

The fiscal and equity impact of tax expenditures in the EU: evidence from microsimulation modelling

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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 – poverty and inequality reduction, and employment promotion, among others. Tax expenditures 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 needs to be carefully evaluated, especially in the present context of constrained public finances. Tax expenditures might in some cases distort economic incentives be it towards consumption or investment, in some case by favouring rent seeking behaviour and making tax systems less transparent and/or regressive from a social viewpoint.

While policy recommendations often call for streamlining tax expenditures, in practice policy measures are often difficult to design in particular given the difficulty in measuring the fiscal and equity impact of tax expenditures. This paper quantifies the fiscal and equity effects of tax expenditures in 27 European countries making use of EUROMOD, the EU-wide microsimulation model. We focus on four specific categories of preferential tax treatments affecting personal income taxation related to housing, pension, education and health expenditures. One key feature of the microsimulation model EUROMOD is that it embeds the interaction between different tax instruments and benefits entitlement which, in EU tax systems, proves essentially to fully gauge the fiscal and equity impact of tax expenditures. In order to quantify the impact of tax expenditure on governments' tax revenues and on households' disposable income a benchmark tax system scenario is created where tax expenditures – in the form of allowances, deductions, exemptions, reliefs and credits – are explicitly considered.

We find a variety of effects, in terms of sign and magnitude, across Member States, and within these, among types of households and across generations. 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. This result points out to the importance of a careful country specific scrutiny, for each type of tax expenditures.

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1. Introduction

Tax expenditures are preferential tax treatments granted to specific individuals or categories of households which aim at achieving social and economic goals – poverty fighting, inequality reduction, and employment promotion, among others.¹ Tax expenditures are widely used by EU Member States. However, their fiscal and equity impact is not always clear and their effectiveness and efficiency as a policy instrument needs to be carefully evaluated, especially in the present context of constrained public finances. In fact, as any preferential scheme, tax expenditures introduce distortions in the tax system, making it prone to rent seeking behaviour and less transparent tax systems and can sometimes prove regressive from a social viewpoint. Since 2014, and in the context of the Budgetary Framework Directive, Member States are required to publish information on the effects of tax expenditures on government tax revenues. The identification of tax expenditures remains a highly controversial and arguably difficult topic, however, (see OECD 2010 and European Commission, 2014).

Tax expenditures are defined as a "transfer of public resources that is achieved by reducing tax obligations with respect to a benchmark tax, rather than by a direct expenditure", see OECD (2003). Examples include exemptions and allowances of part of the income to derive the tax base, credits which are deducted from the tax liability, tax rate reduction for certain types of tax payers (e.g. low-income households, pensioners, etc.) or activity (e.g. cultural goods) or tax deferrals (e.g. as those affecting corporate taxes). From a public finance perspective, tax expenditures entail a cost in terms of foregone revenues compared to the benchmark tax system, which might be more difficult to justify in times when substantial consolidation efforts are required, see Kalyva et al. (2015). In such a context, cost-benefit analysis of tax expenditures is particularly warranted.

Nevertheless, a precise quantification of such loss and the analysis of its distributional effects are not straightforward, in particular in a cross-country perspective. In this paper we make use of EUROMOD, the EU-wide microsimulation model (Sutherland and Figari, 2013), in order to quantify the fiscal and equity impact of tax expenditures concerning four categories namely, pension, housing, health and education related tax expenditures.

The use of microsimulation models allows one to evaluate how specific tax expenditures interact with the broader provisions in the tax-benefit system for a representative sample of individuals. For instance, in some countries the working tax credits are tied to family benefits (e.g. as in the UK). Some tax exemptions and benefits are also means-tested, implying that changes in gross taxable income need to be taken into account when evaluating the overall size of tax relief. All in all, as the different provisions of the tax-benefit system contribute to determining the overall liability/entitlement of the taxpayers, and, thus, the effect of (repealing) tax benefits, the use of microsimulation models has undoubtedly the potential to greatly improve our knowledge of the size and effects of tax expenditures. In a recent paper, Avram et al. (2012) use the EUROMOD microsimulation tool to quantify the size of tax expenditures in the personal income tax systems in selected EU countries, alongside their redistributive implications. A distinctive feature of the analysis is that the authors explicitly differentiate among types of tax benefit, based not only on their purpose, but also on the design of the relief. In particular, whether a tax relief is granted through a

¹ See European Commission (2014) for a comprehensive description of tax expenditures in direct taxation in EU Member States.

reduction of the relevant tax base (that is, through an allowance) or through a reduction of the gross tax liability (tax credit) has non negligible implications on the final impact on the post-tax income distribution.

This paper provides the first comprehensive and comparable cross-country quantitative analysis of the fiscal and equity effects of tax expenditures focussing on four specific categories of preferential tax treatments affecting personal income taxation related to housing, pension, education and health expenditures. These specific tax expenditures have a potential impact on labour decision (pension related tax expenditures), housing acquisition and the market of merit goods (health and education related tax expenditures) but they can be also relevant from a redistribution viewpoint which is often disregarded in the existing literature despite its importance related to the size and the design of the tax expenditures. First, pensions play a key role in inter-generational redistribution as well as between income groups. In some countries pensions have also acted as a key instrument to smooth households' income fluctuations. The differing evolutions of pension and wages and influence of tax policy changes have also had important redistributive impact during the recent crisis (Figari et al., 2015). Second, housing tax expenditures are often biased towards ownership, in particular through mortgage tax deduction, with equity implications depending on the tax-benefit system and its interaction with the housing market. Third, health and education expenditures are traditionally linked to expenditures made by the tax payer on her behalf or on behalf of her relatives and their equity impact depends on the consumption patterns and liquidity constraints of the tax payer.

The remainder of the paper is organised as follows. Section 2 provides a discussion of the rationale of social related tax expenditures affecting personal income taxation followed by an overview of the existing identification and reporting practises related to tax expenditures in Europe in Section 3. 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 focussing on the fiscal and equity impacts of each type of tax expenditure considered in the paper.

2. The rationale of social related tax expenditures affecting personal income taxation

Tax expenditures have long been used as a tool for promoting social and economic objectives. Common goals include promoting the accurate measurement of income, altering the distribution of fiscal benefits and burdens to address differences in ability-to-pay, and promoting socially desirable activities. Tax expenditures can be categorized in different ways. Some countries categorize tax provisions by budget function, such as health, social assistance, and housing, etc.; budget functions serve as one way to identify provisions that operate in a common area of policy or share a similar purpose. Alternatively, a distinction can be made between tax expenditures that effectively substitute for social policy or those concerning economic spending programs. Following the general division between the categories of "social" and "business" tax expenditures proposed by Toder (1999, 2005), those related to pensions, housing, education and health represent the main components of the "social" (or welfare) tax expenditures category. This category includes tax expenditures that support social policy goals, such as promoting retirement saving, health insurance coverage, education, home ownership, and providing income support for low-income families. Examples of social tax expenditures are the mortgage interest deduction, the tuition credits for higher education, the exclusion of contributions for health insurance. On the contrary, business related tax expenditures are provisions generally aimed at promoting investment and economic

growth, including accelerated depreciation for capital investment, the research and experiment tax credit, and preferential taxation of capital gains.

In the US the so called social tax expenditures affecting personal income taxation represent the main part of total tax expenditures in relation to GDP. Among social tax expenditures the main components are those for pensions, health and housing, while tax expenditures for education are less important (Toder, 1999 and 2005; Burman *et al.*, 2008). Social related tax expenditures are increasingly been used also in Europe in pursuing a wide variety of economic and social aims. Although their specific design can differ across countries, reflecting differences in the whole tax-benefit systems, they tend to have some common features, as discussed in Section 3.

Identifying the tax expenditure's purpose or rationale is a necessary first step in determining how the tax expenditure's performance should be assessed. For some tax expenditures, the intended purpose may be clear from the legislative history; for others the purpose may not be clear and may need to be inferred. Sometimes tax expenditures are motivated by clear economic or social reasons on the ground of efficiency or equity. Sometimes their motivation has to be found outside the traditional economic approach, for instance in the perspective of the political economy (see Kalyva, 2016).

The following are the main examples of broad purposes for social tax expenditures:

- to encourage taxpayers to engage in particular activities which are socially desirable or which the government consider 'meritorious'. Tax expenditures are so geared toward encouraging investing in education and research, saving, health coverage, or housing;
- to adjust for differences in individuals' ability to pay taxes. Taxpayers who had large out-of-pocket medical expenses or theft losses may deduct some of these non-discretionary expenses that produce the effect of reducing their economic capacity.

In the experience of most countries the first rationale appear to be more frequent than the latter. A few tax expenditures exist to adjust for differences in individuals' ability to pay taxes; this is the case of health related tax expenditures. If two taxpayers have the same income, but one has a catastrophic illness and costly medical bills (or large casualty and theft losses), the other taxpayer is judged better able to pay taxes on his income. This can justify specific tax allowances for medical expenses. The same argument could justify also the deduction of education related expenses.

The rationale for the first purpose – encouraging to engage particular activities - (why the public sector should support particular activities, and why taxpayers should engage in particular activities, like education or housing, or private pensions) depends fundamentally on the role assigned to the public sector in the economy in each country in line with the traditional reasons of efficiency and equity. Tax expenditures that provide incentives may produce social benefits if they reduce inefficiencies that would otherwise exist. Spillovers, or externalities, are a case of such inefficiencies. A tax expenditure can generate efficiency benefits if it changes incentives in a way that reduces spillover costs or increases activities that produce spillover benefits. This is mainly the case of education and health. An example of spillover benefits is when people investing in education produce knowledge that enters the public realm and is freely available to others. In this case, education provides benefits, or positive externalities, to other people who are unrelated to the

investors. Economists widely agree that some government subsidy – also through the tax system - for education may be justified because the social returns from education exceed the private returns that investors receive. In the absence of a subsidy, the amount invested in education would be less efficient from society's standpoint. Here the operative principle is that a public subsidy is needed when individuals, who do not capture all the benefits themselves, would undertake too little of the activity in the absence of a subsidy.

Sometimes the reason of the public support for particular activities – and so the use of tax expenditures – must be found on the ground of the so called “merit goods, that is commodities or activities which are judged that an individual or society should have on the basis of some concept of need, rather than ability and willingness to pay. Examples include the delivery of health services to improve quality of life and reduce morbidity, subsidized housing and education and private pensions. The essence of merit goods is to do with an information failure to the consumer. This arises because consumers do not perceive quite how good or bad the good is for them: either they do not have the right information or lack relevant information. With this definition, a merit good is defined as good that is better for a person than the person realises. Individuals are myopic, they are short-term utility maximisers and so do not take into account the long term benefits of consuming a merit good and so they are under-consumed. This can mainly explain the public support – also through tax expenditures – that almost all countries provide for private pensions.

More frequently tax expenditures may have simultaneously multiple purposes and motivations. Reasons linked to equity and the nature of merit goods explain tax expenditures provided for education, pensions, housing and health. But at the same time tax expenditures may be justified on the ground of efficiency; for instance, positive externalities are related to education, housing and health; correction of inefficiency in insurance markets or correction of negative externalities explain the public support for health and private pensions.

Social tax expenditures, like other forms of tax expenditures, seem to be in continuous expansion across countries even if their rationale remains unclear or is absent at all or tax reforms proposals would intend to eliminate main of them. The reason can be found in the perspective of political economy (Kalyva, 2016). The reason is that tax expenditures are vulnerable to lobbying more than equivalent spending programs (Tyson, 2014). Tax expenditures are popular because they constitute a way of increasing public support for social policy, while seeming to be tax cuts rather than increases in spending. Compared with direct spending with similar aims, they better meet the need of government to appear to favour spending restraint. Special interest groups may find it easier to argue for tax breaks than for explicit spending support. Tax expenditures often bypass the scrutiny accorded to spending in the regular budget and may not require annual renewal in the budgetary process; this lack of transparency (Stiglitz, 2002) may explain some of the appeal they hold for policy maker.² As a result, they can grow over time and avoid reform, reduction or repeal. Common practice around the world is that the tax law is permanent, and not subject to regular legislative reauthorisation or review. In contrast with appropriated spending, which must be re-enacted annually, or even those entitlement programmes that are subject to periodic reauthorisation, this puts tax expenditures in a much less vulnerable position. Furthermore, even with a strong efficiency,

² For the case of corporate tax expenditures see Stiglitz, 2014.

effectiveness, or equity case against a tax expenditure, repeal or reform of that provision is not politically realistic, in that it would be a tax increase, an option that is anathema for many politicians.

3. Tax expenditures in the European Union and existing empirical evidence on their quantification

Kalyva et al. (2014) provides an extensive review on tax expenditure in direct taxation reporting practices across EU countries. Importantly though, in most cases the official reporting on tax expenditures concerns only the fiscal cost of tax expenditures without similarly disclosure on their impact on households' income. The European Commission provides general guidelines on the reporting of tax expenditures. Following the Directive on requirements for budgetary frameworks, EU Member States should provide detailed reporting on the impact of tax expenditures on government revenues (Art. 14.2). One key principle of this Directive is the need to ensure that "the quality of fiscal data is transparency, which must entail the regular public availability of such data" which applies to the reporting of tax expenditures. However no further definition provides a benchmark for assessing the impact of tax expenditures or the level of detail in reporting these. A recent important change though concerns the recording of tax credits (which cover tax allowance, exemption, or deduction) in national accounting with the introduction of the ESA 2010 reporting standards, see OJEU (2013). Accordingly, "the whole amount of tax credits is recorded as government expenditure, and not as a reduction of tax revenue". This principle therefore acknowledges the nature of tax expenditure to allow the derivation of tax credits on a net basis, i.e., accounting explicitly for the impact of refundable tax credits on government expenditures. The whole amount of the payable tax credit should be recorded as government expenditure ("Total payable tax credits", PTC) while mentioning the amount of the 'transfer component' (TC), which are payable tax credits that exceed the taxpayer's liability and that are paid out to the taxpayer. This change implies therefore that tax expenditures are to be recorded on a gross basis resulting in increases in government expenditures and revenues at the moment the government recognises the obligation to pay, see Kalyva et al. (2014).³

While recent EU legislative measures recognise the relevance of accounting and measuring the impact of tax expenditures, the EU Member States practices, including methods, details and timeliness, differ notably. As noted by Kalyva et al. (2014), 18 out of the 28 Member States regularly reported on tax expenditures. This reporting can be made by government or non-government bodies which are, in many instances, associated to government institutions. The variety of approaches and definition used makes a cross-country comparison based on these data extremely complex if not impossible, however. It is therefore impossible to assess the relative efficiency and impact of the tax expenditures in place in the Member States using as only source the statistics released at national level.

Existing evidence on the fiscal and equity impact of tax expenditures is very scattered, reflecting the variety of definition used and the difficulty to compare existing estimates across countries. To date the most comprehensive cross-country comparative analysis is provided by the study conducted by

³ A specific treatment of tax expenditures associated contingent liabilities is foreseen. This concerns in particular the Deferred Tax Assets (DTAs). DTAs on the balance sheet of a corporation may give the right to pay less tax, although a DTA is not recorded as a tax credit until such a right effectively exists and can be used up to a certain amount and, in this case, ESA2010 rules for the recording of tax credits are to be applied for both payable and non-payable tax credits, see European Commission (2014).

the OECD (2010). However the OECD (2010) report itself acknowledges the limitation of any cross-country comparison: *“Even apparently significant numerical differences in numbers and amounts of tax expenditures can be driven by apparently small differences in definition and judgment. To put the issue briefly at the outset, the point of the data comparisons in this volume is really not to provide answers, but rather to identify good and useful questions”*. In addition, when relying on national statistics as source of information, one has to bear in mind that each and every country use a specific definition of the benchmark tax system, in addition to potential differences in method used to estimate tax expenditure (i.e. initial revenue loss, revenue foregone method or equivalent outlays.). The OECD (2010) partly adjusts the figures reported by the countries covered in this study. Table 1 displays the main results of the study in terms of impact of tax expenditures for the EU Member States covered. As expected the relative importance of tax expenditures in income taxation are wide, from a low 0.20% of GDP in Germany to a high 3.85% in the United Kingdom. Overall the OECD estimates suggest that the structure of tax expenditures in PIT was skewed towards housing, at least in the cases of Spain, the United Kingdom and Germany.

Table 1: Tax expenditure in personal income taxation (PIT): OECD estimates

Country (year)	Total TE in PIT (% GDP)	Health	Education	Housing	Pension	Others
Germany (2006)	0.20%	0.00%	0.00%	0.15%	0.03%	0.02%
Netherlands (2008)	0.30%	0.00%	0.06%	0.04%	0.05%	0.15%
Spain (2009)	1.03%	0.00%	0.00%	0.41%	0.17%	0.45%
United Kingdom (2007-2008)	3.85%	0.00%	0.00%	1.17%	2.24%	0.44%

Note: Based on figures reported in OECD (2010). Totals based on tax expenditures affecting personal income taxation only.

Aside from the OECD (2010) study, a number of country cases studies have been conducted showcasing the importance of accounting for tax expenditures in fiscal analysis, although not necessarily focusing on the fiscal or equity impact of tax expenditures. Recent country-specific studies have focused on specific countries to evaluate the fiscal impact of various types of tax expenditures, such as Thöne (2011) for Germany, Tyson (2014) for Italy, Klun (2012) for Slovenia or Collins and Walsh (2011) on Ireland, to name a few recent such studies. Other studies have focused on the specific impact of tax expenditures on the behaviour of tax payers. For instance in a recent study Barrios et al. (2015) used the EUROMOD microsimulation model to analyse the fiscal impact of reforms affecting in-work cash benefits for low-income workers in five EU countries. The authors show in particular that the direct fiscal costs of these measures can be partially and sometimes even fully covered when accounting for the behavioural reaction on the labour supply side. In another recent paper, Doerrenberg et al. (2015) focus on the German case to show that, in presence of tax expenditure, the elasticity of taxable income is not a sufficient statistic to conduct welfare analysis in presence of externalities and behavioural reaction to tax changes. Yet very few studies, apart from those cited above have carried out comparative analysis on the joint fiscal and equity impact of tax expenditure on a cross country basis. As mentioned earlier, the major difficulty behind this type of exercise lies in the lack of common definition and differences in tax structures and practices across

countries. Despite the difficulties in measuring tax expenditures on a cross-country basis, they do affect the interpretation of many relevant aspects of public finances and tax policy, such as tax to GDP ratios, as well as the distributional impact reflecting cross-country difference in aversion against income inequalities, see OECD (2003).

4. Methodology and data

The rationale of tax expenditures is strictly linked to their definition and measurement. As mentioned above tax expenditures are defined as a "*transfer of public resources that is achieved by reducing tax obligations with respect to a benchmark tax, rather than by a direct expenditure*", see OECD (2003). So tax expenditures must be measured as exceptions to some benchmark or baseline income tax. The identification of tax expenditures 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, meaning that certain tax provisions may be regarded as tax expenditures 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 (so called conceptual approach) and those that use a country's own tax laws as a basis to define the benchmark (so called legal approach), isolating differential or preferential treatment judged as tax expenditures (e.g., targeted provisions to address specific policy objectives). The former will classify as tax expenditures elements which might otherwise be considered part of tax design.

In the personal income taxation the first question that must be addressed is what is the overall tax base: income, consumption, or some combination. The main difference between an income and a consumption tax is that the latter exempts the normal return from savings.

In the experience of the US the "normal" tax baseline is meant to represent a practical and broad-based income tax (Toder, 2005), that departs from a truly comprehensive base that taxes all real income once. The normal tax baseline in the United States excludes some income (imputed rent, accrued capital gains), includes some items that are not income (inflationary gains). Some of the largest tax expenditures in the current U.S. income tax are preferences for capital income, including the net exclusion of pension and earnings from tax-deferred retirement plans, tax preferences for capital gains, exclusion of interest on life insurance savings. These items would not be tax expenditures relative to a consumption base. In Italy, tax expenditures have been measured both against a measure of comprehensive economic income (consumption plus change in net worth) and also against a dual income tax (DIT) system, which taxes labour income at progressive rates but capital income at a low single rate (MEF, 2011).

In any case determining whether a tax code provision meets the definition of a tax expenditure requires judgment. Even with a traditional income tax as benchmark, reasonable judgments must be made about what is normal and what is an exception.

In this paper, the analysis is based on a benchmark tax-benefit system scenario simulated with a tax-benefit microsimulation approach. The use of microsimulation models provide a clear advantage over other methods, such as the use of nationally reported statistics, for comparing tax expenditures on a cross-country basis. In particular, an important advantage of microsimulation models is that

they do not carry any normative implication on the benchmark tax system while deriving macro-fiscal impact of tax reforms through appropriate statistical weighting of the micro-data used to reflect individual and household specific characteristics. A microsimulation model embeds the interaction between different tax instruments and benefits entitlement which is usually not considered in more aggregated approaches and can, in certain instance, greatly influence the final impact of tax reforms.

Given the cross-country perspective adopted in this paper, we make use of EUROMOD the EU-wide microsimulation model more and more frequently used for comparative policy analysis. The model captures the full range of institutional features of tax and benefit systems in the EU countries. These include detailed income definitions (such as taxable income or "means" relevant for computing income-tested benefits), precise characterisation 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 of how these vary with earnings and individual or family characteristics.⁴ The EUROMOD model has been validated against national administrative statistics on tax revenues collected as well as 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 behavioural effects.⁵ The version of EUROMOD used in this paper is based on information on 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) which follow the same statistical benchmark across countries.⁶ EU-SILC is a nationally representative annual household survey collecting detailed income information, in this wave for 2009 calendar year. Monetary values are updated to 2013 using relevant price indices. Generally, education- and health-related tax expenditures are based on the actual expenses carried out by the tax payer, information usually missing from SILC data. In order to circumvent this problem, these expenses have been imputed from the EU Household Budget Surveys (EU-HBS) taking the average expense at household level within 15 strata of characteristics – according to age group of the household head (4), family composition (6) and income quintile groups (5).

Following the most applied practices, Swift (2006) lists four alternative budgetary approaches to build the benchmark scenarios. The first approach is the *revenue foregone method*, which provides an ex-post measure of the revenue lost due to the presence of tax expenditures, absent any change behavioural reaction from the taxpayers. Alternatively, the *revenue gain approach* quantifies the increase in revenue that could be expected if a particular tax concession was to be removed. A third possible approach is the *revenue outlay method* which consists in estimating the pre-tax expenditure required to achieve the same after-tax benefit if a given tax expenditure were to be replaced by a corresponding public expenditure programs. A fourth approach adopts explicitly a dynamic perspective by estimating the *present value of the tax savings* associated with the tax expenditure.

⁴ At the same time, due to lack of detailed information in the underlying data EUROMOD simulations might not be able to capture all details embedded in the national tax legislation.

⁵ For a recent analysis of tax expenditure with EUROMOD incorporating behavioural effects see Barrios, Fatica, Martinez and Mourre (2015).

⁶ The micro-data used for the UK come from the Family Resource Survey.

In order to analyse the budgetary and distributional impacts of social tax expenditures related to pension, housing, education and health the *revenue gain approach* is adopted, showing the increase in revenue (and decrease in household disposable income) that could be expected if a particular tax concession was to be removed.

4.1. Pension-related tax expenditures

In Europe different systems regarding the taxation of pension contributions and pension revenues are in place (see first column of Table A.1 for an overview). The most common system taxes both public and private pensions and follows the so-called EET approach (Exempt contributions, Exempt investment income and capital gains of the pension institution and Taxed benefits). This approach, like the TEE, is equivalent to a consumption tax (see Kalyva *et al.*, 2014, Box 5.1; Whitehouse, E., 2009) and the deductibility of the social contribution is justified in order to avoid double taxation.⁷ However, there are several exceptions and country-specific features in the taxation of public pensions in the EU. This is the case in particular when social insurance contributions for pension schemes are taxed (fully or partially) or pensions are not taxed, fully or partially, by means of extra allowances and credits or reduced tax rates.

If one takes as one's "base" a fair tax in which all forms of income are treated the same (income tax benchmark), then the special treatment of retirement savings along the EET approach is clearly one of the most significant categories of tax expenditures. The deferral of taxation produces the additional advantage of tax rate smoothing as pension incomes are taxed at lower rates than those applied to the deduction of contributions.

Such a treatment provides a strong tax advantage over other forms of savings where capital returns are typically taxed. Sometimes countries provide additional incentives (for instance through reduced taxation of pension income) that make the treatments preferential even if compared with the standard EET approach.

These incentives are mainly motivated by the purpose of encourage long-term savings and investment (increasing it toward the socially optimal level), of smoothing income over the life-cycle and preventing old-age poverty. However, these tax expenditures should be reviewed carefully as far as their effectiveness and distributive effects. In the experience of many countries the evidence that these special provisions lead to higher levels of national savings is weak. Even if the interest elasticity of savings were positive, the question is whether the increase in private savings is large enough to offset reduced tax revenues, which lead to negative public savings. In the US preferential tax treatment of pensions constitutes an important source of tax expenditures, but the incidence of these and other tax expenditures allegedly directed at encouraging savings is regressive and increasingly so, as the inequality of wealth is even greater than the inequality in income.

The empirical analysis presented in this paper adopts the *revenue gain approach* and it is based on the comparison between the baseline system (the tax system in place as of June 2013) and a benchmark scenario, constructed in a comparable way across countries, that fully reflects a EET

⁷ The fiscal treatment of accrued or realised investment incomes, which are mainly relevant for funded (private) pension systems, is not considered.

system.⁸ In the interpretation of the results it is important to bear in mind that the shift to the benchmark scenario might imply a redistribution between different cohorts of taxpayers, namely workers paying social contributions and pensioners receiving pensions, with important life cycle implications not considered in this cross sectional analysis.

4.2. Housing-related tax expenditures

Many countries provide preferential tax treatments also for home ownership, mainly based on the assumption that they generate positive externalities on the society, encouraging long term savings and investment. In the personal income taxation these special treatments may regard mortgage interest, income from renting, housing-related expenses and capital gains from housing transactions.⁹ In particular, most part of the EU countries allow a deduction or a tax credit for mortgage interest and do not tax imputed rents for home ownership (see first column of Table A.2 for an overview of rules in place in the European countries).

The benchmark tax treatment of housing related tax expenditures in order to identify and quantify their relevance is still controversial. Using a standard income tax benchmark (and the related corollary of tax neutrality between different capital investment), returns from residential property – imputed rents included - should be taxed as other capital income (through progressive tax rates in a comprehensive income tax and or through flat rates in a dual income tax) with deduction of mortgage interest and housing related expenses. Moreover, in order to assure tax neutrality, the deduction of paid rents should be allowed. In this framework the exemption of imputed rents and the exemption of capital gains from housing transactions would constitute tax expenditures, while the non deductibility of paid rents would represent a tax discrimination.

Alternatively, following a consumption tax benchmark – for instance in the form of TEE (Taxation of income invested in the immovable property, Exemption of returns and of disinvestment) – the deductibility of mortgage interest – and not the exemption of imputed rents - would be regarded as tax expenditure¹⁰.

⁸ In this case the contributions for pension regimes need to be deducted from the taxable base, and to include pensions in that base. Any other tax allowances or tax credits are removed from the benchmark scenario. In case of Italy where a general tax allowance does not exist, the abolishment of the tax credit targeted to pension incomes means that such incomes are fully subject to the tax schedule without any tax relief. Table A.1 provides an overview of tax expenditures related to pension incomes included in EUROMOD and the actions taken to construct the benchmark scenario, according to the above mentioned assumptions.

⁹ Due to data availability (i.e. net imputed rent) and important considerations on the tax system to be considered as benchmark (European Commission, 2014; Verbist, Figari and Zantomio, 2015), in this analysis we do not consider the fiscal treatment of the value (return or imputed rent) of owner-occupied immovable property.

¹⁰ The treatment of imputed rent remains controversial. Following a consumption tax benchmark, where the assumption is that income from capital is tax-free in the baseline, there are still items that may or may not be qualified as tax expenditures. For example, the US Treasury lists the exemption of imputed rent on owner-occupied homes as a tax expenditure item against a consumption baseline because housing services would be taxable under a comprehensive consumption base. But if housing services were taxable, the purchase of a home would be tax-deductible as an investment. Without knowing exactly how taxation of owner-occupied housing would be implemented under a consumption tax (deduction with taxation of imputed rent or prepaid with no taxation of the return), it is hard to know whether the exemption of imputed rent would be a tax expenditure because it exempts consumption of housing from tax or the proper consumption tax treatment because the tax has been pre-paid.

Housing tax expenditures raise many questions in the field of efficiency and equity and tax design. Sometimes it's unclear the rationale of the preferential tax treatment. For instance in the US various different justifications have been offered for the mortgage interest deduction, including encouraging home ownership, stimulating residential construction and maintenance, and encouraging families to save and invest. Moreover, a tax expenditure intended to benefit a particular activity, industry, or class of people may wind up benefiting others not targeted by the tax expenditure by changing prices and incomes. For example, one rationale for the mortgage interest deduction is that it encourages home ownership. To the extent that the deduction is effective, it increases housing demand, which may raise the price of housing. Today's homeowners purchased their houses at prices that reflected the existence of the mortgage interest deduction. The benefit of the tax expenditure is said to be capitalized in this higher price of housing, particularly in the short term. Depending on how much the deduction increases housing demand, some of the benefits of the tax expenditure will flow in the form of higher prices and incomes to other parties such as home builders, mortgage lenders, and real estate agents. A misallocation of resources and a bias toward household debt may result.

One view on equity holds that taxpayers who have similar abilities to pay taxes should receive similar tax treatment; two taxpayers with the same income, net worth, and identical houses may be taxed differently if one owns his house and the other rents, because mortgage interest on owner-occupied housing is tax deductible, while paid rents are not allowed as a deduction. Moreover tax expenditures on housing could favour wealthier households; in the US Fischer and Huang (2013) find that people with top 20 percent income take 73 percent of the total tax deduction on mortgage interest; the top 1 percent alone takes 15 percent of tax deduction on mortgage interest.

In other cases tax expenditures may correct for a market failure by reducing the burden of complying with the tax system. The exclusion of capital gains on owner-occupied housing is an example that could be justified using this approach, as the exclusion eliminates the need for homeowners to maintain detailed records of all home improvements necessary to establish the basis for the home at time of sale.

In our empirical analysis, the identification of the budgetary and distributional impacts of the housing related tax expenditures follow, in general, the same logic and methodology explained above for pensions: any tax allowances or tax credits are removed from the benchmark scenario, by, respectively, increasing the taxable income by the appropriate amounts, or simply by abolishing the preferential policy from the tax system. Table A.2 provides the actions taken to construct the benchmark scenario for each country selected.

4.3. Education-related tax expenditures

Almost all countries in the EU provide preferential tax treatment for education related expenses, even if their relevance seems to be lower than that of the other social related expenses and also compared with the US, where the public support for education is provided to students and families through multiple tax expenditures (Cedefop, 2009).

The concept of benchmark tax system is controversial also for education related tax expenditures. In theory education can be viewed as an expense incurred in earning an income; as such education expenses may reduce the individual ability to pay taxes. If the income is taxes, with no deduction for

the expense, then the activity will be discouraged. Hence the deduction can be supported as removing a distortion. On the contrary, if education expenses are allowed as a deduction on a cash basis, while capital expenses are generally deducted according to their depreciation, the tax treatment would be not neutral between human capital investment and physical capital, with the tax system favouring the first. In practise the argument of adjusting differences in individuals' ability to pay taxes is rarely advanced; instead, the tax expenditures are justified as promoting access, improving social equity, removing financial barriers and offsetting socially undesirable underinvestment in education.

In our analysis we consider the tax reliefs related to expenditures carried out by the tax payer on her own behalf or on the behalf of her relatives which take the form of deduction from the tax base (with some limits and characterisations, see first column in Table A.3) in Estonia, Latvia, Lithuania and Malta or tax credit in France, Italy and Portugal. The analysis of the budgetary and distributional impacts of education-related tax expenditures is based on a benchmark where the existing tax expenditures are abolished.

4.4. Health-related tax expenditures

Health-related tax expenditures serve various purposes and as in the case of pensions and housing may be motivated by different economic and social reasons. European tax systems differ in the way they treat health related expenditures and health insurance costs. Even id the issue is controversial, generally a distinction is made between extraordinary health expenses and not. Tax expenditures – mainly in the form of tax deduction - are generally stronger in the first case than in the latter. In the first case their deduction from the personal income tax base rather than being a tax expenditures fulfils the need of adjusting for differences in individuals' ability to pay taxes. For not-extraordinary or discretionary health expenses, some countries provide tax concessions – in the form of tax credit – that can be qualified as tax expenditures.

Tax incentives are also provided sometimes for private health insurance. The main aim is to encourage people to cover against health risks and to address the inefficiencies of insurance markets. Some of these tax provisions effectively supplemental benefits provided by government health programs and subsidize the cost of private health insurance, reducing the up-front cost of obtaining health insurance. Tax credits represent a new form of income transfer and their effect has little empirical evidence; in the US experience Hinde (2016) finds positive impact of premium tax credits in encouraging the participation to insurance coverage.

As for the other tax expenditures, the empirical analysis is based on the *revenue gain method* showing the potential increase in revenue and decrease in household disposable income due to abolishing the existing tax reliefs in the form of deductions from the tax base as in Germany, Ireland and Latvia or tax credits as in Greece, Italy and Portugal (see first column in Table A.4).

5. Empirical evidence

5.1. Tax Expenditures on Pensions

Figure 1 and Table 2 provide the budgetary impact of pensions related tax expenditures comparing the actual tax regime in each Member State with the benchmark tax expenditure free scenario. For a great majority of the selected Member States, removing tax expenditures related with pensions

represents a positive change in the tax revenues collected by the government ranging from an impact close to 0% in Luxembourg to 26% in Portugal. At the same time, in eight countries abolishing tax expenditures related with pension incomes decreases tax revenues – in the Czech Republic case, the fall in tax revenues reaches figures above 20%.

<Figure 1 HERE>

On the one hand, the positive budgetary impact observed in most of the countries depends on the existing exemption of pensions from income tax (Lithuania and Slovenia), lower tax rates applied on private pensions and the presence of specific tax reliefs related to pension incomes. On the other hand, the overall negative budgetary impact is due to the fact that the baseline tax regime includes negative tax expenditures, which are abolished when constructing the EET benchmark scenario. More specifically, social insurance contributions related to public pension regimes are not fully deducted from the taxable income in Check Republic, Hungary, Ireland (for public employees and self-employed) and UK (for state pension), while private pension contributions are not deductible or deductible with limits in a number of countries.

Table 2 Budgetary and redistributive effects of abolishing pension-related tax expenditures

Country	% change in tax revenue	% change in disposable income	GINI in the baseline	GINI in the scenario without TEs
Austria	5.65	-1.12	0.25516	0.25730
Belgium	7.25	-1.27	0.22943	0.23487
Bulgaria	22.18	-1.75	0.32771	0.33290
Cyprus	9.98	-0.83	0.27399	0.26940
Czech Republic	-20.98	1.96	0.23690	0.24042
Denmark	-0.64	0.25	0.25124	0.25229
Estonia	12.42	-2.02	0.31144	0.32005
Greece	-13.42	2.00	0.31540	0.31959
Finland	5.04	-1.43	0.24042	0.24042
France	3.60	-0.69	0.27666	0.27640
Germany	4.08	-0.75	0.27012	0.27228
Hungary	-10.93	2.12	0.27334	0.27633
Ireland	-4.79	1.25	0.27676	0.28095
Italy	7.65	-1.92	0.31661	0.32314
Lithuania	13.00	-1.68	0.40633	0.40765
Luxemburg	0.04	-0.01	0.24883	0.24938
Latvia	21.50	-3.97	0.35126	0.36556
Malta	-2.42	0.26	0.28498	0.28572
Netherlands	1.42	-0.94	0.25184	0.25620
Poland	-0.44	0.08	0.31049	0.31077
Portugal	25.93	-4.55	0.30555	0.30614
Romania	23.48	-4.12	0.32828	0.33509
Spain	2.74	-0.36	0.30606	0.30696
Sweden	14.87	-4.53	0.23584	0.23694
Slovenia	13.37	-1.39	0.23854	0.23684
Slovakia	13.92	-1.06	0.23894	0.23933
United Kingdom	-6.71	1.43	0.31696	0.32133

As expected the correlation between changes in tax revenue and changes in disposable income is negative and significant (-0.92, p-value 0.00). Abolishing pension-related tax expenditures implies a higher level of inequality of the overall income distribution in all countries but Cyprus, France and Slovenia, with the GINI coefficient that increases more than one percentage point in Latvia and more than 0.5 percentage points in Belgium, Bulgaria, Estonia, Italy, Latvia and Romania.

The changes in the overall inequality of the income distribution can be traced by looking at the distribution of the budgetary impact by decile of income groups that is clearly differentiated across countries but with some common patterns. In countries where abolishing pension related TEs implies a net increase in the tax revenue, the distribution of the change in tax revenue over decile groups is regressive (i.e. the poorest individuals contribute relatively more than the richest) in Belgium, Estonia, Finland, Italy, Latvia and Romania (Figure 2, panel a), progressive in Cyprus, France, Portugal, Sweden, Slovenia and Slovakia (Figure 2, panel b) while it is flat or characterised by an inverted U-shape in Austria, Bulgaria, Germany, Spain and Lithuania (Figure 2, panel c). In countries where abolishing pension related TEs implies a net loss in aggregate revenue this comes mostly from individuals in the top part of the distribution with an overall regressive impact due to the richest individuals paying less taxes (Figure 2, panel d).

<Figure 2 a, b, c, d HERE>

Overall the distributional pattern observed with respect to the revenue is mirrored if one focuses on the percentage variation in equivalised disposable income.¹¹ In Figure 3 the change in disposable income by decile groups is decomposed by three different types of households: working age, pensioners and multigenerational households where working age and pensioner individuals cohabit.

Across countries, pensioners tend to face most of the burden of the increased revenue due to abolishing pensions-related tax expenditures, with a stronger negative impact on the disposable income in the bottom-middle part of the income distribution. By contrast working age households, in particular in middle-top part of the income distribution, are benefitting from abolishing pension pensions-related tax expenditures in all countries where this produce a net loss in terms of revenue but also in Austria, Germany, Spain and Lithuania.

These results suggest that overall the pensions-related tax expenditures can be progressive at two levels: first among pensioners, by favouring lower income pensioners (mainly through a favourable tax treatment of pension incomes), and second among working-age individuals (through partial or no deduction of pension contributions) draining resources in particular from those at the top of the income distribution.

<Figure 3 a, b, c, d HERE>

Due to the nature of the tax expenditures related to pensions which involve both working age and retires individuals, it is difficult to foresee an age pattern of their distributive effects which depends

¹¹ The measure of income is the equivalised household disposable income (DPI), which is the after tax income of a household, available for spending or saving, divided by the number of household members, weighted according to the following factors: 1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14, according to the Eurostat definition. Deciles are based on equivalised household disposable income under the existing tax system.

on the nature of the tax expenditures, individual incomes, tax-benefit systems and the family composition. Figure 4 reports the age pattern for the 27 European countries from which it emerges that pension-related tax expenditures imply a redistribution of resources across generations, overall by favouring pensioners vs working age population even within the same country (Austria, Germany, Spain).

<Figure 4 a, b, c, d HERE>

5.2. Tax Expenditures on Housing

Housing related tax expenditures exist in 22 countries and their removal implies an overall positive change in tax revenues in all countries – although of lower magnitudes, when compared with the pensions related tax expenditures. The change in tax revenues is below 5 percentage points in most countries but it reaches around 7% in Luxemburg and Spain, 14% in Denmark and 17% in the Netherlands (Table 3). Generally, the tax reliefs related to the mortgage interest payments (in the form of either deduction from tax base or tax credit) are responsible for the largest part of the revenue increase although across countries are present different preferential tax treatments of rent received (exempted or subject to lower tax rates) or paid (partly deductible from the tax base)

<Figure 5 HERE>

Table 3 Budgetary and redistributive effects of abolishing housing-related tax expenditures

Country	% change in tax revenue	% change in disposable income	GINI in the baseline	GINI in the scenario without TEs
Belgium	4.85	-1.33	0.22943	0.22760
Bulgaria	0.25	-0.02	0.32771	0.32767
Cyprus	0.96	-0.08	0.27399	0.27366
Czech Republic	0.12	-0.01	0.23690	0.23687
Denmark	13.77	-5.35	0.25124	0.23057
Estonia	0.74	-0.12	0.31144	0.31120
Greece	1.67	-0.25	0.31540	0.31346
Finland	1.75	-0.50	0.24042	0.23946
France	2.96	-0.53	0.27666	0.27498
Ireland	1.90	-0.49	0.27676	0.27671
Italy	3.76	-0.94	0.31661	0.31516
Lithuania	0.89	-0.12	0.40633	0.40609
Luxemburg	7.43	-1.34	0.24883	0.24420
Malta	0.05	-0.01	0.28498	0.28496
Netherlands	16.90	-4.90	0.25184	0.24553
Poland	0.00	0.00	0.31049	0.31049
Portugal	1.49	-0.26	0.30555	0.30571
Romania	0.05	-0.01	0.32828	0.32823
Slovenia	0.45	-0.05	0.23854	0.23835
Spain	7.55	-0.99	0.30606	0.30456
Sweden	2.96	-0.90	0.23584	0.23494
United Kingdom	0.02	-0.00	0.31696	0.31695

Abolishing housing-related tax expenditures implies a lower level of inequality of the overall income distribution in all countries, with the GINI coefficient that decreases of about 2 percentage points in Denmark and about 0.5 percentage points in Luxembourg and the Netherlands.

In all countries abolishing housing related TEs implies a net increase in the tax revenue with a clear progressive pattern over decile groups (i.e. the richest individuals contribute relatively more than the poorest).

<Figure 6 a, b, c HERE>

For the analysis of housing related tax expenditures, owners and renters households are distinguished. A number of interesting features are worth highlighting in each case.

Where the tax expenditures removed in the benchmark scenario are related only (or mainly) to a mortgage interest relief (see Table A.2 for a description), the most affected deciles are at the top of the distribution thus pointing to the regressive nature of the housing tax system that tends to favour owners in the middle-top of the distribution. Nevertheless, in countries where housing related tax-expenditures favour renters those in the bottom-middle part of the distribution tend to be favoured as it emerges in Ireland, Italy, Portugal, and Spain.

<Figure 7 a, b, c HERE>

Overall these results suggest the potential heterogeneous impact of different instruments within the same tax expenditure category.

5.3. Education-related tax expenditures

Education-related tax expenditures exist in a minority of European countries and have been simulated in seven of them (See Table A.3). They mainly consist in deduction of (certain) expenses from the tax base or tax credit from the gross tax liability. In terms of cost, they are close to 1 percentage point of the income tax revenue in Latvia, 0.6 in Portugal and much less in the other countries (see Figure 8) . With such overall limited impact in terms of revenue (and hence disposable income) the changes in the inequality of income distribution, as measured by Gini coefficients, are almost negligible (Table 4).

<Figure 8 HERE>

Table 4. Budgetary and redistributive effects of abolishing education-related tax expenditures

Country	% change in tax revenue	% change in disposable income	GINI in the baseline	GINI in the scenario without TEs
Estonia	0.26	-0.05	0.3114	0.3114
France	0.26	-0.05	0.2766	0.2765
Italy	0.11	-0.03	0.3166	0.3166
Latvia	0.87	-0.18	0.3514	0.3513
Lithuania	0.04	-0.01	0.4063	0.4063
Malta	0.05	-0.00	0.2850	0.2850
Portugal	0.64	-0.11	0.3055	0.3055

Although the increased revenue due to abolishing the education-related tax expenditures comes mostly from the individuals in the top part of the distribution (Figure 9), the effects in terms of disposable income is more sizeable in the middle part of the distribution (Figure 10). Overall the education-related tax expenditures tend to favour middle-top income individuals but the differences deciles are too small to be significant.

<Figure 9 and 10 HERE>

5.4. Health-related tax expenditures

Health-related tax expenditures exist in a minority of European countries and have been simulated in six of them (See Table A.4). They mainly consist in deduction of (certain) expenses from the tax base or tax credit from the gross tax liability. In terms of cost, they are close to 2 percentage points of the income tax revenue in Latvia, 1.5 ppt in Portugal, 1 ppt in Ireland and Italy and 0.5 ppt in Germany and Greece (see Figure 11). With such overall limited impact in terms of revenue (and hence disposable income) the changes in the inequality of income distribution, as measured by Gini coefficients, are almost negligible (Table 5).

<Figure 11 HERE>

Table 5. Budgetary and redistributive effects of abolishing health-related tax expenditures

Country	% change in tax revenue	% change in disposable income	GINI in the baseline	GINI in the scenario without TEs
Germany	0.86	-0.16	0.2701	0.2699
Greece	0.47	-0.07	0.3154	0.3153
Ireland	1.13	-0.74	0.2735	0.2768
Italy	1.15	-0.29	0.3166	0.3163
Latvia	1.99	-0.39	0.3511	0.3513
Portugal	1.51	-0.27	0.3055	0.3055

The increased revenue due to abolishing the health-related tax expenditures comes mostly from the individuals in the top part of the distribution (Figure 12), with individuals in the middle-top of the income distribution being relatively more favoured by the health-related tax expenditure with the main exception of Ireland where individuals in the first half of the distribution gain relatively more (Figure 13).

<Figure 12 and 13 HERE>

6. Conclusions

Regardless the wide use of tax expenditures across European countries, their fiscal and equity impact is not always clear and their effectiveness and efficiency as a policy instrument needs to be carefully evaluated, especially in the present context of constrained public finances. Nevertheless, a precise quantification of revenue and distributional effects of tax expenditures is not straightforward, in particular in a cross-country perspective.

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

Tax expenditures related to pension, housing, education and health represent the main components of the “social” tax expenditures category that in some circumstances can effectively substitute for social policy programs and whose rationale can also be found in the meritorious characteristics of these goods. Indeed, tax expenditures may provide incentives to encourage particular activities and reduce inefficiencies that would otherwise exist.

Overall the empirical analysis suggests that the impact of tax expenditure on tax revenues and on income inequalities can be sizeable. The budgetary and equity impact of the tax expenditures is clearly differentiated across types of social tax expenditures and countries and it is especially pronounced for pension-related tax expenditure. In case of pension-related tax expenditures the impact can be either negative or positive, ranging from -21% of the baseline tax revenue in Czech Republic to + 26% in Portugal. In case of housing-related tax expenditures the revenue impact is above 1% in the majority of countries, reaching more than 10% in Denmark and the Netherlands. Education- and health-related tax expenditures are much less widespread and their budgetary impact is more limited but still relevant in some countries.

The overall impact on the income distribution can hide important redistributive flows that can go both directions, however, i.e., either on the progressive or regressive side, depending not only on the country considered but also on the different household types considered for the analysis of each tax expenditure pointing out to the importance of a careful country specific scrutiny in each case.

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Table A.1 Pension-related tax expenditures simulated in EUROMOD and their impact on tax revenue and disposable income

Country	Existing tax expenditures in EUROMOD (2013 tax systems)	EUROMOD implementation treatment to construct benchmark scenario
Austria	Extra pensions deducted from taxable income and taxed separately	Extra pensions not deducted and separate taxation abolished
	Contributions to private pensions not deducted (negative tax expenditure)	Deducted from taxable base
	Tax allowance: exceptional deduction (based on pension income being positive)	Pension income excluded
	Tax credit for pensioners	Abolished
Belgium	Contributions to private pensions not deducted (negative tax expenditure)	Deducted from taxable base
	Tax Credit for pension income	Abolished
	Tax credit for replacement income	Abolished (the part related to pension incomes)
Bulgaria	Pensions not included in taxable income	Public pensions and private pensions included in taxable income
	Contributions deducted up to 10% of taxable income	Contributions fully deducted
Cyprus	Contributions to private pensions deducted up to 1/6 of taxable income	Existing limit abolished
	Non-taxable old age and survivor pensions not taxable	Non-taxable old age and survivor pensions included in taxable income
Czech Republic	Contributions to private pensions deducted to the extent they exceed CZK 12,000, up to a maximum of CZK 12,000	Existing limit abolished
	Personal exemption (tax credit) not allowed to those with pension income (negative tax expenditure)	Exemption allowed to those with pension incomes as well
	Pensions exempted from PIT (taxed only the amount above 36 times the minimum wage)	Public pensions included in taxable income
	Contribution not deducted (negative tax expenditure)	Contribution deducted from taxable income
Denmark	Contribution to private pensions deducted up to 100.000 per year	Existing limit abolished
Estonia	Contributions to the 3rd pillar deductible with limits.	Existing limits abolished
	Private pensions taxed at a lower rate (i.e. 10%)	Standard rate applied
	Pension allowance	Allowance abolished
Greece	Contributions to private insurance schemes not deductible	Contributions made deductible
	Pensioner's solidarity contribution and Additional pensioner's solidarity contribution	Abolished
Finland	Pensioner's allowance	Abolished
	Special tax on pensions	Abolished
	Local tax: pension income allowance	Abolished
	Contribution to private pensions deducted with limits	Limits abolished
France	Contributions to PERP* deducted with maximum limits.	Limits abolished.
	Tax deduction for pension incomes (with minimum and maximum "abattement")	Abolished "abattement" for pensioners
Germany	Tax-exempt part of pensions (Versorgungsfreibetrag)	Abolished
	Tax allowance for elderly persons	Abolished
	Contributions to private pensions not deducted (negative tax expenditure)	Deducted from taxable base
Hungary	Survivors and private pensions not taxed	Included in PIT
	Contributions to public pensions not deducted	Deducted from taxable income
	Contributions to private pensions not deducted	Deducted from taxable income

Ireland	Deduction of pension contributions (superannuation and private) subject to limits	Limits abolished
	Pension contributions for private employees and self-employed not deducted	Contributions deducted
	Age related tax credit	Abolished
Italy	Deduction of private pension contributions (with a maximum of 5164.57 Euro per year)	Maximum abolished and private pensions deducted as well
	Income tax credit for pension incomes	Abolished
	Lower income tax on private pensions	Private pensions included in taxable income
Lithuania	Pensions exempted from tax	Included in PIT
	Contributions not deducted	Contributions deducted
	Contributions to private pensions give rights to a tax credit (not full amount)	Contributions made deductible
Luxemburg	Private pensions not taxed	Included in PIT
	Private pension contributions deducted with limits	Limits abolished
	Pensioners allowance	Allowance abolished
Latvia	Private pensions not taxed	Included in PIT
	Non-taxable minimum income allowance for pensioners	Allowance abolished
Malta	Private pensions not taxed	Included in PIT
	Survivors and disability pensions not taxed	Included in PIT
	Contributions to private pensions not deducted	Contributions deducted
Netherlands	Old age asset allowance	Abolished
	Old age credit	Abolished
	Contributions not deducted	Interactions between SICs and the whole tax-ben system do not allow to deduct SICs from tax
Poland	Private pensions not taxed	Included in PIT
	Contributions to private pensions not deducted	Deducted from tax base
Portugal	Private pensions not taxed	Included in PIT
	Contributions to private pensions not deducted	Deducted from tax base
	Pensioner tax allowance	Abolished
	Contributions related to employment income deducted with limits (30% of self employment income deducted)	Limits abolished
Romania	Contributions to private pensions deducted for employees only and with limits.	Limits abolished, deduction extended to all tax payer. xpp = 0 in the data
	Tax allowance for pensioner	Allowance abolished
Spain	Contributions to private pensions not deducted (negative tax expenditure)	Deducted from taxable base
	Individual taxation: Personal Tax Credit (complement for aged > 65 and > 75)	Complement for aged >65 and >75 abolished
	Individual taxation: Employment Income Tax Allowance Supplement for elderly workers (Reducción por prolongación de la actividad laboral)	Supplement for elderly workers abolished
	Individual taxation: regional tax credits related to age (Illes Balears Canarias, Castilla-La Mancha,). We do not consider tax relief related to the presence of dependent (elderly) parents in the hhs.	Abolished
	Joint taxation: Personal Tax Credit (complement for aged > 65 and > 75)	Complement for aged >65 and >75 abolished
	Joint taxation: Employment Income Tax Allowance Supplement for elderly workers (Reducción por prolongación de la actividad laboral)	Supplement for elderly workers abolished
	Joint taxation: regional tax credits related to age (Illes Balears Canarias, Castilla-La Mancha). We do not consider tax relief related to the presence of dependent (elderly) parents in the household	Abolished
	Allowance for voluntary Private Pension contributions limited to 12000 Krona per year	Limit abolished

	Additional Basic Allowance for pensioners	Abolished
	Contributions to pensions schemes paid by an employee made fully credited against income tax liability	Contributions made deductible from taxable income rather than tax credit
Slovenia	Deduction of private pension contributions with limits	Limits abolished
	Seniority allowance	Abolished
	Pensioner Allowance (Tax Credit)	Abolished
Slovakia	Public pensions not taxed	Pensions included in PIT
	Old age Public pensions deducted from basic allowance (i.e. old age pensioners have lower allowance)	Rebate of allowance abolished
	Contributions to private pensions not deducted (check from 1/1/2013)	Contributions deducted
United Kingdom	Contributions to state pension not deducted (negative tax expenditure)	Deducted from taxable base
	Age allowances	Set as standard personal allowance
	Married Couples Allowance	Abolished

* Plan d'épargne retraite populaire

Table A.2. Housing-related tax expenditures simulated in EUROMOD and their impact on tax revenue and disposable income

Country	Existing tax expenditures in EUROMOD (2013 tax regimes)	EUROMOD implementation treatment to construct benchmark scenario
Belgium	Mortgage Interest Tax relief	Tax credit abolished
Bulgaria	Mortgage Interest Tax relief	Not simulated (check)
	Tax deduction for income from rent	Abolished
Cyprus	Tax allowance for income from rent (20%)	Abolished
Czech Republic	Interest for mortgage repayment exemption	Deduction abolished
Denmark	Mortgage interest payments deducted for the definition of investment income incomes for taxes	Deduction abolished
	Mortgage interest deduction	Not simulated (check)
	Rent not taxed	Rent include in PIT
Estonia	Mortgage interest payments among deductible expenses	Deduction abolished
Greece	Rent taxed at separate rates (10% and 33% for rent above 12000 euro per year).	Rent included in PIT and separate tax abolished
	Additional tax on rental (1.5%)	Abolished
Finland	Allowance of 85% of interest expenses on mortgage interests as part of tax of investment income	Allowance abolished
	Rent taxed as part of capital income tax	Rent included in PIT
France	30% deduction on rent income for taxation purposes	Reduction abolished
	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 brought the house less than 5 years before)	Tax credit abolished
Ireland	Rent tax credit (rent relief for private rented accommodation)	Tax credit abolished
	Refundable Mortgage interest tax credit	Tax credit abolished
Italy	Tax credit for main residence mortgage interest payment (19% of interest payments up to 4000 Euro per year)	Tax credit abolished
	Income from renting immovable property subject to separate tax (lower rate than PIT, i.e. 21%)	Separate taxation abolished. Income from renting immovable property included in taxable income
	Deduction for paid rent for immovable property if tax payer income below certain limits	Tax credit abolished
	Tax credit for refurbishment of immovable property (from 36% to 65% of actual expenses, to be claimed back in 10 years)	Tax credit abolished
Lithuania	Tax credit of mortgage interest payments	Tax credit abolished
Luxemburg	Allowance for mortgage interest payments	Allowance abolished
	Deduction of a % of income from rent received	Deduction abolished
	Rent not taxed	Rent included in taxable income (previous allowance?)
Malta	Allowance of rent for self-employed	Allowance abolished
	Rent subject to social contributions (in addition to income tax)	?
Netherlands	Mortgage interest payments deducted	Deduction abolished
	Rent not taxed	?
Poland	Deduction of 7% of mortgage interest payment up to a limit	Deduction (not binding) abolished
Portugal	Tax credit for (15%) mortgage interest and capital payments with limit	Tax credit abolished

	Tax credit for (15%) rent	Tax credit abolished
Romania	Tax allowance for rental income (rental income subject to some health insurance contribution)	Allowance abolished
Slovenia	Deduction of 40% of rental income	Deduction abolished
Spain	Mortgage tax credit (Deducción por inversión en vivienda habitual: Adquisición o rehabilitación de la vivienda habitual)	Tax credit abolished
	Main residence rent tax credit (Deducción por alquiler de vivienda habitual)	Tax credit abolished
	Regional tax credit: young taxpayers renting main residence tax credit (Deducción por cantidades satisfechas por el alquiler de la vivienda habitual)	Tax credit abolished
Sweden	Tax credit for negative capital income due to main residence mortgage interest payment – investment income and property income)	Tax credit abolished
	Tax on capital income (i.e. investment income and property income) net of interests on mortgage payments	Deduction of mortgage interests abolished
	Income from property taxed as capital income (i.e. proportional tax); deduction not simulated	Income from property included in taxable income
United Kingdom	Rent on rooms in own residence untaxed if below £4250 per year	Income from renting own residence included in taxable income

Table A.3. Education-related tax expenditures simulated in EUROMOD and their impact on tax revenue and disposable income

Country	Existing tax expenditures in EUROMOD (2013 tax regimes)	EUROMOD implementation treatment to construct benchmark scenario
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. Not implemented due to lack of info in data	Expenditures added to the potential deductions
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. Implemented in the baseline: not based on expenditure	Tax relief set to 0 in baseline
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. Implemented in the baseline: imputed from aggregate statistics	Tax relief set to 0 in baseline
Latvia	Deduction of expenses prescribed as deductible by the Individual Income Tax Law. Not implemented due to lack of info in data	Tax relief added to the other existing tax allowances
Lithuania	Deduction of payments for the taxpayer's (or children) professional training or higher educational studies. Not implemented due to lack of info in data	Tax relief added to the other existing tax allowances
Malta	Deduction of school fees. Implemented but simulation equal to zero due to lack of info in data	Tax relief added to the other existing tax allowances
Portugal	A credit equal to 10% of tax payer and his dependants' education expenses with limits. Implemented but simulation equal to zero due to lack of info in data	Tax relief added to the other existing tax allowances

Note: in the analysis the baseline system is considered the one with tax expenditures.

Table A.4. Health-related tax expenditures simulated in EUROMOD and their impact on tax revenue and disposable income

Country	Existing tax expenditures in EUROMOD (2013 tax regimes)	EUROMOD implementation treatment to construct benchmark scenario
Germany	Deduction of extraordinary expenses. Deduction implemented in the baseline, assumed to be health related	Tax relief set to 0 in baseline
Greece	Credit (up to 3000 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. Implemented in the baseline based on expenditure included in the national SILC data	Tax relief set to 0 in baseline
Ireland	Deduction: Medical insurance and expenses. Not implemented due to lack of info in data.	Tax relief added to the other existing tax allowances
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. Implemented in the baseline imputed from aggregate statistics	Tax relief set to 0 in baseline
Latvia	Deduction of expenses prescribed as deductible by the Individual Income Tax Law. Not implemented due to lack of info in data	Tax relief added to the other existing tax allowances
Portugal	Credit (with limits) equal to 10% of unreimbursed health-related expenses, Implemented but simulation equal to zero due to lack of info in data	Tax relief added to the other existing tax allowances

Note: in the analysis the baseline system is considered the one with tax expenditures.

Figures

Figure 1: Tax revenue effects of abolishing pension-related tax expenditures

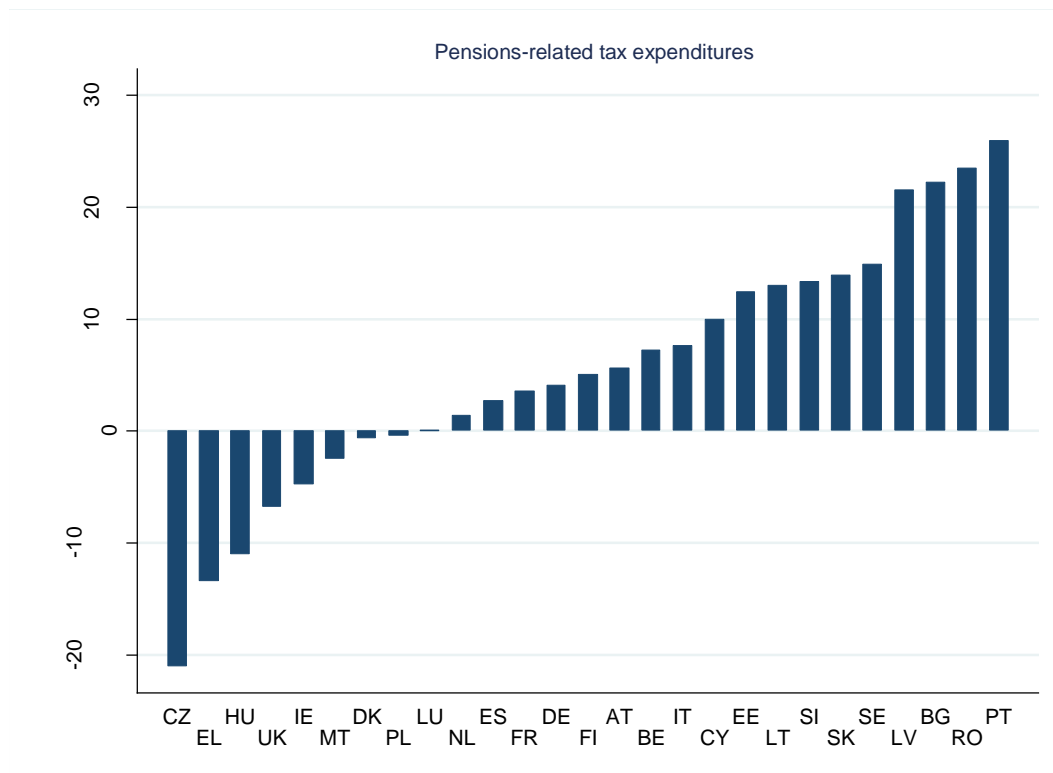
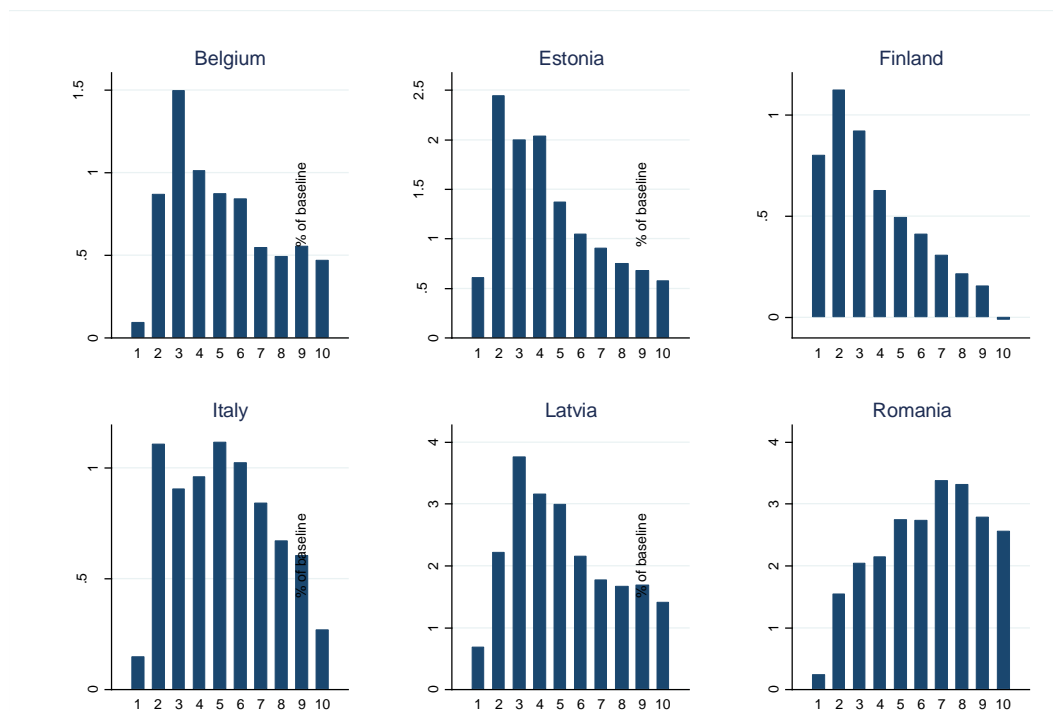


Figure 2.a: Change in tax revenue over decile groups due to abolishing pensions-related tax expenditures



Note: different scale across countries. Decile groups based on equivalised disposable income in the baseline

Figure 2.b: Change in tax revenue over decile groups due to abolishing pensions-related tax expenditures

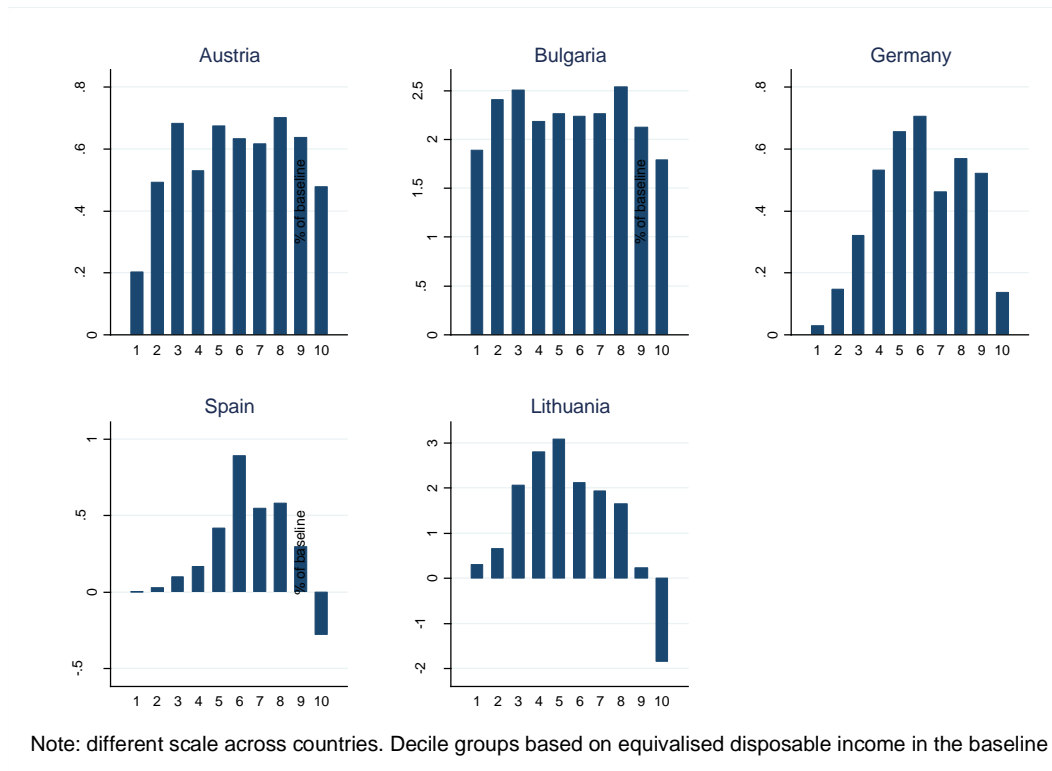


Figure 2.c: Change in tax revenue over decile groups due to abolishing pensions-related tax expenditures

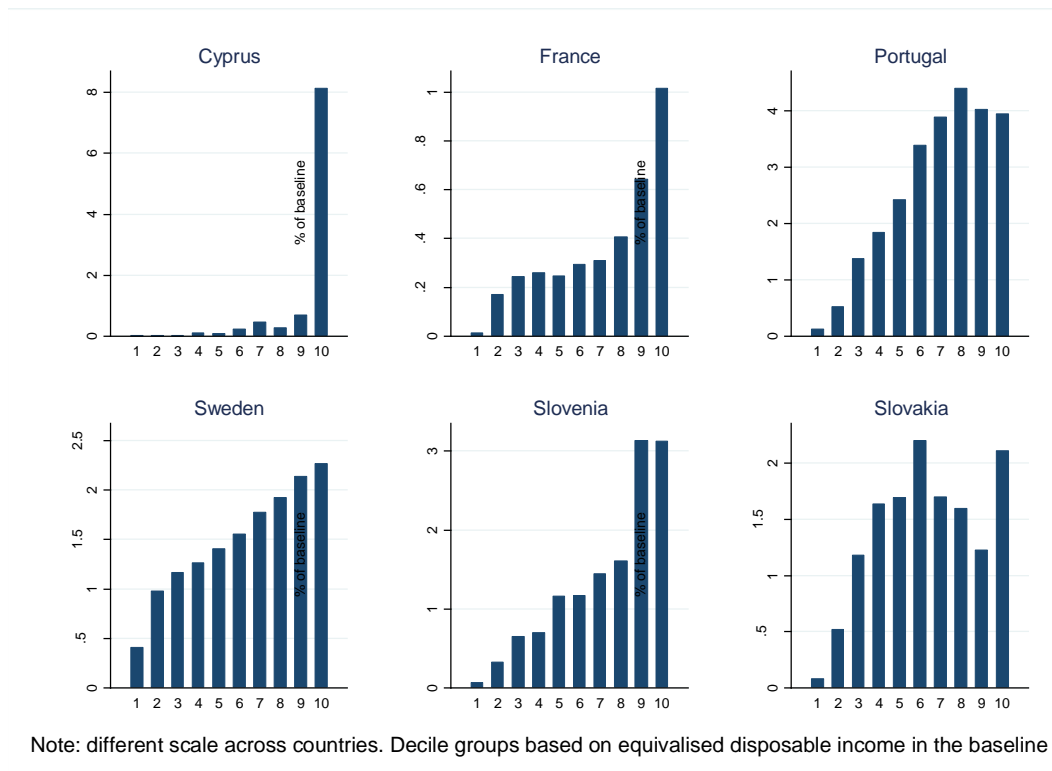


Figure 2.d: Change in tax revenue over decile groups due to abolishing pensions-related tax expenditures

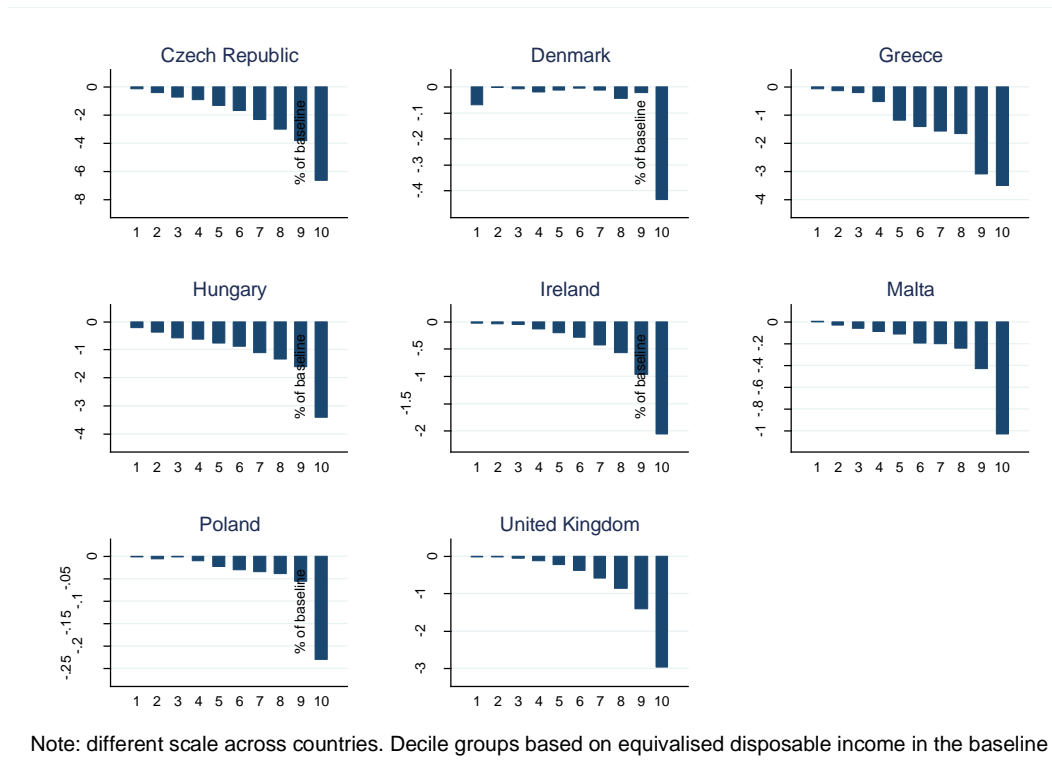


Figure 3.a: Change in disposable income decomposed by hh types and decile groups due to abolishing pensions-related tax expenditures

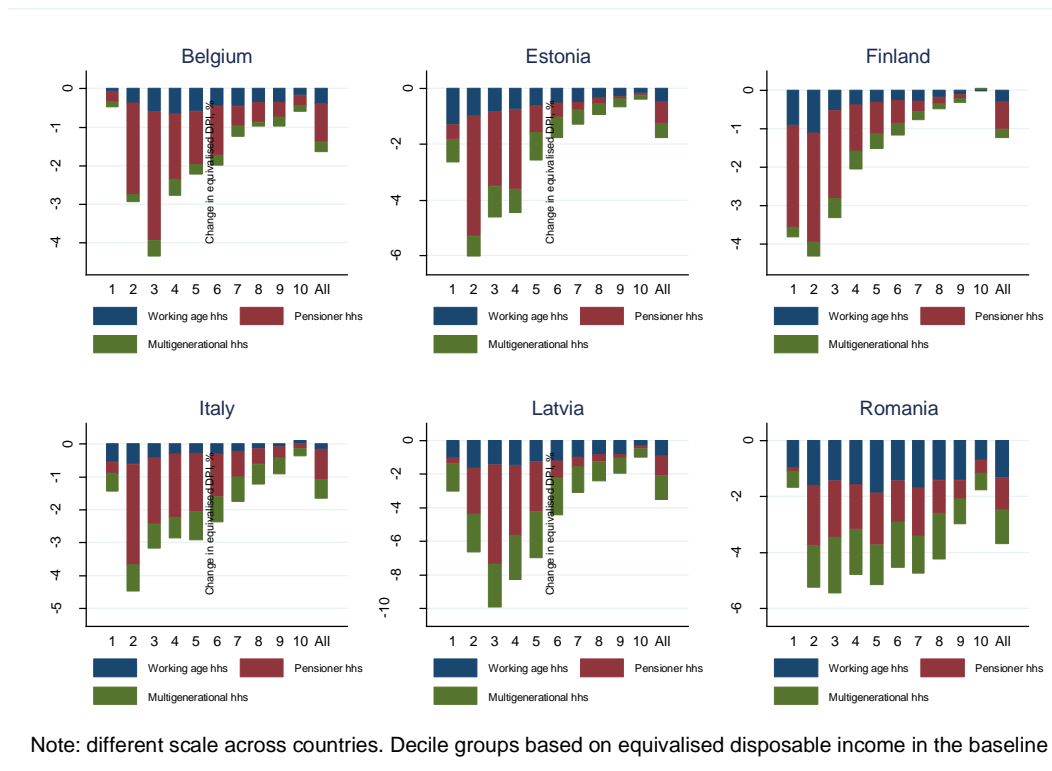
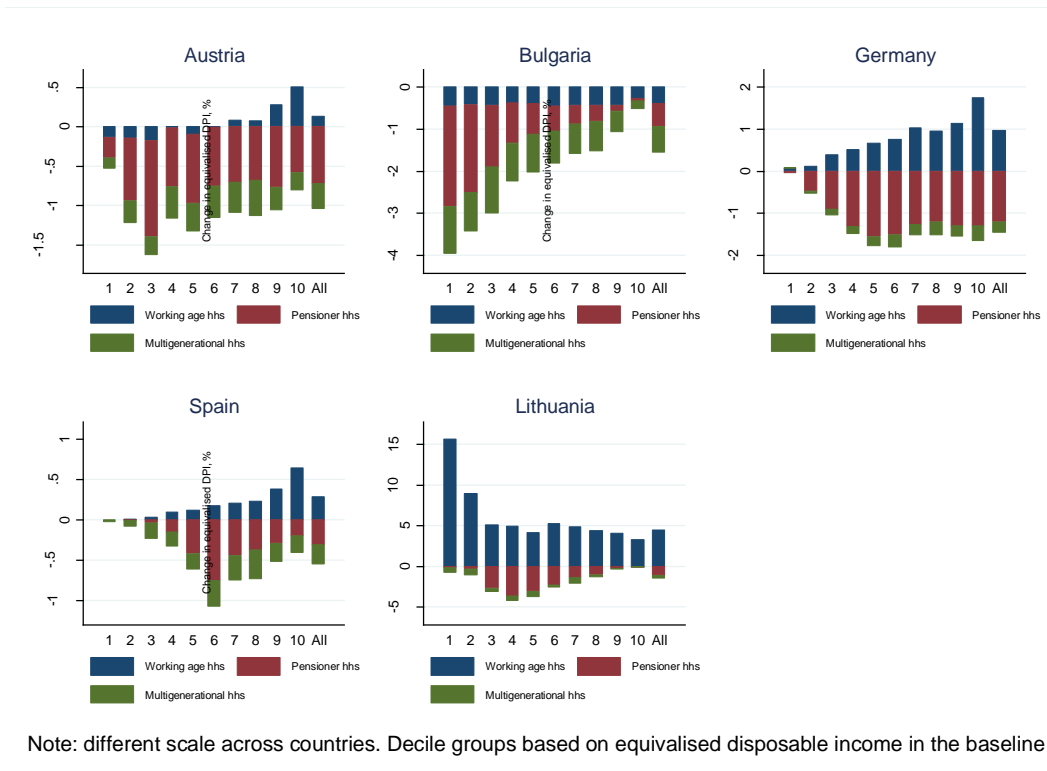
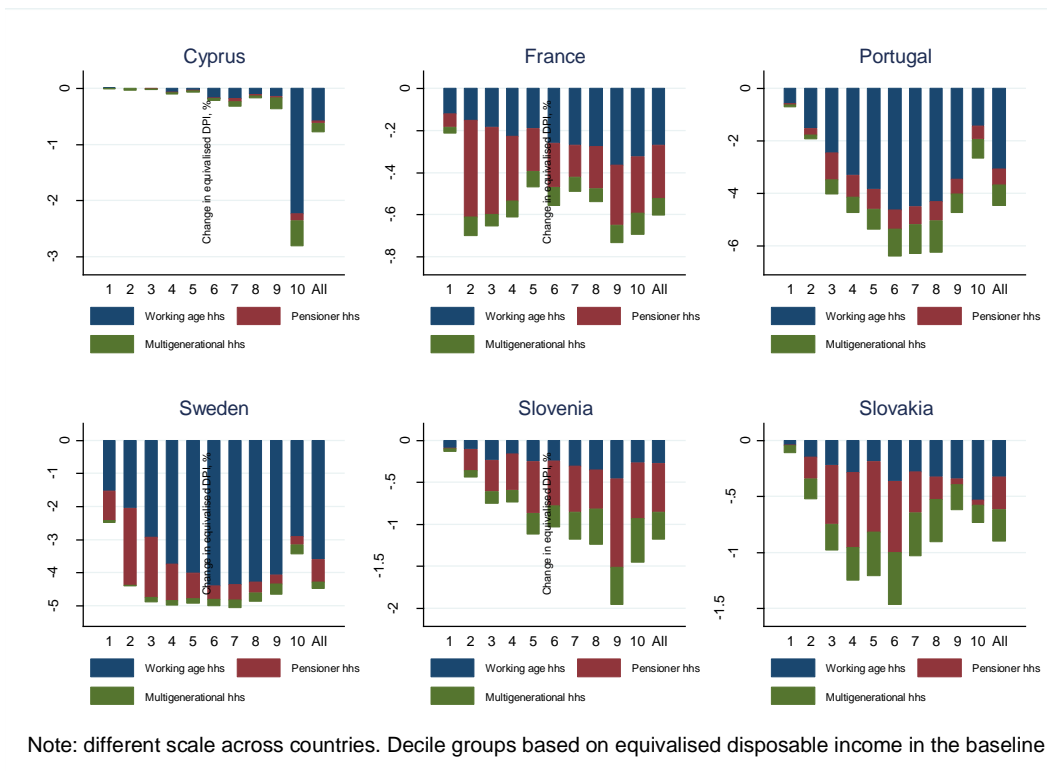


Figure 3.b: Change in disposable income decomposed by hh types and decile groups due to abolishing pensions-related tax expenditures



Note: different scale across countries. Decile groups based on equivalised disposable income in the baseline

Figure 3.c: Change in disposable income decomposed by hh types and decile groups due to abolishing pensions-related tax expenditures



Note: different scale across countries. Decile groups based on equivalised disposable income in the baseline

Figure 3.d: Change in disposable income decomposed by hh types and decile groups due to abolishing pensions-related tax expenditures

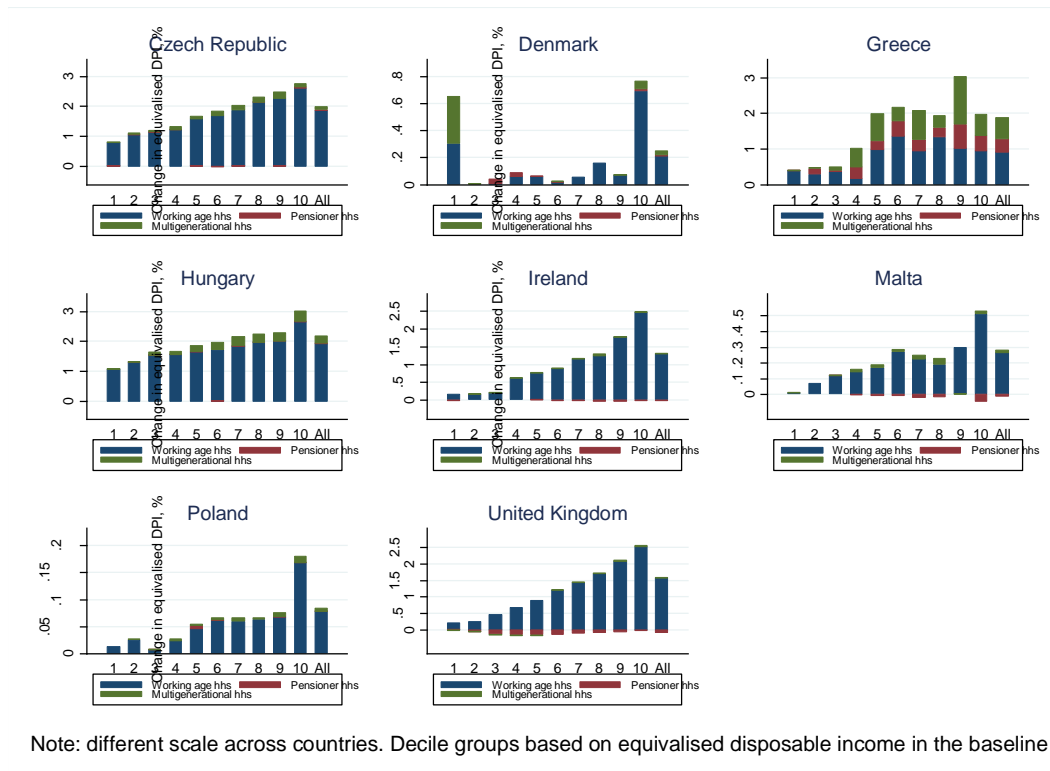


Figure 4.a: Change in equivalised disposable income by age group due to abolishing pensions-related tax expenditures

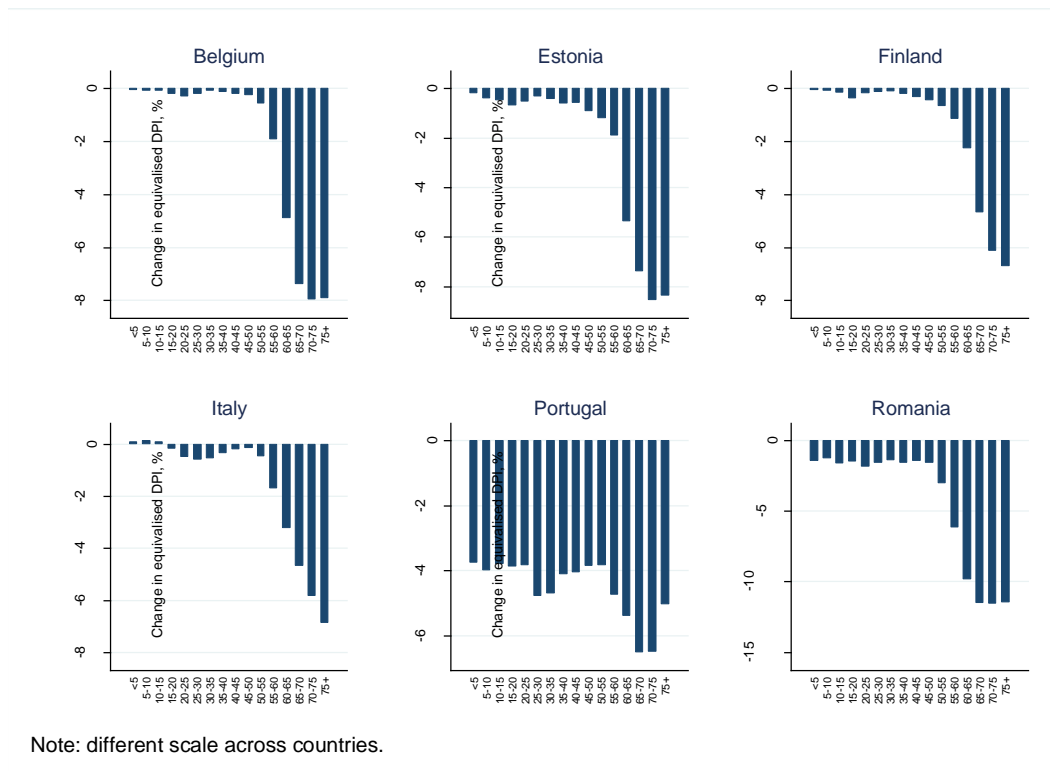


Figure 4.b: Change in equivalised disposable income by age group due to abolishing pensions-related tax expenditures

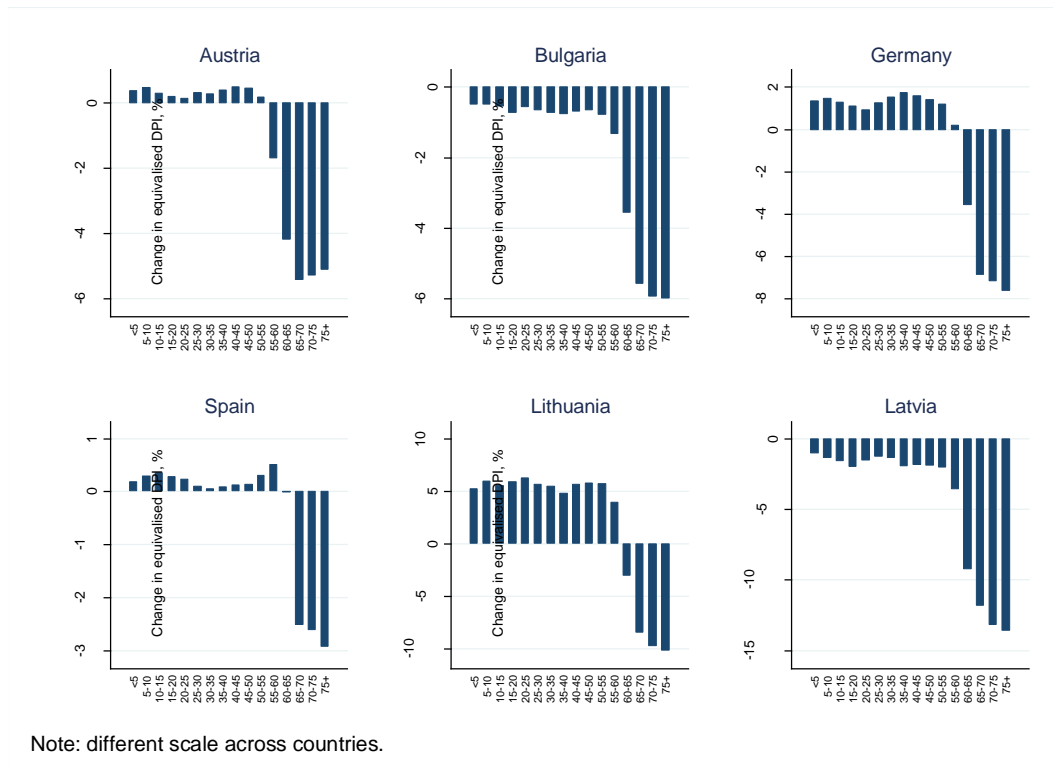


Figure 4.c: Change in equivalised disposable income by age group due to abolishing pensions-related tax expenditures

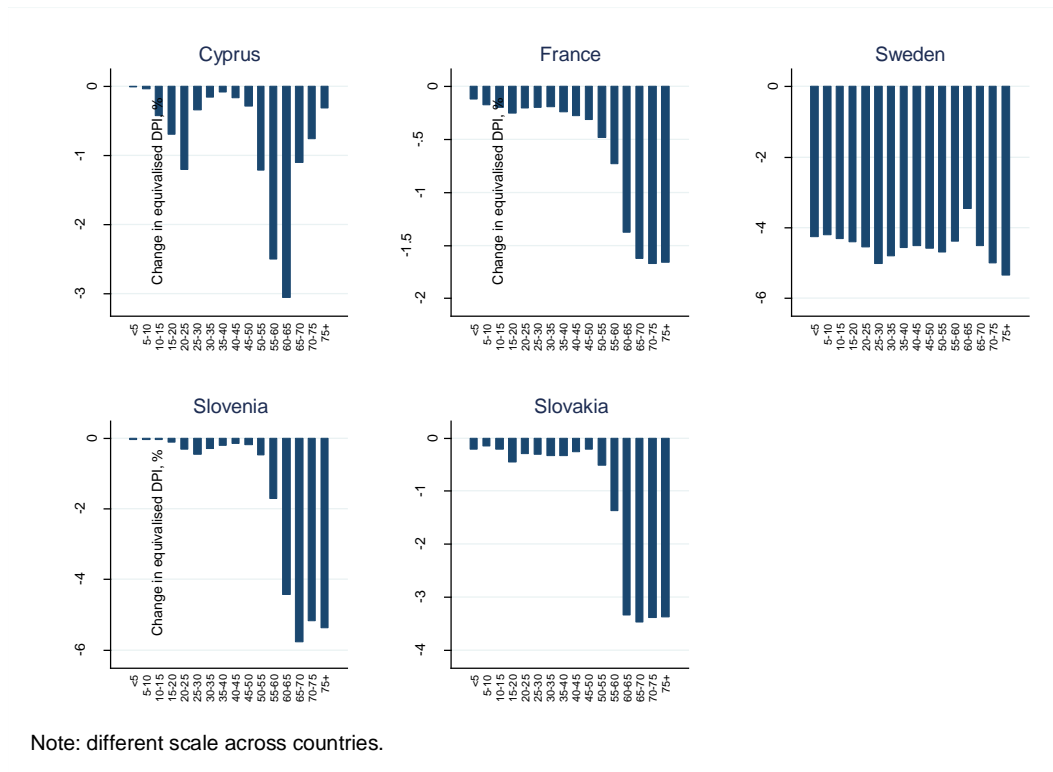


Figure 4.d: Change in equivalised disposable income by age group due to abolishing pensions-related tax expenditures

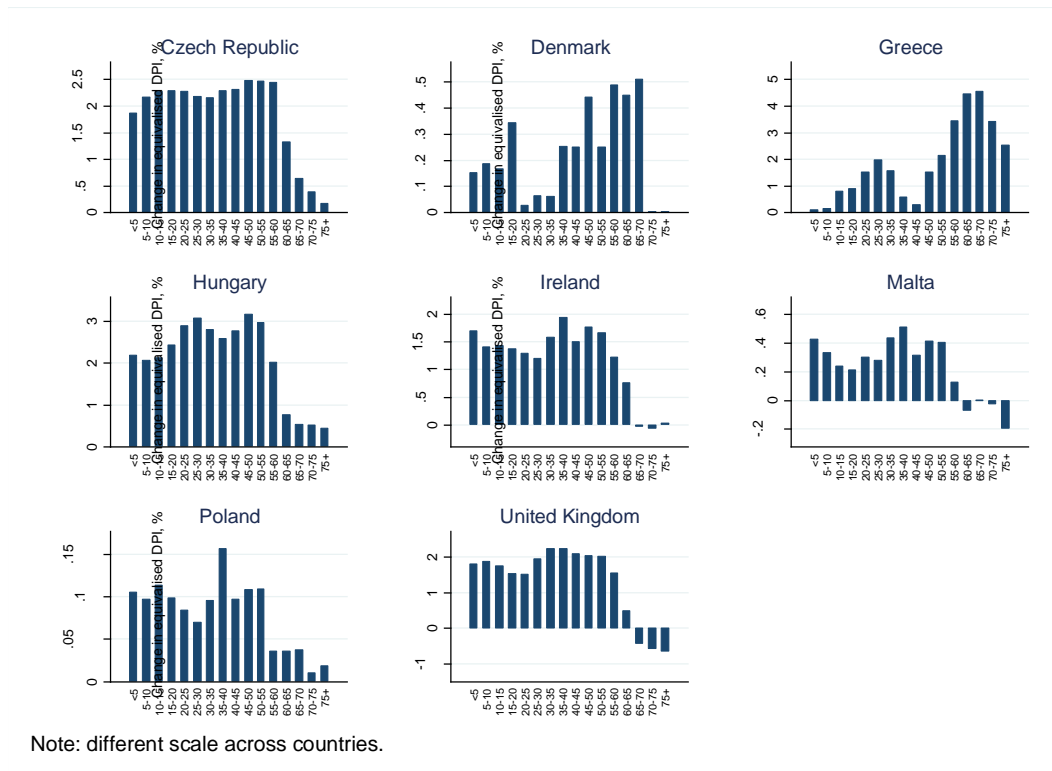


Figure 5: Tax revenue effects of abolishing housing-related tax expenditures

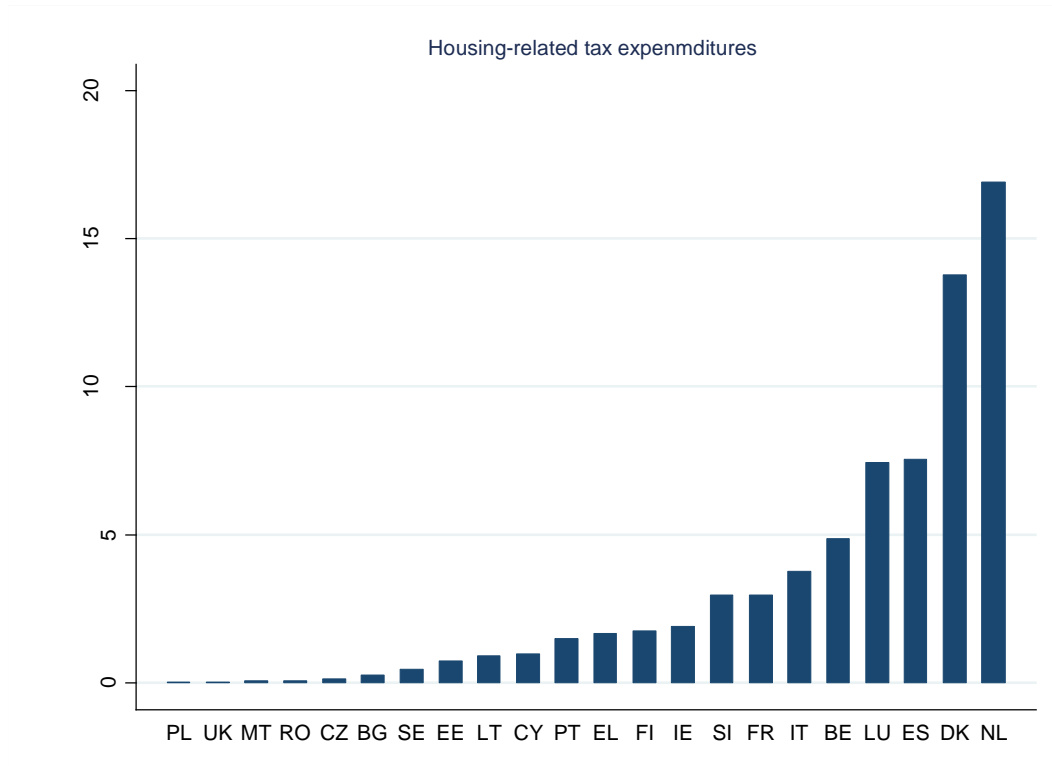


Figure 6.a: Change in tax revenue over decile groups due to abolishing due to abolishing housing-related tax expenditures

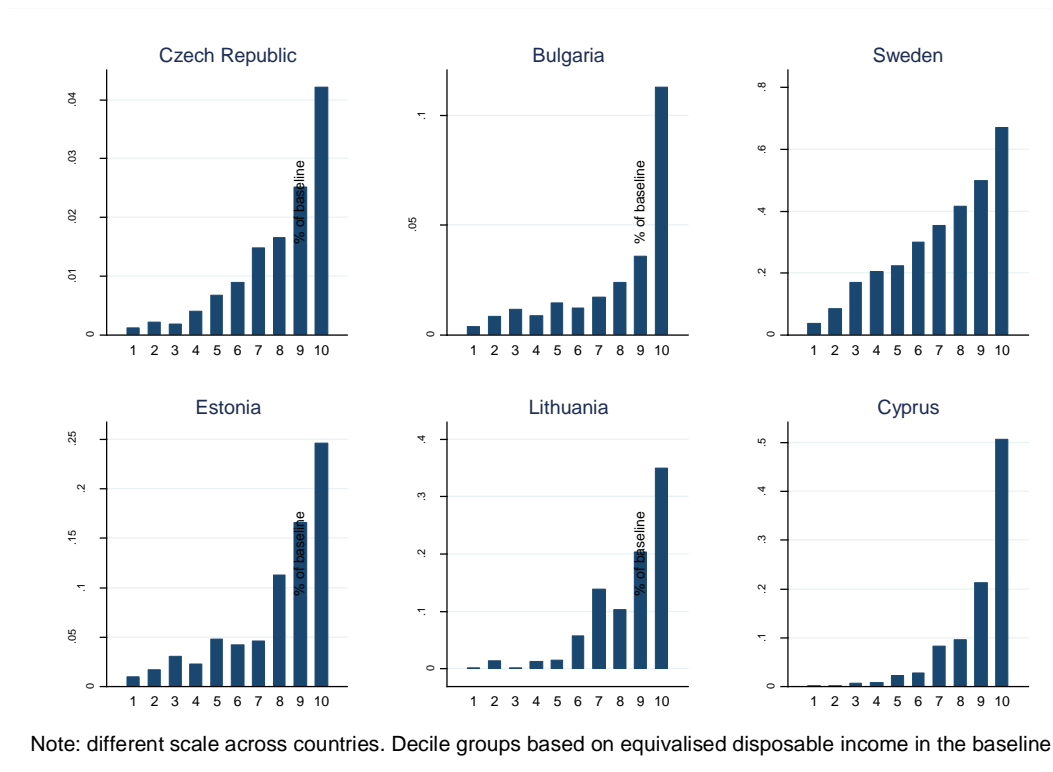


Figure 6.b: Change in tax revenue over decile groups due to abolishing due to abolishing housing-related tax expenditures

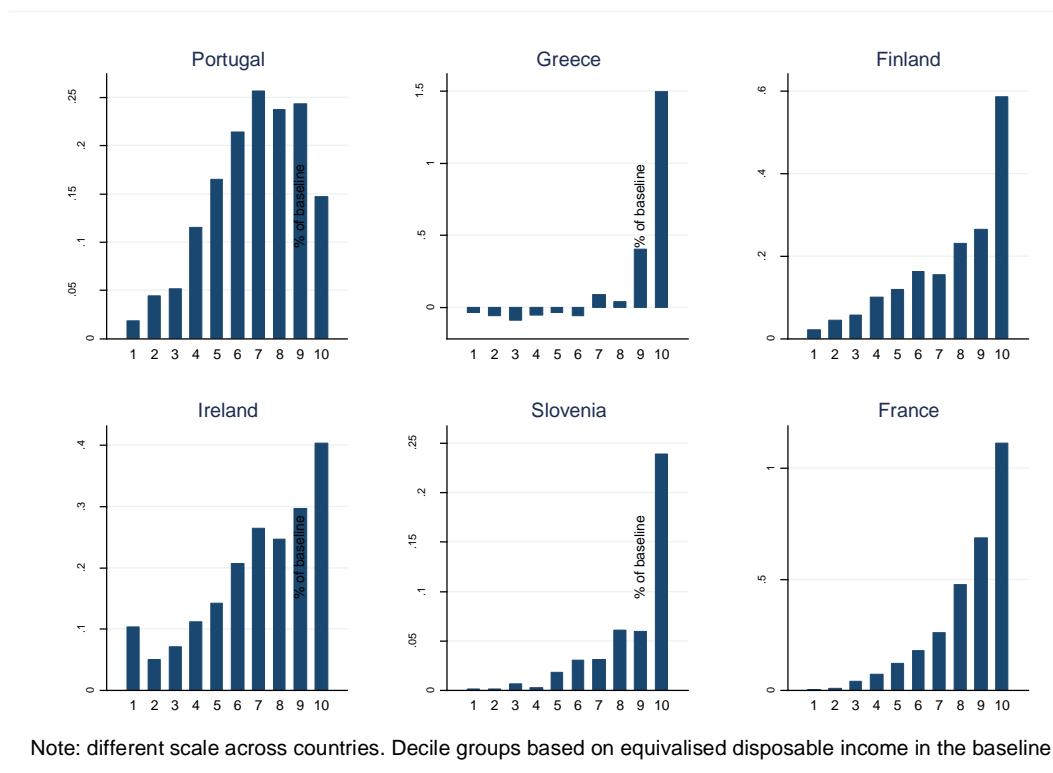


Figure 6.c: Change in tax revenue over decile groups due to abolishing housing-related tax expenditures

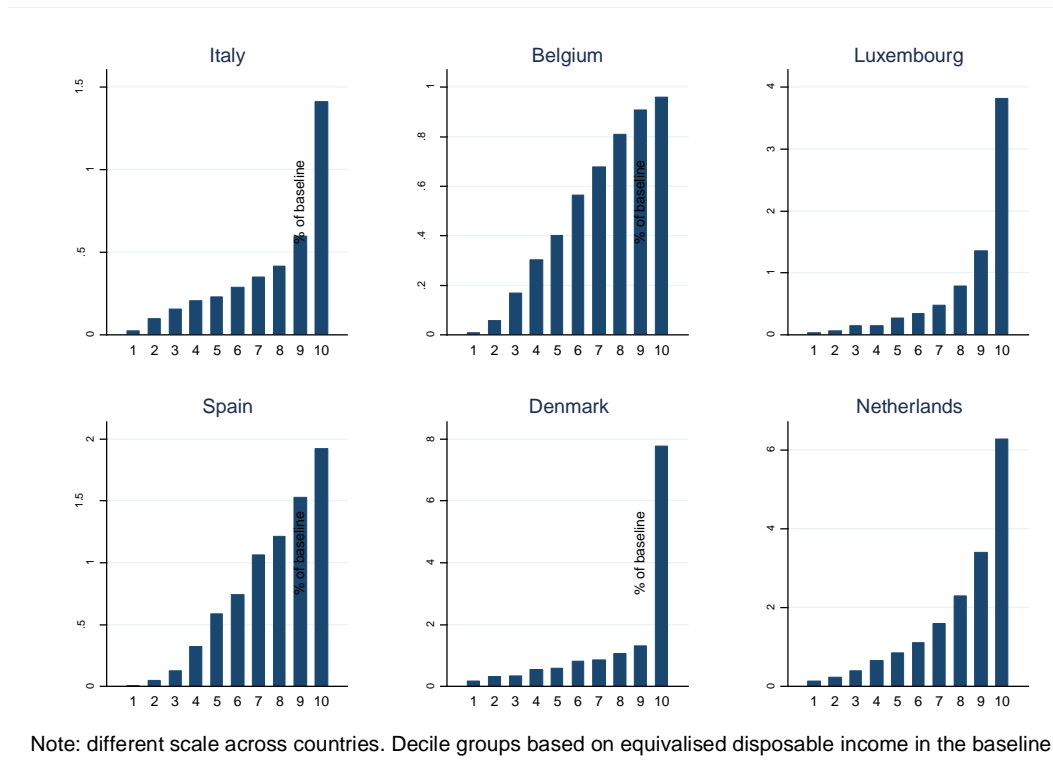


Figure 7.a: Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related tax expenditures

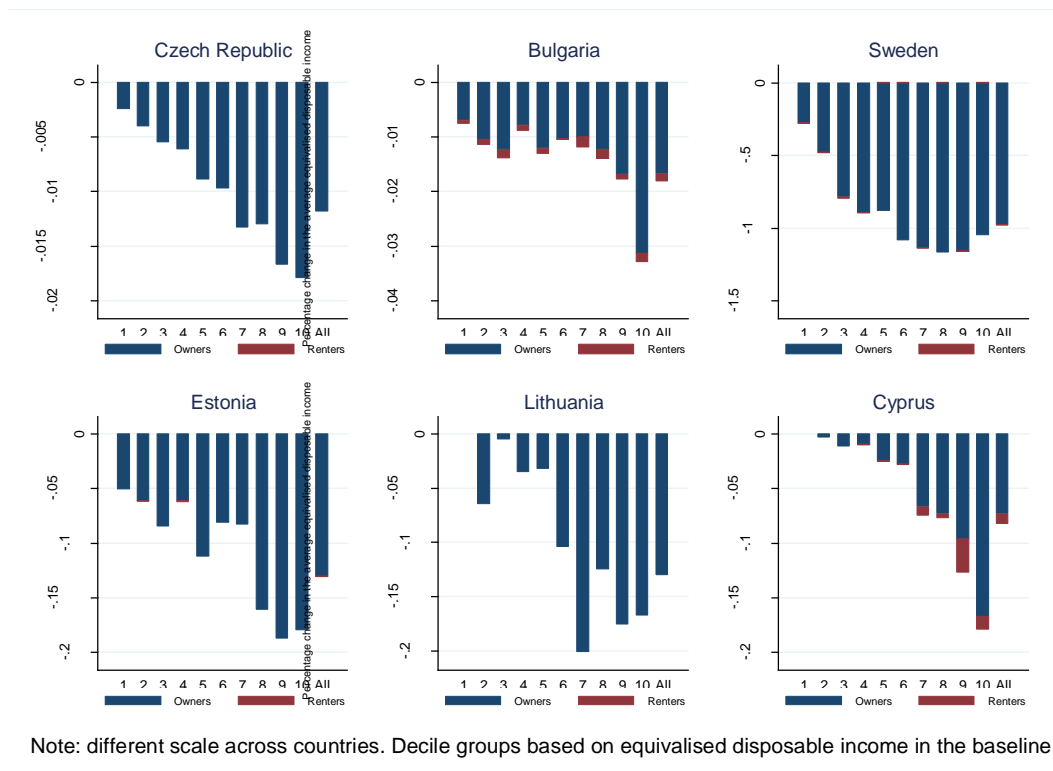
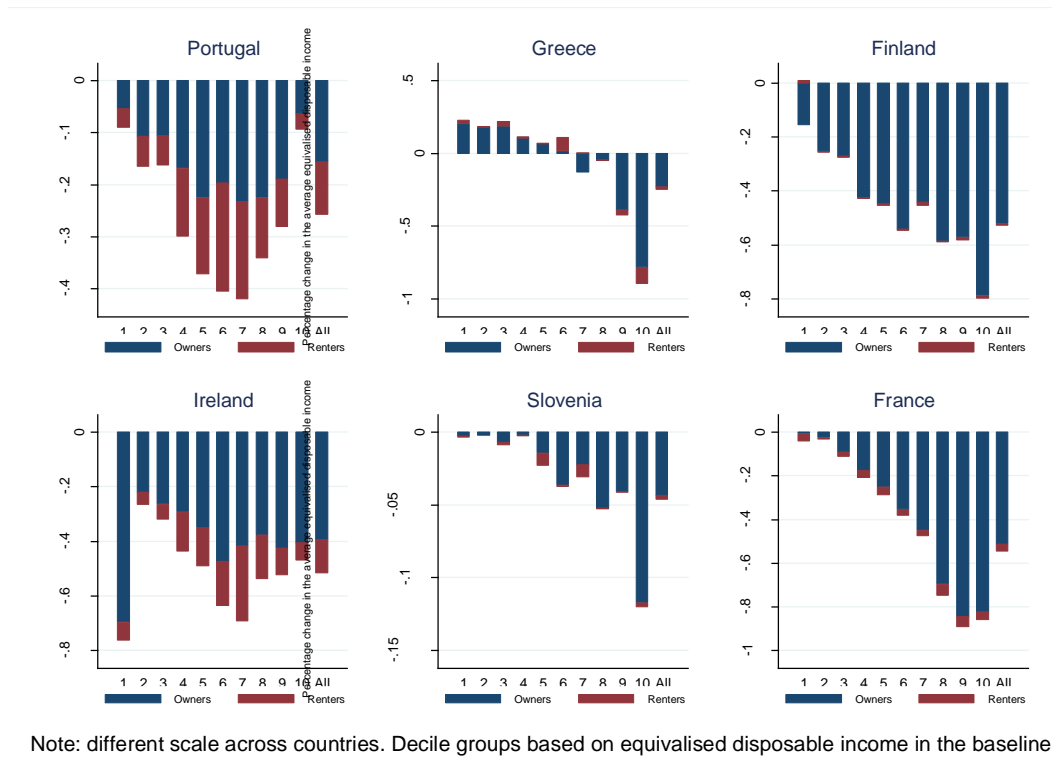
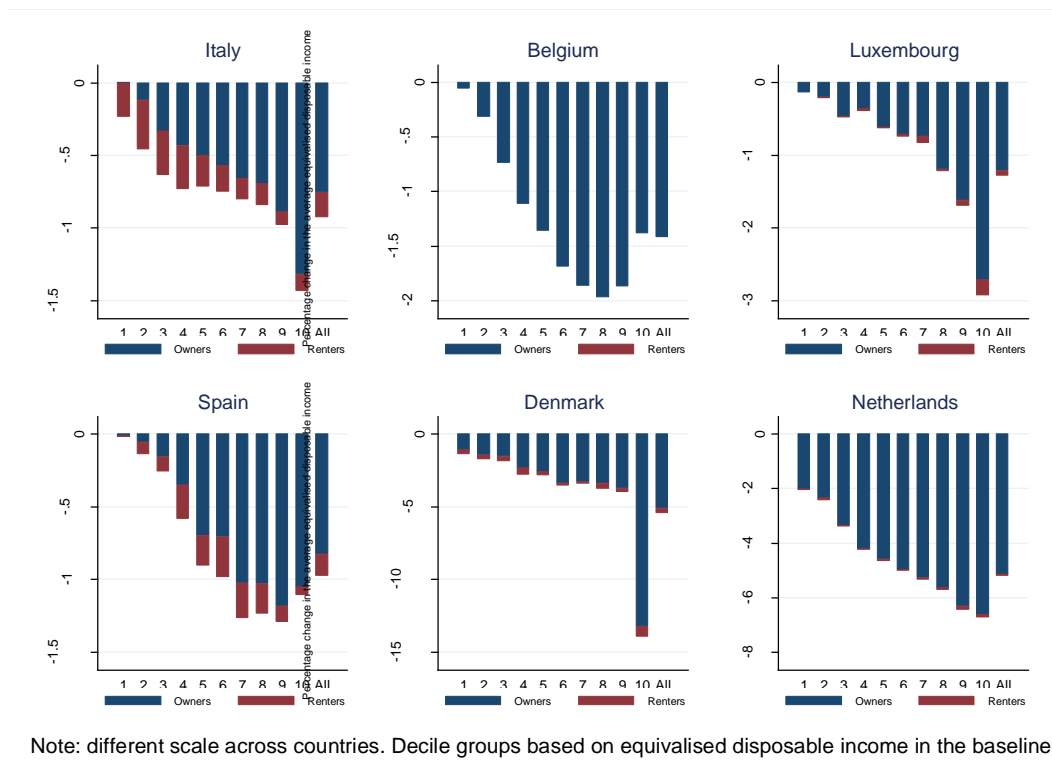


Figure 7.b: Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related tax expenditures



Note: different scale across countries. Decile groups based on equivalised disposable income in the baseline

Figure 7.c: Change in disposable income decomposed by hh types and decile groups due to abolishing housing-related tax expenditures



Note: different scale across countries. Decile groups based on equivalised disposable income in the baseline

Figure 8: Tax revenue effects of abolishing education-related tax expenditures

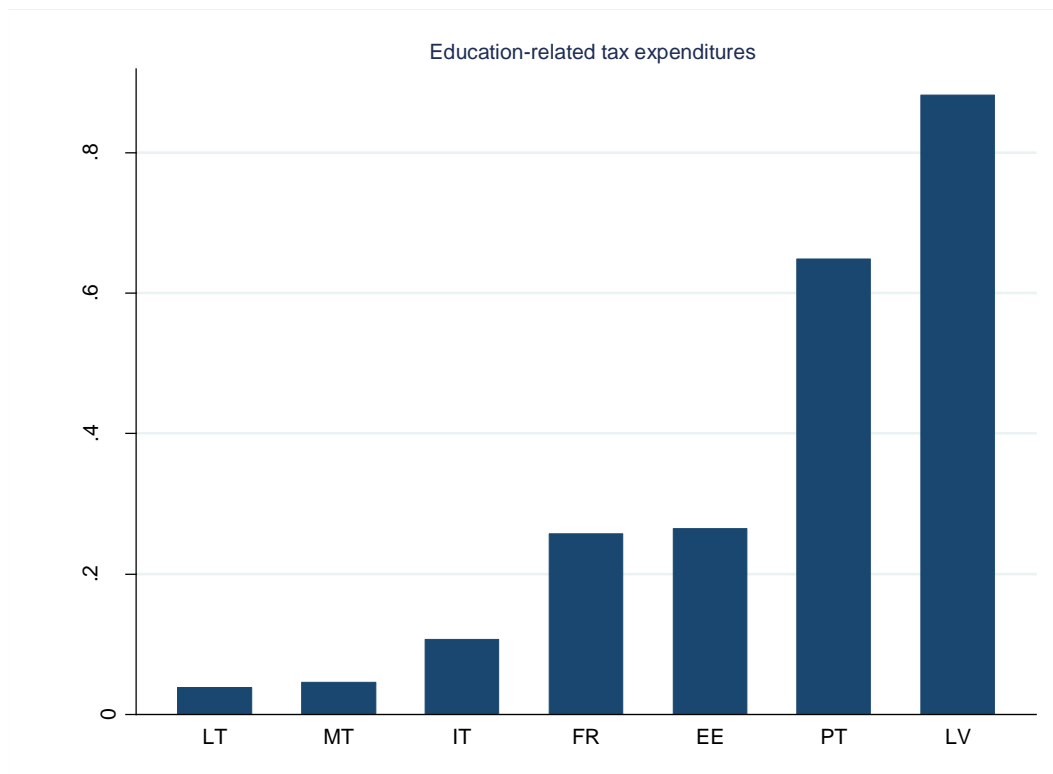


Figure 9: Change in tax revenue over decile groups due to abolishing education-related tax expenditures

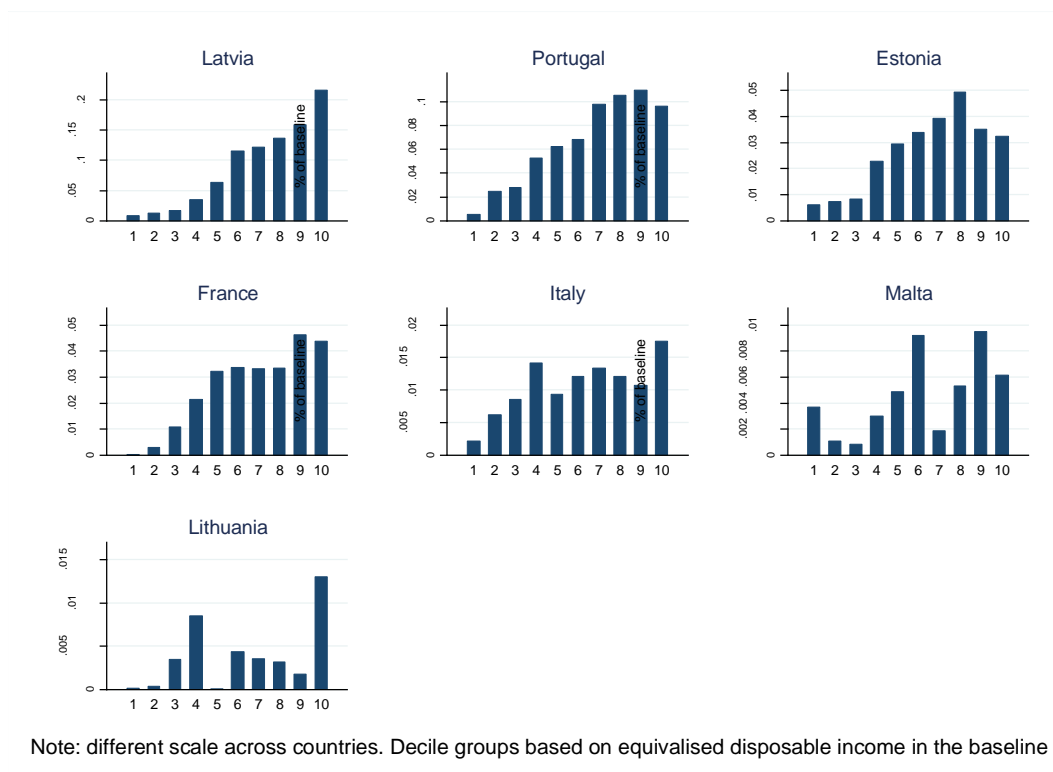


Figure 10: Change in disposable income decomposed by hh types and decile groups due to abolishing education-related tax expenditures

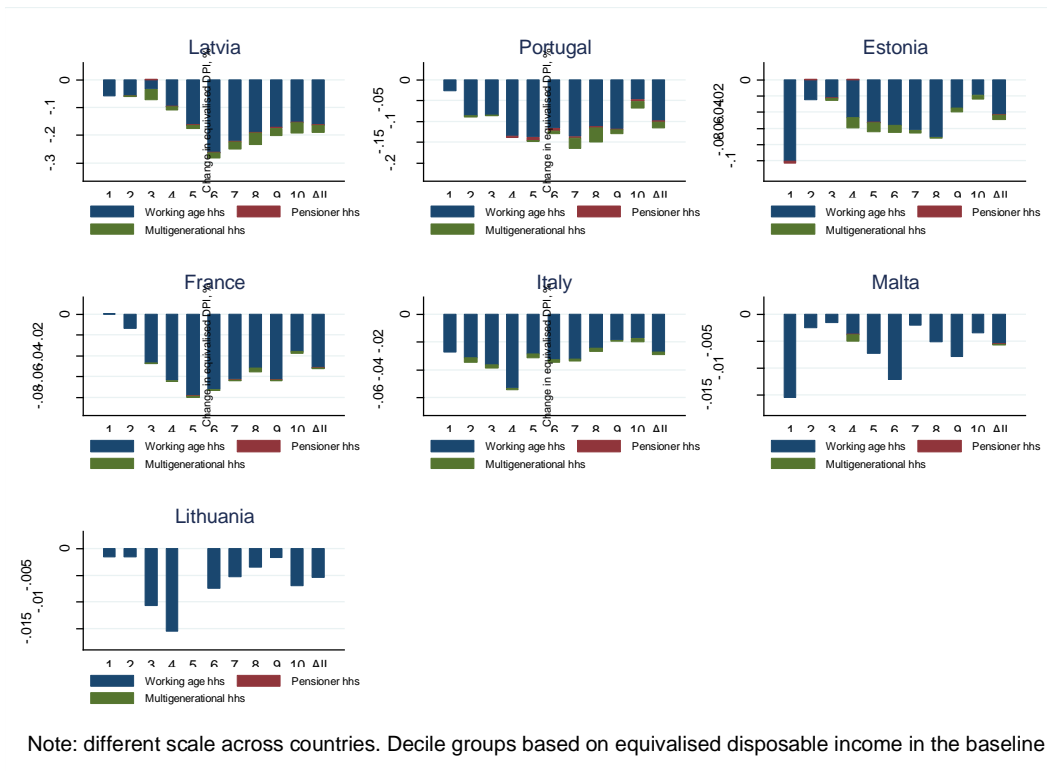


Figure 11: Tax revenue effects of abolishing health-related tax expenditures

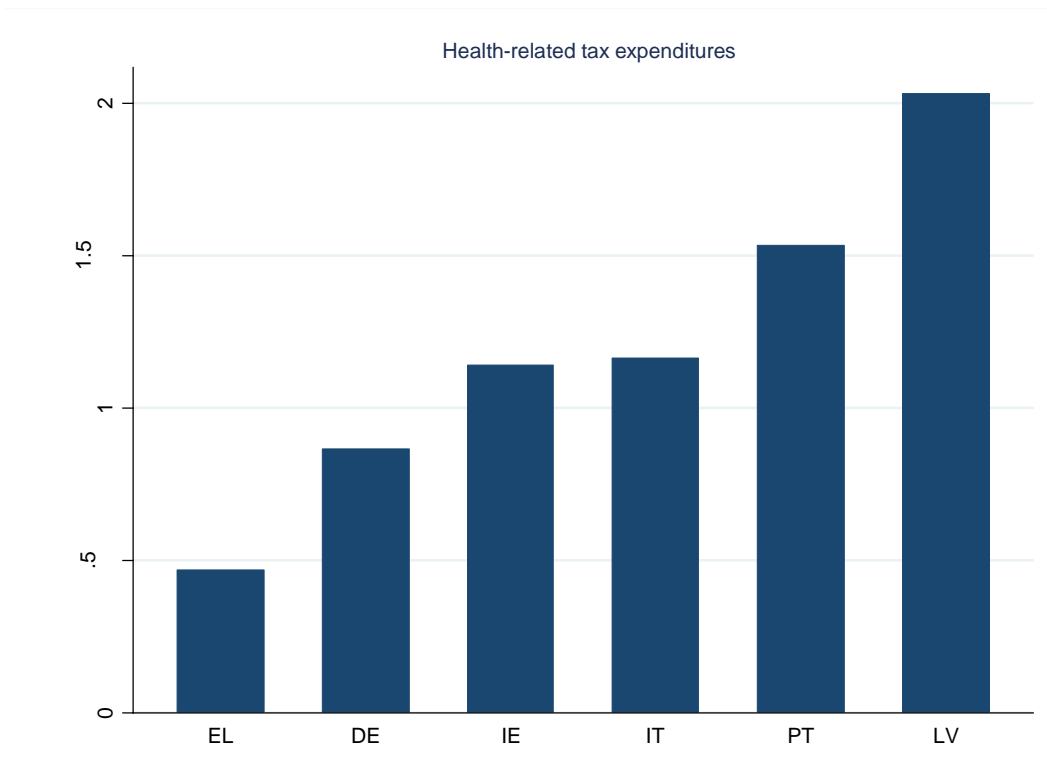


Figure 12: Change in tax revenue over decile groups due to abolishing due to health-related tax expenditures

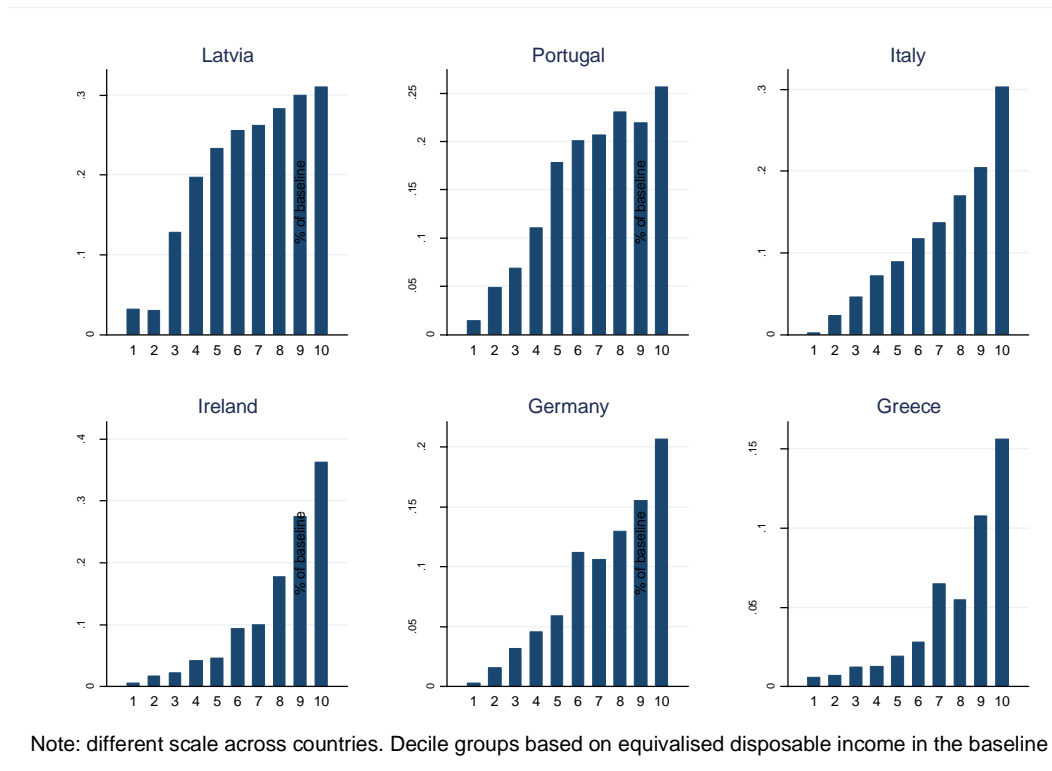


Figure 13: Change in disposable income decomposed by hh types and decile groups due to abolishing health-related tax expenditures

