JRC TECHNICAL REPORT

The budgetary and redistributive impact of pension taxation in the EU: A microsimulation analysis

2021

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June 2021

Abstract

Pension taxation has large budgetary and distributional effects, in particular in the light of ageing societies and the importance of pension benefits in old-age income. This paper investigates the impact of taxing public and mandatory occupational old-age pensions in the EU, focusing on both contributions and benefits. Using the microsimulation model EUROMOD, we simulate two hypothetical taxation scenarios for the 27 Member States of the EU. While the double exemption scenario (EE) fully removes pension taxation, the double taxation scenario (TT) fully taxes pension benefits and does not exempt pension contributions. A switch to the EE scenario is associated with a fiscal cost of 0.9% of GDP, whereas the adoption of the TT scenario would lead to a fiscal gain of 1.2% of GDP, abstracting from behavioural reactions. Rich taxpayers tend to gain relatively more compared to the poor under the EE scenario because of progressive personal income taxation in a majority of countries, while the opposite holds for the TT scenario. The distributional impact, nevertheless, depends also to a large extent on the relative importance of public and mandatory occupational pension benefits in old-age income.

Keywords: pension taxation, old-age pensions, pension contributions, microsimulation, redistribution

JEL codes: H24, H55

Executive summary

- Pension benefits are the main source of old-age income in many European countries, constituting over 80% of disposable household income. In the light of aging societies in most Member States, pension payments account for a large and growing share of public budgets, suggesting taxation of pensions as a means for fiscal stability.

- Pension taxation is an important policy instrument to shape income redistribution and elicit pension saving. Although many countries tax public pension benefits in the same way as employment income, pension benefits often enjoy preferential tax treatment over labour incomes through specific tax allowances, tax credits or tax exemptions.

- This paper compares different pension tax regimes and investigates the impact of taxing public and mandatory occupational old-age pensions in the EU, focusing on both contributions and benefits.

- Public pensions can be taxed at different stages of life, either at working age, when contributions are made or at retirement when receiving old-age pension benefits. Several countries apply a partial exemption for pension contributions, while also granting preferential tax treatment to pension benefits. We classify countries according to the tax treatment of the main old-age pension benefits and employee pension contributions into six pension tax groups, showing the heterogeneity of pension tax treatment across the EU.

- To assess the budgetary and equity impact of pension taxation, we use the microsimulation model EUROMOD, running on EU-SILC data. We simulate two hypothetical taxation scenarios for the 27 EU Member States. We compare the current rules (baseline) to two hypothetical tax scenarios: the first scenario (EE) removes any tax burden on pension benefits and it allows for tax deduction of pension contributions. In contrast, the second scenario (TT) fully taxes pensions, while not allowing for tax deduction of corresponding contributions. Note that this static exercise does not account for behavioural reactions.

- The average fiscal cost in the EU of switching to the EE is 0.8% of GDP. Several countries face an even higher cost of 2% and more, while others, mainly Central Eastern European (CEE) countries, are less affected, often because they exempt or only partially tax pension payments. In contrast, switching from the baseline to the TT scenario (fully taxing pension contributions and payments) improves fiscal balances by 1.2% of GDP on average. Similarly, there are large differences within the EU. For some countries to the fiscal gain might reach about 2% of GDP, while others are hardly affected. The factors driving higher tax revenues, when switching to the TT scenario, are the preferential tax treatment of pension benefits (specific allowances or reduced tax rates) and the tax exemption of pension contributions.

- We find that the EE scenario has a regressive impact in 13 out of 27 countries, which reflects that pensions are currently progressively taxed in many countries. In contrast, switching to the TT scenario has a progressive impact in 18 of 27 Member States. Interestingly, we do not always find that the TT scenario leads to a progressive outcome, even if a country has a progressive personal income tax scheme. In some cases, income poor households are affected more strongly because they depend to a larger extent on public pension benefits than richer households.

- By design of the reform, the EE scenario decreases the overall at-risk-of-poverty rate, while the TT increases it in all countries. The impact of inequality is less straightforward. Switching to the EE scenario increases income inequality both among the elderly and among the working age population in almost all countries. Contrarily, the TT scenario lowers inequality for both age groups in most countries, except in nine. In four countries, the TT scenario increases inequality for both groups, while in the other five countries inequality increases only for the elderly.

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1 Introduction

Pension benefits are the main source of old-age income in many European countries, constituting over 80% of disposable household income (European Commission, 2018a). Furthermore, the share of the elderly in the EU population of currently about 25% is estimated to continue growing notably until 2050 (Eurostat, 2019). In the light of ageing societies, pension taxation is a key policy lever to shape income redistribution and elicit pension saving. In EU countries, pension contributions and pension benefits often enjoy specific beneficial tax treatment (e.g. tax allowances and tax credits). At the same time, there is scarce empirical evidence on the redistributive impact of pension taxation, especially from a cross-country/EU-wide perspective, largely due to the difficulties in quantifying this impact in a comparative manner.

This paper sheds light on the taxation of public and mandatory occupational old-age pensions in the EU, focusing on contributions and benefits. To quantify the budgetary and distributional tax implication of pensions, we rely on EUROMOD, the microsimulation model for the EU using the tax and benefit policies from 2019 and EU-SILC data from 2017, which has been updated to represent the 2019 situation. In particular, we compare the current rules (baseline) to two hypothetical tax scenarios: The first scenario (EE) removes any tax burden on pension benefits and it allows for tax deduction of pension contributions. In contrast, the second scenario (TT) fully taxes pensions, while not allowing for tax deduction of corresponding contributions. The simulations serve as a static illustration of the current state of pension taxation in the EU, in the absence of behavioural reactions to the two hypothetical scenarios. Due to the cross-sectional nature of the data, we abstract from modelling the lifetime dimension at the individual level.

Extensive literature on income redistribution concludes that around 70-80% of redistribution in European countries is attributed to social benefits and the rest to direct taxes. Public old-age pensions (including survivor pensions) alone comprise the most important redistributive instrument, which account for around 40-50% of total fiscal redistribution (e.g., Wang et al, 2012; Wang et al 2013, Caminada et al. 2017, Caminada et al., 2019; Joumard et al. 2012; Fuest et al., 2010; Mahler and Jesuit, 2006). Similarly, Giullaud et al. (2020) and Avram et al. (2014) show that in most countries pensions have a similar income redistribution capacity as taxes and being higher than that of other social benefits. In many countries public pension schemes are earnings related, which perpetuates the inequalities in labour market in old age (Ebbinghaus, 2021). Furthermore, the design of pension systems matters. Public pensions, although acting as an insurance in old age, might also contain a redistributive element, which results in decreased income inequalities among the elderly. In fact, pension incomes are generally more equally distributed than labour or capital incomes.

While social security systems have been relatively well studied, less attention has been paid to the taxation of social security benefits. Ferrarini and Nelson (2013) argue that taxing social transfers is a relatively recent feature, dating back to the early 1970s. They stress that the distributive effect of social insurance benefits should be assessed after deducting applicable taxes. Ignoring income taxes might lead to an overestimated impact of social security benefits in reducing income inequality and to imprecise conclusions on the importance of various tax-benefit elements in income redistribution. For example, when taking into account the taxation of social insurance benefits, means-tested benefits have been found to reduce income inequality more than social insurance benefits in the Netherland and Finland, while the opposite occurs if taxation is ignored.

Although many countries tax transfers from social insurance schemes in the same way as employment income, the important exception – on which this paper focuses – is the taxation of pension income. In most EU countries, pension benefits enjoy preferential tax treatment over labour incomes through specific tax allowance, tax credits or tax exemptions. Verbist (2007) investigates the impact of taxing pension and unemployment benefits in 15 EU countries also using EUROMOD. While she finds large differences across countries, on average Member States tax old-age pensions at a lower rate than income from work. Therefore the relative income position of pensioners is better in net than in gross terms, which is important for international comparisons. She also finds that taxes on pension benefits in most countries are more progressive than taxes on earnings, which indicates that tax systems contribute to reducing inequality in old age.

The preferential tax treatment of pension contributions or benefits can create significant amounts of forgone revenues and has important equity implications. The literature considers the forgone revenue due to the preferential tax treatment of certain groups or income components as tax expenditures (Swift, 2006). Barrios et al. (2020) quantify the fiscal and equity impacts of pension-related tax expenditures in the EU, related to both private and public pensions and pension contributions using EUROMOD. In particular, Barrios et al. (2020) compare the actual pension tax regime of each EU Member State to a benchmark tax system, where pension contributions are exempt and pension benefits are fully taxed. Any deviation of the actual tax regime from the benchmark is considered as pension-related tax expenditure. They point out that pension-related tax expenditures not only are sizable in many countries, but they also tend to be progressive.[1]

Keenay and Whitehouse (2003) examined the tax treatment of pensioners in 15 OECD countries and compared their average and marginal tax rates with the corresponding ones of the working age. They find that nearly all 15 countries grant a notable beneficial tax treatment to the elderly. Similarly, the OECD (2019) also notes that personal income tax plays an important role in old-age support since the average personal income tax rate paid by pensioners is lower than that paid by the working age population. In addition, some types of social insurance contributions, for instance to the pension system or to unemployment insurance, are seldom paid by pensioners.

In the light of the dire need for better understanding of the size and the distributive impact of current taxation of public pension benefits and pension contributions, this paper provides a comparative analysis across all 27 EU Member States. We first, contribute to the literature by theoretically describing the institutional features of the current state of public pension taxation in the EU, shedding light on the notable differences across Member States, and second, by empirically quantifying its distributional and budgetary impact.

To preview our results, switching to the EE scenario is associated with a fiscal burden of about 0.9% of GDP whereas the TT scenario would lead to a fiscal plus of 1.2% of GDP. We find large variations across countries, even among those who apply a similar pension taxation regime. While the EE scenario has

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[1] In contrast to the impact of public pensions, Redonda et al. (2019) note that tax expenditures related to private pensions disproportionally benefit the rich. Individuals from higher brackets are more likely to save for retirement because they have available resources while poorer households concentrate on short-term consumption needs first. Hence, providing additional tax breaks for private pension savings exacerbates inequalities. Princen et al. (2020) using EWIGE, the EUROMOD wealth extension based on the Household Finance and Consumption Survey (HFCS), similarly show that private pension-related tax expenditures, disproportionately benefit the rich in a majority of the selected 17 EU countries.

a regressive impact in 13 out of 27 Member States, the TT scenario is associated with a regressive impact in 18 countries. Pensioner households generally experience larger proportional income changes in both scenarios than working-age households, which suggests that the tax treatment of pension benefits is quantitatively more important than the one applied to pension contributions, at least for the given cohorts. Finally, switching to the EE scenario increases income inequality in most countries, but decreases the at-risk-of-poverty rate by design of the reform. The opposite is true for the TT scenario.

The remainder of this paper is as follows: In the next section, we will outline the methodology. Then we will discuss the budgetary implications and move to the equity impact. The last section concludes.

2 Pension taxation in the EU

While there is large variety of pension tax regimes across the world, the reasons for the choice of these regimes are not clear. Cremer and Pestieau (2016) review the general principles of pension taxation and provide theoretical arguments as to why pensions should be taxed differently than other types of income. The authors argue that the design of public pensions should go together with the design of taxation to align work and savings incentives induced by the two systems. For instance, if a policymaker intends to prolong the retirement entry date, then the net-of-tax pension benefit should be linked to the expected length of the retirement period.

Public pensions can be taxed at different stages of life, either at working age, when contributions are made or at retirement when receiving old-age pension benefits. Several countries apply a partial exemption for pension contributions, while also granting preferential tax treatment to pension benefits. Theoretically, and in some rare cases practically, no taxation (EE) and double taxation (TT) regimes can also exist. Figure 1 compares the tax treatment of public and mandatory occupational old-age pension benefits in the EU, which reveals similarities, but also a large heterogeneity. We group Member States to the six pension tax groups – EE, Et, ET, TE, Tt, and tt – considering the tax treatment of (a) *pension contributions paid by employees* and (b) *taxation of old-age pension benefits.* "T/E" indicates whether pension benefits or contributions are fully taxed (T) or fully exempted (E) from personal income taxation (PIT), while "t" indicates a limited exemption of social contributions (e.g. via cap) or a reduced effective tax rate on pension benefits (via specific tax allowances or tax credits). Please note that we classify countries according to the tax treatment of the main old-age pension benefits and employee pension contributions. It might well be the case that in a country that is classified as ET, the contributions on pensions might not be deducted for the self-employed or farmers and a few minor old-age pension benefits remain untaxed.

EU countries differ not only by the tax groups distinguished above, but also by who – employer or employee – pays a larger share of total pension contributions. For the majority of Member States the payment of pension contributions is shared between employee and employer and in 14 countries employers pay a higher share (AT, BE, BG, CZ, EL, ES, FI, FR, HU, IE, IT, LV, SE, SK). Only five countries (CY, DE, LU, MT and PL) equally split payments between the two. In SI, employees pay more. In six countries, however, pension contributions are paid by one side or are tax-financed: In EE pension contributions are paid only by employers, whilst in HR, NL, LT and RO payment falls under the

responsibility of the employee.[2] Danish pension benefits are tax-financed. Of course, this distinction represents only the legal variations of the possible division of pension payments and does not reflect the true tax incidence.[3] This paper disregards pension contributions paid by employers and focuses on the part of pension contributions paid by employees (or the self-employed, farmers) and could be deductible from the personal income tax (PIT) base.

Figure 1: Pension taxation in the EU
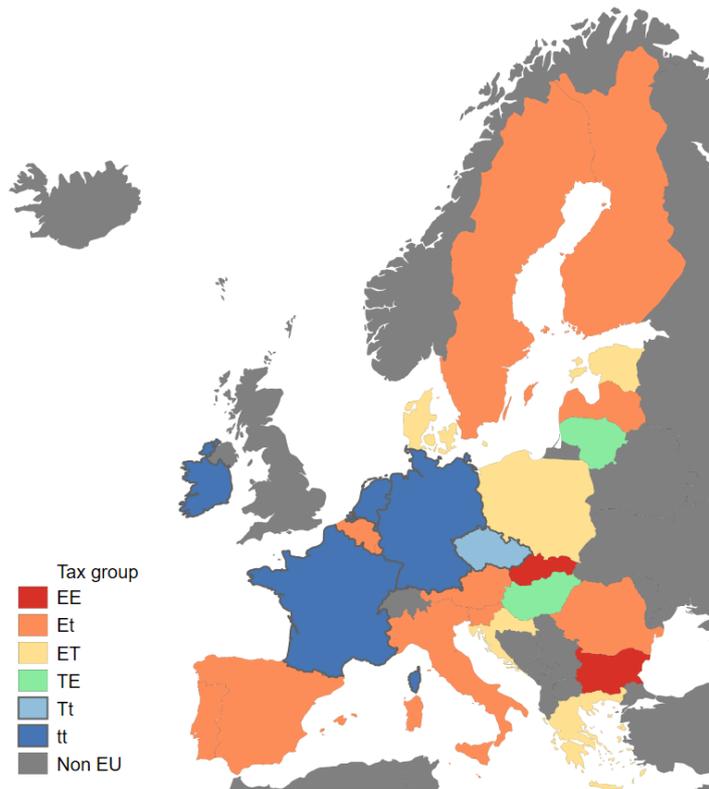
Note: The first letter of each tax group refers to the tax treatment of pension contributions, while the second letter indicates the tax treatment of main old-age pension benefits (E = fully exempt, T = fully taxed). t refers to a reduced exemption of pension contributions (e.g. via a cap) or to a reduced effective tax rate (e.g. because of the existence of specific pension or age-related tax allowances/credits) on pension benefits.
Greece and Finland impose an additional tax on pension income (on top of PIT).
Source: authors' elaboration based on EUROMOD microsimulation model and EUROMOD Country Reports.

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[2] LT and RO recently have reformed their social security systems and have fully transferred the employer's share of pension contributions onto employee. Until 2018 in RO and until 2019 in LT employers were paying a higher share of pension contributions than employees.
[3] Müller and Neumann (2016) discuss the literature on the economic incidence of social security contributions and provide empirical evidence for Germany. Their findings largely confirm the view that legal and economic incidence of social security contributions coincide.

3   Methodology

We rely on EUROMOD, the microsimulation model of the EU (Sutherland and Figari, 2013), which allows analysis of the first-round fiscal impact of tax and benefit reforms on government budgets and disposable income. The model applies countries' policies for calculating tax liabilities and benefit entitlements, taking into account the interactions within the tax and benefit system, and generates disposable individual or household income. EUROMOD uses the EU Statistics on Income and Living Conditions Survey (EU-SILC) data, which is harmonised by Eurostat. EUROMOD takes some variables directly from the underlying EU-SILC data, such as demographic and labour market characteristics, gross market income and other incomes (pensions, incomes from other households, etc.). While demographic and labour market characteristics remain the same, uprating factors[4] are used to bring the income values from the survey reference period up to the level of the year in which the tax and benefit system is coded. To assess the budgetary, distributional as well as inequality and poverty impacts of switching to the hypothetical pension taxation scenarios, we use the tax-benefit rules as of June 30, 2019 and 2017 EU-SILC data[5] with incomes being updated to 2019 values.

In all simulations, we focus on public and mandatory occupational old-age and survivor pension benefits (including various supplements), but not on disability pensions, as the target population in most cases will be different. Table 1 summarizes the different hypothetical pension taxation scenarios. The EE scenario exempts contributions to qualifying old-age pensions (mandatory public and occupational) from personal income taxation, i.e. allowing for their deduction from the base, and it exempts qualifying pension benefits from taxation (from both taxes and social contributions, if present). In contrast, the TT scenario removes any preferential tax treatment of qualifying pension contributions and it fully taxes the corresponding pension benefits. The choice of these two extreme scenarios was inspired by political considerations and the aim to cover the range of pension tax regimes.[6]

Table 1 Overview of hypothetical pension taxation scenarios

Scenario	Description
Baseline	Tax and benefit rules, as of June 30, 2019.
EE	Tax deduction of qualifying pension contributions from the personal income tax (PIT) base, while not taxing qualifying pension benefits (neither via taxes nor social contributions).
TT	No tax deduction of qualifying pension contributions from the PIT base, while fully taxing qualifying pension benefits.

Source: Own elaboration.

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[4] These uprating factors are typically index variables taken from Eurostat or national statistical offices such as the consumer price index, earnings increase or other legal variations in benefit amounts.

[5] Income and pension information refers to 2016.

[6] Note that these scenarios are hypothetical and serve as an illustration. In countries there might even be legal constraints on imposing a double exemption or double taxation of pensions. For example, see the recent court ruling by Federal Fiscal Court (*Bundesfinanzhof*) on May, 19, 2021 (X R 20/19), which ruled that pensions should not be taxed twice. Similar legal restrictions might also apply in other EU Member States.

Table 4 (Appendix) provides an overview of qualifying pension benefits and contributions in each country. In the following, we always refer to qualifying pension benefits, i.e. old-age and mandatory occupational pension benefits are taken into account in the two scenarios when we use the term "pension benefits".

We mainly rely on the concept of *annual equivalised disposable income*. The equivalised disposable income is calculated by dividing the total income of a household, after tax and other deductions, by the sum of household members converted into equalized adults. Household members are equalised by weighting each according to their age, using the so-called modified OECD equivalence scale. As a result, each household member receives the same amount of equivalised disposable income.[7] Relying on equivalised disposable income allows the attribution of important benefits – determined at the household level, e.g. social assistance or housing benefits – to individuals, considering the complexity of the tax-benefit system. However, this approach comes at a cost when comparing simulation results by individual characteristics, because individual (gross) income differences are averaged out.

Simulation results are provided separately for the total population and along several breakdowns: household type, gender and skill level. Since the concept of equivalised disposable income does not allow a comparison of income differences within households, we modify the income definition for the distributional subgroup analysis (by gender and skill types). More precisely, we *adjust individual disposable income*, assuming that all household-level benefits (e.g. housing benefits) are split equally among adult members and added to individual disposable income. When relying on individual adjusted disposable income, we further restrict the sample to adults. The exception is the subgroup analysis of the risk of poverty and inequality, for which we use the standard equivalised disposable income concept. For this measure, which concentrates on the lower tale of the income distribution, it is important to take into account incomes received by all household members, including means-tested benefits that are paid to a household and not to an individual and equivalise those incomes accounting for a household composition. The assumption is that all household members are either below or above the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income. For instance, a man or a low-skilled person would be classified as being at risk of poverty only if the whole their household falls below this threshold.

The interpretation of the simulated results should also take into account a few important aspects: a) data-related, b) simulation of the interactions in tax-benefit systems, c) static modelling, and d) comparability across countries.

a) Although the EU-SILC is the main source for income distribution analysis, it is not designed to analyse pension systems a priori, mainly because it lacks information on the individual employment biography. As a result we cannot simulate the level of and eligibility for individual pension benefits. Therefore, most pension benefits (except mainly means-tested or lump-sum

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[7] https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Equivalised_disposable_income. This approach is widely accepted in academia and by many political institutions such as DG EUROSTAT or the OECD. In general, equivalised income is a measure of household income taking account of the differences in household size and composition, adjusting for the relative cost of living. For a discussion of different equivalisation scales, see e.g. Anyaegbu (2010). As an example, for a childless couple household with a monthly total household income (after tax and benefits) of 3,000 EUR, equivalised disposable income is calculated as 3,000 / (1+0.5) = 2,000 EUR. Accordingly, each of the two adults has an individual equivalised disposable income of 2,000 EUR per month.

pensions) are not simulated but are taken directly from the EU-SILC data. Nevertheless, the macro validations of the main old-age pension benefits from the survey and administrative sources usually show a pretty good fit.[8] However, there might be larger derivations for minor pensions for some countries that are either poorly reflected in this survey or cannot be validated because of a lack of administrative information.[9] Because of these limitations, the true extent of the budgetary, distributional as well as inequality and poverty-related impacts of the simulated changes might be under or overestimated.

b) One of the important features of the EUROMOD microsimulation model is its ability to capture the interactions of different tax-benefit elements. Yet, it is important to point to the differences in the benefit systems – especially of means-tested benefits – across the EU. In some countries, net incomes (post-tax) are tested for the eligibility for means-tested benefits. Thus, the change in the taxation of pension benefits will be automatically translated into increased or decreased incomes used for tested purposes and, in turn, lower or higher means-tested benefits. However, some other countries (BG, CY, MT, PT, DK and LU for social assistance, and FI and SE for pensioner and general housing allowance) use gross incomes or adjusted gross incomes to define the eligibility for all or some means-tested benefits, most importantly for the main social assistance/minimum income guarantee benefits and/or housing benefits. In this case, any change in taxation on pension benefits would not have any effect on means-tested benefits. In reality, the thresholds for means-tested benefits or income disregard should be adjusted. In ES, the main means-tested social assistance benefit is not simulated but taken directly from the EU-SILC data (also in IT, but social assistance and housing benefits are rather minor in this country). In addition, even when simulated, means-tested benefits are usually over-simulated in the model due to the full take-up assumption – benefits are assigned to all eligible individuals – and the inability to accurately model the asset test, which is often also used for defining the eligibility for means-tested benefits due to the lack of data. For all these reasons the changes in disposable income, inequality and poverty measures should be interpreted with caution.

c) We simulate the static overnight effects of the two pension taxation scenarios, assuming no behavioural responses of affected individuals. While this is informative in itself, in such case individuals generally respond to incentives that are being affected by tax reforms and adjust their behaviour accordingly. For instance, there is countless empirical evidence of taxpayers adjusting their (intertemporal) labour supply, including their date of retirement, which in turn impacts disposable income (for a general discussion see e.g. Meghir and Phillips, 2009). In addition, personal income tax reforms might also affect consumption/savings choices (Sandmo, 1985) or fertility (Apps and Rees, 2004).

d) Although the main advantage of using EUROMOD is its comparability across the countries, the results should be interpreted cautiously. Even when countries share seemingly similar properties of the tax treatment of old-age pension benefits and pension contributions (as seen in Table 1), the results of the simulated scenarios can be very different. The progressivity or

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[8] Each EUROMOD country report provides macrovalidation tables at the end.
[9] Out of six countries for which the analysis was done for private pensions, only DK private pensions and their receivers are well represented in the Survey (over 90% compared to the administrative data). For PL, LU, LT and SK no validation is provided and for BE only 5% of private pensions are captured in the EU-SILC compared to the administrative data.

regressivity of the results very much depend on several aspects. First, the initial distribution of pension benefits (and other incomes) across the population and which of the pension benefits are already taxed in the baseline. Second, the interplay of various elements of tax-benefit systems (PIT rate and progressivity, existence of various allowances, tax credits, existence of various social benefits, etc.).[10] The household composition might also play a role (some countries have a relatively bigger share of single person households, while in some others multi-generational families are more prevalent).

4   Results

4.1   Budgetary impact

Figure 2 compares the fiscal cost across the EU Member States associated with moving from the baseline to a hypothetical pension taxation scenario (EE or TT). Replacing the baseline by the EE scenario, i.e. effectively removing any taxation on pension payments and allowing for the full exemption of pension contributions, is costly in all Member States, albeit with large differences. This comes as no surprise because most countries either do not exempt pension contributions from taxation by deducting them from the personal income tax base or they impose a tax on pension payments. On average (weighted by GDP), the fiscal burden amounts to 0.8% of GDP in the EU. Several countries face an even higher cost of 2% and more, while others, mainly Central Eastern European (CEE) countries (CY, CZ, EE, HR, HU, LV, MT, RO, SI and SK), are less affected, often because they exempt or only partially tax pension payments.

Figure 2 Fiscal cost of the EE and TT scenarios (in % of GDP)
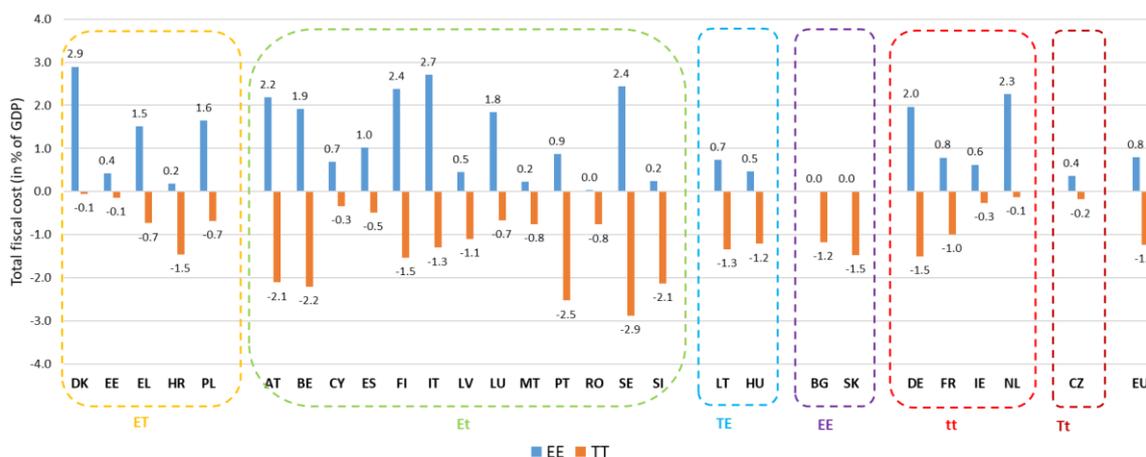
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

In contrast, switching from the baseline to the TT scenario (fully taxing pension contributions and payments) improves fiscal balances by 1.2% of GDP on average. As for the EE scenario, there are large differences within the EU. Five countries (AT, BE, PT, SE and SI) would gain about 2% of GDP, while others are hardly affected (CZ, DK, EL or NL). The factors driving higher tax revenues when switching

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[10] The progressivity (measured by the Kakwani index) of the baseline tax-benefit systems is provided in Appendix A1.

to the TT scenario are preferential tax treatment of pension benefits (specific allowances or reduced tax rates) and tax exemption of pension contributions.

The budgetary effect associated with a switch to the EE or TT scenario differs significantly across countries – even within the same tax group (ET, Et, EE, TE, Tt, tt; see Figure 1). However, this comes as no surprise since the magnitude of public pension benefits and their tax treatment depends on the characteristics of a county's tax-benefit system. Further, some countries hardly tax pension benefits (BG, HU, LT, SK), while others impose an additional tax on high pensions (EL, FI). As a result, there is no general rule implying that budgetary effects associated with a move to the EE or TT scenario are similar within a pension tax group. In the following, we discuss country-specific results in more detail, separately by tax groups.

Among the five countries within the ET tax group (DK, EE, EL, HR and PL), the fiscal cost when switching to EE is largest for DK (2.9%/GDP) and still sizable for EL and PL (about 1.5%/GDP), but not for EE (Estonia) and HR. In the latter two countries, public pensions are generally low – benefitting from the basic allowance in personal income taxation, which explains the small budgetary effect. Under the TT scenario, HR has the highest fiscal gain (+1%/GDP) followed by EL and PL (+0.7%/GDP). In HR, EL and PL, the fiscal gain stems almost exclusively from a higher tax burden borne by those of working age, as pension contributions are no longer tax-deductible (ET tax group). In DK and EE, switching to the TT scenario has little impact on tax revenue, because public benefits are largely financed via taxes (DK) or pension contributions are mainly paid by employers (EE).

Within the Et tax group (AT, BE, CY, ES, FI, IT, LU, LV, MT, PT, RO, SE, SI), the EE scenario is associated with a large budgetary cost in several (e.g. AT, BE, FI, IT, or SE) but not in all Member States. In countries where the fiscal cost of switching to the EE system is limited (e.g. CY, LV, RO, SK), mainly Central Eastern European countries, the level of public pension benefits is rather low and therefore also the corresponding tax burden. Switching to the TT scenario also leads to a large fiscal gain in several countries (e.g. AT, BE, PT, SE, SI), while in others it is rather limited (e.g. CY or ES).

In the two tax groups TE (LT, HU) and EE (BG, SK) the budgetary results are as expected, e.g. the budgetary cost of switching to the EE system for BG and SK is zero in BG and SK since the EE scenario is identical to the baseline. In LT and HU, the impact is rather low, since only pension contributions become exempt under the EE scenario, while pension benefits are already tax-exempt. The TT scenario, in contrast, is associated with sizable net fiscal gains in all four countries (1.2-1.5%/GDP).

Within the tt tax group (DE, FR, IE, NL), NL[11] faces the largest fiscal cost of about 2.3%/GDP in the EE scenario, while this figure is only 0.5%/GDP for IE. In the TT scenario, the fiscal gain ranges between 1.5%/GDP (DE) and 01%/GDP (NL).

Finally, in CZ (Tt), the fiscal impacts of switching to the EE or TT scenario are limited since the level of public pension benefits is rather low.

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[11] The results for NL have to be interpreted with care since pension contributions cannot be disentangled from individual income in EUROMOD due to technical reasons.

4.2 Distributional results

This section investigates how the two pension scenarios affect the different subgroups of the population. First, we analyse the impact along the income distribution to analyse the redistributive impact. Then, we break down the results by gender, household type and skill level.

4.2.1 Distributional impact by income deciles

To investigate the distributional impact associated with the two hypothetical pension taxation scenarios (EE and TT), Figure 3 illustrates the corresponding changes in mean annual equivalised disposable income by decile for each EU Member State. To improve readability, the scaling of the y-axis – indicating the income change in percent – is not harmonized across countries. The distributional analysis allows evaluating how individuals are affected depending on their position in the income distribution. In general, the distributional impact of switching to the EE or TT scenarios depends on two factors: (1) the distribution of pension benefits and pension contributions across deciles, and (2) the tax treatment of pensions in each country (taking into account interactions with benefits).

The EE scenario is regressive if the associated income gain (in percent of total income) increases with income, implying that (income) rich taxpayers benefit relatively more than the (income) poor. If the opposite is true, we call it progressive.[12] According to Figure 3 (blue bars), rich taxpayers gain relatively more than poor (regressive impact) in 13 out of 27 countries (AT, CY, CZ, ES, EL, HR, IE, IT, LU, NL, PT, RO and SI), which stems from the progressive PIT. Rich taxpayers benefit more from removing the tax-burden on pension benefits, as progressive tax schemes tax them more heavily in the baseline compared with poorer taxpayers.[13]

In four countries (DK, LV, PL, SE), however, we observe a progressive impact when switching to the EE scenario. In all four countries, qualifying pension benefits are more important (as share of total taxable income) at the lower end of in the income distribution (see Appendix A2). Accordingly, poorer taxpayers benefit more – despite progressive PIT – since their taxable income grows relatively less in the EE scenario compared to richer taxpayers. In DK, richer Danes rely more on private pensions that are still taxed in the EE scenario. For SE and LV, Figure 3 has is humped-shape. Taxpayers in the first decile benefit in the baseline and in the EE scenario from the basic allowances, granted in the personal income taxation, which explains the smaller impact compared to higher deciles. The hump (deciles 2 to 5) then results from the relatively higher share of affected pension benefits in total taxable income compared to higher deciles, as described above.

In the remaining countries, the results of the EE scenario are ambiguous, except in BG and SK, where the effect is zero because of exempting both pension contributions and not taxing pension benefits

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[12] When public pension benefits are equally important along the income distribution, i.e. their share is for instance 20% of total income in each decile, then we would expect that moving to the EE scenario is a regressive reform since the (income) rich benefit more when personal income taxation is progressive. The opposite would be true when moving to the TT scenario.

[13] In RO and SI we do not observe large effects because pension taxation is similar to the EE scenario in both countries. The two Central Eastern European countries apply an Et pension tax regime, effectively exempting pension contributions paid by workers and granting a preferential tax treatment to pension benefits (RO: tax allowance for pensioners; SI: specific tax credit for pensioners).

(EE tax group). Finally, the results for PT are not in line with expectations: while taxpayers in the first eight deciles even lose when switching to the EE scenario, the 9th and in particular the last decile (+9%) gain. Pensioners are not gaining much from the EE reform, as many were not paying much of the PIT because of the existence of the tax allowance for pensioners. In contrast, because of the interdependencies of the tax-benefit system, the working age population lose.[14]

Next, we discuss the distributional results associated with a shift to the TT scenario (orange bars in Figure 3). The impact is progressive if (income) rich taxpayers lose relatively more (in percent of their total income) than (income) poor, and regressive vice versa. For the majority of 16 countries (AT, CY, CZ, EL, ES, FI, FR, HR, IE, LU, LV, MT, PT, RO, SE and SI) the TT scenario has a progressive impact. The TT scenario removes tax privileges and therefore it increases taxable income of individuals in most countries, which leads to a higher proportional tax burden among richer taxpayers due to the progressive nature of the tax system. As a result, the overall effect is progressive.[15] In contrast, in three Member States (BG, LT, SK) the TT scenario is associated with a regressive impact. However, none of the three countries taxes the main public pension benefits, which are relatively more important at lower incomes (TE, EE tax regimes). Therefore, when taxing these pension benefits, households with lower incomes lose relatively more than richer ones. In NL, the TT effect stems from the removal of the old-age credit (and changes to other tax credits). In DK, the baseline is rather similar to the TT scenario, as the main old-age pensions are tax-financed and pension benefits are taxed. In the remaining countries, the results are neither clearly regressive nor progressive.

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[14] In Portugal, the increase of the tax allowances for employee SIC (the limit for the SIC allowance was removed) and the introduction of an allowance for SIC paid by the self-employed resulted in a lower taxable base for more than one third of the affected tax payers. The lower taxable base implies that some people could not fully use their tax credits because of lower tax dues. Therefore, the increased allowances not only did not offset the decrease in tax credits but led to lower after-tax incomes for some people. Decreased after-tax incomes were not compensated by the social assistance scheme, as gross incomes are used for the mean-tests in Portugal. The most affected were people with children, as many could not fully use their child (and other) credits (e.g. the at-risk of-poverty rate for two adults with one child increased by 1 p.p.).

[15] If e.g. public pension benefits are tax-financed rather than contribution-based and/or if public pension benefits are concentrated at the lower end of the income distribution, then the TT scenario might be associated with a regressive impact despite progressive personal income taxation.

Figure 3 Distributional impact of the EE and TT scenarios
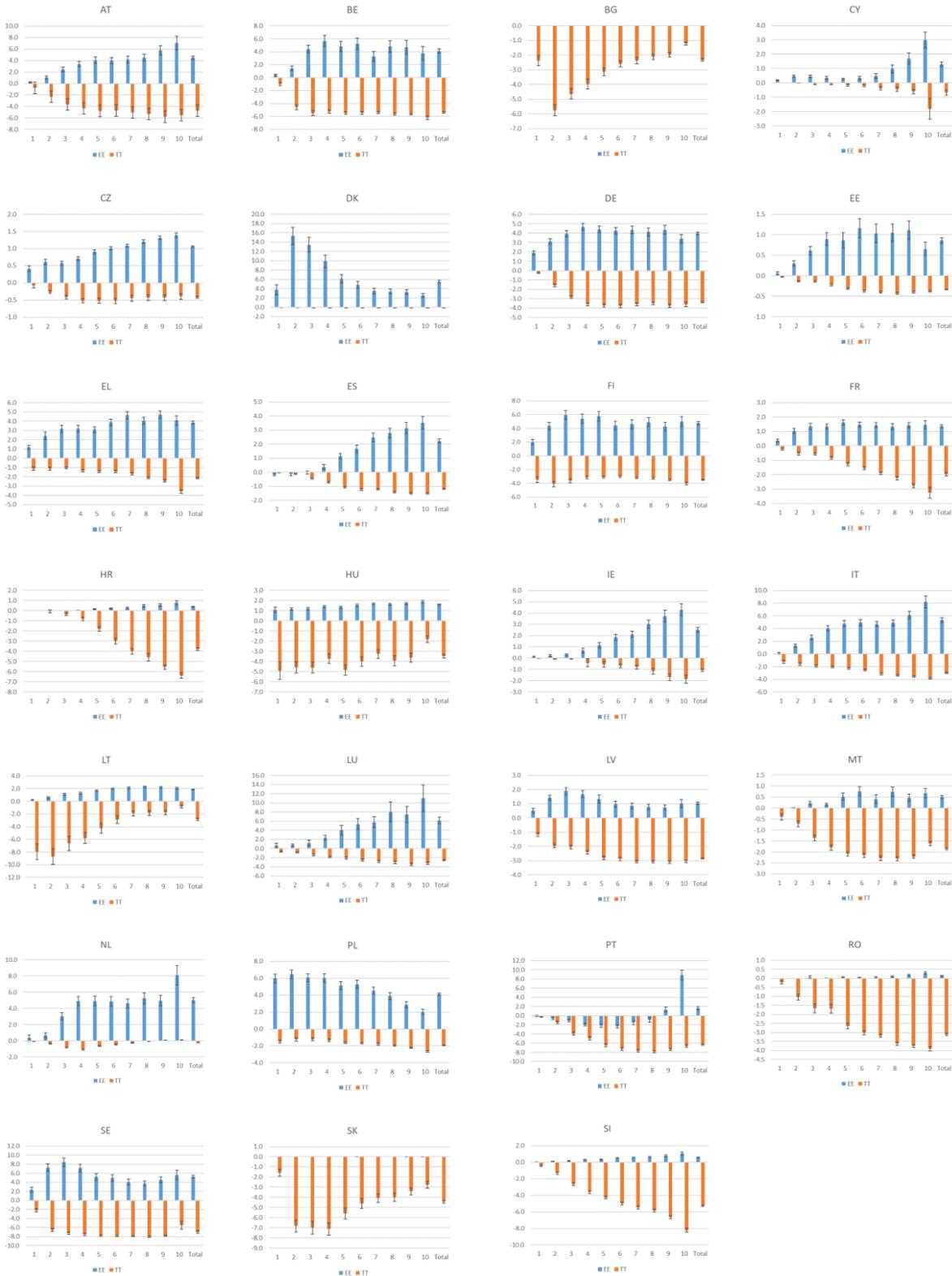
Note: The scaling of y-axis differs across countries. The plot shows the mean annual equivalised disposable income by decile (in % of baseline). 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

4.2.2 Distributional impact by subgroups

This section sheds light on how pension taxation impacts subgroups of the population. More precisely, we compare the simulation results by household types (single pensioner, couple pensioner, working age and multigenerational), gender and skill levels (low, medium and high). Appendix A3 provides the detailed results (Table 2 and Table 3, Figure 11, Figure 12 and Figure 13).

Household type

We classify households as pensioner households according to age: Singles aged 65 years or more are treated as single pensioners, and couples where both partners are elderly above 65 are treated as a couple pensioner household.[16] Whenever, we observe households with adults below 64 years of age, we call them working age. A multigenerational household is composed of pensioners and working age adult members. While pensioner households are generally only affected through changes in the taxation of pension benefits, working age households are exposed to changes in the tax treatment of pension contributions (degree of tax exemption).[17] Multigenerational households are affected by both channels, since they are composed of working age individuals and pensioners. When comparing the simulation results by household types, we rely on the concept of equivalised disposable income.

The EE scenario improves the financial situation of taxpayers in all countries, except in BG and SK, which already run an EE pension tax regime. Furthermore, pensioner households are not affected in HU and LT, because pension benefits are not taxed in the baseline (TE tax group). Here, only working age and multigenerational households experience a small income gain (about +2%). In the vast majority of the remaining countries (pension tax groups ET, ET, Tt or tt), pensioner households are the main winners of under the EE scenario. They benefit more than working age and multigenerational households in 20 (of the remaining 23) countries. The income increase of pensioner households ranges between moderate +0.5% (RO) and large +28% (DK).[18] In contrast, Czech pensioners benefit relatively little because pension benefits up to 36 times the minimum wage per year are exempt from PIT, which effectively exempts a large share of pensioners from taxation. Finally, the impact of the EE scenario is generally low in SI and IE and does not differ significantly across household types.

Second, we shed light on the impact of the TT scenario on household types. In about half of all EU countries (AT, BE, BG, CZ, DE, FI, HU, LT, LV, NL, SE, SI, SK) pensioners are worse off (as a percentage of income) than working age or multigenerational households. The income drop among pensioners ranges between -17% (LT) and -1.2% (NL).

Finally, we breakdown the household type-specific simulation results by pension tax group of each country, which provides interesting insights. Lithuanian and Hungarian pensioners bear the full burden

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[16] If a household consists of more than 2 pensioners – but no working age adult – we still count it as a couple pensioner household. However, this applies to very few cases only.

[17] Strictly speaking this is a fuzzy definition as some people above 65 years might still be working and paying pension contributions while not receiving old-age pension benefits (or working and receiving pension benefits), and people below that age might already be not working and receiving a pension.

[18] One reason why working age taxpayers benefit less from a switch to the EE system is the fact that most countries already (partly) exempt pension contributions (tax regimes: ET, Et, EE, tt). Secondly, individuals generally work more years and pay contributions compared with the length of retirement. This dynamic dimension is not addressed in this static framework.

of the TT scenario as their pension benefits become taxable, while pension contributions are already taxed in the baseline (TE tax group). In contrast, pensioners are hardly affected by the TT scenario if pension benefits are fully taxed (ET pension tax group: EK, EE, EL, HR, PL). In those countries, working age households are worse off. In the remaining countries belonging to other pension tax groups (Et, EE. Tt or tt), the TT scenario can affect pensioner households or working age households more strongly, depending on the specific characteristics of each tax system. In some countries (AT, BE, BG, CZ, FI, LV, SE, SK, SI), pensioner households are worse off than working age or multigenerational households,[19] while in others working households are hit most (ES, EL, IE, EE, IT, LU, MT, PL, RO).[20]

<u>Gender</u>

The gender and skill-level analyses rely on an alternative individual income concept. It rests on the assumption that all household-level benefits are split equally among adult members which are then added to individual disposable income (see methodology section). The underlying sample consists of the adult population.

In the light of progressive PIT systems, men benefit generally more from a switch to the EE scenario than women if the share of pension benefits (and pension contributions) is the same across gender. Because men on average earn more and receive higher pension benefits (in absolute terms) than women, they face a higher tax burden (relative to income).[21] Removing the pension-related tax burden in the EE scenario would therefore benefit men more than women. Figure 12 confirms this expectation: Men benefit statistically significantly more than women in 12 Member States (AT, CY, EL, FI, HR, HU, IE, IT, NL, RO, SE, SI), while women benefit more in only three Member States (DE, DK, PL). In the remaining countries, we do not observe significant differences across gender. Next, we shed more light on the three countries in which women benefit more from a shift to the EE scenario. In DK and PL, the results are fully driven by pensioners since both countries have an ET pension taxation group. In both countries, female pensioners report higher absolute and relative affected pension benefits on average than men do. As a result women are more impacted by the EE scenario than men. For DE, however, we cannot draw firm conclusions since EUROMOD calculates PIT assuming joint taxation in couple households.

Focusing on the TT scenario, men are expected to lose more than women from a shift to the TT scenario analogously to the EE scenario. Indeed, men face an income drop which is statistically significantly larger than for women in 14 Member States (AT, BE, EE, EL, ES, FR, HR, IT, LU, MT, PL, PT, RO, SI), while the opposite is true in DE, HU, LT, NL, SK. In the remaining countries, we do not observe significant differences across gender. In the five countries, where women lose relatively more than men, this is driven by the distribution of affected pension benefits (except in DE, where joint taxation does not allow to draw firm conclusions at the individual level analogous to the EE scenario). In HU, LT and SK,

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[19] For instance, in BE, the fact that both scenarios have a larger impact on pensioners can be explained by the important tax advantages that are given to pensioners, especially to those with low incomes. Also in LV, pensioners are subject to the relatively high tax allowance, so removing it increases the tax burden on pensioner households more than removing the contribution allowance for working age households.

[20] In FR, CY, and PT, there is no significant difference of the impact of the TT scenario across household types. Here the average income loss due to the removal of partial tax exemptions to pension contributions, is not significantly different from the higher average tax burden borne by pensioner households.

[21] The gender pay gap underlying the income differences across gender is discussed for the EU, e.g. in European Commission (2018b).

pension benefits are higher for men, while pension benefits relative to disposable income are higher for women. As a result, women are affected more than men, relative to their disposable income. Dutch men receive higher absolute and relative pension benefits compared to women; however, women are disproportionately burdened by the removal of the old-age tax credit.

<u>Skill level</u>

When dividing the population according to their skill level, we use the same income definition as for the gender breakdown.[22] Figure 13 shows impact of switching to the EE and TT scenario, respectively, by skill level. Analogous to the breakdown by gender, we expect the high-skilled to be affected more than the low-skilled if pension benefits are similarly distributed by skill type.

First, in the EE scenario, the high-skilled gain most compared with the medium- and low-skilled in 10 Member States (AT, CY, CZ, HR, HU, IE, LT, PT, RO, SI), while the low-skilled are the main beneficiaries in seven Member States (DK, EE, EL, FI, FR, PL, SE). In the remaining countries the effect is zero (BG, SK) or not statistically significantly different across skill-levels. In the seven countries, where the low-skilled are the main beneficiaries of the EE scenario, the relevant pension benefits are concentrated at the lower end of the income distribution, as do the low-skilled (Appendix A2). Interestingly, we find very large income increases among the low-skilled in three Scandinavian countries (+8.9% in FI, +12.7% in DK, +10% in SE). Again, these large effects result from a disproportionately high importance of affected pension benefits at low incomes.

Next, focusing on the TT scenario, the high-skilled face larger income losses than the medium- and low-skilled in 13 Member States (AT, BE, EE, EL, ES, FR, HR, IE, IT, LU, LV, RO, SI), while low-skilled suffer most in six Member States (BG, FI, HU, LT, PL, SK). In the remaining countries the effect is not statistically significantly different across skill-levels. The larger income loss faced by the low-skilled (relative to the medium- and high-skilled) is particularly pronounced in HU, LT and SK. Common to all three countries is the tax exemption for pension benefits (tax groups: TE, EE) and a higher (relative) importance of affected pension benefits for the low-skilled than for the medium- and high-skilled.

4.3 Equity results

This section shows the impact of the EE and TT scenarios on inequality and poverty. We use the Gini coefficient and, the quintile share (S80/S20) ratio for illustrating inequality, and the at-risk-of-poverty rate for poverty. All these measures are calculated using the standard equivalised disposable income concept. It is important to note that the impact on inequality and especially poverty should be interpreted with extreme caution since the interaction of different tax-benefit components, more importantly with means-tested benefits, is limited for some countries as gross incomes are used to define the eligibility for those benefits (e.g., BG, CY, DK, ES, FI, LU, MT, SE and PT).[23] Means-tested benefits for ES are not simulated and are taken directly from the data. Therefore, the impact of the

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[22] When splitting individual results by skill level, we rely on individual education level as a proxy: individuals with tertiary education are assigned to the high-skill level; upper-secondary and post-secondary to the medium-skill level; and lower-secondary, primary or not completed primary to the low-skill level.

[23] Please consult the point b of the limitations in the methodology section.

change in the poverty level for these countries is expected to be overestimated in the TT scenario and underestimated in the EE scenario.

4.3.1 Impact on inequality

Figure 4 depicts the change in the Gini coefficient of equivalised disposable income for both scenarios for all countries. In the presence of a progressive PIT, the removal of taxation on pension benefits or/and the introduction of a deduction for pension contributions (EE scenario) are expected to increase income inequality. Higher marginal tax rates are paid by higher earners, so if pension benefits go untaxed and pension contributions made exempted from PIT, they profit from the changes more than people with low incomes. As seen in the previous section, in most countries the upper tail of the income distribution benefitted more than the lower one from the EE reform, therefore the Gini coefficient has increased. The biggest increase in inequality can be observed in LU and PT[24] followed by NL, IT and AT. For other countries (e.g., IE, ES), for which the pattern of the changes in the equivalised disposable income (Figure 3) is similar to the previously mentioned countries, the smaller percentage changes in incomes lead to a lower increase in the Gini coefficient. The exceptions are DK and to a lesser extent PL, for which the Gini coefficients decrease. As noticed earlier, in both countries, affected pension benefits are concentrated at the lower part of in the income distribution, especially in DK (see Appendix A2). Therefore, despite progressive personal income taxation, poorer taxpayers benefit more since their taxable income shrinks relatively more in the EE scenario compared to richer taxpayers (Figure 3 of the previous section). In DK and PL only the taxation on pension benefits was removed but no changes to the tax treatment of the social contributions were made as these are already PIT exempt. The changes in the Gini coefficient are not statistically significant for FI and SE.

We observe the opposite for the TT scenario. Increasing (or introducing) the taxation of pension benefits or/and removing the existing tax deduction on pension contributions would lead to higher taxation for all, but more so for higher income deciles. This in turn translates to the decreased Gini coefficient for most countries. The exception is BG, HU, LT, SK and to a lesser extent in NL. For the first four mentioned countries, the main pension benefits which are mostly concentrated at the lower tail of income distribution[25] are not taxed in the baseline scenario.[26] This particularly benefits people from lower deciles as they rely to a greater extent on pension income than the rich. The introduction of a PIT that is not (very) progressive on the main pension benefits leads to a higher relative income loss at the lower end of income distribution. Thus, the impact is regressive and hence the Gini coefficient increases. For NL the old-age credit was removed and changes in the other tax credits were made, which mainly affected people from the 2nd through 5th income deciles; therefore, the Gini coefficient slightly increased.

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[24] In PT only the tenth decile is gaining form the reform, while the other deciles are losing (Figure 3). This is the result of the complex component interaction of different tax components that was explained in the distributional results section. In addition, please note that in PT and also in LU, full interaction with the means-tested benefits cannot be captured, so the increase in inequality is expected to be lower.

[25] Except HU where pension payments are distributed more equality across deciles (see Appendix A2).

[26] In the baseline pension contributions are PIT exempt only in BG and SK.

Figure 4 Inequality impact – the Gini coefficient change – of the EE and TT scenarios
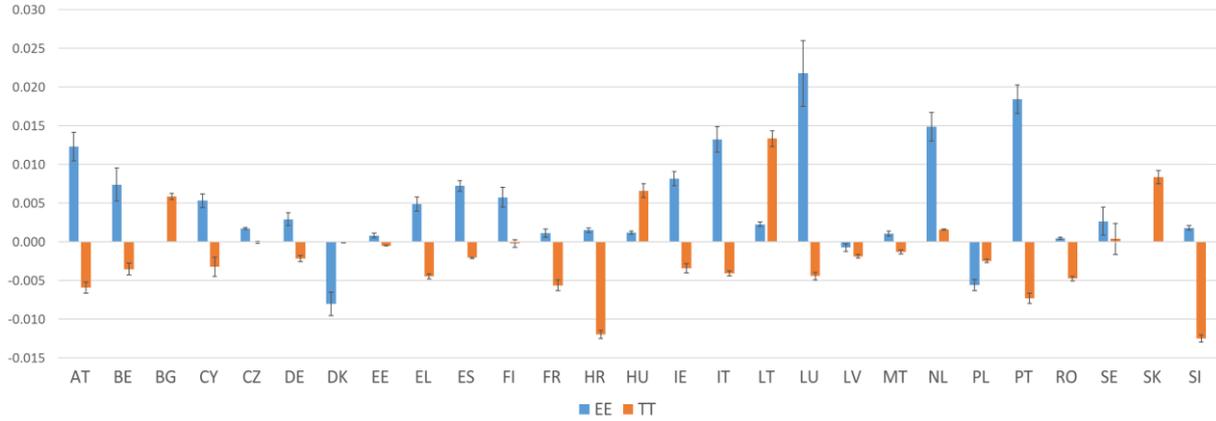
Note: 95% confidence intervals are provided. The change in the Gini coefficient of equivalised disposable income is expressed in absolute values (or Gini points), i.e. 0.005 indicates an increase of the Gini coefficient by 0.005.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

The Gini indicator is the most common measure of income inequality; however, a single indicator cannot capture all aspects of income inequality. The traditional Gini coefficient is known to be most sensitive to inequalities in middle part of the income distribution and less sensitive to the small income changes at the tails (Ryu H.K., 2013, Ellison G. T., 2002).[27] In addition, rather similar values of the Gini coefficient might be the result of quite different income distribution patters. To better capture the inequality changes at the top and the bottom of income distribution, the quintile share ratio S80/S20 might be a better measure. This measure calculates the ratio over the share of total equivalised disposable income earned by the top 20% relative to the share earned by the bottom quintile (20%).[28]

The percentage changes of the S80/S20 ratio under each scenario (Figure 5) show a very similar picture as the Gini coefficient. The direction of the change is the same for all countries with the exception of SE. Under the EE scenario the quintiles share ratio is not changed while the Gini coefficient is slightly increased. This means that the changes were affecting the middle of the income distribution rather than the tails. The result is in line with the distributional changes seen in the Figure 3. For the TT scenario, we calculate a small 2% decrease of the quintile share ratio, but no statistically significant changes in the Gini coefficient for SE. This is the result of the top two deciles losing slightly more than the first two deciles and rather uniform changes in the middle of the income distribution. For other countries the conclusion drawn on the changes in income inequality could be only reinforced. Under the EE scenario, the S80/S20 indicator clearly shows that the lowest quintile, where affected pension benefits are concentrated, gained more than the top one in DK and PL. Under the TT scenario the quintile ratio increases for the same four countries – BG, HU, LT, SK and slightly for NL – but LT stands out more than before, with the indication to the substantial loses in the lowest quintile.

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[27] However this was recently challenged by Gastwirth J.L. (2017). His results indicate that the Gini coefficient is not overly sensitive to changes in the middle of the distribution. On the contrary, it is more sensitive to changes in the both distribution tails than in the middle part.
[28] This share is equal to 1 under a perfectly equal income distribution.

Figure 5 Inequality impact – the S80/S20 ratio change – of the EE and TT scenarios (in % of the baseline)
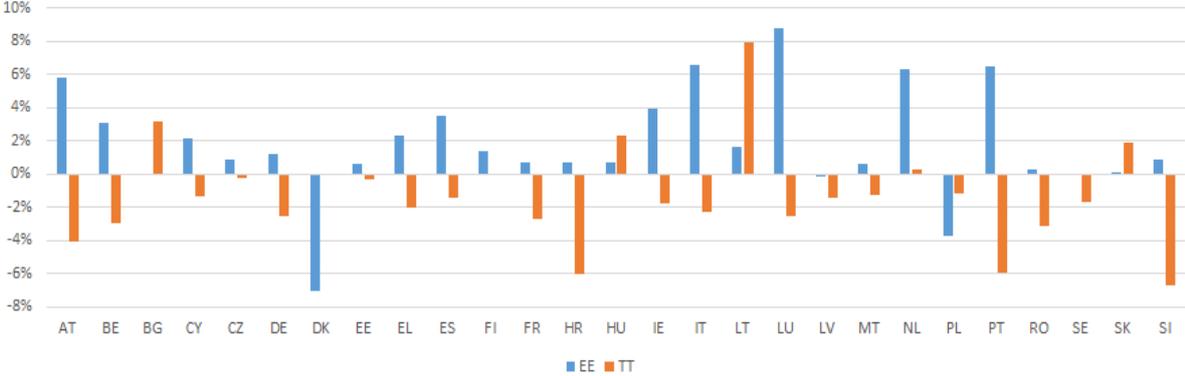
Note: The plot shows the change in the quintile share (S80/S20) ratio in % of the 2019 baseline.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

In addition to the change to the quintile share ratio for total population we calculate the ratios among those below the age of 65 and above this age threshold. Figure 6 shows how the EE scenario affects inequality, measured by S80/S20, over age and tax groups. A majority of countries is placed in the upper right rectangle, which indicates that moving to the EE scenario increases inequality both for the working age population and for the elderly. The impact is particularly strong for LU as pensions are concentrated in the middle-top deciles (see Figure 10), and the top PIT rate is also very high. The impact for working age individuals is also driven by the inclusion of early retirement pensions and a cut-off 65 years point,[29] in addition to the change in pension contribution taxation. Most of the countries on the right (LU, NL, BE, AT and PT), implying higher inequality among the elderly, have very high – 50% or above – top PIT rates, which makes the tax structures very progressive. Therefore, removing taxation on pensions, benefits top incomes more than the lower ones and increases the quintile share ratio.

On the other side – the lower left rectangle – only DK and PL are placed. In both countries only the taxation on pension benefits was removed but no changes to the tax treatment of the social contributions were made as these were already PIT exempt. In DK, lower inequality among those aged 65 when switching to the EE scenario results from the fact that public pensions are more important at lower incomes (2-3 deciles) in relative and absolute terms. Accordingly, richer pensioners benefit less under the EE scenario than those with lower incomes as they rely more on private pensions and other incomes, which continue to be taxed under the EE scenario. For PL, the EE scenario reduces inequality slightly for both age groups. On the one hand, affected pension benefits are concentrated at the lower part (1-4 deciles) of the income distribution, while, on the other hand, the cut-off point of 65 years and the removal of taxation also on the early retirement pensions drive the effect on the working age group. Therefore, despite progressive personal income taxation, poorer taxpayers benefit more since their taxable income shrinks relatively more in the EE scenario compared to richer taxpayers.

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[29] In reality people would receive pensions even before the age of 65, but due this cut-off some pensioners are treated as working-age individuals in our analysis.

Figure 6 Inequality impact – the S80/S20 ratio change by age group – EE scenario (in % of the baseline)
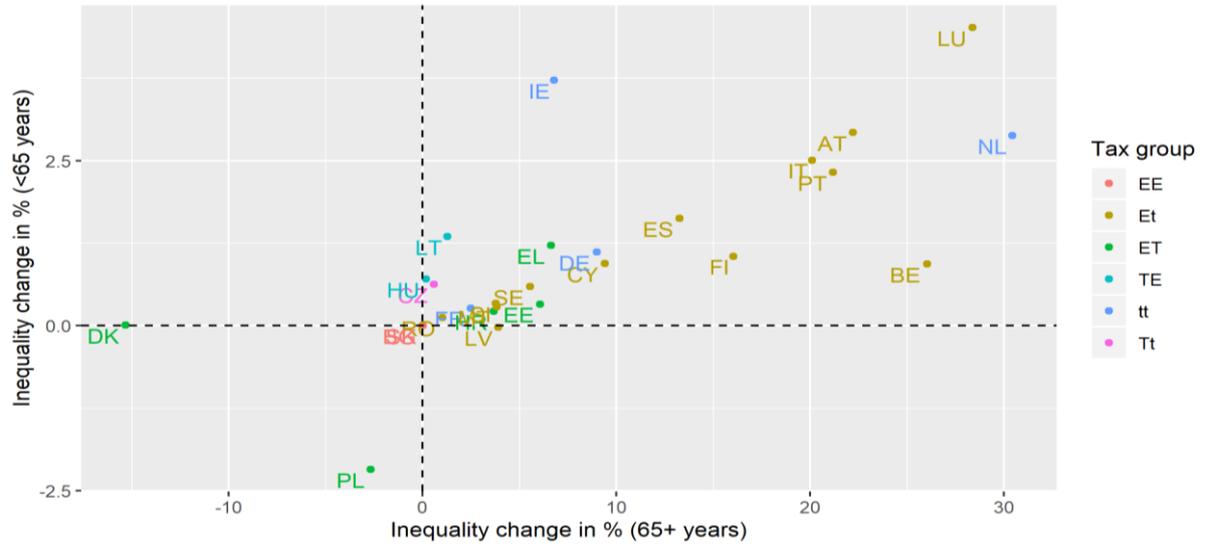
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

In contrast to the EE scenario, the picture for the TT scenario is more varied (Figure 7). The upper right rectangle locates countries which do not tax pension benefits (TE and EE tax groups). Hungarian pension benefits are rather equally distributed across the deciles, while for SK and BG they are concentrated in the second and third and in LT in the first-third deciles. Coupled with the PIT structures that are not very progressive in those countries, we see an inequality increase for both age groups. The impact is particularly strong for LT elderly, as the lowest quintile bear substantial income losses. The inequality increases for people aged below 65 years in HU and LT (ET tax groups) due to the cut-off point and the new taxation of the early retirement pension in LT.

The lower right corner shows countries with higher inequality among the elderly, but lower among working age people. In this group, FI stands out as a country with the highest inequality increase among the elderly. Firstly, pension benefits are concentrated in the second and third deciles, and secondly, the simulations removed the national and regional pension income allowances, which targeted the bottom of the income distribution, while being phased out with increased pension benefits.

Finally, the majority of countries are concentrated in the lower left square, which indicates that the TT scenario reduces inequality among both age groups, which is expected in progressive tax systems. The effect is the strongest among SI elderly. Similarly to FI, the reform removes the tax credit for pensioners, but differently; the tax credit in SI is proportional to pension income. Working age people lost out due to the abolished tax exemption of pension contributions from PIT.

Figure 7 Inequality impact – the S80/S20 ratio change by age group – TT scenario (in % of the baseline)
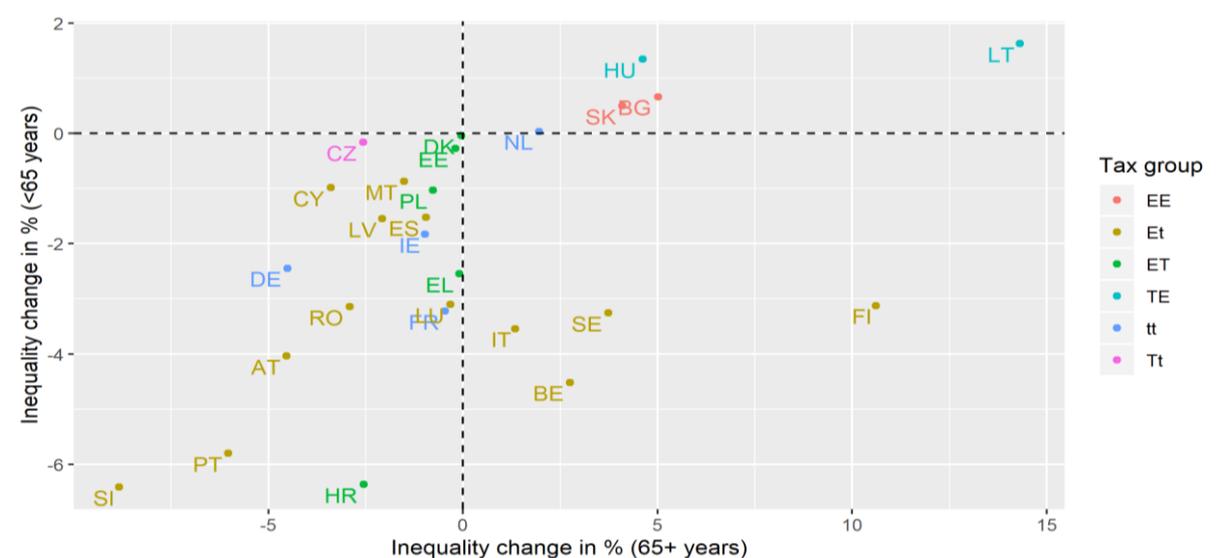
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

The inequality impact of the TT scenario differs significantly across countries, even within the same tax group. As mentioned before, whether a scenario increases or decreases inequality and by how much depends on the interplay of several factors: the relative importance of pension benefits across the income distribution, PIT structure, and also on how pension contributions are shared between the employee and employer. For instance, within the ET tax group (in green), DK pensions are tax-financed and EE employers are obliged to pay all pension contributions for their employees, which explains why we do not see an effect among the working-age population. In PL pension contributions are equally shared, while an EL employer pays more than an employee. In HR, however, pension contributions are fully borne by employees, thus the larger inequality drop for people below 65 years.

4.3.2 Impact on poverty

Figure 8 shows the impact on poverty. In general, the EE scenario reduces the at-risk-of-poverty indicator, while the TT increases it. The results are intuitive, as we do not simulate budget-neutral reforms where the fiscal net effect is zero (with additional compensatory measures), but use two hypothetical scenarios. Under the EE scenario, with no taxation on pension benefits and the exemption of pension contributions from PIT, the reduction in the poverty rate is up to 1 p.p. for most countries and almost 2 p.p. in PL and SE. For example, in PL, the equivalised disposable income increase by around 6% for the first two deciles, which is much more than in other countries. In turn, the decrease in the at-risk-of-poverty rate is also more pronounced. The exception from the general trend is PT for which the poverty rate slightly increases (0.3 p.p.). This result is expected, as in the EE scenario only the top decile benefits from the reform and all other deciles, including the lowest, lose (Figure 2). This happens due to the changes in tax allowances and corresponding interactions in the overall tax-benefit system, as addressed in the distributional results section.

Introducing or increasing taxation of pension benefits, removing/changing tax allowances or credits for pension income (or age specific deductions) and not allowing for pension contribution deductions (TT scenario), would increase the at-risk-of-poverty rate in all countries. In Sweden, we observe the

biggest increase (4 p.p.), where the additional basic allowance for pensioners and the tax credit for employee pension contributions are removed. For LT and SK, the increase of 3.5 p.p. is due to the taxation of rather low previously not taxed old-age, survivor's and early retirement pension benefits.

Figure 8 Poverty change of the EE and TT scenarios (in p.p.)
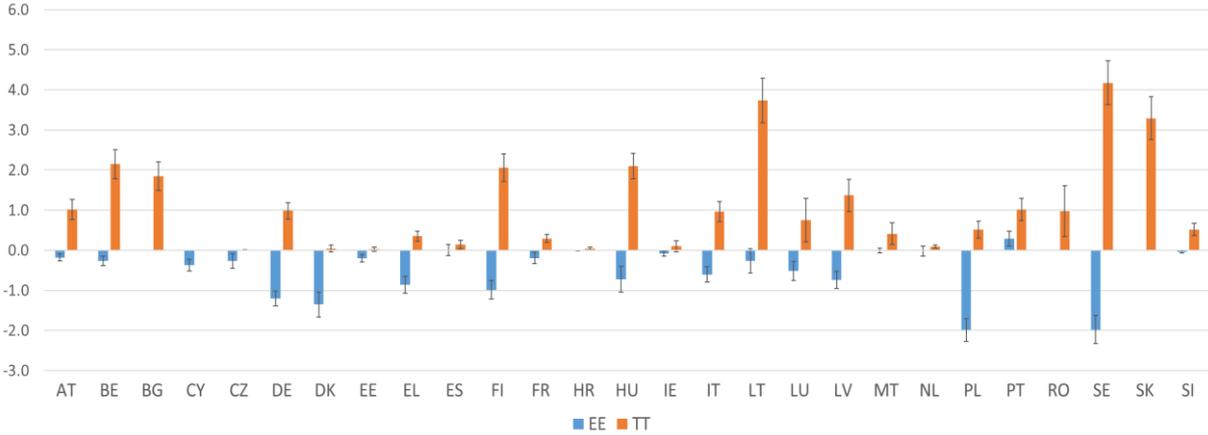
Note: The change in the at-risk-of-poverty rate for the total population. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

The overall changes in poverty level might hide important variations for the different household types (Figure 14, Figure 15). In a majority of countries, pensioner households are affected most. For a few countries for which we observe statistically significant differences between the household types, both EE and TT scenarios have the bigger impact on single pensioners. For instance, under the EE scenario, the at-risk-of-poverty level for single pensioners decreased by more than 16 p.p. in SE, 14 p.p. in PL, and 10-11 p.p. in FI and DK. For LU, the change is much higher for couple pensioner households. Under the TT scenario, the biggest increase of almost 30 p.p. is for couple pensioner households in LT. The poverty for single pensioners increases the most in SK and SE (by 26-28 p.p.), also in BE and HU (by 20 and 16 p.p. respectively).[30]

In line with the above and for comparability reasons, the breakdown of the at-risk-of-poverty rate by gender and by skill-types is also done by relying on the equivalised disposable income concept.[31] In most countries there are no statistically significant differences between genders (Figure 18). In the countries where we observe a statistically significant difference of the reform effects, women are affected more: in FI and PL in the EE scenario and in BE, HU, SE and SK in the TT scenario. The change in the at-risk-of-poverty rate by skill-type breakdown does not have a clear pattern for most countries in the EE scenario (Figure 16). Only Scandinavian countries and CY show a clearer link between the skill level and poverty reduction (the highest reduction in poverty is for the lowest skill-type, while for the highest skill-type the change is rather minor). Under the TT scenario, the increase in poverty is mainly borne by the households with lowest skill-type (Figure 17). The highest increase is for SE (almost 6 p.p.). Please note that this result is most likely overestimated. Gross incomes, which do not change in the reform scenario, are used for the entitlement to the pensioner housing allowance; therefore, we

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[30] The share of single women among single pensioner households is on average 70%: varying from 63-64% in DE, DK, IE, LU, MT to 79-80% in CY, EE, LV, PT, which partly reflects the longer life expectancy of women.
[31] More on that is provided in the methodology section.

do not observe any changes. In reality, the incomes used for the means-test for the housing allowance, are expected to be adjusted as net pension benefits decrease.

5   Conclusions

This paper sheds light on the different old-age pension taxation groups in the EU and its budgetary and distributional impact using EUROMOD, the microsimulation model of the EU. To quantify the budgetary and distributional tax implication of pensions, we compare the current rules (baseline) to two hypothetical tax systems: The first scenario (EE) exempts old-age pension benefits from taxation and fully deducts pension contributions from the personal income tax base. In contrast, the double taxation scenario (TT) fully taxes pension benefits, while not allowing for any tax deduction of the corresponding contributions.

Switching to the EE scenario is associated with a fiscal burden of about 0.8% of GDP whereas the TT scenario would lead to a fiscal plus of 1.2% of GDP. This is not surprising as most EU countries tax pensions in some way or another – except several Central Eastern European countries – while providing tax deductions for pension contributions. The budgetary results also show a large variation within and across the same pension taxation group. As a result, being in a particular tax group turns out to be a poor predictor of both the fiscal and equity impact of old-age pension taxation.

We find that the EE scenario has a regressive (progressive) impact in 13 (4) out of 27 Member States, which partly reflects that pensions are currently progressively taxed in many countries. In contrast, switching to the TT scenario has a progressive (regressive) impact in 18 (4) of 27 Member States. We do not observe a clear redistributive pattern for the remaining countries. Interestingly, we do not always find that the TT scenario leads to a progressive outcome, even if a country has a progressive personal income tax scheme. In some cases, income poor households are affected more strongly because they depend to a larger extent on public pension benefits than richer households.

In particular pensioner households are the main beneficiaries in the EE scenario in many countries, as their income consists mainly out of old-age pensions. In contrast, under the TT scenario pensioner households are the main losers in about half of the countries. The heterogeneous effects show no clear pattern depending on the individual skill level. While the high-skilled are most affected by pension taxation in some countries, there are others where the low-skilled face very large changes in disposable income. This is particularly true, when old-age pensions are targeted at lower incomes, for instance in Denmark.

For a majority of countries, switching to the EE scenario increases income inequality, but decreases the at-risk-of-poverty rate by design of the reform. The opposite is true for the TT scenario. In the presence of a progressive PIT, poverty increases in all and inequality decreases in most countries, except in nine. In four countries inequality increases for both the working age population and the elderly. In the other five countries inequality increases only for the elderly. The direction and the magnitude of the change very much depends on the initial distribution of pension benefits, existing taxation of pensions and tax deduction of pension contributions, household composition, etc.

The breakdown of the at-risk-of-poverty rate by different household types signals that for a few countries the most affected are single pensioner households, while for most countries the differences between the household types are not statistically significant. Similarly the breakdown of the change in

the at-risk-of-poverty rate by gender and skill-type shows a not so clear picture. For the countries for which the observed differences are statically significant, women and the low-skilled are slightly more affected by the hypothetical reforms than other groups.

From a political perspective pension taxation is becoming increasingly important. In the light of aging societies in most Member States, pension payments account for a large and growing share of public budgets, suggesting taxation of pensions as a means for fiscal stability. According to EUROSTAT the old-age dependency ratio, calculated as the share of persons of 65 years or more over the remaining population above 15 years, is expected to increase from 32% in 2020 to 52% in 2050. For Italy and Portugal, the old-age-dependency ratio is even expected to surpass the 60% threshold.[32]

To conclude, EU Member States tax pension benefits and contributions in many different ways. Most countries exempt pension contributions from taxation, at least partially, while taxing pension benefits in some way. However, even among countries within the same pension taxation group, there are large differences regarding the implied budgetary and redistributive effects. While we simulate the static overnight implications of pension taxation, there is room for further research. In particular, future research should shed more light on the dynamic effects of pension taxation using longitudinal data. One could estimate the redistributive life-time effect of taxing pension contributions and benefits, for instance taking into account individual differences in employment biographies or life expectancy. Another research avenue is to investigate how pension taxation affects individual decisions regarding savings, labour supply, and retirement over the life-course.

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Appendix

A1 Progressivity (Kakwani index)

Figure 9 Kakwani index across the EU in the baseline
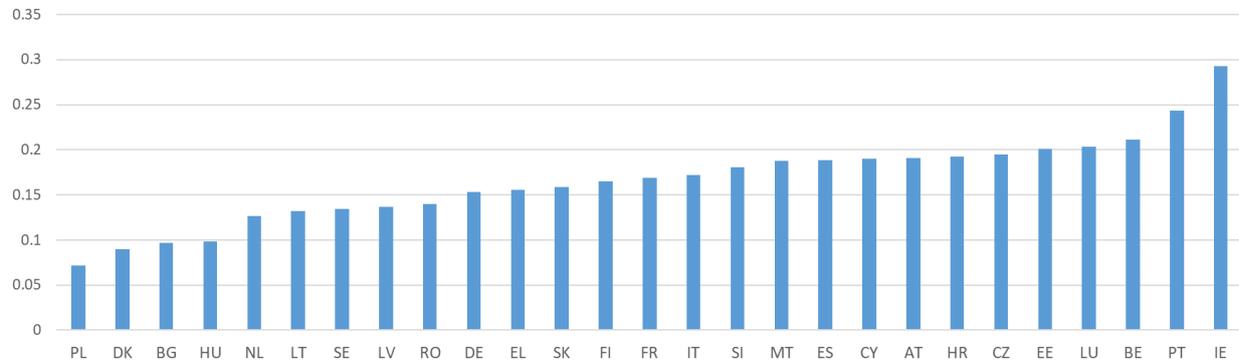
Note: Theoretically the Kakwani index can vary between −1 to 1. The larger the index is, the more progressive is the tax-benefit system.

Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

A2 Decomposition of the equivalised disposable income

Figure 10 Decomposition of the equivalised disposable income across the EU in the baseline

FI

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

FR

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

HR

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

HU

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

IE

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

IT

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

LT

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

LU

200%
150%
100%
50%
0%
-50%
-100%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

LV

150%
100%
50%
0%
-50%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

MT

150%
100%
50%
0%
-50%

1 2 3 4 5 6 7 8 9 10 Total

■ Original income ■ Taxes ■ SIC ■ Pensions ■ Other benefits ■ Means-tested benefits

Note: The scaling of the y-axis differs across countries. Pension category includes all public pension benefits (not only old-age and survivors, but also other pensions, such as disability or orphan).
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

A3 Subgroup analysis (Impact on disposable income)

Figure 11 Income effects of the EE and TT scenarios, by household type (in % of the baseline)

a) EE scenario
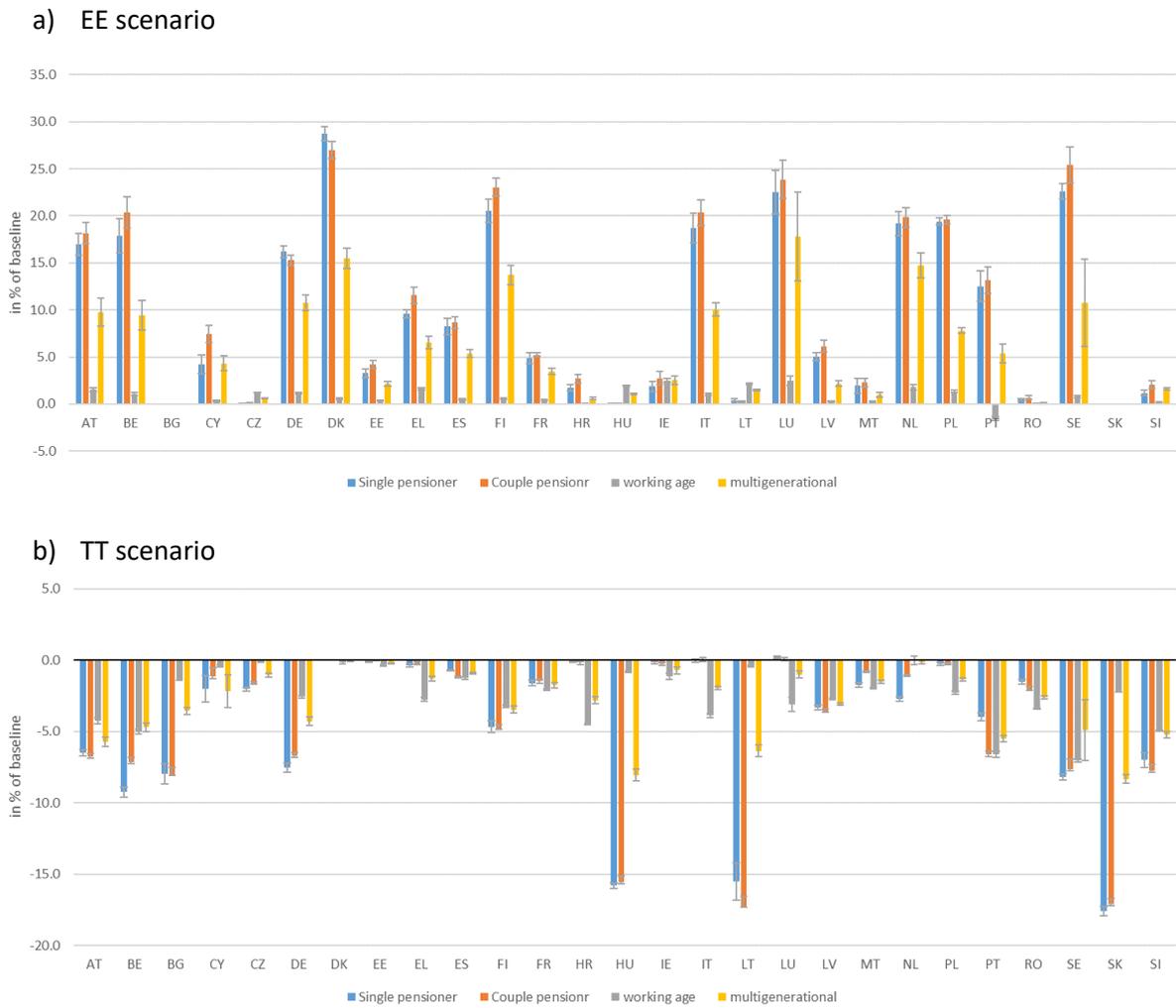
b) TT scenario

Note: Change in mean equivalised disposable income. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 12 Income effect of the EE and TT scenarios, by gender (in % of the baseline)
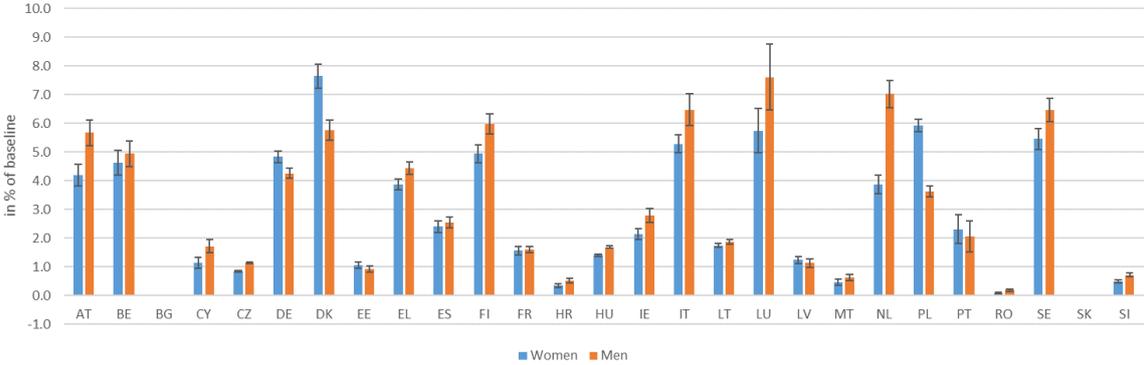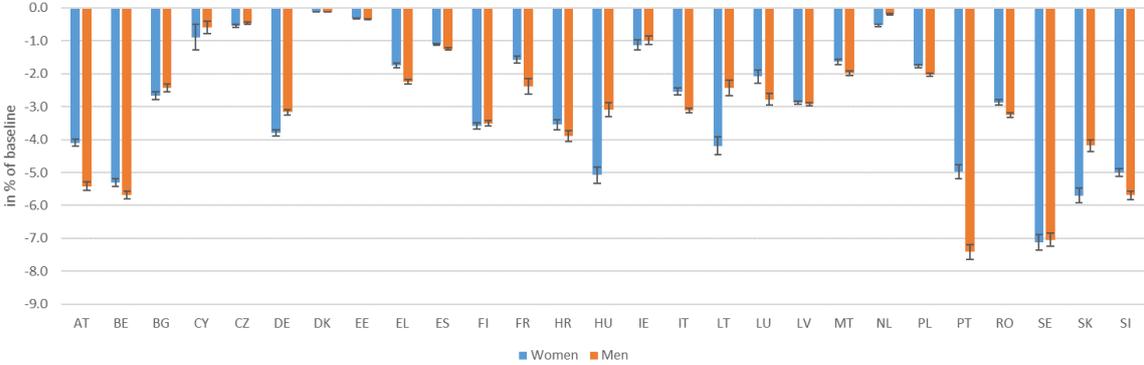
a) EE scenario

b) TT scenario

Note: Based on adjusted individual disposable income. We assume that all household-level benefits (e.g. social assistance or housing benefits) are equally shared among adult household members. Hence, we calculate adjusted individual disposable income by adding the household benefit share to individual disposable income. The underlying sample consists of the adult population. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 13 Income effect of the EE and TT scenarios, by skill type (in % of the baseline)
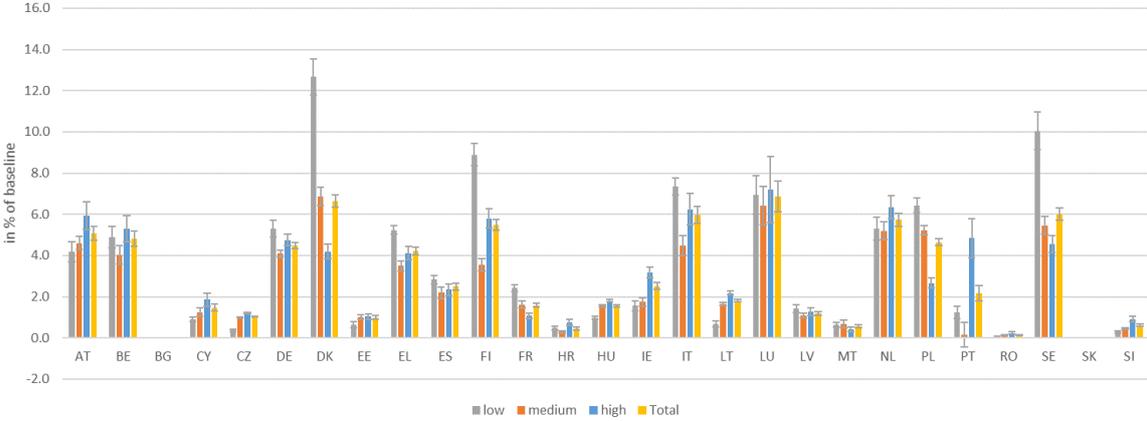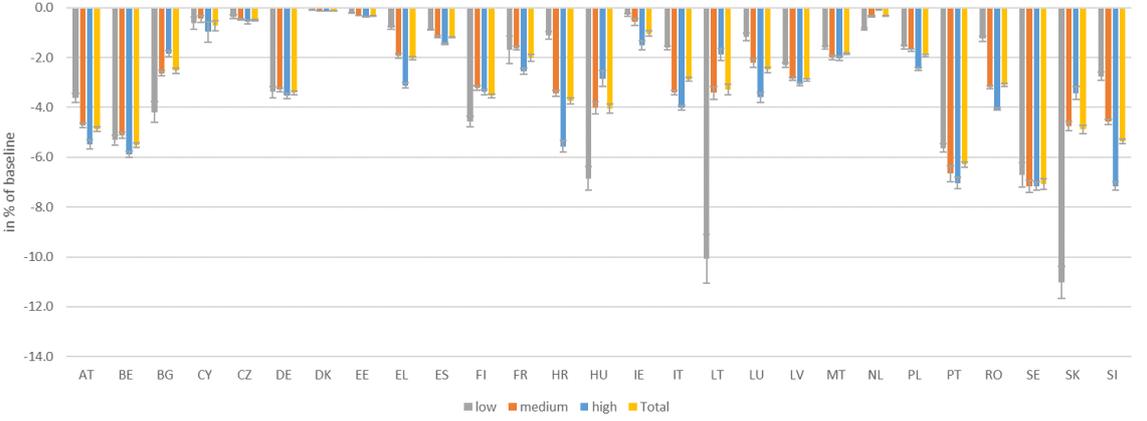
a) EE scenario

b) TT scenario

Note: Based on adjusted individual disposable income. We assume that all household-level benefits (e.g. social assistance or housing benefits) are equally shared among adult household members. Hence, we calculate adjusted individual disposable income by adding the household benefit share to individual disposable income. The underlying sample consists of the adult population. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Table 2 Income effect of the EE scenario (in % of the baseline)

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SK	SI
Gender																											
Women	4.2	4.6	0.0	1.1	0.9	4.8	7.6	1.1	3.9	2.4	4.9	1.6	0.4	1.4	2.1	5.3	1.7	5.7	1.2	0.5	3.9	5.9	2.3	0.1	5.5	0.0	0.5
Men	5.7	4.9	0.0	1.7	1.1	4.3	5.8	0.9	4.4	2.5	6.0	1.6	0.5	1.7	2.8	6.5	1.9	7.6	1.1	0.6	7.0	3.6	2.1	0.2	6.5	0.0	0.7
Skill level																											
low	4.2	4.9	0.0	0.9	0.4	5.3	12.7	0.7	5.2	2.8	8.9	2.4	0.5	1.0	1.6	7.4	0.7	6.9	1.4	0.6	5.3	6.4	1.2	0.1	10.0	0.0	0.3
medium	4.6	4.0	0.0	1.2	1.0	4.1	6.9	1.0	3.5	2.2	3.5	1.6	0.3	1.6	1.7	4.5	1.6	6.4	1.1	0.7	5.2	5.2	0.2	0.1	5.5	0.0	0.5
high	5.9	5.3	0.0	1.9	1.2	4.8	4.2	1.0	4.1	2.3	5.8	1.1	0.7	1.8	3.2	6.2	2.2	7.2	1.3	0.4	6.3	2.7	4.8	0.2	4.5	0.0	0.9
Total	5.1	4.8	0.0	1.5	1.0	4.5	6.6	1.0	4.2	2.5	5.5	1.6	0.5	1.6	2.5	6.0	1.8	6.9	1.2	0.6	5.7	4.6	2.2	0.1	6.0	0.0	0.6

Note: Based on adjusted individual disposable income. We assume that all household-level benefits (e.g. social assistance or housing benefits) are equally shared among adult household members. Hence, we calculate adjusted individual disposable income by adding the household benefit share to individual disposable income. The underlying sample consists of the adult population. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Table 3 Income effect of the TT scenario (in % of the baseline)

	AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SK	SI
Gender																											
Women	-4.1	-5.3	-2.7	-0.9	-0.5	-3.8	-0.1	-0.3	-1.7	-1.1	-3.6	-1.6	-3.5	-5.1	-1.1	-2.5	-4.2	-2.1	-2.9	-1.6	-0.5	-1.8	-5.0	-2.9	-7.1	-5.7	-5.0
Men	-5.4	-5.7	-2.4	-0.6	-0.5	-3.2	-0.1	-0.4	-2.2	-1.2	-3.5	-2.4	-3.9	-3.1	-1.0	-3.1	-2.4	-2.8	-2.9	-2.0	-0.2	-2.0	-7.4	-3.3	-7.0	-4.2	-5.7
Skill level																											
low	-3.6	-5.3	-4.2	-0.6	-0.4	-3.4	-0.1	-0.2	-0.8	-0.9	-4.6	-1.7	-1.1	-6.8	-0.3	-1.6	-10.1	-1.2	-2.3	-1.6	-0.9	-1.6	-5.6	-1.2	-6.7	-11.0	-2.8
medium	-4.7	-5.1	-2.6	-0.5	-0.5	-3.3	-0.1	-0.3	-1.9	-1.2	-3.2	-1.6	-3.4	-4.0	-0.6	-3.4	-3.4	-2.2	-2.9	-2.0	-0.3	-1.7	-6.7	-3.2	-7.2	-4.8	-4.6
high	-5.5	-5.9	-1.8	-1.0	-0.6	-3.5	-0.1	-0.4	-3.1	-1.4	-3.4	-2.6	-5.6	-2.8	-1.5	-4.0	-1.9	-3.6	-3.1	-2.0	-0.1	-2.4	-7.0	-4.1	-7.2	-3.4	-7.2
Total	-4.9	-5.5	-2.5	-0.7	-0.5	-3.4	-0.1	-0.3	-2.0	-1.2	-3.5	-2.0	-3.7	-4.0	-1.0	-2.9	-3.3	-2.5	-2.9	-1.9	-0.3	-1.9	-6.3	-3.1	-7.1	-4.9	-5.4

Note: Based on adjusted individual disposable income. Based on adjusted individual disposable income. We assume that all household-level benefits (e.g. social assistance or housing benefits) are equally shared among adult household members. Hence, we calculate adjusted individual disposable income by adding the household benefit share to individual disposable income. The underlying sample consists of the adult population. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

A4 Subgroup analysis (Poverty)

Figure 14 Poverty change for the EE scenario, by household type (in p.p.)
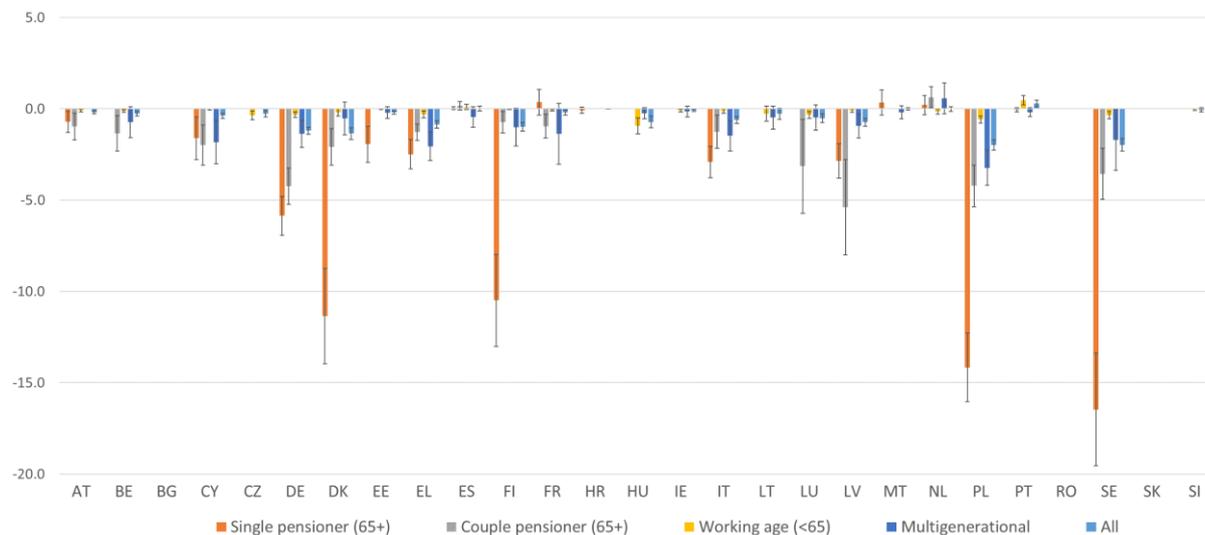
Note: the change in the at-risk-of-poverty rate. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 15 Poverty change for the TT scenario, by household type (in p.p.)
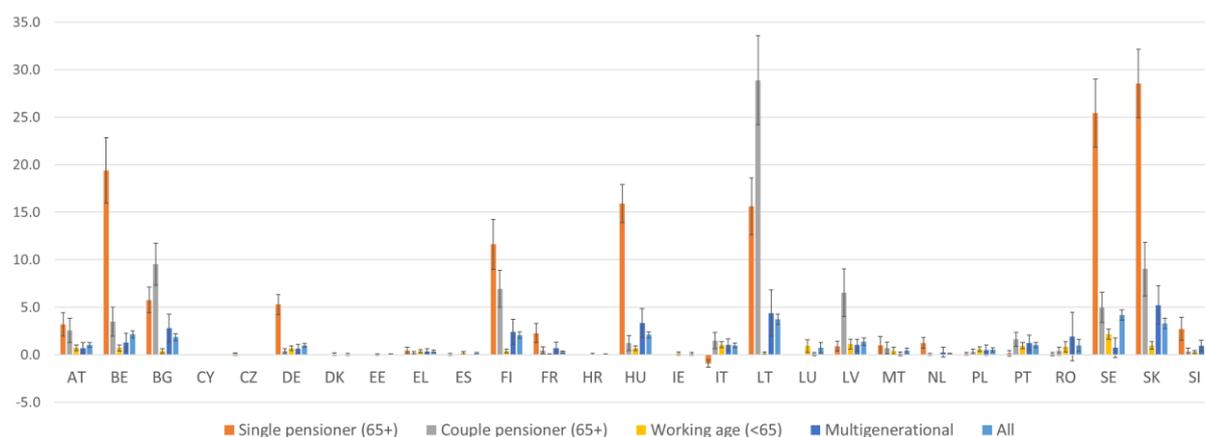
Note: the change in the at-risk-of-poverty rate. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 16 Poverty change for the EE scenario, by skill type (in p.p.)
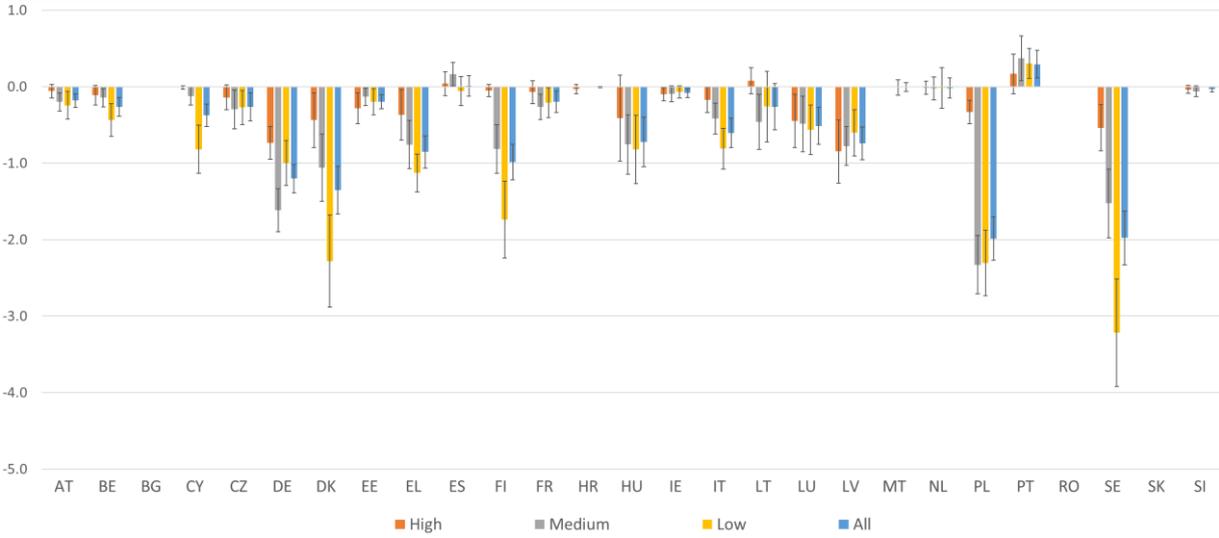
Note: the change in the at-risk-of-poverty rate. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 17 Poverty change for the TT scenario, by skill type (in p.p.)
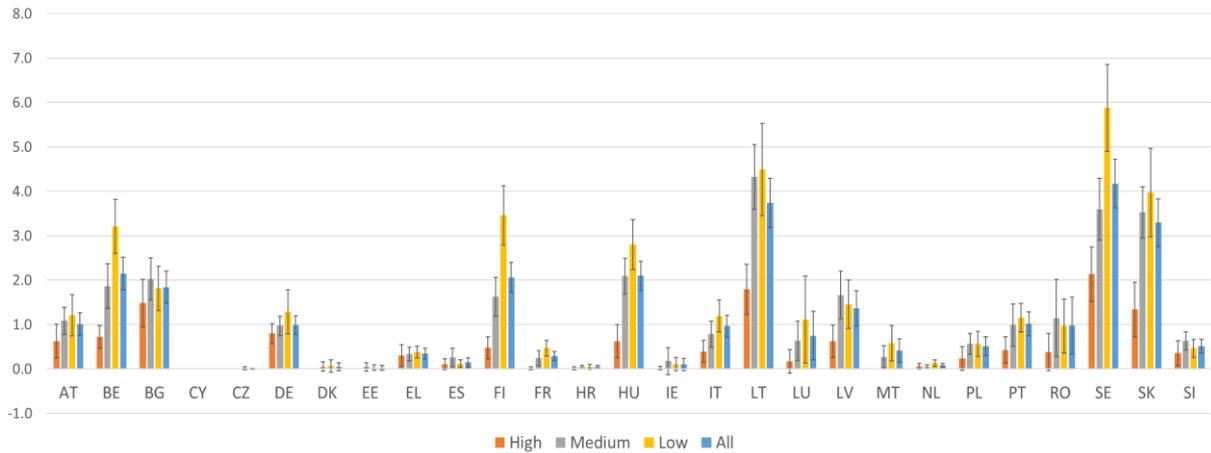
Note: the change in the at-risk-of-poverty rate. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

Figure 18 Poverty change for the EE and TT scenarios, by gender (in p.p.)
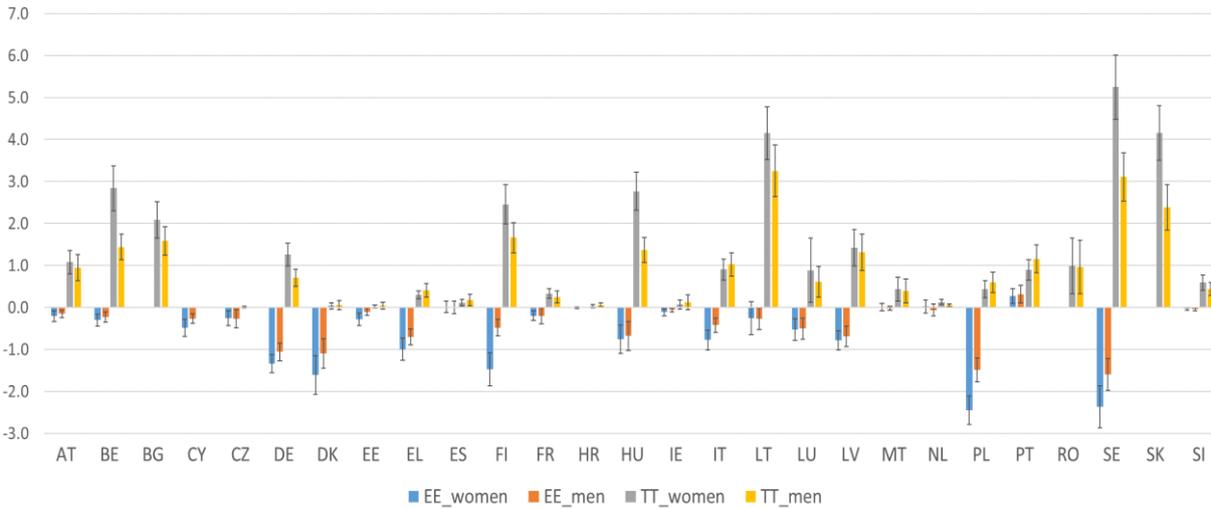
Note: the change in the at-risk-of-poverty rate. The difference is provided in percentage points. 95% confidence intervals are provided.
Source: European Commission, Joint Research Centre (B2), based on the EUROMOD model.

A5 Overview of implemented changes by scenario

Table 4 Overview of implemented changes under different scenarios

MS	Var	Description	Baseline	EE	TT	PEE	PTT	Comments
AT	tscsepi_s, tscseot_s	Old-age pension contribution (self-employed)	d		x			
	tsceepi01_s, tsceepi02_s	Old-age pension contribution (employee)	d		x			
	tintaxp_s	Tax allowance for exceptional deductions (Sonderausgabenpauschale)	d		x			
	tintcpe_s	Tax allowance for pensioners (Pensionistenabsetzbetrag)	d	x	x			Set to zero under TT (also under EE to avoid a double relief)
	poa00	Old-age pension (Alterspension, Vorzeitige Alterspension, Invaliditaets/Berufsunfaehigkeitspension - PV)	t	x				
	psu	Survivor pensions (Hinterbliebenen/Waisenpension - PV)	t	x				
	poacs	Old-age pension for civil servants (Ruhegenuss - PG)	t	x				
	pxp00, pxpot	Extra pensions (13th & 14th pension payment)	t					The 13th and 14th pension are taxed separately in Austria. Pxpot is zero in the data.
	pmmtu_s	Minimum pension			x			
BE	tsceepi_s	Old-age pension contributions (employees)	d		x		x	
	tscse_s	Old-age pension contributions (self-employed)	d		x		x	No disaggregation possible, therefore we assume the pension share to same as for employees. The EE scenario sets pensioner social contributions to zero.
	tscpe_s	pensioner SICs	d	x		x		
	xpp	private pension contributions				x		
	tintcri_s	Tax deduction	d		x		x	TT: part related to pension income is abolished
	poa	Old Age Pension	t		x	x		

	psu	survivor pensions	t		x	x	
	byr	Early retirement pension	t		x		
	ypp	Private pensions	t			x	WARNING: only 6 observations report private pensions! We cannot draw any conclusions regarding the taxation of private pensions!
BG	tsceepi_s	Old-age pension contributions (employees)	d		x		
	tscsepi_s	Old-age pension contributions (self-employed)	d		x		
	poa00	Old-age pension (Пенсия за осигурителен стаж и възраст); Note: if input data before 2016 are used, poa00 equals the total amount poa. If input data for 2016 or later are used, then poa00 is based on a disaggregated benefit information in SILC (var py102g).			x		Public pensions are not taxed in Bulgaria.
	poamt_s	Social old-age pension (Социална пенсия за старост); Note: if input data before 2016 are used, poamt_s is set to 0 as information on social old-age pensions is part of poa00 (equal to poa). If input data for 2016 or later are used, then poamt_s is simulated.			x		
	psu	Survivor pensions (Наследствена пенсия)			x		
CY	tsceepi_s	contributions to widow and pension fund	d		x		
	tscse00_s	General SIC (ασφαλιστικές εισφορές αυτοεργοδοτούμενων)	d		x		Disentangling of pension contributions not feasible.
	tpipb_s	contribution to government pension plan		x			
	tscpehl_s	Pensioner health contribution	d	x			Under the EE scenario, pensioners do not pay health contributions.
	poasp	old age social pension (κοινωνική σύνταξη)	t	x			
	poatx	taxable old age pension (σύνταξη γήρατος)	t	x			
	poant	non-taxable old age pension (σύνταξη γήρατος)			x		
	psuwd	widow pension (σύνταξη χηρείας)			x		
	psuot	other survivor pensions			x		

	Variable	Description					Comments
	bsaoa_s	low pension benefit			x		The effect of taxing the minimum pension benefit is basically zero, because it is means-tested anyway.
CZ	tsceepi_s	Old-age contributions (employee)		x			
	tscsepi_s	Old-age contributions (self-employed)		x			
	tschlgv_s	State funded public health insurance contributions (pensioners)		x			Under the EE scenario, pensioners do not pay health contributions.
	poa	Old age pension (Starobni duchod)	t	x			Pensions are only taxed above a certain amount.
	psu	Survivors pension (vdovsky duchod)	t	x			Pensions are only taxed above a certain amount.
DE	tsceepi_s	Old-age pension contribution (employee)	d	x	x		Partial deduction in the baseline; set to zero if applicable in TT (and EE to avoid double relief)
	tscsepi_s	Old-age pension contribution (self-employed)	d	x	x		Partial deduction in the baseline; set to zero if applicable in TT (and EE to avoid double relief)
	tscpe_s	Pensioner social contribution		x			EE - pensioners are exempted from paying social contributions.
	tintape_s	Allowances on Income from Pensions	d	x	x		Partial deduction in the baseline; set to zero if applicable in TT (and EE to avoid double relief)
	poa00	Old-age pension	t	x			
	poacs	Old-age pension for civil servants	t	x			
	poapu	Pension for employees in public service (Rente der Zusatzversorgungskassen des öffentlichen Dienstes)	t	x			
	poaps	Pension schemes for self-employed, freelancers, and farmers (Rente berufsständischer Versorgungswerke, landwirtschaftlicher Alterskassen und Landabgaberenten) and Supplements to old-age pension insurance contributions for farmers (Zuschüsse der landwirtschaftlichen Alterskassen)	t	x			
	poass	Old-age pension of statutory pension insurance	t	x			
	psuwd	Widow(er)'s pension	t	x			

Country	Code	Description	Type			Notes
DK	tscpiee_s	Supplementary labour market contribution (ATP-bidrag): employee	d	x		
	xpp00_s	Contributions to private pension plans that can be deducted from personal income	d		x	
	tintaox_s	Additional deduction of pension contributions/savings	d	x	x	
	poa00_s	Old age pension (Folkepension)	t	x	x	
	poa01_s	Pension Supplement (Pensionstillæg)	t	x	x	
	poa02_s	Supplementary Pension (ældrecheck/ supplerende pensionsydelse)	t	x	x	
	poa03	Pensions from the labour market contribution scheme (ATP-pensioner)	t	x	x	
	poaot	Heating Aid for Pensioners	t			
	pyr	Early Retirement Pension (Efterløn)	t	x	x	
	psu	Survivor' benefits (Efterleverpension)	t	x	x	
	ypp	Private pensions	t		x	
EE	tscsepi_s	Pension contributions for self-employed		x		N.B. Pension SIC contributions are paid by employers and self-employed; employees pay only contributions for the mandatory second pillar pensions
	tpcsepi_s	Funded pension contribution for self-employed	d	x		
	tpceepi_s	Employee pension contributions to the funded scheme	d	x		
	poa00	Old age pensions	t	x		
	psu	Survivors' pension (toitjakaotuspension)	t	x		
	bsape_s	Pensioner's living alone allowance (üksi elava pensionäri toetus)		x		For this allowance, net (after tax) pensions are tested.
EL	tsceepi_s	Employee pension contribution	d	x		
	tscsepi_s	Self-employed pension contribution	d	x		
	tscfrpi_s	Farmer pension contribution	d	x		

	Code	Description	Type			Comments
	txcpe_s	Pensioners solidarity contribution		x		
	poacm	Supplementary old age pension	t	x		By not taxing pensions, SIC for sickness contribution is removed.
	poa00	Main old age pension	t	x		By not taxing pensions, SIC for sickness contribution is removed.
	poaot	Minor old age pensions	t	x		By not taxing pensions, SIC for sickness contribution is removed.
	psuwd	Survivors' pensions	t	x		By not taxing pensions, SIC for sickness contribution is removed.
	boanc_s	Social pension			x	
	pxp_s	Compensations for pension reduction (all)	t	x		
	prd_s	Temporary pension reductions (all)	t	x		
	i_pxp13	13th pension	t	x		Part of pxp_s (compensations ford pension reduction)
ES	tsceepi_s	Employee pension insurance contributions	d		x	
	tscsepi_s	Self-employed pension insurance contribution		x		
	i_tcrgoa_j	Regional old age tax credit (for people 75+)	d		x	
	poa00	Contributory old-age pension (pension por vejez contributiva)	t	x		
	poaot	Other old-age benefits (otras prestaciones por vejez)-statutory insurance for old age	t	x		
	psuwd00	Contributory widow pension (pension por viudedad contributiva)	t	x		
	psuot	Other survivor pension (otra pension de supervivencia)	t	x		
	poacm_s	Contributory old-age pension complement (complemento por minimo a pension por vejez)	t	x		
	poanc_s	Non contributory old-age pension (pension no contributiva por vejez)	t	x		

Country	Code	Description	Type			Comment
	psuwdcm_s	Contributory widow pension complement (complemento por minimo a pension por viudedad)	t	x		
FI	tsceepi_s	Tax allowance for employee pension contribution	d		x	
	tscsepi_s	Tax allowance for self-employed pension contribution	d		x	
	tscfrpi_s	Tax allowance for farmer pension contribution	d		x	
	i_innagt	Special tax on pensions		x		
	i_tinnatape	Pension income allowance	d		x	Tax allowance removed (except for disability and private pensions)
	i_tinmutape	Local tax: pension income allowance	d		x	Tax allowance removed (except for disability and private pensions)
	poa00	Old-age pensions	t	x		Tax allowance for this pension automatically removed. By not taxing pensions, medical care contribution is removed.
	psu	Survivors pensions	t	x		Tax allowance for this pension automatically removed. By not taxing pensions, medical care contribution is removed.
FR	tsceepi_s	Old-age pension contributions (employees)	d		x	Social taxes (CSG and CRDS) are not considered as pension SIC. Therefore the EE scenario does not deduct them (relevant for employees and self-employed).
	tscsepi_s	Old-age pension contributions (self-employed)	d		x	
	tintace_s	Tax deduction for C1 income (including public pensions)	d		x	
	poa00	old-age pensions	t	x		Pension income (poa00, psu) is subject to the CSG and CRDS.
	psu	survivor pensions	t	x		Pension income (poa00, psu) is subject to the CSG and CRDS.
	bsuwd_s	Means-tested widow allowance (age below 55, paid for 2 yrs)	see comment			Only 3 individuals receive the benefit, therefore we disregard the 3.

	Code	Description	col1	col2	col3	shaded	Comment
	bsaoa_s	Solidarity allowance for the elderly (ASPA)	see comment				There is no individual who receives the benefit and pays PIT. Therefore, we will not include it in the PIT base.
HR	tscbesi_s	Pensioners' health contribution	d		x		
	il_tsceepi	Employee's pension contribution	d		x		
	il_tscsepi00	Self-employed pension contribution	d		x		
	poa	Retirement (old age) pension (Starosna mirovina)	t	x			
	psu	Family (survivor) pension (Obiteljska mirovina)	t	x			
	boa	Old-age benefits			x		
	bsu	Survivor benefits			x		
HU	tsceepi	Pension insurance contribution (employee)		x			
	tscsepiee	Pension insurance contribution (self-employed)		x			
	poa	old age income (öregségi/saját jogú nyugdíj)			x		
	psu	survivor benefits (hozzátartozói jogon járó nyugdíj)			x		
IE	tpceepi_s	superannuation	d	x	x		
	tscse00_s	self-employed PRSI			x		The pension-part cannot be disentangled.
	tscee00_s	employee PRSI			x		The pension-part cannot be disentangled.
	tsceepb_s	public sector pension related deduction (contribution)	d		x		
	tintcoa_s	Age tax credit (65+)	d	x	x		TT - set to zero (EE- set to zero to avoid a double relief).
	poact_s	state pension (contributory)	t	x			
	pyr_s	state pension (transition)	t	x			
	poanc_s	State pension (non-contributory)	t	x			
	psuwdct_s	widows contributory pension	t	x			

Country	Code	Description					Notes
	psuwdnc_s	Widow's, Widower's or Surviving Civil Partner's (Non-Contributory) Pension	t	x			
IT	tsceepi_s	Employee SICs for pension funds (IVS)	d		x		
	tscsepi_s	Self-employed SICs for pension funds (IVS)	d		x		
	tintcpe_s	Personal tax credit for pension income	d	x	x		The old-age tax credit (75+) is set to the rates being applied to employees in TT (and to zero in EE to avoid a double relief). The rates are described in the Euromod country report, p. 54: (https://www.euromod.ac.uk/sites/default/files/country-reports/year10/Y10_CR_IT_Final.pdf)
	poa	Old-Age Pension(Pensioni di Vecchiaia – poa)	t	x			
	psu	Survivors' Pension(Pensioni ai Superstiti – psu)	t	x			
	poaxp_s	Pension extra payment	t	x			
	poamt_s	Social pension (Pensione / Assegno sociale)			x		
LT	tsceepi_s	Pension contributions for employees			x	x	
	tscsepi_s	Pension contributions for self-employed			*	*	*the interaction in the tax-benefit system does not allow to deduct SIC from the tax.
	xpp	Tax credit for contributions for private pensions	d			x	
	boa	Old age benefits			x	x	
	bsu	Survivors' benefits			x	x	
	byr	Early retirement benefit			x	x	
	ypp	Private pensions	t			x	Only 7 observations. We cannot draw any conclusions regarding the taxation of private pensions!
	tscsepi_s	Tax allowance for self-employed pension contribution	d		x	x	

	Code	Description	Type				Notes
LU	tsceepi_s	Tax allowance for employee pension contribution	d	x		x	
	tsceepbpi_s	Tax allowance for civil servant pension contributions	d	x		x	
	tintapv_s	Private pension contributions	d*		x	x	*Exempted with limits thus PEE exempts it fully from taxation, PTT taxes it fully.
	tintape_s	Allowance for pension income	d	x		x	Same level and design as the allowance for salaried occupations (except for disabled and pensions for past education of children)
	tintcpent_s	Tax credit for pensioners	d	x		x	Same level and design as the tax credit for employees (except for disabled and pensions for past education of children)
	ypp	private pension	t*		x	x	*50% of private pension is taxed thus PEE exempts it fully from taxation, PTT taxes it fully. 32 observations. We cannot draw any conclusions regarding the taxation of private pensions!
	byr	Benefit - Early retirement pension (Pré-retraite)	t	x		x	Is in the list for calculating SIC, so removing from taxation also removes from SIC.
	poacm	Pension - Old-age - Additional from Employer (2nd pilier) (Pension de retraite - 2nd pilier)			x	x	
	poaxp	Pension - Old-age - End of year allowance (Pension de vieillesse - allocation de fin d'année)	t	x		x	
	poapups	Pension - Old Age - Both public and private sectors (Pension de vieillesse - secteurs privé et public) - New (aggregate) since EU-SILC 2016	t	x		x	

	Code	Description					Notes
	psupups	Pension - Survivors - Both public and private sectors (reversion pension) (Pension de survie - secteurs public et privé) - New (aggregate) since EU-SILC 2016	t	x		x	
LV	tintaee_s	Tax allowance for SIC contributions for employees	d		x		Pension-related contributions part cannot be disentangled.
	tintase_s	Tax allowance for SIC contributions for self-employed	d		x		Pension-related contributions part cannot be disentangled.
	tintape_s	Tax allowance for pensioners	d		x		Same level and design as the general allowance for employees (except for disabled)
	poatx	Old-age pension (Vecuma pensija)	x	x			
	psutx	Survivor's pension (Pensija par apgādnieka zaudējumu)	x	x			
	poass_s	Old-age state social security benefit (Valsts sociālā nodrošinājuma pabalsts saistībā ar vecumu)			x		
	psuss_s	State social security benefit for a survivor (Valsts sociālā nodrošinājuma pabalsts apgādnieka zaudēšanas gadījumā)			x		
MT	ils_sicee	Employee SIC (general)	d		x		Employees pay Class One social insurance contributions. Different SIC types are not distinguished.
	ils_sicse	Self-employed SIC (general)	d		x		Class-Two contributions are paid by self-occupied and self-employed persons. Different SIC types are not distinguished.
	tinrp_s	Tax rebate on pensions	d	x	x		TT Tax rebate abolished, except for disability pensions. EE applied only for taxable pensions (disability pension).
	psu	Survivor pensions (orphans allowance included)	t	x			

Country	Code	Description	Type			Notes
	poanm	Simulated contributory pension (includes many types of pensions: Two Thirds pension, Retirement pensions, Increased retirement pension, National minimum pensions, Increased national minimums pensions, Decreased national minimum pension, Top-Up to retirement pension)	t	x		
	boanc_s	Senior citizenship grant		x		
	boamt_s	Age pension		x		
NL	tsceepi_s	People's social insurance*	d*			*the interaction in the tax-ben system does not allow to fully deduct SIC from the tax. Tax credits apply to income tax and peoples' insurance contributions as a whole. They reduce the income tax and peoples' insurance contributions proportional to the tax/contribution rates on the lowest income tax bracket.
	tintcpe_s	Old age credit	d	x		Old age credit removed, it automatically removes supplementary old age credit for single person
	tinta00_s	Self-employment tax allowance	d	x		Same level and design as for people below 65 (increased for older people)
	tintc00_s	General tax credit	d	x		Same level and design as for people below 65 (increased for older people)
	tintcee_s	Work credit	d	x		Same level and design as for people below 65 (increased for older people)
	poa00_s	Pension : old age : main/basic : simulated	t	x		
	psu_s	Pension : survivors : simulated (orphan benefit included)	t	x		
	poacm	Pension: other pensions	t	x		
PL	tsceepi_s	Employee pension contribution	d	x	x	
	tscsepi_s	Self-employed pension contribution	d	x	x	
	tscmaeepi_s	Maternity leave pension contribution	d	x	x	
	xpp	Contributions to private pensions			x	
	ypp	Private pension			x	Only 8 observations. We cannot draw any conclusions regarding the taxation of private pensions!
	poa00	Old-age insurance pension	t	x	x	By not taxing pensions, health contributions paid on pensions are removed.

	Code	Description	Type					Comment
	poaab	Old-age pension from abroad	t	x		x		By not taxing pensions, health contributions paid on pensions are removed.
	poafr	Pension : old age : farmer			x		x	
	poaot	Pension : old age : other	t	x		x		By not taxing pensions, health contributions paid on pensions are removed.
	psu00	Pension : survivors : main/basic	t	x		x		By not taxing pensions, health contributions paid on pensions are removed.
	psuot	Pension : survivors : other			x		x	
	pyr	Early retirement pension	t	x		x		By not taxing pensions, health contributions paid on pensions are removed.
	poa04_s	Pension for mothers with 4+ children	t	x		x		Old-age pension for women over 60 with four or more children if not in receipt of other pensions. By not taxing pensions, health contributions paid on pensions are removed.
	boa13_s	Thirteenth pension (paid if in receipt of any public pension)	t	x		x		By not taxing pensions, health contributions paid on pensions are removed.
PT	tintaee_s	Tax allowance for SIC contributions for employees (up to a limit)	d	x	x			Pension-related part not specified. EE - removing the limit; TT - abolishing the tax allowance
	tscse_s	SIC contributions for self-employed		x				Pension-related part not specified
	tintape_s	Tax allowance for pensioners	d		x			Set to 0 (except for disabled and private pensions)
	poact_s	Old age contributory pension	t	x				
	psu	Survivor pension (pensão de sobrevivência)	t	x				
	poanc_s	Old age social non-contributory pension (pensão social de velhice)	t	x				
RO	tscee_s	Employee pension social insurance contributions	d		x			
	tscse_s	Self-employed pension social insurance contributions	d		x			
	tintape_s	Tax allowance for pensioners	d	x	x			TT Same level and design as the general allowance for employees (all pensions). EE set to 0 (except for disability pensions).
	poa	Old age pensions	t	x				
	psu	Survivor pensions & benefits	t	x				

	Code	Description					Notes
	bsaoa_s	Minimum social pension			x		
SE	tscee_s	Tax credit for employee SIC (general)	d		x		N.B. Types of SIC are not specified for employees (only for employers and self-employed)
	tscsepi_s	Pension contributions for self-employed		x			
	tintape_s	Additional Basic Allowance for pensioners	d		x		
	poa	Old age pension	t	x			
	psu	Survivors pension	t	x			
SK	n/a	No information on the private pension contributions (to the third pillar)					
	tsceepiaj_s	Social insurance contributions paid from income from agreements		x		x	Affects only a few pensioners who also have incomes from agreements.
	tsceepi_s	Employee pension contributions	d		x		
	tscsepi_s	Self-employed pension contributions	d		x		
	poa00	Old-age benefits (except termination pay)			x		
	psu00	Widow's, widower's and orphan's pension			x		
	poaot	Other old-age pension			x		
	pyr	Early retirement pension			x		
	ypp	Private pension	t			x	54 observations
SI	tsceepi_s	Employee pension and disability insurance contributions	d		x		
	tscsepi_s	Self-employed pension and disability insurance contributions	d		x		
	tintc_s	Pensioner tax credit	d	x	x		TT abolished (except for disabled), EE adjusted to apply only on taxable pensions (disability)
	poa00	basic old age pension	t	x			
	psu00	basic survivor pension	t	x			

Notes: Baseline refers to the tax and benefit rules in place as of June 30, 2019. The EE scenario allows for the full deduction of pension contributions from the personal income tax base, while qualifying pensions are not taxed (removing also social contributions borne by pensioners). The TT scenario does not deduct pension contributions from the personal income tax base and fully taxes qualifying pension benefits received. The PEE and PTT scenarios, are equivalent to the EE and TT scenarios, considering also private pensions (contributions). Pension contributions are highlighted in green. Private pensions have not been considered in most countries (indicated in grey), but in BE, DK, LT, LU, PL and SK. t – taxed, d – deducted, x – changed (compared to baseline).

General warning: For some countries, gross incomes are used for the means-test for social assistance (and other) benefits, thus removing the tax on pensions (or starting taxing) will not have an effect on the decreased (increased) eligibility for those benefits. In reality, the thresholds for the means-tested benefits should be changed accordingly. For the countries where net incomes are assessed, changes in pension taxation will be transformed to the changes in receipt of means-tested benefits.

N.B. Regarding tax allowances and credits for pensioners/older people. In case it is a top up on a general allowance/credit, the specific allowance/credit was abolished. If it is a substitute for a general allowance, the design and limits were introduced as for the general allowance/credit (employment and pension incomes are considered together for the allowance/credit). Changes are done only for the pension benefits of interest (e.g. disabled pensions remain entitled to previous pension allowance/credit).

Source: Own elaboration based on EUROMOD model and EUROMOD country reports: https://euromod-web.jrc.ec.europa.eu/using-euromod/country-reports/latest