that are received by natural persons through inheritance are subject to the inheritance tax in Hungary. The total market value of the assets left by the deceased is used as tax base. A general tax rate of 18% applies, except in case of the inheritance of dwellings and connected rights. In such cases a tax rate of 9% is levied on the value of immovable property (Ernst & Young, 2014; National Tax and Customs Administration Hungary, 2017). Also, a special rate applies for motor vehicles. A few beneficiaries are exempt from taxation:

- Lineal heirs (i.e. grandparents, parents, children) and spouse are exempt from taxation on the full amount of the inheritance.
- Stepchildren and stepparents are exempt from taxation on HUF 20,000,000 from the net worth of the share.
- The inheritance is exempt from taxation in case an inheritor builds a residential building on inherited land property within four years and the net floor space of the residential suite(s) in the residential building is at least 10% of the permissible building space fixed in the general zoning plan.

Assumptions: n/a

Aspects of the policy that were not implemented:

- The special rate for motor vehicles.
- The exemption for stepchildren and stepparents.
- The exemption for inheritors that build on inherited land within four years.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Gift tax (“Ajándékozási illeték”)

Description:

Assets that are received by natural persons through gifts are subject to the gift tax in Hungary. The total market value of the assets given by the donor is used as tax base. A general tax rate of 18% applies, except for the gift of dwellings and connected rights. In such cases a tax rate of 9% is levied on the value of immovable property (Ernst & Young, 2014; National Tax and Customs Administration Hungary, 2017). Also, a special rate applies for motor vehicles. A few beneficiaries are exempt from taxation:

- The lineal heirs (i.e. grandparents, parents, children) and spouse are fully exempt from taxation.
- In order to avoid double taxation all gifts for which the beneficiary or donor must pay personal income taxes, social security taxes or healthcare contributions are fully exempt from taxation.
- Regardless of the kinship between the donor and beneficiary, no tax has to be paid on gifts that have a net value lower than HUF 150,000.
- The gift is exempt from taxation in case a beneficiary receives land property through a gift and builds a residential building on this land property within four years and the net floor space of the residential suite(s) in the residential building is at least 10% of the permissible building space fixed in the general zoning plan.

Assumptions: n/a

Aspects of the policy that were not implemented:

- The exemption to avoid double taxation.
- The exemption for beneficiaries that build on land they received through a gift.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.9.1.2 Refinement of existing EUROMOD policies

Taxation of income from financial assets

Description:

All investment income and capital gains are taxed separately under a withholding tax. Special rules apply for longer-term investment income such as time deposits, but cannot be taken into account. The tax rate for all income types equals 16% in 2014 and 15% in 2017 (European Commission, 2018; see <https://net.jogtar.hu/jogszabaly?docid=99500117.TV>). Currently, the EUROMOD includes a separate tax on divided income at a flat of 20% but is switched off for all policy years. For the HFCS policy system we can correctly implement the withholding tax.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): Change in tax rate.

Tax relief for contributions made to private pension funds

Description:

A tax credit of 20% is granted to all individuals that make contributions to private insurance funds, with a maximum of HUF 120,000 in 2014 and HUF 100,000 in 2017 (HUF 150,000 in 2014/HUF 130,000 in 2017 for individuals that reach the statutory retirement age before 1 January 2020) (European Commission, 2018; see <https://net.jogtar.hu/jogszabaly?docid=99500117.TV>). The tax relief for contributions to private pension funds is currently not simulated, but can be added by using information from the HFCS.

Assumptions:

- The statutory retirement age is gradually increasing until it reaches 65 in 2022. We use the same pension age that is currently being used in the 2014 and 2017 policy systems of EM-SILC, i.e. 62 year old.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Change in maximum amount.

Asset-test for social benefits

Description:

To be eligible for the old-age allowance the total value of property cannot be higher than 80 times the minimum old-age pension of HUF 28,500 per year (i.e. HUF 2,280,000), or the value of each of the separate pieces of property cannot be higher than 30 times the minimum old-age pension (i.e. HUF 855,000). Property includes real estate and vehicles, but the main residence is not taken into account and neither are vehicles which are used to transport a mobility-impaired person (OECD, 2017c; <https://www.missoc.org/missoc-database/comparative-tables/>). This asset-test is currently not taken into account in the simulation of the old-age allowance. With HFCS we can add this.

Assumptions:

- Since we do not know whether a vehicle is used to transport a mobility-impaired person, we assume that this is not the case.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.9.2 Upgrading of monetary variables

An overview of how the amounts are updated is presented in Table A.9.1. First, the main asset variables are updated based on their aggregates as reported in the Annual National Accounts (OECD, 2017b). The variables "amr", "aob", "amrpv", "aobpv01-03" are updated based on the gross stock of buildings and structures. Vehicles ("avh"), valuables ("avl") and self-employment business assets ("asb") are both updated with the gross stock of personal transport equipment due to insufficient information. Second, financial assets are updated based on their size as reported in the balance sheet for financial assets (Eurostat, 2017a). Deposits ("adp") are updated with the total stock of transferable and other deposits, personal business assets other than self-employment ("apb") with the total stock of unlisted shares & other equity, mutual funds ("amf") and managed accounts ("ama") with the stock of investment fund shares, shares ("ash") with the stock of listed shares, private pension ("app") with the stock of life insurance and pension entitlements, other assets ("aot") with the stock of life-insurance technical reserves and other accounts and debt ("adb) with the total stock of liabilities.

Thirdly, due to missing information, we updated the inheritance and gift variables (“aihvr”, “aihimvr”, “agivr”, “agiimvr”) with the respective tax revenues (OECD, 2017a). Finally, the variables financial assets (“ape”) and real assets (“ara”) are updated based on their separate components.

Table A.9.1 Overview of uprating indices used for wealth variables in EUROMOD, Hungary.

Uprate index	Variables uprated by the index	Value 2014	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	88.43	120.13	Gross stock of buildings and structures, Housing Price Index (2)
\$f_avh	avh	150.6	154.41	Stock of personal transport equipment, Consumer Price Index (2)
\$f_avl	avl	150.6	154.41	Stock of other durables, Consumer Price Index (2)
\$f_asb	asb	150.6	154.41	Stock of machinery & equipment and intellectual property products, Consumer Price Index (2)
\$f_adp	adp	24,167.3	27,432.3	Stock of transferable & other deposits, in million euro (1)
\$f_amf	amf, ama	12,903.5	13,539.6	Stock of investment fund shares, in million euro (1)
\$f_abd	abd	9,673.8	17,099.6	Stock of debt securities, in million euro (1)
\$f_apb	apb	35,467.0	47,815.9	Stock of unlisted shares and other equity, in million euro (1)
\$f_ash	ash	1,474.7	2,535.9	Stock of listed shares (domestic & other), in million euro (1)
\$f_app	app	9,955.0	11,807.2	Stock of life insurance and pension entitlements, in million euro (1)
\$f_aot	aot	13,809.2	15,640.2	Stock of non-life insurance technical reserves and other accounts, in million euro (1)
\$f_adb	adb	30,055.8	27,252.6	Stock of total liabilities, in million euro (1)
\$f_aih	aihvr, aihimvr	4,983.0	6,980.0	Inheritance tax revenue >0 euro, in million euro (3) ¹
\$f_agi	agivr, agiimvr	1,196.0	1,143.0	Gift tax revenue >0 euro, in million euro (3) ¹

Note: All stock variables refer to the situation at the end of the year. ¹ Figures refer to 2016.

Source: (1) Annual Sector Accounts, Balance sheet for financial assets (Eurostat, 2017a); (2) Annual National Accounts, Fixed assets by activity and by asset, ISIC Rev 4 (OECD, 2017b); (3) Tax revenue database (OECD, 2017a).

A.9.3 Comparison of socio-demographic characteristics

Table A.9.2 Comparison of socio-demographic variables, EM-HFCS vs. EM-SILC, income reference year, Hungary.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	14.62	15.38	15.70
	16 – 29	17.08	16.92	17.21
	30 – 44	21.54	19.74	23.10
	45 – 64	29.20	31.50	27.11
	65 – 99	17.56	16.47	16.87
Gender	Female	52.48	52.45	52.52
	Male	47.52	47.55	47.48
Education	Not completed primary education	8.86	9.83	10.10
	Primary education	5.03	5.43	4.62
	Lower secondary education	19.85	18.93	26.96
	Upper secondary education	43.09	42.59	39.99
	Post-secondary (non-tertiary) education	-.1	5.02	3.36
	Tertiary education	23.17	18.19	14.97
Economic status	Pre-school	4.71	5.69	5.79
	Farmer	-.1	-.1	-.1
	Employer or self-employed	4.47	4.60	4.87
	Employee	40.08	37.34	34.61
	Pensioner	23.22	22.70	25.42
	Unemployed	5.63	5.57	5.72
	Student	16.62	16.31	16.36
	Inactive	0.16	3.04	
	Sick or disabled	3.11	3.39	7.03
	Other	1.63	1.36	
	Family worker	0.38	-.1	0.19
Marital status	Single (never married)	38.89	41.35	42.39
	Married	42.03	37.91	37.93
	Separated	-.1	1.04	-.1
	Divorced	9.06	8.83	9.87
	Widowed	10.02	10.88	9.81
Tenure status	Owner paying mortgage	0.01	2.56	-.1
	Outright owner	23.21	18.25	-.1
	Tenant or subtenant paying rent at prevailing or market rate	62.49	65.92	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	4.63	-.1
	Accommodation is socially rented	-.1	3.28	-.1
	Accommodation is rented for free	4.91	5.36	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Table A.9.2 provides a comparison of some socio-demographic characteristics of the EM-HFCS and EM-SILC sample. In general, proportions are similar between EM-HFCS and EM-SILC, with a small difference in tenure status. While the number of outright owners is higher in EM-HFCS, the number of owners paying mortgages is higher in EM-SILC (and almost zero in EM-HFCS).

A.9.4 Micro-validation of income concepts

Table A.9.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Hungary.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	6,225	6,644	-19,279	184,393
	EM-SILC	5,889	4,211	-810	95,460
Benefits	EM-HFCS	623	958	0	13,051
	EM-SILC	454	611	0	6,841
Taxes	EM-HFCS	964	1,057	0	29,199
	EM-SILC	955	759	0	24,851
Social insurance contributions	EM-HFCS	986	1,798	0	67,024
	EM-SILC	960	1,180	0	18,925
Disposable income	EM-HFCS	4,897	4,010	-21,631	122,515
	EM-SILC	4,429	2,527	-1,903	57,072

Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones. Amounts are converted to an amount in EUR based on the average exchange rate in 2014 (i.e. €1 = HUF 308.71).

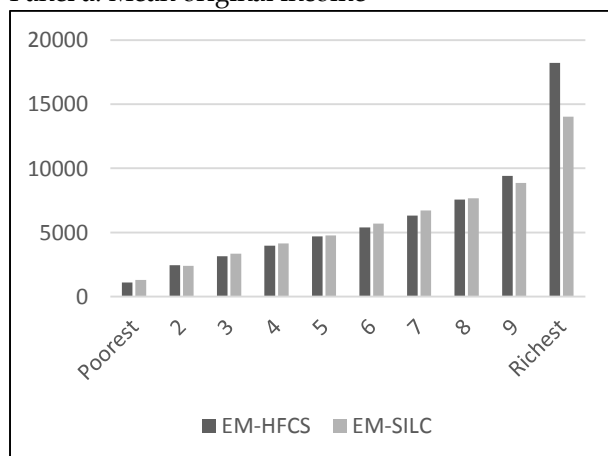
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. Exchange rate is retrieved from the European Central Bank.

Table A.9.3 shows that original & pension income is higher in EM-HFCS in comparison to EM-SILC. The difference equals more or less €340 but increases to around €460 in disposable income. This might be at least partially related to the oversampling of the wealthy applied in HFCS.

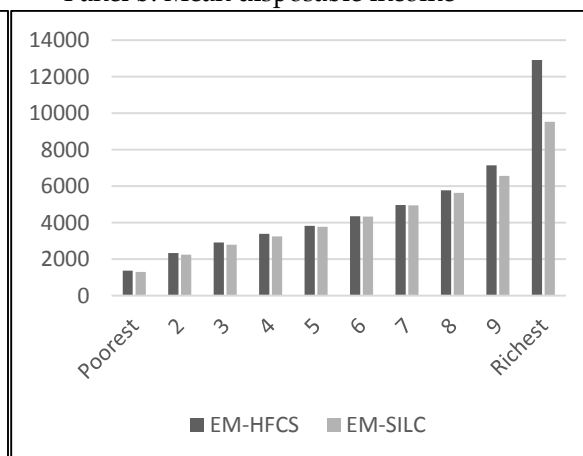
Next, Figure A.9.1 panel a and b show the mean values of original and disposable income across disposable income deciles. Up to the ninth decile mean values are corresponding. The average incomes in the tenth decile are higher for EM-HFCS, which might again be the result of oversampling the wealthy. Figure A.9.1 panel c, d and e present the distribution of benefit, taxes and social insurance contributions, respectively. Overall, EM-HFCS simulates higher amounts for these income concepts at the top of the distribution.

Figure A.9.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Hungary.

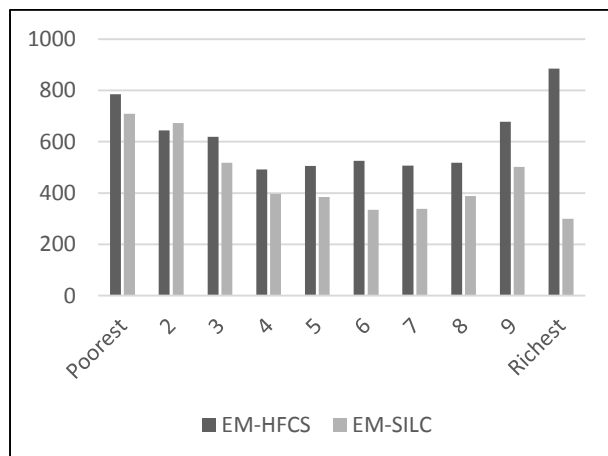
Panel a: Mean original income



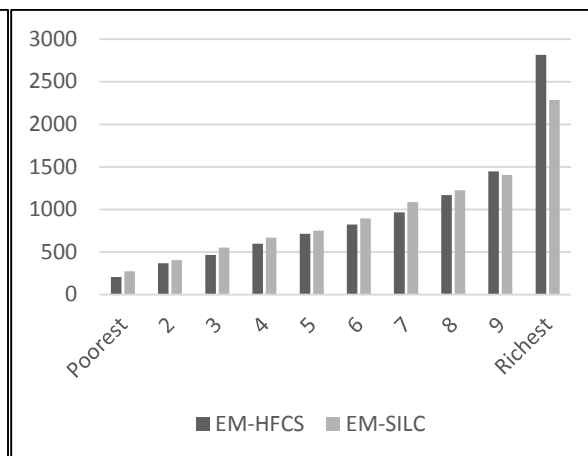
Panel b: Mean disposable income



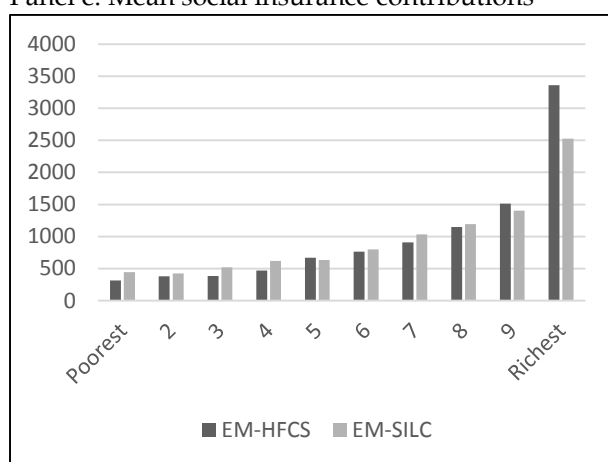
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.9.5 Macro-validation of new EUROMOD policies

Table A.9.4 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.9.5 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.9.4 Number of eligible cases for wealth taxes, Hungary.

	Eligible cases	2014		2017	
		Taxpayers	Population	Taxpayers	Population
Real property transfer tax	69	69	42,300	69	42,300
Inheritance tax	47	5	3,514	5	3,514
Gift tax	28	1	224	1	224

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

The total number of eligible cases for the inheritance tax is higher in comparison to the final number of taxpayers. This relates to the fact that inheritances between lineal heirs are not taxed such that 42 cases are exempt from taxation. The same story goes for gifts between lineal heirs (27 cases are exempt). The limited number of eligible cases for all simulated wealth taxes result in strongly underestimated tax revenues (see Table below).

Table A.9.5 Validation of simulated wealth tax revenues (in million euro), Hungary.

		EM-HFCS	External	Ratio
Real property transfer tax	2014	54.52	265.23 (1)	20.56%
	2017	73.87	419.91 (1)	17.59%
Inheritance tax	2014	4.49	16.14 (1)	27.82%
	2017	6.27	26.40 (1)	23.75%
Gift tax	2014	0.13	3.87 (1)	3.36%
	2017	0.13	3.97 (1)	3.27%

Note: Tax revenues are converted to an amount in EUR based on the average exchange rate in 2014 (i.e. €1 = HUF 308.71) and 2017 (i.e. €1 = HUF 309.19) reported by the [European Central Bank](#).

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

A.10 Ireland

A.10.1 Description of wealth taxes

A.10.1.1 New EUROMOD policies

Real property tax (“Local property tax”)

Description:

In 2012 there was a household charge of €100 that needed to be paid by liable owners of residential property. The household charge was an interim measure for 2012 only. a flat-rate charge of €200 needs to be paid by owners of residential property that was not the owner’s only or main residence.

Changes after the income reference year (only those relevant for the 2017 policy):

- An annual local property tax (LPT) is charged on all residential properties. The tax base is the market value of the residential property on the valuation date. Property values are organized into several value bands of €50,000, up to €1 million. The tax liability is calculated by applying 0.18% to the midpoint of the relevant band. Residential properties valued over €1 million are assessed on the actual market value at a rate of 0.18% on the first €1 million in value and at 0.25% on the portion of the value above €1 million.
- Until 2019, the tax base of the local property tax is the market value of each property at the valuation date of 1 May 2013. The fieldwork period of the survey was between March and September 2013. Because the value of the household’s main residence (“amr”) and the value of other real estate property (“aob01-03”) are uprated for 2017, we divided these variables with the uprating factors for these variables. In this way, the original variables with the value in 2013 are included in the simulation.

Table A.10.1 LPT valuation band and charge, Ireland.

Valuation band number	Valuation band, €	LPT charge in 2013. Half year charge.	LPT charge in 2014 (base year). Full-year charge.
01	0 - 100,000	45	90
02	100,001 - 150,000	112	225
03	150,001 - 200,000	157	315
04	200,001 - 250,000	202	405
05	250,001 - 300,000	247	495
06	300,001 - 350,000	292	585
07	350,001 - 400,000	337	675
08	400,001 - 450,000	382	765
09	450,001 - 500,000	427	855
10	500,001 - 550,000	472	945
11	550,001 - 600,000	517	1,035
12	600,001 - 650,000	562	1,125
13	650,001 - 700,000	607	1,215
14	700,001 - 750,000	652	1,305
15	750,001 - 800,000	697	1,395
16	800,001 - 850,000	742	1,485
17	850,001 - 900,000	787	1,575
18	900,001 - 950,000	832	1,665
19	950,001 - 1,000,000	877	1,755

Source: Local property tax (Irish Tax and Customs, 2017).

Aspects of the policy that were not implemented:

- From 2015 onwards, local authorities can vary the LPT base rate on residential properties. The base rate is the rate as applied in 2014. The local authority can increase or decrease the LPT rate by up to 15% of the base rate. This is referred to as the Local Adjustment Factor (LAF). Since the HFCS does not include information on the region people live in this is not taken into account in the EUROMOD simulations. In 2017 only 8 out of 31 local authorities adjusted their LPT rate, some of them downward, while others upward (Irish Tax and Customs, 2017). Hence, they may partially cancel each other out and the effect on total tax revenues of not taking this into account is assumed to be small.

Real property transfer tax (“Stamp duty”)

Description:

The stamp duty rate for residential building is 1% when the purchase value of the building is smaller than or equal to €1 million and 2% for the amount above €1 million. The rate for non-residential property is 2% (Irish Tax and Customs, 2018a).

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and gift tax (“Capital Acquisition Tax – CAT”)

Description:

The Capital Acquisition Tax (CAT) needs to be paid in the case when a gift or an inheritance is received. Both gifts and inheritances have a tax-free threshold of which the amount depends on the relationship between the donee and the beneficiary (the person receiving the benefit). There are three categories with different tax-free thresholds (Irish Tax and Customs, 2018b):

- Group A: The person receiving the gift or inheritance is a child of the person giving it. This includes adopted children, stepchildren and some foster children.
- Group B: The person receiving the gift or inheritance has a family relationship with the person giving it. This includes a parent, brother, sister, nephew, niece, grandparent, grandchild, a lineal ancestor or a lineal descendant of the person making the gift.
- Group C: The person receiving the gift or inheritance has a relationship with the person giving it which is not already covered in Group A or B.

The tax rate on the amount in excess of the tax-free thresholds is 30% in 2012. Spouses are fully exempted from this tax. In addition, you do not pay CAT on a gift with a value of €3,000 or less from any one person in any one year.

Assumptions:

- We assume that for the exemption of the main residence, all the necessary conditions are fulfilled.
- In HFCS there is only information about inheritances and gifts received from (1) maternal grandparents, (2) paternal grandparents, (3) parents, (4) children, (5) other relatives and (6) others. Starting from this information, we created three categories:
 - o Group A: those received from parents (HFCS category 3).
 - o Group B: those received from children, maternal/paternal grandparents and other family members (HFCS categories 1, 2, 4 & 5).
 - o Group C: all other relationships (HFCS category 6).

Aspects of the policy that were not implemented:

- Certain transfers when a marriage or civil partnership ends are exempted from taxation, as well as transfers for support, maintenance and education payments.
- The tax-free thresholds apply for life, which means that previous gifts and inheritances received under the same group threshold should be taken into account when calculating the tax. In HFCS we do not have sufficiently detailed information to include this in the simulation.
- There is an exemption for the main residence; if you receive a gift or inheritance of a house that has been your main residence it may be exempt from taxation if you do not own or have an interest in any other house. There are several conditions that need to be fulfilled.

Changes after the income reference year (only those relevant for the 2017 policy):

- The tax rate on the amount in excess of the tax-free threshold is 33% in 2017.

A.10.1.2 Refinement of existing EUROMOD policies

Taxation of income from immovable property

Description:

Rental income is part of taxable income. It is possible to deduct certain expenses including the interests from mortgages used to purchase, improve or repair the property that is rented out. For real estate that is rented for residential purposes, you can deduct 75% of the mortgage interests paid. For non-residential rented real estate, the deduction is 100%. The deductions for mortgage interests for real estate which is rented out are included in the simulation of the personal income tax ("tin_ie").

Assumptions: n/a

Changes after income reference year (only those relevant for 2017 policy):

- For real property that is rented for residential purpose, you can deduct 80% of the mortgage interests paid in 2017.

Tax relief for mortgage repayment

Description:

Mortgage interests on the main residence can be deducted during the first 7 years of the mortgage. Different limits for first and non-first-time buyers apply. In the case of first-time buyers, the tax relief is 25% of a maximum of €10,000 in the first 2 years, 22.5% in year 3 to 5 and 20% in the last 2 years. These amounts are doubled for married or widowed people. In the case of non-first time buyers, the relief is 15% of maximum €3,000 (also doubled for married or widowed people). A loan only qualifies for the tax relief if it was taken out between 1 January 2004 and 31 December 2012. For those eligible, the tax relief can still be claimed up to 31 December 2020. The eligibility condition concerning the year of mortgage is included in the simulation of the tax relief for mortgage repayment.

Assumptions:

- In the existing simulation, the assumption is made that everyone is a non-first-time buyer. We replaced this with the assumption that people who are 35 or younger are first time buyers and those who are older than 35 are non-first-time buyers.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Asset-test for social benefits

Description:

All non-contributory benefits have an asset-test: income from investments and property is not taken into account for determining the income test, but a formula is applied to the value of all assets. The formula depends on the specific benefit. The result of the formula is then added to income. The wealth test that is already simulated is approximated by an imputed amount of "afc". In HFCS, "afc" is actually observed instead of imputed. Also, real property is observed in HFCS. Therefore, the value of other real property ("aob") is included in the common asset and means-testing policy ("AMtesting_ie").

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.10.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.10.2. They are all uprated with figures from Eurostat (2017a; 2017b; 2017c; 2017d; 2017e). For the non-financial variables we used the following uprates: for the variables "amr" (the current value of the main residence) and "amrpv" (the purchase value of the main residence) we made use of the gross stock of dwellings, for other buildings ("aob", "aob01-03" & "aobpv01-03") we used the gross stock of other buildings than dwellings, vehicles ("avh") are uprated with the financial consumption of the households on transport, valuables ("avl") are uprated with the gross capital formation and "asb" (self-employed business assets) is uprated with the stock of machinery, equipment, weapons systems, and intellectual property products. The financial assets are uprated as follows: "adp" (deposits) with the stock of transferable and other deposits, "amf" (mutual funds) and "ama" (managed accounts) with the stock of investment fund shares, "abd" (bonds) with the stock of debt securities, "apb" (non-self-employment private business) with the stock of unlisted shares and other equity, "ash" (shares) with the stock of listed shares, "app" (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, "aot" (others) with the stock of non-life insurance technical reserves and other accounts receivable/payable and "adb" (debt) with the stock of total liabilities. For all the variables concerning inheritances and gifts ("aihvr", "aihimvr", "aihmrvr" & "agivr") the tax revenues of capital transfers are used for the uprating.

Table A.10.2 Overview of uprating indices used for wealth variables in EUROMOD, Ireland.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, amrpv	204,151.2	229,818 ²	Dwellings, in million euro (1) ⁵
\$f_aob	aob, aob01-03, aobpv01-03	107,966.3	131,545.4 ²	Other buildings, in million euro (1) ⁵
\$f_avh	avh	10,095.8	11,783.2	Financial consumption expenditure of households: transport, in million euro (2)
\$f_avl	avl	35,496.4	71,808.8 ³	Gross capital formation, in million euro (3) ⁶
\$f_asb	asb	119,686.2	150,788.7 ⁴	Machinery, equipment, weapons systems and intellectual property products, in million euro (1) ⁵
\$f_adp	adp	113,775	121,284	Transferable & other deposits, in million euro (4)
\$f_amf	amf, ama	327	2,647	Investment fund shares, in million euro (4)
\$f_abd	abd	178	373	Debt securities, in million euro (4)
\$f_apb	apb	35,493	31,866	Unlisted shares and other equity, in million euro (4)
\$f_ash	ash	9,388	13,335	Listed shares, in million euro (4)
\$f_app	app	49,591	40,127	Life insurance, annuity entitlements and pension entitlements, in million euro (4)
\$f_aot	aot	14,839	14,846	Non-life insurance technical reserves and other accounts receivable / payable, in million euro (4)
\$f_adb	adb	181,056	151,862	Total financial liabilities, in million euro (4)
\$f_aih	aihvr, aihimvr, aihmrvr	282	411	Tax revenues on capital transfers, in million euro (5) ⁶
\$f_agi	agivr	282	411	Tax revenues on capital transfers, in million euro (5) ⁶

Note: All stock variables refer to situation at the end of the year. ¹ The values for 2017 are about 2016, unless otherwise indicated. ² Figures refer to 2015. ³ Figures refer to 2017. ⁴ Figures refer to 2014. All values are at household level (S14) unless otherwise indicated. ⁵ Figures are about households and non-profit institutions serving households (S14_S15). ⁶ Figures are about the total economy. Source: (1) Annual Sector Accounts, Balance sheets for non-financial assets (Eurostat, 2017b); (2) Final consumption expenditure of households by consumption purpose (Eurostat, 2017c); (3) GDP and main components (output, expenditure, and income) (Eurostat, 2017d); (4) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a); (5) Main national accounts tax aggregates (Eurostat, 2017e).

A.10.3 Comparison of socio-demographic characteristics

Table A.10.3 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Ireland.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	13.9	22.6	22.59
	16 - 29	19.4	18.3	19.36
	30 - 44	27.0	22.1	23.73
	45 - 64	26.0	24.8	22.70
	65 - 99	13.7	12.2	11.61
Gender	Female	50.5	50.5	50.37
	Male	49.5	49.5	49.63
Education	Not completed primary education	22.0	19.3	24.96
	Primary education	10.0	16.5	12.61
	Lower secondary education	13.5	12.6	14.15
	Upper secondary education	29.1	19.1	22.77
	Post-secondary (non-tertiary) education	.1	5.4	4.12
	Tertiary education	25.4	27.1	21.40
Economic status	Pre-school	.1	7.1	9.20
	Farmer	.1	.1	.1
	Employer or self-employed	7.2	5.3	6.61
	Employee	36.0	30.4	32.14
	Pensioner	12.0	8.7	9.82
	Unemployed	11.5	9.4	9.21
	Student	22.4	23.3	20.82
	Inactive	0.9	0.5	
	Sick or disabled	1.9	3.8	12.09
	Other	7.8	11.5	
	Family worker	0.2	.1	0.13
Marital status	Single (never married)	46.2	51.1	54.21
	Married	45.0	40.4	39.76
	Separated	.1	2.5	.1
	Divorced	4.3	1.5	1.88
	Widowed	4.5	4.4	4.15
Tenure status	Owner paying mortgage	40.6	34.7	.1
	Outright owner	34.0	34.9	.1
	Tenant or subtenant paying rent at prevailing or market rate	24.5	15.3	.1
	Accommodation is rented at a reduced rate (below market price)	.1	13.1	.1
	Accommodation is socially rented	.1	.1	.1
	Accommodation is rented for free	0.9	1.9	.1

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

In table A.10.3 a comparison of the socio-demographic variables in EM-HFCS and EM-SILC is made. Overall, the characteristics of the sample in both databases are highly similar, except for education level and the tenure status. For the tenure status, there is a higher share of individuals that are paying a mortgage and a lower share of individuals that own their property outright in EM-HFCS than in EM-SILC. The educational level shows that there are more individuals in primary education, and less in secondary education in EM-SILC than in EM-HFCS.

A.10.4 Micro-validation of income concepts

Table A.10.4 gives a comparison of the overall income concepts of EM-HFCS and EM-SILC. Original & pension income, disposable income and taxes are considerably higher in EM-HFCS in comparison to EM-SILC. Benefits and social insurance contributions, on the other hand, are considerably lower in EM-HFCS than in EM-SILC.

Table A.10.4 Comparison of overall EUROMOD concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Ireland.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	28,790	35,368	-19,833	1,207,267
	EM-SILC	22,744	23,097	-3,339	1,608,376
Benefits	EM-HFCS	3,098	3,860	-7,821	30,884
	EM-SILC	5,713	4,857	0	26,279
Taxes	EM-HFCS	6,535	15,292	-1,543	605,771
	EM-SILC	4,774	7,789	-533	693,560
Social insurance contributions	EM-HFCS	646	895	0	17,059
	EM-SILC	1,527	2,947	0	232,250
Disposable income	EM-HFCS	24,531	18,418	-17,565	555,336
	EM-SILC	22,156	11,623	-100	683,239

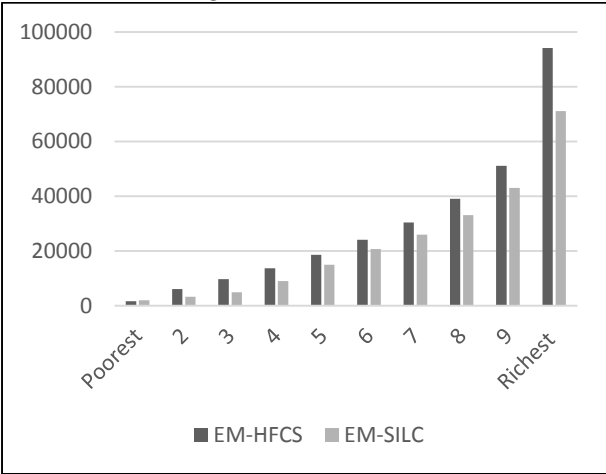
Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

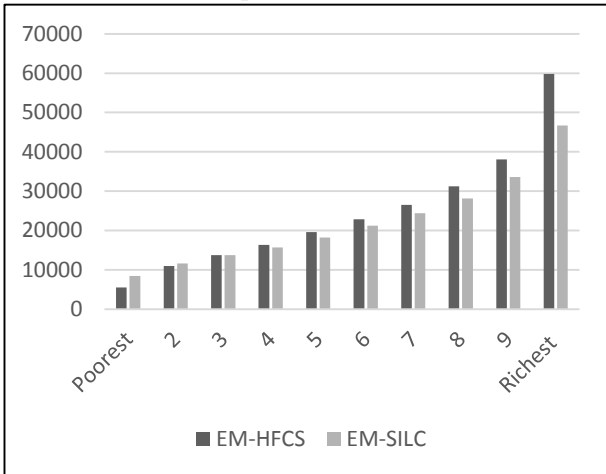
Next, we present the distribution of the income concepts from Table A.10.4 across disposable income deciles. Figure A.10.1 panel a and b present the mean values of original & pension income and disposable income. The mean values of original & pension income are higher in EM-HFCS than in EM-SILC for all deciles, except for the lowest one. Also, for the highest seven deciles of disposable income, EM-HFCS shows to have higher values than EM-SILC. Panel c and e show the distribution of benefits and social insurance contributions, respectively. Also, in these figures, we see that that the mean values from EM-SILC are systematically higher than those from EM-HFCS. The mean values of taxes (panel d), on the other hand, are for most of the deciles higher in EM-HFCS than in EM-SILC.

Figure A.10.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Ireland.

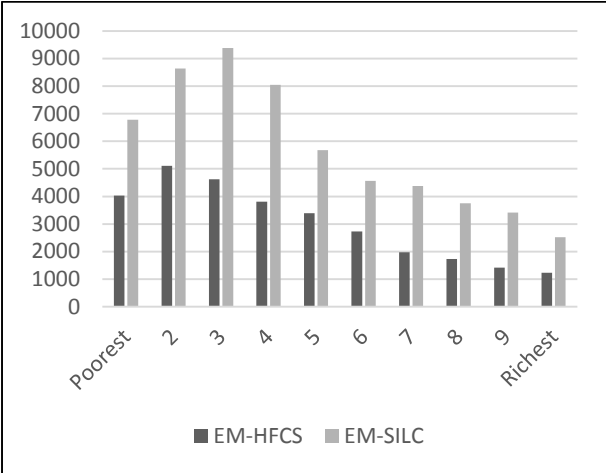
Panel a: Mean original income



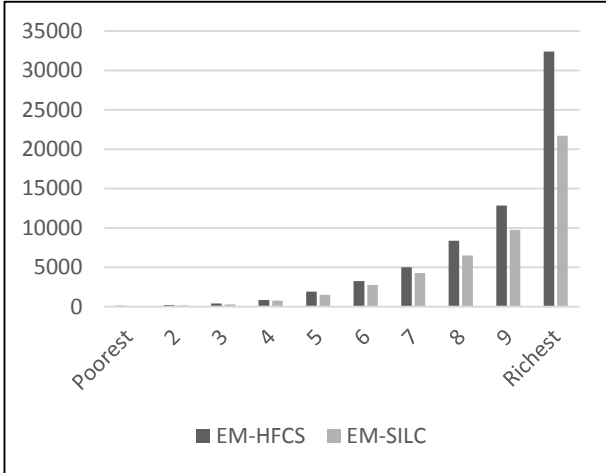
Panel b: Mean disposable income



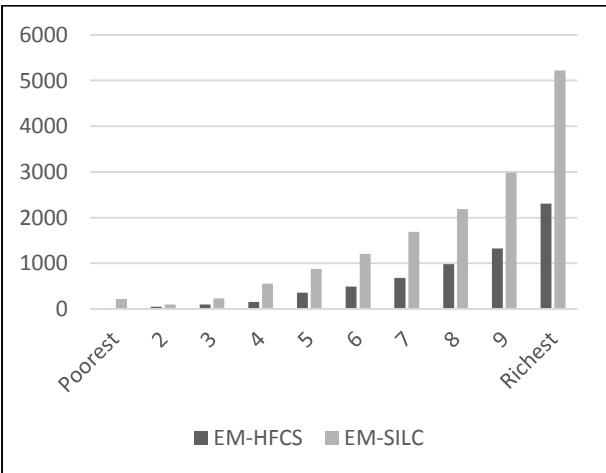
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.10.5 Macro-validation of new EUROMOD policies

Table A.10.5 summarizes the number of eligible cases in the sample and the final number of taxpayers for the simulated real property tax. Subsequently, Table A.10.6 presents a comparison of the simulated tax revenues with external figures.

Table A.10.5 Number of eligible cases for wealth taxes, Ireland.

	Eligible cases	2012		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	3,968	3,938	1,226,062	3,917	1,221,527
Real property transfer tax	79	36	9,153	36	9,153
Inheritance and gift tax	96	13	3,184	17	4,273

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

The real property tax for 2012 is very highly underestimated (only 11.6%; see Table A.10.6). A possible reason for this is that the external figures about the local property tax from the OECD are too high. For the validation of the 2017 policy, we made use of the tax revenue from the local property tax that is available in the Taxes in Europe database. The tax revenue from the recurrent taxes on immovable property from the OECD for 2017 is about 4 times higher. Therefore, the OECD-figures about 2012 could also be too high. External figures about the household charge and the non-principal private residence charge are absent in the Taxes in Europe database.

The low ratios for the real property transfer tax can also be explained by the external figures we used. For this, we used the OECD tax revenues from the taxes on financial and capital transactions, which contains more than only the transaction of real property.

Table A.10.6 Validation of simulated wealth tax revenues (in million euro), Ireland.

	Year	EM-HFCS	External	Ratio
Real property tax	2012	172.6	1,478 (1)	11.7%
	2017	453.9	463 (2)	98.03%
Real property transfer tax	2012	56.6	105 (2)	53.90%
	2017	68.8	301 (2)	22.86%
Inheritance/gift tax	2012	191.40	282 (1)	67.87%
	2017	341.10	411 (1)	82.99%

Source: (1) Tax Revenue Database (OECD, 2017a). (2) Taxes in Europe Database (European Commission, 2018).

A.11 Italy

A.11.1 Description of wealth taxes

A.11.1.1 New EUROMOD policies

Real property transfer tax (“Imposta di Registro, Ipotecaria e Catastale”)

Description:

Three different taxes are levied on all transactions implying a change of owner of real estate property or transactions deemed to be equivalent:

- The Registration Duty (“Imposta di Registro”) is levied upon the legal registration of acts of different nature (concerning a legal transaction or an administrative or legal operation). The main source of revenues is connected to real estate transaction and corporate operations.
- The Mortgage Duty (“Imposta Ipotecaria”) is linked to mortgage institutions, modifications or redemptions, and transcriptions concerning real estate.
- The Cadastral Duty (“Imposta Catastale”) is levied upon acts (civil, commercial, legal, extrajudicial) related to the transfer of real assets.

The rates/amounts depend on whether the transferred real asset is to be used as main residence or not and if the seller is a person or a firm. The following table reports the rates/amounts when the seller is a person in place from 2014.

Table A.11.1 Real property transfer tax rates, Italy.

Type of property	Registration Duty	Mortgage Duty	Cadastral Duty
Main residence	2%	€50	€50
Other residence	9%	€50	€50

The taxes are levied on the cadastral value raised by 5% and multiplied by a coefficient which is different according to the building type: 110 for main residence and 120 for other residences.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and gift tax (“Imposta di successione e donazione”)

Description:

Assets that are received by natural persons through inheritance or gift are subject to the inheritance and gift tax. The tax is levied on the total market value of the whole estate that is inherited from the deceased or received by the donor. The main exception is represented by immovable properties that are evaluated by their cadastral value revaluated by 1.05 and multiplied by a coefficient according to the type of dwelling (i.e. 110 for main residence or 120 for other buildings). Each beneficiary is taxed individually on the net share that he or she inherited or received.

The relationship with the deceased or the donor determines the amount of the allowance, which is calculated over the life of the beneficiary, and the tax rate. The main parameters are summarized in the table below.

Table A.11.2 Inheritance and gift tax rates, Italy.

Beneficiary	Tax rate	Exemption
Lineal heir and spouse	4%	€1,000,000
Sibling	6%	€100,000
Other relatives	6%	n/a
Others (i.e. non-relatives)	8%	n/a

Assumptions: n/a

Aspects of the policy that were not implemented:

- In addition to the inheritance and gift tax there is a stamp duty (“Imposta ipotecaria e catastale”) which can be a flat amount or a percentage of the total value of the asset received (€168 or 1%-2%) depending on the nature of the assets and the relationship between the donor and donee.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Net wealth tax (“Imposta di Bollo su conti correnti e attività finanziarie”)

Description:

From 2012 a specific net wealth tax is in place in the form of a Stamp duty on Italian bank accounts and financial assets. The tax liability is related to the possession of bank accounts or financial assets located in Italy. The tax is due by the owner of the assets. Some important changes occurred since 2012 and they are summarised in the table below. From 2014 the tax rate is set to 0.2% with a minimum tax amount of 34.20 euro and no maximum amount. Bank accounts and bonds issued by Italian Post Office with annual average value lower than 5000 euro are exempted from the tax.

Table A.11.3 Specific net wealth tax brackets and tax rates, Italy.

	2012	2013	From 2014 onwards
Tax rate	0.10%	0.15%	0.20%
Minimum tax amount	€34.20	€34.20	€34.20
Maximum tax amount	€1,200	€1,200	---
Exemption	Bank accounts and bonds issued by Italian Post Office with annual average value lower than €5,000		

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.11.1.2 Refinement of existing EUROMOD policies

Real property tax (“Imposta Municipale Unica/ Tassa sui Servizi Indivisibili”)

Description:

The Municipality Property Tax (IMU – “Imposta Municipale Propria”) is due by: (i) owners of buildings, building areas, arable lands located in Italy; (ii) individuals enjoying some real rights on that buildings areas or lands (holders of usufruct, right of user, right of occupancy, emphyteusis, building lease); (iii) lessees; (iv) licensees of State demesne.

For buildings registered at the cadastre, the tax base is the cadastral value raised by 5% multiplied by a coefficient which is different according to the building type (from 34 to 160). For the building areas, the tax base is the current selling value. For arable lands, the tax base is the estate income, raised by

25% and multiplied by 75. Each municipality fixes its own tax rates, which can be found on the web site of the Ministry of Finance: <http://www.finanze.it/dipartimentopolitichefiscali/ici/delibere>
 In 2014 the new tax "TASI" has been applied to the cadastral income of main residences ("amriv") raised by 5% and multiplied by a coefficient equal to 160. Tax rates are different according to the type of building and municipalities can modify them: in the simulation an average tax rate of 0.17% has been applied, without considering any tax credit (due to lack of data).

IMU is simulated on the cadastral value of other buildings ("tprob_s") raised by 5% and multiplied by a coefficient equal to 160 with an average tax rate equal to 1.06%.

Assumptions:

- The cadastral value ("amriv" and "aobiv") has been derived applying a coefficient to the market values of the properties in order to get the total aggregate value of cadastral income corresponding to what found in administrative data. However, it is well known that in reality there is no perfect match between market value and cadastral value (often outdated).
- Due to lack of information about the municipality (and even region) of residence, an average national tax rate has been applied.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Starting from 2016 IMU and TASI are no more due for the main residence, with the exception of luxury flats, villas, castles and palaces of historic or artistic importance.

A.11.2 Uprating of monetary variables

To be able to run the 2017 policy system on 2014 input data in EUROMOD uprating indices need to be applied ("Uprate_it"). We used the same uprating indices as those used for the EM-SILC data, with the default factor (i.e. HICP) applying to variables included in HFCS and not in the EM-SILC data (due to lack of reliable external aggregates to be used to derive uprating factors for asset variables).

Table A.11.4 Overview of uprating indices used for wealth variables in EUROMOD, Italy.

Uprate index	Variables uprated by the index	Value 2014	Value 2017	Source
\$f_aobiv	Amriv, aobiv	0.4954	0.5021	Department of Finances, cadastral value other residences
\$f_yiy	Yiy*	0.0135	0.007	Average interest rate of state bonds
\$f_HICP	A* (with the exclusion of amriv and aobiv)	99.9	101.3	Eurostat; AMECO

A.11.3 Comparison of socio-demographic characteristics

Table A.11.5 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Italy.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	14.13	14.73	14.95
	16 - 29	14.34	14.25	14.53
	30 - 44	19.99	20.89	22.11
	45 - 64	29.43	28.40	27.57
	65 - 99	22.11	21.74	20.81
Gender	Female	51.40	51.43	51.63
	Male	48.60	48.57	48.37
Education	Not completed primary education	8.94	12.30	14.22
	Primary education	19.77	16.65	18.80
	Lower secondary education	28.35	26.58	26.13
	Upper secondary education	32.02	30.98	27.96
	Post-secondary (non-tertiary) education	-.1	-.1	2.34
	Tertiary education	10.92	13.48	10.55
Economic status	Pre-school Farmer	4.17	5.14	5.56
	Farmer	-.1	-.1	-.1
	Employer or self-employed	6.87	8.89	7.88
	Employee	29.58	28.21	29.91
	Pensioner	18.02	17.56	21.33
	Unemployed	9.2	7.49	4.99
	Student	16.77	15.78	14.73
	Inactive	3.92	1.51	14.65
	Sick or disabled	1.68	1.52	-.1
	Other	9.76	13.88	-.1
	Family worker	-.1	-.1	0.94
Marital status	Single (never married)	39.90	40.20	41.21
	Married	47.26	46.78	48.70
	Separated	-.1	2.30	-.1
	Divorced	4.62	2.22	2.29
	Widowed	8.21	8.48	7.79
Tenure status	Owner paying mortgage	11.77	17.33	-.1
	Outright owner	58.06	55.65	-.1
	Tenant or subtenant paying rent at prevailing or market rate	20.44	19.03	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	-.1	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	9.73	7.97	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.11.5 provides a comparison of some socio-demographic characteristics of the EM-HFCS and EM-SILC sample. In general, the composition of the sample is similar between EM-HFCS and EM-SILC. Yet, there are some differences that have to be mentioned. Firstly, EM-SILC has a higher proportion of individuals that have not yet completed primary education and in tertiary education, while EM-HFCS includes more individuals belonging to the primary education category. Secondly, the number of individuals paying mortgage is considerably higher in EM-SILC.

A.11.4 Micro-validation of income concepts

Table A.11.6 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Italy.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	20,136	19,068	-15,662	389,594
	EM-SILC	22,021	19,450	-2,712	1,166,784
Benefits	EM-HFCS	459	887	0	16,000
	EM-SILC	1,227	3922	0	145,483
Taxes	EM-HFCS	3,533	5,339	-711	110,981
	EM-SILC	3,905	6868	-709	510,657
Social insurance contributions	EM-HFCS	1,578	2,424	0	62,847
	EM-SILC	1,780	2,101	0	43,462
Disposable income	EM-HFCS	15,483	11,894	-21,901	231,048
	EM-SILC	17,562	11,902	-2,787	649,380

Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

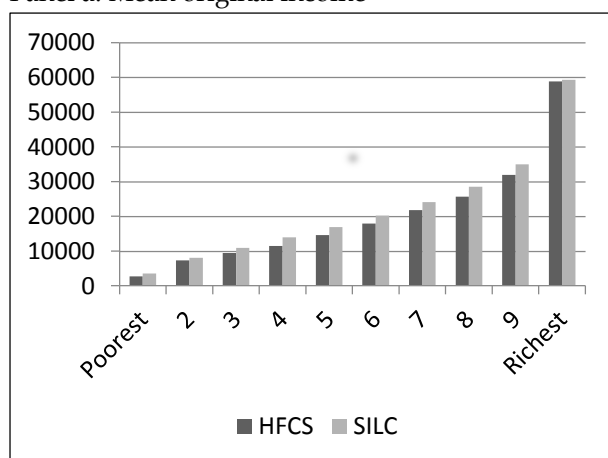
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.11.6 shows that disposable income is higher in EM-SILC and this is the consequence of higher original & pension income and benefits. Taxes and social insurance contributions are higher in EM-SILC, but to a much lesser extent.

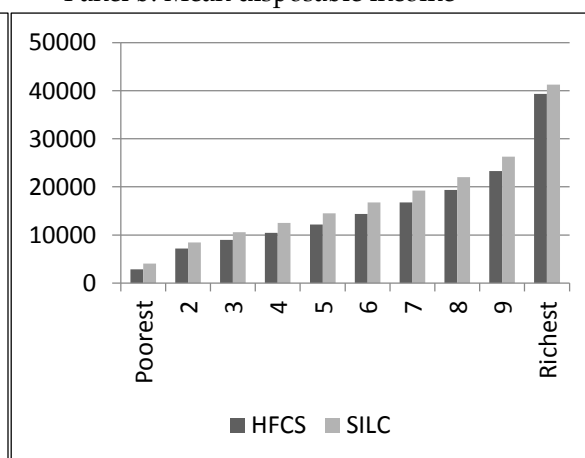
Next, Figures A.11.1 panel a and panel b present mean values of original and disposable income by disposable income deciles. The mean values are slightly higher in EM-SILC than in EM-HFCS. Figure A.11.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions by disposable income deciles. The distribution of benefits is affected by outliers in the top distribution based on SILC data and generally the comparison between the two sources of data is more difficult.

Figure A.11.1 Distribution of income concepts across disposable income deciles (in e per year), EM-HFCS vs. EM-SILC, income reference year, Italy.

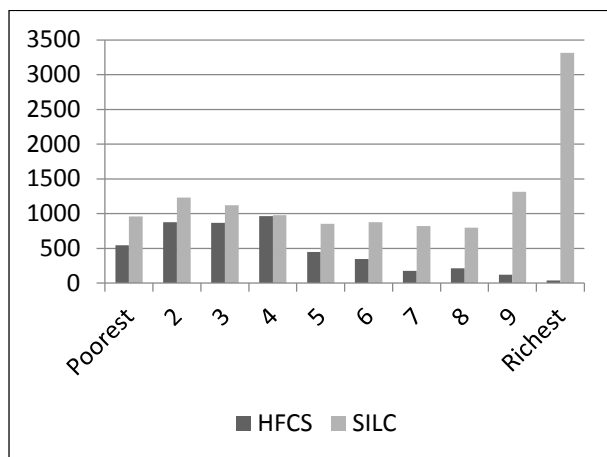
Panel a: Mean original income



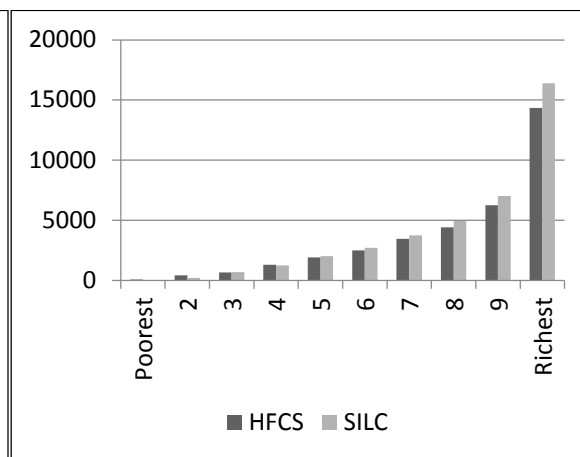
Panel b: Mean disposable income



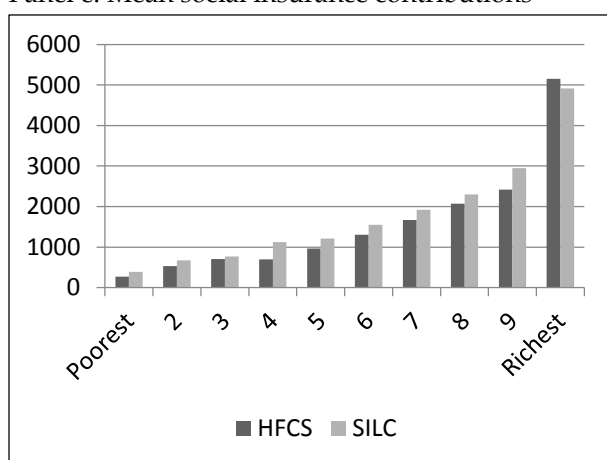
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.11.5 Macro-validation of new EUROMOD policies

Table A.11.7 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.11.8 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.11.7 Number of eligible cases for wealth taxes, Italy.

	Eligible cases	2014		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	6,070	6,070	17,577,593	1,880	5,693,335
Real property transfer tax	77	77	300,929	77	300,929
Inheritance & gift tax	204	30	86,236	30	86,236
Net wealth tax	8,156	8,156	24,694,121	8,156	24,694,121

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.11.8 Validation of simulated wealth tax revenues (in million euro), Italy.

	Year	EM-HFCS	External	Ratio
Real property tax	2014	19,113	17,900	106.77%
	2017	15,675	14,400	108.85%
Real property transfer tax	2014	504	n.a.	n.a.
	2017	507	n.a.	n.a.
Inheritance & gift tax	2014	398	622	63.98%
	2017	404	557	72.53%
Net wealth tax	2014	1,402	2,743	51.11%
	2017	1,412	2,743	51.47%

Source: own calculations based on EM-HFCS. External data from Ministry of Economy and Finance, various sources

Table A.11.8 shows a comparison between the simulated wealth taxes and the tax revenues provided by external figures from the Ministry of Economy and Finance. Across time the main difference is represented by the revenue of the Real property tax because in 2017 it is not due on main residences anymore. This is well captured in the simulated policy system and the small discrepancy with respect to the external remains constant. There is no way to validate the simulated revenue of Real property transfer tax because this source of revenue is not collected separately for individual/families and firms and the revenue is registered together with other different stamp duties without any chance to disaggregate it.

The relatively large discrepancies observed for Inheritance & gift tax is mainly explained by missing the data on top rich in the wealth distribution and to a lesser extent because the HFCS does not observe inheritances and gifts made between members of the same household (most of these transfers would be anyway exempt from taxation if below the legal threshold). The discrepancy observed for the net wealth tax is mainly explained by the lack of external data related to individual/families and the underreporting of capital income and stock in the survey.

A.12 Luxembourg

A.12.1 Description of wealth taxes

A.12.1.1 New EUROMOD policies

Real property tax (“Impôt foncier”)

Description:

Property taxes are imposed on all real estate located in Luxembourg and must be paid for by the owner of the real estate. The so-called unitary value (i.e. cadastral value) is used as tax base. The property tax comprises two separate tax rates, i.e. a base rate and a municipal rate. These two rates are multiplied by each other and are then levied on the unitary value of the real estate. There are no exemptions from this tax (Ernst & Young, 2014; Le Gouvernement Du Grand-Duché De Luxembourg, 2017). The tax is structured as follows:

Table A.12.1 Basic real property tax rates, Luxembourg.

	Rate
<i>Building land for housing purposes</i>	
During the first two years	1.5%
As of the third year	10%
<i>Agriculture and forestry undertakings</i>	
For the first €2,500 of the unitary value or part thereof	0.8%
For the rest of the unitary value exceeding the first €2,500	1%
<i>Luxembourg City basic rate</i>	
Single-family houses with a unitary value below €3,800	0.8%
All other buildings	0.9%
<i>Other municipalities</i>	
Single-family houses with a unitary value below €2,500	0.9%
All other buildings	1.0%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

Table A.12.2 Luxembourg City municipal rates, Luxembourg.

	Rate
Agriculture and forestry property	350% ⁹
Commercial buildings	750%
Mixed-use buildings	500%
Buildings to other uses	250%
Single-family houses & block of flats	250%
Undeveloped land other than building land for residential purposes	500%
Land for residential purposes	500%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014). For municipal rates Luxembourg 2013 see http://www.impotsdirects.public.lu/content/dam/acd/fr/legislation/legi13/M_morial_B_-_N_123_du_11_d_cembre_2013.pdf. For municipal rates Luxembourg 2017 see <http://www.impotsdirects.public.lu/content/dam/acd/fr/legislation/legi17/b3623-2017.pdf> and <https://www.vdl.lu/vivre/demarches-administratives/payer-ses-factures-et-impots>.

⁹ Instead of using the tax rate for Luxembourg City we calculated the median tax rate based on the rates set in the different municipalities (see <http://legilux.public.lu/eli/etat/adm/agd/2017/12/01/b3623/jo#> for an overview).

The final property tax rates are thus the following:

Table A.12.3 Final real property tax rates, Luxembourg.

	Rate
<i>Building land for housing purposes</i>	
During the first two years	5.25%
As of the third year	35%
<i>Agriculture and forestry undertakings</i>	
For the first €2,500 of the unitary value or part thereof	4%
For the rest of the unitary value exceeding the first €2,500	5%
<i>Luxembourg City municipal rate</i>	
Single-family houses with a unitary value below €3,800 ¹	2%
All other buildings (rest category – non-commercial use)	2.25%
All other buildings (rest category – commercial-use)	6.75%
<i>Other municipalities</i>	
Single-family houses with a unitary value below €2,500	n/a
All other buildings	n/a

Note: ¹ Single-family house: a house that is inhabited by only one family. It can either be a detached or semi-detached house or apartment.

Source: Own calculations.

Assumptions:

- We have no information on the region where the immovable property is located. Therefore, we use the municipal rates of Luxembourg City (apart from the rate for agriculture and forestry undertakings) since the number of inhabitants in this municipality is equal to about one fifth of the population in Luxembourg. Consequently, we assume that the legislation of Luxembourg City is a good proxy for the whole of Luxembourg.
- For the taxation of single houses we use the base rate for Luxembourg City, since we also use the municipal rates from Luxembourg City.
- EY (2014) assumes that the cadastral value of a property in Luxembourg can be approximated by 5% of its market value. Yet, this assumption resulted in too high cadastral values, i.e. €3,000 on a monthly basis whilst €3,800 is used a thresholds on a yearly basis. Thus, based on these policy parameters we assume the cadastral value to be 0.5% of a property's market value. This assumption results in a more reliable approximation of the cadastral values.
- We have no information on how long households have a building land in their possession. Due to the high tax rate starting from the third year, we assume that all households start building on their land before the third year to avoid paying these high taxes.
- We assume that building land will be used for housing purposes.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Since we were not able to find relevant and recent information online concerning the base rates, taking into account that the municipal rates did not change between 2013 and 2017, we assume that the base rates did not change either such that the tax legislation remains unchanged.

Real property transfer tax (“Droits de transcription sur les mutations à titre onéreux d’immeubles”)

Description:

In Luxembourg a transfer tax has to be paid on the acquisition of new immovable property. A base rate of 6% is levied on the sales price of the property in combination with an additional transcription fee of 1%. Furthermore, the transfer of shares within companies, except for the transfer of unit in partnerships owning real estate in Luxembourg and the acquisition of immovable property by public institutions or municipalities are exempt from the real estate transfer tax in total. Finally, a so-called municipal surtax is levied by the municipality Luxembourg City on real estate located in Luxembourg City. The tax equals 50% of the real estate transfer tax amount.

In order to lower the costs of buying a property, the government has introduced a tax credit (the so-called “Bëllegen Akt”) that can be deducted from the total property transfer tax. This tax credit equals 20,000 euro per person and is doubled in case of a couple. However, in all cases the Registration and Domains Administration receives a minimum €100 registration fee. Furthermore, the tax credit is only granted in case an individual buys a property that is destined to be his or hers main residence for at least 2 years. If the individual buys a building plot that is destined to be used for the construction of the main residence, the individual must occupy the residence within a period of four years (Ernst & Young, 2014; Le Gouvernement Du Grand-Duché De Luxembourg, 2015; see <https://abc-immmo.lu/les-frais-lies-a-lacquisition-dun-bien-immobilier/>).

Assumptions:

- We assume that the conditions are fulfilled in order to receive the tax credit.

Aspects of the policy that were not implemented:

- Transfers of shares within companies.
- The acquisition of immovable property by public institutions or municipalities.
- The municipal surtax.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance tax (“Droits de succession”)

Description:

Assets that are received by natural persons through inheritance are subject to the inheritance tax. The tax base differs according to residence. In case the individual (heir or legatee) is an inhabitant (i.e. resident) of Luxembourg, the inheritance tax is levied on the total market value of the whole estate that is inherited from the deceased. However, real estate or movable goods that are located outside Luxembourg (and are owned by the deceased who is domiciled in Luxembourg) and that are inherited by the individual are taxed in accordance with the reference to citizenship of the deceased. In the other case that the individual (heir or legatee) is a non-resident, the inheritance tax is levied on the total market value of the real net estate located in Luxembourg at the time of decease. Each beneficiary is taxed individually on the net share that he or she inherited. The tax structure of the inheritance tax is summarized in the Table below (Ernst & Young, 2014; European Commission, 2018; Ernst & Young, 2013b; Ernst & Young, 2013c).

Table A.12.4 Inheritance tax rates, Luxembourg.

Degree of relationship	Tax rate for the statutory share	Tax rate exceeding the statutory share
Lineal heirs (i.e. (grand-)children and (grand-)parents)	0%	2.5% - 5%
Between registered partners or spouses having common children or descendants for more than 3 years	0%	0%
Between registered partners or spouses having no common children or descendants for more than 3 years	5%	5%
Between siblings (i.e. brothers and sisters)	6%	15%
Between uncles, aunts, nephews or nieces	9%	15%
Between adopted children and the adopting parents in the case of a simple adoption (no tax favorable treatment)	9%	15%
Between great-uncles, great-aunts, great-nephews or great-nieces	10%	15%
Between the descendants of the adopted children and the adopting parents in case of a simple adoption (no tax favorable treatment)	10%	15%
Between unrelated parties	15%	15%

Source: International estate and inheritance tax guide 2013 (Ernst & Young, 2013b).

If the net taxable amount that the heir received exceeds €10,000, the rates summarized above are increased with an additional charge varying from 1/10 to 22/10.

Table A.12.5 Grossing-up factors used for inheritance tax rates, Luxembourg.

From...€	Up to...€	Increase in tax rate
€10,000	€20,000	1/10
€20,000	€30,000	2/10
€30,000	€40,000	3/10
€40,000	€50,000	4/10
€50,000	€75,000	5/10
€75,000	€100,000	6/10
€100,000	€150,000	7/10
€150,000	€200,000	8/10
€200,000	€250,000	9/10
€250,000	€380,000	12/10
€380,000	€500,000	13/10
€500,000	€620,000	14/10
€620,000	€750,000	15/10
€750,000	€870,000	16/10
€870,000	€1,000,000	17/10
€1,000,000	€1,250,000	18/10
€1,250,000	€1,500,000	19/10
€1,500,000	€1,750,000	20/10
€1,750,000	...	22/10

Source: International estate and inheritance tax guide (Ernst & Young, 2013b).

A few exemptions are foreseen in the legislation of the inheritance tax:

- The statutory share of any direct heir is exempt from taxation. However, the share exceeding the statutory share is taxed nevertheless.
- Inheritance between registered partners or spouses that have at least one common child for more than 3 years is exempt from taxation.
- Inheritance by the registered partner or surviving spouse since more than three years in the form of a usufruct or annuity, in cases where the descendant's children of a previous marriage

inherited the property subject to such right of usufruct or have responsibility for the annuity is exempt from taxation.

- The inheritance is set free of taxes as long as it does not exceed the maximum net amount of €1,250.
- Inheritances received by charities are exempt from taxation.

Assumptions:

- We assume that all individuals who receive an inheritance receive their statutory share. We do not simulate the tax that is applied on the amount that exceeds this statutory share.
- HFCS combines siblings, uncles, aunts, nephews, nieces, great-uncles, great-aunts, great-nephews and great-nieces in the category "other relatives". We assume that an inheritance from uncles and aunts is most likely due to their age and therefore apply the tax rate of 9% for the whole group.
- HFCS covers both real property and/or movable goods that are located inside and outside Luxembourg. However, since we do not know the location of these assets we tax all the reported assets as if they are located in Luxembourg.

Aspects of the policy that were not included:

- The inheritance tax for non-residents (no information).
- Inheritances between spouses, legal cohabitants or adopting parents and children (no information).
- Taxation of shares exceeding statutory shares.
- We do not include the second and third exemption since we are not able to simulate inheritances between partners and spouses.
- We do not include the fifth exemption since we cannot identify charities.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Gift tax ("Droits d'enregistrement sur les donations")

Description:

Assets that are received through *inter vivos* gifts are subject to taxation in Luxembourg. These gifts can be taxed in two ways, i.e. taxation based on a fixed amount or a percentage that depends on the relationship between the donee and the donor. In case the donee receives immovable property the following rules apply:

- Immovable property that is located outside Luxembourg is taxed with a fixed amount of €12, even if the notarial deed is registered in Luxembourg itself.
- Immovable property that is located in Luxembourg is taxed at a percentage on the total value, even if the notarial deed is not registered in Luxembourg itself.
- An additional tax rate can be levied in case the immovable property is located within the municipality of Luxembourg City.

In case of movable property the following rules are in place:

- Gifts of movable property, of which the notarial deed occurs in Luxembourg, is taxed at a percentage no matter where the movable property is located.
- Gifts of movable property are exempt from taxation if the notarial deed occurs outside Luxembourg and the movable property is located abroad.

Note that gifts of movable property are only taxed if they are made in writing. This means they often do not need to be declared and therefore are not taxed. In case a gift is made under the terms of a marriage contract or if a gift is made in view of marriage the gift tax is reduced with 50%.

In principle, gifts of immovable property are subject to an additional *transcription fee* of 1% levied on the market value of the building (Ernst & Young, 2013b; Ernst & Young, 2014; Le Gouvernement Du Grande-Duché de Luxembourg, 2014).

The structure of the gift tax is summarized in the Table below:

Table A.12.6 Gift tax rates, Luxembourg.

Degree of relationship	Tax rate
Lineal heirs, without a report waiver/reintegration exemption (<i>sans dispense de rapport</i>)	1.80%
Lineal heirs, with report waiver/reintegration exemption (<i>avec dispense de rapport</i>)	2.40%
Ancestor's partitions	
Attribution of shares without exceeding the statutory shares	1.80%
Attribution of shares exceeding the statutory shares but within the boundaries of the disposable portion	2.40%
Attribution of shares exceeding the statutory shares and the disposable portion	3%
Between partners or spouses that have been registered for at least 3 years and do not have any marriage contract	4.80%
Between spouses that have a marriage contract or a gift in contemplation of marriage	2.40%
Between siblings (i.e. brothers and sisters)	6%
Between siblings through a marriage contract or a gift in contemplation of marriage	3%
In favor of non-registered charities, municipalities and hospices	4.80%
In favor of non-profit making organizations	4.80%
Between uncles, aunts, nephews or nieces	8.40%
Between the adopted children and adopting parents	8.40%
Between the father-in-law or the mother-in-law and the son-in-law or daughter-in-law	8.40%
Between the individuals that are listed above if the gifts are made through a marriage contract or are given in contemplation of marriage	4.80%
Between great-uncles or great-aunts and great-nephews and great-nieces	9.60%
Between the adopted children's descendants and the adopting parents	9.60%
Between the individuals listed above if the donations are made through a marriage contract or are given in contemplation of marriage	4.80%
Between all relatives having a lower kinship than those mentioned above	14.40%

Source: International estate and inheritance tax guide 2013 (Ernst & Young, 2013b).

Assumptions:

- We assume that all gifts are assets located in Luxembourg.
- Since there is no information on the rate for "others" (i.e. not relatives) we apply the tax rate of 14.40% as this is in line with the tax rate for inheritances received by "others".
- HFCS combines siblings, uncles, aunts, nephews, nieces, great-uncles, great-aunts, great-nephews and great-nieces in the category "other relatives". We assume that a gift from uncles and aunts is most likely due to their age and therefore we apply the tax rate of 8.40% for the whole group.
- We assume it is most common that legatees decide themselves which parts of the gift(s) are allocated to the different recipients (i.e. no reintegration exemption).

Aspects of the policy that were not implemented:

- HFCS covers gifts of (im)movable property that are located inside and outside Luxembourg. However, since we do not know the location of these assets we tax all the reported assets as if they are located in Luxembourg.
- The additional tax on assets that are located within the municipality of Luxembourg City (no information).
- The 50% tax reduction in case of a marriage contract.
- Gift tax for direct heirs, with reintegration exemption.
- Gift tax for attribution of shares exceeding the statutory shares but within disposable portion.
- Gift tax for attribution of shares exceeding the statutory shares and disposable portion.
- Gift tax between spouses or partners, with or without a marriage contract.
- Gift tax between siblings through a marriage contract.
- Gift tax in favor of municipalities, hospices and non-registered charities.
- Gift tax in favor of non-profit making organizations.
- Gift tax between the adopting parents and the adopted children.
- Gift tax between father-in-law or the mother-in-law and the son-in-law or the daughter-in-law.
- Gift tax between individuals listed above if the donations are made through a marriage contract or are given in contemplation of marriage.
- Gift tax between the adopting parents and the adopted children's descendants.
- Between all relatives that have a lower kinship than those mentioned above.
- Between father-in-law or mother-in-law and the son-in-law or the daughter-in-law in the case where the deceased spouse has not left any common children or descendants of them.
- Gift tax of movable property because we assume that most people will not declare these gifts as it is not compulsory.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.12.1.2 Refinement of existing EUROMOD policies

Withholding tax on interests from savings

Description:

In 2006 Luxembourg introduced a 10% withholding tax on income from certain savings interests paid out to residents of Luxembourg who are not tax residents in another state. The tax is applied on interest received on bank accounts, income from government securities and income from bonds. The following income sources are exempt from the withholding tax:

- Current income.
- Income which is derived from the sale of shares.
- Interest income and related advantages credited on banking current accounts if the interest rate is lower than 0.75%.
- Interest payments which are paid once a year and are not exceeding €250 per person.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Withholding tax increased to 20% (Liégeois et al., 2018).

Withholding tax on dividend income

Description:

Luxembourg levies a withholding tax on dividend income at 15%. Half of the dividend income is taxed under the general personal income tax, where the already paid withholding tax is subtracted from the final tax burden. Based on the information of the HFCS data this tax can be added to EUROMOD.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Tax relief for mortgage repayment

Description:

Loan financing costs can be deducted from income in case taxpayers take out a mortgage for the acquisition or construction of their main residence (additional properties are thus not eligible). If the main residence is not occupied, the loan financing costs can be fully deducted without an upper ceiling. However, from the moment that the main residence is occupied the deductible amount is limited to a certain threshold multiplied by the total number of family members. Up until 2016 the maximum amounts were the following: €1,500 annually per family member for the first 6 years of occupation; €1,125 annually per family member for the following 5 years of occupation and €750 annually per family member for the years thereafter. The tax relief is only granted to residents of Luxembourg. This tax deduction is already included in EUROMOD, but since there is no information in EM-SILC about the year of occupation, currently the relief that corresponds 6-10 years of occupation is implemented. With HFCS we can approximate the year of occupancy with the year in which the main residence was bought so that all three amounts can be taken into account.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Change in yearly thresholds (Le Gouvernement Du Grand-Duché De Luxembourg, 2018).

Asset-test for social benefits

Description:

In the guaranteed minimum income both an income and wealth test are included (“bsacm_lu”). The income test takes into account the entire gross revenue of a household, possessions and replacement or supplementary social security benefits. Resources of wealth refer to: deposits on savings accounts, securities, loans, valuables and land (whether built upon or not). These assets are determined by conversion into a life annuity of the global value of the wealth through multipliers that have to be defined by the State. The value of real property situated in Luxembourg is defined according to the unit values fixed by the tax administration. Also, the resources of the individuals living with him or her are taken into account. With information from HFCS we can include wealth in the asset-test.

A.12.2 Uprating of monetary variables

An overview of how the amounts are uprated is presented in Table A.12.7. First, the main asset variables are uprated based on their aggregates as reported in the Annual National Accounts (OECD, 2017b). The variables “amr”, “aob”, “amrpv”, “aobpv01-03” are uprated based on the gross stock of buildings and structures. Vehicles (“avh”) and valuables (“avl”) are both uprated with the gross stock

of personal transport equipment due to insufficient information. Self-employment business assets are uprated based on the gross stock of machinery & equipment and intellectual property rights. Second, financial assets are uprated based on their size as reported in the balance sheet for financial assets (Eurostat, 2017a). Deposits (“adp”) are uprated with the total stock of transferable and other deposits, mutual funds (“amf”) and managed accounts (“ama”) with the stock of investment fund shares, shares (“ash”) with the stock of listed shares, private pension (“app”) with the stock of life insurance and pension entitlements, other assets (“aot”) with the stock of non-life insurance technical reserves and other accounts, debt (“adb”) with the total stock of liabilities and personal business other than self-employment (“apb”) with the total stock of unlisted shares. Thirdly, due to missing information, we uprated the inheritance and gift variables (“aihvr”, “agiimvr”) with the tax revenue of the inheritance tax as reported in the OECD tax revenue database (OECD, 2017a). Finally, the variables financial assets (“ape”) and real assets (“ara”) are uprated based on their components.

Table A.12.1 Overview of uprating indices used for wealth variables in EUROMOD, Luxembourg.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	123,377.25	135,055.48 ²	Gross stock of buildings and structures, in million euro (2) ³
\$f_avh	avh	17,706.34	21,953.78 ²	Stock of personal transport equipment, in million euro (2) ³
\$f_avl	avl	17,706.34	21,953.78	Stock of other durables, in million euro (2) ^{3,4}
\$f_asb	asb	33,460.04	38,313.82 ²	Stock of machinery & equipment and intellectual property products, in million euro (2) ³
\$f_adp	adp	29,298.12	33,907.90	Stock of transferable & other deposits, in million euro (1)
\$f_amf	amf, ama	5,946.50	9,774.09	Stock of investment fund shares, in million euro (1)
\$f_abd	abd	5,026.8	4,257.39	Stock of debt securities, in million euro (1)
\$f_apb	apb	15,610.53	18,510.87	Stock of unlisted shares and other equity, in million euro (1)
\$f_ash	ash	3,365.59	4,014.53	Stock of listed shares (domestic & other), in million euro (1)
\$f_app	app	8,132.10	11,397.30	Stock of life insurance and pension entitlements, in million euro (1)
\$f_aot	aot	987.30	1,006.54	Stock of non-life insurance technical reserves and other accounts, in million euro (1)
\$f_adb	adb	27,162.17	34,082.65	Stock of total liabilities, in million euro (1)
\$f_aih	aihvr	72.0	86.0 ²	Tax revenue, in million euro (3) ⁵
\$f_agi	agiimvr	72.0	86.0 ²	Tax revenue, in million euro (3) ^{5,6}

Note: All stock variables refer to the situation at the end of the year. ¹ Figures refer to 2016 unless otherwise indicated; ² Figures refer to 2015; ³ Due to insufficient information on household level we use figures for the whole economy (s1); ⁴ Due to missing information, we use the total stock of personal transport equipment as proxy for the uprate of the stock of other durables; ⁵ We use tax revenues due to insufficient information; ⁶ We use the same tax revenue as we did for the inheritance tax due to missing information.

Source: (1) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a); (2) Annual National Accounts, Fixed assets by activity and by asset, ISIC rev4 (OECD, 2017b); (3) Tax Revenue Database (OECD, 2017a).

A.12.3 Comparison of socio-demographic characteristics

Table A.12.2 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Luxembourg.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	17.41	18.57	18.50
	16 – 29	17.56	18.03	17.74
	30 – 44	23.18	23.01	23.48
	45 – 64	28.0	26.95	26.27
	65 – 99	13.85	13.44	13.99
Gender	Female	50.28	50.13	50.24
	Male	49.72	49.87	49.76
Education	Not completed primary education	13.10	15.11	29.15
	Primary education	20.31	24.23	16.90
	Lower secondary education	11.85	13.39	11.10
	Upper secondary education	32.24	27.52	25.26
	Post-secondary (non-tertiary) education	-1	1.51	1.70
	Tertiary education	22.50	18.24	15.88
Economic status	Pre-school	6.20	7.46	7.88
	Farmer	-1	-1	-1
	Employer or self-employed	3.38	3.01	3.31
	Employee	41.20	41.36	35.82
	Pensioner	16.00	13.89	12.46
	Unemployed	3.01	3.66	2.97
	Student	20.30	18.34	17.47
	Inactive	1.30	0.11	
	Sick or disabled	1.49	1.98	19.11
	Other	7.06	10.21	
	Family worker	0.05	-1	0.36
Marital status	Single (never married)	47.23	44.92	44.40
	Married	40.99	42.25	43.52
	Separated	-1	1.10	-1
	Divorced	7.0	6.86	6.57
	Widowed	4.78	4.85	5.51
Tenure status	Owner paying mortgage	35.94	42.17	-1
	Outright owner	34.49	28.30	-1
	Tenant or subtenant paying rent at prevailing or market rate	25.27	24.90	-1
	Accommodation is rented at a reduced rate (below market price)	-1	2.89	-1
	Accommodation is socially rented	-1	-1	-1
	Accommodation is rented for free	4.30	1.75	-1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Table A.12.8 provides a comparison of some socio-demographic characteristics between the EM-HFCS and EM-SILC sample. In general, the composition of the sample is similar between EM-HFCS and EM-SILC. Yet, there are some differences that have to be mentioned. Firstly, EM-SILC has a higher proportion of individuals that have not yet completed primary education or achieved primary education, while EM-HFCS includes more individuals belonging to the upper-secondary and tertiary education categories. Secondly, the share of single individuals is higher in EM-HFCS. EM-SILC has a higher proportion of individuals that are either married or separated.

A.12.4 Micro-validation of income concepts

Table A.12.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Luxembourg.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	48,971	49,616	-4,941	1,109,000
	EM-SILC	44,526	36,776	-9,400	586,531
Benefits	EM-HFCS	4,534	6,134	0	100,000
	EM-SILC	5,409	7,287	-261	74,192
Taxes	EM-HFCS	8,900	16,449	-808	314,616
	EM-SILC	7,348	12,454	-1,038	241,414
Social insurance contributions	EM-HFCS	4,805	4,345	0	45,466
	EM-SILC	4,714	3,793	0	44,019
Disposable income	EM-HFCS	39,801	29,558	-3,852	867,925
	EM-SILC	37,874	19,644	1,842	342,952

Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

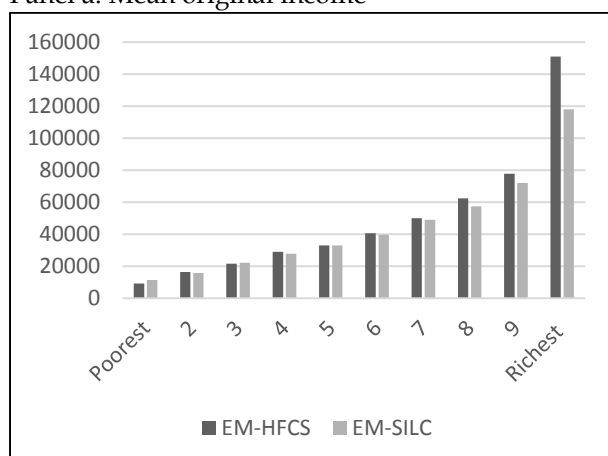
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.12.9 shows that original & pension income is higher in EM-HFCS. The difference is equal to about €4,445 and decreases to approximately €1,930 in disposable income. Mean benefits are higher for EM-SILC, while taxes and social insurance contributions are higher for EM-HFCS.

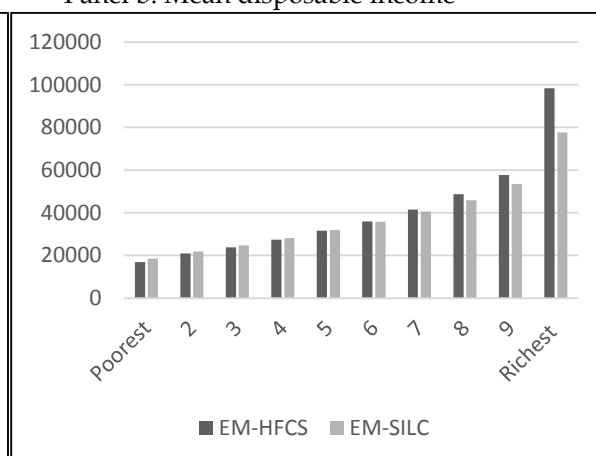
Next, Figure A.12.1 panel a and b present mean values of original and disposable income by disposable income deciles. The mean values are similar between EM-HFCS and EM-SILC, apart from the tenth decile where mean incomes are higher for EM-HFCS. Figure A.12.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions by disposable income deciles.

Figure A.12.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Luxembourg.

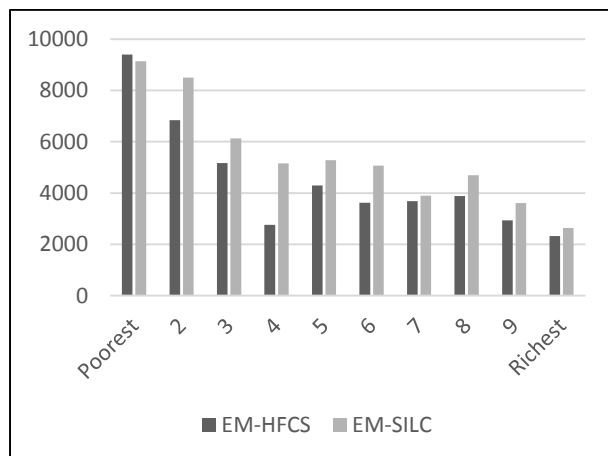
Panel a: Mean original income



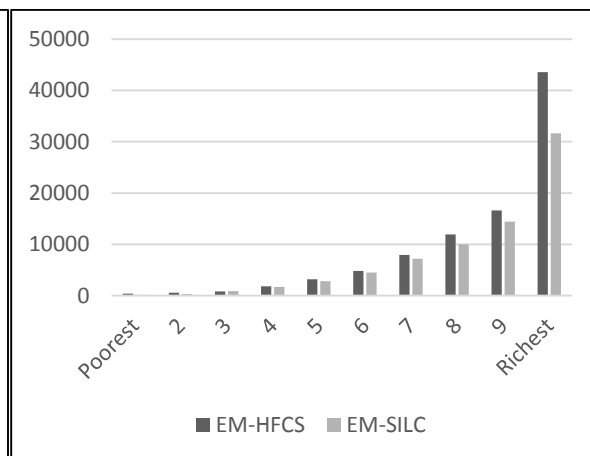
Panel b: Mean disposable income



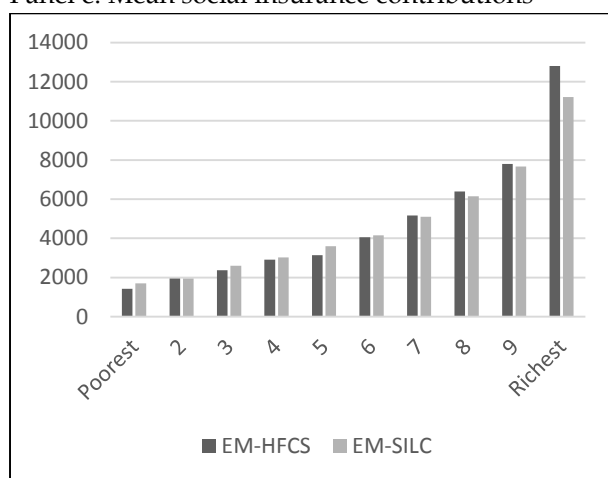
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.12.5 Macro-validation of new EUROMOD policies

Table A.12.10 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.12.11 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.12.4 Number of eligible cases for wealth taxes, Luxembourg.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	1,295	1,295	157,609	1,295	157,609
Real property transfer tax	41	41	5,700	41	5,700
Inheritance tax	37	8	1,048	8	1,048
Gift tax	10	1	76	1	76

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

The total number of eligible cases for the inheritance tax is considerably higher than the final number of taxpayers. This can be attributed to the fact that 29 eligible cases receive an inheritance from a lineal heir (exempt from taxation). When looking at the number of gift tax payers Table A.12.10 shows that

we lose 9 cases. This stems from the fact that 9 cases do not have a value on the variable “agiimvr” (assets – gift – immovable property). Given that only gifts of immovable property are taxed, these cases do not pay a gift tax.

Table A.12.5 Validation of simulated wealth tax revenues (in million euro), Luxembourg.

		EM-HFCS	External	Ratio
Real property tax	2013	15.62	33.0 (1)	47.33%
	2017	15.62	38.0 (1)	41.11%
Real property transfer tax	2013	72.97	164.0 (1)	44.49%
	2017	89.90	319.0 (1) ²	28.18%
Inheritance & gift tax	2013	17.62	71.80 (2)	24.54%
	2017	22.96	85.90 (2) ¹	26.73%

Note: ¹ Figure refers to 2016. ² Total of taxes on financial and capital transactions (e.g. mortgage registration duties, taxes on sale of immovable property etc.).

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a);

(2) Taxes in Europe Database (European Commission, 2018).

In comparison to external figures our simulations seem to be rather low. This has mainly to do with the fact that there are only a very limited number of eligible cases for the real property transfer tax and inheritance & gift taxes. Regarding the real property tax, this relates to the fact that we have made the assumption that cadastral values are approximately 0.5% of market values (cfr. supra).

A.13 Poland

A.13.1 Description of wealth taxes

A.13.1.1 New EUROMOD policies

Property tax (“podatek od nieruchomości”)

Description:

The real estate property tax is charged as a local tax and needs to be paid by the owners of the real estate. The tax base depends on the type of asset concerned: for buildings, the tax base is the usable area, for structures, it is the value of the structure (the tax book value) and for land, it is the area. The tax rates are established by the Commune Council (PKF, 2013).

Assumptions:

- The maximum tax rate for residential land is equal to 0.77%. For constructions, the maximum tax rate is equal to 2% (European Commission, 2018). Because we have no information about the real tax rates that are chosen by the local governments, we assume that the chosen tax rates are equal to these maximum values.
- For structures, we assume that the tax book value is equal to the current value of the structures.

Aspects of the policy that were not implemented:

- The tax on the area of the land that is not the area of the household’s main residence.

Changes after income reference year (only those relevant for 2017 policy): n/a

Real estate transfer tax (“Podatek od czynności cywilnoprawnych”)

Description:

The tax on civil law transactions (TCLT) is levied on certain contracts such as contracts of sale and contracts of exchange of property rights and the establishing of a mortgage. The transfer tax is part of the registration duties. The tax rate is 2% for the sales agreement of real estate (Deloitte, 2017b; PKF, 2017).

Assumptions:

- If at least one of the parties of the contracts on the transfer of ownership of real property needs to pay VAT on this transaction, the civil law transaction tax should not be paid. Because we have no information about VAT, we assume that this is never the case.

Aspects of the policy that were not implemented:

- Tax exemption for the sale of land ownership constituting a farm.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and gift tax (“Podatek od spadków i darowizn”)

Description:

The inheritance and gift tax apply to assets that are located in Poland. Beneficiaries who are spouses, descendants (also adopted children, stepchildren, and grandchildren), ascendants (i.e., parents, stepparents and grandparents) and brothers and sisters from the deceased or donor are exempt from tax if they declared their inheritance/gift to the respective tax office within six months. Donations of money do not have to be declared if made via notarial act (Deloitte, 2017b). Taxpayers are divided into three groups, depending on the relationship to the person from whom the inheritance/gift is received (Deloitte, 2017b):

- Group 1: spouses, descendants, ancestors, siblings, stepchildren, stepparents, children-in-law and parents-in-law.
- Group 2: descendants of siblings, siblings of parents, descendants, and spouses of stepchildren, spouses of siblings, siblings of spouses, spouses of siblings of spouses and spouses of other descendants.
- Group 3: other individuals.

The tax rates of the inheritance/gift tax for these three group are (Deloitte, 2017b):

- Group 1: the tax rates range from 3% to 7%. The first 9,637 zł is exempt from taxation if no other taxable inheritance/gift has been received from the same individual within a five-year period.
- Group 2: the tax rates range from 7% to 12%. The first 7,276 zł is exempt from taxation if no other taxable inheritance/gift has been received from the same individual within a five-year period.
- Group 3: the tax rates range from 12% to 20%. The first 4,902 zł is exempt from taxation if no other taxable inheritance/gift has been received from the same individual within a five-year period.

Table A.13.1 shows the tax brackets and tax rates in detail.

Table A.13.1 Inheritance and gift tax rates and tax brackets, Poland.

Surplus in zł		The tax is
Above	Up to	
1) from acquirers in group I		
	10,278 zł	3%
10,278 zł	20,556 zł	308 zł 30 gr and 5% from the surplus over 10,278 zł
20,556 zł		822 zł 20 gr and 7% from the surplus over 20,556 zł
2) from acquirers in group II		
	10,278 zł	7%
10,278 zł	20,556 zł	719 zł 50 gr and 9% from the surplus over 10,278 zł
20,556 zł		1.644 zł 50 gr and 12% from the surplus over 20,556 zł
3) from acquirers in group III		
	10,278 zł	12%
10,278 zł	20,556 zł	1,233 zł 40 gr and 16% the surplus over 10,278 zł
20,556 zł		2,877 zł 90 gr and 20% the surplus over 20,556 zł

Source: Inheritance tax in Poland (Dudkowiak & Kopec, 2017).

Assumptions:

- The inheritances and gifts between close family members are only exempted from taxation when they comply with certain specific obligations. For instance: the inheritance/gift needs to be declared with the respective tax office within six months. We assume that all inheritances/gifts fulfill all the specific obligations.
- The HFCS-survey gives information about inheritances/gifts received from (1) maternal grandparents, (2) paternal grandparents, (3) parents, (4) children, (5) other relatives and (6) others. The first four categories are part of group 1, therefore we exempted them from taxation.¹⁰;
- We assume that category 5 mainly contains aunts and uncles.
- The tax-free amounts are only applicable when no other taxable inheritance/gift has been received from the same individual within a five-year period. We assume that this is the case.

¹⁰ Group 1 is still included in the inheritance/gift policy in EUROMOD. The policy function that contain this categories are switched off.

Changes after income reference year (only those relevant for 2017 policy): n/a

A.13.1.2 Refinement of existing EUROMOD policies

Tax relief for contributions to private pension funds

Description:

Contributions to individual pension security accounts can be deducted from the tax base. In 2013 the deduction could not exceed 4% of the individual's retirement insurance contribution base from the previous year, with a maximum deduction of 4,321.2 zł. Those with a salary below the minimum wage could deduct maximum 720 zł, even if it is higher than 4% of their retirement base.

Assumptions:

- In HFCS there is no information about the retirement insurance contribution base from the previous year. Therefore, we used as proxy the retirement insurance contribution base of the HFCS year.

Changes after income reference year (only those relevant for 2017 policy):

- In 2017 the 4% no longer applies, the maximum deduction is for everyone equal to 5,115.6 zł.

A.13.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.13.2. They are all uprated with figures from Eurostat (2017a; 2017b; 2017c; 2017d; 2017e). For the non-financial variables, we used the following uprates: for the variables "amr" (the current value of the main residence) and "amrpv" (the purchase value of the main residence) we made use of the gross stock of dwellings, for other buildings ("aob" & "aobpv01-03") we used the gross stock of other buildings than dwellings, vehicles ("avh") are uprated with the financial consumption of the households on transport, valuables ("avl") are uprated with the gross capital formation and "asb" (self-employed business assets) is uprated with the stock of machinery, equipment, weapons systems, and intellectual property products. The financial assets are uprated as follows: "adp" (deposits) with the stock of transferable and other deposits, "amf" (mutual funds) and "ama" (managed accounts) with the stock of investment fund shares, "abd" (bonds) with the stock of debt securities, "apb" (non-self-employment private business) with the stock of unlisted shares and other equity, "ash" (shares) with the stock of listed shares, "app" (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, "aot" (others) with the stock of non-life insurance technical reserves and other accounts receivable/payable and "adb" (debt) with the stock of total liabilities. For the variables concerning inheritances and gifts ("aihvr" & "agivr") the tax revenues of capital transfers are used for the uprating.

Table A.13.2 Overview of uprating indices used for wealth variables in EUROMOD, Poland.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, amrpv,	575,041	594,441 ¹	Dwellings, in million euro (1) ³
\$f_aob	aob, aobpv01-02	91,637	91,663 ¹	Other buildings, in million euro (1) ³
\$f_avh	avh	28,437.5	30,093.9 ²	Financial consumption expenditure of households: transport, in million euro (2)
\$f_avl	avl	74,925.1	91,512.8	Gross capital formation, in million euro (3) ⁴
\$f_asb	asb	58,055	60,016	Machinery, equipment, weapons systems and intellectual property products, in million euro (1) ³
\$f_adp	adp	134,667	181,187.9	Transferable & other deposits, in million euro (4)
\$f_amf	amf, ama	20,567	32,082.6	Investment fund shares, in million euro (4)
\$f_abd	abd	1,245.9	2,478.1	Debt securities, in million euro (4)
\$f_apb	apb	66,270.8	84,026.6	Unlisted shares and other equity, in million euro (4)
\$f_ash	ash	10,945.3	13,087.6	Listed shares, in million euro (4)
\$f_app	app	18,377.8	19,092.7	Life insurance, annuity entitlements and pension entitlements, in million euro (4)
\$f_aot	aot	11,260.2	52,029.7	Non-life insurance technical reserves and other accounts receivable / payable, in million euro (4)
\$f_adb	adb	142,705.4	169,960.3	Total financial liabilities, in million euro (4)
\$f_aih	aihvr	60	63.9 ²	Tax revenues on capital transfers, in million euro (5) ⁴
\$f_agi	agivr	60	63.9 ²	Tax revenues capital transfers, in million euro (5) ⁴

Note: All stock variables refer to the situation at the end of the year. ¹ Figures refer to 2015. ² Figures refer to 2016. ³ Figures are about households and non-profit serving households (S14_S15). ⁴

Figures are about the total economy.

Source: (1) Annual Sector Accounts, Balance sheets for non-financial assets (Eurostat, 2017b); (2) Final consumption expenditure of households by consumption purpose (Eurostat, 2017c); (3) GDP and main components (output, expenditure, and income) (Eurostat, 2017d); (4) Annual Sector Accounts, Balance sheets for financial assets (Eurostat, 2017a); (5) Main national accounts tax aggregates (Eurostat, 2017e).

A.13.3 Comparison of socio-demographic characteristics

Table A.13.3 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Poland.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	15.7	15.8	16.33
	16 - 29	19.1	18.8	20.79
	30 - 44	23.2	22.9	21.36
	45 - 64	27.6	27.6	27.80
	65 - 99	14.4	14.9	13.72
Gender	Female	51.7	51.7	51.58
	Male	48.3	48.3	48.42
Education	Not completed primary education	11.5	20.6	16.61
	Primary education	16.3	13.4	16.55
	Lower secondary education	4.3	4.1	4.35
	Upper secondary education	49.5	42.7	44.98
	Post-secondary (non-tertiary) education	0.0	2.9	2.31
	Tertiary education	18.4	16.3	15.21
Economic status	Pre-school	5.7	15.8	6.32
	Farmer	-.1	6.3	-.1
	Employer or self-employed	7.3	8.8	7.88
	Employee	34.4	34.7	30.95
	Pensioner	18.2	14.3	21.96
	Unemployed	6.7	5.7	5.61
	Student	17.6	5.4	16.25
	Inactive	4.8	3	
	Sick or disabled	0.8	3.5	9.27
	Other	3.4	2.4	
	Family worker	1.1	-.1	1.10
Marital status	Single (never married)	41.4	39.8	39.76
	Married	45.8	48	47.80
	Separated	-.1	0.3	-.1
	Divorced	3.9	3.4	4.21
	Widowed	9.0	8.5	8.23
Tenure status	Owner paying mortgage	13.8	10.6	-.1
	Outright owner	67.4	72.8	-.1
	Tenant or subtenant paying rent at prevailing or market rate	7.1	4.3	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	1.3	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	11.7	11.0	-.1

Note: ¹ Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

In table A.13.3 a comparison of the socio-demographic variables in EM-HFCS and EM-SILC is made. Overall, the characteristics of the sample in both databases are highly similar, except for education level and economic status. The economic status shows that there is a higher share of individuals in EM-SILC than in EM-HFCS that are in pre-school or that are farmer and a lower share of individuals that are students. The educational level shows that there are more individuals that not yet completed primary education in EM-SILC than in EM-HFCS.

A.13.4 Micro-validation of income concepts

In Table A.13.4 we show the summary statistics of the main income concepts. A comparison of the mean values indicates some serious discrepancies between EM-HFCS and EM-SILC. The difference is equal to almost €1,500 in original and pension incomes and almost €1,000 in disposable income. The fact that the maximum values for original and disposable income and for taxes are higher for EM-HFCS than for EM-SILC, is likely due to the oversampling of the wealthy applied in HFCS.

Table A.13.4 Comparison of overall EUROMOD income concepts of EM-HFCS vs EM-SILC, income reference year, Poland.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	8,898	7,623	-2,963	182,012
	EM-SILC	7,434	5,640	-4,288	88,625
Benefits	EM-HFCS	575	1,252	0	37,682
	EM-SILC	585	1,068	0	20,527
Taxes	EM-HFCS	1,364	1,768	0	54,496
	EM-SILC	1,101	1,102	0	23,864
Social insurance contributions	EM-HFCS	1,131	892	0	7,746
	EM-SILC	878	730	0	5,749
Disposable income	EM-HFCS	6,978	5,200	-1,988	119,769
	EM-SILC	6,040	3,822	-2,960	59,436

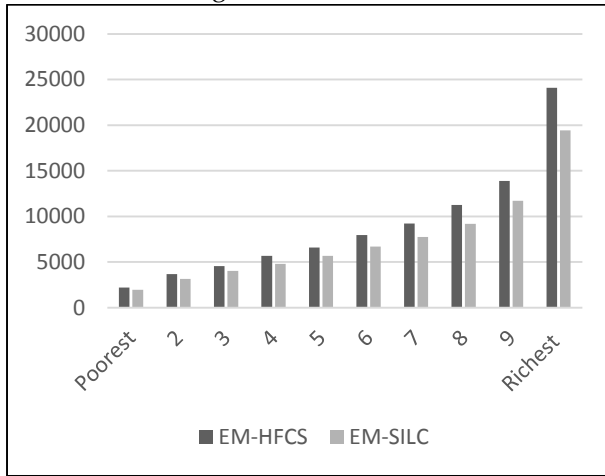
Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

Source: own calculations based on EM-HFCS and EM-SILC.

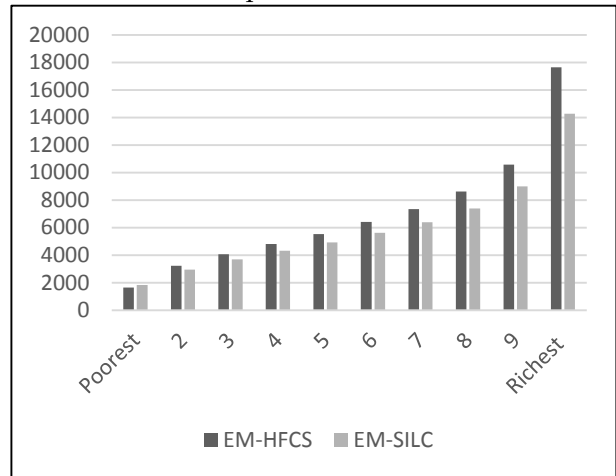
Next, we present the distribution of the income concepts from Table A.13.4 across disposable income deciles. Figure A.13.1 panel a, b, d and e show the distribution of original & pension income, disposable income, taxes, and social insurance contributions, respectively. The mean values of all these income concepts are higher in EM-HFCS than in EM-SILC for almost all deciles. Figures A.13.1 panel c shows that while the average social benefit is quite similar, the distribution of these benefits differs between EM-HFCS and EM-SILC.

Figure A.13.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Poland.

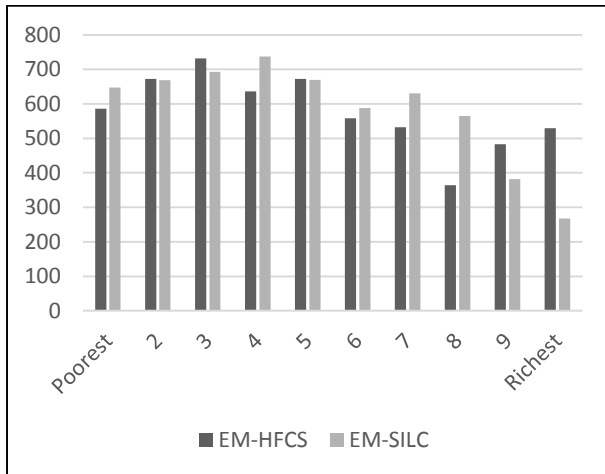
Panel a: Mean original income



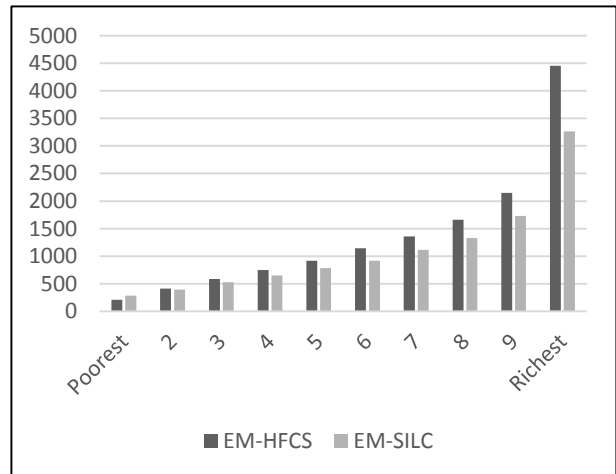
Panel b: Mean disposable income



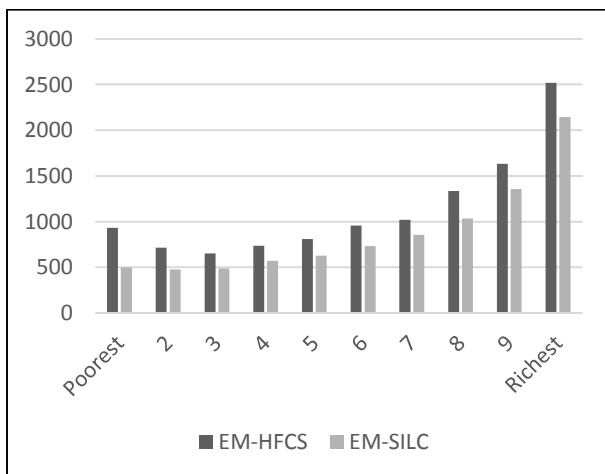
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.13.5 Macro-validation of new EUROMOD policies

Table A.13.5 summarizes the number of eligible cases in the sample and the final number of taxpayers for the simulated real property tax. Subsequently, Table A.13.6 presents a comparison of the simulated tax revenues with external figures.

Table A.13.5 Number of eligible cases for wealth taxes, Poland.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	3,436	3,428	13,375,016	3,428	13,375,016
Real property transfer tax	51	50	231,159	50	231,159
Inheritance and gift tax	85	1	1,785	1	1,785

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

The real property tax is underestimated (a ratio of 35.64 for 2013 and of 32.2 for 2017; see Table A.13.6). A possible explanation for this is that we only simulate the local property tax for the area of the household main residence and for constructions. All other areas that are also taxed are not included in the simulated policy, because we have no information about this. The overestimation of the real property transfer tax can possibly be explained by the fact that we could not simulate the tax exemptions for the situations when VAT is already paid on the transaction and for the cases where the transaction concerns land ownership constituting a farm. The overestimation of the inheritance/gift tax can be explained by the fact that for both years there is just one case on which this simulation is based.

Table A.13.6 Validation of simulated wealth tax revenues (in million euro), Poland.

	Year	EM-HFCS	External (1)	Ratio
Real property tax	2013	1,578	4,428 (2)	35.64%
	2017	1,583	4,916 (2)	32.2%
Real property transfer tax	2013	232	115 (2)	201.74%
	2017	238	101 (2)	235.64%
Inheritance and gift tax	2013	167	1,093 (1)	15.3%
	2017	178	1,183 (1)	15.05%

Note: Exchange rate for 30 June 2013 = 4.3376 and for 30 June 2017 = 4.2259.

Source: (1) Tax Revenue Database (OECD, 2017a); (2) Taxes in Europe Database (European Commission, 2018).

A.14 Portugal

A.14.1 Description of wealth taxes

A.14.1.1 New EUROMOD policies

Real property tax (“Imposto Municipal sobre Imóveis”)

Description:

Taxes are levied on all immovable property located in Portugal and must be paid for by the owner of the real property. The cadastral value, calculated by the Portuguese authorities, is used as tax base. The applied tax rates differ depending on the type of property: rural property is taxed at a fixed rate of 0.8%, assessed urban property is taxed at a rate between 0.30% - 0.50% (can be chosen by the municipality) and unassessed urban property is taxed at a rate between 0.30% - 0.80% (can be chosen by the municipality). In case a property belongs both to the rural and urban category, the property is taxed accordingly to its share belonging to the rural and urban categories. In case the taxpayer is resident in a country or region that falls under a more generous or beneficial tax regime, the applied rate is 7.50%, regardless of the type of property. The tax rates for urban property are tripled if the property has been vacant for more than one year. Certain properties, such as state-owned properties or social security institutions, are exempt from taxation. Furthermore, also the following exemptions are simulated:

- Newly built, enlarged, renovated or purchased urban immovable properties destined to be occupied as the permanent residence of the taxpayers or a member of his household or destined for rental may be exempt from tax for a three-year period if their taxable value does not exceed €125,000.00 and for taxpayers whose taxable income does not exceed €153,300.
- Rural and urban properties, the taxable value of which does not exceed 10 times the annual value of the social benefits index, held by taxpayers whose gross taxable income for personal income tax purposes does not exceed 2.2 times the annual value of the social benefits index.

Rural building:

- Land located outside urban agglomerates (building land not included) which have a normal use as income-generating use commercial and industrial.
- Land located within urban agglomerates which cannot be used for any income or can only be used for generating agricultural or forestry income.
- Buildings directly affected by the production of agricultural or forestry income

Urban buildings:

- All buildings except the above.

Assumptions:

- We can only include farms in the rural category, as there is no more specific information included in the HFCS. All other buildings are considered to be urban.
- We use a weighted average of the tax rates of the different districts as there is no regional information in HFCS. Furthermore, the average includes both tax rates applicable to assessed and unassessed urban building as we can make no distinction between the two. The average tax rate for 2012 equals 0.36% and 0.34% for 2017 (Autoridade tributária e aduaneira, 2018).
- We assume that all properties are either 100% urban or 100% rural.
- Due to missing information regarding the cadastral values, we calculate the ratio between the total market value and total cadastral value of Portuguese properties (80%) and allocate this to the different properties, taking into account the percentage of ownership (see

[http://info.portaldasfinancas.gov.pt/pt/dgci/divulgacao/estatisticas/estatisticas_patrimonio/Documents/Liquidacao IMI e transferencias municipios.pdf](http://info.portaldasfinancas.gov.pt/pt/dgci/divulgacao/estatisticas/estatisticas_patrimonio/Documents/Liquidacao%20IMI%20e%20transferencias_municipios.pdf) for information on the total cadastral value of properties).

- We cannot take into account whether buildings are renovated or enlarged. Therefore, we grant the tax exemption to all households that bought a property in 2010, 2011 or 2012 if they meet the additional eligibility criteria.

Aspects of the policy that were not implemented:

- Taxation of residents in countries or regions with more beneficial tax regimes.
- The exemptions as they contain too specific information.
- Taxation of mixed buildings.
- Higher taxation for vacant buildings

Changes after income reference year (only those relevant for 2017 policy):

- List of exemptions increased;
- No longer a difference between assessed and unassessed urban properties; urban properties taxed at a rate between 0.30% - 0.45% (chosen by municipality).
- Tax deductions for households with dependents (since 2016 March 30th).
- Additional tax rate to the municipal property tax (since 2016).

Tax deduction:

- Households that have one or more dependents can be granted a tax reduction in case they use an urban building as permanent residence. The property has to be the owner's own. The deduction increases along with the number of dependents, i.e. €20 for 1 dependent, €40 for 2 dependents, €70 for three or more dependents.

Additional tax rate:

- In case the taxable value of a property amounts between €600,000 and €1,000,000 an additional rate of 0.7% applies. For taxable values exceeding €1,000,000 an additional marginal rate of 1% applies. There is a separate additional tax rate for corporate entities (which is not taken into account).

Assumptions 2017 policy:

- Municipalities are free in their decision to grant the tax reduction. However, we assume that municipalities apply this exemption for all households that fulfil the requirements.

Real property transfer tax (“Imposto Municipal sobre as Transmissões Onerosas de Imóveis”)

Description:

Both residents and non-residents who buy immovable property in Portugal are obliged to pay a transfer tax. This transfer tax is levied on the transfer value of the property, or if higher, on the taxable value of the property for purposes of the Municipal immovable property tax (IMI; previous). A tax rate of 5% is levied on the purchase of rural immovable property. In case of the purchase of an urban property, the applied tax rates differ according to the type of property and the intention of use (see below). In addition to the transfer tax a stamp duty of 0.80% is applied on the purchase value of the property (for both rural and urban properties). Certain types of property such as properties held by the central government are exempt from taxation, as well as the main residence if the taxable value does not exceed €92,407.

Table A.14.1 Real property transfer tax rates for real property bought exclusively for use as permanent residence, Portugal.

Assessment base	Tax rate
For every € between €0 - €92,407	0%
Then, for every € between €92,407 - €126,403	2%
Then, for every € between €126,403 - €172,348	5%
Then, for every € between €172,348 - €287,213	7%
Then, for every € between €287,213 - € 574,233	8%
Finally, for every € higher than, or equal to €574,233	6%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

Table A.14.2 Real property transfer taxes for real property bought for residential use (other than for use as permanent residence), Portugal.

Assessment base	Tax rate
For every € between €0 - €92,407	1%
Then, for every € between €92,407 - €126,403	2%
Then, for every € between €126,403 - €172,348	5%
Then, for every € between €172,348 - €287,213	7%
Then, for every € between €287,213 - € 550,836	8%
Finally, for every € higher than, or equal to €550,836	6%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

The assessment bases listed above differ for the regions of Madeira and Azores as the lower and upper limits are calculated by applying a 1.25 coefficient. Furthermore, urban immovable property that is both neither for permanent or residential use, is taxed at a rate of 6.5%. Individuals that reside in a country or region that has a more beneficial tax regime and acquire immovable property located in Portugal will be taxed at a rate of 10% without any exemptions or deductions.

Assumptions:

- We apply the tax rate on the purchase value of the property.
- HFCS only covers individuals who are residents of Portugal.

Aspects of the policy that were not implemented:

- Higher taxation for individuals that live in countries or regions with more beneficial tax regimes.
- The different assessment bases for Madeira and the Azores.
- The exemptions except for the tax exemption for transfers up to a value of €92,407.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and Gift tax (“Imposto do selo”)

Description:

The inheritance and gift tax was abolished in Portugal in 2004 and incorporated into the so-called stamp duty such that gratuitous transfers of property (i.e. inheritances and gifts) are still taxed by the Portuguese government. The tax rates are the following: a flat rate of 10% on both inheritances and gifts of movable and immovable property and an additional 0.8% is levied on gifts of immovable property. There are two exemptions from this tax:

- Inheritances between spouses, civil partners, descendants and ascendants are fully exempt from taxation.
- Gifts between spouses, civil partners, descendants and ascendants are fully exempt from taxation, except for gifts of immovable property where the rate of 0.8% still applies.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Mortgage registration duties (“Imposto do selo”)

Description:

The registration of a mortgage is taxed at different rates depending on the duration of the mortgage. Mortgages with a term of less than 1 year are taxed at 0.04% on a monthly basis. Terms between 1 and 5 years are taxed at a rate of 0.5% yearly. Mortgages of which the term lasts longer than 5 years are taxed at 0.6% (yearly).

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.14.1.2 Refinement of existing EUROMOD policies

Tax relief for mortgage repayment

Description:

A 15% tax credit for mortgages (both capital and interests) and rents is granted up to a maximum amount of €296 for mortgages and €502 for rents in 2017 (tax credit of 30% in 2012, with maximum amount of €591 for both mortgages and rents). Since 2015, higher limits apply for households on low incomes. The mortgage tax credit is paid out to all people who took out their mortgage before 31 December 2011. For renters the tax credit remains in place for everyone. With data from HFCS we can add the condition that the mortgage had to be taken out before 31 December 2011.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Tax relief for contributions to private pension funds

Description:

There is a 20% tax credit for contributions made to private pension funds up to a maximum amount of €400 for individuals under the age of 35, €350 for individuals between 35 and 50 years old and €300 for individuals older than 50 year. The tax credit is currently not included in EUROMOD, but can be added with HFCS.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Asset-test for social benefits: Assistance unemployment benefit

Description:

Individuals that have not worked long enough to claim the main unemployment benefit are eligible to the assistance unemployment benefit. In order to be eligible claimants must meet the eligibility conditions and pass the income test, i.e. the family unit equivalent income cannot be equal to, or higher than, 80% of the Social Support Index (SSI). The income test includes specific rules for financial

and property income. If 5% of the total financial assets is higher than the reported yearly investment income, this amount will be taken into account. If 5% of the total real property assets is higher than the reported yearly property income, this amount will be taken into account. The value of the main residence is not taken into account for an amount equal to 450 times the Social Support Index. In general, the total family's financial assets must be lower than 240 times the Social Support Index. With data from HFCS we are able to take into account the 5%-rule of both financial and property income, and the upper limit for the total family's financial assets.

Assumptions: n/a

Aspect of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Asset-test for social benefits: Social integration income

Description:

Individuals or families that do not have sufficient economic resources and are at risk of social exclusion can claim the social integration income if certain eligibility conditions are met. The same rules concerning financial and property income are included in the income test, as is the case for the assistance unemployment benefit (see above). In 2012 (2017) the total family's financial income must be lower than 240 (60) times the Social Support Index (SSI).

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after income reference year (only those relevant for 2017 policy): n/a

A.14.2 Uprating of monetary variables

An overview of how the amounts are uprated is presented in Table A.13.3. First, the main asset variables are uprated based on their aggregates as reported by the Instituto Nacional de Estatística (2017). The variables "amr", "aob", "amrpv", "aobpv01-03" are uprated based on the gross stock of buildings and structures. Vehicles ("avh") and valuables ("avl") are both uprated with the gross stock of personal transport equipment due to insufficient information. Self-employment business assets ("asb") are uprated with the total stock of machinery & equipment and intellectual property rights. Second, financial assets are uprated based on their size as reported in the balance sheet for financial assets (Eurostat, 2017a). Deposits ("adp") are uprated with the total stock of transferable and other deposits, mutual funds ("amf") and managed accounts ("ama") with the stock of investment fund shares, bonds ("abd") with the stock of debt securities, non-self-employment private business assets ("apb") with the stock of unlisted shares and other equity, shares ("ash") with the stock of listed shares, private pension ("app") with the stock of life insurance and pension entitlements, other assets ("aot") with the stock of non-life insurance technical reserves and other accounts and debt ("adb") with the total stock of liabilities. Thirdly, we uprated the inheritance and gift variables ("aihvr", "agiimvr", "agimbvr") with the total amount of inheritances and gifts. These figures were provided by the Portuguese Tax Administration. Finally, the aggregate variables financial assets ("ape") and real assets ("ara") are uprated based on their subcomponents.

Table A.14.3 Overview of uprating indices used for wealth variables in EUROMOD, Portugal.

Uprate index	Variables uprated by the index	Value 2012	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	239,226.0	238,148.0	Gross stock of buildings and structures, in million euro (1) ¹
\$f_avh	avh	324.2	282.6	Stock of personal transport equipment, in million euro (1) ¹
\$f_avl	avl	324.2	282.6	Stock of other durables, in million euro (1) ^{1,2}
\$f_asb	asb	1,635.1	1,415.2	Stock of machinery & equipment and intellectual property products, in million euro (1) ¹
\$f_adp	adp	146,533.2	169,345.9	Stock of transferable & other deposits, in million euro (2)
\$f_amf	amf, ama	11,796.5	16,756.0	Stock of investment fund shares, in million euro (2)
\$f_abd	abd	23,322.6	12,821.0	Stock of debt securities, in million euro
\$f_apb	apb	61,590.2	78,620.8	Stock of unlisted shares and other equity, in million euro (2)
\$f_ash	ash	4,469.5	4,771.9	Stock of listed shares (domestic & other), in million euro (2)
\$f_app	app	42,518.5	44,257.9	Stock of life insurance and pension entitlements, in million euro (2)
\$f_aot	aot	16,599.1	14,548.5	Stock of non-life insurance technical reserves and other accounts, in million euro (2)
\$f_adb	adb	161,227.2	146,230.3	Stock of total liabilities, in million euro (2)
\$f_aih	aihvr	1,287.9	4,088.1	Total amount of inheritances >0 euro, in million euro (3)
\$f_agi	agiimvr, agimbvr	687.4	1,170.9	Total amount of gifts >0 euro, in million euro (3)

Note: All stock variables refer to the situation at the end of the year. ¹ Figure for 2017 refers to 2015. ² Due to insufficient information we use the total stock of transport equipment as proxy for other durables.

Source: (1) Stock of households' capital (S.14) by type of fixed assets (Instituto Nacional de Estatística, 2017); (2) Annual Sector Accounts, Balance sheet for financial assets (Eurostat, 2017a); (3) Statistics received directly from the Portuguese Government.

A.14.3 Comparison of socio-demographic characteristics

Table A.14.4 Comparison of socio-demographic variables, EM-HFCS vs. EM-SILC, income reference year, Portugal.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	15.07	15.57	15.93
	16 – 29	15.58	15.82	16.03
	30 – 44	22.41	22.33	22.45
	45 – 64	27.38	26.78	26.56
	65 – 99	19.56	19.50	19.02
Gender	Female	52.41	52.33	52.22
	Male	47.59	47.67	47.78
Education	Not completed primary education	10.59	17.91	20.52
	Primary education	43.42	38.48	37.23
	Lower secondary education	17.31	17.23	16.24
	Upper secondary education	15.53	15.33	13.37
	Post-secondary (non-tertiary) education	-.1	0.35	0.83
	Tertiary education	13.16	10.68	11.79
Economic status	Pre-school	4.72	4.77	5.55
	Farmer	-.1	-.1	-.1
	Employer or self-employed	5.93	5.10	7.06
	Employee	32.02	34.26	33.52
	Pensioner	21.02	21.73	22.15
	Unemployed	11.22	10.11	6.27
	Student	17.43	16.25	15.59
	Inactive	0.53	1.32	
	Sick or disabled	1.84	1.65	9.15
	Other	5.10	4.82	
	Family worker	0.19	-.1	0.25
Marital status	Single (never married)	40.89	39.40	40.46
	Married	46.82	48.83	46.63
	Separated	-.1	-.1	-.1
	Divorced	5.17	4.71	5.62
	Widowed	7.11	7.07	7.30
Tenure status	Owner paying mortgage	38.02	33.70	-.1
	Outright owner	38.20	40.77	-.1
	Tenant or subtenant paying rent at prevailing or market rate	17.21	10.98	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	6.93	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	6.58	7.62	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and input data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Table A.14.4 provides a comparison of some socio-demographic variables between the samples of EM-HFCS and EM-SILC. Overall, the characteristics of the population in both datasets are highly similar, except for the obtained educational level and tenure status. While EM-SILC has a higher share of individuals that have not yet completed primary education, EM-HFCS has a higher number of individuals that completed primary and tertiary education. Regarding tenure status, EM-HFCS has a higher proportion of individuals that pay mortgage, while EM-SILC has a higher share of individuals

that own their property outright. Despite these minor differences, we can conclude that there is a high level of correspondence between the two datasets.

A.14.4 Micro-validation of income concepts

Table A.14.5 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Portugal.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	11,693	14,824	-12,603	507,000
	EM-SILC	11,903	12,448	-1,233	426,006
Benefits	EM-HFCS	827	1,568	0	46,220
	EM-SILC	1,040	1,799	0	51,588
Taxes	EM-HFCS	1,171	4,000	0	147,244
	EM-SILC	1,221	3,370	0	164,000
Social insurance contributions	EM-HFCS	954	1,118	0	19,381
	EM-SILC	1,012	1,387	0	46,861
Disposable income	EM-HFCS	10,395	10,205	-18,156	359,756
	EM-SILC	10,501	7,552	609	215,146

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

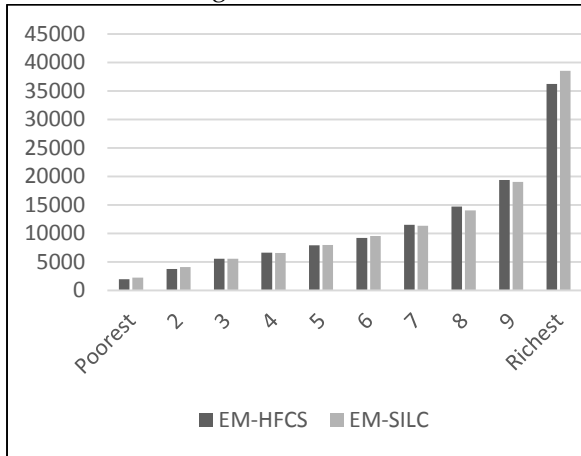
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.14.5 indicates that original & pension income is higher in EM-SILC. The difference between both datasets equals €210. This difference decreases slightly to €110 in disposable income and can at least partially be attributed to the higher amount of benefits in EM-SILC. Mean taxes and social insurance contributions are also higher in EM-SILC, which is the result of higher original incomes.

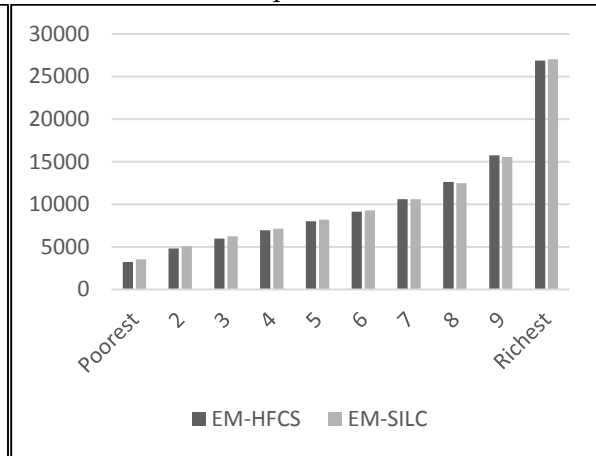
Next, Figures A.14.1 panel a and b present the mean values of original and disposable income across quintiles of disposable income. Up to the ninth decile, mean values are highly similar. However, average incomes in the tenth decile are higher for EM-SILC than for EM-HFCS. Figure A.14.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions. Overall, EM-SILC simulates higher amounts of benefits, which is mainly related to the fact that EM-SILC is more targeted towards lower incomes and EM-HFCS captures almost all social benefits by a single variable. Finally, the distribution of taxes and social insurance contributions is quite similar between both databases, with slightly higher values for the tenth decile in EM-SILC.

Figure A.14.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Portugal.

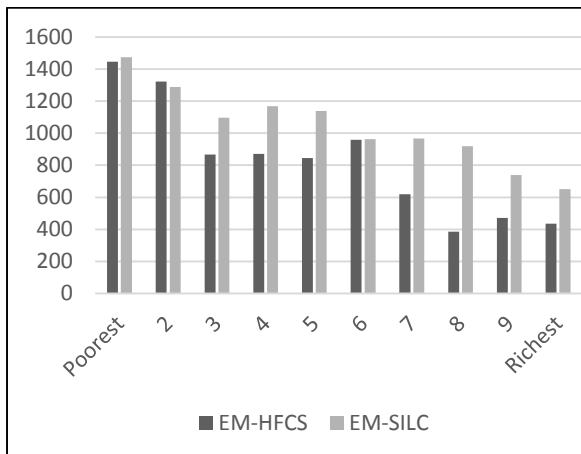
Panel a: Mean original income



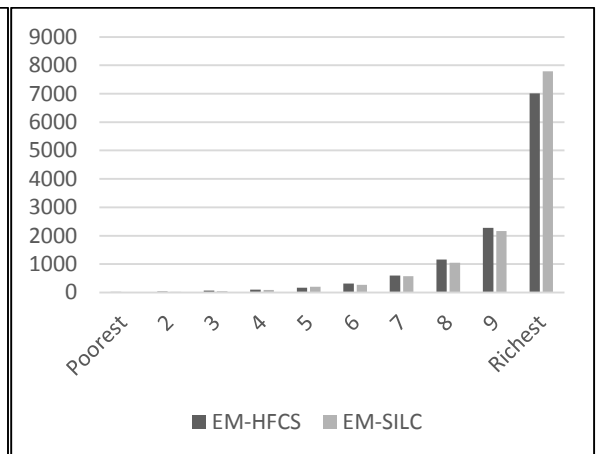
Panel b: Mean disposable income



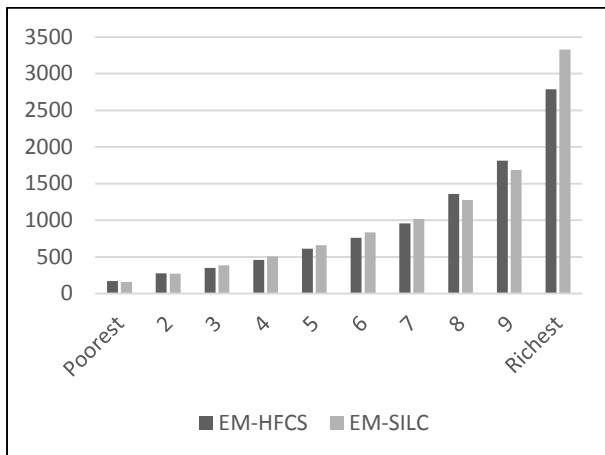
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.14.5 Macro-validation of new EUROMOD policies

Table A.14.6 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.14.7 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.14.6 Number of eligible cases for wealth taxes, Portugal.

	Eligible cases	2012		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	5,269	4,754	2,697,611	4,770	2,704,456
Real property transfer tax	25	21	8,976	21	8,976
Inheritance & gift tax (stamp duty)	158	57	33,037	57	33,037
Mortgage registration duties	59	59	29,484	59	29,484

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.14.6 shows that there are 515 cases exempt from the real property tax. To be more precise, 459 out of these 515 cases are not paying taxes because the taxable value of their properties is lower than 10 times the annual value of the Social Support Index and their gross taxable income is lower than 2.2 times the annual value of the Social Support Index. The remaining 56 cases are exempt from taxation because of the tax rules for newly built, renovated, enlarged or purchased immovable property (see tax description). Due to uprating of monetary variables there are only 490 cases exempt from taxation in 2017. Concerning the real property tax, only four cases do not pay taxes. 2 out of these 4 cases do not have a value on the purchase value of their main residence and are therefore not taxed. The remaining 2 cases have a main residence purchase value that does not exceed €92,407. Finally, there are 101 cases that do not pay an inheritance & gift tax. This is due to the fact that these cases received an inheritance/ gift from a lineal heir.

Table A.14.7 Validation of simulated wealth tax revenues (in million euro), Portugal.

		EM-HFCS	External	Ratio
		2012	1,452	1,140 (1)
Real property tax	2017	1,443	1,630 (1)	88.53%
Real property transfer tax	2012	69.44	417.0 (1)	16.65%
	2017	68.98	841.0 (1)	8.20%
Inheritance & gift tax (stamp duty)	2012	100.90	1,407 (2)	7.17%
	2017	320.40	1,430 (2) ¹	22.41%
Mortgage registration duties	2012	14.95	31.80 (1)	47.01%
	2017	14.95	32.28 (1)	46.31%

Note: ¹ Figure refers to 2016.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a); (2) Taxes in Europe database (European Commission, 2018).

Following Table A.14.7 the real property transfer tax seems to be severely underestimated for both policy years. This can be attributed to the limited number of eligible cases in the input data. The inheritance & gift tax also seems to be heavily underestimated. In fact, this has to do with the external figure that we have to use to assess our simulation. Because the inheritance & gift tax is included in the stamp duty we have to use the tax revenue of the stamp duty in general, while the inheritance & gift tax only makes up a small share of this tax revenue.

A.15 Slovakia

A.15.1 Description of wealth taxes

A.15.1.1 New EUROMOD policies

Real property tax (“Daň z nehnuteľností”)

Description:

In Slovakia the real property tax is divided into three separate taxes, i.e. a *land tax*, a *construction tax* and an *apartment tax*. The tax must be paid by either the owner of the immovable property or the administrator owned by the central, regional or local government. In case the taxpayer cannot be identified, the tax is levied on the individual that is making use of the property. If a property is owned by multiple taxpayers, each individual must pay his or her share according to the size of his or her co-ownership share (Ernst & Young, 2014; European Commission, 2018).

Property that is taxed under the so-called **land tax** includes: arable land, hop-fields, vineyards, gardens, forest lands and so on. In order to calculate the total land tax, the land area in square meters is multiplied by the value of the land per square meter (whereby the value depends on the region where it is located). Then, the base tax rate of 0.25% is levied on the total value of the land. Municipalities are free to alter this tax rate as long as this rate does not exceed 5 times the lowest annual tax rate set by the tax administrator.

The **construction tax** is levied on residential buildings and other buildings forming structural attachments to these buildings such as leisure-time structures, garden sheds, and so on. The size of the property area is taxed at a rate of €0.033/m². This tax rate can be altered by the municipalities as long as it does not exceed 10 times the lowest annual tax rate. In case a building consists of multiple stories the tax administrator may add a floor surcharge of up to €0.33 for each floor other than the ground floor.

The **apartment tax** is levied on apartments and non-residential premises in an apartment building in which at least one apartment or non-residential premise was acquired by natural persons or legal entities. In accordance with the construction tax the tax rate equals €0.033/m². Once again, the municipality can change this tax rate as long as it does not exceed 10 times the lowest annual tax rate.

Assumptions:

- We are only able to simulate the tax on the main residence since the HFCS does not have any information on the size of other owned buildings or structural attachments such as garden sheds etc. In an attempt to improve the simulation of the real estate tax, we calculated the average property size of the household main residence in the input data. We then allocated this average property size of 97m² to all individuals in the dataset that reported to have one or more additional properties, if these properties are houses or apartments. HFCS only captures information of three properties, whilst it is possible that individuals possess more than three properties in reality. Therefore, we created an additional variable (aobar04) and allocated average property sizes according to the number of additional properties (on top of the three properties included in HFCS). To be more specific, this means that individuals who have 4 properties receive a value of 97m² on the variable aobar04, individuals that have 5 properties receive a value of 97m²*2 on the variable and aobar04 and individuals that have 6 properties receive a value of 97m²*3.

However, since we do not know the type of these additional properties, we assume these properties to be houses or apartments, given that these are most common.

- Due to the fact that we do not have information about the tax rates that are applied in the different municipalities, and HFCS does not contain information on the number of stories a building consists of, we use the average tax rate that was applied in Slovakia in 2013 (Podnikateľská alianca Slovenska, 2013).
- In case of multi-ownership we do not know who else owns a share of the residence. Therefore we start from the size of the whole main residence and take into account the reported share that the household owns. We then apply the tax rate on this share. E.g. Assume that a household owns 50 per cent of a residence that comprises 200 m². The household will then be taxed on 100 m².

Aspects of the policy that were not implemented:

- The exemption for Red Cross etc.
- The land tax.

Changes after the income reference year (only those relevant for the 2017 policy):

- Change in average tax rate (Podnikateľská alianca Slovenska, 2015).

Assumptions 2017:

- We use average tax rates for 2015 since this is the most recent information available.

A.15.1.2 Refinement of existing EUROMOD policies

Tax relief for contributions made to private pension funds

Description:

The tax relief for contributions to private insurance funds allows taxpayers to lower their tax base by deducting the amount of additional pension savings. Until 2010 the upper limit of the tax relief was €398.33 per year. The tax relief was abolished in 2011 and later reintroduced in 2014 with a new maximum deductible amount of €180 per year. This relief is only implemented in EUROMOD up until 2010. It can be added for the years 2013 and 2017.

A.15.2 Uprating of monetary variables

An overview of how the wealth variables are uprated is presented in Table A.15.1. Firstly, the main asset variables main residence ("amr"), other building(s) ("aob"), purchase value main residence ("amrpv") and purchase value of other buildings ("aobpv01-03") are uprated based on the total gross stock of buildings and structures. Secondly, we used the gross stock of other durables to uprate the value of vehicles ("avh") and the value of valuables ("avl"). Both variables are uprated with the same index, mainly due to insufficient information. Thirdly, employment business wealth ("asb") is uprated with the gross stock of machinery and equipment. Fourthly, no information was available concerning the asset category money owed to household ("ahh"). Therefore, we used the default uprating index "\$f_CPI", i.e. Consumer Price Index. Fifthly, we used information from the financial balance sheets of Slovakia (Eurostat, 2017a) to uprate the variables deposits ("adp") with the total stock of transferable & other deposits, mutual funds ("amf") and managed accounts ("ama") with the total stock of investment fund shares, bonds ("abd") with the total stock of debt securities, non-self-employment private business ("apb") with the total stock of unlisted shares and other equity, shares ("ash") with the total stock of listed shares, private pension ("app") with the total stock of life insurance and pension entitlements, other ("aot") with the total stock of non-life insurance technical reserves and debt ("adb") with the total stock of liabilities. Finally, the variables financial assets ("ape") and real

assets ("ara") are updated with their components. The sum of these two variables is used to update the wealth variable total assets ("ato").

Table A.15.1 Overview of uprating indices used for wealth variables in EUROMOD, Slovakia.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	370,244.14	397,221.85 ²	Gross stock of buildings and structures, in million euro (2) ³
\$f_avh	avh	23,206.873	25,107.596 ²	Stock of personal transport equipment, in million euro (2) ³
\$f_avl	avl	23,206.873	25,107.596 ²	Stock of other durables, in million euro (2) ^{3,4}
\$f_asb	asb	113,621.205	123,401.92 ²	Stock of machinery & equipment and intellectual property products, in million euro (2) ³
\$f_adp	adp	26,623.20	32,518.0	Stock of transferable & other deposits, in million euro (1)
\$f_amf	amf, ama	3,760.0	5,210.20	Stock of investment fund shares, in million euro (1)
\$f_abd	abd	897.0	2,019.10	Stock of debt securities, in million euro (1)
\$f_apb	apb	137.3	139.9	Stock of unlisted shares and other equity, in million euro (1)
\$f_ash	ash	58.5	219.3	Stock of listed shares (domestic & other), in million euro (1)
\$f_app	app	10,975.0	12,821.5	Stock of life insurance and pension entitlements, in million euro (1)
\$f_aot	aot	3,938.6	5,195.10	Stock of non-life insurance technical reserves and other accounts, in million euro (1)
\$f_adb	adb	24,167.8	32,629.5	Stock of total liabilities, in million euro (1)

Note: All stock variables refer to the situation at the end of the year at the household level (unless indicated otherwise). ¹ The value of 2017 refers to the situation at the end 2016 (unless indicated otherwise). ² Figures refer to 2015. ³ We use the stock for sector s1 (total economy) due to insufficient information on the household level (s14). ⁴ We use the gross stock of transport equipment as proxy for the gross stock of other durables, due to missing information.

Source: (1) Annual Sector Accounts, Balance sheet for financial assets (Eurostat, 2017a); (2) Annual Sector Accounts, Fixed assets by activity and by asset, ISIC Rev4 (OECD, 2017b).

A.15.3 Comparison of socio-demographic characteristics

Table A.15.2 Comparison of socio-demographic variables, EM-HFCS vs. EM-SILC, income reference year, Slovakia.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	15.44	16.18	16.44
	16 – 29	18.76	18.06	20.78
	30 – 44	24.81	24.08	23.13
	45 – 64	27.29	27.02	26.99
	65 – 99	13.69	14.66	12.65
Gender	Female	51.41	51.24	51.31
	Male	48.59	48.76	48.69
Education	Not completed primary education	8.89	11.59	4.03
	Primary education	1.29	3.07	4.25
	Lower secondary education	19.80	14.11	14.98
	Upper secondary education	55.88	52.99	51.14
	Post-secondary (non-tertiary) education	-.1	1.64	-.1
	Tertiary education	14.13	16.60	15.35
Economic status	Pre-school	5.01	5.87	6.19
	Farmer	-.1	-.1	-.1
	Employer or self-employed	7.02	6.87	5.72
	Employee	37.50	38.41	30.30
	Pensioner	19.58	19.65	19.81
	Unemployed	7.42	7.43	8.21
	Student	19.21	16.68	16.03
	Inactive	0.25	2.45	8.11
	Sick or disabled	2.96	2.22	-.1
Other	1.04	0.42	-.1	
	Family worker	-.1	-.1	0.18
Marital status	Single (never married)	43.00	41.38	44.16
	Married	43.77	45.51	41.03
	Separated	-.1	-.1	-.1
	Divorced	5.93	5.52	7.65
	Widowed	7.29	7.59	7.17
Tenure status	Owner paying mortgage	18.18	10.89	-.1
	Outright owner	68.06	79.42	-.1
	Tenant or subtenant paying rent at prevailing or market rate	9.70	-.1	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	7.92	-.1
	Accommodation is socially rented	-.1	1.56	-.1
	Accommodation is rented for free	4.06	0.21	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

As shown by table A.15.2 there are some minor differences between the sample of EM-HFCS and EM-SILC in educational achievements and tenure status. First of all, the share of individuals that have completed secondary education (both lower and upper) is slightly higher in EM-HFCS, while the proportion of individuals that have achieved tertiary education is higher in EM-SILC. Second, there are some small differences in tenure status of respondents. In EM-HFCS, the share of individuals that pay a mortgage is considerably higher in comparison to EM-SILC, while the number of individuals

that own their residence outright is higher in the latter. Yet, both datasets are in general quite corresponding.

A.15.4 Micro-validation of income concepts

Table A.15.3 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Slovakia.

Variable			Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS		7,841	7,062	-4,357	172,945
	EM-SILC		7,933	5,477	-555	144,000
Benefits	EM-HFCS		887	1,111	0	7,506
	EM-SILC		838	999	0	12,058
Taxes	EM-HFCS		507	795	0	19,182
	EM-SILC		510	898	0	31,627
Social insurance contributions	EM-HFCS		1,277	1,546	0	26,290
	EM-SILC		1,159	1,190	0	19,361
Disposable income	EM-HFCS		6,945	4,938	-4,415	133,742
	EM-SILC		7,026	3,619	1,253	104,949

Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones.

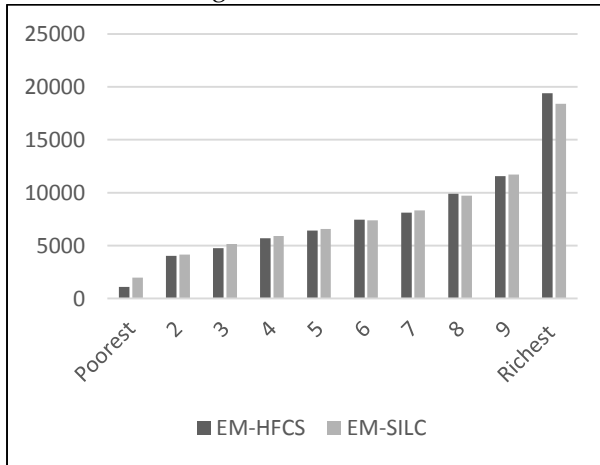
Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.15.3 indicates that original & pension income is higher in EM-HFCS. The difference between both datasets equals more or less €100. This difference decreases slightly to €80 in disposable income. Mean benefits, taxes and social insurance contributions are also higher in EM-HFCS, which is the result of higher original incomes.

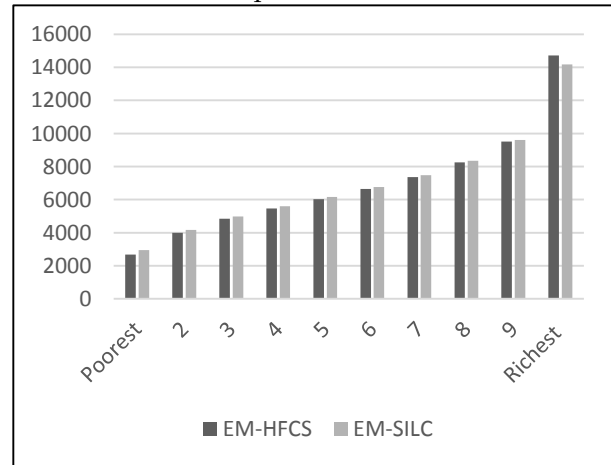
Next, Figure A.15.1 panel a and b present the mean values of original and disposable income across quintiles of disposable income. The mean values of the income variables correspond well. Mean incomes are on average higher for EM-HFCS, which could be the result of oversampling the wealthy. The same story goes for the distribution of benefits, taxes and social insurance contributions (panel c, d and e).

Figure A.15.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Slovakia.

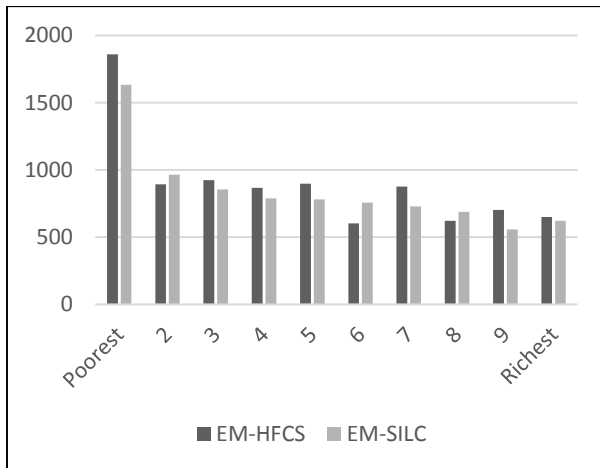
Panel a: Mean original income



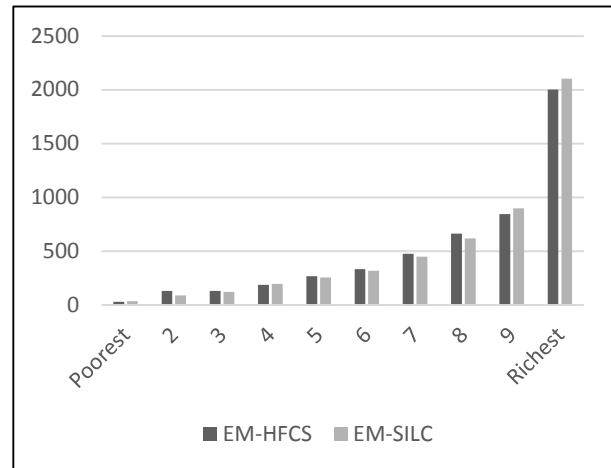
Panel b: Mean disposable income



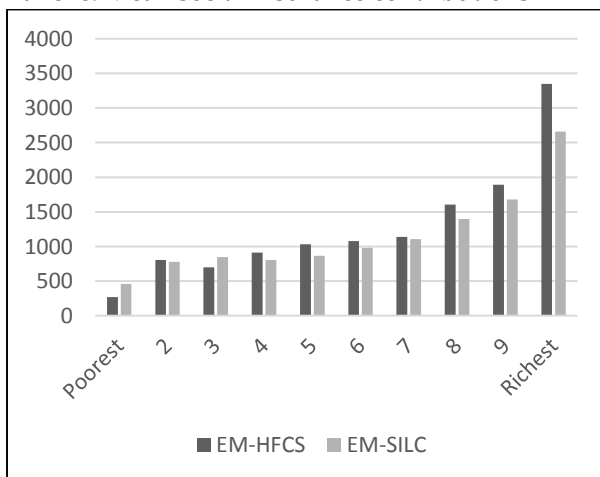
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.15.5 Macro-validation of new EUROMOD policies

Table A.15.4 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.15.5 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.15.4 Number of eligible cases for wealth taxes, Slovakia.

	Eligible cases	2012		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	1,879	1,863	1,594,174	1,863	1,594,174

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.15.4 shows that the number of final taxpayers is slightly lower in comparison to the number of eligible cases. 16 cases in the input data do not have a value on the purchase value/year of their main residence. There is information available about their other owned properties. However, these properties are not belonging to the category “houses & apartments”. Since we can only simulate the construction and apartment tax in EUROMOD these properties cannot be taxed. Hence, they are not included in the simulation.

Table A.15.5 Validation of simulated wealth tax revenues (in million euro), Slovakia.

		EM-HFCS	External	Ratio
Real property tax	2013	39.96	105.0 (1)	38.06%
	2017	36.31	115.0 (1)	31.57%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

Following Table A.15.5 the real property tax seems to be underestimated for both policy years. This can be explained by a number of reasons. First of all, we are only able to properly simulate the tax for main residences. We have to use an approximation for the taxation of “other properties”. Second, we use average tax rates for 2013 and 2017. The simulated revenue for 2017 is lower in comparison to 2013 and can at least be partially explained by the fact that we use the average tax rate of 2015. The aforementioned shortcomings result in less accurate simulations.

A.16 Slovenia

A.16.1 Description of wealth taxes

A.16.1.1 New EUROMOD policies

Real property tax ("davek od premoženja")

Description:

The Slovenian property tax system consists of two types of duties on the possession of real property: the charge for the use of building land and the property tax (Ministry of finance, 2013; 2018).

The *charge for the use of building land* is levied on vacant and constructed building land possessed by legal persons and individuals. The charge is set by local communities for vacant building land based on the area of the building land planned for the building, and for constructed building land based on the useful area of the residential house or business premises (Ministry of finance, 2013; 2018).

The *property tax* is levied on premises such as buildings and parts of buildings, including apartments, garages and secondary homes. The tax needs to be paid by the owner of the property. The criteria for the taxable base are determined by the government and local communities. The tax rate depends on the type of property and its value and has a progressive structure with six tax brackets and seven tax rates.¹¹ Buildings with a surface of less than 160 square meters are exempted from this tax. A taxpayer with more than three family members, who live in the owner's house, is entitled to a reduction of 10% (Ministry of finance, 2013; 2018).

There is a temporary exemption for 10 years to taxpayers who own a newly constructed building or repaired or renovated the building, if the value of these buildings has increased as a result of renovation by more than 50%. Business premises used by the owner or user for business activity are exempted from the real property tax.

Assumptions:

- For the temporary exemption for renovated buildings, we assume that all buildings for which the current value is at least twice the amount of the purchase value are repaired or renovated buildings.

Aspects of the policy that were not implemented:

- The charge for the use of building land could not be simulated because the tax is determined by local communities in absolute amount for each tax object.
- Exemptions from the real property tax that could not be simulated are buildings used for agricultural purposes and cultural or historical monuments.
- The exemption for buildings with a surface of less than 160 square meters could not be simulated for other buildings than the main residence.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

¹¹ Tax rates for 2013 can be found at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV11462>, and those for 2017 at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=PRAV12979>.

Real property transfer tax ("davek na promet nepremičnin")

Description:

For the tax on the transfer of property the taxable person is in general the seller of the property, the tax rate is 2% of the tax base and the tax base is the selling price of the property (Ministry of Finance, 2013; 2018).

Assumptions:

- The tax is only levied when if VAT has not been charged on the transfer. We assume that is always the case.
- We don't have information about who is the seller of the properties. Therefore, we simulate the policy as if it is the buyer who is the taxpayer of the real property transfer tax.

Aspects of the policy that are not implemented:

- When the real property is sold by public auction in a procedure of enforcement, the tax base equals the selling price achieved at auction less the property transactions tax included in the price.
- The transfer of a title on the property for which value-added tax has already been charged is not considered as a transfer of property. Establishment or transfer of the right of superficies for which value-added tax has already been paid is not subject to this tax.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Inheritance and gift tax ("davek na dediščine in darila")

Description:

The tax is paid by individuals or legal persons of private law who have received property in the form of inheritance or gifts – both immovable or movable properties. Movable property received is not subject to the tax if it does not exceed the value of €5,000 (Ernst and Young, 2013a; 2017). The inheritance and gift tax are levied progressively. The tax rates depend on the taxable value of the property and on the beneficiary's relationship to the deceased or donor (Ernst and Young, 2013a; 2017).

The tax base of inherited or given property is the value after deduction of debts and other liabilities. For real estate this value is set at 80% of the generalized market value set by mass valuation or at the market value set by an individual valuation; for movable property, except money, this value is set as the market value.

Beneficiaries are divided into four categories: (1) spouses, children and their spouses, and stepchildren; (2) parents and siblings and their descendants; (3) grandparents and (4) all others. Beneficiaries who are part of the first category are not subject to inheritance or gift tax. The rates for the second class range from 5% to 14%, for the third class from 8% to 17%, and for the fourth class from 12% to 39% (Ernst and Young, 2013a; 2017)¹².

Assumptions:

- In HFCS there is only information about inheritances and gifts received from (1) maternal grandparents, (2) paternal grandparents, (3) parents, (4) children, (5) other relatives and (6) others. Starting from this information, we created four categories:
 - o Category 1: those received from parents (HFCS category 3);
 - o Category 2: those received from children (HFCS category 4);
 - o Category 3: none of the HFCS categories;

¹² The detailed tax rates and tax brackets are found in the Law on tax on inheritances and gifts (ZDDD; <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4705>) and European Commission (2014).

Category 4: those received from maternal and paternal grandparents, other relatives and others (HFCS categories 1,2 5 & 6).

Aspects of the policy that were not implemented:

- Beneficiaries who inherit or receive a residence, and who have no other residence and were living in the household of the deceased or donor at the time of the death or gift, are not subject to inheritance or gift tax;
- Exempted from the inheritance and gift tax are (1) farmers who inherit agricultural land or the entire farm and (2) legal persons of private law, established for religious, humanitarian, educational, cultural, charitable and certain other activities.

Changes after the income reference year (only those relevant for 2017 policy): n/a

A.16.1.2 Refinement of existing EUROMOD policies

Taxation of income from financial assets

Description:

Income from financial assets is taxed separately at 25%. With HFCS we can include the tax-free amount of €1,000 for interests on deposits (article 132 in the income tax act¹³).

Aspects of the policy that were not implemented:

- The tax rate of 25% decreases with every five years of ownership: to 15% after 5 years, 10% after 10 years and 5% after 15 years (article 133 of the income tax act).

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Taxation of rental income

Description:

Rental income is part of taxable income. A standard amount of 10% of the income can be deducted as an expense. 90% of rental income is added to the taxable income list.

Assumptions: n/a

Aspects of the policy that were not implemented: n/a

Changes after income reference year (only those relevant for 2017 policy): n/a

A.16.2 Uprating of monetary variables

An overview of how the monetary variables are uprated is presented in Table A.16.1. They are all uprated with figures from Eurostat. For the non-financial variables, we used the following uprates: for the variables "amr" (the current value of the main residence) and "amrpv" (the purchase value of the main residence) we made use of the gross stock of dwellings, for other buildings ("aob", "aob01-02" & "aobpv01-02") we used the gross stock of other buildings than dwellings, vehicles ("avh") are uprated with the financial consumption of the households on transport, valuables ("avl") are uprated with the gross capital formation and "asb" (self-employed business assets) is uprated with the stock of machinery, equipment, weapons systems, and intellectual property products. The financial assets are uprated as follows: "adp" (deposits) with the stock of transferable and other deposits, "amf" (mutual funds) and "ama" (managed accounts) with the stock of investment fund shares, "abd" (bonds) with the stock of debt securities, "apb" (non-self-employment private business) with the stock of unlisted shares and other equity, "ash" (shares) with the stock of listed shares, "app" (private pension) with the stock of life insurance, annuity entitlements and pension entitlements, "aot" (others) with the stock

¹³ Source: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4697>

of non-life insurance technical reserves and other accounts receivable/payable and "adb" (debt) with the stock of total liabilities. For the variables concerning inheritances and gifts ("aihimvr", "aihmbvr", "aihmrvr", "aihvr", "agiimvr", "agimbvr", "agivr", "agimrvr") the tax revenues of capital transfers are used for the uprating.

Table A.16.1 Overview of uprating indices used for uprating wealth variables in EUROMOD, Slovenia.

Uprate index	Variables uprated by the index	Value 2013	Value 2017 ¹	Source
\$f_amr	amr, amrpv	38.62	38.42	Dwellings, in billion euro (1) ³
\$f_aob	aob, aob01-02, aobpv01-02	3.2	3.24	Other buildings, in billion euro (1) ³
\$f_avh	avh	3.34	3.64	Financial consumption expenditure of households: transport (2)
\$f_avl	avl	7.06	8.35 ²	Gross capital formation (3) ⁴
\$f_asb	asb	2.66	2.6	Machinery, equipment, weapons systems and intellectual property products, in billion euro (1) ³
\$f_adp	adp	15.3	17.47	Transferable & other deposits, in billion euro (4)
\$f_amf	amf, ama	1.14	1.59	Investment fund shares, in billion euro (4)
\$f_abd	abd	0.31	0.13	Debt securities, in billion euro (4)
\$f_apb	apb, ydv	6.68	7.7	Unlisted shares and other equity, in billion euro (4)
\$f_ash	ash	1.44	1.31	Listed shares, in billion euro (4)
\$f_app	app	2.63	3.11	Life insurance, annuity entitlements and pension entitlements, in billion euro (4)
\$f_aot	aot	3.2	2.81	Non-life insurance technical reserves and other accounts receivable / payable, in billion euro (4)
\$f_adb	adb	12.25	12.62	Total financial liabilities, in billion euro (4)
\$f_aih	aihimvr, aihmbvr, aihmrvr, aihvr	7.8	8.4	Tax revenues on capital transfers, in million euro (5) ⁴
\$f_agi	agiimvr, agimbvr, agivr, agimrvr	7.8	8.4	Tax revenues on capital transfers, in million euro (5) ⁴

Note: All stock variables refer to situation at the end of the year. ¹ Values of 2017 refer to 2016, unless otherwise indicated. ² Figures refer to 2017. All values are at household level (S14) unless otherwise indicated. ³ Figures are about households and non-profit institutions serving households (S14_S15). ⁴ Total economy.

Source: (1) Balance sheet for non-financial assets (Eurostat, 2017b); (2) Final consumption expenditure of households by consumption purpose (Eurostat, 2017c); (3) GDP and main components (output, expenditure and income) (Eurostat, 2017d); (4) Balance sheets for financial assets (Eurostat, 2017a); (5) Main national tax aggregates (Eurostat, 2017e).

A.16.3 Comparison of socio-demographic characteristics

Table A.16.2 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, income reference year, Slovenia.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	Proportion
Age	< 16	15.1	16.5	15.14
	16 - 29	16.2	17.2	17.36
	30 - 44	19.9	22.4	22.42
	45 - 64	30.8	28.7	28.55
	65 - 99	18	15.2	16.52
Gender	Female	50.4	50.4	50.51
	Male	49.6	49.6	49.49
Education	Not completed primary education	9.5	12.8	11.71
	Primary education	6.7	5.2	6.28
	Lower secondary education	18.5	17.2	21.22
	Upper secondary education	48.6	47.1	45.78
	Post-secondary (non-tertiary) education	-.1	-.1	-.1
	Tertiary education	16.7	17.6	15.01
Economic status	Pre-school	6.6	6.4	6.10
	Farmer	-.1	-.1	-.1
	Employer or self-employed	4.8	4.1	3.88
	Employee	31.8	35.5	36.89
	Pensioner	27.4	24.9	24.48
	Unemployed	8.6	8.3	5.31
	Student	17.6	19.1	17.00
	Inactive	0.3	0.3	
	Sick or disabled	0.6	0.5	6.34
	Other	2.3	1.1	
	Family worker	0.2	-.1	-.1
Marital status	Single (never married)	48.18	47.2	47.44
	Married	40.3	40.8	39.96
	Separated	-.1	-.1	-.1
	Divorced	2.9	5.3	5.52
	Widowed	8.6	6.7	7.08
Tenure status	Owner paying mortgage	10.8	8.4	-.1
	Outright owner	66.7	67.8	-.1
	Tenant or subtenant paying rent at prevailing or market rate	10.0	5.5	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	3.0	-.1
	Accommodation is socially rented	-.1	-.1	-.1
	Accommodation is rented for free	12.5	15.3	-.1

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

In table A.16.2 a comparison of the socio-demographic variables in EM-HFCS and EM-SILC is made. Overall, the characteristics of the sample in both databases are highly similar, except for educational level and the tenure status. While EM-HFCS has a higher share of individuals that have completed primary or secondary education, EM-SILC has a higher number of individuals that have not completed yet primary education or for which the highest level of education is tertiary education.

A.16.4 Micro-validation of income concepts

Table A.16.3 gives a comparison of the overall income concepts of EM-HFCS and EM-SILC. Original & pension income and disposable income are considerably higher in EM-SILC than in EM-HFCS, by about €3,300 and €3,000, respectively. Mean taxes and social insurance contributions are also higher in EM-SILC than in EM-HFCS, which is the result of the higher original incomes.

Table A.16.3 Comparison of overall EUROMOD income concepts of EM-HFCS vs EM-SILC, Slovenia income reference year.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	11,436	10,390	-5,532	247,206
	EM-SILC	14,731	10,546	-1,586	155,352
Benefits	EM-HFCS	980	1,424	0	12,000
	EM-SILC	1,957	2,406	0	21,895
Taxes	EM-HFCS	874	2,708	0	87,761
	EM-SILC	1,273	2,222	0	41,625
Social insurance contributions	EM-HFCS	1,955	2,356	0	54,633
	EM-SILC	2,690	2,398	0	30,392
Disposable income	EM-HFCS	9,587	5,445	2,891	104,812
	EM-SILC	12,648	5,918	447	87,016

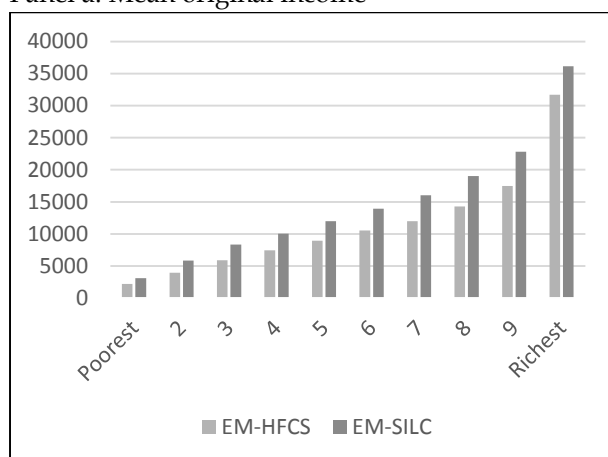
Note: Incomes are equivalised using the "OECD-modified scale". Presented values are the weighted ones.

Source: own calculations based on EM-HFCS and EM-SILC.

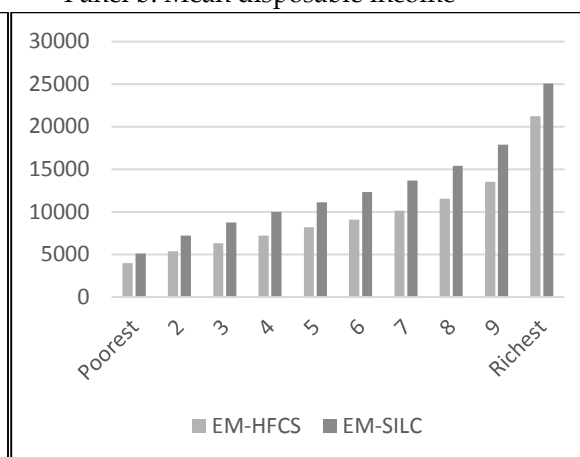
Next, we present the distribution of the income concepts from Table A.16.3 across disposable income deciles. Figure A.16.1 panels a, b, d and e show the distribution of original & pension income, disposable income, taxes, and social insurance contributions, respectively. The mean values of all these income concepts are higher in EM-SILC than in EM-HFCS, and this for all deciles. Figure A.16.1 panel c shows the distribution of benefits, which is quite similar for the lowest half of the distribution of both datasets. The four highest deciles are higher in EM-SILC than in EM-HFCS.

Figure A.16.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Slovenia.

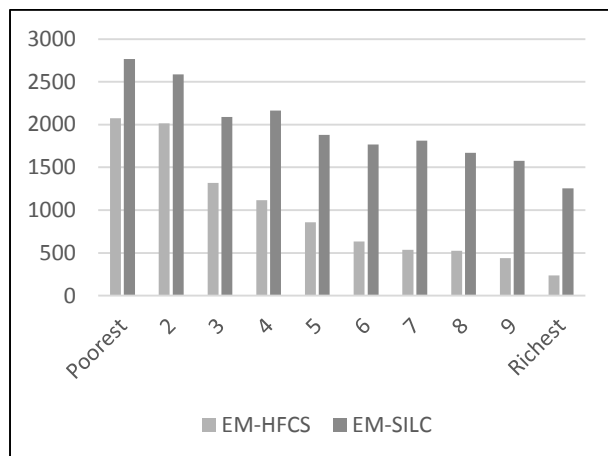
Panel a: Mean original income



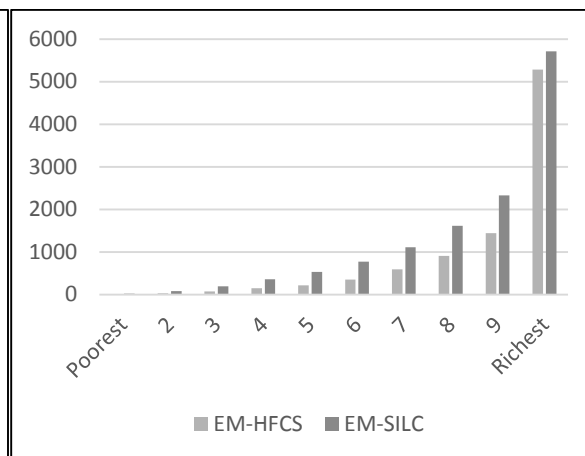
Panel b: Mean disposable income



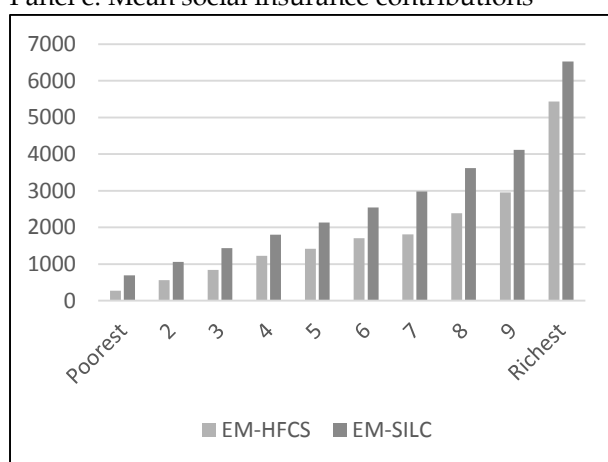
Panel c: Mean benefits



Panel d: Mean taxes



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.16.5 Macro-validation of new EUROMOD policies

Table A.16.4 summarizes the number of eligible cases in the sample and the final number of taxpayers for the simulated real property tax. Subsequently, Table A.16.5 presents a comparison of the simulated tax revenues with external figures.

Table A.16.4 Number of eligible cases for wealth taxes, Slovenia.

	Eligible cases	2013		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	2,066	206	74,469	224	79,900
Real property transfer tax	15	15	4,350	15	4,350
Inheritance and gift tax	49	2	305	2	305

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

The real property tax for 2012 is very highly underestimated (a ratio of about 20%; see Table A.16.5). A possible reason for this is that we could not simulate the charge for the use of building land. The overestimation of the real property transfer tax can possibly be explained by the fact that we could not simulate the exemption for those transactions on which VAT is already paid. The overestimation of the inheritance/gift tax can be explained by the fact that for both years there are only two cases on which these simulations are based.

Table A.16.5 Validation of simulated wealth tax revenues (in million euro), Slovenia.

	Year	EM-HFCS	External	Ratio
Real property tax	2013	38.56	199 (1)	19.38%
	2017	41.86	211 (1)	19.84%
Real property transfer tax	2013	34.98	23 (1)	152.09%
	2017	34.96	32 (1)	109.25%
Inheritance/gift tax	2013	0.86	7 (1)	12.29%
	2017	0.94	8 (1)	11.75%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

A.17 Spain

A.17.1 Description of wealth taxes

A.17.1.1 New EUROMOD policies

Real property tax (“Impuesto sobre bienes inmuebles”)

Description:

A real property tax is levied on real properties located in Spain and are due by the owner of the property. The cadastral value of the property is used as tax base for the calculation of the property tax. Tax rates differ between municipalities, which can set these rates within the limits provided in the national tax legislation, and also depend on the type of property. More specifically, urban properties are taxed at a minimum rate of 0.40% and a maximum rate of 1.10%. For rural properties the minimum and maximum tax rates equal 0.30% and 0.90%, respectively. Certain properties, such as properties owned by the central government, Spanish Red Cross, etc. are exempt from taxation (Ernst & Young, 2014; Kuypers et al., 2017).

Assumptions:

- We cannot make a distinction between rural and urban areas in HFCS. Since urban areas include on average more houses, we assume the majority of houses to be taxed as urban properties.
- We use the average tax rate of 0.75% as mentioned by Ernst & Young (2014).

Aspects of the policy that were not implemented:

- Higher tax rates that can be set by municipalities, e.g. in case they are the capital of an autonomous region.
- The capital gains tax on urban land (impuesto sobre el increment de valor de terrenos de naturaleza urbana) due to insufficient information.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

Real property transfer tax (“Impuesto sobre transmisiones patrimoniales onerosas”)

Description:

The acquisition of real property is subject to taxation in Spain. The tax is levied on the fair market value of the property, i.e. market value minus burdens which reduce its value. The general tax rate equals 6%. However, regional authorities can decide to set another tax rate as long as it varies between 6% and 11%. Certain properties such as buildings owned by the national government or Spanish Red Cross are exempt from taxation (Ernst & Young, 2014). In addition to the “regular” transfer tax there is also a tax on documents that register the transfer of real property, which was equal to 1% in 2010 (Ernst & Young, 2014; European Commission, 2018).

Assumptions:

- HFCS does not include regional information such that we apply an average tax rate that is set by the Autonomous Regions, i.e. 7% in 2010 (de la Fuente, 2013).

Aspects of the policy that were not implemented:

- Under certain circumstances the transfer tax is also levied in case of the transfer of shares from real property companies.

Changes after the income reference year (only those relevant for the 2017 policy):

- Change in tax rates (see <https://www.fiscal-impuestos.com/guia-fiscal-2015-capitulo-5-itp-ajd-normativa-comunidades-autonomas.html>).

Assumptions 2017:

- We calculated a new weighted average tax rate for 2017 based on the tax rates set by the autonomous regions in 2015, as this was the most recent information we could find. For 2017 this corresponds to a tax rate of 8.20% on the fair market value of the property. The tax on the documents that register the transfer also increased to 1.5% (de la Fuente, 2017).

Inheritance and gift tax (“Impuesto sobre sucesiones y donaciones”)

Description:

The acquisition of property through inheritance or *inter vivos* gifts is subject to taxation and is due by the inheritor or beneficiary of the gift. The tax is levied on the market value of the inherited/received assets, i.e. the value of these assets minus burdens which can decrease its value. A certain amount is tax deductible depending on the relationship between the deceased/donee and inheritor/beneficiary (Kuypers et al., 2017). More concretely, there exist four different groups:

- All children (both natural & adopted) under 21 years;
- All children older than 21 years, grandchildren, parents, grandparents, spouses and partners of a registered partnership;
- Family in-law and their ascendants/descendants, stepchildren, siblings, nieces/nephews and aunts/uncles;
- All other individuals.

After taking into account the tax deduction, the following tax rates are applied to the tax base:

Table A.17.1 Inheritance and gift tax rates, Spain.

Lower limit	Upper limit	Tax rate
€0	€7,993.46	7.65%
€7,993.46	€15,980.91	8.50%
€15,980.91	€23,968.36	9.35%
€23,968.36	€31,955.81	10.20%
€31,955.81	€39,943.26	11.05%
€39,943.26	€47,930.72	11.90%
€47,930.72	€55,918.17	12.75%
€55,918.17	€63,905.62	13.60%
€63,905.62	€71,893.07	14.45%
€71,893.07	€79,880.52	15.30%
€79,880.52	€119,757.67	16.15%
€119,757.67	€159,634.83	18.70%
€159,634.83	€239,389.13	21.25%
€239,389.13	€398,777.54	25.50%
€398,777.54	€797,555.08	29.75%
€797,555.08	Above	34.00%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

Note that Autonomous Regions can set different taxes as long as they do not increase the overall tax burden (Ernst & Young, 2014; see tax legislation <https://www.boe.es/buscar/doc.php?id=BOE-A-1987-28141>).

The tax liability is also subject to multipliers depending on the relationship between the deceased/donee and inheritor/beneficiary and the wealth of the recipient prior to the transfer (see Table A.17.2) (Kuypers et al., 2017).

Table A.17.2 Inheritance and gift tax multipliers, Spain.

Net worth of donee		Group 1 and 2	Group 3	Group 4
From	To			
€0	€402,678.11	1.0000	1.5882	2.0000
€402,678.11	€2,007,380.43	1.0500	1.6676	2.1000
€2,007,380.43	€4,020,770.98	1.1000	1.7471	2.2000
€4,020,770.98	...	1.2000	1.9059	2.4000

Source: EWIGE – European Wealth data InteGration in EUROMOD. JRC Working Papers on taxation and Structural Reforms No 4/2017 (Kuypers et al., 2017).

Assumptions:

There is no information available in HFCS on the region of residence. We made a comparison between the tax legislation of the four biggest Autonomous Regions, i.e. Andalusia, Catalonia, Madrid and Valencia. Tax legislation of Andalusia and Valencia are highly similar to the national legislation. The Catalanian legislation deviates quite strongly for certain tax parameters. Therefore, we decided to use the national tax legislation for 2010 and 2017, given that these are quite resembling to the legislation of Andalusia and Valencia.

Aspects of the policy that were not implemented:

- Inheritances/ gifts between spouses or legal cohabitants.
- Tax exemptions for inhabitants of Ceuta and Melilla.
- Tax reduction in case the same assets are transferred two or more times within a period of 10 years.

Changes after the income reference year (only those for the 2017 policy): n/a

Net wealth tax (“Impuesto sobre el patrimonio”)

Description:

Net wealth ownership of individuals is taxed on a yearly basis in Spain. The net wealth tax existed until it was abolished in 2008. It was reintroduced in 2011 and still exists up until now. The tax base is net wealth, i.e. the difference between the value of assets and rights and the value of liabilities which may decrease its value. The tax is due by the owner of the taxable wealth and depends on whether the individual is a resident in Spain. Residents are taxed on their whole net wealth, i.e. irrespective of where they are located. In case of non-residents the net wealth tax is only levied on the assets that are situated in Spain (Ernst & Young, 2014; Kuypers et al., 2017; see Tax legislation <https://www.boe.es/buscar/act.php?id=BOE-A-1991-14392&tn=1&p=20161203>). The tax bands and rates are summarized in Table A.17.3.

Table A.17.3 Net wealth tax rates, Spain.

Lower band	Upper band	Tax rate
€0	€ 167,129.45	0.20%
€ 167,129.45	€ 334,252.88	0.30%
€ 334,252.88	€ 668,499.75	0.50%
€ 668,499.75	€ 1,336,999.51	0.90%
€ 1,336,999.51	€ 2,673,999.01	1.30%
€ 2,673,999.01	€ 5,347,998.03	1.70%
€ 5,347,998.03	€ 10,695,996.06	2.10%
€ 10,695,996.06	Above	2.50%

Source: Cross-country review of taxes on wealth and transfers of wealth (Ernst & Young, 2014).

There is a general tax allowance of €700,000 for Spanish residents. Other exemptions are among other things the household main residence up to €300,000, intellectual property rights, household belongings and so forth. The local government is the competent authority (Ernst & Young, 2014; Kuypers et al., 2017; see Tax legislation <https://www.boe.es/buscar/act.php?id=BOE-A-1991-14392&tn=1&p=20161203>).

Assumptions: n/a

Aspects of the policy that were not implemented:

- HFCS only includes information on the wealth of Spanish residents, such that the taxation of wealth held by non-residents in Spain cannot be implemented.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.17.1.2 Refinement of existing EUROMOD policies

Tax exemption for dividends

Description:

In Spain, dividends are not subject to taxation up to a maximum annual amount of €1,500 (see Tax legislation <https://www.boe.es/buscar/act.php?id=BOE-A-2006-20764&b=5&tn=1&p=20061129>). The exemption was in force until 2015, where after it was abolished. This deduction is currently not included in EUROMOD, but can be added with HFCS.

Assumptions:

- Dividend income is imputed based on total investment income, the stock of shares and the average rate of return on shares.

Aspects of the policy that were not implemented: n/a

Changes after the income reference year (only those relevant for the 2017 policy):

- Abolished in 2015.

Taxation of income from real property

Description:

The (fictive) income received from immovable property (main residence not included) is subject to taxation. The taxation depends on whether the real property is rented out or not. In case of the former, the received rental income is taxed. The tax base used for the calculation of the tax is the received rental income reduced with 50% or reduced with 100% in case the tenant is between 18 and 35 years and his/her net income from labour is in the tax period higher than the public indicator on income of different purposes. In case of the latter, the tax is applied to an imputed annual income. This income is determined as 2% of the cadastral value, or 1.1% if the cadastral value has been adjusted after

1/1/1994 (Kuypers et al., 2017; see Tax legislation <https://www.boe.es/buscar/act.php?id=BOE-A-2006-20764&b=5&tn=1&p=20061129>). The taxation of (fictive) rental income is currently not included in EUROMOD, but can be added with HFCS.

Assumptions:

- We assume that the majority of the cadastral values has been adjusted after 1/1/1994 and therefore we apply the rate of 1.1% (see http://www.catastro.minhap.gob.es/esp/estadisticas_7.asp).

Aspects of the policy that were not implemented:

- We do not have information on the tenant of real properties and therefore we do not implement the special case in which rental income is reduced by 100%.

Changes after the income reference year (only those relevant for the 2017 policy):

- Since 2011 the rental income can be reduced by 60% (Ernst & Young, 2013b).

Mortgage tax credit for main residence

Description:

Up until 2012, investment in the purchase or renovation of the mains residence was deductible from the personal income tax. All costs related to the purchase or renovation (including capital and interest mortgage repayments) are included in the deductible basis. 15% of those costs can be deducted up to a maximum amount of €9,015. In other words, the maximum tax credit equals €1,352.26. The tax deduction can also be received for amounts deposited in a special account with the aim of saving to acquire or renovate a first residence. The actual purchase does, however, have to take place maximum four years later. If the residence was purchased before January 20th 2006 an additional 5% is deductible on the first €4,507.59 (Kuypers et al., 2017; see Tax legislation <https://www.boe.es/buscar/act.php?id=BOE-A-2006-20764&b=5&tn=1&p=20061129>). The additional deduction in case a residence was purchased before 2006 is not included in EUROMOD, but can be added with HFCS.

Assumptions:

- In order to be eligible for the tax credit you need to occupy the main residence for at least three years. We assume the condition to be fulfilled.
- We only know the year of property acquisition and not the day and month. We assume all residences that were purchased until 2005 to be eligible for the additional deduction.

Aspects of the policy that were not implemented:

- Special rates for the region of Catalonia.
- Tax credit for amounts deposited in a special account with the aim to acquire or renovate a the first residence.
- Deduction for costs incurred to make the residence suitable for disabled individuals.

Changes after the income reference year (only those relevant for the 2017 policy):

- In 2011 the maximum amount increased from €9,015 to €9,040 per year (Adiego et al., 2016).
- The additional tax rate of 5% that was granted if a residence was bought before January 20th 2006 was abolished in 2012 (Adiego et al., 2013).

- The mortgage tax credit is no longer in effect since 2013 for individuals who bought their residences after January 1st of that year (Agencia Tributaria, 2017a). The tax credit is still grandfathered for existing beneficiaries.

Asset-test of “Complementary benefit to non-contributory pensions due to housing rent”

Description:

Pensioners who receive a non-contributory old-age benefit are eligible for a complementary benefit if they are living in a rented house or apartment and if they do not own any other real property and are not related to the owner of the house or apartment they are living in. The benefit equals €525 per year in 2012 (see http://www.imserso.es/imserso_01/prestaciones_y_subvenciones/solicitud_complemento_titulares_pnc_en_vivienda_alquilada/index.htm). With HFCS we can add the condition that a pensioner may not own any other real property.

Assumptions: n/a

Aspects of the policy that were not implemented:

- We do not know if there is a relationship between the tenant and the owner of the property.

Changes after the income reference year (only those relevant for the 2017 policy): n/a

A.17.2 Uprating of monetary variables

An overview of how the amounts are uprated is presented in Table A.17.4. First, the main asset variables are uprated based on their aggregates as reported by the Agencia Tributaria (2017b). The variables “amr”, “aob”, “amrpv”, “aobpv01-03” are uprated based on the gross stock of buildings and structures. Vehicles (“avh”) and valuables (“avl”) are both uprated with the gross stock of valuables since personal transport equipment is also included in this category. Self-employment business (“asb”) is uprated based on the gross stock of machinery & equipment and intellectual property rights. Second, financial assets are uprated based on their size as reported in the balance sheets for financial assets by Eurostat (2017a). Deposits (“adp”) are uprated with the total stock of transferable and other deposits, mutual funds (“amf”) and managed accounts (“ama”) with the stock of investment fund shares, shares (“ash”) with the stock of listed shares, private pensions (“app”) with the stock of life insurance and pension entitlements, other assets (“aot”) with the stock of non-life insurance technical reserves and other accounts and debt (“adb”) with the total stock of liabilities. Thirdly, due to missing information, we uprated the inheritance and gift variables (“aihvr”, “agiimvr”) with the tax revenue of the inheritance tax as reported in the OECD Tax Revenue Database (OECD, 2017a). Net wealth (“anw”) is uprated based on the reported figure by the Spanish Central Bank (Banco de España, 2017). Finally, the aggregate variables financial assets (“ape”) and real assets (“ara”) are uprated based on their components.

Table A.17.4 Overview of uprating indices used for wealth variables in EUROMOD, Spain.

Uprate index	Variables uprated by the index	Value 2010	Value 2017	Source
\$f_amr	amr, aob, amrpv, aobpv01-03	72,815.0	127,713.0	Gross stock of buildings and structures, in million euro (1) ^{1,2,3}
\$f_avh	avh	544.199	739.458	Stock of personal transport equipment, in million euro (1) ^{1,2,3}
\$f_avl	avl	544.199	739.458	Stock of other durables, in million euro (1) ^{1,2,3}
\$f_asb	asb	19.631	29.702	Stock of machinery & equipment and intellectual property products, in million euro (1) ^{1,2,3}
\$f_adp	adp	731,362.0	778,682.0	Stock of transferable & other deposits, in million euro (2)
\$f_amf	amf, ama	131,052.0	309,086.0	Stock of investment fund shares, in million euro (2)
\$f_abd	abd	49,246.0	22,710.0	Stock of debt securities, in million euro (2)
\$f_apb	apb	295,946.0	416,573.0	Stock of unlisted shares and other equity, in million euro (2)
\$f_ash	ash	91,403.0	125,124.0	Stock of listed shares (domestic & other), in million euro (2)
\$f_app	app	109,295.0	160,151.0	Stock of life insurance and pension entitlements, in million euro (2)
\$f_aot	aot	76,592.0	60,241.0	Stock of non-life insurance technical reserves and other accounts, in million euro (2)
\$f_adb	adb	948,259.0	769,126.0	Stock of total liabilities, in million euro (2)
\$f_aih	aih	2,425.0	2,676.0	Revenue inheritance tax, in million euro (4) ²
\$f_agi	agi	2,425.0	2,676.0	Revenue gift tax, in million euro (4) ²
\$f_anw	anw	5.443	5.481	Stock of net wealth, in billion euro (3)

Note: All stock variables refer to the situation at the end of the year at the household level, unless indicated otherwise. ¹ The value for 2010 refers to the situation at the end of 2011. ² The value for 2017 refers to the situation at the end of 2016. ³ Refers to stock at levels of autonomous communities. ⁴ Figures for 2017 refer to the situation at the end of 2015.

Source: (1) Statistics of the wealth tax payers (Agencia tributaria, 2017b); (2) Annual Sector Accounts, Balance sheet for financial assets (Eurostat, 2017a); (3) Statistical Bulletin (Banco de España, 2017); (4) Tax Revenue Database (OECD, 2017a).

A.17.3 Comparison of socio-demographic characteristics

Table A.17.5 Comparison of socio-demographic characteristics, EM-HFCS vs. EM-SILC, Spain.

Variable	Category	EM-HFCS	EM-SILC	Census data
		Proportion	Proportion	
Age	< 16	15.96	15.71	16.01
	16 - 29	15.62	16.79	15.77
	30 - 44	25.37	25.94	25.25
	45 - 64	25.88	25.09	25.64
	65 - 99	17.16	16.47	17.32
Gender	Female	50.84	50.57	50.65
	Male	49.16	49.43	49.35
Education	Not completed primary education	12.71	16.28	22.61
	Primary education	30.66	24.22	15.30
	Lowery secondary education	16.23	20.35	23.94
	Upper secondary education	17.78	17.10	16.61
	Post-secondary (non-tertiary) education	-.1	1.90	-.1
	Tertiary education	22.62	20.16	21.54
Economic status	Pre-school	5.63	5.86	6.36
	Farmer	-.1	-.1	-.1
	Employer or self-employed	6.49	6.38	6.07
	Employee	31.35	34.06	30.96
	Pensioner	14.47	12.66	19.40
	Unemployed	13.27	11.19	15.77
	Student	16.58	15.34	12.87
	Inactive	1.02	1.73	
	Sick or disabled	2.11	2.23	7.25
	Other	9.09	10.56	
Marital status	Family worker	-.1	-.1	0.39
	Single (never married)	43.05	43.59	43.52
	Married	45.86	45.69	45.46
	Separated	-.1	1.76	-.1
	Divorced	4.21	2.39	4.69
Tenure status	Widowed	6.87	6.57	6.33
	Owner paying mortgage	32.28	33.18	-.1
	Outright owner	51.08	46.66	-.1
	Tenant or subtenant paying rent at prevailing or market rate	11.27	11.90	-.1
	Accommodation is rented at a reduced rate (below market price)	-.1	2.87	-.1
	Accommodation is socially rented	-.1	-.1	-.1
Accommodation is rented for free	5.37	5.40	-.1	

Note: ¹Data not available.

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC. (1) Census data (European Statistical System, 2017).

Table A.17.5 presents a comparison between some socio-demographic characteristics of the EM-HFCS and EM-SILC sample. In general, the percentages in EM-HFCS are very similar to those in EM-SILC. When looking at education, we notice that EM-SILC covers more individuals who have not (yet) completed primary education, whilst EM-HFCS includes more individuals with primary education as their highest educational level achieved. In EM-HFCS there are no individuals who have achieved a post-secondary education. In EM-SILC this proportion is relatively low. The economic and marital status of the individuals is quite comparable between EM-HFCS and EM-SILC.

A.17.4 Micro-validation of income concepts

Table A.17.6 Comparison of overall EUROMOD income concepts (in € per year), EM-HFCS vs. EM-SILC, income reference year, Spain.

Variable		Mean	Std.Dev.	Min.	Max.
Original & pension income	EM-HFCS	16,883	21,532	-3,993,961	3,878,782
	EM-SILC	15,651	12,278	-5,925	151,908
Benefits	EM-HFCS	1,451	2,495	0	40,000
	EM-SILC	1,731	3,040	-3,975	77,269
Taxes	EM-HFCS	909	3,112	0	709,404
	EM-SILC	1,750	2,972	0	52,122
Social insurance contributions	EM-HFCS	930	818	0	7,520
	EM-SILC	917	805	0	5,255
Disposable income	EM-HFCS	16,495	18,349	-3,994,416	3,680,748
	EM-SILC	14,714	8,914	-1,919	152,060

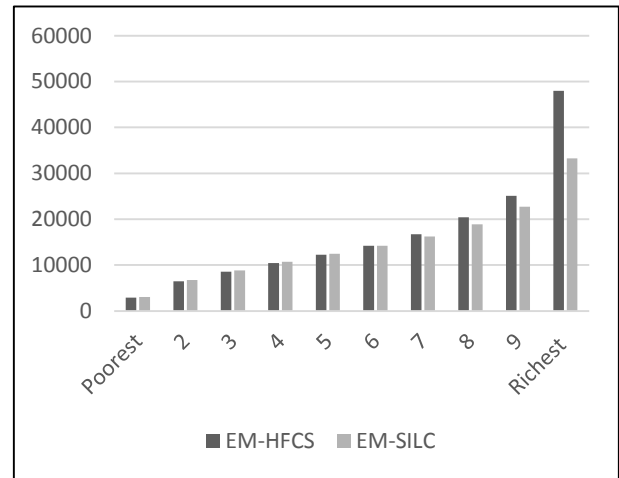
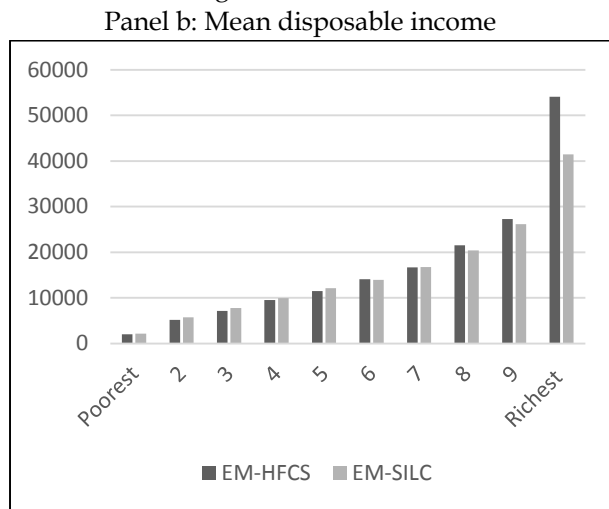
Note: Incomes are equivalised using the “OECD-modified scale”. Presented values are the weighted ones. *Source:* Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

Table A.17.6 indicates that the difference in original and pension income is equal to about €1,230 but increases to approximately €1,780 in disposable income. Yet, the social benefits and taxes in EM-HFCS are lower in comparison to EM-SILC. The fact that the mean and maximum values for the original and disposable income are higher in EM-HFCS may be a result of the oversampling of the wealthy applied in HFCS. In contrast, the maximum value of social benefits is higher in EM-SILC, which can be explained by the fact that EU-SILC is more targeted towards lower incomes.

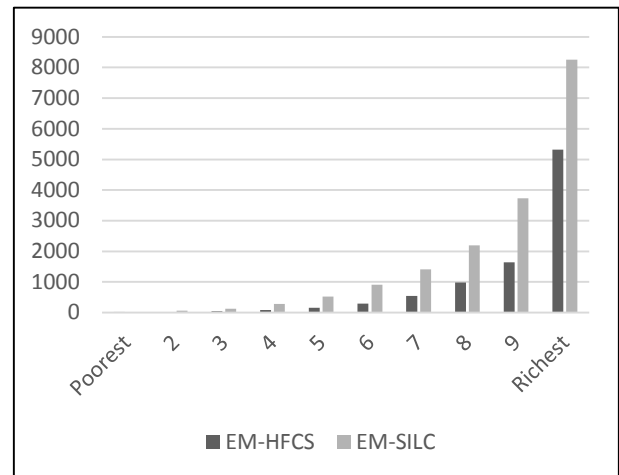
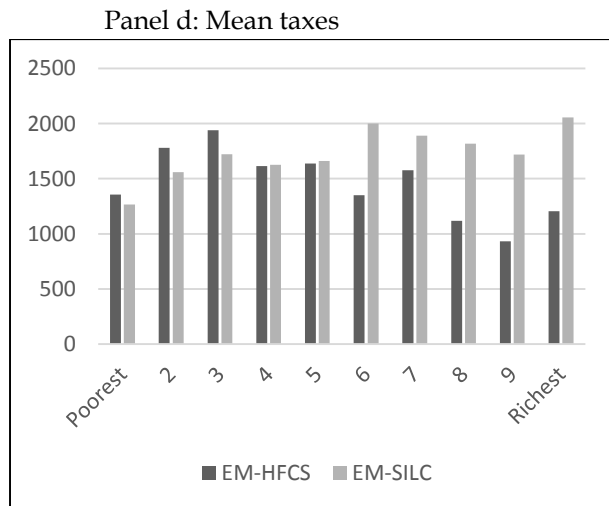
Figure A.17.1 panel a and b present mean values of original and disposable income by disposable income deciles. Up to the ninth decile, mean values of the income-variables correspond well. However, average income in the highest income decile is higher for EM-HFCS. Once again, this could be the result of oversampling the wealthy. Figure A.17.1 panel c, d and e show the distribution of benefits, taxes and social insurance contributions. . The level of benefits simulated in EM-HFCS differs strongly from the social benefits simulated in EM-SILC. EM-HFCS simulates lower amounts of benefits, which can be attributed to the fact that all social benefits apart from pensions and unemployment benefits are captured by a single variable, which likely results in underreporting. On top of that, we are not able to simulate benefits on the regional level for Spain. The distribution of taxes is also slightly different between EM-HFCS and EM-SILC, with higher values for EM-SILC. Finally, the distribution of social insurance contributions is highly similar between both surveys.

Figure A.17.1 Distribution of income concepts across disposable income deciles (in € per year), EM-HFCS vs. EM-SILC, income reference year, Spain.

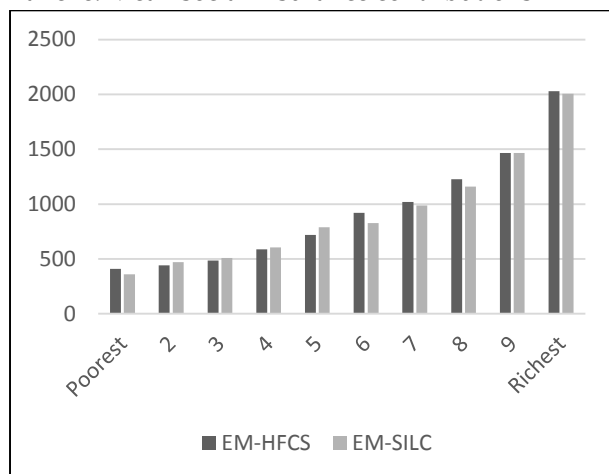
Panel a: Mean original income



Panel c: Mean benefits



Panel e: Mean social insurance contributions



Source: Own calculations based on EUROMOD and micro-data from EM-HFCS and EM-SILC.

A.17.5 Macro-validation of new EUROMOD policies

Table A.17.7 summarizes for the simulated wealth taxes the number of eligible cases in the sample and the final number of taxpayers. Subsequently, Table A.17.8 presents for the simulated wealth taxes a comparison of the simulated tax revenues with external figures.

Table A.17.7 Number of eligible cases for wealth taxes, Spain.

	Eligible cases	2012		2017	
		Taxpayers	Population	Taxpayers	Population
Real property tax	5,586	5,586	15,234,706	5,586	15,234,706
Real property transfer tax	77	77	236,799	77	236,799
Inheritance & gift tax	150	110	237,503	112	240,448
Net wealth tax	10,150	n/a	n/a	1,133	313,698

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS.

Table A.15.6 Validation of simulated wealth tax revenues (in million euro), Spain.

		EM-HFCS	External	Ratio
		Real property tax	2010	10,780
	2017	10,780	13,045 (1)	82.64%
Real property transfer tax	2010	2,979	8,228 (1)	36.21%
	2017	4,826	8,585 (1)	56.21%
Inheritance & gift tax	2010	3,237	2,425 (1)	133.48%
	2017	3,732	2,709 (1)	137.76%
Net wealth tax	2010	n/a	n/a	n/a
	2017	1,490	1,348 (1)	110.53%

Source: Own calculations based on EUROMOD and micro-data from EM-HFCS. (1) Tax Revenue Database (OECD, 2017a).

The simulated tax revenues deviate rather strongly from the external sources, but in general there are good explanations for this. It is important to note that the external statistics are not always available at a detailed level, such that they may not be fully comparable to our simulations. First, the simulated tax revenue of the real estate transfer tax is considerably lower than the tax revenues reported in the Taxes Revenue Database (OECD, 2017a). This stems from the fact that we simulate this transfer tax only for households and transactions related to the purchase or sale of residences, whilst the OECD reports figures for the whole economy and for all financial transactions (e.g. transfer of movables, corporate transactions...). In addition, the number of eligible cases is rather low in comparison to the sample size. Second, for the inheritance & gift tax and the net wealth tax our simulated revenues are higher than reported in the official statistics, mainly because we cannot take into account regional legislation and therefore decided to apply the national legislation. Due to considerable differences in regional legislation, this may result in less accurate simulations.

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