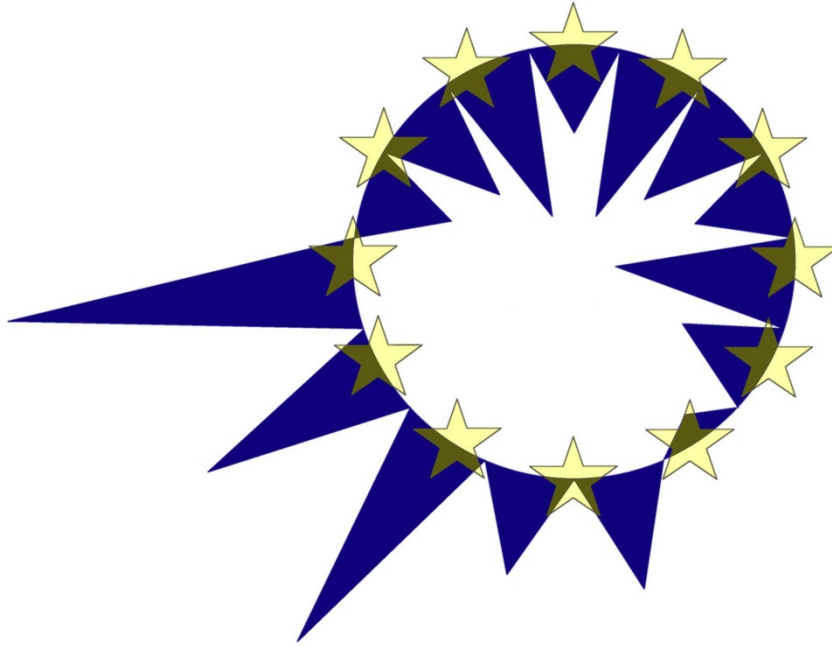


EUROMOD

WORKING PAPER SERIES



EUROMOD Working Paper No. EM 9/14

The effect of tax-benefit changes on the income distribution in EU countries since the beginning of the economic crisis

Paola De Agostini
Alari Paulus
Holly Sutherland
Iva Tasseva

May 2014

The effect of tax-benefit changes on the income distribution in EU countries since the beginning of the economic crisis¹

Paola De Agostini, Alari Paulus, Holly Sutherland and Iva Tasseva

ISER, University of Essex

Abstract

We compare the distributional effects of policy changes introduced in the period 2008-2013 in twelve EU countries using the EU microsimulation model EUROMOD. The countries, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Latvia, Lithuania, Portugal, Romania and the UK, chose different policy mixes to achieve varying degrees of fiscal consolidation or expansion. We find that comparisons of the size and distributional effects of policy changes over time are sensitive to the counterfactual assumption that is adopted in adjusting 2008 policies for changes in prices and incomes over the period. Nevertheless, it is clear that the direct tax, public pension and cash benefit changes had broadly progressive effects across the pre-policy change income distributions, except in Germany, Estonia and Lithuania. Including increases in VAT alters the comparative picture by making the policy packages appear more regressive, to varying extents. The paper also explores the implications of the policy changes for measures of risk of poverty and examines the incidence of the changes by age.

JEL Classification: C81, H55, I3

Keywords: Tax-benefit policy reform, European Union, Income distribution, Microsimulation.

Corresponding author: Holly Sutherland, hollys@essex.ac.uk

¹ This work was financed by the European Commission, Directorate General for Employment, Social Affairs and Inclusion through the Social Situation Monitor and this paper is also published as Social Situation Monitor Research Note 2/2013. This paper uses EUROMOD version G1.4. We acknowledge the contribution of all past and current members of the EUROMOD consortium. 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]. For Germany, Ireland, France, Latvia, Lithuania, Portugal and Romania we make use of microdata from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat under contract EU-SILC/2011/55; for Estonia, Greece, Spain and Italy the national EU-SILC “PDB” data made available by respective national statistical offices; and for the UK Family Resources Survey data made available by the Department of Work and Pensions via the UK Data Archive. We would also like to thank Silvia Avram, Francesco Figari, Xavier Jara, Sean Lyons, Chrysa Leventi, Jekaterina Navicke and Olga Rastrigina for advice and assistance. The authors alone are responsible for the analysis and interpretation of the data reported here.

1. Introduction

Many EU countries have carried out substantial fiscal policy reforms since the economic crisis started in 2008, often aimed to achieve fiscal consolidation, along with more regular type of changes to keep tax-benefit systems in line with price and wage developments. Every policy change has distributional implications and it is important to assess these to ensure their consistency with broader distributional goals.

In this paper we examine the direct effects of fiscal policy changes on household incomes in the period since the beginning of the economic crisis and up to 2013, from a comparative perspective. We focus on tax-benefit policy changes, leaving aside the potentially larger effects on income distribution from labour market developments and financial, macroeconomic and political upheaval and on inequalities more generally from cuts in spending on public services.² We compare the size and distributional effects of direct personal tax and cash benefit changes in twelve EU countries: Germany, Estonia, Ireland, Greece, Spain, France, Italy, Latvia, Lithuania, Portugal, Romania and the United Kingdom. The paper updates a similar analysis carried out in Avram et al. (2012), extending the country coverage and focusing on all tax-benefit changes (rather than those intended to reduce government deficits), as well as adding some new features to the analysis.³

The countries covered provide a cross-cutting picture of how different European countries have fared through the crisis: they include some countries still in crisis (Greece, Spain, Italy, Portugal), some that by 2013 are in recovery (Estonia, Latvia, Lithuania, Romania), others where the recovery is still fragile (Ireland, UK) and some that have been less affected by crisis in the period in question (France and Germany). According to Eurostat statistics, Greece is the only EU country with the economy shrinking throughout the period having lost a total of 23% of its GDP since 2008, followed by other Southern European countries and Latvia (with a total loss of between 6.5% and 7.5%).⁴ While the crisis initially hit the three Baltic countries especially hard, with their economies contracting by between 14% and 18% in 2009, they have also been among the quickest to recover though only Estonia's real GDP has exceeded the 2008 level by 2013. The only other two countries among the twelve which experienced GDP growth on the whole in this period are France and Germany. Furthermore, while the level of unemployment is decreasing again in all three Baltic States, it is still much higher than before the crisis, having increased threefold in the period 2008-2010. Based on the change in percentage points, unemployment has increased the most and still keeps rising in Greece and Spain, having reached about 25% in 2012. Other countries with high unemployment include Portugal and Ireland (about 15% in 2012). On the other hand, Germany is the only country in the EU where unemployment in 2012 (less than 6%) was lower than in 2008.

² Other studies are attempting to explore some of these complex issues at the national level – for example see Jenkins et al. (2013) for a number of country case studies including Ireland, Italy and the UK, and Matsaganis and Leventi (2013) for Greece.

³ Furthermore, Appendix 1 considers the effect of policy changes that have been implemented since 2012 by comparing the distributional effects of policies 2008-2012 (from Avram et al., 2012) with those for 2008-2013.

⁴ The analysis here draws on the latest annual macro-economic data available at the time of writing. See Eurostat database, Real GDP growth rate – volume (indicator: tec00115), Unemployment rate by sex and age groups (indicator: une_rt_a), and General government deficit and surplus (indicator: teina200).

The most relevant macro-economic statistics for the context of this paper are the dynamics of public deficit. With the only exception of Germany, the countries we consider had the largest public deficits in the EU in 2008 (together with Hungary, Poland and Malta). Equally significant is that ten of them were among those in the EU where the increase in the level of public deficit from 2008 to 2012 was the most constrained, or even decreased, with Latvia, Romania and Estonia showing the highest decline (by between 2.7 and 2.9 percentage points). This list also includes Ireland which experienced a record deficit in 2010 (30%). Only Spain and Portugal are distinct from the rest with their public deficit increasing notably in this period, by 6.1 and 2.8 percentage points, respectively. As a result, the sample of countries has become quite heterogeneous with Spain, Greece and Ireland (still) having the highest deficits in the EU in 2012 (between 8% and 11%) and Estonia and Germany the smallest (around zero).

The degree of deficit reduction that these twelve governments aimed to achieve, along with other policy goals, naturally varied, and so did the policy mix implemented in this period. Our analysis addresses the question of how reforms to direct personal taxes and cash benefits affected different income groups and types of household, and how they impacted on risk of poverty. We also consider the incidence of increases in VAT across the household income distribution.

The structure of this paper is as follows. Section 2 discusses the underlying data and methodological framework, including a brief description of EUROMOD, the EU tax-benefit microsimulation model. Section 3 assesses the aggregate size (and direction) of the budgetary effect using three different assumptions about the indexation of policy parameters in the counterfactual scenarios. Section 4 presents an analysis of the distributional effects of the measures in the twelve countries and section 5 shows how the different policy mixes each have their own distributional implications. Section 6 examines which types of households gained or lost the most, focussing particularly on redistribution between children and the elderly and section 7 discusses the implications of the policy changes for risk-of-poverty indicators. Section 8 departs from the main focus on the components of household income and considers the incidence of changes in VAT across the income distribution. Section 9 sensitivity-tests the results for the effects across the income distribution by using the 2013 income distribution to rank households, rather than the pre-reform distribution. Section 10 concludes by summarising our policy relevant findings and by explaining the caveats to be adopted when interpreting them.

2. Methodology

In this analysis we compare policy scenarios while keeping the main characteristics of the population constant. In doing so we focus on the (static) effect of the policy changes alone, separately from other effects such as changes in the labour market, in the level and distribution of market incomes, in behavioural responses to the policy changes or in household composition and demographic characteristics. We start this section by first describing the underlying micro data used in the analysis. Then we discuss the different policy scenarios and explain the adopted methodology for calculating the policy changes. Lastly, we describe the tax-benefit microsimulation model EUROMOD used to calculate household disposable income under the different policy scenarios.

2.1 Data and population characteristics

This analysis is based on micro-data from the Eurostat and national versions of the European Union Statistics on Income and Living Conditions (EU-SILC) and the Family Resources Survey (FRS) for the UK. The data are a representative sample of each national population. They are collected in 2010 and include income data from 2009 – see Table 1.⁵ Market incomes are updated from the data year to 2013 using appropriate indexes (U) for each income source and with as much detail as possible (e.g. to disaggregate earnings by sector or other relevant sub-division where information is available).⁶

With these adjustments income levels (and to the extent possible, distributions) reflect changes between the data year and 2013, though other characteristics relating to demographics, household composition and the labour market reflect the situation as captured by the data. Avram et al. (2012) examined the sensitivity of the effect of policy changes across the income distribution to modelled changes in the labour market (2007-12) and found that the distributional results were broadly the same. In this paper we do not make adjustments to labour market or other characteristics. But in contrast to Avram et al. (2012) who use pre-crisis, 2007 income data, the data used in this paper capture major changes to the income distribution and labour market as a consequence of the first phase of the crisis (see section 1 for a description of the macroeconomic changes in the period). Furthermore, Latvia, Lithuania and Romania experienced large waves of emigration between 2007 and 2012 causing the total population to drop, while in Ireland and Spain net migration was positive and well above the EU average over the period.⁷ As not only the economic conditions but also the demography in the countries have changed, the data used in this paper represent more accurately the population structure and economic environment in the period 2008-2013 and is preferred over previous data used in other studies.

Table 1: Summary of input datasets

Country		Input dataset	Income reference period
Germany	DE	EU-SILC 2010	2009 (annual)
Estonia	EE	National SILC 2010	2009 (annual)
Ireland	IE	EU-SILC 2010	2009 (annual)
Greece	EL	National SILC 2010	2009 (annual)
Spain	ES	National SILC 2010	2009 (annual)
France	FR	EU-SILC 2010	2009 (annual)
Italy	IT	National SILC 2010	2009 (annual)
Latvia	LV	EU-SILC 2010	2009 (annual)
Lithuania	LT	EU-SILC 2010	2009 (annual)
Portugal	PT	EU-SILC 2010	2009 (annual)
Romania	RO	EU-SILC 2010	2009 (annual)
UK	UK	FRS 2009/10	2009/10 (monthly)

⁵ For the UK the data and incomes refer to the financial year 2009-10.

⁶ See the EUROMOD Country Reports for more information on how this is done. <https://www.iser.essex.ac.uk/euromod/resources-for-euromod-users/country-reports>

⁷ See Eurostat database, Crude rate of population change (indicator: tps00006) and Crude rate of net migration plus adjustment (indicator: tsdde230).

2.2 Policy scenarios and policy effect

Our aim is to assess the effects of policy changes between 2008 and 2013. The 2008 tax-benefit system relates to the period before the start of the financial and economic crisis in most European countries, and the 2013 policy system is the most recent operating in each country at the time of this study. We focus on tax-benefit policy changes which directly affect the income distribution, i.e. changes in personal direct taxation, social insurance contributions, and public pensions and other cash benefits.

In formal terms, following Bargain and Callan (2010), we define total change in household disposable income between a starting and an end period (respectively 0 and 1) as follows:

$$\Delta = d_1(p_1, y_1) - d_0(p_0, y_0)$$

where y represents gross market income (and population characteristics), d the structure of the tax-benefit system that transforms gross market incomes and household characteristics into disposable income, and p the policy parameters of the tax-benefit system (with monetary values).

As Bargain and Callan (2010) explain in detail, total changes can be decomposed into the effects of policy changes and changes in the characteristics of the population (e.g. demography and labour supply). While the *actual* total effect can be only estimated once micro-data become available both for the start and the end period, it is possible to assess the policy effects conditional on household characteristics in a given point in time, using a single dataset. In this paper, we only estimate the effects of policy changes with market incomes (y) constant at 2013 levels. Thus, the change in household disposable income due to the policy reforms (the so called “policy effect”) between 2008 and 2013 is

$$\Delta_p = d_{2013}(p_{2013}, U_{2013}y_{2009}) - d_{2008}(\alpha p_{2008}, U_{2013}y_{2009})$$

where the first term is the 2013 “baseline” scenario, i.e. 2013 policy rules applied to market incomes (updated to the 2013 levels), and the second term is the counterfactual scenario with the 2008 policy rules applied to the same market incomes. Furthermore, the monetary parameters p (e.g. benefit amounts and tax thresholds) of the 2008 system are indexed with a factor α to bring them to “2013 levels”. In both cases, the 2009 market incomes are updated using a vector of indices (U), with as much detail as possible for each income source.

The choice of α is crucial and we consider three different approaches:⁸

- $\alpha_1 = MII$ (Market Income Index) where all tax thresholds and benefit levels are indexed with the growth of average market income.
- $\alpha_2 = CPI$ (Consumer Price Index) where all tax thresholds and benefit levels are indexed in line with the inflation.

⁸ Close alternatives to MII would be changes in the wage level and nominal GDP, as used e.g. in Callan et al. (2007) and Clark and Leicester (2004), respectively. A further possible assumption, used in Avram et al. (2012), is to index the pre-crisis policy regime according to existing national practice. However, because this differs across countries and is hard to establish in some of them, we do not do this in the current paper.

- $\alpha_3 = 1$ where no indexation applies to the monetary amounts of the starting period. This corresponds to existing practice in some countries where no statutory indexation of monetary policy parameters is in place.

In other words, our three counterfactual scenarios describe household disposable income as if the 2008 tax-benefit system was applied to 2013 market incomes, with parameters adjusted respectively by changes in average income, changes in the cost of living or not adjusted at all.

We adopt each of these assumptions about indexing 2008 policies in turn and, comparing them with the actual 2013 system, we examine the effect of policy changes over the period 2008-2013 relative to market income (i.e. mainly wage) growth (α_1), in real terms (α_2) as well as in nominal terms (α_3). The changes that we capture include actual indexation practice, which may conform or not to one of the indexation assumptions, together with reforms to the structure of tax-benefit systems or individual taxes and benefits. As shown in section 3, due to the very different movements in prices and incomes in the countries considered over this period, the assumption about how to index the 2008 system in constructing the counterfactual makes a critical difference to the conclusions that are drawn about the aggregate scale of the policy reforms. Section 4 shows that the counterfactual indexation also affects comparisons of the distributional effects.

Bargain and Callan (2010) argue that MII-based indexation provides a ‘distributionally neutral’ benchmark, as taxes and benefits are kept in line with private incomes and hence the position of households in the income distribution would be only influenced by changes in their market income (relative to the average level) and not by policy changes. For this reason, we focus only on that scenario at some points in this paper. However, as this type of indexation not only implies an increase in benefit levels in times of economic growth but also a reduction when market incomes are falling (as they are in some countries, see below) we often consider all three counterfactuals in parallel, for comparative purposes. For further discussion, see also Hills et al. (2014). In practice, the choice of indexation is an important aspect of fiscal policy and should be explicit in the decision making process.

2.3 *The European tax-benefit model EUROMOD*

To calculate household disposable income under the different policy scenarios, our analysis makes use of EUROMOD, the EU tax-benefit microsimulation model based on information from EU-SILC and the FRS data for the UK. EUROMOD simulates cash benefit entitlements and direct personal tax and social insurance contribution liabilities on the basis of the tax-benefit rules in place and information available in the underlying datasets. Policies are those in place on June 30th in the year in question. Market incomes are taken from the data, along with information on other personal and household characteristics (e.g. age and marital status). See Sutherland and Figari (2013) for further information.

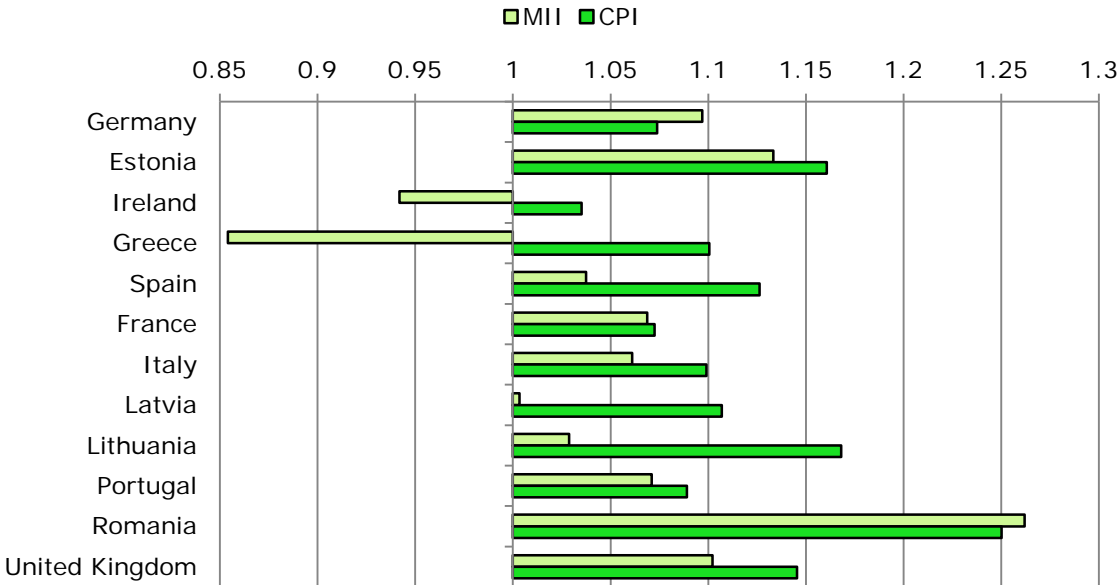
In this analysis, some adjustments are made for tax evasion (Greece, Italy) and non take-up of certain means-tested benefits (Estonia, Ireland, Spain, France, Latvia, Romania, and UK).⁹ Behaviour in these as well as other respects is assumed to be the same before and after the policy changes.

⁹ A study by Matsaganis et al. (2010) estimated that the non take-up of means-tested benefits for the elderly in two of the countries examined here (Greece and Spain) could be very extensive. There is a long history of research on non take-up in the UK (e.g. Duclos, 1995; Pudney et al., 2006).

3. The size of the policy effect 2008-2013

As noted above the turbulent economic circumstances in the period considered by this paper have resulted in widely varying changes in price and income levels across countries. Figure 1 shows the change in the Consumer Prices Index (CPI) for the period, compared with the change in average market incomes. The latter is measured using EUROMOD and the data shown in Table 1, comparing average market incomes in 2013 with those in 2008. This essentially makes use of the income updating factors in EUROMOD which adjust observed 2009 incomes back to 2008 and forward to 2013, in combination with what the SILC income data for 2009 tell us about the composition of income by source. We refer to the index of average market incomes as the Market Income Index (MII).

Figure 1: Movement in prices (CPI) and market incomes (MII) 2008-2013



Sources: EUROMOD version G1.4.

Over this 5-year period market incomes grew slowly in most of the countries and actually fell in nominal terms considerably in Greece and also in Ireland. In no country except Germany and Romania did incomes rise faster than prices. In some countries the difference between movements in prices and income is relatively small (Estonia, France, Portugal and Romania) while in others there are major differences (Spain, Latvia and Lithuania as well as Ireland and Greece). Clearly, there will be large differences in the relative cross-country effects of 2013 policies relative to those of 2008, depending on how the latter are indexed. Figure 2, which shows the budgetary effect of the policy changes according to the three alternative indexation counterfactuals, demonstrates that this indeed is the case.

First, panel (a) of Figure 2 shows the percentage change in average (equivalised) household disposable income between 2008 and 2013 due to policy changes, where 2008 policies are indexed by the growth in market incomes.¹⁰ This indicates the extent to which policy

¹⁰ The results shown throughout are based on *equivalised* household disposable income (using the modified OECD scale) to account for the economies of scale arising from the household composition. While a relative

changes maintained benefit levels and tax thresholds relative to average market incomes. In only two countries (Romania and the UK) was more being spent on tax-benefit policies in 2013 than would have been under the 2008 system if policies had kept pace with market income change.¹¹ The increases in the value of tax-benefit policies in these countries are equivalent to 0.9% and 1.3% respectively, of total household disposable income.

The largest drop in the value of tax and benefit policies, measured against the yardstick of market income is in Ireland (12.5%), followed by Greece and Portugal (6.4% each). In other countries the reduction in income due to tax-benefit changes varies between 1% and 3%. German and Lithuanian reforms had on average an almost neutral effect on income compared to the average income growth scenario.

Panels (b) and (c) show the equivalent aggregate effects using the other two counterfactual assumptions. Each of the three figures ranks countries according to the size of the aggregate effect on household incomes and the ranking differs across figures to some extent, driven by the differences in movements in prices and incomes shown in Figure 1. Panel (b) shows the effect on incomes of the 2013 system relative to 2008 policies if they had kept pace with the changes in the cost of living as measured by the CPI. Comparing panels (a) and (b), the ranking of the first four countries is preserved though Greece and Portugal show now very different results. The scale of income loss in Greece is much larger when 2013 is compared with 2008 indexed by prices rather than market income because the price level in Greece rose by 10% whereas market incomes fell by 15% (Figure 1). In contrast, the difference in indexes for Portugal is rather small (less than 2 percentage points). Lithuania is now ranked lower as the policy changes appear to do much better if the 2008 is indexed by market incomes. This is because market income growth was very low (3%), whereas inflation was much higher in the period (17%). Indeed a price-indexed 2008 system would have been more generous than the 2013 system in Lithuania, indicated by the 3.5% reduction in income in panel (b), whereas a market indexed 2008 system would have been only slightly more valuable to households than the 2013 system, indicated by the 0.1% loss in income shown in panel (a). Latvia has preserved its rank, however, the average income loss households experience between 2008 and 2013 is larger when the benchmark is CPI (2.7%) than when it is MII (0.4%). The reason is again that market incomes grew at a lower rate than prices. Germany also shows a change of sign between the two panels, in the opposite direction, while the UK shows a neutral effect with the CPI benchmark.

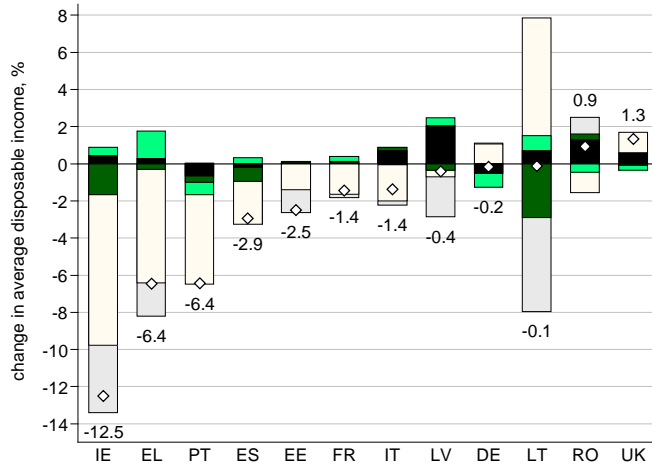
Panel (c) in Figure 2 compares 2013 policies with 2008 policies without any indexation, capturing the effect of policy changes in nominal terms. With the exception of Ireland and Greece where market incomes fell, this counterfactual makes the 2013 system seem relatively generous and in seven of the twelve countries the 2013 system results in household incomes that are higher in nominal terms than under the 2008 system. This is primarily due to increases in nominal values of public pensions (except in Greece). However, in Portugal, Spain and Latvia (in addition to Greece and Ireland) households are still worse off. Reforms cut the average nominal value of tax-benefit policies in these cases.

change in income for a *given* household does not depend on income equivalisation (as the numerator and the denominator are adjusted by the same factor), this no longer holds at the aggregate level as the equivalence scale is specific to the household. However, the differences are small.

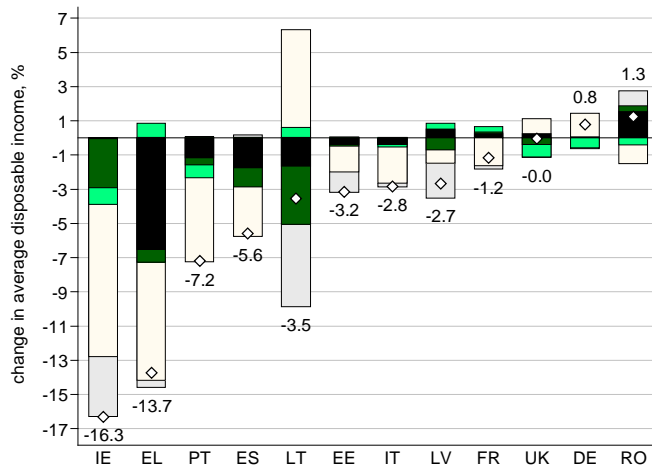
¹¹ The results for Latvia and the UK have been revised compared with earlier drafts. In the case of Latvia, the changes are quite substantial and relate to the uprating of pension incomes.

Figure 2: Aggregate effects on household disposable income of policy changes 2008-2013 under three counterfactual indexation assumptions

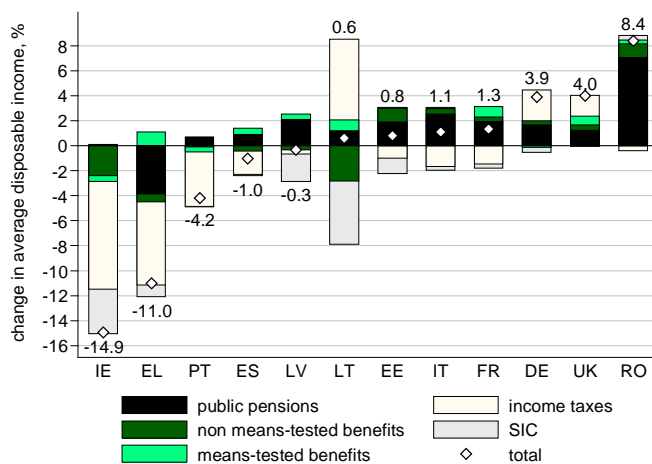
(a) MII (market incomes)



(b) CPI (prices)



(c) No indexation



Notes: Countries are ranked by the net change in average disposable income. Source: Own simulations using EUROMOD version G1.4.

Figure 2 also shows the relative importance of each type of policy measure. Comparing across countries this varies greatly, indicating that there has been no common approach. Under all scenarios, increases in income tax are important in most countries especially Ireland, Greece, Portugal and Spain and in terms of the share of the total, also in Estonia, Italy and France. Increases in social insurance contributions are important in Lithuania, Ireland, Latvia and Greece and, in terms of the share of the total, also in Estonia. Cuts in non-means tested benefits are relatively large in Lithuania and Ireland.

Of course the relative importance of the components depends on the scenario but the component that is particularly sensitive to the choice of indexation is public pensions. This is because these make up, in most countries, a large share of household incomes. Differential indexation of pensions across countries over the crisis period also contributes to variation in the importance of this component in our measures of income change (see Appendix 2). For example, under the no indexation scenario only in Greece, where pensions have been cut in nominal terms, do they contribute to the overall reduction in incomes shown in panel (c). In Latvia, Romania and UK, public pensions are uprated with a larger index than either MII or CPI alone, hence making a positive contribution to household disposable income in all scenarios. On the other hand, in Portugal and Spain, public pensions rose less than either MII or CPI causing household disposable income to drop in those scenarios. And in Lithuania and Italy, public pensions rose slightly more than MII and yet less than CPI, showing opposite effects in the two scenarios.

4. Distributional effects of policy changes 2008-13

The incidence of the policy changes across the income distribution is illustrated in Figure 3, showing the proportional change in average household disposable income by decile group. The effects are shown for each of the three counterfactual indexation assumptions. Deciles are calculated using household disposable income for each individual, equivalised with the modified OECD scale, and based on the income distribution before the policy changes, i.e. the respective 2008 counterfactual scenario. Thus, the deciles are not the same for each of the distributions shown, and the decile groups do not contain exactly the same people. In interpreting Figure 3, it is the overall shape of each curve than can be compared.¹² However, we might expect the distributional effects to be different if an alternative income measure was used for ranking. In section 9 we explore whether these results change when households are ranked on the basis of the income distribution with 2013 policies in place. The comparison suggests that different rankings do indeed alter the shape of the profiles to some extent and especially at the bottom of the distribution, though the overall story is broadly the same.

In many of the countries considered, our judgement of whether the policy changes were progressive – in the sense of “pro-poor” or a downward sloping curve (i.e. that losses are a smaller proportion of incomes at the bottom of the distribution than at the top; or that gains are a larger proportion) – is the same for each of the three counterfactual scenarios, although the degree to which this is the case may vary. In Ireland, Greece, France, Italy, Latvia, Romania and the UK the policy changes in 2008-13 had a broadly progressive impact. Except for the bottom decile group, the same can be said for Spain and Portugal. In

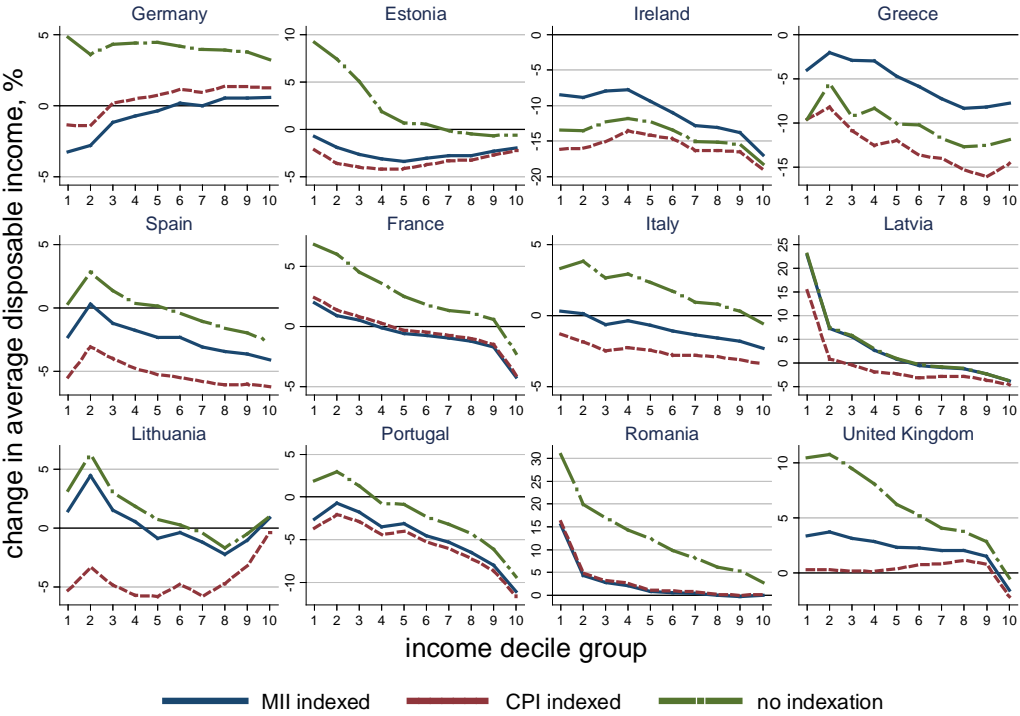
¹² Therefore, the distance between the curves for each decile group should not be used as a measure of the difference in the policy effect between the scenarios.

the remaining three countries the judgement depends on the scenario. In Germany the effect is regressive (pro-rich) if measured against the MII and CPI-indexed counterfactuals and broadly neutral if compared to the 2008 policy system in constant nominal terms. In Estonia the nominal effect is progressive but becomes U-shaped under the other scenarios. In Lithuania there is no clear gradient except that under the CPI-indexed counterfactual the policy changes appear quite strongly regressive.

In some countries the slope of the MII and CPI indexed curves differs rather little. But in Germany, Estonia, Ireland, Latvia, the UK and especially Lithuania the changes from 2008 to 2013 appear less progressive (or more regressive) when the 2008 system is indexed using prices. When the effect of policy reforms is measured in nominal terms, it appears more generous and progressive than measured with other indexation scenarios, apart from Ireland and Greece (where market incomes are falling) and Latvia (where average market incomes were stagnant comparing the beginning and end of the period).

This is equivalent to saying that failing to index benefit levels and tax thresholds by either prices or incomes tends to have a pro-rich effect. The higher the actual indexation factor the more pro-poor the effect of policy changes will be.

Figure 3: Percentage change in household disposable income due to policy changes 2008-2013 by household income decile group and counterfactual indexation assumption



Notes: Deciles are based on equivalised household disposable income in 2013 with 2008 policies in place, indexed by one of the three counterfactual indexes and are constructed using the modified OECD equivalence scale to adjust incomes for household size. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: Own simulations using EUROMOD version G1.4.

5. Which types of policy made a difference?

In this section we examine which types of policy have made a difference to the distributional effects. Figure 4 presents results only for the comparison between 2013 and 2008 policies indexed by average income growth (MII).

The previous section highlights that in most of the countries (Ireland, Greece, Spain, France, Italy, Latvia, Portugal, Romania and the UK) policy changes 2008-2013 are progressive. In general, this is achieved by different interventions.

In Estonia, Greece, Italy and Latvia increases in income taxes and social insurance contributions are proportionally fairly uniform across the income distribution, whilst in Ireland, Spain, France and Portugal they are more progressive. Indeed, they drive the progressivity of the changes as a whole in most of these countries. In Romania a cut in contributions in the bottom decile group drives the overall progressive effect.

In France the tax and contribution increases targeted on the top of the distribution are combined with benefit increases at the bottom (relative to market incomes) to produce a modestly sized progressive effect overall. Interestingly, the changes in Germany are a mirror image: tax and contribution cuts for the better off and benefit decreases for the lower income households, resulting in the overall regressive effect.

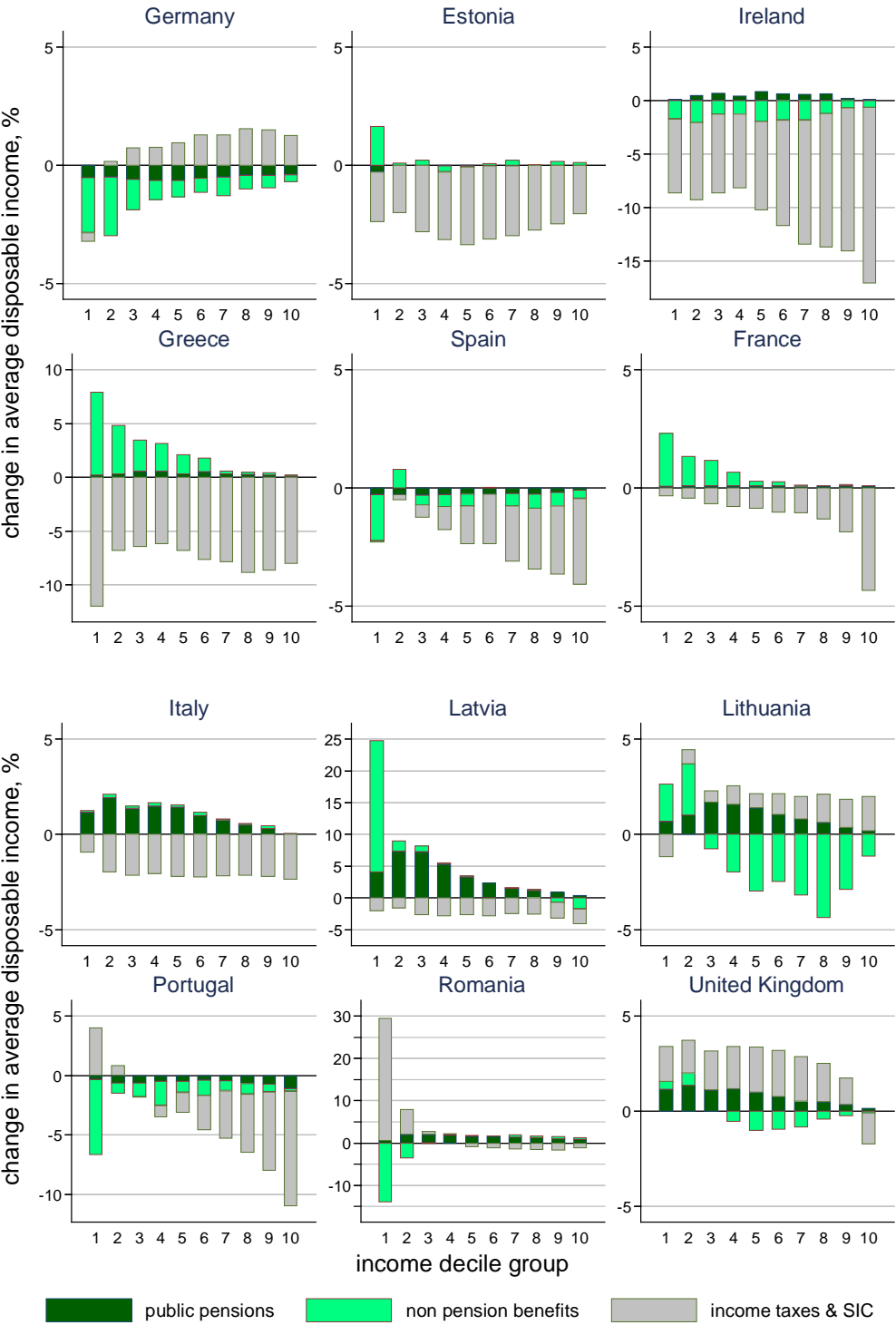
In Latvia the overall progressivity is due to a combination of benefit and pension increases (relative to market incomes which in Latvia were stagnant in the period). In Greece increase in the *relative* generosity of benefits contributes most to the progressive picture (although, as shown in Figure 2, in real and in nominal terms the value of benefits falls).

6. Which types of people were most affected?

The incidence of the effects of policy reforms by types of people is also of interest, and in particular whether younger people have been favoured over older people, or vice versa. The indexation treatment of public pensions through the crisis period has a major influence on the fiscal and distributional effects of the policy reforms as a whole in some countries. But, as shown in Figure 5, the size of this effect depends on the indexation assumption that is used to construct the counterfactual. Figure 5 plots the percentage change in average household disposable income by 5-year age groups. Note that this is calculated by assigning (equivalised) household income to each individual. For example, a household containing a baby, his mother aged 30 and her father aged 70 would appear three times in the chart in the 0-4, 30-34 and 70-74 age groups. Thus there is some smoothing of the effects of policy changes targeted on specific age groups, though Figure 5 still shows some variety in the age incidence profiles across countries and also variation according to the indexation assumption used in constructing the 2008 policy counterfactuals.

For some countries our judgement about the “age preference” implicit in the policy changes is common across counterfactual indexation scenarios. The changes are (relatively) pro-elderly in Estonia, Ireland, Latvia, Portugal and Romania. In the other countries conclusions about age preference depend on the specific scenario and in all cases this is mainly due to the effect of public pensions and the relationship between the particular assumption about the indexation of the 2008 system and the actual indexation of pensions during the period.

Figure 4: Percentage change in household disposable income due to specific policy changes 2008-2013 by household income decile group (MII counterfactual indexation assumption)



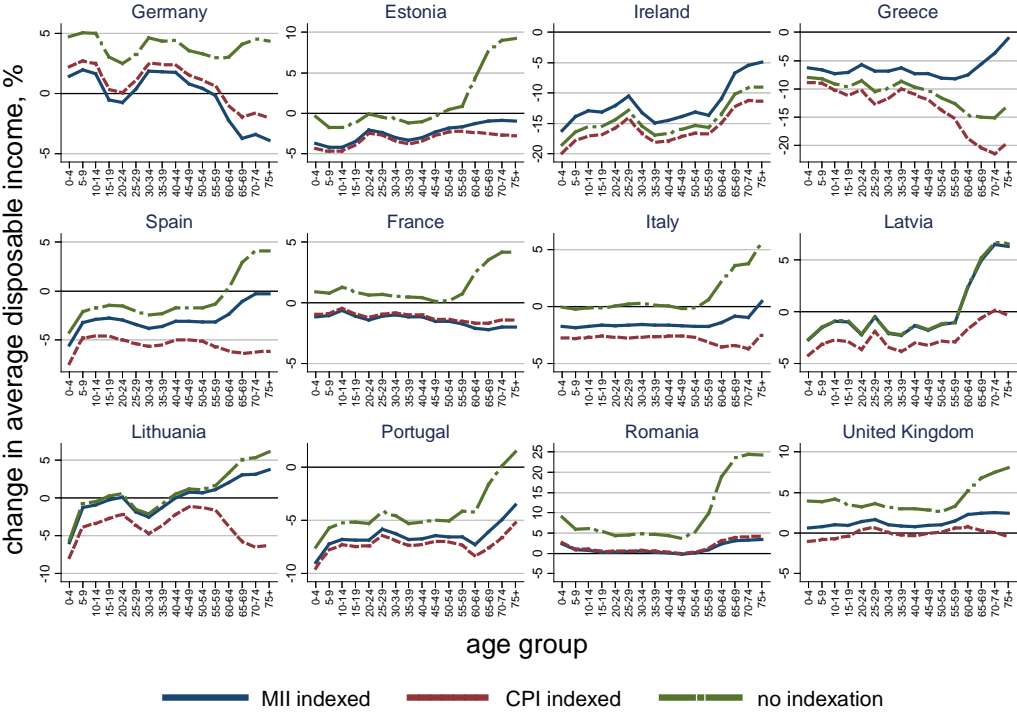
Notes: Deciles are based on equivalised household disposable income in 2013 with 2008 policies in place, indexed by market income change (MII) and are constructed using the modified OECD equivalence scale to adjust incomes for household size. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: Own simulations using EUROMOD version G1.4.

In France and the UK, where pensions were in fact indexed (see Appendix 2) the no-indexation assumption makes the changes seem pro-elderly whereas otherwise they are broadly age-neutral. In Spain and to some extent in Italy a similar point applies, although the market income updating scenario also implies a somewhat pro-elderly distribution.

In Greece the whole picture depends on the indexation assumption. In practice public pensions on average fell at about the same rate as market incomes (see Figure 2a). Assessing policy changes against (declining) market income makes them appear pro-elderly. However, measuring the effects against CPI or in nominal terms makes the actual 2013 system seem much less favourable for the older population.

In Germany, since 2010 the tax allowance on special expenses has been increased and the changes favour the middle-aged groups and their children. The introduction of a flat tax rate on capital income particularly affected the elderly, whereas children and middle-aged people benefited from the decrease in the tax liability.

Figure 5: Percentage change in household disposable income due to policy changes 2008-2013 by age group and counterfactual indexation assumption



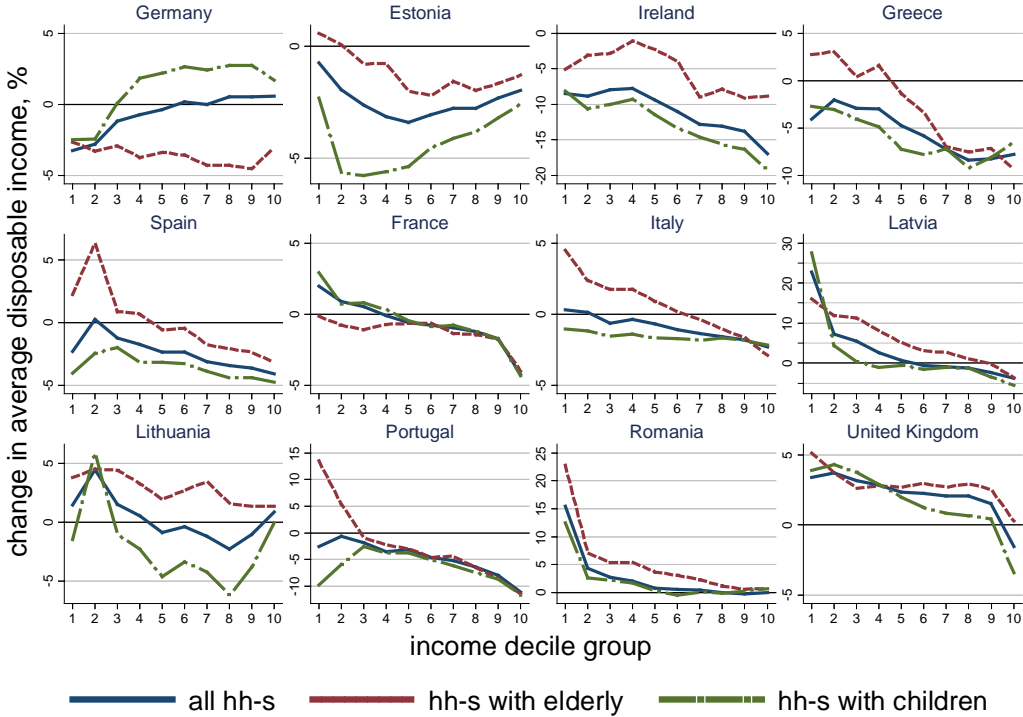
Notes: The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: Own simulations using EUROMOD version G1.4.

It is also of interest to understand how the incidence of policy changes is shared across different types of household taking account of their position in the income distribution. Figure 6 compares the proportional change in disposable income by decile group for the whole population (as in Figure 3) with that for (a) people in households with children (defined as aged under 18) and (b) people in households containing elderly people (defined

as aged 65 or more). Here we focus on the changes 2008-2013 measured against the 2008 system indexed by market incomes (MII).

There is no common pattern across countries. In some countries such as France, Romania and the UK the differences across household types are small. However, in most countries this is not the case. As we have seen the German policy changes favour households with children and Figure 6 shows that this applies across the income distribution except at the bottom. Failing to index means-tested benefits has had a negative impact on the poorest 3 income deciles. In all the other countries households with children generally lose more or gain less than households with elderly people. This is strongly the case across the whole distribution in Estonia and Ireland. It applies to the whole distribution except the top in Greece and Italy and except the top and bottom in Latvia and Lithuania. It is also the case, but mainly for the bottom, in Portugal.

Figure 6: Percentage change in household disposable income due to policy changes 2008-2013: by type of household and household income decile group (MII counterfactual indexation assumption)



Notes: Deciles are based on equivalised household disposable income in 2013 with 2008 policies in place, indexed by market income change (MII) and are constructed using the modified OECD equivalence scale to adjust incomes for household size. Children are defined as those aged under 18 and “elderly people” as those aged 65 or more. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: own simulations with EUROMOD version G1.4.

7. Implications of the policy changes for poverty indicators

The policy changes that we consider have implications for the at risk of poverty rate (AROP).¹³ If policy changes increase incomes at the bottom of the distribution by more than the median (or reduce them by less) then we would expect AROP to fall, when using a poverty threshold that moves with changes in median income. If policy changes increase incomes at the bottom by more than the rate of indexation then we expect AROP based on an “anchored” poverty line to fall.¹⁴ Conversely, if incomes at the bottom do not keep pace with the median (rising by less or falling by more) then relative AROP will rise and if they fall relative to the indexed counterfactual then anchored AROP will rise. From Figure 3 we can see that in many but not all cases we can expect relative AROP to fall and anchored AROP to rise due to the policy changes. As with the rest of the analysis in this paper, it should be remembered that we are abstracting from changes in market incomes and household composition, which would lead to additional effects. The focus here is purely on the direct effects of policy changes.

Table 3 shows the implications for both relative and anchored AROP using the each of the MII and CPI indexed counterfactual 2008 policies.

Two key comparisons are shaded in the table. Using the market income indexation counterfactual, the reduction in relative poverty risk indicates that the 2008 system is less effective at reducing risk of relative poverty than the 2013 policy system in all countries except Germany. The effect is small (less than 1 percentage point) in Estonia, Ireland, Spain, France, Italy, Lithuania and the UK, and larger in Latvia (2.5 percentage points). Using price indexation of the 2008 system, anchored poverty is moderately lower in 2013 only in Romania (1.5 pp) and in France (0.8 pp). The increase in anchored AROP is very substantial in Ireland (10.5 percentage points) and Greece (6.2 percentage points). This is because, as shown by Figure 1, prices were rising while incomes were falling in these countries in the period 2008-2013. The anchored poverty line was rising much faster than the value of policies which were falling far short of keeping pace with inflation, and even being cut in nominal terms.

Table 3 also shows the effects on AROP by age groups. Looking first at the changes in relative income (using the market income indexation counterfactual and relative AROP) the most striking effect is the large drop in relative poverty risk observed in most countries for the oldest age group (65+). This is because in most countries pensions were indexed by prices (see Appendix 2) which in this period grew faster than market incomes (see Figure 1), so the relative position of pensioners improved when measured against the market income counterfactual. In Latvia poverty risk among the elderly falls by 12.2 percentage points (from 30.7% to 18.5%, not shown in the table). The reduction is also substantial in other countries such as Estonia, Ireland, Greece, Spain and Portugal where it is more than 4 percentage points. The exceptions are France and the UK, where poverty reduction among the elderly is similar to that for the population on average and Germany, where poverty risk among the elderly as well as other age groups rises a little.

¹³ We also explored the effect of policy changes on income inequality using the Gini coefficient and found these to be relatively small, in most cases inequality reducing. The change in the Gini exceeded 1 percentage point with the MII indexation only for Ireland (-1.5 pp), Latvia (-1.8 pp) and Portugal (-1.7 pp); and with the CPI indexation for Latvia (-1.1 pp), Lithuania (+1.1 pp) and Portugal (-1.6 pp).

¹⁴ Here, the anchored poverty line is 60% of the median calculated for the corresponding 2008 counterfactual policy system.

The relative risk of poverty among working age adults (age 18-64) and children (age 0-17) tends to fall by less or rise a little, indicating that the incomes of these age groups among those close to poverty tend to move along with the median. Change in risk of poverty among children is notably different from that for the working age population in Estonia where it rises by 1.5 percentage points, Greece where it falls by 1.1 percentage points and the UK where it falls by 1.5 percentage points.

The explanations for these patterns can be found in the combination of the falling median (especially in Ireland, Greece and Portugal) in this relative income scenario with pension incomes being relatively well-protected in most countries when compared with the evolution of market incomes (see Figure 5).

As we have seen, when measuring poverty against a benchmark of the cost of living, and assessing policy effects against the 2008 system indexed for inflation, the proportion of the population falling below the poverty threshold rises in most countries. With some exceptions we see particularly large increases in risk of poverty among the elderly, which are in marked contrast with the “relative” picture in Ireland and Greece, as for the population as a whole.

We also see large increases in anchored poverty for children in Ireland (13.5 percentage points) and a larger increase than for the population as a whole in Estonia, Spain, Italy, Latvia, Lithuania and Portugal.

Table 3: The effects of policy changes 2008-2013 on At-Risk-of-Poverty (AROP) rates

		DE	EE	IE	EL	ES	FR	IT	LV	LT	PT	RO	UK
(A) Indexation of 2008 policies by market income (MII)													
	2008 policies %	12.2	17.7	16.6	19.0	21.0	11.0	17.9	23.9	23.0	18.2	22.4	16.5
ANCHORED	2013 policies %	13.6	19.2	22.3	20.7	21.2	10.4	17.8	21.0	22.4	18.2	21.0	14.8
Change: ppts	<i>All</i>	1.5	1.5	5.7	1.8	0.2	-0.6	-0.1	-2.8	-0.6	0.0	-1.4	-1.6
	<i>0-17</i>	1.8	3.1	7.8	2.0	1.2	-0.7	0.9	-0.8	0.4	1.7	-1.4	-2.6
	<i>18-64</i>	1.3	1.4	5.3	2.5	0.8	-0.7	0.3	-0.8	-0.4	0.8	-1.0	-1.2
	<i>65+</i>	1.6	0.1	2.9	-0.9	-3.3	-0.1	-2.1	-13.0	-2.9	-4.6	-2.7	-1.9
Change in median %		-0.4	-3.3	-10.2	-5.5	-2.3	-0.7	-0.9	0.5	-0.7	-3.6	0.0	2.5
RELATIVE	2013 policies %	13.4	17.1	15.9	17.9	20.2	10.2	17.4	21.4	22.1	16.4	21.0	15.8
Change: ppts	<i>All</i>	1.2	-0.6	-0.7	-1.0	-0.8	-0.8	-0.6	-2.5	-0.9	-1.8	-1.3	-0.7
	<i>0-17</i>	1.3	1.5	-0.3	-1.1	-0.2	-0.8	0.3	-0.5	0.3	-0.2	-1.4	-1.5
	<i>18-64</i>	1.2	0.0	-0.3	-0.1	-0.2	-0.8	-0.1	-0.6	-0.7	-0.7	-1.0	-0.4
	<i>65+</i>	1.3	-5.3	-4.2	-4.2	-4.0	-0.6	-2.8	-12.2	-3.0	-7.0	-2.7	-0.6
(B) Indexation of 2008 policies by CPI													
	2008 policies %	12.5	17.3	14.2	18.7	21.1	11.0	17.7	22.7	22.7	18.0	22.3	15.6
ANCHORED	2013 policies %	13.0	19.7	24.8	24.9	22.1	10.3	18.5	22.8	25.0	18.5	20.9	15.5
Change: ppts	<i>All</i>	0.5	2.5	10.5	6.2	0.9	-0.8	0.8	0.0	2.3	0.5	-1.5	-0.1
	<i>0-17</i>	0.3	3.3	13.5	3.4	1.8	-0.9	1.5	0.8	3.0	1.7	-1.6	-0.5
	<i>18-64</i>	0.6	1.8	8.8	4.9	1.4	-0.8	0.8	0.7	1.8	1.1	-1.1	-0.1
	<i>65+</i>	0.2	4.1	13.2	13.1	-1.6	-0.4	0.3	-3.4	3.5	-2.8	-3.1	0.4
Change in median %		0.7	-4.1	-15.3	-15.2	-5.4	-0.4	-2.7	-3.0	-5.8	-4.4	0.5	0.9
RELATIVE	2013 policies %	13.4	17.1	15.9	17.9	20.2	10.2	17.4	21.4	22.1	16.4	21.0	15.8
Change: ppts	<i>All</i>	0.9	-0.2	1.7	-0.8	-1.0	-0.9	-0.3	-1.4	-0.6	-1.6	-1.3	0.2
	<i>0-17</i>	0.8	1.5	3.1	-3.9	-0.6	-1.0	0.2	-0.5	-0.5	-0.4	-1.4	-0.2
	<i>18-64</i>	0.9	0.0	1.1	-1.5	-0.5	-0.9	-0.2	-0.2	-0.8	-0.8	-1.0	0.1
	<i>65+</i>	0.9	-2.7	1.4	4.4	-3.1	-0.6	-1.3	-6.8	0.3	-5.7	-2.9	0.8

Notes: At Risk of Poverty (AROP) is measured as the percentage of the population with equivalised household disposable income below 60% of the median, using the modified OECD equivalence scale to adjust incomes for household size. For “anchored” poverty risk, the threshold uses the median calculated for the corresponding 2008 counterfactual policy system. The shaded sections of the table indicate the key combinations – see the text for an explanation. Source: own simulations with EUROMOD version G1.4.

8. Including changes in VAT

In all but two of the countries we consider there have also been major changes to the rates of VAT. While these do not have an effect on household disposable income they do impact directly each household's consumption potential. For this reason, we also compare the effect of direct tax and cash benefit measures discussed above with those of increases in VAT.

Using our own estimates or external information (where available) on the incidence of (pre-reform) VAT by income group (decile or quintile), we have estimated the increase in VAT payment due to the increase in the standard rate VAT as a proportion of disposable income. In doing so, we have assumed that (i) there is no change in pre-tax expenditure or in pre-tax relative prices and (ii) the VAT increases are proportional to the pre-reform VAT payments.¹⁵

The effects are shown in Figure 7, which also indicates the change in the main VAT rate which ranges from no change (Germany and France) to increases of 5 percentage points (Spain and Romania). The combined effect of the VAT increase and of the changes simulated with EUROMOD (direct taxes, benefits and pensions) is shown with a dashed line, contrasted with the effect of the income changes alone with a solid line (as in Figure 3). Here we use the counterfactual 2008 policies indexed by change in market income (MII).¹⁶

We find that in each of the countries, the effect of VAT is regressive across the income distributions.¹⁷ The relative degree of regressivity across countries is due to (a) differences in the structure of VAT and how it relates to consumption patterns (i.e. the extent to which goods with lower tax rates are consumed by those on low incomes) and (b) the effective savings rate across the income distribution. For Greece, spending is much higher than income in the lower income decile groups. The same is likely to apply in the other countries, but to a lesser extent.

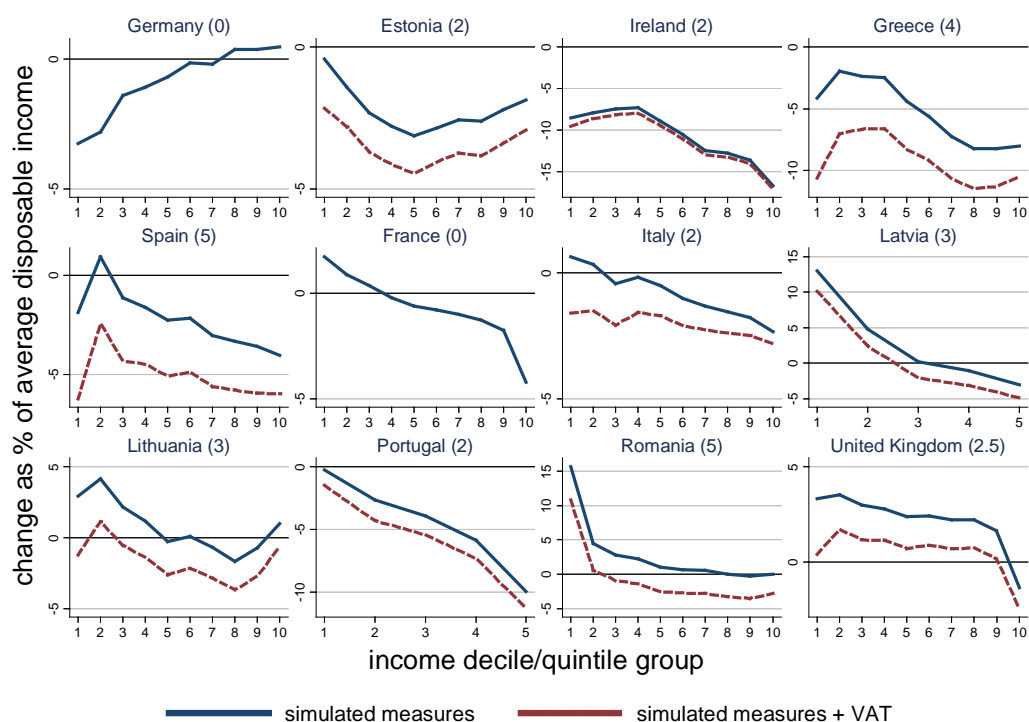
The impact of VAT changes is naturally larger in countries with bigger increases in the standard VAT rate but what is important to note is that in several countries (Greece, Spain, Lithuania, Romania and the UK) the effects are of similar magnitude to the measures affecting household incomes directly, which highlights their importance.

¹⁵ The studies used are, respectively, Vörk et al. (2008) for Estonia, Leahy et al. (2011) for Ireland, Matsaganis and Leventi (2013) for Greece, Institute for Fiscal Studies (2011) for Spain, Taddei (2012) for Italy, Ivaškaitė-Tamošiūnė (2013) for Lithuania and Barnard (2010) for the UK. For the other countries we carried out our own calculations based on information from Household Budget Surveys (HBS) on the distribution of expenditure by COICOP categories by income decile/quintile group. 2006 HBS was used for Italy, 2008 HBS for Latvia, 2005/06 HBS for Portugal and 2009 HBS for Romania. Note that EUROMOD's input database (EU-SILC) does not include data on expenditure.

¹⁶ Note that by combining the results in this way we assume that the composition of the decile groups in the two data sources are the same. Both sets of calculations use a very similar concept of household disposable income and (generally) the same equivalence scale. However, the fact that different surveys are used means that there are bound to be some differences in the composition of the income deciles. These results should be viewed with caution, therefore.

¹⁷ It should be noted that assessing the effect of taxes paid on the basis of recorded spending patterns as a proportion of recorded household income can distort the view of the regressivity or otherwise of indirect taxes, and especially the effect at the bottom of the income distribution.

Figure 7: Policy changes as a percentage of household disposable income by income decile/quintile group: change excluding and including VAT increases (MII counterfactual indexation assumption)



Notes: Deciles or quintiles are based on equivalised household disposable income in 2013 with 2008 policies in place, indexed by market income change (MII) and are constructed using the modified OECD equivalence scale to adjust incomes for household size. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: own calculations with EUROMOD version G1.4 and Barnard (2010), Ivaškaitė-Tamošiūnė (2013), Leahy et al. (2011), Matsaganis and Leventi (2013), Institute for Fiscal Studies (2011), Taddei (2012) and Vörk et al. (2008).

9. Some sensitivity tests: re-ranking

The analysis presented in Figure 3 ranks households based on income under the relevant 2008 counterfactual scenario, i.e. 2008 policies updated by one of the three alternative indexes. The interpretation of this chart has focussed on the different shapes of the curves rather than the specific differences between scenarios for each decile group. This is because the decile groups do not contain exactly the same people in each ranking. In this section, we explore the effect of ranking households by their disposable income after the policy changes have taken place: under the 2013 policy system which is common for all comparisons.

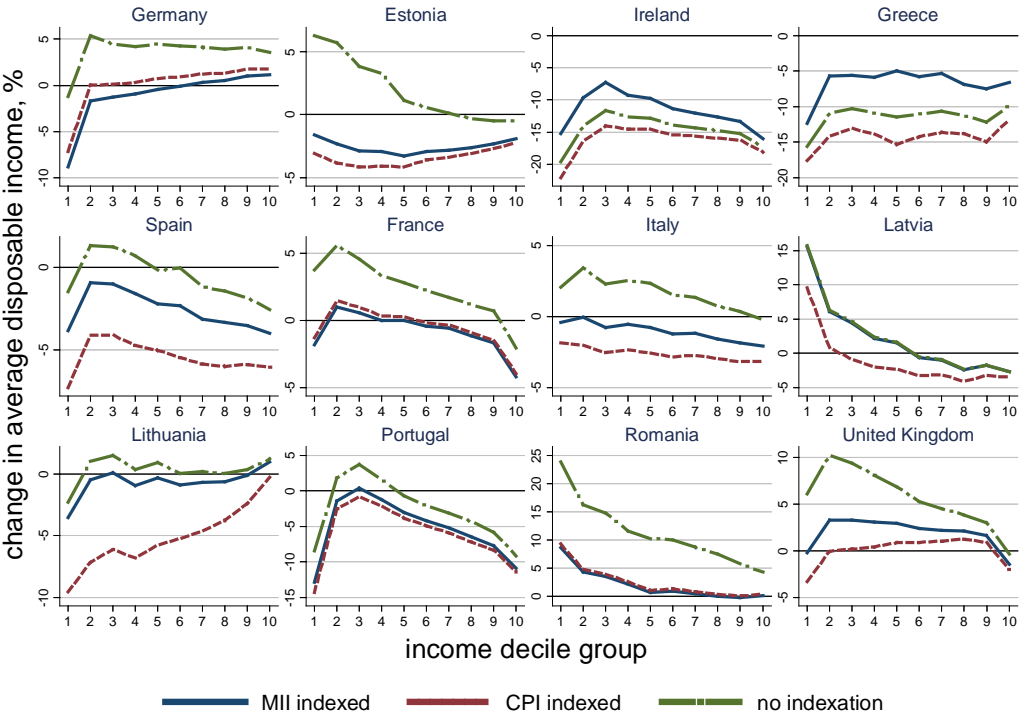
Figure 8 shows the incidence of the policy changes across the 2013 income distribution. The only difference when comparing Figure 3 with Figure 8 is the location of households in decile groups. We expect households that have lost more than average to move down the distribution and those who have gained more than average to move up. In particular, we expect households that have lost significantly to move into one of the lower decile groups. The calculation of relative change in income shown in these charts is carried out by dividing the change in mean income for the decile group by the decile group mean income

before the policy changes. Therefore, using the distribution of income post-policy change automatically has the effect of inflating the size of any percentage loss and moderating the size of any percentage gain. This applies to all decile groups but will be most obvious for the bottom decile group.

Comparing with Figure 3 we can see that there is a general feature that the bottom decile group looks different: losses look larger and gains smaller. The same applies to the second decile group in some countries. Apart from this effect, which might on its own modify our conclusions about the progressivity or otherwise of the policy changes being analysed, there are generally few other differences that would change our conclusions about the effect of the policy changes, or the effects of the counterfactual indexation assumptions that we have made.

However, there is one notable exception and that is Greece. The scale of the policy changes is such that post-reform incomes are substantially lower in each decile of the income distribution, in the middle as well as the bottom. This has the effect of making the proportional change similar in size across the distribution as well as larger at the bottom: modifying our assessment of progressiveness to broadly neutral.

Figure 8: Percentage change in household disposable income due to policy changes 2008-2013 by household income decile group and counterfactual indexation ranked using 2013 incomes and policies



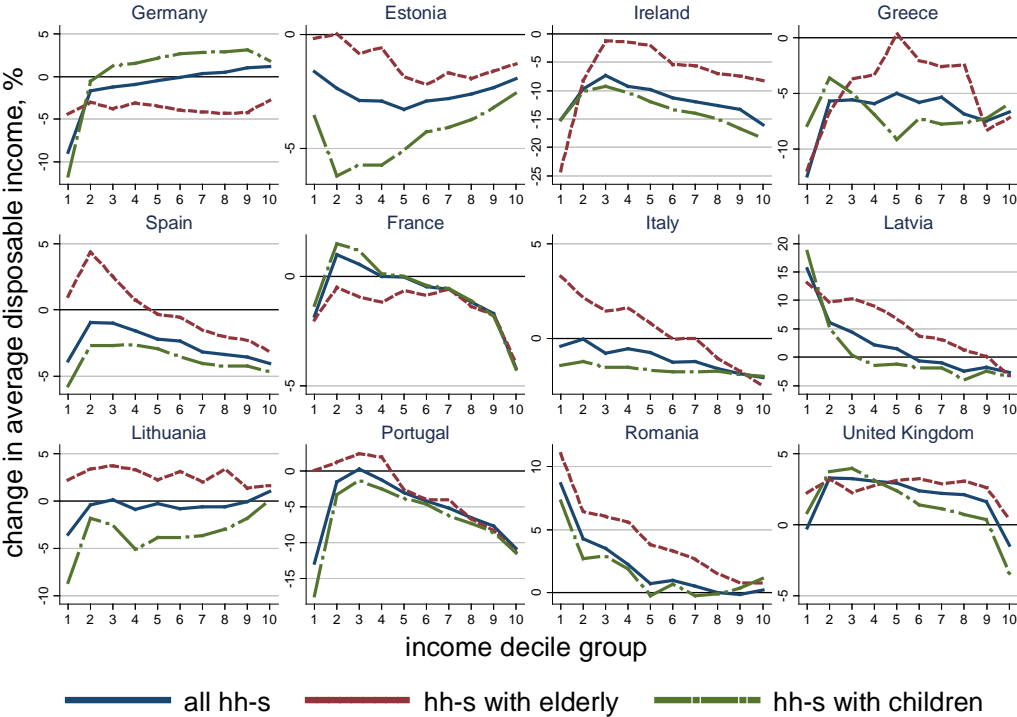
Notes: Deciles are based on equivalised household disposable income in 2013 with 2013 policies in place, and are constructed using the modified OECD equivalence scale to adjust incomes for household size. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: Own simulations using EUROMOD version G1.4.

Similarly Figure 9 shows how a different ranking affects our conclusions with respect to how the incidence of policy changes is shared across different types of households, if we compare with Figure 6.

The comparison uses the 2008 counterfactual indexed by the growth in market incomes. To the extent that one household type or the other has experienced greater income change, we might expect the re-ranking to affect our conclusions about the incidence of this across the income distribution.

Our conclusions about whether children or the elderly have borne the brunt of income losses (or benefited from income gains) would be broadly the same for the two different rankings, with three exceptions. In Greece, instead of households with elderly at the bottom and middle of the distribution losing less than households with children, the main difference shifts to the middle of the distribution and households with elderly in the bottom decile group are actually doing worse than households with children. This is consistent with some elderly households losing large amounts of income and falling into the bottom decile group as a result of the policy changes.

Figure 9: Percentage change in household disposable income due to policy changes 2008-2013: by type of household and household income decile group ranked using 2013 incomes and policies (MII counterfactual indexation assumption)



Notes: Deciles are based on equivalised household disposable income in 2013 and are constructed using the modified OECD equivalence scale to adjust incomes for household size. Children are defined as those aged under 18 and “elderly people” as those aged 65 or more. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: own simulations with EUROMOD version G1.4.

In the case of Germany and Ireland, Figure 9 also shows the lines crossing. In the case of Ireland, similarly to Greece, the bottom decile group after the policy changes includes some elderly households with very large income losses, exceeding those of households with

children, whereas elsewhere in the income distribution households with children are less well-protected from income loss than households with elderly people. An opposite case is observable for Germany.

This comparison has been carried out using the 2008 counterfactual policy system indexed by market incomes. It should be noted that using one of the other two indexation assumptions might also affect conclusions about the effect of household re-ranking. In particular, for Greece and Ireland, we might expect the picture to be different using indexation by prices, since in those two countries prices have risen relative to incomes over the period.

10. Concluding remarks

Our analysis of the direct effects of tax-benefit policy changes on household income in the period 2008 to 2013 has shown the following:

- For most of the countries considered, the policy changes resulted in a reduction in income in aggregate terms. When considered relative to market income changes over the period only in the UK and Romania were policies in 2013 more generous than in 2008. When compared in real terms, 2013 policies more than kept up with the cost of living only in Germany and Romania. The countries for which the policy changes resulted in the largest reductions in household income are Ireland, Greece and Portugal. In real terms in these countries incomes fell by 16%, 14% and 7% respectively, due to tax-benefit changes alone.
- The distributional effects of these changes are broadly progressive (i.e. losses are a smaller proportion of incomes at the bottom of the distribution than at the top; or that gains are a larger proportion) in Ireland, Greece, France, Italy, Latvia, Romania and the UK. Except for the bottom decile group, the same can be said for Spain and Portugal. In the remaining three countries the judgement depends on how 2008 policies are adjusted to 2013 levels. In Germany the effect is regressive (pro-rich) under the MII and CPI-indexed counterfactuals and broadly neutral if compared to the 2008 policy system in constant nominal terms. In Estonia the effect is progressive with the counterfactual not indexed but becomes U-shaped under the other scenarios. In Lithuania there is no clear gradient except that under the CPI-indexed counterfactual the policy changes appear quite strongly regressive.
- The larger the value of the counterfactual indexation factor used to bring 2008 policy to 2013 levels the worse the 2013 system appears to perform relative to the pre-crisis policy system. This applies to both the average effect and the progressivity of the policy changes. In other words, failing to index by either prices or incomes in practice tends to have a pro-rich effect. The higher the actual indexation factor that is used the more pro-poor the effect will be.
- Including the effect of increases in the standard rate of VAT reduces the progressivity of the policy changes.
- Using a relative poverty threshold, based on the median which shifts due to the policy changes, and using the 2008 policy system indexed by market income change as the benchmark, we find that the 2013 policy system results in lower risk of poverty in all countries except Germany. The effect is large in Latvia (2.5 percentage points) and at least 1 percentage point in Greece, Portugal and Romania.

- Using a poverty threshold anchored to 2008 policies and the assumption that they are indexed by CPI, we find that risk of poverty is moderately lower only in France and Romania and rising in most of other countries. The increase is very substantially in Ireland (10.5 percentage points) and Greece (6.2 percentage points).
- There are notable differences by age group, driven to a large extent, but not entirely, by the treatment of public pensions relative to other incomes over the period.

There are some caveats that should be borne in mind.

First, our analysis focuses on policies that have a direct effect on household incomes. This does not include the impact of cuts in in-kind benefits and services on households, which have been sizeable in some of the countries considered. This is for two reasons. Firstly, the information requirements for a comparable analysis of twelve countries are considerable. Secondly, given the present state of research and knowledge in this area, any distributional results would be driven by the assumptions that would need to be made about the valuation of services, their incidence and the nature and incidence of the cuts.

In addition, we do not include the effects of cuts (in real or nominal terms) in public sector pay, which were included in the analysis of fiscal consolidation measures in Avram et al. (2012). More generally we do not include the effects on the income distribution of reductions in market incomes and we do not attempt to construct a counterfactual for the income distribution as a whole. Our focus is deliberately on the distributional effects of policy changes, estimated conditional on population characteristics in 2010 and keeping other factors constant, in order to provide an assessment of the choices made by governments. We should not forget, however, in interpreting the results that in some of the countries market incomes have fallen considerably (Ireland and Greece) and have only recently started to rise in others (Latvia and Lithuania). We refer to the incidence of the policy changes as “progressive” in many of the countries (including Greece). This means that the policy changes have proportionately reduced incomes more at the top of the distribution than at the bottom, or increased more at the bottom than the top. At the same time, incomes from all sources at the bottom of the distribution may have been falling faster than at the top, especially in countries without the protection of a comprehensive minimum income scheme (again, as in Greece). By focussing on policy changes alone we do not capture this effect.

Furthermore, when considering the distributional effects we have ranked people according to their household income before the impact of the 2008-13 policy changes. We have also shown that ranking by income after the changes (section 9) causes the changes in the bottom of the distribution to appear worse (more negative or less positive) than when the distribution is ranked by pre-policy change incomes. The question “who in the current income distribution has paid most?” is not the main focus of this paper. However, it is clear that for countries where policy changes have reduced income considerably (using any counterfactual) across the distribution, such as Ireland and Greece, ranking by the post-reform situation results in a different and less progressive picture in response to that question.

Finally, we have shown that comparisons of the size and distributional effects of policy changes over time in different countries are sensitive to the counterfactual assumption that is adopted. This is particularly important to be aware of in times of economic turbulence and when the relative movements of prices and incomes are large and varying.

References

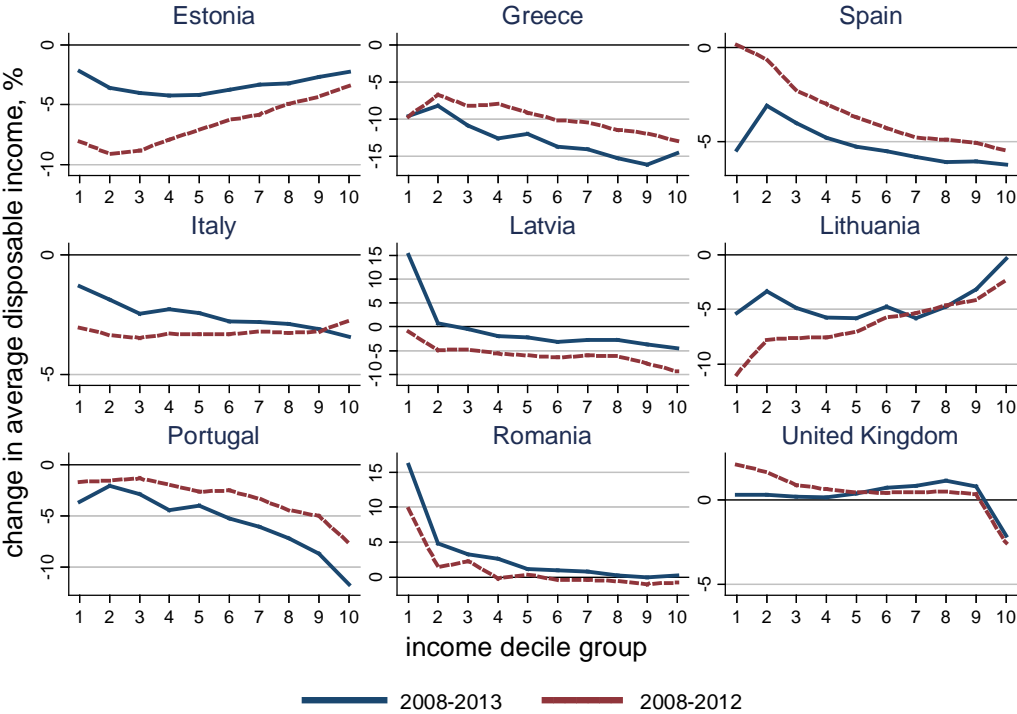
- Avram, S., F. Figari, C. Leventi, H. Levy, J. Navicke, M. Matsaganis, E. Militaru, A. Paulus, O. Rastrigina, and H. Sutherland (2012). The distributional effects of fiscal consolidation in nine EU countries. Research Note 1/2012 of the *European Observatory on the Social Situation and Demography*, European Commission.
- Bargain, O. and T. Callan (2010). Analysing the effects of tax-benefit reforms on income distribution: A decomposition approach. *Journal of Economic Inequality* 8(1), 1–21.
- Barnard, A. (2010). The effects of taxes and benefits on household income, 2008/09. Office for National Statistics.
- Callan, T., K. Coleman, and J. R. Walsh (2007). Assessing the impact of tax-transfer policy changes on poverty: methodological issues and some European evidence. In O. Bargain (Ed.), *Micro-Simulation in Action: Policy Analysis in Europe Using EUROMOD*, Volume 25 of Research in Labor Economics. Elsevier.
- Clark, T. and A. Leicester (2004). Inequality and two decades of British tax and benefit reforms. *Fiscal Studies*, 25(2), 129–158.
- Duclos, J.-Y. (1995). On equity aspects of imperfect income redistribution. *Review of Income and Wealth*, 41, 177–190.
- Hills, J., A. Paulus, H. Sutherland and I. Tasseva (2014). A lost decade? Decomposing the effect of 2001-11 tax-benefit policy changes on the income distribution in EU countries. ImPRovE Working Paper, forthcoming.
- Institute for Fiscal Studies (2011). A retrospective evaluation of elements of the EU VAT system. A report to the European Commission, DG TAXUD.
- Ivaškaitė-Tamošiūnė, V. (2013), Pajamų persikirstymas formuojantis gerovės kapitalizmui Lietuvoje. Daktrao disertacija. Vilnius: VU, LSTC.
- Jenkins, S.P., A. Brandolini, J. Micklewright and B. Nolan (2013). *The Great Recession and the Distribution of Household Income*. Oxford University Press, Oxford.
- Leahy, E., S. Lyons and R. Tol (2011). The Distributional Effects of Value Added Tax in Ireland. *The Economic and Social Review*, 42(2), 213-235.
- Matsaganis, M. and C. Leventi (2013). The distributional impact of the Greek crisis in 2010. *Fiscal Studies* 34(1), 83–108.
- Matsaganis, M., H. Levy and M. Flevotomou (2010). Non take up of social benefits in Greece and Spain. *Social Policy and Administration*, 44(7) 827–844.
- Pudney, S., R. Hancock and H. Sutherland (2006). Simulating the reform of means-tested benefits with endogenous take-up and claim costs. *Oxford Bulletin of Economics and Statistics*, 68(2) 135-166.
- Sutherland, H. and F. Figari (2013). EUROMOD: the European Union tax-benefit microsimulation model. *International Journal of Microsimulation* 6(1), 4–26.
- Sutherland, H., R. Hancock, J. Hills and F. Zantomio (2008). Keeping up or falling behind? The impact of benefit and tax uprating on incomes and poverty. *Fiscal Studies*, 29(4) 467-498.
- Taddei A. (2012). L'ipotesi di tax-shift dal lavoro ai consumi in Italia: un'analisi di microsimulazione fiscale utilizzando il modello EUROMOD. University of Genova DEP Working Paper 7/2012.

Võrk, A., A. Paulus and H. Poltimäe (2008). Maksupoliitika mõju leibkondade maksukoormuse jaotumisele. PRAXIS WP No. 42, Tallinn.

Appendix 1: Policy changes 2012-2013

As well as an overall picture of the effect of policy change in the period 2008-2013, it is of interest to identify the impact of the most recent changes and in particular those implemented since the analysis for 2008-2012 presented in Figure 7 of Avram et al. (2012). These compared 2012 policies with those from 2008, indexed by CPI by measuring the percentage change in household disposable income by income decile group. They are therefore broadly comparable with the CPI indexed comparison of 2008 with 2013 shown in Figure 3 of this paper. Figure A1 contrasts them directly for the nine countries included in both studies. It should be noted that they are, however, not fully comparable because the two sets of results are based on different micro-data. The 2008-2013 results use 2010 SILC and the 2008-2012 results use 2008 SILC.¹⁸ In addition, the definitions of the deciles are calculated using the two different counter-factual distributions (2012 and 2013 incomes, respectively, based on 2008 policies updated by CPI).

Figure A1: Percentage change in household disposable income due to policy changes 2008-12 and 2008-2013: by type of household and household income decile group (CPI counterfactual indexation assumption)



Notes: Deciles or quintiles are based on equivalised household disposable income in 2013 and 2012 respectively with 2008 policies in place, indexed by change in prices (CPI) and are constructed using the modified OECD equivalence scale to adjust incomes for household size. The charts are drawn to different scales, but the interval between gridlines on each of them is the same. Source: Avram et al (2012; Figure 7) and own calculations with EUROMOD version G1.4.

¹⁸ For the UK, both sets of results use Family Resources Survey 2009/10.

In Greece and Portugal the effect of additional policy changes 2012-13 relative to the 2008 system updated by CPI was to reduce incomes, across all or most of the income distribution. In Spain, the greater losses in the bottom decile group in 2013 compared with 2012 are mainly due to population differences in the underlying data.¹⁹ In Estonia, Latvia, Lithuania and Romania the opposite is the case, with those at the bottom of the distribution benefiting most in proportional terms from the changes in the most recent year. The same applies to Italy, except in the top decile group. In the UK households in the bottom of the distribution have seen reductions in their income due to benefit cuts in 2013 particularly affecting the bottom half of the distribution. These include the indexation of most working age benefits by 1% instead of inflation, freezing and reduction of some benefits²⁰, and the introduction of a "benefit cap" on the maximum in benefits that can be received by some households.

¹⁹ As explained at the beginning of this appendix, the two sets of results are based on different datasets (2008 and 2010 SILC). This affects the comparability of results shown in Figure A1 for all countries but especially for Spain because the SILC weights have been substantially revised in the 2010 SILC (following the 2011 census results) by Statistic Spain, resulting in substantial changes in the income distribution.

²⁰ Particular reforms taking place in 2013 are the reduction of disability living allowance and of housing benefit ("bedroom tax" for social renters and reduce local reference rent for private tenants).

Appendix 2: Indexation of public pensions 2008-13 (June 30th)

- **Germany:** Old age pensions are adjusted annually based on a combination of the gross wage growth and a stabilisation factor taking dependency ratio into account. As the indexation factor is difficult to determine and does not always go in line with earnings growth, we have assumed for simplicity that pensions grow with CPI.
- **Estonia:** indexation takes place in April and is based on a weighted average of CPI (20%) and wage growth (80%) in the previous year with a further condition ruling out nominal pension decreases. Since 2009, the indexation factor can be lower than the weighted average in the case of negative (or low) economic growth, and smoothing over 5 subsequent years is required if the actual factor has been higher or lower than the raw index. The cumulative applied index for this period was 15.1%, while a cumulative raw index was 12.7%.
- **Ireland:** no official indexation rules; 2009 increased by 3%; 2010-13 held constant in nominal terms.
- **Greece:** 2008-13 frozen; see Appendix 3 for information about other changes to pensions.
- **Spain:** 2008-10 indexation by CPI; 2011 frozen; 2012 indexed by 1%; 2013 pensions less than 1,000 EUR indexed by 2%, and pensions more than 1,000 EUR by 1%.
- **France:** 2008-13 indexation with the forecasted CPI in April.
- **Italy:** 2008-11 indexation mainly by prices (“FOI index”). Full indexation up to some level of pension; then up to 90% and 75% of price increase; 2012-2013: frozen above three times the minimum level of public pension (around 1,400 euro per month in 2012).
- **Latvia:** 2008 indexation by a weighted average of CPI and wage growth; 2009-2013 frozen.
- **Lithuania:** 2008-9 ad hoc increase. 2009-13 nominal level reduced and then restored.
- **Portugal:** 2008-10 indexation by a combination of CPI and real GDP growth; 2011-13 frozen (except for low pensions) plus extraordinary contribution on pensions >1,350 euro/month). (13th and 14th monthly instalments suspended in 2012 and restored in 2013.)
- **Romania:** 2008-9 large increases in some pensions; 2010-2012 no indexation; 2013 indexation by a weighted average of CPI and average wage growth.
- **UK:** Basic state pension: 2008-10 indexation by prices (“RPI” which tended to be higher than CPI); 2011 above inflation increase; 2012-13 “triple lock” (best of 2.5%, prices or earnings). Earnings related pensions (public and private): indexed by RPI (up to 2011) then CPI.

Appendix 3: Policy change between 2008-2013

Germany

Direct taxes and contributions

- Income Tax: decrease in the nominal levels of tax allowances for elderly persons and pensions for civil servants; tax allowances for agriculture and forestry kept nominally constant. In 2010, the tax allowance for special expenses has been reformed leading to an increase in the value of the allowance.
- Tax on capital income (Abgeltungssteuer): Up until the end of 2008, income from capital and income from employment were taxed at the same rate. Since 2009, a final withholding tax on capital income has been implemented, with a flat tax rate of 25% on capital income exceeding an allowance that is collected at source. This reform has mainly affected the bottom of the income distribution and the elderly.
- Social Insurance Contributions (SIC):
 - SIC paid by self-employed: decrease in the contribution rate paid for statutory pension and health insurance
 - SIC paid by employees: slight fall in the contribution rates – lower rate for pension insurance and higher rate for long-term care and unemployment insurance.
 - SIC paid by pensioners: Increase in the contribution rate for statutory long-term care insurance for pensioners; however, the average contribution to private health insurance has remained nominally constant.
 - SIC for self-employed: decrease in the contribution rate paid for statutory pension and health insurance.

Benefits and tax credits

- Child benefit (Kindergeld): Children have to be younger than 25 (27 in 2008) to be eligible for the benefit; from 2009 on an additional rate has been introduced for the fourth child onwards.
- Education benefits (BaFöG): In 2009 benefit add-on has been introduced for parents.

Estonia²¹

Direct taxes and contributions

²¹ In addition, there are the following changes which are not (fully) simulated: female pension age increased from 61 to 62; cuts in minor benefits (additional childcare leave for fathers and compensation of study loans abolished, sickness benefit and severance pay reduced, and the eligibility for dental care benefit narrowed); the abolition of tax deduction for donations and trade union membership fees. The indexation of public pensions was also changed (allowing in the case of nominal wage decreases or low economic growth to apply lower indices in subsequent years) though the effect of this is not explicitly captured with the way we define our counterfactuals. We also exclude a new means-tested family benefit as this was introduced after 30th June 2013.

- Employer and employee unemployment insurance contributions: increase in the rates.
- Pension and health insurance contributions: increase in the minimum levels.
- Income tax concessions: the narrowing of eligibility conditions for income tax child allowance; reductions for deductible expenses; tax allowances kept constant in nominal terms.

Benefits and tax credits

- Child allowance and large family allowance: the latter was abolished while the child allowance for families with 3+ children was increased. The net result was a gain for large families.
- Child school allowance: abolished.
- Childcare allowance: the narrowing of eligibility conditions.
- Unemployment insurance benefit: increase in the minimum level.
- Social assistance benefit: increased.

Ireland²²

Direct taxes and contributions

- Personal income tax: the threshold for the standard rate band reduced; tax relief on pension contributions reduced; tax credits reduced (the basic personal tax credit, tax credit for lone parents and for employees, age tax credit, widowed tax credit, rent tax credit, mortgage interest relief); income tax exemption for those aged over 65 reduced.
- Social insurance contributions (PRSI – Pay-Related Social Insurance):
 - Employee: the ceiling and a PRSI allowance were abolished; superannuation no longer excluded from the contribution base.
 - Employer: the lower rate (8.5%) was reduced by a half.
 - Self-employed: the income threshold for liability increased; the rate increased by 1pp.
- Public sector pension related deduction (i.e. the public service pension levy): a new levy introduced on public sector salaries, with progressive tax rates ranging from 0-10.5%.
- Universal Social Charge (USC): a new levy (replacing Health Contribution and a temporary levy existing in 2009-10) introduced on earnings and (private and contributory) pensions, with progressive rates ranging from 2-10%.
- Household Charge: a new property tax with progressive rates (0.09% and 0.125% of the property value).

Benefits and tax credits

²² In addition, the following change is not simulated: tax on deposit interest increased by 5pp.

- Child Benefit: payments reduced by 20-35% (more for larger families), with a compensating increase in the dependent child component for welfare payments; the upper age limit slightly reduced.
- Welfare payments: payments to those of pension age slightly increased (by ca 3%) while the rest were reduced (by about 5%).
- One parent family payment: income disregard reduced.
- Maternity benefit: reduced.
- Jobseeker's Assistance: payment rates for young unemployed people reduced by 25-50%.
- Family Income Supplement (an in-work benefit): increased by about 3%.
- Early Childcare Supplement: abolished (and a non-cash subsidy introduced).

Greece

Direct taxes and contributions

- Social Insurance Contributions (SIC):
 - Employee unemployment insurance contributions increased (+0.5%); all contributions increased for liberal professionals working as self-employed (i.e. doctors, lawyers, engineers); an additional 2% solidarity contribution for civil servants; flat rate unemployment contributions for the self-employed introduced; upper earnings threshold for the calculation of SIC employees first insured before 1993 increased.
 - Introduction of 'Pensioners' Solidarity Contribution'(2010), i.e. a special tax on main pensions, with tax rates between 3% for pensions above €1,400 per month to 14% above €3,500 per month.
 - Introduction of 'Additional Pensioners' Solidarity Contributions' for pensioners below 60 with main pensions exceeding €1,700 per month, with rates between 6% and 10%.
 - Introduction of 'Pensioners' Solidarity Contribution on Supplementary Pensions', all supplementary pensions are subject to an additional tax, between 10% for pensions up to €250 per month and 20% for pensions exceeding €300 per month.
- Tax on Pensions: all main old-age pensions exceeding €1,300 are subject to 12% taxation. The tax rate applies to the pension amount exceeding €1,300 after the deduction of all solidarity contributions concerning main pensions. Pensions are not allowed to fall below €1,300.
- Income Tax: The 2013 reform introduced major amendments to personal income tax. A new tax schedule with three tax brackets was introduced for income deriving from employment and pensions. Self-employment income is taxed by a separate tax schedule with two tax brackets. Different tax schedules for farming income (13% flat tax) and rental income (two tax bands) were introduced. The zero tax bracket was abolished. However, an employment tax credit was introduced (see below).
- Interest income tax: The rate was increased by 5ppt in 2013.

- ‘Solidarity Contribution’: Introduction of a tax paid by individuals with net taxable incomes exceeding €12,000 per year, with rates varying from 1% to 4%.
- Emergency Property Tax: all persons who own commercial or residential property in Greece are subject to this tax.
- Self-employed and liberal professions contribution: a special levy on self-employed and liberal professions aged less than 63 set at €650 per year.

Benefits and tax credits

- Retirement Benefits: Until 2009 retirement benefits were paid 14 times per year. In 2013 they are paid 12 times per year, with the exception of invalidity pensions.
- Unemployment Insurance Benefit: reduced by 22% (i.e. to €360 per month).
- Unemployment assistance for older workers: The income threshold was raised from €5,000 to €12,000 per year.
- Third child benefit, lump sum €2,000 birth grant and lifetime pension for mothers of many children: each benefit abolished.
- Large family benefit: Became means-tested in 2013.
- Child benefit: Introduced.
- Social pension: 13th and 14th month payments are abolished.
- Rent subsidy: Suspended.
- Tax Credits: An employment income tax credit was established. The tax credit is equal to €2,100 if employment income is up to €21,000 per year. It is capped to the amount of people’s actual tax liability (i.e. no negative tax applies). The tax credit is decreased by €100 for each additional €1,000 of employment income over €21,000 (it becomes zero for people with employment income over €42,000 per year). Tax credits for rent, education expenses, mortgage interest, private insurance contributions, and installation of eco-friendly energy systems were abolished. Disability tax allowance was turned into a tax credit.

Spain

Direct taxes and contributions

- Income Tax:
 - Introduction of two new tax brackets for top earners (at 44% for annual incomes between €120,000 and €175,000, and at 45% for annual incomes over €175,000) (from 2011).
 - Introduction of an additional tax bracket: rate of 54% for incomes above €300,000, rates increased progressively in all other brackets (by 0.75 percentage points for income below €17,707 to 6 percentage points for incomes over €175,000) (from 2012).
- Increase in minimum and maximum contribution base.
- Increase in the minimum wage on which some tax-benefit elements depend on.

- Tax on capital income:
 - Introduction of a flat tax rate on capital income (18%) replaced with two tax bands 19% up to 6,000 euro per year and 21% above that limit (from 2010).
 - Introduction of a rate increase and additional bracket for capital taxation (from 19-21% to 21-27%) (from 2012).
- Means-test: Application of means-test on €400 tax credit from 2010.

Benefits and tax credits

- Unemployment benefit: Introduction of a temporary unemployment protection programme (from 2009)
- Pensions: Pension freeze for 2011, except for minimum and non contributory pensions.
- Child benefit:
 - Various reforms on child related benefit at the regional levels from 2008 to 2013.
 - Elimination of universal birth grant from January 2011.
 - Reduction of child benefit for children aged 0 to 2 from €500 to €291 (from 2011).
- Other social benefits: Freeze of Indicator for social benefits (IPREM) from 2010. The income tests of child benefit and unemployment insurance and assistance benefits are based on this indicator (from 2011).
- Between 2010 and 2013 some regional governments have eliminated or reformed (scaled-down) their benefits.
- Tax credit:
 - Between 2010 and 2013 some regional governments have eliminated or reformed (scaled-down) their tax credits.
 - Regional large families tax credit restricted to those with a tax base less than EUR 39,000 a year (from 2013).
 - New €400 annual tax-credit (since 2009).

France

Direct taxes and contributions

- Income tax:
 - Introduction of a “tax holiday” in 2009: if the taxable income fell in the 2nd income tax band, tax was reduced by two third. This applied only to 2009.
 - In 2012, a new income tax band was introduced. Incomes over EUR 150,000 are now subject to income tax at the rate of 45% instead of 41%.
 - Introduction of an exceptional contribution on individual earning more than EUR 250,000 and couples earning more than EUR 500,000 per year (from 2013).
 - Overtime pay was not subject to taxation and social insurance contribution between 2009 and 2012. This was resumed since 2013.

- Tax on capital income: Until 2011, dividends were subject to a 40% deduction in addition to a fixed deduction of EUR 1,525 for singles and EUR 3,050 for couples, before taxation. The fixed portion of the deduction was abolished in 2012.
- Social Insurance Contributions (SIC):
 - Old age insurance contribution rate increased from 2012.
 - Reduction of self-employed insurance contribution for low earners working within the Industry and Trade (from 2013).
 - From 2012-13, changes of pensions insurance contribution for self-employed working within various sectors.

Benefits and tax credits

- Unemployment insurance benefit: From 2009 change rule of entitlement for the calculation of unemployment insurance duration distinguishing those age over or below 50. Individuals are eligible to unemployment benefit if they have been in activity at least 6 months during the last 22 months (before 2009) or at least 4 months during the last 28 months (after 2009).
- Family Allowance: From 2011 reduce age limit from 16 to 14 for additional amounts of the benefit.
- Since 2012 education grant was made available also to family with income exceeding the benefit threshold on a differential base: before 2012 family with income below a certain threshold were entitled to the whole benefit, while those with income above the threshold were not entitled. From 2012, if family income is below the threshold the entire benefit is paid, otherwise, the amount of the benefit equals the difference between the benefit and family income in excess of the threshold.
- From 2012, households who slightly exceed the income threshold for the Back to School Allowance are eligible for the residual amount of this benefit (ARS différentielle, AD) if their revenue is less than the threshold, plus the relevant benefit amount.
- Social assistance means-tested benefit (RSA):
 - The more general social assistance benefit (RSA), designed to provide income support also to working individuals with low incomes, replaced the lone parent means-tested benefit (API) and minimum guaranteed income benefit (RMI) from 2009.
 - An end of year bonus was introduced for RSA recipients in 2012 and removed in 2013.

Italy

Direct taxes and contributions

- Social Insurance Contributions (SIC):
 - SIC paid by employees (and employers): increase in the rates paid by temporary workers.

- SIC paid by self-employed: increase in the rates; increase in the minimum contribution threshold applied on earnings – the increase is larger than CPI and MII.
- Tax on rental income: Since 2011, a fixed rate of 21% applied on rental income introduced (before rental income was part of the tax base of the progressive income tax: generally it represents a tax advantage for most of tax payer).
- Property tax: 2008-2011 (ICI: property tax on other residences (i.e. not main residence); 2012: IMU, new property tax on main residence and other residences. 2013: IMU only on other residences.
- Additional solidarity contributions: Introduced in 2012.
- Income tax: Tax allowances, deductions and credits are kept nominally constant over the period. Regional personal income tax: increase in the rates in most of the regions.
- Tax on capital incomes: Decrease in the tax rate for deposits, but increase in the tax rate for other bonds and dividends.

Benefits and tax credits

- Regular Unemployment Benefit: Replaced by a relatively more generous scheme (in terms of coverage and adequacy) in 2013.
- Social Allowance for Elderly: Increase in the level of the allowance, which exceeds the growth in market incomes and prices.
- Family Allowances (Assegni familiari): The benefit amounts have been kept nominally constant while the bands applied on the income of the benefit unit used to define benefit amount have grown with a higher rate than CPI and MII.
- Public Pensions:
 - In 2012, pensions above 90,000 euro per year are subject to a proportional cut.
 - No indexation of pensions above three times the minimum amount (approximately 1400 euro per month in 2012) since 2012.

Latvia²³

Direct taxes and contributions

- Compulsory social insurance contributions: an income ceiling removed.
- Employee and self-employed social insurance contributions: rates and base increased.
- Personal income tax:
 - Standard rate for employment income reduced by 1pp; tax exemptions reduced.
 - Personal tax allowance reduced, while tax allowance for dependents increased.
 - Rate for self-employment income: increased from 15% to 24%.

²³ In addition, there are the following changes which are not (fully) simulated: an increase in female pension age; extension of the property tax to residential houses; reduction of property tax for large families; introduction of a ceiling on sickness benefit.

- Income tax on dividends: introduced.

Benefits and tax credits

- Public pensions: frozen (from 2009 to mid-2013).
- State family benefit: reduced and eligibility conditions narrowed.
- Child birth benefit: reduced.
- Contributory benefits: introduction of a ceiling on unemployment benefit; maternity, paternity, and parental benefits.
- Unemployment benefit: duration extended and qualifying working period reduced.
- Maternity benefit: reduced.
- Parental benefit: eligibility limited to non-working parents only; minimum amount increased.
- Childcare benefit for non-employed parents increased.
- Social assistance benefits: basic amount increased and duration extended.
- Social security benefit for disabled from childhood increased.

Lithuania²⁴

Direct taxes and contributions

- A large reform in social insurance contributions, PIT and health insurance contributions in 2009 (with a transition period in 2010):
 - The main PIT tax rate reduced from 24% to 15%.
 - Compulsory health insurance contributions: universalized and set at 9% rate of the taxable income, gross wage or the monthly minimum wage corresponding to the group the person belongs to.
 - Basic allowance and allowances for children increased but also made dependent on income (progressively reduced with income).
 - The total tariff of PIT and social insurance contributions for the employed remained unchanged, but the allocation of insurance contributions between the employer and the employee was altered.
 - Changes to the rates, coverage and the base of social insurance contributions for self-employed and those receiving income from sports, performing and copyright agreements. Special rules and rates for PIT and social insurance payments apply during the transition period.

²⁴ In addition, there are the following changes which are not (fully) simulated: (gradual) increase in pension age; reduced replacement rate and increased waiting period for sickness social insurance benefit; changes in social assistance benefit (reduction for persons able to work but not working, extra payments to former long-term unemployed); a social experiment in 5 municipalities with the function of provision of social assistance transferred to municipalities' discretion; new special PIT rates on income from distributed profit (20%) and individual activities classified as non-free occupations and from securities (5%).

Benefits and tax credits

- Child benefit: became means-tested, coverage reduced, amount reduced for families with three or more children.
- Unemployment social insurance benefit: reduction of the ceiling.
- Maternity and paternity social insurance benefit: reduction of ceilings, replacement rate and duration of payment; extension of required insurance record; benefit no longer multiplied by the number of born children.
- Social assistance benefits: introduction of equivalence scales.

Portugal

Direct taxes and contributions

- Income tax:
 - Increases in tax rates; introduction of a new tax bracket for incomes above €150,300 per year; tax brackets reduced from 8 to 5.
 - Reduction in the reference indicator for tax credits and in tax credits' upper limits.
 - Reduction in the pension tax allowance and tax credits for education and training, and housing.
 - Introduction of an additional solidarity tax for those with taxable income exceeding Euro 80,000 per year.
- Tax on capital income: increase tax rate.
- Social insurance contributions: change for self-employed workers.

Benefits and tax credits

- Social benefits:
 - 2010-2012: freeze the nominal 2009 value of the social benefit index (SBI) which is the base for most social benefits.
 - Reduction in the amount of child benefit.
 - Reduction in the generosity of the implicit equivalence scale of unemployment assistance benefit.
 - Reduction in the amount payable as social insertion income.
- Pensions:
 - 2011: freeze pensions; 2012 pensions, except low pensions frozen.
 - Introduction of extraordinary contribution on pensions.
- Unemployment benefit:
 - 10% bonus for couples with children or single parents receiving UB.
 - Reduced unemployment benefit amount and duration but also reduced minimum contribution period.

Romania

Direct taxes and contributions

- Social Insurance Contributions (SIC):
 - SIC paid by employees: Increase in SIC, but an upper limit has been introduced in 2011.
 - SIC paid by self-employed: increase in the rate paid for pension and sickness insurance.
 - SIC paid by active population and pensioners: reduction in the health SIC.
- Income Tax: Tax allowances for pensioners and employees have been kept constant; increase in the deduction for private pension contributions (larger than the growth in market incomes and prices).

Benefits and tax credits

- Child raising allowance (Indemnizatia pentru cresterea copilului): Its amount has been reduced from 0.85% to 0.75% of previous income. The lower threshold has remained the same, but the upper ceiling has been subject to changes in policy rules. Thus, the parent has the option of choosing to take up the benefit for 1 or 2 years and the upper threshold is set accordingly, higher for 1 year and much lower for 2 years. The upper ceiling decreased from 4,000 RON per month to 3,400 RON per month if opting to receive the benefit for 1 year and 1,200 RON per month if opting to receive it for 2 years.
- Child raising incentive (Stimulentul lunar): Large increase in the benefit amount.
- Allowance for new born children and the outfit for the new born children (Alocatia pentru copiii nou-nascuti si trusoul pentru nou-nascuti): Abolished in 2011.
- Minimum social pension/ social allowance for pensioners (Pensia minima garantata): Introduced in 2009.
- Means-tested family benefits (Alocatia familiala complementara si Alocatia de sustinere pentru familia monoparentala): Increase in the income test, which however is lower than MII and CPI. Increase in the benefit amount which exceeds MII and CPI. Complementary family allowance (higher threshold) has been introduced in 2011. Support allowance for lone-parents (lower threshold): increase in the income test, which however is lower than the growth in market incomes and prices. Increase in the benefit amount which exceeds MII and CPI. An income test-allowance for lone parents (higher threshold) has been introduced in 2011.
- Means-tested heating benefit (Ajutorul pentru incalzirea locuintei): Benefit amounts were either decreased or did not keep up with growth in market incomes and prices.
- Unemployment benefit: The benefit has been reduced by 15% as of 2011 (austerity measure).
- Universal child benefit: The benefit for children under the age of 2 is kept nominally constant, while the benefit for children over the age of 2 has been increased with a rate higher than MII and CPI.

United Kingdom:²⁵

Direct taxes and contributions

- Income Tax:
 - The introduction of a top tax band on incomes over £150,000 per year; 45% in 2013.
 - Above inflation increases to the income tax personal allowance, offset by reductions in the threshold to the higher rate of income tax and upper thresholds on contributions (see below).
 - Introduction of an abatement of the personal allowance by £1 in every £2 of taxable income over £100,000 per year.
 - Age related allowance additions restricted to existing recipients and frozen at 2012 rates (from 2013).
- National Insurance contributions:
 - An increase in all contribution rates of one percentage point.
 - Increases in the lower limits for contributions and decreases in the upper limits.
 - Decrease in the contracted-out National Insurance rate reduction.
- Council Tax (local taxation): Council Tax frozen in 2011 and 2012 (also in 2013 in Scotland).

Benefits and tax credits

- Child Benefit:
 - Rates frozen at their 2010 level.
 - Withdrawn from families with anyone earning £50,000 per year or more, tapered to £60,000.
- Working Tax Credit (WTC) and Child Tax Credit (CTC):
 - Real increases in the per child element of CTC and freezing of the basic amount of WTC/CTC at 2010 levels; couple and lone parent element also frozen in 2012.
 - Baby element of the CTC abolished.
 - Freezing of the 30-hours addition in WTC at its 2010 level; 30-hours disregard in Housing Benefit (HB) and Council Tax benefit (CTB) also frozen.
 - Childcare addition to WTC reduced from 80% of costs to 70%.

²⁵ For the UK, policy changes are described in relation to what would normally happen through annual indexation. The regime of indexation also changed over the period. Most benefits, tax credits and tax thresholds (and public sector pensions) are now indexed by CPI instead of using the RPI/Rossi indexes. In general this will tend to mean lower indexation although in 2012 it made little difference. Some policy changes that took effect in the UK 2008-13 are not captured in our analysis. These include the increase of the female state pension age from 60 to 61 and the replacement of Invalidation benefit by Employment and Support Allowance which involves a stricter work test and transfer to a means-tested scheme after a period of a year.

- Increase in the withdrawal rate of WTC/CTC from 39% to 41%; family element also tapered at 41% from the lower threshold (instead of 6.67% from a high threshold).
- WTC payable to people aged 60+ and those on Carer's Allowance if they work more than 16 hours per week (previously 24); work requirement increased from 16 to 24 hours per week for couples with children.
- Child Benefit payments disregarded in the assessment of CTC/WTC.
- Basic State Pension (BSP):
 - Indexing BSP by highest of average earnings growth, CPI inflation and 2.5% ("triple lock").
- Pension Credit (means-tested pension):
 - Increase in the lower capital threshold in Pension Credit (and HB and CTB for pension age people) from £6000 to £10,000.
 - Guarantee Credit indexed with BSP (at or more than inflation).
 - Savings Credit threshold increased and maximum payments reduced.
- Income Support and associated benefits: deductions from benefit (Income Support, HB and CTB) for non-dependents uprated by the CPI (previously frozen in nominal terms).
- Winter Fuel Allowance: cuts in levels of payment.
- Housing Benefit (HB): Local Housing Allowance (LHA – HB for private tenants) maximum rents set at the 30th percentile of local rents rather than the 50th percentile. National caps on the amount of rent that can be claimed introduced, and the 5+bedroom rate abolished. The disregard of rent up to 15% more than LHA levels is removed. LHA is limited to single-room levels for single people aged 25-35. Housing benefit for those in social housing is reduced for those of working age living in housing that is deemed under-occupied ("bedroom tax").
- In 2013 the levels of most benefit and tax credit payments for working age people, except those elements related to disability, were indexed by 1% instead of CPI (2.2%).
- Total household benefits capped at £500 per week for couples and lone parents and £350 per week for single