Redistribution in a joint income-wealth perspective: a cross-country comparison

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Sarah Kuypers¹, Francesco Figari², Gerlinde Verbist¹

¹Herman Deleeck Centre for Social Policy, University of Antwerp
²University of Insubria and ISER University of Essex

Abstract

When determining living standards it is increasingly argued that we should give more prominence to the joint distribution of income and wealth. Moreover, given increased levels of inequality in most Western countries over the past decades, many researchers and policymakers have made strong arguments for broadening the taxes on (income from) wealth. However, research on both aspects is scarce due to the lack of appropriate data and methods. By including the Eurosystem Household Finance and Consumption Survey (HFCS) into the tax-benefit microsimulation model EUROMOD we are able to add two novel aspects to the literature on the redistributive effects of tax-benefit systems. First, we evaluate the redistributive effects of tax-benefit systems against the joint distribution of income and wealth instead of income only. Second, we include the analysis of recurrent wealth taxes (i.e. real property and net wealth taxes) and event-based wealth. We analyse all this in a cross-country comparison of Belgium, Finland, France, Germany, Italy and Spain. We show that the more comprehensive joint income-wealth framework of living standards results in considerable reranking of individuals, which in turn leads to a lower redistributive impact than is traditionally considered based on income alone. Moreover, we find that wealth taxes are currently not used to their fullest potential as a redistributive instrument.

Key words: EUROMOD, HFCS, simulations, wealth policies, distributional analysis

JEL Classification: C15, H24, I3

Corresponding author: Sarah Kuypers, Sint-Jacobsstraat 2, 2000 Antwerp, Belgium, sarah.kuypers@uantwerpen.be

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1 Introduction

In the developed world well-being and living standards have traditionally been defined and measured through monthly or yearly income streams. However, it is increasingly acknowledged that other financial resources such as savings and assets also impact living standards in a significant way (Kuypers & Marx, 2016). Savings and assets can serve as a buffer to smooth out consumption during low income periods or to face unexpected costs, but they also provide their owners with a form of economic power because they can be used as collateral to further accumulate wealth (Cowell & Van Kerm, 2015; Azpitarte, 2012). Given the increasing importance of wealth over income (Piketty, 2014), one can even argue that being a capital owner has become the most important determinant of living standards today and even more so in the future. For these and other reasons we should give more prominence to the joint distribution of income and wealth (Jäntti, Sierminska & Van Kerm, 2013; OECD, 2013; Brandolini, Magri & Smeeding, 2010; Stiglitz, Sen & Fitoussi, 2009).

Recently there has been a resurgence in the interest in inequality. Various studies have pointed towards increased inequality in both income and wealth over the past decades in many OECD countries (see e.g. OECD, 2015; Piketty, 2014; Piketty and Saez, 2013). These levels of inequality strongly depend on the redistributive outcomes of the tax-benefit systems in place. Despite the advances made in the living standards literature, the broader way of determining living standards in terms of both income and wealth is hardly translated into policy analysis. Indeed, the redistributive effects of taxes and social transfers are typically evaluated against the distribution of disposable household income, which only provides a partial view. Moreover, the extension of current wealth taxes and the introduction of new ones is often mentioned as a possible way to reduce inequality. However, empirical evidence is largely missing as existing studies do not take into account wealth taxes and policies which are of course also part of the redistributive effort of welfare states (see e.g. Verbist & Figari, 2014; Immervoll & Richardson, 2011; Verbist, 2004; Zandvakili, 1994).

This paper contributes to the literature by adding precisely these two novel aspects to redistributive analyses of tax-benefit systems. First, we use and extend the framework developed in the asset-based poverty literature to evaluate the redistributive effects of tax-benefit systems against the joint distribution of income and wealth instead of income only. Second, we include recurrent wealth taxes (i.e. real property and yearly net wealth taxes) and event-based wealth taxes (i.e. real estate transfer taxes, inheritance and gift taxes) into the analysis of progressivity and redistributive effects of taxation. By enabling an integrated assessment of direct taxes and benefits on both income and wealth against the joint distribution of income and wealth, our analysis allows to focus on the specific situation of households which are asset rich/income poor and vice versa (Hills, 2013). Furthermore, we analyse all this in a cross-country framework by comparing results across six EU countries; namely Belgium, Finland, France, Germany, Italy and Spain. These countries represent a broad range of tax-benefit systems, different types and importance of wealth taxes and important cross-country differences in the distributions of income and wealth as well as their correlation (Arrondel, Roger & Savignac, 2014).
All this is facilitated by the inclusion of the Eurosystem Household Finance and Consumption Survey (HFCS) dataset as an underlying database for the EU-wide tax-benefit microsimulation model, EUROMOD. As the HFCS originally contains only gross income amounts which are not suitable for distributive analysis, its inclusion in EUROMOD allows to derive net incomes by simulating the gross-to-net transition taking into account all important details of the social security and personal income tax system (Kuypers, Figari & Verbist, 2016). Moreover, the policy domains currently covered in EUROMOD are expanded with simulations of existing wealth taxes.

The remainder of this paper is organised as follows. The data and methods are described in Section 2. We discuss the inclusion of the HFCS database into EUROMOD and the extension of the simulations of wealth taxes. In Section 3 we briefly discuss the new joint income-wealth framework which will be extended to redistributive analyses. The empirical results of our newly proposed framework are shown in two steps. First, Section 4 presents how the assessment of the redistributive effects of tax-benefit instruments is altered when evaluated against the joint distribution of income and wealth. Second, the progressivity and redistributive impact of wealth taxes is analysed in Section 5. We also look at how they relate to other redistributive instruments. The last section concludes.

2 Data & methods

2.1 The HFCS data and choice of countries

The Eurosystem Household Finance and Consumption Survey (HFCS) is a new dataset covering detailed household wealth, gross income and consumption information. It is the result of a joint effort of the National Banks of the Euro zone, three National Statistical Institutes and the European Central Bank (ECB). The first wave of the HFCS was made available to researchers in April 2013 and contains ex-ante harmonised information on more than 62,000 households in 15 Euro area member states which were surveyed mostly in 2010 and 2011 (HFCN, 2013a). In this paper we cover 6 countries: Belgium, Finland, France, Germany, Italy and Spain. An overview of their data reference periods and sample sizes is provided in Table 1.

<table>
<thead>
<tr>
<th>Table1: Overview of reference periods and sample sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference period</td>
</tr>
<tr>
<td>Country</td>
</tr>
<tr>
<td>Belgium</td>
</tr>
<tr>
<td>Finland</td>
</tr>
<tr>
<td>France</td>
</tr>
<tr>
<td>Germany</td>
</tr>
<tr>
<td>Italy</td>
</tr>
<tr>
<td>Spain</td>
</tr>
</tbody>
</table>

Source: HFCN, 2013a, p.74

The selection of countries was made such that they represent different types of income and wealth distributions as well as their correlation (Arrondel, Roger & Savignac, 2014, see also Figure 1). They also provide a good representation of a broad range of tax-benefit systems.
and types of existing wealth taxation. They are EU member states with well-developed housing markets, thus presenting good cases for the analysis of housing wealth which is a major component of most households’ wealth. In addition, across the 15 HFCS countries the highest quality and reliability of the data seems to be achieved in these 6 countries. The sample sizes of these countries are among the highest in the HFCS and reliability of the data is known either through an external validation against other sources (e.g. for Belgium see Kuypers, Marx & Verbist (2015)) or because the HFCS survey has been adapted from prior existing and well known surveys covering wealth information (e.g. Spain, France, Finland and Italy).

The HFCS dataset contains some interesting features. In terms of the analysis in this paper, it is particularly interesting that the HFCS oversamples the very wealthy to obtain a better coverage of the top of the wealth distribution, and hence of wealth taxes. This is necessary because there exist large sampling and non-sampling errors as a consequence of the large skewness of the wealth distribution. In particular the wealthiest households are less likely to respond and more likely to underreport, especially in the case of financial assets (Davies et al., 2011). Kennickell (2008) and Bover (2008) argue that on top of its correction for nonresponse oversampling of the wealthy also provides more precise estimates of wealth in general and of narrowly held assets as standard errors are much smaller. However, Vermeulen (2016; 2014) shows that despite the oversampling strategy wealth shares of the top 5 and 1% are still underestimated. This might undermine the potential use of the data to simulate the effects of new recurrent taxes on wealth. Table 2 shows for each of our 6 selected countries the criteria that are used to oversample the wealthy and the effective oversampling rates that are reached. There is no oversampling strategy used in the Italian HFCS, but the final sample still represents 4 per cent more of the top 10% wealthiest households compared to their share in the population.

<table>
<thead>
<tr>
<th>Country</th>
<th>Oversampling top 10%</th>
<th>Oversampling top 5%</th>
<th>Oversampling criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>47 per cent</td>
<td>60 per cent</td>
<td>Average regional income</td>
</tr>
<tr>
<td>Finland</td>
<td>68 per cent</td>
<td>85 per cent</td>
<td>Individual income and socio-economic status from population register</td>
</tr>
<tr>
<td>France</td>
<td>129 per cent</td>
<td>208 per cent</td>
<td>Wealth</td>
</tr>
<tr>
<td>Germany</td>
<td>117 per cent</td>
<td>148 per cent</td>
<td>Taxable income of municipalities or street sections in large municipalities</td>
</tr>
<tr>
<td>Italy</td>
<td>4 per cent</td>
<td>0 per cent</td>
<td>No oversampling</td>
</tr>
<tr>
<td>Spain</td>
<td>192 per cent</td>
<td>314 per cent</td>
<td>Taxable wealth of individuals</td>
</tr>
</tbody>
</table>

Notes: “Oversampling top 10%”: \((S_{90} - 0.1)/0.1\), where \(S_{90}\) is the share of sample households in the wealthiest 10%. “Oversampling top 5%”: \((S_{95} - 0.05)/0.05\), where \(S_{95}\) is the share of sample households in the wealthiest 5%. Wealthiest households are defined as having higher net wealth than 90% (95%) of all households, calculated from weighted data.

Source: HFCN, 2013a, p.36-38

2.2 Construction of a EUROMOD input dataset based on the HFCS

In order to exploit the cross-country dimension of the HFCS data, it is quite natural to build a database from the HFCS for EUROMOD, the EU-wide tax-benefit model, rather than for separate national models. 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 from the underlying database for all EU countries. Instruments which are not simulated (mainly contributory pensions), as well as market incomes, are taken directly from the data (Sutherland and Figari, 2013). As such, EUROMOD is of value in terms of assessing the first order effects of tax-benefit policies and in understanding how policy reforms may affect redistribution, work incentives and government budgets in the short term. Currently EUROMOD runs on EU-SILC data, but it is built in a flexible way such that tax-benefit policies can be simulated on different databases. In order to be integrated in EUROMOD, a database needs to fulfil a set of basic requirements listed in Figari et al. (2007). Most of these requirements are met by the HFCS data and the income components covered in the HFCS are largely the same as those in EU-SILC, as well as most other information affecting tax liability or benefit entitlement (Kuypers, Figari & Verbist, 2016).

The inclusion of the HFCS data as underlying input database for EUROMOD allows us to simulate disposable incomes, which are more suitable for distributional analysis than the original gross HFCS incomes. As a result we can jointly observe disposable incomes and net wealth, which for some countries was not possible before. An extensive overview and validation of the derivation of the EUROMOD input dataset based on the HFCS can be found in Kuypers, Figari & Verbist (2016) and Kuypers et al. (2016). The outcomes in terms of disposable incomes have been compared to those obtained based on the EU-SILC input database and tax revenues of personal income taxes were validated against administrative statistics. The overall quality of outcomes is high and due to the oversampling the HFCS appears to cover the top of the distribution better than EU-SILC.

2.3 Extending the scope of policy analysis

A second added value of using the HFCS in EUROMOD is that it allows to extend the current scope with wealth-related policy simulations, such as the taxation of income from wealth and on financial and non-financial assets, tax incentives for asset accumulation, asset means-testing in eligibility for social benefits, etc. The main categories of policies that were added include recurrent taxes such as real property taxes and net wealth taxes as well as wealth transfer taxes such as real property transfer taxes, inheritance and gift taxes. A detailed description of the implementation in EUROMOD of each of these policies is discussed in Kuypers et al. (2016). Policies that cannot be simulated include the inheritance and gift tax in Italy and Finland and also the real estate transfer tax in Finland because this information is missing in the HFCS for these countries.

In many cases the added simulations on wealth policies require the inclusion of new variables in the input database. Some assumptions are particularly noteworthy for the analysis in this paper. First, property taxes in all countries are levied on the taxable value (sometimes also referred to as cadastral value) of real estate, while the HFCS only covers market values. We have approximated taxable values by estimating a ratio between market values from HFCS and information on cadastral values from external sources. Regarding the variables on inheritances and gifts the HFCS covers all information on inheritances and gifts at the
household level. This implies that the data do not include transfers made between members of the same household, like for instance between spouses. Also, if several members of the same household receive an inheritance/gift from the same donor they are considered jointly. Since in practice these should be taxed separately it is possible that we will overestimate the tax burden for these cases in the simulations. The French and Spanish net wealth taxes require information on net wealth during the policy year, while HFCS reports it at the moment of interview. In order to approximate net wealth at the time the tax would have been applicable we subtract from net wealth observed at the time of interview all real estate, inheritances and gifts purchased/received throughout the policy and survey year and financial income as an approximation of the growth of financial assets.

Some of these wealth-related policies are either regionalised or contain some regional component. Due to the lack of residence information in the HFCS not every policy aspect can be included in full detail in the EUROMOD simulations. In Belgium the inheritance and gift taxes as well as the recurrent and transfer real estate taxes are different across regions. In all cases the regional systems were coded in EUROMOD and households were randomly assigned to one of the three regions. For France, Finland, Germany, Italy and Spain regional or municipal differences exist in the tax rates of the recurrent property taxes and also in the real estate transfer tax in Germany and Spain. But since the differences in tax rates are relatively small, at least in the HFCS reference year, national average tax rates are used. For Spain, the simulation of the inheritance and gift tax is based on the legislation of Cataluña, which appears to be a representative region both in terms of the tax system as in terms of the population share it represents.

Our simulation results were extensively validated on both their internal and external consistency. With regard to the latter Table 3 presents a comparison of the outcomes regarding tax revenues for our newly simulated wealth tax policies with external figures from the OECD Tax Revenue Database (2016) and national documents. It is, however, 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 simulation outcomes. For instance, in EUROMOD we simulate the transfer tax on real property owned by private households, while the external figures in most countries also comprise taxes paid on the transfer of financial property and there is no distinction made between taxes paid by households versus other agents. Furthermore, 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. Spain is an exception here with higher simulated tax revenues, but this is most likely due to the fact that in the simulations the Catalan legislation is applied to all individuals, while several other regions grant large, if not total, exemptions for certain categories of inheritances/gifts. However, given these comparability restrictions our results are fairly consistent with administrative figures. Only the simulations of the net wealth taxes in France and Spain appear to considerably overestimate the actual revenues. For Spain this can again be the consequence of the fact that we apply the same legislation to all individuals, while important exemptions are granted in some regions. In case of the recurrent real estate
the largest differences are found for Finland and Germany. For Finland this will mostly be due to the approximation we used to estimate taxable values, while the fact that we cannot apply municipal, or even regional, differences in tax rates is likely the explanation for Germany. Although the OECD figures are not without their flaws they suggest that our outcomes are fairly reasonable. In addition, we may state that the HFCS-EUROMOD tool is currently in Europe the best instrument available for (re)distributive analyses of tax-benefit systems taking into account wealth information.
<table>
<thead>
<tr>
<th>Country</th>
<th>Policy</th>
<th>EM-HFCS</th>
<th>External source (*)</th>
<th>EM-HFCS/External source (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>Real estate tax</td>
<td>2,691</td>
<td>2,981</td>
<td>90.3%</td>
</tr>
<tr>
<td></td>
<td>Real estate transfer tax</td>
<td>1,898</td>
<td>2,440 (**)</td>
<td>77.8%</td>
</tr>
<tr>
<td></td>
<td>Registration duties on mortgage creation</td>
<td>198</td>
<td>248</td>
<td>79.8%</td>
</tr>
<tr>
<td></td>
<td>Inheritance tax</td>
<td>1,142</td>
<td>1,782</td>
<td>64.1%</td>
</tr>
<tr>
<td></td>
<td>Gift tax</td>
<td>118</td>
<td>270</td>
<td>43.7%</td>
</tr>
<tr>
<td></td>
<td>Tax on long-term saving</td>
<td>163</td>
<td>185</td>
<td>88.1%</td>
</tr>
<tr>
<td>Finland</td>
<td>Real estate tax</td>
<td>656</td>
<td>462</td>
<td>142.0%</td>
</tr>
<tr>
<td>France</td>
<td>Real estate tax</td>
<td>15,590</td>
<td>13,647</td>
<td>114.2%</td>
</tr>
<tr>
<td></td>
<td>Real estate transfer tax</td>
<td>6,300</td>
<td>7,188 (**)</td>
<td>87.6%</td>
</tr>
<tr>
<td></td>
<td>Inheritance &amp; gift tax</td>
<td>5,303</td>
<td>7,357</td>
<td>72.1%</td>
</tr>
<tr>
<td></td>
<td>Net wealth tax</td>
<td>5,900</td>
<td>3,580</td>
<td>164.8%</td>
</tr>
<tr>
<td>Germany</td>
<td>Real estate tax</td>
<td>5,864</td>
<td>4,374</td>
<td>134.1%</td>
</tr>
<tr>
<td></td>
<td>Real estate transfer tax</td>
<td>3,728</td>
<td>4,857 (**)</td>
<td>76.8%</td>
</tr>
<tr>
<td></td>
<td>Inheritance &amp; gift tax</td>
<td>1,356</td>
<td>4,550</td>
<td>29.8%</td>
</tr>
<tr>
<td>Italy</td>
<td>Real estate tax</td>
<td>5,751</td>
<td>9,663 (***))</td>
<td>59.5%</td>
</tr>
<tr>
<td>Spain</td>
<td>Real estate tax</td>
<td>8,310</td>
<td>7,317</td>
<td>113.6%</td>
</tr>
<tr>
<td></td>
<td>Real estate transfer tax</td>
<td>6,268</td>
<td>9,026 (**)</td>
<td>69.4%</td>
</tr>
<tr>
<td></td>
<td>Inheritance &amp; gift tax</td>
<td>2,987</td>
<td>2,931</td>
<td>101.9%</td>
</tr>
<tr>
<td></td>
<td>Net wealth tax</td>
<td>3,842</td>
<td>2,057</td>
<td>186.8%</td>
</tr>
</tbody>
</table>

Notes: (*) National documents and OECD Tax Revenue Database (2016); (**) no distinction available between tax duties on real and financial transactions and between transactions by private households and others; (***) includes the tax paid by firms on commercial properties and lands.

Source: Own calculations based on EM-HFCS.
3 The joint distribution of income and wealth

Although there exist clear links between income and wealth through savings and borrowing constraints, their correlation is far from perfect. Possible factors mitigating the income-wealth relationship include asset portfolio choices, life-cycle effects and intergeneration transfers (Jäntti, Sierminska & Van Kerm, 2013; Jäntti, Sierminska & Smeeding, 2008; Skopek et al., 2012). Based on our data the Spearman rank correlations of equivalised disposable income and equivalised net wealth range from 0.39 for Finland, 0.46 for Belgium, 0.52 for Italy, 0.59 for Germany, 0.60 for France, to 0.62 for Spain. Figure 1 shows the position of individuals in the quartile groups based respectively on the income and wealth distributions. In the case of a perfect correlation, the options ‘11’ (i.e. individuals belonging to the first quartile group of income distribution and wealth distribution), ‘22’, ‘33’ and ‘44’ should correspond to 25% each. This is, however, not the case, showing that there is considerable reranking of individuals if one would move from one distribution to the other. In all countries only around 11% and 14% of individuals are located in the bottom (top) quartile in both the income and wealth distributions (i.e. ‘11’ or ‘44’) and even a smaller share of individuals is located in the second and third quartiles of both distributions.

Figure 1: Distribution across quartiles of disposable income and net wealth (% of individuals)

Note: Spearman rank correlations are 0.46 for BE, 0.39 for FI, 0.60 for FR, 0.59 for DE, 0.50 for IT and 0.62 for ES.
Source: own calculations based on EUROMOD running on HFCS (EM-HFCS).

The lack of a clear correspondence between the position in the income and wealth distribution pose doubts about the reliability of a single concept to measure the individual well-being. Traditional measures of living standards disregard the role of assets and debt, with the exception of the direct income flow that is generated by certain types of assets (i.e. rents, dividends, …) (Kuypers & Marx, 2016; Brandolini et al., 2010). However, increasingly more researchers and policymakers acknowledge the role savings and assets play in the financial well-being of households. There are households which can smooth out consumption by
relying on savings and assets, loans or the financial help of others and these are clearly better off than those who do not have these opportunities (Kuypers & Marx, 2016). In contrast, the presence of large financial liabilities may make households more economically vulnerable than their incomes suggest. The specific situations faced by the ‘asset rich/income poor’ and ‘income rich/asset poor’ households (Hills, 2013) should be taken into account by defining living standards in terms of both income and wealth.

Several studies look at how these flow and stock variables can be integrated into a new living standards concept (for an overview see Kuypers & Marx, 2016). In this paper we apply the approach first proposed by Weisbrod & Hansen (1968) to annuitize wealth into a flow of resources, which is then added to income, using the following formula:

\[ AY_t = Y_t + \left( \frac{\rho}{1 - (1 + \rho)^{-n}} \right) NW_{t-1} \]

where \( AY_t \) refers to annuitised income, \( Y_t \) equals income received from labour, pensions and other transfers, \( NW_{t-1} \) is net worth (defined here as the difference between gross wealth and liabilities, see also section 5) held at the beginning of the year, while \( \rho \) and \( n \) are the interest rate and length of the annuity. With regard to the latter \( T_1 \) refers to time to death of the first person, \( T \) time to death of the survivor. These are expressed in life expectancies by age and gender. \( b \) is the reduction in the equivalence scale which results from the death of the first person. Here, we apply the standard parameter choices of the literature, among others a 2 per cent interest rate and both income and wealth are equivalised by the same scale, but alternative assumptions may have a significant impact (Kuypers & Marx, 2016).

### Table 4: Gini index and poverty headcount for two living standard concepts

<table>
<thead>
<tr>
<th></th>
<th>Gini coefficient</th>
<th>Poverty headcount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Income</td>
<td>Net wealth</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.3265</td>
<td>0.5981</td>
</tr>
<tr>
<td>Finland</td>
<td>0.2487</td>
<td>0.6381</td>
</tr>
<tr>
<td>France</td>
<td>0.2800</td>
<td>0.6698</td>
</tr>
<tr>
<td>Germany</td>
<td>0.2994</td>
<td>0.7444</td>
</tr>
<tr>
<td>Italy</td>
<td>0.3108</td>
<td>0.6079</td>
</tr>
<tr>
<td>Spain</td>
<td>0.3384</td>
<td>0.5764</td>
</tr>
</tbody>
</table>

Source: Own calculations based on EM-HFCS.

\(^2\) Financial income is not included as it no longer exists when wealth is depleted.
Table 4 shows how aggregate levels of inequality and poverty are affected by the use of this broader defined living standards concept. The first column shows for each indicator the results for disposable income (hence, without taking into account wealth and its taxation). The last columns present the Gini coefficient and poverty rate when living standards are considered in terms of the sum of disposable income and annuitized net wealth derived according to formula (1). In both cases the poverty line is defined as 60 per cent of the median of the respective living standard concept. In general, the inclusion of net wealth information results in an increase in inequality and poverty outcomes. However, we find that the impact is higher for Germany and France than for the other four countries, which appears to be largely the consequence of the fact that the net wealth distribution is the most unequal in these countries. The position of individuals across quartiles of disposable income and the joint income-wealth distribution is presented in Figure 2. The largest share of individuals in the first quartile of the income distribution also remains at the bottom when annuitized net wealth is added. The same is true for the top quartile. However, there is considerable reranking of individuals in the middle of the distribution. Reranking is lowest for France and Germany such that the increase in the poverty headcount mainly reflects a poverty line effect rather than a reranking effect.

4 A broader assessment of the redistributive effects of tax-benefit systems

Section 3 showed that there is considerable reranking between the income and wealth distributions, which strongly argues in favour of using a joint income-wealth concept to determine living standards. The use of this different framework may also have an effect on the evaluation of the distribution of tax-benefit instruments considered traditionally in redistributive analyses; this is the focus of this section. Section 5 will then also include wealth taxes into the analysis. In what follows all results are calculated based on yearly amounts.
aggregated at the household level and equivalent for household size\(^3\), all individuals are considered. In countries where multiple imputation is applied, the results represent their average.

The distributive assessment of tax-benefit instruments is often illustrated by means of concentration coefficients (see e.g. Korpi & Palme 1998; Marx, Salanauskaite & Verbist, 2016; OECD, 2008). These are calculated in a similar way as Gini coefficients. The difference between a concentration and a Gini coefficient lies in the variable according to which units are ranked: with the Gini coefficient the ranking and focal variable are the same, while with a concentration coefficient the focal variable (e.g. social benefits or taxes) is different from the ranking variable (e.g. income). A concentration coefficient will be zero if all units receive the same absolute amount of transfers (i.e. corresponding to the 45° line in the Lorenz diagram). Following Marx, Salanauskaite & Verbist (2016) we make a distinction between weak and strong pro-poorness. Strong pro-poorness corresponds to a negative concentration coefficient, whereas weak pro-poorness is captured by a concentration coefficient between zero and the value of the Gini. When the concentration coefficient has a value lower than the Gini of the ranking variable, then those at the bottom of the distribution benefit relatively more: individuals receive a higher share of the income component than their share of for instance income. When the value of the concentration coefficient is larger than the Gini, then the benefit entails pro-rich distribution. Concentration coefficients can thus provide insight into the pro-poorness (or pro-richness) of the various income components in a scale-invariant way (i.e. irrespective of their overall size).

In this section we compare outcomes for three ranking variables, notably disposable income, net wealth and the sum of disposable income and annuitized net wealth. Our aim is to investigate the impact by shifting from the traditional living standard concept of disposable income to one that also includes a measure for wealth. As an intermediary step, we have also used net wealth as ranking variable. The concentration coefficients can be seen as a summary presentation of the distribution of tax-benefit instruments over living standards (represented here by disposable income on the one hand and income plus net wealth on the other), as is frequently done when considering the distributive patterns of e.g. benefits. Other strands of literature have used market or gross income as ranking variables, e.g. in the tax progressivity literature tax progressivity is measured against incomes before deduction of taxes; we come back on this approach in section 5 when we include wealth taxes in the analysis. The choice of ranking variable can have an impact on outcomes when reranking of units occurs when switching between income concepts (Marx, Salanauskaite & Verbist, 2016).

Figure 3 presents for each ranking variable their Gini coefficient and the concentration coefficients for three categories of tax-benefit policies, notably income taxes, social insurance contributions and social benefits. We find that in all countries and according to the three ranking concepts all three instruments are pro-poor, be it to different degrees. Income taxes appear to be the most pro-poor instruments (i.e. these taxes are concentrated relatively more among the rich) in the six countries, while also social contributions are strongly pro-poor (but

\(^3\) We use the modified OECD scale to equilise incomes.
less than income taxes, which is in line with other studies, see e.g. Verbist & Figari 2014). Maybe somewhat surprising social benefits appear to be weak pro-poor. By decomposing these numbers over separate tax and benefit components we will show below what the drivers are of these outcomes. Interestingly, pro-poorness of income taxes and social contributions is considerably smaller when using net wealth as a ranking variable; this follows from the reranking that occurs among income units when shifting from disposable income to net wealth as ranking variable. It shows that there are income units with net wealth and low incomes who pay relatively few (or no) taxes and/or social contributions, who are typically income dependent. Consequently, for the joint income-wealth distribution taxes and contributions are somewhat less pro-poor than in the traditional income framework. For social benefits the pattern is somewhat less clear-cut, but in general rather similar: they are less pro-poor when ranking on the basis of the joint income-wealth concept than on the basis of income only. Let us now look into more detail at the different components of income taxes and social benefits.

**Figure 3: Gini and concentration coefficients tax-benefit instruments by three ranking variables**

![Gini and concentration coefficients tax-benefit instruments by three ranking variables](image)

Source: Own calculations based on EM-HFCS.

The concentration coefficients of the different instruments \( C \) can be decomposed as the sum of the concentration coefficients \( C_i \) of each type \( i \) weighted by their share \( S_i \) in the total \( S \) (Marx, Salanauskaite & Verbist, 2016; Kakwani, 1977):

\[
C = \sum_{i=1}^{n} \frac{S_i}{S} C_i
\]

First, for the personal income taxes we distinguish between taxes levied on capital income and taxes levied on other types of income (although rental income is generally taxed as other income in the countries studied here). The results of this decomposition are shown in Figure 4. Overall the taxes on capital income are more concentrated at the top than taxes on other types of income, which is what is expected given that the basis for capital income (wealth) is in general more unequally distributed than income from work (which is the main part of other
income taxes here). Spain, however, is an exception. Capital income taxes have the strongest degree of pro-poorness in Belgium. Capital income taxes become more pro-poor when evaluated against the wealth distribution than against the income distribution in Finland, Italy and Spain, while the opposite is true for Belgium and Germany. Among the first group, the concentration is even higher for the joint distribution in the case of Italy, but not for Finland and Spain. In the case of Belgium and Germany the concentration against the joint distribution is even slightly lower compared to the separate distributions. However, taxes on capital income represent only a marginal share in total income taxes. Hence, the trends in total income taxes is largely driven by taxes on other income, such that the discussion of Figure 3 also applies here.

**Figure 4: Concentration coefficient of personal income taxes – decomposition by type**

![Graph showing concentration coefficients](image)

Note: France is not included because tax on capital and other income cannot be distinguished. In most countries rental incomes are not included in the capital income tax, but taxed together with other incomes.

Source: Own calculations based on EM-HFCS.

Second, for social benefits we distinguish here between pensions, child benefits, unemployment benefits and other benefits. The decomposition results are shown in Figure 5. The total concentration coefficient discussed in Figure 3 seems to be the result of two main underlying trends. First, with the exception of Finland, pensions are the least pro-poor of the four categories of benefits, and this is even more the case when evaluated against wealth or the joint income wealth concept. This can be clearly explained by the life cycle model of wealth accumulation: pensioners generally have relatively low incomes, but have typically accumulated considerable net wealth throughout their working lives such that they are relatively more concentrated at the top of the wealth distribution. On the other hand, the other types of social benefits are often more strongly pro-poor by the joint distribution of income and wealth than by the distribution of disposable income only. This is logical as those receiving social transfers such as unemployment benefits are typically households with low incomes and low wealth, such that they are concentrated at the very bottom of the joint distribution. Finally, the total concentration coefficient of social benefits appears to be most strongly determined by what happens to the concentration of pensions as they represent the highest share in total benefits (except for Finland).
It is interesting to note the difference between concentration coefficients which reflect the outcomes of transfer programs and targeting intentions which are part of the policy design for instance through eligibility conditions (Marx, Salanauskaite & Verbist, 2016; Van Lancker & Van Mechelen, 2015). Indeed, although income testing of social benefits is quite common, wealth information is only included in the means-test of some social benefits in some countries. Yet, we find that in general social benefits do tend to the end up among those in most need, i.e. those having both low income and low wealth.

Figure 5: Concentration coefficient of social benefits – decomposition by type

Another way of looking at the redistributive effect of social benefits is to consider their effectiveness in terms of poverty alleviation. In practice this means comparing the poverty rate with and without taking into account social transfers in the respective concept of living standards, while holding the poverty line constant. We apply a measure of relative poverty reduction instead of an absolute one because the latter is also less sensitive to the initial level of the poverty rate (Van Lancker & Van Mechelen, 2015). Table 4 already showed that the initial poverty rate is higher in the joint income-wealth framework, here we concentrate only on the anti-poverty effects of social benefits.

\[
RPR = \frac{P_{pre} - P_{post}}{P_{pre}} \times 100
\]  

(3)

Again, poverty thresholds are in both cases determined as 60 per cent of the median of the respective living standards concept. As the results above indicated pensions can have considerably different effects than other social transfers. Therefore, we study their impact separately in Table 5. First, relative poverty reduction is lower for joint income-wealth poverty than for traditional income poverty. The lower relative poverty reduction for joint poverty of pensions may be the consequence of the fact that much less elderly are regarded as poor in the joint income-wealth framework than in the traditional income framework as they...
have higher wealth levels and shorter expected remaining life times. For those also regarded as poor in the joint income-wealth perspective it appears pensions are by itself not sufficient to close the poverty gap. Also for the other benefits the determination of the poverty line in terms of income and wealth probably implies a larger poverty gap, such that the benefits are no longer enough to elevate people out of poverty. Belgium appears to be a special case with respect to the fact that the relative poverty reduction is higher for pensions in the income dimension, but higher for other benefits in the joint framework.

Table 5: Relative reduction of poverty headcount due to social benefits

<table>
<thead>
<tr>
<th></th>
<th>Income poverty</th>
<th>Joint income – net wealth poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pensions</td>
<td>Other benefits</td>
</tr>
<tr>
<td>Belgium</td>
<td>53.45</td>
<td>46.49</td>
</tr>
<tr>
<td>Finland</td>
<td>21.13</td>
<td>48.90</td>
</tr>
<tr>
<td>France</td>
<td>66.50</td>
<td>65.78</td>
</tr>
<tr>
<td>Germany</td>
<td>58.30</td>
<td>52.09</td>
</tr>
<tr>
<td>Italy</td>
<td>58.24</td>
<td>11.71</td>
</tr>
<tr>
<td>Spain</td>
<td>42.88</td>
<td>29.97</td>
</tr>
</tbody>
</table>

Source: Own calculations based on EM-HFCS.

While Table 5 presented the effects on the total poverty rate, Figure 6 shows how age-specific poverty rates are reduced. It is clear that relative poverty reduction is the highest among the elderly, regardless of the living standards concept that is used. Furthermore, the difference in poverty reduction between the two concepts of living standards is largest for children in Belgium, France and Germany, while it is for people at active age in Italy, Spain and Finland.

Figure 6: Relative reduction of poverty headcount due to social benefits – decomposition by age

Note: children<=18, active age 19-64, elderly >=65
Source: Own calculations based on EM-HFCS.
5 The progressivity and redistributive effect of wealth taxes

In the section we analyse the progressivity and redistributive effect of wealth taxes. First we show the distribution of wealth taxes through concentration coefficients, as was done in the previous section for the other tax-benefit instruments. Next, we focus on the progressivity of wealth taxes, drawing on the literature of measuring tax progressivity.

Figure 7 shows the concentration coefficient for total wealth taxes using the same three ranking variables (income, wealth and joint income-wealth) as well as for recurrent and event-based wealth taxes separately. Wealth taxes appear to be pro-poor (i.e. poorer income units pay relatively less taxes than richer), and this according to all three distributions. Interestingly, wealth taxes become more pro-poor when wealth is (included in) the ranking variable. If we compare with income taxes in Figure 3, than we find that income taxes are more pro-poor than wealth taxes when units are ranked on the basis of income only. On the contrary, wealth taxes are more pro-poor when net wealth is used as the ranking variable. In the joint income-wealth framework evidence is more mixed with stronger pro-poorness for wealth taxes in France and Italy, stronger pro-poorness for income taxes in Spain, and roughly similar scores for both tax types in Belgium, Finland and Germany. In general, the recurrent wealth taxes appear to be more pro-poor than the event-based wealth taxes, with the exception when evaluated against the income distribution in Belgium.

Figure 7: Concentration coefficient of wealth taxes – total and decomposition by type

![Concentration coefficient of wealth taxes](image)

Source: Own calculations based on EM-HFCS.

Until now, we have analysed the distribution of the various tax-benefit components in the framework of different living standards concepts. However, the tax progressivity literature presents an alternative framework to study the distribution of the tax burden, notably by comparing taxes with the base on which these are levied (i.e. before taxes are applied). Hence, we present the distribution of the different wealth taxes over pre-tax wealth and calculate related progressivity indicators. We can use two pre-tax wealth concepts to rank units, i.e.
either gross or net wealth, where the latter takes into account outstanding debt on gross wealth. Here, we mainly use pre-tax gross wealth, as most wealth taxes disregard liabilities and hence use gross wealth as the tax base. We use the pre-tax net wealth concept as a sensitivity check because the net wealth taxes of France and Spain do take into account outstanding liabilities. Moreover, it sheds light on the relation between the distribution of wealth taxes and debt. The pre-tax concepts of gross and net wealth need to be derived as the wealth that is observed in the HFCS refers to the moment of the survey which implies it is already net of taxes paid during the policy reference year. The gross concept is then derived as the sum of the HFCS reported net wealth and the EUROMOD simulated wealth taxes.

Figure 8: Mean of wealth taxes by pre-tax gross wealth quintiles – Belgium

Note: Only those eligible for the tax (i.e. a positive tax base) are included. Unweighted number of distinct observations (depending on the type of tax either individuals or households): real estate tax: 1,733, real estate transfer tax: 36, registration duty mortgage creation: 20, inheritance tax: 48, gift tax: 33, tax on long-term saving: 67.
Source: Own calculations based on EM-HFCS.

We start by looking at the distribution of wealth taxes among those paying the respective tax across quintiles of pre-tax gross wealth (calculated on the full population). We present here in Figure 8 only the case of Belgium, the results for the other countries are shown in the annex in Figure A.1 to Figure A.4. In general, we find that among those paying a particular wealth tax, the wealthy tend to pay a higher amount than those who are less well off. In general, the real estate transfer tax is the most proportionally distributed, while the net wealth taxes in France and Spain are the most concentrated at the highest pre-tax gross wealth quintiles.

4 To avoid confusion we use gross and net here to refer to the difference with or without taking into account outstanding debt, while we use the terms pre-tax and post-tax to distinguish whether or not taxes are taken into account.

5 We categorise the Belgian real property tax as a wealth tax in line with other countries. However, strictly speaking it is an income tax as it is levied on the concept of ‘cadastral income’, which reflects an approximation of the average rent that would be paid for the real estate property.
In light of these results the next question that arises is to what extent these wealth taxes are used as a redistributive instrument. In other words, do these wealth taxes represent any significant redistribution, and hence decrease inequality? The redistributive effect of a tax system depends on both the degree of progressivity and the tax level (Verbist & Figari, 2013). With regard to the latter Figure 9 compares average wealth tax rates when either using pre-tax gross wealth or pre-tax net wealth as the tax base and ranking variable. In general we find that the average tax rates are extremely low. As expected they are slightly higher for net wealth than for gross wealth. Belgium has the highest tax rate for all taxes combined, representing still only 0.3 per cent of total pre-tax gross wealth (or 0.65 per cent of pre-tax net wealth). Tax rates of event wealth taxes are in general higher than those of recurrent wealth taxes.

Figure 9: Average tax rates as percentage of pre-tax gross wealth versus pre-tax net wealth

An often used indicator of progressivity is the Kakwani index (Kakwani, 1977). It indicates how far a tax system deviates from proportionality by measuring the difference between the concentration coefficient of wealth taxes ($C_T$) and the Gini of pre-tax wealth ($G_W$):

$$K_T = C_T - G_W$$  \hspace{1cm} (4)

This overall Kakwani index can also be decomposed over the Kakwani indices of different tax categories weighted by their share in total taxes:

$$K_T = \sum_{i=1}^{n} \frac{s_i}{S} K_{T_i}$$  \hspace{1cm} (5)

The Kakwani index for total wealth taxes as well as it two components are presented in Figure 10. The Kakwani’s are shown on the left axis, while the importance of each individual tax in the total is depicted on the right axis. In terms of the most relevant tax base, pre-tax gross wealth, most taxes are proportional, with the exception of Italy where they are progressive. When they are expressed in terms of pre-tax net wealth, wealth taxes are rather regressive, or less progressive in the case of Italy. In most cases recurrent wealth taxes are closer to
proportionality than event related wealth taxes. The combination of the extremely low tax rates and the proportional or regressive incidence of the taxes results in a negligible redistributive effect.

Figure 10: Kakwani index – total and decomposition by type

![Graph showing Kakwani index for different countries and tax types]

Notes: Rec w tax=recurrent wealth taxes, Event w tax=event-based wealth taxes; no event wealth taxes can be simulated for Finland and Italy.
Source: Own calculations based on EM-HFCS.

6 Conclusion

Over the last decades there has been a renewed interest in inequality. Given increased levels of inequality in most Western countries, many researchers and policymakers have made strong arguments for broadening the taxes on wealth and income from wealth. These arguments relate both to horizontal and vertical equity reasons, as well as to efficiency considerations, as wealth taxes minimise economic distortions by taxing fixed factors. In this paper we have provided for the first time empirical evidence that wealth taxes are indeed currently not used to their fullest potential as a redistributive instrument. At the same time a different literature has argued that when determining living standards more prominence should be given to the joint distribution of income and wealth. We show that this more comprehensive framework of living standards results in considerable reranking of individuals and therefore the evaluation of the redistributive effects of tax-benefit systems.

In particular, by assessing redistributive instruments against the joint distribution of income and wealth and including wealth taxes into the analysis we show that welfare states across Europe are actually less redistributive than is considered by the partial perspective on the income distribution. First, personal income taxes and social insurance contributions are not as redistributive as they are traditionally thought to be as they are levied on those with the highest labour incomes, which are not necessarily those with the highest net wealth. Both capital income taxes and wealth related taxes currently do not imply a redistribution of any significance. Although they are relatively progressive, taxes on capital income represent only
a negligible share of total income taxes. Moreover, the combination of extremely low tax rates and a proportional or regressive distribution means that wealth taxes hardly have any impact on the distribution of wealth. In other words, there is currently no equal taxation between income poor-asset rich and income rich-asset poor individuals. Furthermore, pensions are much less relevant as a redistributive and poverty reduction instrument when we take into account the full distribution of financial resources. A slightly more positive trend is found for certain social transfers, such as unemployment and child benefits, which are in redistributive outcomes more concentrated at the bottom of the joint distribution than the income distribution. But unfortunately they are not sufficiently high to elevate people above the joint income-wealth poverty line. We also show that the impact of adding wealth information to redistributive analyses may be different across countries depending on the level of wealth inequality and wealth taxation as well as the correlation between the distributions of income and wealth.

Our results raise interesting future research possibilities on potential wealth policy reforms, for which the HFCS-EUROMOD model allows to analyse the distributive, work incentive and budgetary consequences in a cross-country perspective. First, regarding the current debate on wealth taxation there is a special focus on revenue-neutral policy reforms aimed at shifting the tax burden from labour taxation to wealth taxation. In other words, wealth tax reforms (affecting either real or financial assets) can be accompanied by further changes to non-wealth-related components of the tax-benefit system potentially enhancing labour supply incentives (i.e. a reduction of tax burden on low earners). For the simulation of alternative wealth taxes, the focus can be on real and financial assets to reflect non cash components that still enhance potential consumption due to their monetary return. Simulations can focus on the budgetary effects of the hypothetical reforms in order to highlight the amount of differential fiscal revenues entailed. On the one hand, additional fiscal revenues entailed by non-revenue-neutral tax reforms could be of great interest to several European countries currently facing severe fiscal imbalances. On the other hand though, revenue neutral tax reforms capable of shifting the burden away from labour to wealth (e.g. providing an extra tax relief in the form of a tax deduction or a tax credit to labour earnings) represent an appealing route for enhancing economic growth and fostering employment.

Second, since we find that existing social transfers are insufficient in elevating people out of poverty, the broader income-wealth framework can imply new insights for social policy design. While social policies have traditionally focused on income maintenance, it is argued that encouraging asset accumulation among the poor is a potential new social policy strategy complementing existing ones. These so-called ‘asset-based social policies’ provide incentives to households to build up savings and assets. However, the policies that currently exist in most European countries typically encourage asset accumulation through tax incentives, which often make them unavailable for the poor. It would be interesting to simulate potential reforms of these policies or the introduction of a new pro-poor policy.
References


OECD. (2016). OECD Tax Revenue Database.


Annex

Figure A 1: Mean of wealth taxes by pre-tax gross wealth quintiles – France

![Bar charts showing mean wealth taxes by pre-tax gross wealth quintiles for France.](image1)

Note: Only those eligible for the tax are included. Unweighted number of observations: real estate tax: 10,482, real estate transfer tax: 484, inheritance & gift tax: 240, Net wealth tax: 2,158

Figure A 2: Mean of wealth taxes by pre-tax gross wealth quintiles – Germany

![Bar charts showing mean wealth taxes by pre-tax gross wealth quintiles for Germany.](image2)

Note: Only those eligible for the tax are included. Unweighted number of observations: real estate tax: 2,159, real estate transfer tax: 58, inheritance & gift tax: 97
Figure A 3: Mean of wealth taxes by pre-tax gross wealth quintiles – Spain

Note: Only those eligible for the tax are included. Unweighted number of observations: real estate tax: 5,280, real estate transfer tax: 139, inheritance & gift tax: 112, Net wealth tax: 9,445

Figure A 4: Mean of wealth taxes by pre-tax gross wealth quintiles – Finland & Italy

Note: Only those eligible for the tax are included. Unweighted number of observations: real estate tax Finland: 8,626, real estate tax Italy: 1,884