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The distributional effects of personal income tax expenditure

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The distributional effects of personal income tax expenditure[1]

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Abstract

Less visible than benefit expenditure, spending channelled through the tax system via tax concessions and advantages can amount to substantial amounts of foregone revenue. In this paper we use EUROMOD, a tax-benefit micro-simulation model covering all EU member states, to investigate the size and distributional effects of tax allowances and tax credits in 6 European countries. We also investigate in detail which types of policy instruments have the most potential to redistribute towards the bottom and which are likely to be mostly benefitting households at the top of the income distribution. We examine both categorical targeting (i.e. eligibility rules that depend on some individual or household general characteristics) and explicit income targeting .We find that with a few exceptions the impact of tax allowances and tax credits on inequality is small. Tax credits are generally more progressive than tax allowances. However, with the exception of refundable tax credits, the design of the allowances/credits appears to be less important than the characteristics of the population they are targeting and/or other features of the income tax system in determining the redistributive effect. Consequently, tax concessions appear ill-suited to target resources towards households in the bottom part of the income distribution.

JEL Classification: D31, H24, I38

Keywords: tax expenditure, redistribution, income tax, microsimulation

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[1] The paper uses EUROMOD F6.36. EUROMOD is continually being improved and updated and the results presented here represent the best available at the time of writing. Any remaining errors, results produced, interpretations or views presented are the author's responsibility. The process of extending and updating EUROMOD is financially supported by the Directorate General for Employment, Social Affairs and Inclusion of the European Commission [Progress grant no. VS/2011/0445]. We make use of micro-data from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat as well as of the national SILC datasets of Spain and Italy made available by the Spanish National Statistics Institute (INE) and the Italian National Institute for Statistics (ISTAT) respectively, The usual disclaimers apply.

1. Introduction

Tax-benefit systems are one of the main tools available for public interventions aimed at inequality reduction. Whereas a lot of work has gone into measuring the size and redistributive effects of public transfers (Plotnick 1984; Jäntti and Danziger 2000; Cantillon, Marx et al. 2003; Brady 2005; Fuest, Niehues et al. 2010), much less is known about how fiscal expenditure via the tax system affects the relative position of different types of households. Lack of knowledge in the area may be partly explained by the difficulties and ambiguities involved in measuring tax expenditure. A number of previous studies have focused on the assumptions needed to compute tax expenditure measures as well as on examining their implications (Burman 2003; Altshuler and Dietz 2011). Yet, no consensus regarding a standardized way of measuring tax expenditures appears to emerge from the field.

Irrespective of measurement issues, most authors acknowledge that tax expenditures are an important and possibly growing spending item in public budgets (Greve 1994; Howard 1997; OECD 2010). In the US, tax concessions and advantages ("the hidden welfare state") have been estimated to amount to half of the size of the visible welfare state (Howard 1997). An OECD report calculates that tax expenditures amounts to between 0.26% and 5.21% of GDP depending on country and year with Canada, the United States, and the United Kingdom being the largest spenders (OECD 2010).

Several theoretical arguments have been advanced either in support or against the enactment of tax expenditures (Greve 1994; Howard 1997; OECD 2010). On the positive side, it has been suggested that by directing resources through the tax system rather than direct transfers, governments can economize on administrative costs as well as reduce fraud. In addition, by linking receipt of tax concessions with the payment of tax, application costs for potential recipients may be minimized while at the same time diluting any potential stigma disincentives. They may be also viewed as a less bureaucratic and less intrusive form of government intervention compared to direct transfers as they tend to rely more on incentives and less on mandates. On the negative side, tax expenditures have been attacked as non-transparent, inefficient and unfair. Because tax law is usually not subject to any regular appropriation process, tax expenditures are subject to much less scrutiny compared to transfer programs with similar purposes. As such, they are much less likely to be subject to reform or repeal even in times of recession or slower economic growth (Howard 1997). They may create unintended side-effects and their growth over time may be much more difficult to control or cap. The inefficiency of tax expenditures has been argued based on the fact that the incentives they offer are likely to go overwhelmingly to groups in the population that need them least. Finally, the value of tax expenditures is often larger to higher income groups. This is particularly true of exemptions and deductions in the context of progressive taxation as deducted income would be taxed at progressively higher rates. As such, tax expenditures may be seen as more inequitable compared to direct transfers.

Interest in tax expenditures has recently resurfaced in the context of growing public deficits and a reluctance to increase tax rates for fear of hurting national competitiveness and

discouraging economic activity. By lowering the final tax liability for some groups of taxpayers, tax expenditures effectively narrow the tax base. Their reform or even abolition has been proposed as a way of increasing government revenues without raising the tax burden (Poterba 2011). Previous work on tax expenditures has generally suggested that higher income groups are likely to capture a disproportionately large share of resources distributed via tax relief and thus that they are most likely to benefit from this type of policies (Howard 1997; Burman, Geissler et al. 2008; Toder, Harris et al. 2009). Nevertheless, this result is to a large extent based on studies of the US income tax system in which deductibility of various types of expenditures figures prominently.

A different strand of research has sought to examine the progressivity of tax concessions in a comparative cross-national setting (Wagstaff, van Doorslaer et al. 1999; Wagstaff and van Doorslaer 2001; Verbist 2004). It finds that the progressivity of the various types of tax concessions varies from country to country. Credits tend to generally contribute to progressivity but their overall impact is very small. Deductions (which depend on income) are mostly regressive while allowances (which are lump-sums) are progressive, especially in "English speaking" countries. Tax credits and non-standard deductions and exemptions are also likely to generate household re-ranking thus contributing to horizontal inequality[2]. Albeit offering valuable insights into the distributional consequences of tax relief, these studies suffer from a few shortcomings. First, because tax returns do not include information about taxpayers who are not liable to pay tax, studies relying on them miss a serious portion of the income distribution. Moreover, progressivity and redistributive effect are calculated relative to taxable rather than household disposable income thus missing any interaction or countervailing effects coming from other elements of the tax-benefit system and potentially generating misleading results. Second, the decomposition techniques used in these types of studies cannot take into account the various interactions between the elements of the income tax system or between the income tax system as a whole and other taxes and benefits. Third, progressivity and redistribution can be measured only at the margin. Thus, whether income inequality would increase or decrease when a tax allowance or tax credit is abolished cannot be answered by these studies. Finally, with some exceptions[3], these studies fail to examine in detail the issue of instrument design and how it may affect any redistributive effects.

It may be countered that assessing tax expenditure based on distributional criteria is not a meaningful exercise because the main purpose of tax expenditure is not to redistribute but rather to alter incentives. Yet, this argument is unlikely to hold for two reasons. First, even when the stated purpose of a tax concession is incentives, its distributional (side) effects may be substantial. Since inequality is a legitimate policy concern, the (intended or unintended) distributional consequences of a policy instrument are of interest irrespective of its stated objective. The fact that a type of tax expenditure is regressive (progressive) constitutes a cost

[2] Re-ranking refers to the phenomenon of households changing their relative position in the income distribution when comparing gross market incomes and net incomes after income tax has been applied. Tax allowances and credits that treat taxpayers differently are potentially modifying the ranking of households by income.

[3] For example, Verbist looks into whether the number of tax bands is correlated with the progressivity of the tax rate schedule; Verbist, G. (2004). Redistributive Effects and Progressivity of Taxes: An International Comparison Across the EU Using EUROMOD. EUROMOD Working Paper. **EM 5/04**.

(benefit) that needs to be considered quite independently of whether the policy is achieving its intended outcomes. Second, the purpose of at least some tax expenditure policies is clearly redistribution related. For example, measures related to 'ability to pay' (such as concessions given to disabled individuals, lone parents, heads of large families etc.) have a strong distributional component. Similarly, refundable tax credits aimed at low earners target redistribution alongside work incentives.

We contribute to the literature on fiscal expenditure and to the wider field of redistribution via taxes and benefits by examining the distributional consequences of two types of tax expenditures, i.e. tax allowances and tax credits present in the personal income taxation legislation in six European countries. These are the Czech Republic, Denmark, Germany, France, Italy and Spain. We focus on household and individual taxation as this is the area where tax expenditure instruments are more likely to include a 'social', i.e. distributional objective. The country selection aims to cover a variety of tax expenditure instruments as well as variation in the parameters of the income tax system itself. The remainder of the paper proceeds as follows. Given that the vocabulary on fiscal expenditure has not always been used consistently, section 2 starts by defining and clarifying the terms used in the remainder of the paper. Section 3 outlines the methodology use to measure the value of tax allowances and tax credits as well as to quantify their redistributive effects. The size of fiscal expenditure in the areas we cover is scrutinized in section 4. In Section 5, we present estimates of the overall redistributive effects of tax allowances and tax credits. Section 6 examines the redistributive effects but this time using narrower categories of instruments to enhance comparability and look at policy design more carefully. Finally, section 7 concludes.

2. Definitions and terms

Income tax systems usually do not treat taxpayers in the same way. Various characteristics ranging from family circumstances to income to labour market status etc. can interact with the rules of the income tax system to determine a taxpayer's final liability. In this context, the term tax expenditure has been used to refer to foregone government tax revenue due to special advantageous treatment afforded to some taxpayers. While the exact definition and measure of tax expenditures is a matter of some debate, both scholarly research and national legislation seems to accept as a general principle that tax expenditures should be identified as deviations from 'normal' income tax rules (Burman 2003; Burman, Geissler et al. 2008; OECD 2010; Altshuler and Dietz 2011). There is very little agreement though on which rules should be considered 'normal' and thus included in the benchmark and which rules should be classified as tax expenditures. Ambiguities about the definition of the benchmark tax rules aside, the concept of tax expenditure (as understood in most studies) is a broad one. It encompasses such things as income excluded from taxation, lower tax rates for some groups, deductions from income subject to taxation, deferred tax liability, reductions in the initial tax liability etc. For purposes of this study, we take a different view which is at the same time broader and narrower than the approaches taken both in the US studies on the topic and by the OECD. It is narrower in the sense that we focus on only two types of instruments, namely

deductions from income subject to taxation which we collectively term tax allowances[4] and reductions in the initial tax liability which we term tax credits. Thus, we exclude from our analysis such instruments as tax exempted income, special rates for some categories of taxpayers or special rates applying to some types of incomes, as well as joint taxation (including the 'quotient familial' in France). It may be argued that excluding these instruments offers an incomplete picture since public authorities may pursue very similar objectives using different instruments. Yet, by focusing on two types of instruments we are able to keep the complexity of the analysis manageable as well as to go beyond simply quantifying forgone revenue to examine which features of tax allowances and tax credits are likely to make them more progressive and how these depend on the broader design of the tax system.

Our approach is also broader in the sense that we include some elements which normally would be included in the benchmark tax rules such as general tax allowances and zero rate bands[5] on the grounds that they apply to all tax payers and thus they do not constitute 'deviations'. We have opted to include such instruments as their distributional consequences are seldom neutral. On a similar basis, we include such instruments as child and family related instruments which are sometimes excluded from tax expenditure measurement on the grounds that they are actually a way through which the tax system takes into account ability to pay and thus do not constitute special tax treatment.

Finally, we take a completely cross-sectional view and treat deferred tax liability as a tax allowance, i.e. we disregard the fact that some types of deductions may be taxed later on in life (for example, pension contributions).

In calculating our measures, we ignore any potential behavioural effects. We only include tax instruments that are included in personal income taxation, and thus are targeted at households and not businesses.

3. Methodology

We calculate tax allowances and tax credits at the taxpaying unit level using EUROMOD[6], the European tax-benefit micro-simulation model (Sutherland and Figari 2013). EUROMOD simulates income tax in 27 European countries based on the income tax rules and the household and individual characteristics in the underlying micro dataset. Tax allowances and

[4] Some authors (see for example- Wagstaff, A. and E. van Doorslaer (2001). "What Makes the Personal Income Tax Progressive? A Comparative Analysis of Fifteen OECD Countries." International Tax and Public Finance **8**(3): 299-315, Verbist, G. (2004). Redistributive Effects and Progressivity of Taxes: An International Comparison Across the EU Using EUROMOD. EUROMOD Working Paper. **EM 5/04**, OECD (2010). Tax Expenditure in OECD Countries. Paris, OECD.) differentiate between tax deductions which depend on income and tax allowances which are lump sum. We make no such distinction. Everything a taxpayer can claim to reduce her taxable income is included under the term tax allowance.

[5] Because zerorate tax bands are essentially equivalent to general tax allowances, we include them for purposes of comparability.

[6] We use version F6.36.

tax credits are simulated as part of the usual income tax simulation. Thus, our measures are based on simulated entitlements and not on actual claims in tax records. In interpreting results, one should keep in mind that they relate not to the actual but to the intended distributional effects of tax allowances and credits.

To perform the simulations, EUROMOD uses information about individual and household characteristics from a dataset based on the European Union-Survey of Income and Living Conditions (EU-SILC). Unfortunately, there is not enough detail in SILC to fully simulate all tax allowances and all tax credits in our six countries. In particular, information about many types of deductible expenditures is lacking. An overview of which tax allowances/credits we are able to simulate and which not is available in Appendix I. Obviously, the share of the instruments included in the simulations varies by country. As such, it should be kept in mind that figures for total tax allowances and total tax credits are in all likelihood an underestimation and distributional indices calculated for total tax allowances and total tax credits are not fully comparable across countries. To assess the extent of the problem, we would need external estimates of total foregone government revenues due to tax allowances and tax credits respectively. Alas, such information is difficult to obtain in some countries and virtually impossible in others. Appendix 2 compares our estimates of total foregone revenues to the estimates produced by the OECD (OECD 2010) in three countries, i.e. Germany, France and Spain. However, note that our estimates are not fully comparable with OECD estimates either. In particular, OECD includes in its estimates tax relief that is aimed primarily at firms rather than households. Differential coverage of tax allowances and tax credits in EUROMOD is much less of an issue when we compare countries within instrument types (see below).

We construct two measures of tax allowances and tax credits, which we term respectively gross and net. The gross measure represents the difference in the net tax liability attributable to the existence of the tax allowance or tax credit respectively. The net measure is calculated as the difference in net disposable income attributable to a tax allowance or a tax credit. In addition to the changes in the net tax liability, the second measure also captures any changes in benefits received as a result of altering the tax burden[7]. In both cases, we calculate these measures at the household level and we adjust for household size using the modified OECD equivalence scale. In constructing both measures, we take a 'dynamic' approach. By 'dynamic' we mean that in calculating the effect of an instrument on the net tax liability or on the net disposable income respectively, we allow the other elements of the tax-benefit system to kick in and compensate for the change. In this way, our gross measures account for interactions between elements of the income tax system. For example, a taxpayer may qualify both for a tax allowance and for a wastable tax credit. If the taxpayer's income is such that she can benefit from the entire tax allowance but not the entire wastable tax credit (as her taxable income is too low to fully take advantage of both), there is an interaction between the tax allowance and the tax credit. When calculating our measures of the tax allowance, we remove it such that the taxpayer no longer enjoys its benefits. However, since by removing

[7] For example, if some income tested benefits depend on after tax income, an increased tax liability may trigger larger number of individuals/ households being eligible for these benefits.

the tax allowance we increase the taxpayer's initial gross tax liability, she will now be able to claim a larger portion of the wastable tax credit. Thus, the tax credit can (partially) compensate for the removal of the tax allowance, reducing the taxpayer's net liability and thus government tax revenue. This compensation takes place automatically, as the tax rules apply to the slightly changed household circumstances (in this case, higher gross tax liability). Similarly, tax allowances can lower the marginal tax rate and thus lower the average tax rate of a taxpayer. When removing a tax allowance, a taxpayer's final net liability may increase not just due to the additional tax that needs to be paid on the allowance but also due to a higher average tax rate.

In addition to the interaction between the components of the income tax system, the net measures we construct also take into account the interactions between the income tax system as a whole and the remainder of the wider tax-benefit system. To give an example, an increase in the net tax liability may now qualify an individual or a family for a means-tested benefit. On the one hand, government tax revenues may be increased while on the other its spending outlays may also become larger, automatically, thus mitigating any net revenue raises.

To better understand the extent to which the distributional effects of tax expenditures are influenced by instrument design, we classify tax allowances and tax credits respectively into four categories:

a) General instruments: these are tax reliefs that are available to all tax payers irrespective of income or other personal characteristics; examples are basic/personal allowances, zero rate bands and general, universal tax credits.
b) Family instruments: these are tax concessions offered to tax payers based on family composition and characteristics; examples are child related tax allowances and tax credits, concessions directed at taxpayers with dependent spouses or parents etc.
c) Instruments targeted at vulnerable groups: these are tax advantages which seek to adjust for a perceived disadvantage of a given group of taxpayers; examples are instruments directed at disabled persons, lone parents, the elderly etc.
d) Income related instruments: these are instruments which specifically depend on (taxable) income; they either are more generous towards low-income taxpayers or exclude higher income units altogether; examples are non-wastable tax credits aimed at low income earners, income-tested child or family tax credits etc.

These four categories are neither exhaustive nor mutually exclusive (for example, income tested child tax credits are included both under b) and under d)). They have been chosen based on two criteria, namely EUROMOD simulation capabilities and their potential to redistribute resources towards households with low(er) incomes. Especially the latter two categories being specifically designed to target resources towards the bottom of the income distribution would be expected to be progressive.

Using our two measures of gross and net value, we first present estimates of the total size of tax expenditure on tax allowances and tax credits. We then show how the benefits derived

from out two types of tax relief vary across the income distribution. Finally, we estimate the extent to which tax allowances and tax credits are inequality enhancing or reducing by computing redistribution and progressivity indices (Kakwani 1977). We perform the same set of calculation both for total tax allowances and tax credits respectively and by instrument type. We include 95% confidence intervals for all our estimates[8]. In each case, we analyze tax allowances and tax credits separately.

4. Size of tax allowances and tax credits

Before examining the distributional aspects, we estimate the relative size of tax allowance and tax credits expenditures. Figure 1 shows the total annual revenues forgone as a result of tax allowances and tax expenditures in each of the six countries respectively as a percentage of total government revenue. Both gross and net measures are shown, as explained above[9]. We cannot simulate comprehensively tax expenditure in all of the six countries and as such, the figures are not strictly comparable cross-nationally. Nevertheless, Figure 1 makes clear that from a budgetary perspective, tax expenditures are a very important element. For example, in the Czech Republic tax credits cost more than the entire revenue collected via the personal income tax system. Likewise, foregone revenue due to either tax allowances or tax credits exceeds 10% of total government revenues in Denmark, Germany and Spain. These figures suggest that resources channelled via tax expenditures can be substantial and thus it is both of interest and necessary to investigate the extent to which they affect the distribution of incomes.

[Fig. 1: Annual total lost revenue due to tax allowances and tax credits as a % of government revenue-ABOUT HERE]

In general, the gross and the net measures of foregone revenue are quite close. The only notable exception is tax allowances in France where the net measure is significantly larger than the gross one suggesting that in addition to lost tax revenue, the presence of tax allowances induces *increased* benefit expenditure. This pattern is due to the presence of an interaction between family means-tested benefits and the tax base. Eligibility for these family transfers is income tested against the tax base. Eliminating tax allowances increases the tax base and consequently affects benefit eligibility. Some families who are eligible for means-tested family benefits under the original legislation loose entitlement when tax allowances are removed from the income tax system. Thus, the net overall effect of tax allowances is larger than the loss in tax revenues alone.

[8] Confidence intervals have been calculated using the STATA based package DASP (Distributive Analysis StataPackage) -http://dasp.ecn.ulaval.ca/.

[9] The gross measure refers to annual revenue not collected in taxes whereas the net measure includes lost tax revenues as well as any net changes in expenditure brought about by the removal of the tax allowances/ credits.

Another way of assessing the importance of tax allowances and tax credits is by looking at their incidence. Figures 2 and 3 show the proportion of individuals in households who receive some tax relief via tax allowances and tax credits overall and by quintile group of household disposable income calculated when the respective tax instruments (i.e. either allowances or credits) are not present (rank HDI)[10]. Almost every household in Denmark is entitled to some form of tax allowance. The receipt of tax allowances is widespread in Germany, Italy, Spain and France where more than four fifths of the population benefits from this type of tax expenditures. The only country where tax allowances are not quasi-universal is the Czech Republic.

[Fig 2: Proportion of individuals in households entitled to tax allowances by quintile – ABOUT HERE]

Tax credits are completely absent in Germany and Denmark but widespread in the countries that use them. They are received by over 80% of the population in Italy, Spain and the Czech Republic. Thus, in a majority of countries, both tax allowances and tax credits can be seen as near universal instruments able to reach a large share of the population not just the very rich. The extent to which there are asymmetries in their benefits across the income distribution is investigated in the next section.

[Fig. 3: Proportion of individuals in households entitled to tax credits by quintile-ABOUT HERE]

5. The redistributive effect of tax allowances and tax credits

In addition to the overall share of beneficiaries in the population, Figure 2 also shows the extent to which the likelihood of being able to claim tax allowances varies with income. With the exception of Denmark where receipt of tax allowances is very close to 100% in all quintiles, there is a clear income gradient in the probability of receipt. The steepest slope is found in the Czech Republic where moving from each quintile to the next roughly doubles the probability of receipt. In the remaining four countries, the pattern is somewhat different in that there is a substantial difference between the first quintile and the rest.

[10] Rank household disposable income is essentially a counterfactual; to avoid any errors coming from the fact that tax allowances and tax credits change the relative position of households in the income distribution, we use household disposable income calculated in the absence of tax allowances and tax credits respectively to construct quintiles throughout; we term this income concept rank disposable income to differentiate it from the "full" household disposable income which is defined in the usual way.

In the case of tax credits, the pattern is somewhat different. In Spain and to a lesser extent in Italy, we observe the same jump in proportion entitled when moving from the first to the second quintile followed by a relatively flat line thereafter suggesting that it is only the first quintile that is unable to take advantage of tax credit provisions. In France, the second and the third quintiles are the ones most likely to benefit from tax credits while the bottom and the top of the distribution are least likely to be entitled. Finally, in the Czech Republic the most notable difference is between the bottom three quintiles and the rest. Especially the top but also the fourth quintiles are more likely to be able to take advantage of tax credits compared to the rest.

A clear indication of the potential of tax allowances and tax credits to redistribute can be obtained by assessing the extent to which tax allowances and tax credits contribute to increasing disposable income proportionally more at the bottom compared to the top of the income distribution. Figure 4 plots the share of the gross and net values of tax allowances in household disposable income by rank HDI quintile group. The first thing to notice is that gross tax allowances are slightly upward sloping in their effect in all countries with the exception of Denmark. This indicates that tax allowances are worth more in relative terms to households higher up in the income distribution compared to the bottom. The curve is particularly steep in Germany. In Italy and Spain, the value of tax allowances rises more slowly with income. This pattern suggests that tax allowances are likely to be regressive and increase inequality. Tax allowances make up a very small proportion of household income for all quintiles in the Czech Republic whereas they are important across the income distribution in Denmark.

[Fig 4: Average gross and net values of tax allowances as a % of rank HDI-ABOUT HERE]

Using gross or net values does not matter much with the exception of France. The much larger shares obtained for the bottom quintile when using the net measure instead of the gross confirm the interaction between the tax base and means-tested benefits existent in France. Tax allowances direct resources to the bottom quintile both directly by lowering the tax burden but also indirectly by making these households eligible for income tested benefits, as explained in section 4 above. The indirect effect is almost twice as large as the direct effect.

[Fig. 5: Average gross and net values of tax credits as a % of rank HDI-ABOUT HERE]

The share of tax credits in rank household disposable income is shown in Figure 5. Because Denmark and Germany have no tax credits, only four countries are shown. Albeit non-zero,

tax credits are also very small in France[11]. Unlike tax allowances, tax credits are likely to be relatively more important at the bottom and middle of the income distribution compared to the top. There is a very steep negative income gradient of tax credits in Italy. Tax credits are almost five times more important in the bottom quintile compared to the top. Thus, tax credits in Italy are strongly redistributive, a fact confirmed by redistributive indices (see below). Quintiles in the middle of the income distribution are the largest beneficiaries of tax credits in Spain whereas in the Czech Republic there is a modest negative quasi-linear relationship between income and the share of tax credits in rank household disposable income.

Table 1 summarizes progressivity and redistribution indices for tax allowances and tax credits in the six countries. In keeping with the existing literature, we use the Kakwani index to measure progressivity and the Reynolds-Smolensky index to measure redistribution[12] (Kakwani 1977; Lambert 1989). For completeness, Table 1 also shows implied average tax rates (ATR) and concentration coefficients of total tax allowances and tax credits respectively. With one exception, the effect of tax allowances on inequality is rather modest. The exception is Germany where tax allowances raise the Gini index by approximately 1.3 points. This is due to the fact that tax allowances are relatively important (the corresponding implied average tax rate is 10%) and they are concentrated more in the top part of the income distribution compared to rank disposable income. In addition to Germany, other countries where tax allowances are skewed towards the top of the income distribution are Italy and especially Czech Republic. However, in these two countries the size of tax allowances relative to income is much smaller and hence their effect on inequality relatively muted. France and Denmark are the only two countries where tax allowances are relatively progressive albeit their effect on inequality is very small.

[Table 1: Progressivity and redistribution indices-ABOUT HERE]

In comparison with tax allowances, tax credits tend to be more progressively distributed. This is especially the case in Italy but also in Spain and Czech Republic. All three countries have tax credits that make up roughly 10% of disposable income. The very equal distribution of tax credits in Italy means that on average these reduce inequality by 2.4 points, a large impact. Modelled tax credits are too low in France to have any noteworthy impact[13].

[11] Keep in mind that these are simulated tax credits.

[12] The Kakwani index is calculated as the difference between the Gini coefficient of pre-tax incomes and the concentration coefficient of tax allowances/tax credits; it shows the extent to which tax allowances/ tax credits disproportionately benefit some part of the income distribution relative to the distribution of original, pre-tax incomes (in this case household disposable incomes re-calculated in the absence of the analysed instrument); the Reynolds-Smolenski index is the difference between the Gini coefficient of household disposable income with and without the analyzed instrument(s).

[13] However, we are unable to accurately model all tax credits in France. Results might change were we to use a more accurate and inclusive measure.

6. Progressivity and redistributive effects of specific types of instruments

So far, our analysis has dealt with overall measures of tax allowances and tax credits. In the remainder of the paper, we focus on specific types of tax allowances and tax credits. We take this approach with a twofold objective. On the one hand, focusing on narrower categories of tax allowances and tax credits improves comparability by ensuring that all relevant instruments in each country are captured in the simulations. On the other hand, we have the opportunity to examine more in depth the issue of policy design. For example, if in a given category, all instruments tend to have broadly similar effects on inequality and redistribution, we may conclude that the design of the instrument itself plays a large role in determining its redistributive outcomes. On the contrary, if redistributive effects are quite heterogeneous, this suggests that population characteristics or potentially interactions between the instrument and the rest of the tax benefit system are more important than the design of the instrument itself. In the remainder of this section, we present only results based on net values. Using gross measures instead of net makes no difference for the results.

6.1 General instruments

The first category of instruments we analyze is general instruments. These are tax allowances or tax credits that theoretically benefit all tax payers. They include such measures as personal tax allowances or zero rate tax bands. We look at tax allowances and tax credits separately. In each case, the value of the instrument has been calculated by setting it to zero, re-applying the rules of the tax-benefit system and comparing incomes with and without the instrument.

General tax allowances make up only a tiny proportion of household disposable income in Germany (see Fig. 6). They are however strongly regressive. Relative to rank HDI, they are almost six times as large in the top quintile compared to the bottom quintile. Yet, due to their small size their impact on inequality is very low. General tax allowances are more important in France and especially in Denmark where they make up approximately 8% of rank HDI on average (see Table 2). Tax allowances are progressive both in France and especially in Denmark. In the latter country, general tax allowances are three times as important to the bottom quintile compared to the top. Given both their size and their strong progressive nature, tax allowances have an important impact on inequality in Denmark. They reduce the Gini coefficient by approximately 1.6 percentage points (see Table 2).

[Fig 6: Average net value of general tax allowances as a % of rank HDI by quintile –ABOUT HERE]

There is a strong interaction between general tax allowances and the rate structure of the income tax system. The more progressive the rate structure, the stronger the regressive effect of tax allowances. This is due to the fact that as marginal tax rates on income increase, the value of tax allowances increases as well. On the contrary, if tax allowances are taxed at similar rates throughout the income distribution, tax allowances are equivalent to a flat rate benefit which will be relatively more important at the bottom compared to the top. Thus, in a country with a strongly progressive tax rate structure such as Germany, general allowances are regressive whereas in Denmark, which only has two tax bands, they are progressive[14].

[Table 2: Progressivity and redistribution indices related to general tax allowances and general tax credits- ABOUT HERE]

General tax credits are relatively important in both countries in which they are present, making up between 6-8% of income on average. They are relatively progressive in Spain and proportional in the Czech Republic. In Spain, it is the middle quintiles of the income distribution that gain most from tax credits. This suggests that bottom deciles have incomes that are too low to take full advantage of this type of tax concession. In the Czech Republic, the absolute value of the general tax credit increases with income so that the relative value compared to household income changes little across the income distribution. Again, this pattern suggests that lower income quintiles are unable to take advantage of all available tax credits. What is more, since the absolute value of tax credits does not plateau but keeps rising with income, it is likely that a taxpayer needs to find herself at a relatively high income level in order to realize the full potential of available tax credits. At lower levels of incomes instead, the non-refundability of the general tax credit induces a sort of substitutability with other tax credits that cover large sections of the population.

[Fig.7: Average net value of general tax allowances as a % of rank HDI by quintile ABOUT - HERE]

6.2 Family related instruments

[14] In fact, in the Danish case, the rules of the income tax system imply that the implicit tax rate on the general personal allowance is always the lowest tax rate for all tax payers. The reason is Denmark's two tax bands essentially operate as two semi-independent flat-rate tax systems. The personal allowance may be claimed only under the lower (bottom) tax rate system. As such, all taxpayers get essentially the same benefit (in absolute terms) from the existence of the personal allowance as long as their taxable income is high enough to make full use of the allowance.

Family related instruments include tax allowances and tax credits awarded based on family characteristics only. They include instruments awarded on account of marital status, dependent children or dependent parents/ relatives. They do not include expenditure incurred partly as a result of family characteristics such as child-care or educational costs. As such, this category of instruments is rather general and unlikely to vary with income unless there are specific provisions in the rules.

There are four countries that use family tax allowances (as defined above) in their income tax system, i.e. Denmark, Germany, France and Spain. The size of this type of instrument is trivial in Denmark but relatively important in Spain. Family tax allowances are strongly regressive in Germany albeit their small size prevents them from having any substantial impact on inequality. As in the case of general allowances, the strong progressivity of the rate structure in Germany is likely to be the driving factor behind this result. Family tax allowances are consistently progressive[15] both in Denmark and in France. In Denmark, there are two factors that are likely to make this instrument progressive. On the one hand, the marginal tax rate on this type of allowance is the same for all income groups meaning that the value of the tax allowance does not vary with income. On the other hand, there may be an interaction between the characteristics of the Danish population and the rules of the instrument. More specifically, in Denmark the family tax allowance is the portion of the general tax allowance that is transferable between spouses. If dual earner couples are the norm and if there is positive asortative mating based on earnings capacity, lower income couples are more likely to benefit from this type of allowance. Note however that the allowance imposes larger marginal tax rates on the second earner and may be more regressive if one earner couples are more prevalent in the top of the distribution.

[Fig. 8: Average net value of family tax allowances as a % of rank HDI by quintile-ABOUT HERE]

In France[16], the allowance targets older children and dependent relatives. It is possible that lower income families are more likely to include older children and dependent relatives among their members compared to the top, thus making the instrument progressive. Additionally, the value of the allowance is relatively small making it more likely that lower income tax paying units can claim the full amount of the deduction. In Spain, the family tax allowance is a tax advantage awarded to married couples opting for joint taxation. Its value is highest in the middle of the income distribution, implying that at the bottom of the distribution incomes may be too low to fully take advantage of it.

[15] Tax allowances are less important as income increases.

[16] In addition to various tax allowances and tax credits, France has a special feature of the income tax system that is designed to redistribute towards families with children. This is the so called –'quotient familial (QF) '. I is essentially a form of joint taxation where not only the spouse but also children and other dependent household members are taxed together. The effect of the QF is to essentially lower the final tax liability for taxpayers with children/ dependent relatives who have no or little income of their own; in this paper the QF is taken as part of the rate structure and thus fixed and not included in any calculations on progressivity/ distributional effects.

[Table 3: Progressivity and redistribution indices related to family tax allowances and family tax credits- ABOUT HERE]

Family tax credits are present in the Czech Republic, Italy and Spain. They are progressive in the first two countries and proportional in Spain. In the Czech Republic, the strong progressivity is likely due to the fact that the child tax credit is refundable for low income earners. In the case of Italy, family tax credits decline with taxable income on a sliding scale. As a result, they are much larger in relative terms at the bottom of the income distribution compared to the top. The picture is less clear cut in Spain. This country has a large number of family related tax credits both at the national and at the regional level. In the latter case, receipt of family tax credits is usually conditioned on (low) income. However, regional family tax credits are relatively small in value and they may be overshadowed by their counterparts at the national level. At either levels they are not refundable meaning they may be less valuable to households at the bottom of the distribution who pay little tax.

[Fig. 9: Average net value of family tax credits as a % of rank HDI by quintile -ABOUT HERE]

6.3 Instruments targeted at vulnerable groups

Instruments included in this category have been selected based on their eligibility criteria containing status conditions usually associated with economic vulnerability. They include disability, lone parenthood, unemployment and old-age. In Spain, we have also included tax credits given to young taxpayers living on their own and paying rent[17]. Admittedly, there is some arbitrariness in defining which categories can be considered vulnerable and which not. In particular, the elderly are often a group experiencing lower poverty rates than the rest of the population. Yet, given that the preferential status some policies give them seems to be grounded in their perceived economic insecurity, we have chosen to include them in our 'vulnerable' groups list.

[Fig. 10: Average net value of tax allowances for vulnerable groups as a % of rank HDI by quintile – ABOUT HERE]

[17] The choice was motivated due to the particularities of the Spanish context where unemployment and low wages for the young are known to be a major problem, currently.

Both instruments targeted at vulnerable groups and instruments inversely related to income can be thought of as policies targeted towards the bottom of the income distribution. As such, they can be expected to be particularly suited for income redistribution. However, this is not the case when considering tax allowances. In Germany, tax allowances for vulnerable groups are actually regressive. This is likely to be due both to the progressive nature of the German tax rate structure as well as to the main allowance in this category i.e. the tax allowance for the elderly being a proportion of taxable income rather than a lump sum. In France, where the allowances included under the vulnerable groups heading comprise of instruments aimed at the low-income disabled and the elderly, the effect is strongly redistributive. In addition to being income tested, the French allowances are lump-sum meaning they are relatively more important for the low income households that receive them. Finally, in Spain tax allowances under this category are approximately proportional (see Table 4). In fact, Fig. 10 shows that they are most important for the middle of the income distribution. They are not income-related but they are lump-sum suggesting that while the bottom of the distribution may not be able to exhaust the tax advantage due to lack of income, the plateau-ing of the benefit makes it less advantageous for the top.

In all cases, tax allowances targeted at vulnerable groups make up a tiny proportion of incomes. This is not surprising given that they are meant to cover relatively low numbers of individuals/ families.

[Table 4: Progressivity and redistribution indices related to instruments targeting vulnerable groups- ABOUT HERE]

Similarly, tax credits targeted at vulnerable groups make up a very small percentage of average rank disposable income in all five quintiles. In fact, in all countries except Spain they amount to less than 0.5 p.p. of income irrespective of quintile. Thus, their impact on inequality is negligible. In the Spanish case, they have the familiar U shape whereby the middle of the income distribution gains more from these types of credits relative to the bottom and to the top.

[Fig. 11: Average net value of tax credits for vulnerable groups as a % of rank HDI by quintile – ABOUT HERE]

6.4 Income related instruments

Tax allowances that are explicitly income tested in one form or another exist in Italy, France and Spain. In Italy they consist of a small regional tax allowance so they are virtually

irrelevant for broader measures of inequality and redistribution. They are somewhat more important in the other two countries (See Table 5). Although the income-tested employment allowance in Spain appears to have fairly low income thresholds, its value is largest in the third and fourth quintiles of the income distribution. Additionally, its size relative to income is larger in the top quintile compared to the bottom one. There may be two factors contributing to this pattern. On the one hand, taxable income in the bottom quintiles may be too low for any allowance to have a large impact on disposable income. On the other hand, if the same tax payers qualify for many different allowances there will be a substitution between them as long as income is not high enough to enable claiming all available allowances. Thus, when one allowance is eliminated, there is relatively little impact as other allowances kick in. In France, income related allowances are available only for the disabled and the elderly. They are more effective in boosting the incomes of the bottom quintile compared to Spain. They are also strongly progressive as beneficiaries tend to cluster in the first two quintiles.

[Table 5: Progressivity and redistribution indices related to income-tested tax allowances and income-tested tax credits-ABOUT HERE]

[FIGURE 11: Income related tax allowances as a % of rank HDI-HERE]

Income related tax credits are relatively large and very progressive in Italy. Consequently, they effect a substantial reduction in the Gini coefficient of approximately 2.5 p.p. Income related tax credits in Italy largely overlap with the family related category, hence the very similar result. Both their explicit (inverse) link to taxable income and the fact that they are more likely to benefit families with many children/ dependent relatives are factors likely to contribute to their progressivity. In the other three countries where they are present, tax credits are much less important. They are progressive everywhere but particularly so in the Czech Republic. This is due to the refundability of the child tax credit for low earners. In France as well, the main income related tax credit- the “Prime pour l’emploi” is refundable. Finally, Spain has a large array of regional income related tax credits with different eligibility rules and income thresholds. Taken together they are small in size and have an even smaller impact on inequality. In fact, of the four countries Spain registers the lowest progressivity index for income related tax credits. It’s not entirely clear what causes this pattern but in all likelihood the combination of the Spanish population characteristics and the wider tax-benefit system rules are playing a role.

[FIGURE 11: Income related tax credits as a % of rank HDI-HERE]

7. Conclusions

This paper examines the role played by tax allowances and tax credits embedded in personal income tax legislation in shaping inequality in six European countries. We use EUROMOD- the tax benefit mcirosimulation model to isolate the effect on the income distribution when all or selected tax allowances or tax credits are removed.

We find that tax expenditure is a significant spending item relative to government revenue in all countries albeit there is a considerable cross-national variation. Moreover, with few exceptions, tax allowances and tax credits are able to reach large sections of the population. Thus, at least in the six European countries included in this study, they are by no means a policy instrument intended only/ mainly for the rich. However, despite being widespread, their distributional consequences are not necessarily progressive.

Overall, tax allowances tend to be either regressive or proportional. However, they have a significant impact on inequality only in Germany where they increase the Gini coefficient by 1.2 p.p. Tax credits on the other hand tend to be either progressive or proportional. However, their size is usually too small to impact inequality significantly. The only exception is Italy where tax credits reduce inequality by 2.4 points.

A second general result emerging from our analysis suggests that the distributional effects of tax allowances and tax credits are complex and often unanticipated. In particular, tax allowances and tax credits may interact among themselves as well as with the wider tax-benefit system such as in the case of France where tax allowances induce not only reduced government revenues but also increases spending on some income-tested benefits. As such, reforming them to achieve redistributive objectives may prove particularly problematic, even abstracting from any behavioural effects.

In addition to interactions, the complexity behind the operation of tax allowances and tax credits is also apparent in the fact that their particular design appears to matter little for redistribution. To a large extent, other features of the personal income tax system and/or population characteristics shape their final redistributive impact. This pattern is very clear when we look at the redistributive effect of tax allowances and tax credits in our four separate categories. Despite instruments in the same category being very similar in design, the redistributive impact varies a lot across countries. Thus, with very few exceptions (such as income tested refundable tax credits), instrument design on its own offers little guidance as to the likely redistributive impact.

In some cases, tax allowances and tax credits can be strongly progressive (for example, general tax allowances in Denmark, income-related allowances in France). However, overall the tax system appears to be an inefficient way of targeting resources to low-income households. In particular, neither income related instruments nor instruments targeted towards vulnerable categories achieve any significant inequality reduction. In fact, in a majority of the six countries they are not progressive but proportional even thought there is some explicit or implicit targeting of low-income groups. If the redistributive potential of tax allowances and

tax credits depends on complex interactions with the exact distribution of incomes and population characteristics and/or other features of the personal income taxation system, it may be too difficult to channel resources effectively and efficiently towards low-income households. One clear exception is found in the case of refundable tax credits. They are always strongly progressive irrespective of context, especially if they are linked to income.

Finally, a few caveats should be kept in mind when interpreting our results. First, we are unable to simulate all tax credits and tax allowances existent in the income tax legislation of our six countries due to lack of data availability. As a result, estimates of size and redistributive effect of total tax allowances and tax credits are not strictly comparable[18]. Comparisons of tax instruments within categories are less likely to suffer from this problem[19]. Second, we include in our calculations only deductions from taxable income and from the initial gross liability. We do not consider other aspects of the tax system which are usually included in the tax expenditure literature such as tax-exempt income categories[20], reduced rates etc. Third, we use simulated entitlements to tax allowances and tax credits to perform our calculations and not actual claims. As a result, our findings reflect the intended rather than the actual impact of allowances and credits. Finally, we do not account for any behavioural adaptations when removing tax allowances or tax credits. In this respects, ours is a static first-round effects estimation of tax expenditure instruments.

[18] Our estimates of total foregone revenue though are relatively high implying we are capturing the better part of tax allowance and tax credit expenditure.

[19] Strictly speaking there may be interaction between out category instruments and non-simulated tax allowances and credits which we do not capture.

[20] Tax-exempt income is likely our most prominent omission; it is likely to be an important issue especially when large revenue sources such as pension income are exempt. In our six countries however, pensions are always taxable. The most important type of tax-exempt income is means-tested benefits.

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Table 1 Progressivity and redistribution indices –all tax allowances and all tax credits

	Tax allowances				Tax credits			
	Kakwani	Reynolds-Smolensky	Average tax rate	Concentration Coefficient	Kakwani	Reynolds-Smolensky	Average tax rate	Concentration Coefficient
CZ	0.3649 (.3313;-.3984)	-0.0011 (-.0012;-.0010)	-0.0028	0.6019	-0.0859 (-.0917;-.0801)	0.0056 (.0050;.0062)	-0.1109	0.1577
DE	0.1247 (.1120;.1294)	-0.0127 (-.0132;-.0122)	-0.1028	0.3802	-	-	-	-
DK	-0.0333 (-.0422;-.0246)	0.0039 (.0024;.0054)	-0.2083	0.2091	-	-	-	-
ES	0.0379 (.0337;.0420)	-0.0026 (-.0028;-.0023)	-0.0642	0.3399	-0.0878 (-.0919;-.0837)	0.0078 (.0074;.0082)	-0.1086	0.2241
FR	-0.0183 (-.0256;-.0109)	0 (-.0005; .0005)	-0.0855	0.2696	-0.1917 (-.2048;-.1785)	0.0018 (.0017;.0020)	-0.0103	0.098
IT	0.1572 (.1519;.1601)	-0.0063 (-.0064;-.0060)	-0.0395	0.4562	-0.2842 (-.2884;-.2803)	0.024 (.0237;.0243)	-0.0937	0.0463

Note: There are no tax credits in Denmark and Germany. 95% CI in parentheses.
Source: Own calculations based on EUROMOD F 6.36

Table 2: Progressivity and redistribution indices related to general tax allowances and general tax credits

	Tax Allowances			Tax credits		
	Kakwani	Rey-Smol	ATR	Kakwani	Rey-Smol	ATR
CZ				-0.0093	-0.0011	-0.0817
DK	-0.2203	0.0167	-0.08324			
DE	0.3258	-0.0005	-0.00151			
ES				-0.0272	0.0012	-0.0629

FR	-0.1750	0.0022	-0.01286			
IT						

Note: Empty cells indicate the instrument does not exist in the respective country
Source: Own calculations based on EUROMOD F6.36

Table 3 Progressivity and redistribution indices related to family tax allowances and family tax credits

	Tax Allowances			Tax credits		
	Kakwani	Rey-Smol	ATR	Kakwani	Rey-Smol	ATR
CZ				-0.2966	0.0063	-0.0247
DK	-0.4960	0.0003	-0.0007			
DE	0.4013	-0.0005	-0.0013			
ES	-0.1859	0.0020	-0.0124	-0.0437	0.0003	-0.0092
FR	-0.5006	0.0010	-0.0022			
IT				-0.4970	0.0082	-0.0172

Note: Empty cells indicate the instrument does not exist in the respective country
Source: Own calculations based on EUROMOD F6.36

Table 4: Progressivity and redistribution indices related to instruments targeting vulnerable groups

	Tax Allowances			Tax credits		
	Kakwani	Rey-Smol	ATR	Kakwani	Rey-Smol	ATR
CZ				0.1773	-2.69E-05	-0.0001
DK						
DE	0.2130	-0.0004	-0.0018			
ES	-0.0549	0.0004	-0.0091	0.0241	-0.0001	-0.0022

FR	-0.8651	0.0025	-0.0030	0.1765	-1.89E-05	-1.06E-04
IT				-0.4180	5.45E-06	-1.35E-05

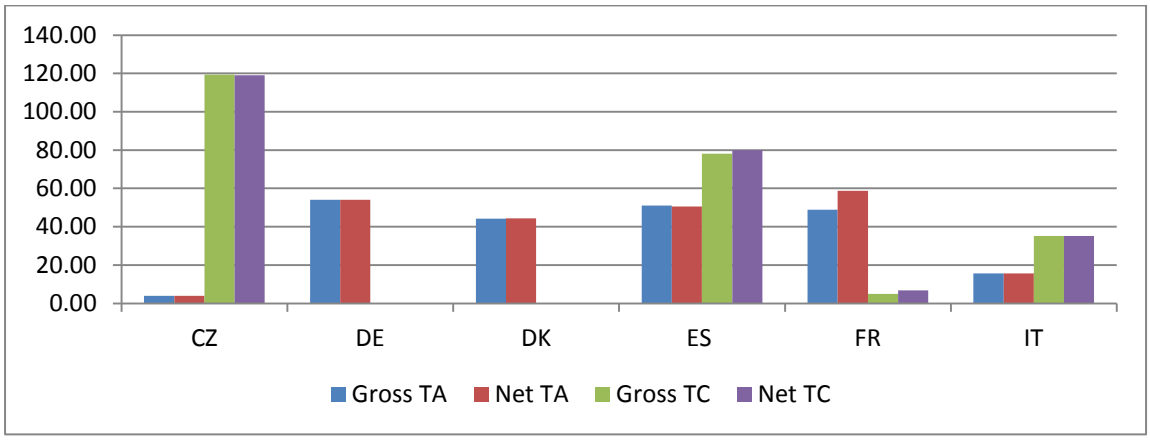
Note: Empty cells indicate the instrument does not exist in the respective country
Source: Own calculations based on EUROMOD F6.36

Table 5 Progressivity and redistribution indices related to income-tested tax allowances and income-tested tax credits

	Tax Allowances			Tax credits		
	Kakwani	Rey-Smol	ATR	Kakwani	Rey-Smol	ATR
CZ				-0.8247	0.0038	-0.0048
DK						
DE	0.4016	-0.0005	-0.0013			
ES	0.0529	-0.0019	-0.0337			
FR	-0.8651	0.0025	-0.0030	-0.6131	0.0029	-0.0048
IT	-0.1950	3.18E-06	-1.66E-05	-0.3434	0.0249	-0.0791

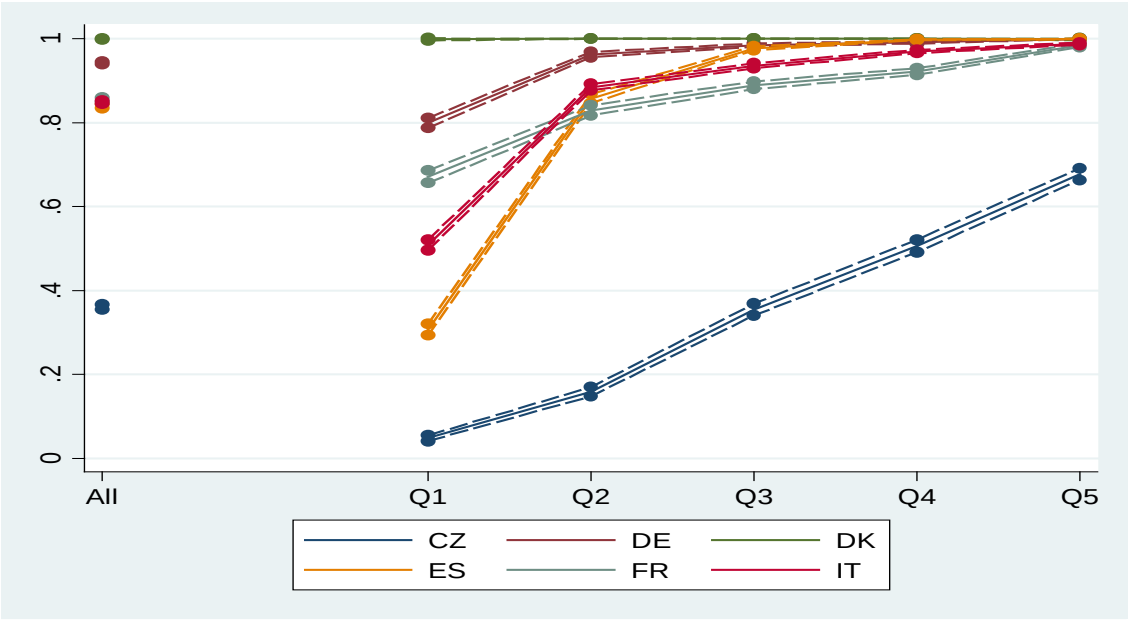
Note: Empty cells indicate the instrument does not exist in the respective country
Source: Own calculations based on EUROMOD F6.36

Figure 1: Annual total lost revenue due to tax allowances and tax credits as a % of government revenue



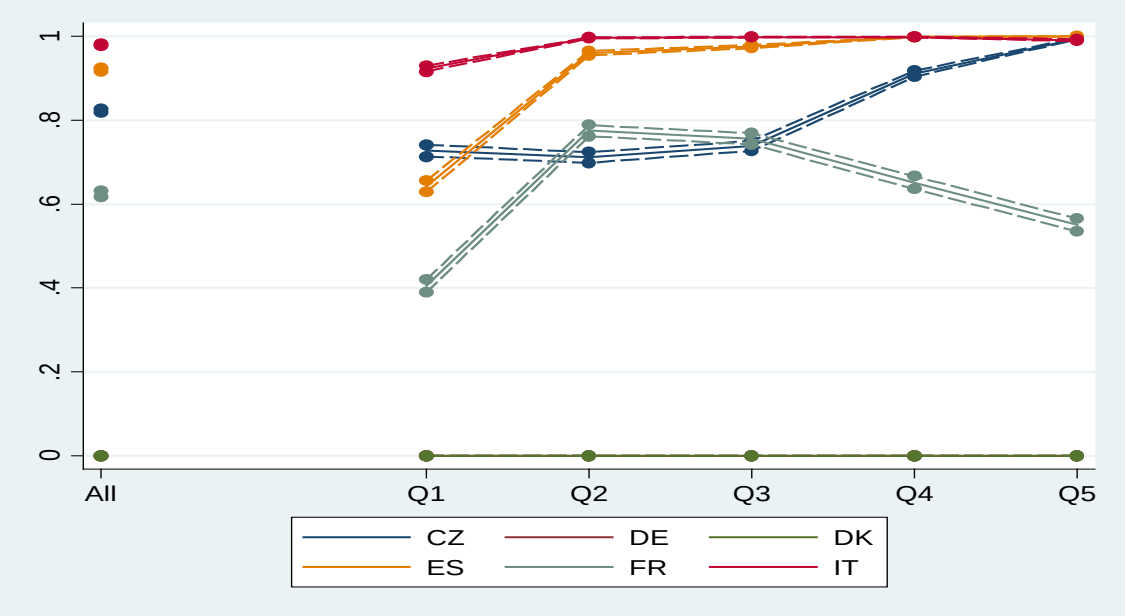
Source: Own calculations based on EUROMOD F6.36

Figure 2: Percentage of individuals in households entitled to tax allowances by quintile



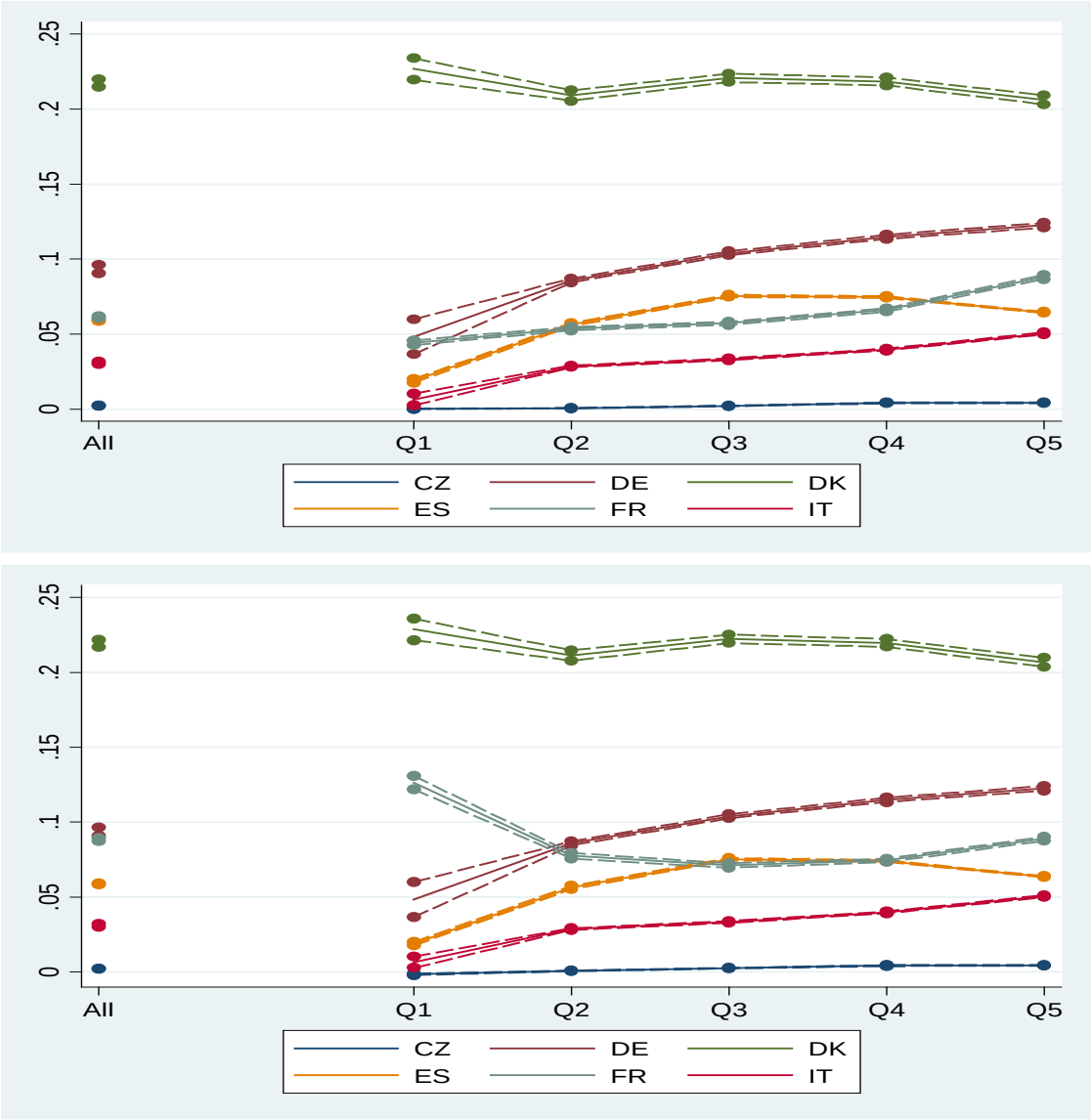
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 3: Percentage of individuals in households entitled to tax credits by quintile



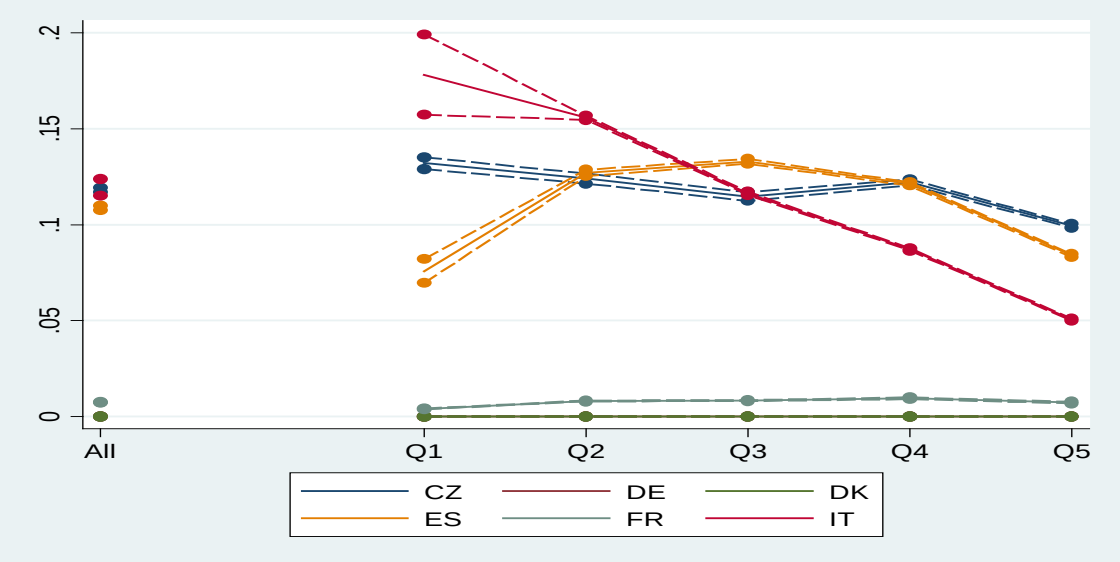
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

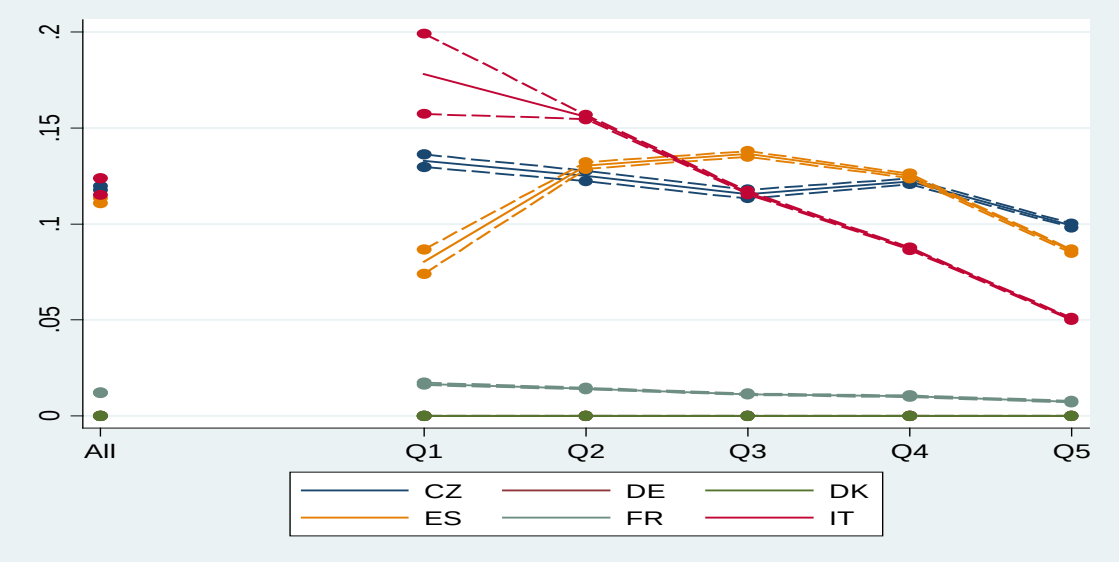
Figure 4: Average gross (top) and net (bottom) values of tax allowances as a % of rank HDI



Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

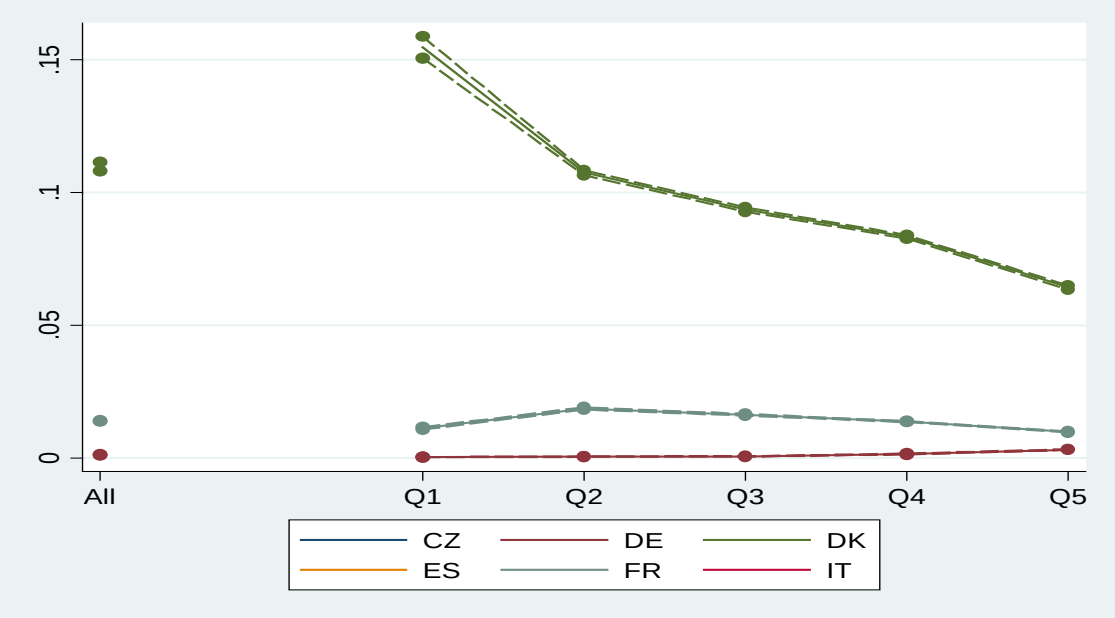
Figure 5: Average gross (top) and net (bottom) values of tax credits as a % of rank HDI





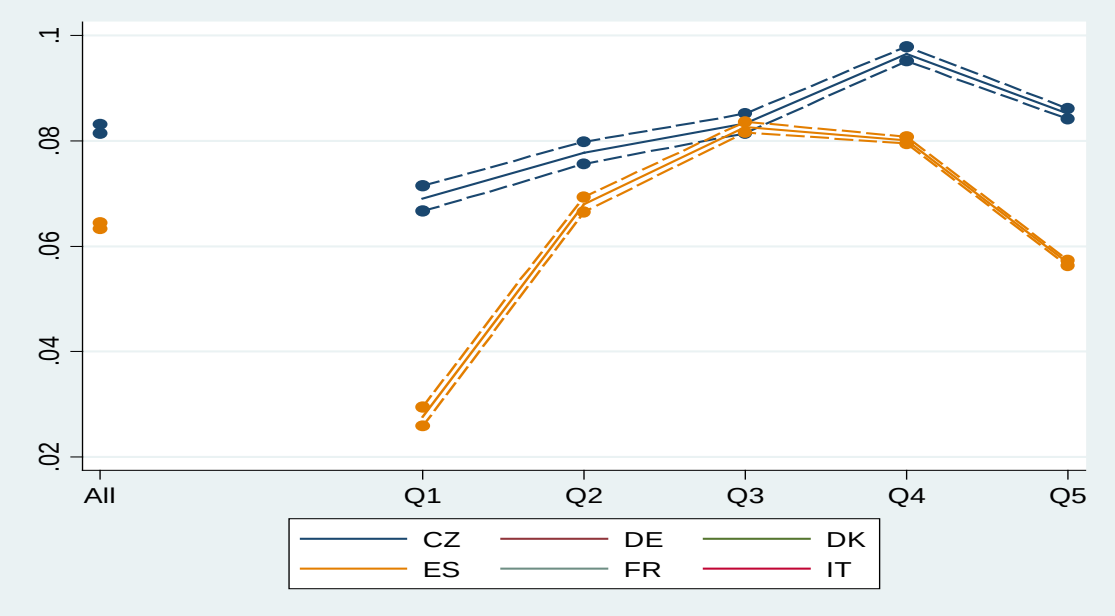
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 6: Average net value of general tax allowances as a % of rank HDI by quintile



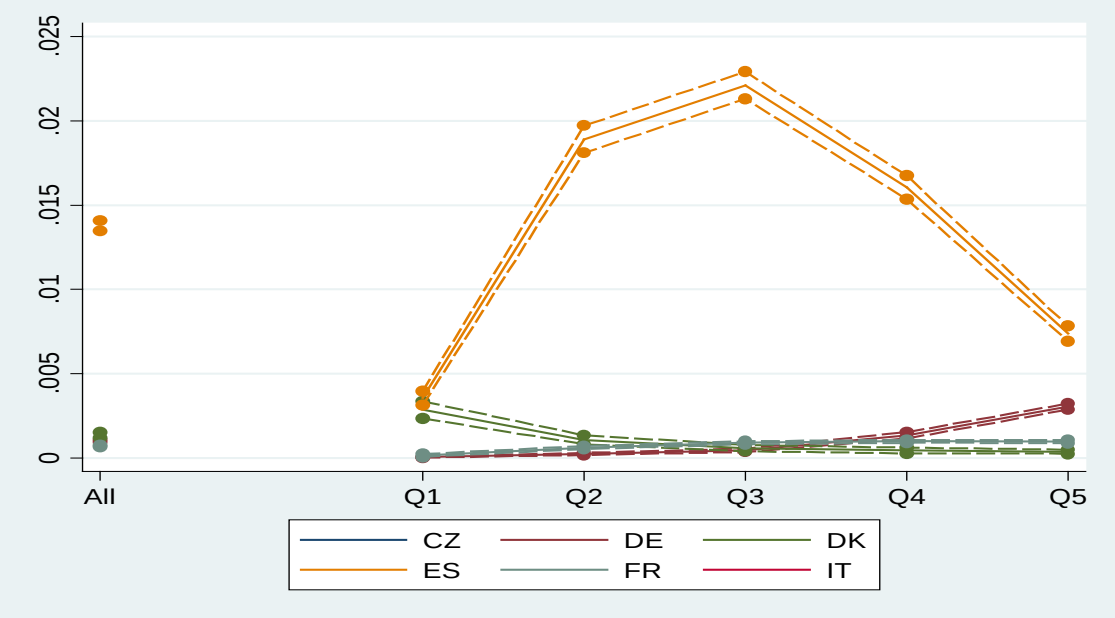
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 7: Average net value of general tax credits as a % of rank HDI by quintile



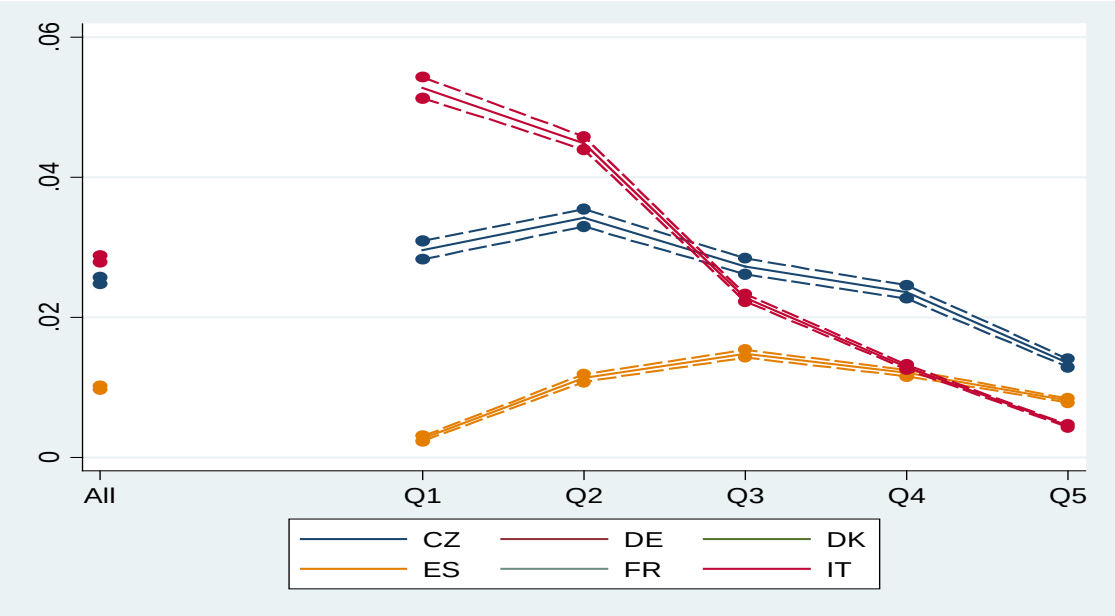
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 8: Average net value of family tax allowances as a % of rank HDI by quintile



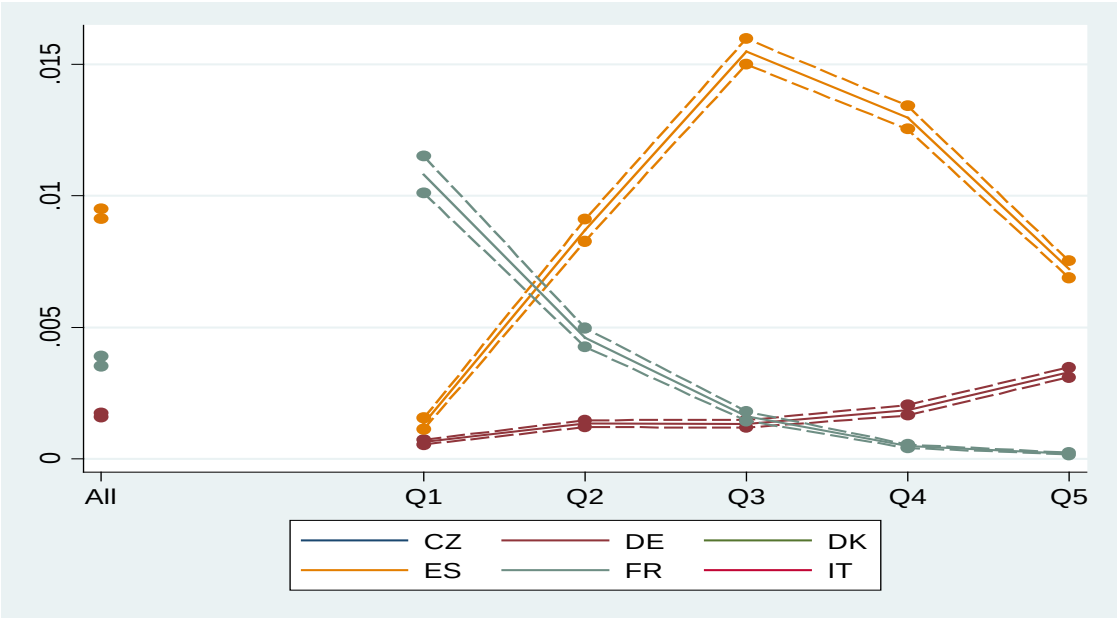
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 9: Average net value of family tax credits as a % of rank HDI by quintile



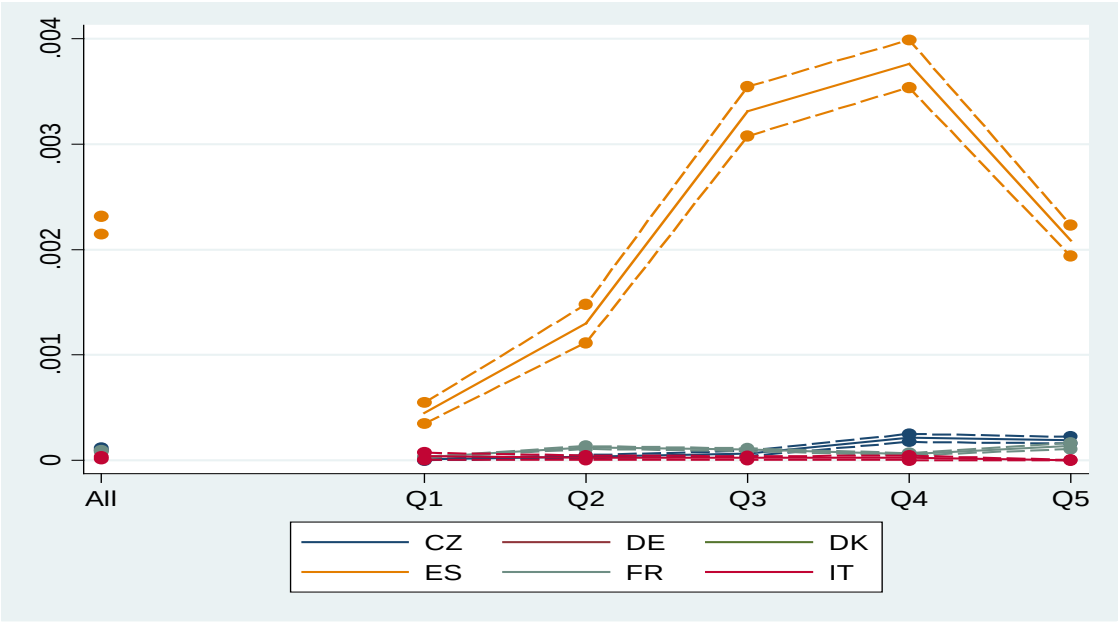
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 10: Average net value of tax allowances for vulnerable groups as a % of rank HDI by quintile



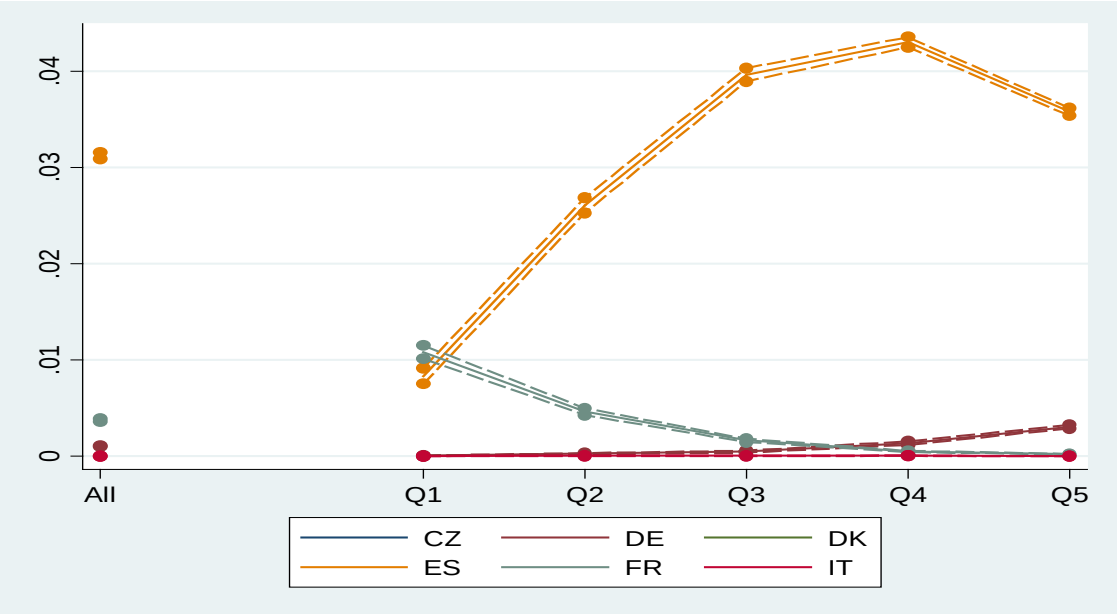
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 11: Average net value of tax credits for vulnerable groups as a % of rank HDI by quintile



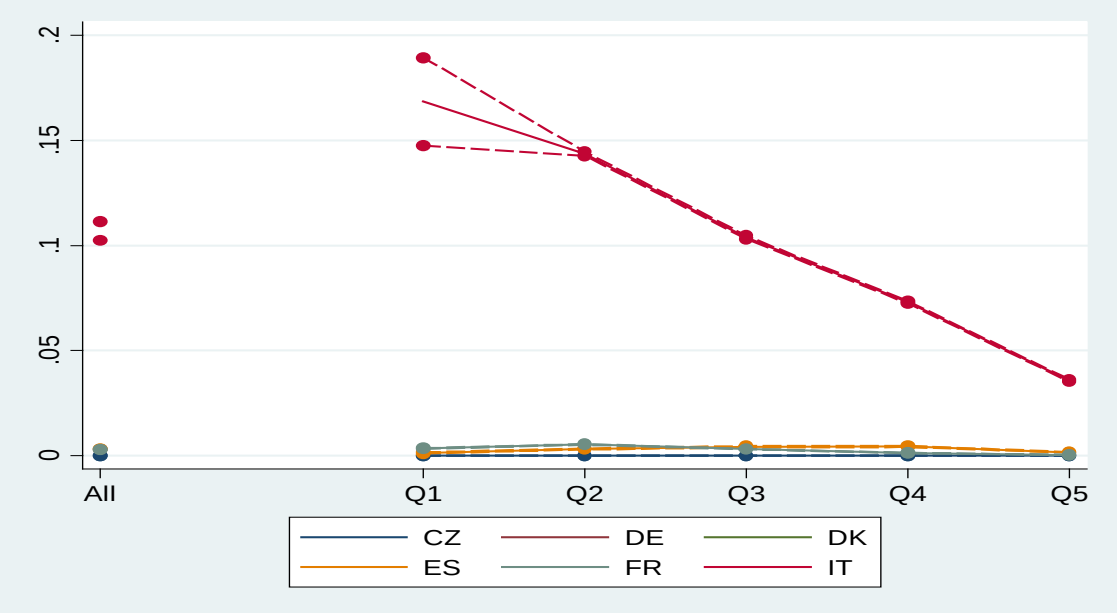
Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 12: Average value of net income related tax allowances as a % of rank HDI by quintile



Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Figure 13: Average net value of income related tax credits as a % of rank HDI by quintile



Note: Quintiles constructed based on household disposable income calculated in the absence of tax allowances; dashed lines represent 95% confidence intervals.
Source: Own calculations based on EUROMOD F6.36

Appendix 1: List of tax allowances and tax credits used in the calculations

Table A1: List of tax allowances in the Czech Republic, Denmark, Germany, France, Italy and Spain

Tax allowances	Simulated	General	Family	Vulnerable groups	Income related
Czech Republic					
Non-taxable portion of pensions	yes	no	no	no	no
Allowance for charitable donations	no	-	-	-	-
Mortgage interest re-payments	yes	no	no	no	no
Complementary pension insurance deduction	yes	no	no	no	no
Allowance on private life insurance payments	no	-	-	-	-
Allowance on labour union fees	no	-	-	-	-
Denmark					
Employee labour market contributions	yes	no	no	no	no
Self-employed labour market contributions	yes	no	no	no	no
Supplementary labour market contribution for employees	yes	no	no	no	no
Unemployment benefit contribution and early retirement benefit contributions	yes	no	no	no	no
Contributions for private pension plans	yes	no	no	no	no
Maintenance payments	yes	no	no	no	no
Earned income tax credit	yes				
General personal allowance	yes	yes	no	no	no
Unused part of spouse's general personal allowance	yes	no	yes	no	no
Negative investment income of partner	yes	no	yes	no	no
Tax allowance for investment income	yes	no	no	no	no
Mortgage interest payments	yes	no	no	no	no
Transport allowance	no	-	-	-	-
Special occupational deductions	no	-	-	-	-

Deposit on company start-ups	no	-	-	-	-
Give deductions	no	-	-	-	-
Other employee expenses above minimum threshold	no	-	-	-	-
Other allowances related to capital income	no	-	-	-	-
Germany					
Non-taxable part of income from public pensions	yes	no	no	no	no
Non-taxable part of income from private pensions	yes	no	no	no	no
Income related expenses-pension income	yes	no	no	no	no
Income related expenses-employment income	yes	no	no	no	no
Tax allowance on alimonies paid	yes	no	no	no	no
Tax allowance for high contribution pensioners	yes	no	no	no	no
Tax deduction on old-age expenses	yes	no	no	no	no
Tax allowance on other insurance contributions	yes	no	no	no	no
Deductions for agriculture and forestry	yes	no	no	no	no
Tax allowance for the elderly	yes	no	no	yes	no
Tax allowance for lone parents	yes	no	no	yes	no
Child tax allowance	yes	no	yes	no	no
Basic 0 tax band (tax free portion of taxable income)	yes	yes	no	no	no
0 rate band on capital income	yes	no	no	no	no
Deduction of other expenses	yes	no	no	no	no
Income exempted from the solidarity surcharge	yes	yes	no	no	no
Tax allowance on child-care costs, alimonies and other expenses	yes	no	no	no	no
Other deductible expenses	no	-	-	-	-
Spain					
Employee social insurance contributions	yes	no	no	no	no
Self-employed social insurance contributions	yes	no	no	no	no
Social insurance contributions paid by the unemployed	yes	no	no	no	no

Employment income tax allowance	yes	no	no	no	yes
Employment income tax allowance-supplement for older workers	yes	no	no	yes	yes
Joint taxation allowance	yes	no	yes	no	no
Tax allowance for workers who accept a job in a different city	no	-	-	-	-
France					
Employee social insurance contributions	yes	no	no	no	no
Self-employed social insurance contributions	yes	no	no	no	no
Deductible part of the CSG	yes	no	no	no	no
Tax allowances on category 1 income (Employment, sickness benefit, taxable pensions, unemployment benefit)	yes	no	no	no	no
Deductions on rent income	yes	no	no	no	no
Deductions on investment income	yes	no	no	no	no
Tax allowance for children older than 18 and dependent ascendants	yes	no	yes	no	no
Deduction of private pension contributions	yes	no	no	no	no
Tax allowance on maintenance payments	yes	no	no	no	no
Tax allowance for low-income disabled and elderly	yes	no	no	yes	yes
Basic 0 rate tax band	yes	yes	no	no	no
Exemption from paying CSG for low income pensioners	yes	no	no	yes	yes
Italy					
Employee social insurance contributions	yes	no	no	no	no
Self-employed social insurance contributions	yes	no	no	no	no
Tax allowance on paid alimonies	yes	no	no	no	no
Tax allowance for private pension contributions	yes	no	no	no	no
Tax allowance for various expenses	yes	no	no	no	no
Basic 0 rate tax band for low income tax payers in Bolzano	yes	no	no	no	yes
Non –taxable rent income	yes	no	no	no	no

Cadastral value of the main residence	yes	no	no	no	no

Source: Information on existing tax allowances and their simulation is taken from both the EUROMOD model and the corresponding Country Reports (Ochmann and Fossen 2011; Adiego, Levy et al. 2012; Ceriani, Figari et al. 2012; Kühl, Nielsen et al. 2012; Münich and Pavel 2012; Denis and Tranoy 2013)

Table A2: List of tax credits in the Czech Republic, Denmark, Germany, France, Italy and Spain

Tax credits	Simulated	General	Family	Vulnerable groups	Income related
Czech Republic					
Personal exemption	yes	yes	no	no	no
Spouse exemption	yes	no	yes	no	no
Disability exemption	yes	no	no	yes	no
Student exemption	yes	no	no	yes	no
Child tax credit (incl. refundable part)	yes	no	yes	no	no
Refundable part of child tax credit	yes	no	no	no	yes
Increased tax credit for severely disabled individuals	no	-	-	-	-
Spain[21]					
Mortgage tax credit	yes	no	no	no	no
Tax credit for renting the main residence	yes	no	no	no	yes
Personal tax credit	yes	yes	no	no	no
Child tax credit	yes	no	yes	no	no
Tax credit for dependent parents	yes	no	yes	no	no
400 euro tax credit	yes	no	no	no	yes
Tax credit for multiple births for parents satisfying certain income and number of children conditions -Andalucia	yes	no	yes	no	yes
Regional tax credit for lone parents- Andalucia	yes	no	no	yes	no
Regional tax credit for dependent parents-Andalucia	yes	no	yes	yes	no
Care it assistance to the individual tax credit-Andalucia	yes	no	no	yes	no
Regional disability tax credit-Andalucia	yes	no	no	yes	yes
Regional rent tax credit for	yes	no	no	yes	yes

[21] The working mother tax credit is de facto treated as a means-tested benefit and not included in the list of tax credits.

young taxpayers-Andalucia					
Tax credit for the birth of the 3rd or successive child-Aragon	yes	no	yes	no	no
Tax credit for the birth of the 3rd or successive child-supplement for low income families-Aragon	yes	no	yes	no	yes
Regional tax credit for the care of disabled or dependent persons -Aragon	yes	no	no	yes	yes
Regional tax credit for renting the main residence-Asturias	yes	no	no	no	yes
Regional tax credit for large families-Asturias	yes	no	no	yes	yes
Regional tax credit for lone parents-Asturias	yes	no	no	yes	yes
Regional tax credit for the self-employed-Asturias	yes	no	no	no	yes
Regional tax credit for old-age -Illes Baleares	yes	no	no	yes	yes
Regional tax credit for disability-Illes Baleares	yes	no	no	yes	yes
Regional tax credit for educational expenses -Illes Baleares	yes	no	no	no	yes
Regional rent tax credit for young taxpayers-Illes Baleares	yes	no	no	yes	yes
Regional childbirth tax credit-Canarias	yes	no	yes	no	no
Regional tax credit on child-care expenditures-Canarias	yes	no	no	no	yes
Regional tax credit for disability-Canarias	yes	no	no	yes	no
Regional large families tax credit- Canarias	yes	no	no	yes	no
Regional rent tax credit-Canarias	yes	no	no	no	yes
Regional unemployment tax credit-Canarias	yes	no	no	yes	yes
Regional tax credit for dependent children and dependent parents/ disabled-Cantabria	yes	no	yes (only parts relating to children and dependent parents)	yes (only part relating to disability and dependent parents)	yes (only part relating to disability and dependent parents)

Regional rent tax credit-Cantabria	yes	no	no	yes	yes
Regional childbirth tax credit-Castilla yLa Mancha	yes	no	yes	no	yes
Regional tax credit for dependent parents-Castilla y La Mancha	yes	no	yes	yes	yes
Regional tax credit for old-age-Castilla y La Mancha	yes	no	no	yes	no
Regional childbirth tax credit-Castilla y Leon	yes	no	yes	no	no
Regional tax credit for large families-Castilla y Leon	yes	no	yes	yes	no
Regional tax credit for child-care expenses-Castilla y Leon	yes	no	no	no	yes
Regional rent tax credit for young persons -Castilla y Leon	yes	no	no	yes	yes
Regional childbirth tax credit-Catalunya	yes	no	yes	no	no
Regional rent tax credit-Catalunya	yes	no	no	yes	yes
Regional mortgage tax credit-Catalunya	yes	no	no	yes (supplemental amount for young people, disabled and unemployed)	yes (supplemental amount for young people, disabled and unemployed)
Regional rent tax credit-Extremadura	yes	no	no	yes	yes
Regional employment tax credit- Extremadura	yes	no	no	no	yes
Regional childbirth and young children tax credit-Galicia	yes	no	yes	no	yes (only income tested-part)
Regional tax credit for large families-Galicia	yes	no	no	yes	no
Regional tax credit for child care expenses- Galicia	yes	no	no	no	yes
Regional rent tax credit for young taxpayers-Galicia	yes	no	no	yes	yes
Regional childbirth credit - Madrid	yes	no	yes	no	yes
Regional rent tax credit for young persons-Madrid	yes	no	no	yes	yes

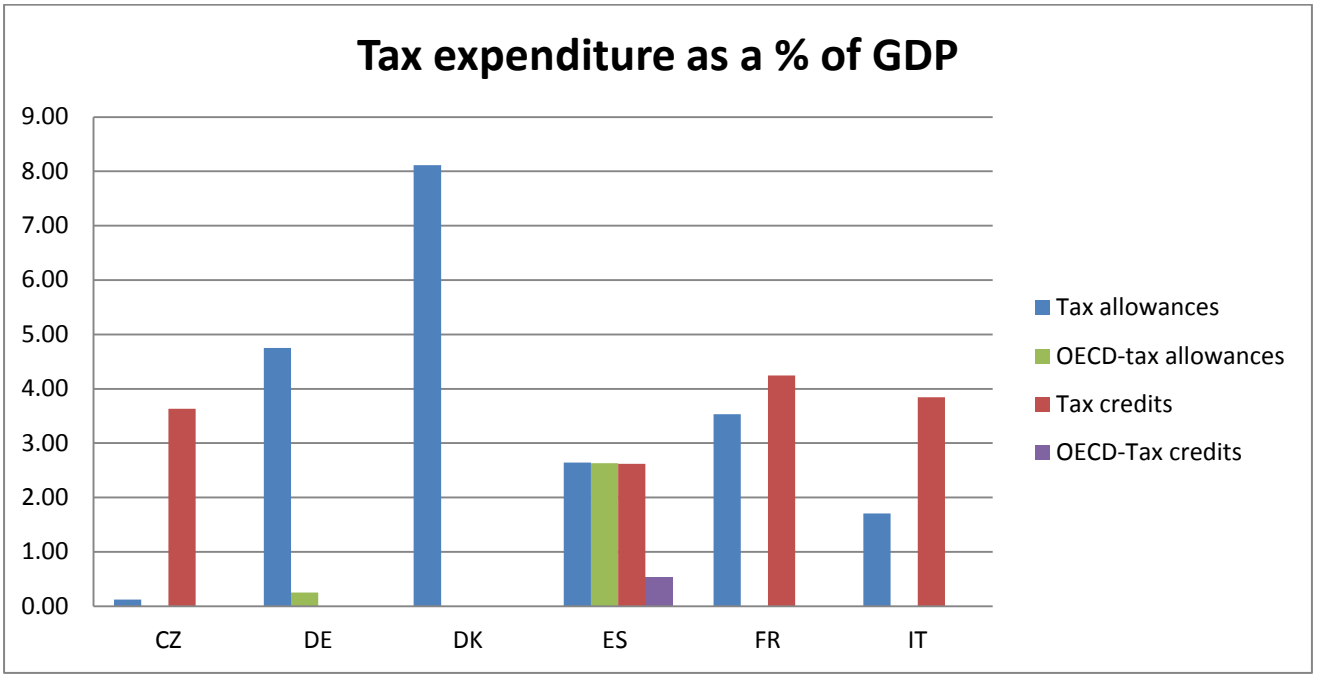
Regional tax credit for low income families with children-Madrid	yes	no	no	yes	yes
Regional tax credit for child care expenses- Murcia	yes	no	no	no	yes
Regional childbirth tax credit-Rioja	yes	no	yes	no	no
Regional childbirth tax credit-Valencia	yes	no	yes	no	yes
Regional tax credit for multiple births-Valencia	yes	no	yes	no	no
Regional tax credit for large families-Valencia	yes	no	no	yes	no
Regional tax credit for old-age and disability-Valencia	yes	no	no	yes	no
Regional housework tax credit-Valencia	yes	no	no	no	yes
Regional tax credit for childcare expenses-Valencia	yes	no	no	no	yes
Regional tax credit for dependent parents-Valenc	yes	no	yes	yes	yes
Regional working mother tax credit-Valencia	yes	no	no	no	no
Regional rent tax credit-Valencia-	yes	no	no	yes (supplement for young or disabled taxpayers)	yes
Regional tax credit low income families with children -Valencia	yes	no	yes	no	yes
Tax credits for charitable donations	no	-	-	-	-
Special tax credits in Ceuta and Melilla	no	-	-	-	-
Domestic help tax credit - Andalucia	no	-	-	-	-
Fostering self-employment tax credit-Andalucia	no	-	-	-	-
Tax credit for cohabiting dependent elderly over 65-Asturias	no	-	-	-	-
Fostering self-employment for females and young individuals - Asturias	no	-	-	-	-
Child adoption tax credit -Illes Baleares	no	-	-	-	-
Fostering self-employment – tax credit Illes Baleares	no	-	-	-	-
Expenditures on child's studies	no	-	-	-	-

out of the residence island tax credit -Canarias					
Mortgage cost increase tax credit-Canarias	no	-	-	-	-
Disability tax credit -Castilla-La Mancha	no	-	-	-	-
Children or parents' disability tax credit -Castilla- La Mancha	no	-	-	-	-
Elderly and disabled taxpayers with caring needs tax credit - Castilla y Leon	no	-	-	-	-
Death of partner tax credit - Catalunya	no	-	-	-	-
Disabled family members care tax credit -Extremadura	no	-	-	-	-
Disabled taxpayers over 65 with care needs tax credit -Galicia	no	-	-	-	-
Fostering self-employment tax credit-Galicia	no	-	-	-	-
Hosting of non-family elderly or disabled individuals tax credit - Madrid	no	-	-	-	-
Child hosting tax credit -Madrid	no	-	-	-	-
Mortgage cost increase tax credit Madrid	no	-	-	-	-
For educational expenses - Madrid	no	-	-	-	-
Fostering self-employment for youth -Madrid	no	-	-	-	-
Disabled child's birth or adoption tax credit -Valencia	no	-	-	-	-
Renting housing for activities in different municipalities' tax credit -Valencia	no	-	-	-	-
Mortgage cost increase tax credit -Valencia	no	-	-	-	-
Public benefits towards maternity tax credit-Valencia	no	-	-	-	-
France					
Tax rebate (Decote)	yes	no	no	no	yes
Tax credit for child care expenses	yes	no	no	no	no
Tax credit on educational expenses	yes	no	no	no	no
Tax credit on mortgage interest expenses	yes	no	no	no	no
Complementary reduction for disabled persons affected by IMAX	yes	no	no	yes	no

Low-earners refundable tax credit	yes	no	no	no	yes
Tax credit for green investments	no	-	-	-	-
Tax credit for employment services	no	-	-	-	-
Italy					
Personal tax credit-employment	yes	no	no	no	yes
Personal tax credit-self-employment	yes	no	no	no	yes
Personal tax credit-pensions	yes	no	no	no	yes
Mortgage interest tax credit	yes	no	no	no	no
Education expenses tax credit	yes	no	no	no	no
Health expenses tax credit	yes	no	no	no	no
Charity donations tax credit	yes	no	no	no	no
Other expenses tax credit	yes	no	no	no	no
Building and refurbishing tax credit	yes	no	no	no	no
Life insurance premium credit	yes	no	no	no	no
Funeral expenses tax credit	yes	no	no	no	no
Tax credit on low pensions	yes	no	no	yes	yes
Dependent spouse tax credit	yes	no	yes	no	yes
Dependent parent tax credit	yes	no	yes	no	yes
Child tax credit	yes	no	yes	no	yes
Additional tax credit for the lone parent	yes	no	no	yes	no
Compensation on the child tax credit to the other spouse	yes	no	yes	no	no
Tax credit for tenants subject to controlled rent	no	-	-	-	-
Tax credit for employees relocating closer to work	no	-	-	-	-
Tax credit on energy conservation expenses	no	-	-	-	-

Source: Information on existing tax credits and their simulation is taken from both the EUROMOD model and the corresponding Country Reports (Ochmann and Fossen 2011; Adiego, Levy et al. 2012; Ceriani, Figari et al. 2012; Kühl, Nielsen et al. 2012; Münich and Pavel 2012; Denis and Tranoy 2013)

Appendix 2: Comparison of EUROMOD and OECD estimates of total tax expenditure



Note: Figures for EUROMOD relate to 2010 in all countries; OECD figures refer to 2008 for Germany and 2009 for Spain; in EUROMOD, revenue lost due to tax allowances and tax credits has been calculated using the definitions in section 2.
Source: Own calculations using EUROMOD 6.36 and (OECD 2010).