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Abstract

Tax expenditures are preferential tax treatments granted to specific individuals or categories of households which aim at achieving social and economic goals. They are widely used by EU Member States. However, their fiscal and equity impacts are not always clear and their effectiveness and efficiency as a policy instrument need to be carefully evaluated, especially in the present context of constrained public finances. This paper quantifies the fiscal and equity effects of social tax expenditures related to housing, education and health in 27 European countries making use of EUROMOD, the EU-wide microsimulation model. We find a variety of effects, in terms of sign and magnitude, across Member States, and within these, among types of households. Overall our findings suggest that the impact of tax expenditure on tax revenues and on income inequalities can be sizeable. The redistributive impact of removing tax expenditures can go both directions, either on the progressive or regressive side, depending on the country and the tax expenditure considered.

JEL: H5, H23, H24

Keywords: tax expenditures, microsimulation, social tax expenditures, fiscal and equity impact, EUROMOD

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1. Introduction

Tax expenditures (TEs) are preferential tax treatments granted to specific individuals or categories of households with the aim of achieving social and economic goals (European Commission, 2014). The term was popularized in the 1960s to draw attention to the increasing use of tax provisions as disguised or “hidden” expenditures. TEs are widely used by EU Member States; however, despite their diffusion, their fiscal and equity impact is not always clear¹. As with any preferential scheme, TEs introduce distortions into tax systems, making them less transparent and more prone to rent-seeking behavior; further, they can sometimes prove to be regressive from a social viewpoint (Greve, 1994; Sinfield, 2018a). Identification of TEs and their impact is becoming paramount for fiscal policy making, and is highly controversial from a political economy perspective (OECD, 2010; European Commission, 2014). A precise analysis of the tax revenue impact and distributional effects of TEs is not straightforward, particularly from a cross-country perspective. This study is the first attempt to empirically quantify such effects in the European context.

The OECD (2003) defines TEs as a "transfer of public resources that is achieved by reducing tax obligations with respect to a benchmark tax system, rather than by a direct expenditure." Examples include exemptions and allowances that reduce the amount of income used to derive the tax base; credits, which are deducted from the tax liability; tax rate reductions for certain types of taxpayers or activities; or tax deferrals (see Morel et al., 2019 for a detailed taxonomy of TEs by function). From a public finance perspective, TEs entail a cost in terms of foregone tax revenues compared to a benchmark tax system (see Kalyva et al., 2014).

Several different ways have been proposed in the literature to measure the revenue loss associated with TEs (see Swift, 2006 for a review). The approaches used to measure tax expenditures also generally differ across countries (OECD, 2010). We consider TEs as exceptions from the general tax rules and measure their value by comparing the total amount of

¹ In contrast to Europe, the US has a long tradition of measuring the fiscal and distributional effects of TEs (Burman et al., 2008; Toder et al., 2011).

taxes levied under the current fiscal regime with TEs to the total amount of taxes levied in their absence.

We make use of EUROMOD, the EU-wide microsimulation model (Sutherland and Figari, 2013), to quantify the fiscal and equity impact of the three main categories of social TEs—housing, education, and health-related—found within the context of personal income tax. The use of microsimulation models allows evaluation of how specific TEs interact with the broader provisions in the tax-benefit system for a representative sample of individuals and has the potential to greatly improve our knowledge about the size and redistributive effects of TEs. In particular, TEs not only interact with the overall personal income tax structure, but also with means-tested benefits when these provisions are based on income net of tax. In our analysis of TEs, we systematically document and account for these interactions, which are often overlooked.

This study complements Avram (2018), who focuses exclusively on the design of TEs within personal income tax without dealing with tax relief associated with specific taxpayer expenditures, as well as Barrios et al. (2018), who focus on the TEs associated with low-income workers. As in previous work, our analysis does not account for behavioral responses. Further, we do not speculate on how removing specific TEs can affect the demand for and prices of meritorious goods or how the latter can impact social and individual welfare. Therefore, the main aim of the study is to quantify the “initial tax revenue loss” associated with TEs and their distributional consequences.

The remainder of the paper is organized as follows. Section 2 provides a discussion of the rationale for social TEs affecting personal income taxation, followed in Section 3 by an overview of the existing identification and reporting practices related to TEs in Europe. Section 4 discusses the methodological approaches used, together with a short presentation of the microsimulation model and the data used. Section 5 provides the empirical evidence, focusing on the fiscal and equity impacts of each type of tax expenditure considered in the study. Section 6 concludes.

2. The rationale of social TEs in the context of personal income taxation

Social TEs within personal income taxation have been increasingly used in Europe to pursue a wide variety of economic and social aims, such as promoting health insurance coverage, home ownership, retirement saving, education, and providing additional resources to low-income families. These schemes are all provided through the tax system, rather than through direct public spending, and, as such, they constitute a specific form of welfare provision known as fiscal welfare (Morel et al., 2018, 2019; Sinfield, 2018a, 2018b).

In the US experience, the bulk of TEs are social TEs that affect personal income taxation (Hacker, 2002; Burman et al., 2008). Among social TEs, the main components are those that address health, housing, and pension issues (Toder, 2000, 2005; Burman et al., 2008). In the European experience, although their specific design can differ across countries, reflecting differences in the overall tax-benefit systems, they tend to have some common redistributive features. Their relevance seems to be less relevant than in the US, because of public coverage of education and universal health care in most countries.

Furthermore, while social TEs seem to be continuously expanding across countries, ongoing policy discussions focus on the need to streamline them for equity, efficiency, and budgetary reasons (Kalyva et al., 2014; Morel et al., 2018). TEs are increasingly popular because they constitute a way of increasing public support for social policies through tax cuts rather than increases in public spending (Prasad, 2011). TEs often bypass the scrutiny of spending in the regular budget process and do not require annual renewal. As a result, TEs are likely to be less transparent than regular public expenditures (Stiglitz, 2002).

TEs related to housing, education, and health are explained by links to equity and also by their nature as “merit goods,” that is, commodities or activities that an individual or society should have on the basis of some concept of need, rather than ability and willingness to pay. Examples include delivery of health services to improve quality of life and reduce mortality and subsidized housing and education. TEs are justified if one assumes that individuals tend to be myopic short-term utility maximisers and so do not consider the long-term and wider social benefits of consuming goods like education or health. Social TEs may also be justified on

efficiency grounds; for instance, positive externalities are typically expected from education, health, and housing spending, such that household spending would be too low without TEs ^{2,3}.

In the following, we review in more detail the rationale for tax expenditures that affect housing, education, and health and their potential impact on household incomes.

2.1 Housing

20 out of 28 European countries provide TEs related to home ownership or use; in personal income taxation, these special treatments may concern mortgage interest, income from renting, housing-related expenses, and capital gains from housing transactions. In particular, fourteen EU countries allow tax relief related to mortgage interest payments. The same number of EU countries, largely overlapping, provide tax relief for income received from renting out a property (see Table A.1 in the online Annex). Housing TEs are justified on vertical equity grounds as a way to provide support to low income families to aid in covering basic needs, such as housing costs. However, they can violate principles of horizontal equity when two taxpayers with the same income, net worth, and identical houses are taxed differently depending on their tenure status, since mortgage interest on owner-occupied housing is tax deductible, while rent payments do not generally result in a tax deduction. The exclusion of imputed rent from taxable income is a common pattern across European countries. As such, it is not usually considered a tax expenditure—not even in the US literature (see Figari et al., 2017, for the distributional impact of the potential inclusion of imputed rent in taxable income). On efficiency grounds, different justifications have been offered for housing related TEs, especially for the mortgage interest deduction, including encouraging home ownership, stimulating residential construction and maintenance, and encouraging families to save and invest. The benefit of the TE also comes through higher housing prices due to the capitalization effect of the tax relief (Figari et al., 2019). However, depending on how much the deduction increases housing demand, some of the

² We acknowledge the importance of the incentive effects associated with TEs but a proper empirical analysis is constrained by the lack of comparable data across countries.

³ Pension tax relief represents another important social TE. However, we have opted to treat pension related TEs in a separate analysis (Barrios et al., 2018) as pension TEs differ significantly from other social TEs since their specific aim, in addition to poverty relief and redistribution, is to address issues related to lifetime consumption and income smoothing (Barr and Diamond, 2009).

benefits of the TE flow in the form of higher prices and income for other parties such as home builders, mortgage lenders, and real estate agents, which may result in a misallocation of resources and also a bias toward household debt, that is a tax-induced incentive to debt finance (Poterba, 1984; Fischer and Huang, 2013).

2.2. Education

Seven EU countries provide preferential tax treatment for education related expenses (Kalyva et al., 2014) in the form of tax credits and deductions for tuition and fees (see Table A.2. in the online Annex). Given the direct public support for education guaranteed in the majority of European countries, the relevance of educational related TEs seems to be lower than that of the other socially related expenses and lower than in the US, where public support for education is provided to students and families through multiple tax incentives (Dynarsky and Scott-Clayton, 2017). Education related TEs are generally justified as promoting access, improving social equity, removing financial barriers, and offsetting socially undesirable underinvestment in education related to both the taxpayer and his\her dependents. As such, education related TEs are motivated by the goal of adjusting differences in individual ability to pay taxes. This argument is also relevant in Europe, where public coverage in most countries is limited to a certain number of years of schooling and families bear a non-negligible share of expenses even when they opt for the public education system⁴.

On efficiency grounds, the tax treatment of education should be neutral, that is, it should be designed in such a way as to ensure the absence of incentives or disincentives. Education can be viewed as an expense incurred for earning an income. Thus, if the income is taxed, with no deduction for the expenses, the activity would be discouraged; hence, the deduction is justified as it removes a distortion. On the contrary, if education expenses are allowed as a deduction on a cash basis, while capital expenses are generally deducted through depreciation, the tax treatment between human capital investment and physical investment would be not neutral.

⁴ TEs can also be seen as subsidization for opting out of the public education system.

2.3. Health

Finally, six European countries grant tax relief associated with specific health expenditures and health insurance costs (see Table A.3 in the online Annex). Generally a distinction is made between extraordinary health expenses and regular ones. TEs—mainly in the form of tax deductions—are generally higher in the first case than in the latter. In the first case, their deduction from the personal income tax base fulfils the need to adjust for differences in individual ability to pay taxes. If two taxpayers have the same income, but one suffers from a serious (and unexpected) illness, TEs are justified to cover costly medical bills or high out-of-pocket expenses for medical treatment.

Tax incentives are also provided for private health insurance. The main aim is to encourage people to obtain coverage against health risks and address the inefficiencies of insurance markets. The ability of individuals to pay for services will depend on their economic means if public provision of health services is of low quality, scarce, and/or the public insurance of medical expenses is incomplete. A favorable tax treatment can indeed provide an incentive to low income individuals to benefit from medical treatments. Overall these tax provisions supplement benefits provided by government health programs (see Branco and Costa, 2018 for the case of Portugal and Di Novi et al., 2018 for Italy) and subsidize the cost of private health insurance (Hinde, 2016), reducing the up-front cost of obtaining good health coverage.

3. Empirical evidence on tax expenditures in Europe.

Kalyva et al. (2014) provide an extensive review of TEs in direct taxation reporting practices across EU countries. Importantly, though, in most cases, the official reporting of TEs concerns only their fiscal cost without any disclosure of their impact on household incomes.

Following the Directive on requirements for budgetary frameworks, EU Member States should provide detailed reporting of the impact of TEs on government revenues (Art. 14.2), although there is no further definition that provides a benchmark for assessing the impact of TEs or the level of detail required to be reported. However, a recent important change concerns the recording of tax credits in national accounting (which, to some extent, also covers tax

allowances, exemptions, or deductions) with the introduction of the European System of National and Regional Accounts (ESA 2010) reporting standards (see OJEU 2013). Accordingly, “the whole amount of tax credits is recorded as government expenditures, and not as a reduction of tax revenues.” This principle therefore acknowledges the nature of TEs to allow the derivation of tax credits on a net basis.

Practices in EU Member States, including methods, details, and timeliness, differ notably. As noted by Kalyva et al. (2014), 18 out of the 28 Member States regularly reported on TEs. However, the variety of approaches and definitions used makes a cross-country analysis of the relative efficiency and impact of the TEs extremely complex, if not impossible.

To date, the most comprehensive cross-country comparative analysis is provided by the study conducted by the OECD (2010), which partially adjusts the figures reported by countries. Accordingly, the relative importance of TEs in income taxation varies widely, from a low of 0.26% of GDP in Germany to a high of 4.90% in the United Kingdom. Following this study, the structure of TEs tends to be skewed towards housing, at least in the cases of Spain, the United Kingdom, and Germany. Since the late 1990s, the OECD has also produced data on indirect social tax benefits, under the label “tax breaks for social purpose” (Adema, 1997), categorized as two types: some “perform the same policy function as transfer payments which, if they existed, would be classified as social expenditures;” others “are aimed at stimulating private provision of benefits” (e.g., favorable tax treatments for private health insurance, Adema et al., 2011).

Based on Adema et al. (2014), Morel et al. (2018) quantified the fiscal effects of social TEs for some European countries, showing their widespread use for a variety of welfare policy purposes. However, Morel et al. (2018) in particular recognize the incomplete nature of the OECD data and its limitations regarding the lack of harmonization, missing data, and arbitrary reporting procedures. They conclude that “OECD data therefore cannot be used to compare between countries or across time” (Morel et al., 2018).

Aside from the OECD (2010) study, a number of country case studies have been conducted showcasing the importance of accounting for TEs in fiscal analysis, although not necessarily

focusing on their fiscal or equity impact (see Thöne, 2013 for Germany; Tyson, 2014 for Italy; Klun, 2012 for Slovenia; Collins and Walsh, 2011 for Ireland; Morel et al., 2019 for France; and Branco and Costa, 2018 for Portugal).

Other studies have focused on the specific impact of TEs on taxpayer behavior. For instance, in a recent study, Barrios et al. (2018) used the EUROMOD microsimulation model to analyze the fiscal impact of reforms affecting tax relief for low-income workers in five EU countries. Doerrenberg et al. (2017) focused on the German case to show that in the presence of tax expenditures, the elasticity of taxable income is not a sufficient statistic to conduct welfare analysis when there are externalities and behavioral reactions to tax changes. Immervoll et al. (2007) conducted a specific analysis for make-work-pay tax expenditures using a theoretical framework and country-specific labor supply elasticities and participation rates to characterize behavioral responses to such TEs in a selected sample of countries.

4. Methodology and data

According to the OECD (2003) definition, TEs must be measured as exceptions to some benchmark or baseline income tax. However, identification of TEs remains a highly controversial issue, as there is no bright line that reveals what provisions in a tax system are part of the baseline or normative tax system and what provisions are special exceptions; this means that certain tax provisions may be regarded as TEs in some countries, but not in others.

The main distinction (OECD, 2010) is between approaches that use a norm based on theoretical concepts of income (the so called “conceptual approach”) and those that use a country’s own tax laws as a basis to define the benchmark (the so called “legal approach”), isolating differential or preferential treatment judged as TEs. The former will classify elements that might otherwise be considered part of tax design as TEs.

In this study, we adopt the “legal approach” and identify tax expenditures as “departures from the normal tax structure” (Surrey and McDaniel, 1985). As such, we apply the *revenue gain approach* (Swift, 2006) to measure the increase in revenue (and decrease in household disposable income) that could be expected if a particular tax expenditure was removed.

The empirical analysis is carried out using a tax-benefit microsimulation approach, comparing the baseline system with TEs and a scenario where any tax relief is removed. The use of microsimulation models provides a clear advantage over other methods for comparing TEs on a cross-country basis, such as the use of nationally reported statistics. In particular, an important advantage of microsimulation models is that they can be used to derive the fiscal and redistributive effects of tax-benefit instruments through appropriate statistical weighting of the micro-data which reflect individual and household specific characteristics. Moreover, they take into account the interactions between tax liabilities and benefit entitlements usually not considered in more aggregated approaches.

Given the cross-country perspective adopted in this study, we use EUROMOD, the EU-wide microsimulation model, which is frequently used for comparative policy analysis and recognized by Morel et al. (2018) as the right tool for producing data on the fiscal and distributive effects of TEs. The model captures the full range of institutional features of tax and benefit systems in EU countries. These include detailed income definitions (such as taxable income or "means" relevant for computing income-tested benefits), and precise characterization of family and assessment units, thresholds, floors, ceilings, and relevant tax rates, as well as specific eligibility rules, claw-back rates, or income disregards used in computing benefit entitlements. Thanks to this considerable level of detail, it is possible to obtain a comprehensive picture of tax burdens and benefit entitlements, and how these vary with earnings and individual or family characteristics.

The EUROMOD model has been validated against national administrative statistics on tax revenues collected, as well as the main social benefits paid to households (Sutherland and Figari, 2013).

The simulations refer to the national tax and benefits codes as of June 2013 and do not take into account behavioral effects (i.e., we apply the tax legislation to the input data in a purely deterministic way). Country-specific calibrations are adopted to take into account tax evasion (Greece and Italy) and non-take-up of certain means-tested benefits (Estonia, Greece, Latvia, and Romania). At the same time, we assume that all tax payers receive the amount of tax

expenditure as they are entitled given the fiscal law, without giving them the chance to claim or not the tax expenditure. We focus exclusively on TEs within the context of personal income tax, which represents the greatest share of TEs in terms of foregone revenue, and has been increasing in size over the last decade (OECD, 2010). At the same time, we acknowledge that important tax relief can also be channeled through the social contribution system (e.g., through non-taxable subsidies paid by employers; for example the employer's contribution to private health insurance schemes in France (Morel et al., 2019)) and indirect taxes (e.g., through exemptions and reduced rates).

The version of EUROMOD used in this study is based on information about personal and household characteristics (including market incomes) from the 2010 EU Statistics on Incomes and Living Conditions (EU-SILC) micro-data (or its more detailed national version, where available).⁵ EU-SILC is a nationally representative annual household survey that collects detailed income information, which in this wave was for the 2009 calendar year. Monetary values are updated to 2013 prices using relevant price indices. We extended EUROMOD to simulate the details of TEs based on the actual expenses of the taxpayers. Housing related expenditures are well captured in EU-SILC data, while education and health-related expenses are usually missing from this data. To circumvent this problem, we started with the information included in the EU Household Budget Surveys (EU-HBS), which report detailed expenditure information.

For households in the EU-HBS that reported positive expenditures on the relevant education and health-related items, we computed the average expense within 15 strata of characteristics—according to the age group of the household head (4), family composition (6) and income quintile groups (5). We then imputed the average expense into EUROMOD input data for the same numbers of households—selected randomly within each stratum—given their characteristics.

⁵The micro-data used for the UK come from the Family Resource Survey.

5. Empirical evidence

To get a better empirical grasp on the size of social TEs across European Member States, we began by simulating a scenario in which TEs related to housing, education, and health are abolished simultaneously. This allowed us to provide the most comprehensive and up-to-date quantification of social TEs in Europe.

Figure 1 reports the size of social TEs expressed as a percentage of personal income tax revenues. TEs range from below 2% of personal income tax revenue in half the countries to more than 17% in the Netherlands. In Portugal, Belgium, and Italy, social TEs represent between 4% and 5% of personal income tax revenue, around 8% in Luxembourg and Spain, and almost 14% in Denmark. It is clear that the budgetary size of TEs can be relevant and their cost to public finance cannot be ignored. The main pattern of OECD estimates (OECD, 2010; Adema et al., 2014) is mirrored in our analysis (for instance, in the cases of Belgium, France, Ireland, Italy, Portugal, and Spain). However, our evidence shows the importance of TEs in other countries (e.g., Denmark, Finland, Greece, Luxembourg, the Netherlands, and Sweden) usually not captured in OECD analysis (see Figure A.1 in the online Annex for the consequences of abolishing TEs in terms of disposable income).

< Figure 1 HERE >

In the following sub-sections, we focus on the three different types of TEs and provide a detailed empirical quantification of their fiscal effects in terms of personal income tax revenue, while considering their interaction with other tax-benefit instruments. For the sake of completeness, we also provide estimates of the impact of TEs on national GDP and disposable income. Moreover, we provide an analysis of their distributional effects by looking at the changes in terms of disposable income by income quintile groups and at the impact on inequality and poverty indices.

5.1. Housing TEs

Housing related TEs exist in 22 countries and their removal implies a change in tax revenues of below 5 percentage points in most countries, but around 7% in Luxemburg and Spain, 14% in

Denmark, and 17% in the Netherlands (Table 1). Generally, tax relief related to mortgage interest payments is prevalent with respect to preferential tax treatments of rent received or paid. The last column of Table 1 documents the size of the fiscal interaction, that is, the extent to which TEs interact with the other elements of the tax and benefit system. These interactions are generally overlooked in both academic literature and policy analysis. Our results suggest that abolishing housing TEs would, in some countries, trigger significant changes in other tax and benefit instruments. This is particularly the case for the Netherlands, where the removal of housing TEs would spur an increase of 6% in social insurance contributions and a decrease of 3% in means-tested benefits. Significant interactions can also be observed in other countries, such as Spain, where the removal of housing TEs would lead to an increase in non-means tested benefits of 5% and an increase of 13% in means-tested benefits. However, in other countries, such as Denmark and Luxembourg, the significant impact on income tax revenues of removing housing TEs would not lead to significant changes in other social benefits or social insurance contributions. Therefore, these results suggest that, while in some instances housing TEs interact significantly with other elements of the tax and social benefits systems, the nature of these interactions is far from uniform, especially when considering social benefits.

<Table 1 HERE>

Abolishing housing-related TEs implies a lower level of inequality of the overall income distribution in almost all countries as measured by the Gini index with a decrease that ranges from 2 percentage points in Denmark to about 0.5 percentage points in Luxembourg and the Netherlands. At the same time, poverty risk increases in most of the countries as a consequence of the reduction in disposable income. The poverty gap is almost unaffected (see Table A.4 in the online Annex for the detailed impact on inequality and poverty indices). In all countries, abolishing housing related TEs implies a net increase in tax revenue, with a clear progressive pattern over decile groups (i.e., the richest individuals contribute relatively more than the poorest); see Figure A.2 a, b, and c in the online Annex.

Where the TEs removed are related only (or primarily) to mortgage interest relief (see Table A.1 for a description), the most affected deciles are at the top of the distribution, pointing to the

regressive nature of a housing tax system that tends to favor owners in the middle-top of the distribution. This result is similar to the findings for the US. For instance Fischer and Huang (2013) find that people with income in the top 20 percent take 73 percent of the total tax deductions for mortgage interest; the top 1 percent alone takes 15 percent of the tax deductions for mortgage interest. Nevertheless, in countries where housing related TEs favor renters (e.g., through tax credits on rent paid), those in the bottom-middle part of the distribution tend to be favored, as emerges in the results for Ireland, Italy, Portugal, and Spain.

<Figure 2 a, b, c HERE>

Overall these results suggest the potential heterogeneous impact of different instruments on the income distribution within the same tax expenditure category which needs to be carefully considered in the analysis of TEs.

5.2. *Education-related TEs*

In terms of income tax revenue, education-related TEs are close to 1 percentage point of the income tax revenue in Latvia, 0.6 ppt in Portugal, and much less in the other countries. The last column of Table 2 provides estimates on the—low—fiscal interactions triggered by the removal of education-related TEs. For instance, the removal of education TEs would lead to a decrease in means-tested benefits of around 1% in Estonia, and interactions are absent or negligible in the other countries. With such an overall limited impact in terms of income tax revenue (and hence, disposable income) changes in the indices of inequality and poverty are almost negligible (Table A.5 in the online Annex).

<Table 2 HERE>

Although an increase in tax revenues from abolishing the education-related TEs comes mostly from individuals in the top part of the distribution (see Figure A.3 in the online Annex), the effects in terms of disposable income are more sizeable in the middle part of the distribution (Figure 3). Overall, education-related TEs tend to favor middle-top income working age individuals but the differences across deciles are too small to be significant and there is no specific pattern based on the chosen tax instrument, that is, tax deductions or tax credits.

<Figure 3 HERE>

5.3. Health-related TEs

Health-related TEs imply percentage point changes in tax revenue of close to 2 in Latvia, 1.5 in Portugal, and 1 in both Ireland and Italy, and 0.5 percentage points in both Germany and Greece. The impact of removing health-related TEs would also trigger fiscal interactions, although only in a few cases. For instance, in Ireland, removing health-related TEs would lead to a decrease of 3% in means-tested benefits. However, in other cases, such as Latvia, where TEs have a significant impact on tax revenue, the same tax expenditure would yield only a small reduction of 0.14% in means-tested benefits. The changes in the indices of income distribution are almost negligible (Table A.6 in the online Annex).

The increased revenue due to abolishing health-related TEs comes mostly from individuals in the top part of the distribution (see Figure A.4 in the online Annex), with individuals in the middle-top of the income distribution being relatively more favored by health-related TEs (see Branco and Costa (2018) for a long-term overview of the different health-related TEs in Portugal, and Di Novi et al. (2018) for Italy) with the main exception of Ireland, where individuals in the first half of the distribution gain relatively more. Moreover, as expected given the prevalence of health-related expenditures, the elderly tend to be favored by TEs, particularly in Germany, Italy, Latvia, and Portugal (Figure 4).

<Figure 4 HERE>

6. Conclusions

Regardless of the wide use of TEs across European countries there is a lot of heterogeneity in their size and effects both within and across countries. Moreover, the fiscal and equity impact of TEs is not always clear and their effectiveness and efficiency as policy instruments needs to be carefully evaluated, especially in the present context of constrained public finances. Nevertheless, a precise quantification of the tax revenue impact and distributional effects of TEs is not straightforward, particularly from a cross-country perspective, due to differences in the methods and definitions used to collect such information.

This study is the first attempt to provide a cross-country comparable quantification of the fiscal and equity impact of TEs in three categories: housing, education, and health. We make use of a microsimulation approach, using EUROMOD, the EU-wide microsimulation model, to evaluate how specific TEs interact with broader provisions in the tax-benefit system for a representative sample of individuals.

Overall, the empirical analysis suggests that the impact of TEs on tax revenues and income inequalities is non-negligible. The redistributive impact of housing TEs is regressive in most countries. Education TEs tend to favor middle- to top-income working age categories, while health TEs tend to favor the top income class and the elderly. Our results also document the size of fiscal interactions triggered by TEs, which primarily relate to housing TEs, reflecting their wider prevalence and relative importance compared to education and health TEs. The nature of these interactions depends on the country considered (leading in some cases to an increase or decrease in social benefits); however, they reflect the specificity of the country's national tax and social benefits systems.

While the reporting of tax expenditures has long been identified as one of the grey areas of fiscal policy (Kalyva et al., 2014), their social impact remains even less well documented. Our results show that such an omission also has a strong social dimension. The generalization of these results across Europe confirms the intuitions of previous studies in the “hidden welfare state” literature about the potentially complex and often unanticipated distributional effects of TEs (Adema et al., 2011; Howard, 1997).

When interpreting our analysis, some caveats should be born in mind. Most importantly, in our study, we do not account for behavioral responses. The effectiveness of tax-related expenditures in addressing a taxpayer behavioral change is out of the scope of the study, since this would imply the need for information on elasticities for all countries in the very different contexts of housing ownership choices, health, and education spending. Morel et al. (2019), Branco and Costa (2018), and Di Novi et al. (2018) provide interesting examples of country specific analysis whose extension in a cross-country perspective is hampered by data availability and left for future research developments.

Moreover, our findings are not intended to provide evidence in favor of or against abolishing TEs but to highlight their revenue and equity consequences from a cross-country perspective, which in other circumstances (e.g., previous OECD studies) has proved extremely difficult and limited.

Finally, it is important to emphasize that the uncovering of the distributional effects of tax expenditures, such as the regressive patterns found in this analysis, is crucial for the design of better targeted tax reforms, reducing inequality and, overall, optimizing not only the tax system but also the benefit system. Importantly, in this analysis these distributional effects include already the interactions between the tax and benefit systems, which, as shown in this analysis, are non-negligible in some European countries.

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Tables

Table 1. Budgetary effects of abolishing housing-related TEs, 2013

| Country | € per year | % of personal income tax revenue | % of GDP | % of disposable income | Interactions |
|----------------|------------------|----------------------------------|----------|------------------------|--|
| Belgium | 2,107,488,688.40 | 4.85 | 0.54 | -1.33 | 0.1% SICs increase; 0.01% MTBs increase |
| Bulgaria | 4,035,313.05 | 0.25 | 0.01 | -0.02 | --- |
| Cyprus | 8,292,961.25 | 0.96 | 0.05 | -0.08 | --- |
| Czech Republic | 6,411,978.46 | 0.12 | 0.00 | -0.01 | 0.04% MTBs decrease |
| Denmark | 6,497,017,542.95 | 13.77 | 2.51 | -5.35 | 0.19% MTBs decrease; 0.01% PEN decrease |
| Estonia | 8,445,963.55 | 0.74 | 0.04 | -0.12 | --- |
| Greece | 200,410,271.33 | 1.67 | 0.11 | -0.25 | --- |
| Finland | 470,537,081.15 | 1.75 | 0.23 | -0.50 | 0.02% MTBs increase |
| France | 4,003,380,600.55 | 2.25 | 0.19 | -0.40 | 0.13% MTBs decrease; 0.01% NTBs decrease |
| Ireland | 297,635,574.69 | 1.90 | 0.17 | -0.49 | 0.01% MTBs increase |
| Italy | 6,837,337,047.14 | 3.76 | 0.43 | -0.94 | --- |
| Lithuania | 12,544,450.62 | 0.89 | 0.04 | -0.12 | --- |
| Luxemburg | 164,107,217.12 | 7.43 | 0.35 | -1.34 | 0.01% SICs decrease |
| Netherlands | 8,969,326,439.46 | 16.90 | 1.36 | -4.90 | 5.58% SICs increase; 3.34% MTB decrease |
| Portugal | 192,313,842.07 | 1.49 | 0.11 | -0.26 | --- |
| Romania | 3,313,708.25 | 0.05 | 0.00 | -0.01 | --- |
| Slovenia | 7,987,507.94 | 0.45 | 0.02 | -0.05 | 0.01% MTBs increase |
| Spain | 6,215,507,838.75 | 7.55 | 0.61 | -0.99 | 1.5% SICs decrease; 13.33% MTBs increase; 4.68% NTBs increase; 0.1% PEN decrease |
| Sweden | 1,653,246,379.53 | 2.96 | 0.38 | -0.90 | 0.03% MTBs increase |
| United Kingdom | 37,357,609.27 | 0.02 | 0.00 | 0 | 0.01% MTBs increase |

Notes. Own simulations based on EUROMOD. SICs: Social Insurance Contributions; MTBs: Means-tested Benefits; NTBs: Non Means-tested Benefits; PEN: Pension benefits. Source: Own simulations based on EUROMOD.

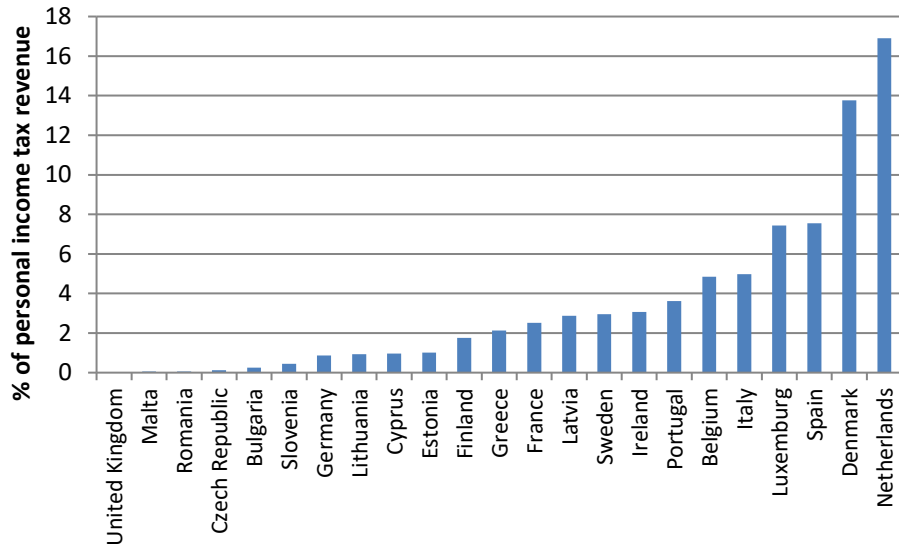
Table 2. Budgetary effects of abolishing education- and health- related TEs, 2013

| Country | € per year | % of personal income tax revenue | % of GDP | % of disposable income | Interactions |
|------------------------------|---------------|----------------------------------|----------|------------------------|---------------------|
| <i>Education-related TEs</i> | | | | | |
| Estonia | 3,008,012 | 0.26 | 0.02 | -0.05 | 0.97% MTBs decrease |
| France | 456,629,892 | 0.26 | 0.02 | -0.05 | 0.04% MTBs decrease |
| Italy | 193,141,002 | 0.11 | 0.01 | -0.03 | --- |
| Latvia | 14,093,267 | 0.88 | 0.06 | -0.18 | 0.14% NTBs decrease |
| Lithuania | 539,190 | 0.04 | 0.00 | -0.01 | --- |
| Malta | 440,653 | 0.05 | 0.01 | -0.00 | --- |
| Portugal | 83,005,700 | 0.64 | 0.05 | -0.11 | --- |
| <i>Health-related TEs</i> | | | | | |
| Germany | 2,183,801,524 | 0.86 | 0.08 | -0.16 | 0.09% MTBs increase |
| Greece | 56,217,370 | 0.47 | 0.03 | -0.07 | --- |
| Ireland | 176,742,895 | 1.13 | 0.10 | -0.74 | 3.04% MTBs decrease |
| Italy | 2,115,063,716 | 1.16 | 0.13 | -0.29 | --- |
| Latvia | 32,082,298 | 2.03 | 0.14 | -0.39 | 0.14% MTBs decrease |
| Portugal | 194,552,425 | 1.53 | 0.11 | -0.26 | --- |

Notes. Own simulations based on EUROMOD. SICs: Social Insurance Contributions; MTBs: Means-tested Benefits; NTBs: Non Means-tested Benefits; PEN: Pension benefits. Source: Own simulations based on EUROMOD.

Figures

Figure 1. Change in personal income tax revenue due to abolishing social TEs, 2013



Source: Own simulations based on EUROMOD.

Figure 2.a. Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related TEs, 2013

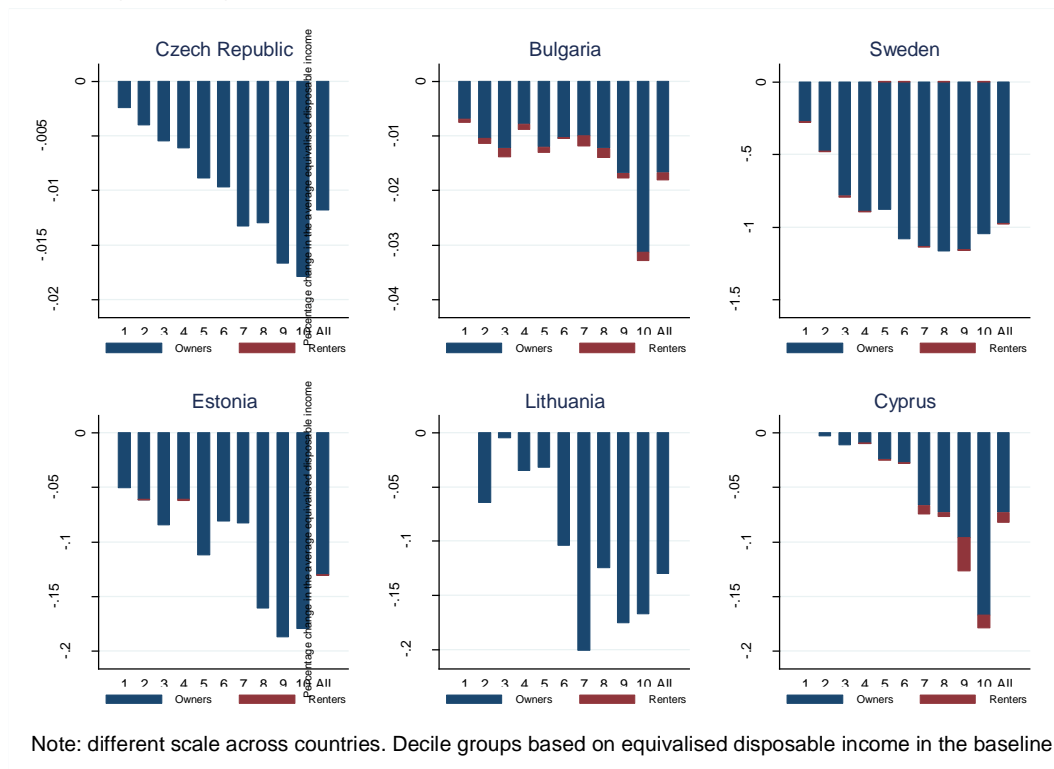


Figure 2.b. Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related TEs, 2013

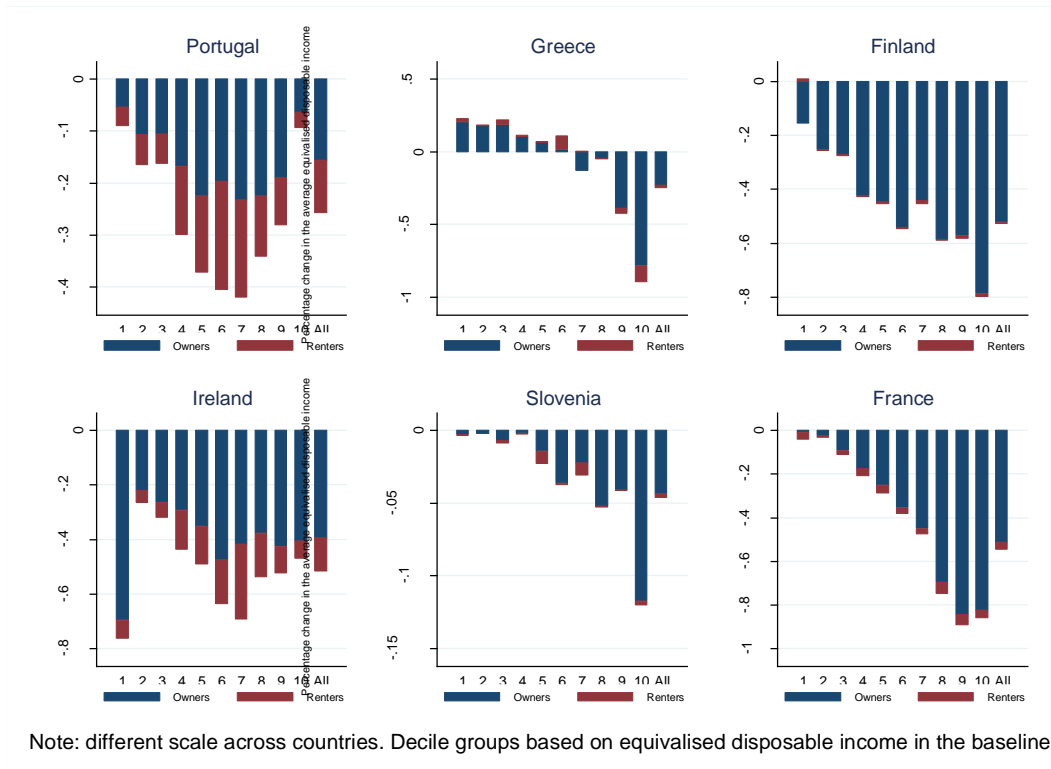


Figure 2.c. Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related TEs, 2013

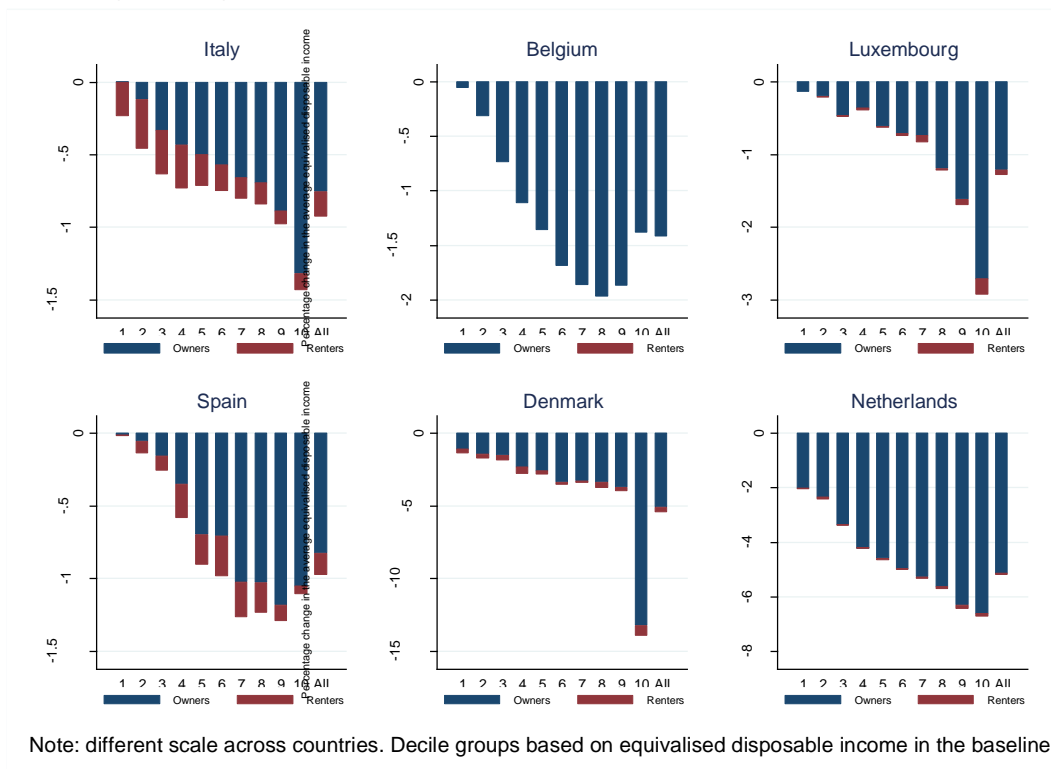


Figure 3. Change in disposable income decomposed by hh types and decile groups due to abolishing education-related TEs, 2013

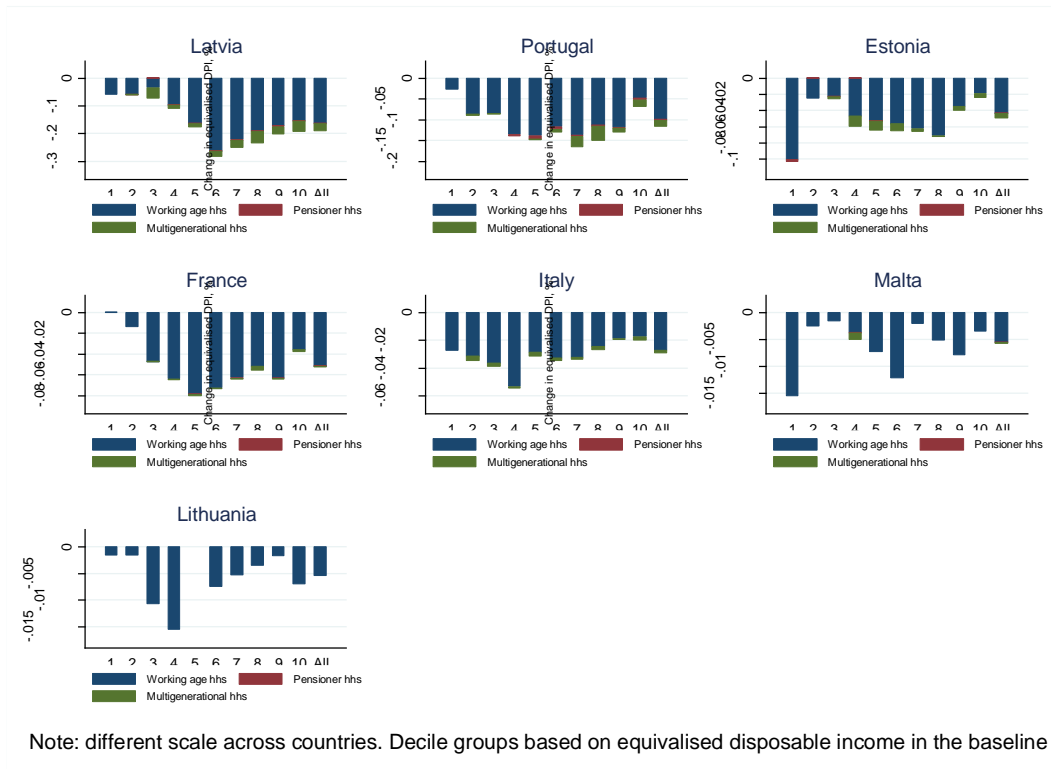
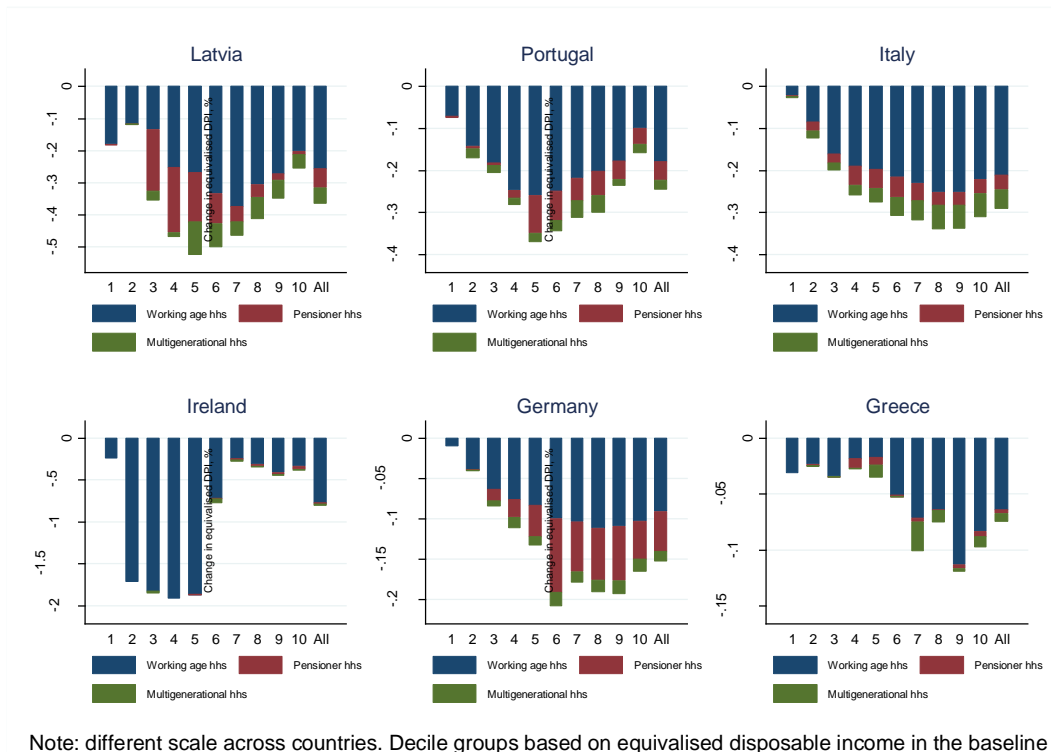
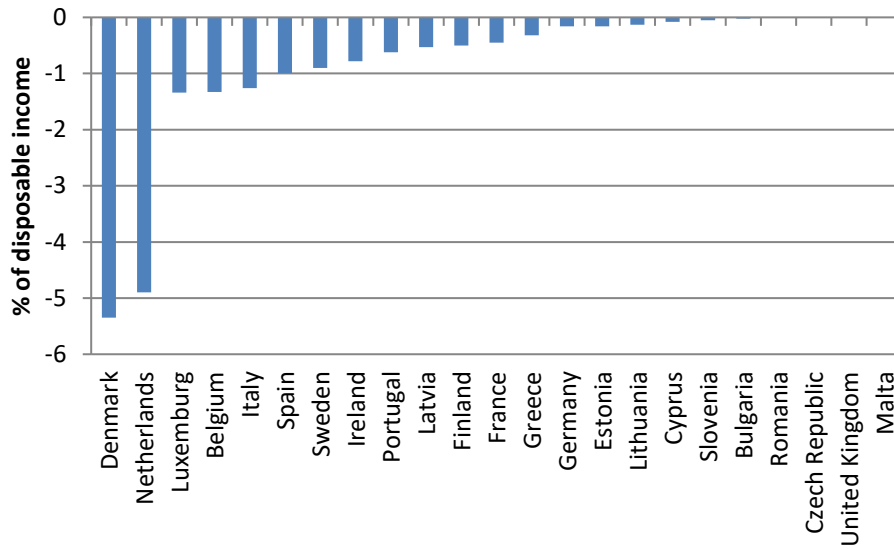


Figure 4. Change in disposable income decomposed by hh types and decile groups due to abolishing health-related TEs, 2013



Appendix

Figure A1. Change in disposable income due to abolishing social TEs, 2013



Source: Own simulations based on EUROMOD.

Figure A2.a. Change in tax revenue over decile groups due to abolishing housing-related TEs, 2013

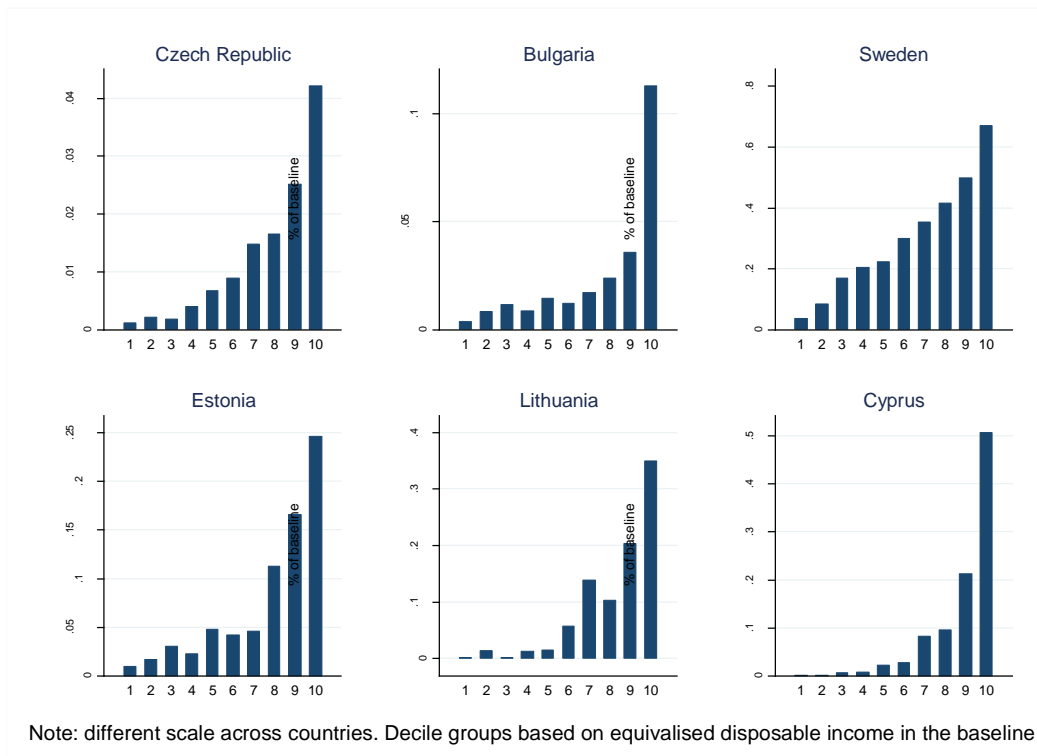


Figure A2.b. Change in tax revenue over decile groups due to abolishing housing-related TEs, 2013

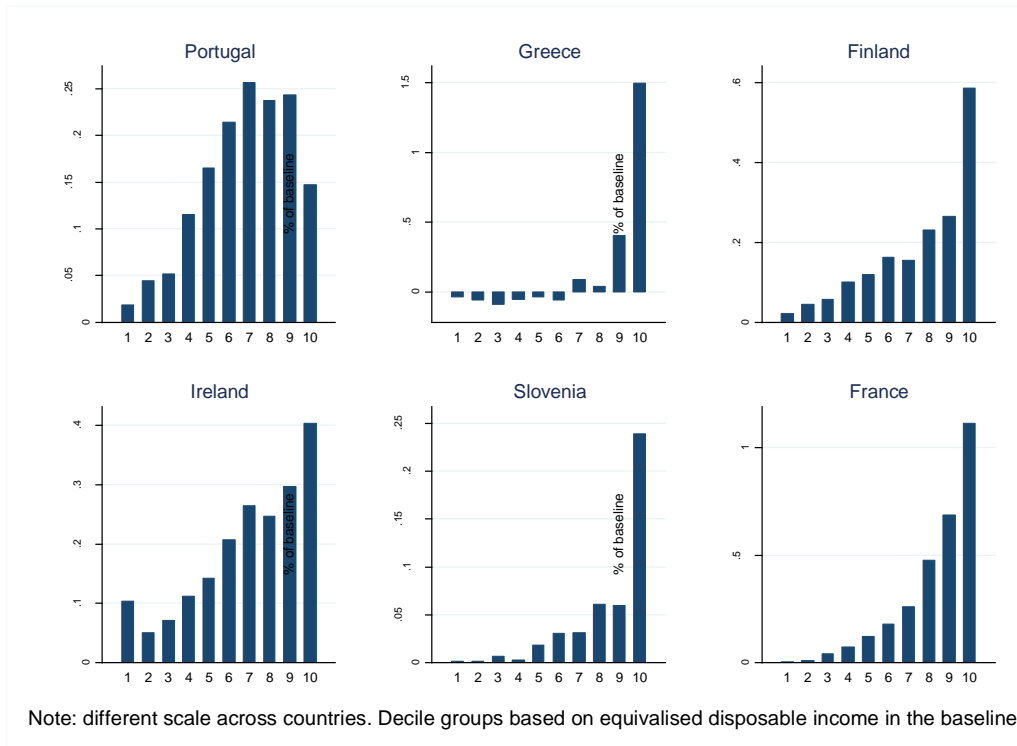


Figure A2.c. Change in tax revenue over decile groups due to abolishing housing-related TEs, 2013

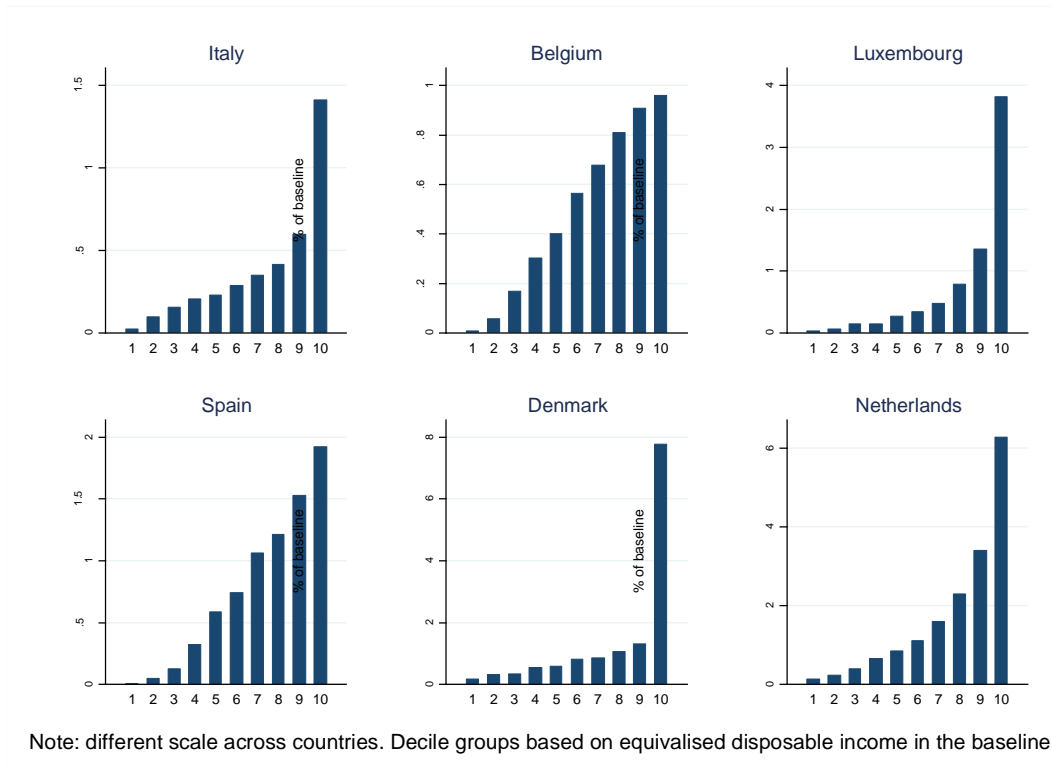


Figure A3. Change in tax revenue over decile groups due to abolishing education-related TEs, 2013

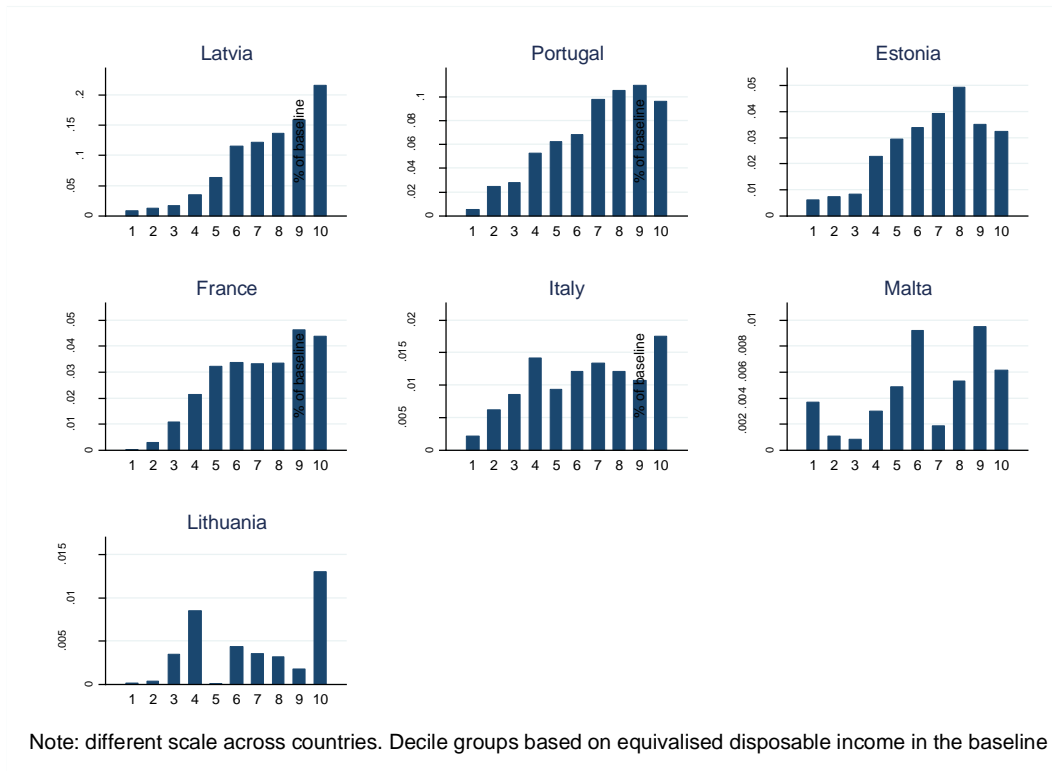


Figure A4. Change in tax revenue over decile groups due to abolishing due to health-related TEs, 2013

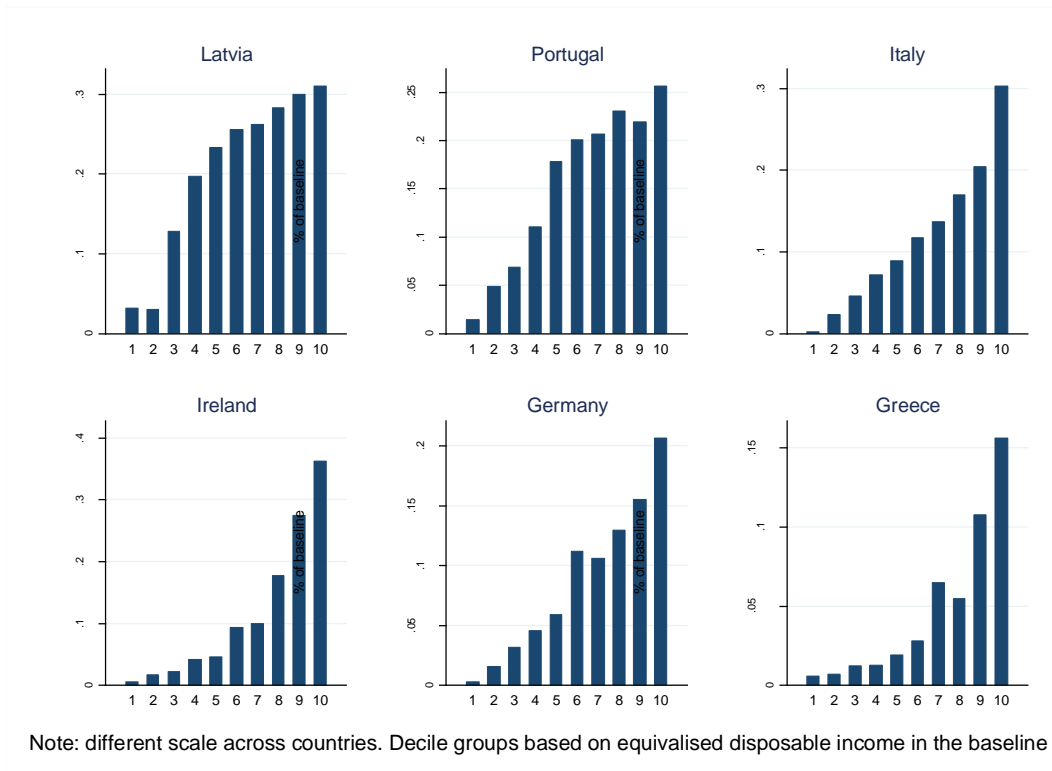


Table A1. Housing-related TEs simulated in EUROMOD, 2013

| Country | Existing TEs in EUROMOD (2013 tax regimes) |
|-----------------------|---|
| Belgium | Mortgage Interest Tax credit |
| Bulgaria | Tax deduction for income from rent |
| Cyprus | Tax allowance for income from rent (20%) |
| Czech Republic | Interest for mortgage repayment exemption |
| Denmark | Mortgage interest payments deducted for the definition of investment income incomes for taxes Rent not taxed |
| Estonia | Mortgage interest payments among deductible expenses |
| Greece | Rent taxed at separate rates (10% and 33% for rent above 12000 euro per year). Additional tax on rental (1.5%) |
| Finland | Allowance of 85% of interest expenses on mortgage interests as part of tax of investment income Rent taxed as part of capital income tax |
| France | 30% deduction on rent income for taxation purposes 40% of actual mortgage interest is deductible from the tax payment (introduced in May 2007; abolished in 2011 but grandfathered; this tax credit applied only during the first 5 years of the mortgage, simulation assumes that if head of the fiscal unit is younger than 45 then he bought the house less than 5 years before) |
| Ireland | Rent tax credit (rent relief for private rented accommodation) Refundable Mortgage interest tax credit |
| Italy | Tax credit for main residence mortgage interest payment (19% of interest payments up to 4000 Euro per year) Income from renting immovable property subject to separate tax (lower rate than PIT, i.e. 21%) Deduction for paid rent for immovable property if tax payer income below certain limits Tax credit for refurbishment of immovable property (from 36% to 65% of actual expenses, to be claimed back in 10 years) |
| Lithuania | Mortgage interest tax credit |
| Luxemburg | Allowance for mortgage interest payments Deduction of a % of income from rent received Rent not taxed |
| Netherlands | Mortgage interest payments deducted |
| Portugal | Tax credit for (15%) mortgage interest and capital payments with limit Tax credit for (15%) rent |
| Romania | Tax allowance for rental income (rental income subject to some health insurance contribution) |
| Slovenia | Deduction of 40% of rental income |
| Spain | Mortgage tax credit Main residence rent tax credit Regional tax credit: young taxpayers renting main residence tax credit |
| Sweden | Tax credit for negative capital income due to main residence mortgage interest payment – investment income and property income) Tax on capital income (i.e. investment income and property income) net of interests on mortgage payments Income from property taxed as capital income (i.e. proportional tax); deduction not simulated |
| United Kingdom | Rent on rooms in own residence untaxed if below £4250 per year |

Table A2. Education-related TEs simulated in EUROMOD, 2013

| Country | Existing TEs in EUROMOD (2013 tax regimes) |
|------------------|--|
| Estonia | Educational expenses are deductible if they are paid by the taxpayer on his own behalf or on the behalf of his dependants under 26 years. |
| France | Parents whose children receive secondary or graduate education are entitled to a tax credit of EUR 61 to 183 per child, depending on the level of the educational institution. |
| Italy | A credit equal to 19% of certain personal expenses is granted, including: expenses for secondary and university education, not exceeding the amount of state tuition fees. |
| Latvia | Deduction of expenses prescribed as deductible by the Individual Income Tax Law. |
| Lithuania | Deduction of payments for the taxpayer's (or children) professional training or higher educational studies. |
| Malta | Deduction of school fees. |
| Portugal | A credit equal to 10% of tax payer and his dependants' education expenses with limits. |

Table A3. Health-related TEs simulated in EUROMOD, 2013

| Country | Existing TEs in EUROMOD (2013 tax regimes) |
|-----------------|--|
| Germany | Deduction of extraordinary expenses (assumed to be health related) |
| Greece | Credit (up to 3.000 euro) equal to 10% of the annual expenses of a taxpayer and his dependants paid to a hospital, which are not covered by Social Insurance Funds or insurance companies insofar as they exceed 5% of the taxable income. |
| Ireland | Deduction of medical insurance and expenses. |
| Italy | A credit equal to 19% of certain personal expenses is granted, including: expenses for surgery, medical specialists and dental prostheses for the amount exceeding 129 euro. |
| Latvia | Deduction of expenses prescribed as deductible by the Individual Income Tax Law. |
| Portugal | Credit (with limits) equal to 10% of unreimbursed health-related expenses. |

Table A4. Redistributive effects of abolishing housing-related TEs, 2013

| Country | Gini in the baseline, with TEs | Gini in the scenario, without TEs | Poverty Head Count ratio in the baseline, with TEs | Poverty Head Count ratio in the scenario, without TEs | Poverty Gap in the baseline, with TEs | Poverty Gap in the scenario, without TEs |
|----------------|-----------------------------------|--------------------------------------|--|---|---|--|
| Belgium | 0.229 (0.002) | 0.228 (0.002) | 11.74 (0.299) | 11.86 (0.299) | 2.84 (0.103) | 2.85 (0.103) |
| Bulgaria | 0.328 (0.003) | 0.328 (0.003) | 19.41 (0.351) | 19.42 (0.351) * | 5.48 (0.125) | 5.49 (0.125) |
| Cyprus | 0.274 (0.003) | 0.274 (0.003) | 13.94 (0.356) | 13.94 (0.356) * | 2.78 (0.092) | 2.78 (0.092) |
| Czech Republic | 0.237 (0.002) | 0.237 (0.002) | 8.01 (0.220) | 8.01 (0.220) * | 1.74 (0.065) | 1.74 (0.065) |
| Denmark | 0.251 (0.006) | 0.231 (0.003) | 10.28 (0.451) | 11.18 (0.462) | 2.19 (0.161) | 2.33 (0.163) |
| Estonia | 0.311 (0.003) | 0.311 (0.003) | 17.32 (0.421) | 17.37 (0.422) | 4.38 (0.137) | 4.39 (0.137) |
| Greece | 0.315 (0.004) | 0.313 (0.004) | 17.96 (0.454) | 17.83 (0.453) | 5.45 (0.193) | 5.43 (0.193) |
| Finland | 0.240 (0.002) | 0.239 (0.002) | 11.64 (0.278) | 11.77 (0.278) | 1.95 (0.057) | 1.97 (0.057) |
| France | 0.277 (0.002) | 0.275 (0.002) | 10.86 (0.236) | 10.87 (0.236) * | 2.40 (0.078) | 2.40 (0.078) * |
| Ireland | 0.274 (0.003) | 0.277 (0.003) | 13.99 (0.498) | 15.27 (0.511) | 2.59 (0.149) | 2.81 (0.151) |
| Italy | 0.317 (0.002) | 0.315 (0.002) | 18.15 (0.225) | 18.38 (0.226) | 6.74 (0.114) | 6.78 (0.114) |
| Lithuania | 0.406 (0.004) | 0.406 (0.004) | 25.10 (0.628) | 25.10 (0.628) * | 10.07 (0.355) | 10.08 (0.355) |
| Luxemburg | 0.249 (0.003) | 0.244 (0.003) | 9.96 (0.402) | 10.22 (0.405) | 1.11 (0.107) | 1.11 (0.093) * |
| Netherlands | 0.251 (0.002) | 0.245 (0.002) | 11.19 (0.422) | 12.38 (0.424) | 2.37 (0.139) | 2.61 (0.142) |
| Portugal | 0.305 (0.003) | 0.306 (0.003) | 16.43 (0.380) | 16.48 (0.380) | 4.21 (0.128) | 4.22 (0.128) |
| Romania | 0.328 (0.002) | 0.328 (0.002) | 21.47 (0.004) | 21.47 (0.004) * | 7.16 (0.159) | 7.16 (0.159) |
| Slovenia | 0.238 (0.001) | 0.238 (0.001) | 12.91 (0.276) | 12.91 (0.276) * | 2.54 (0.076) | 2.54 (0.076) |
| Spain | 0.310 (0.002) | 0.305 (0.002) | 20.82 (0.277) | 19.63 (0.272) | 7.97 (0.141) | 7.46 (0.138) |
| Sweden | 0.236 (0.003) | 0.235 (0.003) | 12.76 (0.308) | 12.94 (0.309) | 3.00 (0.102) | 3.03 (0.102) |
| United Kingdom | 0.317 (0.002) | 0.317 (0.002) | 15.36 (0.165) | 15.36 (0.165) * | 4.54 (0.070) | 4.54 (0.070) * |

Notes: Standard errors in brackets. Poverty line kept constant as in the baseline. * difference between scenario and baseline not statistically different from 0 at 5% level. Source: Own simulations based on EUROMOD.

Table A5. Redistributive effects of abolishing education-related TEs, 2013

| Country | Gini in the baseline, with TEs | Gini in the scenario, without TEs | Poverty Head Count ratio in the baseline, with TEs | Poverty Head Count ratio in the scenario, without TEs | Poverty Gap in the baseline, with TEs | Poverty Gap in the scenario, without TEs |
|-----------|-----------------------------------|--------------------------------------|--|---|---|--|
| Estonia | 0.311 (0.003) | 0.311 (0.003) | 17.32 (0.421) | 17.32 (0.421) * | 4.38 (0.137) | 4.39 (0.137) |
| France | 0.277 (0.223) | 0.277 (0.223) | 10.86 (0.236) | 10.90 (0.236) | 2.40 (0.078) | 2.40 (0.078) |
| Italy | 0.317 (0.002) | 0.317 (0.002) | 18.15 (0.225) | 18.16 (0.225) | 6.74 (0.114) | 6.74 (0.114) |
| Latvia | 0.351 (0.002) | 0.351 (0.002) | 21.11 (0.368) | 21.15 (0.368) | 5.89 (0.132) | 5.90 (0.132) |
| Lithuania | 0.406 (0.005) | 0.406 (0.005) * | 25.10 (0.628) | 25.10 (0.628) * | 10.07 (0.355) | 10.08 (0.355) |
| Malta | 0.285 (0.003) | 0.285 (0.003) * | 15.88 (0.385) | 15.88 (0.385) * | 3.40 (0.109) | 3.41 (0.109) |
| Portugal | 0.305 (0.003) | 0.306 (0.003) | 16.43 (0.380) | 16.60 (0.383) * | 4.21 (0.128) | 4.25 (0.128) |

Notes: Standard errors in brackets. Poverty line kept constant as in the baseline. * difference between scenario and baseline not statistically different from 0 at 5% level. Source: Own simulations based on EUROMOD.

Table A6. Redistributive effects of abolishing health-related TEs, 2013

| Country | Gini in the baseline, with TEs | Gini in the scenario, without TEs | Poverty Head Count ratio in the baseline, with TEs | Poverty Head Count ratio in the scenario, without TEs | Poverty Gap in the baseline, with TEs | Poverty Gap in the scenario, without TEs |
|----------|--------------------------------------|---|--|---|---|--|
| Germany | 0.270 (0.002) | 0.270 (0.002) | 12.96 (0.234) | 12.96 (0.234) * | 2.47 (0.064) | 2.47 (0.064) |
| Greece | 0.315 (0.004) | 0.315 (0.004) | 17.96 (0.454) | 17.96 (0.454) * | 5.45 (0.192) | 5.45 (0.192) |
| Ireland | 0.274 (0.003) | 0.277 (0.003) | 13.99 (0.498) | 15.27 (0.511) | 2.59 (0.149) | 2.81 (0.151) |
| Italy | 0.317 (0.002) | 0.316 (0.002) | 18.15 (0.225) | 18.22 (0.225) | 6.74 (0.114) | 6.75 (0.114) |
| Latvia | 0.351 (0.003) | 0.351 (0.003) | 21.11 (0.369) | 21.35 (0.369) | 5.89 (0.132) | 5.97 (0.132) |
| Portugal | 0.305 (0.003) | 0.306 (0.003) | 16.43 (0.380) | 16.65 (0.383) | 4.21 (0.128) | 4.27 (0.129) |

Notes: Standard errors in brackets. Poverty line kept constant as in the baseline. * difference between scenario and baseline not statistically different from 0 at 5% level. Source: Own simulations based on EUROMOD.