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## The distributional effects of austerity measures: A comparison of six EU countries

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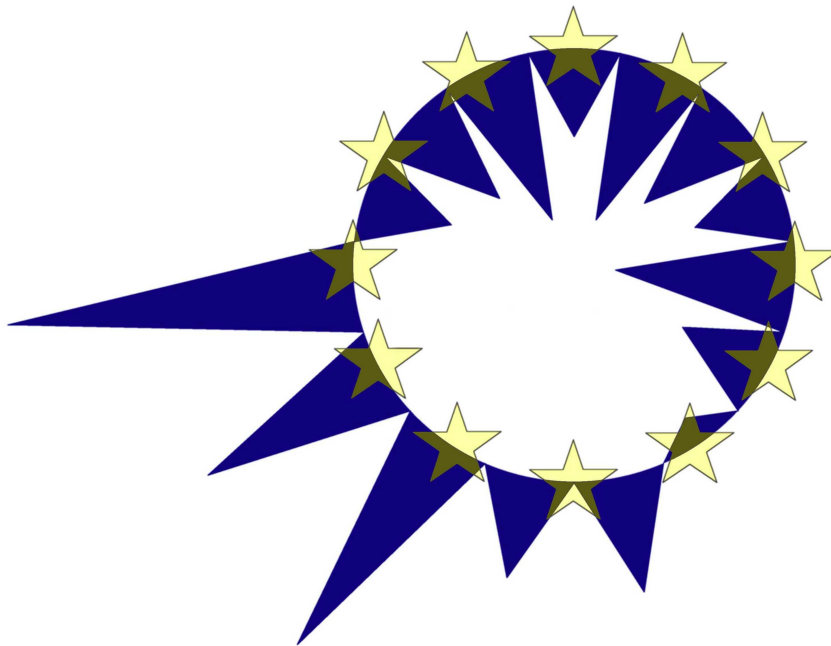
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# EUROMOD

## WORKING PAPER SERIES



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**THE DISTRIBUTIONAL EFFECTS OF  
AUSTERITY MEASURES:  
A COMPARISON OF SIX EU  
COUNTRIES**

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# The Distributional Effects of Austerity Measures: A Comparison of Six EU Countries<sup>1</sup>

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## Abstract

We compare the distributional effects of austerity measures that have been introduced in 6 EU countries in the period of large government budget deficits following the 2007-8 financial crisis and subsequent economic downturn. We explore the effects of policy changes presented as “austerity measures” in Estonia, Ireland, Greece, Spain, Portugal and the UK, using the EU microsimulation model EUROMOD and the Irish national model, SWITCH. The six countries have chosen different policy mixes to achieve varying degrees of fiscal consolidation. We focus on the first round effects of increases in personal taxes, cuts in spending on cash benefits and reductions in public sector pay across the distributions of household income. There is a range of important conceptual and consistency issues to be addressed when doing such analysis, particularly in a comparative setting. These include how to identify “austerity measures” in a consistent manner, the relevant time periods to consider, the assumptions behind the counterfactual scenarios and the scope of the policies considered. Using a set of common assumptions we find that the burden of fiscal consolidation brought about through changes in components of household disposable income is shared differently across the income distribution in the six countries. At one extreme, in Greece, the better off lose a higher proportion of their incomes than the poor and at the other, in Portugal, the poor lose a higher proportion than the rich. Bringing increases in indirect taxes into the picture can alter conclusions about the overall distributional effect, increasing the cost most for those with lower income and making the overall incidence of the measures more regressive.

**JEL Classification:** C81, H55, I3

**Keywords:** Austerity measures, European Union, Fiscal consolidation, Poverty, Microsimulation

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<sup>1</sup> This paper uses EUROMOD version F4.19. EUROMOD is continually being improved and updated and the results presented here represent the best available at the time of writing. Any remaining errors, results produced, interpretations or views presented are the authors' responsibility. For this version of the paper the estimates for Ireland are from the ESRI model SWITCH, based on microdata from the Irish SILC 2008 made available by the Irish Central Statistics Office. For Portugal we make use of microdata from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat under contract EU-SILC/2009/17, the national EU-SILC “PDB” data for Estonia, Greece and Spain 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. The authors alone are responsible for the analysis and interpretation of the data reported here.

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## 1. Introduction

The economic crisis which started in 2008 and the austerity measures to counter the subsequent government budget deficits are widely perceived to be having an impact on income poverty and inequality. In this paper we ignore wider aspects of the economic crisis on income distribution, which are considered for example in Jenkins et al. (2011) and focus instead on austerity measures alone, comparing their size and distributional effects in six EU countries: Estonia, Ireland, Greece, Spain, Portugal and the United Kingdom.

Government budgets were extensively affected by the financial and economic crisis that started in 2007. Of the six countries analysed in this paper, three were running budget surpluses in 2007 and another two had budget deficits around the Stability and Growth Pact limit of 3% of GDP. By 2009 only Estonia had a deficit below that limit. The other five had budget deficits much higher than the EU-27 average and around or above 10% of GDP (see Figure 1). Our choice of six countries to analyse is based on their being among those in the EU with the highest increase in deficit and/or reduction in GDP or employment within the period since 2007. The degree of deficit reduction these six governments set out to achieve naturally varied, and so did the policy mix chosen to achieve it. Our analysis addresses the question of how reforms to direct personal taxes, cash benefits and public sector pay have been distributed across income groups and types of household, and how they have impacted on risk of poverty. We also consider the incidence of changes to some employer costs (social contributions) and increases in VAT, across the household income distribution and discuss the challenge of measuring the incidence of cuts in in-kind benefits and public services.

A range of important conceptual and consistency issues arise when doing such analysis and these are revealed clearly in a comparative setting. They include how to identify “austerity measures” in a consistent manner, the time period to consider, and the assumptions behind the counterfactual scenarios. We exploit information from a representative sample of each national population, using 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 for the UK. Simulations of the effects of changes to pay, taxes and benefits are provided using the EU tax-benefit microsimulation model EUROMOD.<sup>2</sup>

The structure of this paper is as follows. Section 2 discusses the various methodological issues and briefly describes EUROMOD. Section 3 introduces the austerity measures taken in each country and highlights those modelled in this analysis. Section 4 presents an analysis of the distributional effects of the austerity measures in the six countries and shows how the different policy mixes have their own distributional implications. Section 5 concludes by placing this analysis in the context of questions about the effects of the economic crisis as a whole, by summarising our policy relevant findings and by explaining the caveats to be adopted when interpreting them.

## 2. Methodology

There are many analytical choices and assumptions to be made when simulating the effects of austerity measures on income. There are also choices to be made in considering how to measure the impact and what indicators to use. Both types of choice are particularly important when making comparisons across countries. On the one hand the same choices should be made in each country for valid comparisons to be made. On the other hand, the most appropriate choice may vary across

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<sup>2</sup> For Ireland this version of the paper makes use of the national tax-benefit model, SWITCH.

countries, depending on the nature and timing of the measures taken. In addition, possibilities may be limited due to lack of data in some countries, but not in others. In this paper we attempt to define an equivalent (comparable) assessment in each country. This builds on previous work which took an essentially national perspective in each case and considered the implications of methodological differences when interpreting results (Leventi et al., 2010).

Among the methodological issues to be confronted are the following: Which measures count as austerity measures? What is the counterfactual, i.e. what do we assume would have happened to policies without the austerity measures? Which measures can be assessed across the income distribution, with a reasonable degree of precision? To what extent can (and should) indirect effects and macroeconomic changes be accounted for? We consider each in turn.

### **Which measures count as austerity measures?**

In some countries, such as Greece, explicit packages of reforms have been labelled as austerity measures. While mostly involving tax increases and cuts in social benefits and public sector pay, they also include increases in some benefits or reductions in taxes for certain groups to compensate or alleviate the impact of other measures. In any case, the package as a whole can be easily identified. In other countries it is not so clear how policies would have evolved in the absence of the budgetary crisis. In the UK, for example, there was a change of government in mid 2010 and the policy changes include, alongside measures that might have been introduced by any government, cuts and restructuring of the welfare system that arguably are part of a new approach, some under the guise of austerity. In general our approach has been to focus on changes that were explicitly introduced in order to cut the public deficit, or stem its growth. Some of the changes implemented in a particular period that may be part of some other policy agenda and would have also happened in the absence of the fiscal crisis are not considered. The idea is to distinguish between changes that were part of a “business as usual” agenda from those introduced for austerity reasons. In particular the removal of temporary fiscal stimulus measures is not considered as part of the austerity package if those reforms were originally presented as temporary.

A second area of consideration is what reference time period to consider for the changes. In some cases measures are all announced and introduced within a single year. In other cases, for instance in the UK, measures announced at one point (e.g. in 2010) may not be implemented fully until much later (e.g. 2014). There are several different rationales for the phasing of tax increases and spending cuts. One is to reduce the risk of another (or further) macroeconomic downturn and soften the blow for political feasibility reasons. Another is related to the long term restructuring of the tax and welfare system. A third might be to influence expectations and therefore behaviour, particularly in the financial markets. Distinguishing between these three types of phasing is difficult. Furthermore, it is possible that the medium term plans that are announced will be reversed or amended before being implemented as well as further measures introduced (e.g. in Greece, Ireland and Portugal during 2011).<sup>3</sup> For this reason we limit the changes that we analyse to those already introduced (June, 2011). We do not harmonise the reference period for the changes because this naturally differs across countries.

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<sup>3</sup> One of the measures in the UK that will have the largest effect, but only over time, is the decision to change in the index used for indexation of benefits and tax thresholds. This is likely to have the effect of reducing benefits and tax-free income relative to income as a whole. The effect of this is not evident in our short-term simulations.

## The counterfactual

The way in which we simulate the counterfactual scenario (i.e. “what would have happened in the absence of the austerity measures”) is critical to the evaluation of their effects. We have chosen to interpret the “absence of the austerity measures” as the continuation of pre-austerity policies, indexed according to usual practice (or law). Such indexation is not the same across countries. Whereas the UK has long-established indexation rules (Sutherland et al., 2008) which are changing (Joyce and Levell, 2011), most of the policies in Estonia, Ireland and Greece are not regularly indexed and instead are changed occasionally on an ad hoc basis. In Portugal and Spain there is a mix of regular indexation and ad hoc changes.

Furthermore, in order to neutralise their effect, policy changes that are not considered part of the “austerity package” are also included in the counterfactual scenario.

## Which measures can be simulated?

In most countries austerity measures take the form of some combination of: (i) reductions in cash benefits and public pensions; (ii) increases in direct taxes and contributions; (iii) increases in indirect taxes; (iv) reductions in public services that have an indirect impact on the welfare of households using them; (v) reductions in public expenditure that cannot be allocated to households (e.g. pure public goods like defence spending) and increases in taxes that are not straightforward to allocate to households; (vi) cuts in public sector pay (vii) cuts in public sector employment.

The eventual effect on the public budget will be the net effect of these changes. There will be interactions. For example, reductions in public sector pay will serve to reduce tax revenue; increases in indirect taxes will result in increased inflation and hence (in some cases) increased indexation of benefits. The overall result will also depend on any behavioural or macro-economic second and third round effects. In this analysis we focus on the direct, first round, effects of changes in cash payments and direct personal taxes and contributions. In addition to that, the effects of public sector pay cuts are captured for all countries except the UK.<sup>4</sup> The effect of the pay cut is measured net of any reduction in income tax and social contributions. Where possible and relevant we also measure the effect of increased employer contributions and draw on available previous research to show, in broad and approximate terms, the additional effect of indirect tax increases. A fully comprehensive first-round analysis would also include the effects of cuts in public services, taxes and expenditures that are not straightforward to allocate to households, and cuts in public sector employment. These measures are beyond the scope of the analysis in this paper but we return to consider the implications of leaving them out in later sections of this paper.

Furthermore, some of the changes are difficult to capture exactly because our data are not sufficient. Where possible, and especially to maintain cross-country comparability, plausible approximations have been made.

## Macroeconomic and second order effects

It is important to note that our simulations are effectively measuring the effects of the austerity measures on populations with pre-crisis labour market characteristics. Market incomes are adjusted

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<sup>4</sup> In the UK, while public sector institutions have had their budgets cut, and pay rises are certainly restricted, there is no figure for a specific pay cut that can be simulated in this exercise.

by source, in line with actual changes between the period when the data were collected and the “austerity” year (see Table 1 below) but nevertheless the size and distribution of the effects of the austerity policies might be somewhat different once unemployment increases and other labour market changes due to the crisis, directly or indirectly, have been accounted for.<sup>5</sup> We might expect the effects of benefit cuts to be amplified and for tax and contribution increases to be dampened somewhat.

This issue is distinct from whether our analysis captures the full effects of the crisis, which, as explained above, we do not attempt to do. Moreover, the austerity measures themselves may induce second order and macro-economic effects. For example, households facing income losses may adapt their behaviour in an attempt to compensate, at least partly, for such adverse changes in circumstances. For instance, those able to may work longer hours or increase their labour supply in other ways; young people facing drastic reductions in living standards may return to live with their parents; reductions in income will lead to reduction in consumption and, potentially, a slower recovery. These issues too are beyond the scope of this paper which focuses on the first round effects of the austerity measures alone, under the assumption of other things being equal (even when it is clear that they are not). Wider aspects of the crisis beyond the austerity measures are ignored, even though the latter may arguably aggravate the former, at least to some extent.

### **The European tax-benefit model EUROMOD**

Our analysis makes use of EUROMOD, which simulates tax liabilities and benefit entitlements for the household populations of EU Member States. EUROMOD simulates non-contributory cash benefit entitlements and direct personal taxes and social insurance contribution liabilities on the basis of the tax-benefit rules in place and information available in the underlying datasets. Market incomes and the taxes and benefits which are not simulated (e.g. benefits which depend on contribution history) are taken from the data, along with information on other personal/household characteristics (e.g. age and marital status). See Sutherland (2007) and Lietz and Mantovani (2007) for further information.<sup>6</sup> Results for Ireland are based on SWITCH, the Irish tax-benefit model, which uses income concepts aligned with those of EUROMOD (Callan et al., 2011).

In this analysis, some adjustments for non take-up of certain benefits<sup>7</sup> are made for all countries (assumed the same before and after the austerity measures); while tax evasion is assumed not to happen – it is implicitly assumed that legal rules are universally respected and that the costs of compliance are zero.

### **3. Simulating the austerity measures**

We focus on the austerity measures implemented after the 2008 economic downturn and up to mid-2011. However, the period in which austerity measures were introduced is different across countries

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<sup>5</sup> For instance, in Greece the unemployment rate for male workers aged 30-44 rose from 3.5% in 2008 to 8.1% in 2010.

<sup>6</sup> EUROMOD is currently subject to a major updating process. All EU-27 countries in EUROMOD, using EU-SILC as underlying data, will be included by 2012.

<sup>7</sup> A recent 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. Non take-up has been thoroughly researched in the UK (see for example Pudney et al., 2006).

depending on many factors (including the timing of the national macroeconomic and budgetary reactions to the financial crisis): 2009 for Estonia, 2010 for Greece, 2010-11 for Spain and 2009-11 for Portugal, Ireland and the UK (see Table 1).

**Table 1: Summary of input datasets and period of analysis**

Country	Input dataset	Income reference period	Austerity measures
Estonia	National SILC 2008	2007 (annual)	2009
Ireland	National SILC 2008	2008 (current)	2009-11
Greece	National SILC 2007	2006 (annual)	2010
Spain	National SILC 2007	2006 (annual)	2010-11
Portugal	EU-SILC 2007	2006 (annual)	2009-11
UK	FRS 2008/09	2008/09 (current)	2009-11

In each case the level and distribution of market incomes is drawn initially from data from the recent, pre-crisis, past. For Greece, Portugal and Spain this is 2006 income data from the EU-SILC/national SILC, for Estonia it is 2007 income data from the national SILC, for Ireland 2008 income data from the national SILC and for the UK it is 2008/9 Family Resources Survey data. In each case market incomes are updated appropriately to the policy simulation year for the baseline (to 2009 levels in Estonia, 2010 in Greece and 2011 in the rest of the countries). These incomes are then held constant and the counterfactual and reform scenarios are simulated on the same underlying distributions of market income.

We now provide a summary of policy changes in each country. Further details on specific changes are given in Appendix 1.

## **Estonia**

The crisis hit Estonia in 2008 and in 2009 the government started introducing austerity measures in order to tackle the increasing budget deficit, both by finding ways to increase revenues and decreasing expenditures. Pensions and several cash benefits were significantly increased in 2006-08 following the economic boom<sup>8</sup>, and these faced relatively small cuts by the end of 2009. In fact, the flat rate element of public pensions was even increased further in April 2009. In contrast, on the revenue side, social insurance contributions and indirect taxes were increased. There were additional, one-off measures like the sale of CO<sub>2</sub> quota and frontloading of EU grants from the Cohesion Fund. (How these affect people individually is not possible to establish.) On the expenditure side, public sector investments and salaries/wages were reduced and public services cut.

The main policy changes that are simulated in this paper are the following.

- Increased social insurance contributions (employer, employee, self-employed)

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<sup>8</sup> Most importantly, in 2008 the indexation of public pensions was changed – the weight attached to the growth of average salary was increased relative to the consumer price index (which has been much lower than salary growth in recent years) – and, additionally, the flat rate element of public pensions was increased by more than 20%. Another benefit made notably more generous was the parental benefit, while smaller scale increases took place for the subsistence benefit (i.e. social assistance) and additional childcare leave for fathers.



- The suspension of credited and employee contributions to the 2<sup>nd</sup> pension pillar<sup>9</sup>
- Reductions in income tax deductions
- Increase in the standard rate of VAT
- Public sector pay cuts

Policy changes which could not be simulated include cuts in minor benefits and in minor tax allowances, the increase in the reduced rate of VAT and excises.

The base scenario for Estonia is the 2008 policy system with market income (except public sector wages) and pensions uprated to 2009 levels. Note that the increase in public pensions in 2009 is also included in the base scenario because it is not considered to be an austerity measure. The reform scenario is based on this, while additionally simulating the changes listed above.

## Ireland

During the summer of 2008, signs of a weakening of the Irish economy became more evident, and a substantial deficit in the public sector finances emerged. This prompted the government to bring forward the budget for 2009 from its usual date (December) to October 2008. In order to capture the full extent of austerity measures it is essential to include the changes introduced in this budget. Thus, the pre-crisis or pre-austerity baseline is provided by policy for 2008. The austerity measures introduced in budgetary measures for 2009, 2010 and 2011 (announced in December 2010 and implemented from January 2011) are therefore included in the scope of our study.

In broad terms, these include the following.

- Lowering income tax bands and reduction in tax credits
- The introduction of a new income levy
- Increased social insurance contributions (employee, self-employed)
- Cuts in all means-tested and universal cash benefits and a freeze in contributory benefits<sup>10</sup>
- Public sector pay cuts

In addition there were some minor changes to indirect taxes and an increase in the tax on deposit interest in the period 2009-2011 which have not been simulated in the present exercise because of data limitations.<sup>11</sup>

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<sup>9</sup> It is important to note that while the suspension of credited contributions did not affect current household disposable income, it was a significant source of additional revenue for the government. What it basically entails is that for those who are enrolled in the 2nd pension pillar (and by now these are the majority of workers), the government transfers one-fifth of the pension insurance contributions (paid by employers only) from the first to the second pillar, hence reducing the funds available for current public pensions. Therefore, halting temporarily such transfers has helped to fill the hole in the finances of the current pensions at the expense of future pensions.

<sup>10</sup> Among other things, a cash benefit entitled the Early Childcare Supplement was replaced by a new, non-cash scheme of subsidisation of places in early child care for children aged 3 years of age. This brings into sharp focus the issue of cash versus non-cash provision of social support (see e.g. Paulus et al., 2010). In order to assess the overall impact of policy measures, we have, exceptionally, included the value of the non-cash subsidisation (which mitigates the impact of the cut in the cash payment).

## Greece

After a decade of fast growth, the underlying weakness of the Greek economy was made evident in October 2009, when the incoming government announced that earlier fiscal data had been misreported. The fiscal deficit and public debt estimates for 2009 were revised to 15.4% and 126.8% of GDP respectively. Financial markets reacted by increasing spreads on Greek bonds and by lowering credit ratings. Aiming to reduce the public deficit, the government announced a first package of austerity measures in March 2010, and a tax reform in April 2010. When these failed to placate the markets, a second austerity package was announced in May 2010 as part of the negotiated rescue package with the European Commission, the European Central Bank and the International Monetary Fund.<sup>12</sup>

The main policy changes that are simulated in this paper are as follows:

- Increase in top income tax rates (partly compensated by decreasing tax rates for lower bands), changes in tax credits and allowances and broadening of the income tax base
- The introduction of a one-off additional tax on incomes and a special tax on pensions
- Cuts in public pensions
- Public sector pay cuts
- Increases in the standard and reduced rates of VAT

Changes not captured in our simulations include increases in excise duties as well as (minor) reductions in tax credits.

## Spain

In response to the economic crisis, the Spanish government introduced a fiscal stimulus package in 2008-09.<sup>13</sup> In 2010, as a response to pressures from financial markets and the European Commission due to its increasing budget deficit, a set of austerity measures were introduced. Among other

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<sup>11</sup> The revenue impact was modest (e.g. indirect taxes contributing not more than 10% of the increase revenue over that period).

<sup>12</sup> A third package of austerity measures was announced in June 2011 (known as “*Urgent measures for the application of the interim financial strategy framework for the period 2012-2015*”). The measures, applicable from 2011 but not captured in our simulations, include a reduction of the income tax-free bracket from €12,000 to €5,000. All tax allowances were abolished (except the child tax allowance which was reduced) and tax credits were reduced by 50%. A special contribution of 1% to 5% was imposed on individuals with income exceeding €12,000 and an annual entrepreneurship duty of €300 to €500 per year was levied on self-employed and liberal professions. Pensioners’ solidarity contribution was raised and supplementary pensions were reduced. Large property tax, vehicle tax, VAT for restaurant services and excise duties on heating petroleum were also increased. Social insurance contributions for unemployment benefits were raised. In September, the government announced the introduction of a new property tax on persons owning commercial or residential property, to be paid via electricity bills. An appeal against this law is currently under consideration by the Supreme Administrative Court. Finally, approximately 30,000 civil servants are planned to be placed on partial pay by the end of 2011.

<sup>13</sup> The 2008-09 fiscal stimulus included a new benefit for jobless workers who have exhausted unemployment insurance and unemployment assistance benefits, a new personal tax credit, a partial mortgage moratorium for the unemployed, the right to extend the duration of mortgage by two years free of charge, as well as various other measures.

things, the 2010-11 austerity measures partly reversed the fiscal stimulus (which in this analysis are not considered as part of austerity measures) and aimed to reduce public expenditure by €15 billion.

The following policy changes have been simulated.

- The introduction of additional income tax rates for top earners
- Cuts in, and freezing of, cash benefits
- Freezing of public pensions
- Increase in the standard rate of VAT
- Public sector pay cuts

In addition there were the following measures that are not simulated: VAT reduced rates and excise duties were increased and some regional governments eliminated or scaled-down their benefits and tax credits.

### **Portugal**

We consider as austerity measures tax and benefit changes and pay cuts introduced between 2009 and 2011 that were presented by the Portuguese government as explicit policy decisions taken to reduce the budget deficit. They include:

- Increase in income tax rates, introduction of an additional income tax rate for top earners, and reduction of tax credits
- Freezing of nearly all insurance benefits and pensions and reduction of means-tested unemployment assistance, family benefit and social assistance.
- Increase in the standard rate of VAT
- Public sector pay cuts

In addition there were the following measures that are not simulated here: VAT reduced rates and excise duties were increased.

### **United Kingdom**

We consider measures introduced in the period between April 2009 and June 2011. These exclude some measures that were due to happen anyway or were introduced as part of the political deal made in forming the 2010 coalition government. We exclude these (which tend to reduce tax revenue or increase spending) from the comparison by including them both in the base (“pre austerity”) and in the reform scenario (“post austerity” which is the 2011 system) in an effort to focus on those designed to reduce the budget deficit.

It should be noted that the measures introduced by 2011 are already known not to be the end of the story. Further, substantial measures have been announced, which are likely to have a bigger effect on those with lower incomes than those with higher incomes, but are not due to be implemented until 2012 or later.<sup>14</sup>

The main austerity measures introduced between 2009 and 2011 which are simulated are as follows:

- Increased social insurance contributions (employee, self-employed, employer)
- The introduction of an additional top income tax rate and withdrawal of the personal allowance at high incomes
- Cuts in some cash benefits and tax credits and increases in others
- Increase in the standard rate of VAT
- Freezing of local tax (Council Tax).

Other policy changes which could not be simulated include certain cuts in cash benefits.

### Counterfactual

Our simulations compare the situation after the austerity measures have been introduced with that under a “business as usual” (counterfactual) scenario. This broadly corresponds to the pre-austerity policy system indexed in the way that is usually assumed in policy announcements and public finance projections in the country concerned and/or is written into the law. These indexation assumptions are the following:

**Estonia:** No indexation except for pensions (indexed by a weighted average of CPI and wage growth)

**Ireland:** No indexation

**Greece:** No indexation

**Spain:** No indexation except for pensions (indexed by CPI)

**Portugal:** Indexation of most components by CPI at least (CPI assumed)

**UK:** Indexation according to statute or assumptions built into official fiscal projections (OBR, 2011; Annex C). Mainly by prices; some components by earnings; some components not indexed.

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<sup>14</sup> These include freezing Child Benefit rates in 2012 and 2013 and the savings credit part of Pension Credit for 3 more years; removal of Child Benefit from higher-rate taxpayers; increase in the working hours requirement for couples in WTC from 16 to 24; reforms to the medical test for Disability Living Allowance that will reduce the number of claimants by 20%; spending cut on Council Tax Benefit; use of the CPI rather than the Retail Prices Index to uprate all benefits and most tax/contributions (this will tend to reduce the size of regular statutory indexation); limit contributory Employment and Support Allowance to 12 months unless very disabled; impose benefit cap of £500 per week per household (£350 per week if single with no children); reduce HB awards by 10% for some groups on Jobseeker’s Allowance for more than 12 months. For a full list and more detail see Browne (2010; Appendix C). Analysis by Browne and Levell (2010) and Brewer et al. (2011) suggests that these changes have a much more regressive effect than the measures introduced 2009-11.

In some cases the counterfactual scenario that is simulated departs somewhat from the (indexed) actual policy system before the austerity measures were introduced if some of the changes were not related to austerity. These exceptions are noted above and in Appendix 1.

#### **4. The effects of austerity measures**

We consider a number of different types of effects, using various measures. First, we analyse the size and composition of the changes to cash benefits, income taxes and contributions paid by workers (employees and self-employed), public pay cuts (net of corresponding tax and contribution reductions) and also employer contributions and credited contributions, all of which can be simulated with EUROMOD, with the exceptions outlined above and in the Appendix. We do not include the effects of indirect tax increases at this point because our information on this is derived from other studies and we are not able to calculate the effects on fiscal consolidation in a consistent way.

Secondly, the effects on household disposable income are considered, first, in terms of the proportional reductions in income across the income distribution and then in terms of the impact on at risk of poverty rates. Since household disposable income is not directly affected by employer or credited contributions, changes in these are not included in this analysis.

Finally, we show the effect of the VAT increase by expressing it, together with the other measures analysed in this paper, as a proportion of household disposable income.

#### **Size and composition of austerity packages**

The extent and composition of the “austerity packages” analysed here is shown in Figure 2. Measured as a percentage of pre-austerity total disposable income (in order to compare the scale across countries), fiscal consolidation as a result of these measures taken together varies from about 2% of disposable income in the UK to 8% in Ireland. It is 6% in Estonia, and between 2% and 3% in Greece, Spain and Portugal.<sup>15</sup> Figure 2 also shows the relative importance of the different types of measure, including employer contributions and reductions in credited contributions.<sup>16</sup>

Comparing across countries, we can see that the relative importance of the different types of measure varies greatly. Pay cuts on public sector workers (net of taxes and contributions) are substantial in Ireland, Greece and Spain, amounting to between 1 and 2 percent of total household disposable income and, in the case of Greece, more than half of the net overall effect shown in Figure 2. Increases in social insurance contributions are important in Ireland (only on workers), Estonia and the UK (workers and employers). Income tax increases considerably in all countries (except Greece), and particularly in Ireland, Portugal and Spain, where the increases are equivalent to more than 1 percent of total disposable income. In Greece income tax and employee contributions decrease after the austerity measures. This is to a small extent due to taxes and contributions collected from pensions which were reduced. But it is mainly due to the fact that the

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<sup>15</sup> Since more austerity measures are in the pipeline in some of the countries, but not others, the aggregate size of the measures shown in the figure should not be interpreted as indicating the relative extent of fiscal consolidation, through the types of policy shown, in each country.

<sup>16</sup> Changes in credited contributions are only relevant for Estonia. Changes in employer contributions are only relevant in Estonia and the UK.

reform of the income tax schedule, as part of the austerity package, itself lead to a reduction in tax revenue. Overall, expenditure on benefits and pensions is reduced in all countries, particularly in Ireland, Greece and Portugal. Benefit and pension reductions are less important in aggregate in Estonia and the UK.

Figure 3 shows how the austerity measures are distributed by deciles of equivalised disposable income.<sup>17</sup> Note that here we assume that increases in employer contributions affect the relevant employees' incomes rather than on profits or prices or wages generally and that reductions in credited contributions affect current incomes rather than pension incomes in the future. Neither are realistic assumptions and Figure 3 should be interpreted with this in mind.<sup>18</sup> On this basis, in all countries, a larger proportion of the fiscal consolidation is assumed by higher income households than lower income households. This is only to be expected since the richer households have a disproportionate share of total income in each country, so even if taxes were levied at a uniform rate, these households would pay more. In particular, we find that the richest 10% of the population accounts for between 24% (in Spain) and 54% (in the UK) of the overall increased burden including that due to employer and credited contributions. The share effectively paid by those in the upper half of the income distribution ranges from 70% in Portugal to 93% in Greece.

Nevertheless, the contribution of lower income households to the fiscal consolidation effort is not negligible. That is especially evident in Portugal, where the poorest three deciles each contribute about 6% of the overall burden.

Figure 3 also shows a breakdown of the contribution made by each by decile group, in terms of the components shown in Figure 2. Here we can see that in Greece, the effect of pay cuts is concentrated in the upper part of income distribution, while cuts in benefits (mainly pensions) are more equally spread. Most income groups actually benefit from the income tax changes and it is only in the top decile group that the tax burden rises.

In the UK, the effect of increases in contributions shows up for the upper half of the distribution while the increase of income tax only affects the very top of the distribution.<sup>19</sup> The reductions in the middle and bottom of the distribution are almost all due to benefit cuts. In Spain, Portugal and Ireland, benefits and pensions have an effect at all points across the distribution, while the effects of public wage cuts and the increase of income tax are larger for richer deciles (there are no changes to social insurance contributions in Spain). In Estonia, where the main effect is from pay related elements: employer and employee contribution increases, income tax and public wage cuts, a higher share of which comes from the top part of the distribution. The effect from benefit cuts is negligible.

### **Distributional effects on household incomes**

Although better off households pay a larger share, as noted above this is only to be expected, and it does not signify that the burden of the measures in relation to their ability to pay is also larger. The share of the total cost of the measures paid by higher and lower income groups, therefore, tells us

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<sup>17</sup> Incomes are equivalised using the modified OECD scale.

<sup>18</sup> The effects of these changes are shown at the top of the bars in Figure 3, to make factoring them out of the picture relatively straightforward.

<sup>19</sup> Browne and Levell (2010) show the large increase in tax in the top decile group in the UK is itself heavily skewed to the top one percent. This is confirmed by our own analysis, not reported here.

nothing about whether the distribution of the cost is equitable or not. In order to account for the greater ability to pay of richer households Figure 4 shows the average proportional change in household disposable income by decile group caused by the austerity measures that have a direct bearing on household income. The effects of changes to employer and credited contributions are not included here. The results show that the reduction in income due to the measures is relatively flat across the income distribution in Estonia and Spain (i.e. each decile groups pays roughly the same proportion of income). In the UK the effect is also fairly uniform up to the 9<sup>th</sup> decile group, but much larger at the top. The distribution is more uneven in Ireland where the proportional reduction in income is larger at the bottom as well as, more especially, at the top. Pensioners, who are concentrated in the middle decile groups, have had their income relatively well protected. Portugal is the only country with a clearly regressive distribution, with percentage losses that are considerably larger in the first and second decile groups than higher up the distribution. The opposite is the case in Greece, where percentages losses are largest for the top decile groups and those at the bottom pay relatively little.

Figure 5 distinguishes the proportional effect on household income in each decile group by the three main types of change: those in benefits and pensions, those in income taxes and contributions, and those in public sector pay. Cuts to benefits and pensions have a particularly large effect on households in the lower part of the income distribution in Portugal, Ireland and Spain. Interestingly, results are different in the case of Greece, indicating that the pension cuts do not have much effect on the income of poorer households but are mainly concentrated in the upper middle part of the distribution. The effect is relatively small and similar across the bottom two thirds of income distribution in Estonia and the UK.

The pattern of the distribution of tax and contribution changes is quite different. In Ireland and to a lesser extent in Portugal the reductions in disposable income due to tax and contribution increases are larger in the upper part of the distribution. The same applies in the UK but concentrated in the top decile group. (The reduction in tax in the bottom decile group is due to the freezing of local tax.) While in Estonia, the reduction is larger in the first decile group and then relatively flat and declining in the top half of the distribution, in Spain it describes a U-shape with households in the upper middle part of the income distribution most affected. In Greece, most people actually gain from the income tax changes, especially in the middle of the distribution, and it is only in the top decile group, that the tax burden rises.

Finally, public sector pay cuts have a larger effect in the upper part of the income distribution in all the countries where these apply, but the gradient varies, with the strongest effect in Ireland. (These are shown net of taxes and contributions on the reduction - i.e. they take account of the fact that the employees concerned pay less tax because they earn less – which probably explains why the effect is not stronger in the top income groups where taxes are higher.)

It is also of interest to understand how the burden of the austerity measures is shared across different types of household. Figure 6 compares the proportional change in disposable income by decile group on the whole population (as in Figure 4) with that on (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). In Greece this latter group loses more proportionately, regardless of their position in the income distribution. In the other five countries households with older people lose less than all households and it is households with children that tend to lose more, although in Portugal this only applies at the bottom of the income distribution. In Estonia the contrast between the position of children and the elderly is particularly striking, especially towards the bottom of the income distribution. In Greece children are relatively well-protected, especially towards the middle and bottom of the distribution. These effects are partly due to decisions about tax and benefit

changes that particularly affect children or elderly people: for example choices over whether to reduce a child tax credit or a pension. They are also partly driven by the composition of households across the income distributions.

### **Risk of poverty**

The effect of austerity measures on the risk of poverty, defined as having income below 60% of the median, depends on how this effect is calculated. Given the reduction in income at the bottom of the income distributions we might expect the risk of poverty to rise, if a fixed poverty threshold is used. However, if the poverty threshold is allowed to shift with median income (i.e. to decline as median income declines), and given the income reductions in the middle of the distribution shown in Figure 4, it is not clear what to expect in terms of relative poverty risk after the austerity measures are introduced (other things remaining the same). Table 2 shows the change in poverty risk using both a fixed poverty threshold and one that falls as income is reduced and confirms that keeping the threshold the same as before, the proportion at risk of poverty rises in each country. It does so most in Ireland (3.7 percentage points) and Portugal (2.0) but by less than one percentage point in the other countries. In all countries, except Greece and the UK, the proportion of children at risk rises considerably, especially in Ireland. The risk of poverty also increases among the working age population especially in Ireland and Portugal and to a lesser extent in Estonia and Spain. The proportion of older people at risk increases by less, but most in Portugal, Greece and Spain and actually falls a little in Ireland.

Not surprisingly, median equivalised income declines in all countries as a result of the austerity measures. If the poverty line is recalculated on the basis of the median after the measures have been imposed, overall risk of poverty rates are broadly unchanged or fall a little in all countries, except Portugal. By age group, increases in the risk of poverty among those of working age and the elderly are notable in Portugal as is the substantial reduction in the risk of poverty among the elderly in Estonia and Ireland.

### **Indirect taxes**

In some of the countries there have also been changes to indirect taxes that we cannot model in detail (because EUROMOD's input database (EU-SILC) does not include data on expenditure). However, drawing on other research, it is possible give an indication of the size and incidence of the effect of increases in VAT across the income distribution.

Using external information for Estonia, Portugal, Spain and the UK on the incidence of VAT by income decile group and assuming that there was no change in pre-tax expenditure or in pre-tax relative prices, we have estimated the increase in standard rate VAT as a proportion of disposable income.<sup>20</sup> For Greece, the effects of changes in all rates of VAT have been estimated from a previous study using micro-data from a Greek Household Budget survey (Decoster et al., 2010; Matsaganis and Leventi, 2011).<sup>21</sup>

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<sup>20</sup> The studies used are, respectively, for Estonia: Vork et al. (2008), for Spain: Serrano (2001) and for the UK: Barnard (2010). For Portugal we carried out our own approximations based on information from the 2005/06 Household Budget Survey on the distribution of expenditure by COICOP categories by income quintile group. VAT was calculated based on the most usual VAT rate applying to each spending category.

<sup>21</sup> There were no substantial changes to VAT in Ireland in the relevant period, although it is due to rise in 2012.



In Estonia and Spain the main VAT rate increased by two percentage points; in the UK the increase was 2.5 percentage points; in Portugal it was 3 percentage points and in Greece the increase in the main rate was 4 percentage points, plus 1 and 2 percentage point increases to the reduced rates. Assuming the increases have a proportional incidence, we find that in each of the countries, the effect is regressive.<sup>22</sup> This is most clearly so in Greece where the extra tax represents almost 5.6% of household income in the bottom quintile group and 2.7% in the top quintile group. The corresponding figures for the other countries are, for Estonia: 1.5% and 1.1%; for Spain: 1.4% and 1.1%, for Portugal: 1.4% and 1.0% and for the UK: 2.2% and 1.2%.<sup>23</sup>

The combined effect of the VAT increase and of the changes simulated with EUROMOD (direct taxes, benefits and pensions, and public sector pay) is shown in Figure 7 (dashed line), contrasted with the effect of the income changes alone (as in Figure 4: solid line).<sup>24</sup> Given the approximations and the assumptions about incidence made, we cannot draw firm conclusions. Nevertheless, in all five countries where VAT rates were raised, the regressiveness of the increased VAT across the income distribution affects the conclusions we might draw about the distributional effects of the austerity measures. In Spain, Estonia and the UK the proportion of income contributed to the austerity measures by those on low incomes is now increased relative to the contribution by those on high incomes.<sup>25</sup> The very strongly progressive nature of the Greek measures before including the effect of VAT rises is transformed into a U-shaped picture involving large losses for the bottom two decile groups in particular. The percentage losses among the low income Greek population are similar in scale to those for the Irish low income population (where there are no VAT increases).

In a third step we add the effects of increased employer contributions and reduced contribution credits (dotted lines), making further, strong assumptions about the incidence of these effects (see above). If these assumptions are valid – and this, it should be emphasised is open to question – adding these increases to employer costs and reductions in credits to future pensions to the other current losses experienced by the employees in question would have the effect of increasing the progressivity of the combined measures in the two countries where they apply (Estonia and the UK) and especially in Estonia where the size of the effect is large, bringing the “loss”, in terms of a proportion of household income, to a level similar to that in Ireland for those on middle-upper incomes.

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<sup>22</sup> Looking at 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. See Browne and Levell (2010).

<sup>23</sup> 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 tends to apply in the other countries, but to a lesser extent.

<sup>24</sup> 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 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. In particular the study in indirect taxes that we use for Spain is more than 10 years old. Our results should be viewed with caution, therefore.

<sup>25</sup> Browne and Levell (2010) also find these effects for the UK changes in indirect taxes.

On the one hand the fact that the size and distribution of the combined effect depends on how comprehensively the analysis is able to cover all the relevant austerity measures, makes definitive statements about the relative effects of austerity across countries difficult. On the other hand, our estimates of the effects of VAT increases are approximate. And while EUROMOD simulates the size of the changes to employer and credited contributions quite precisely, our assumptions about the incidence of these, as well as the incidence of the VAT changes are necessarily quite tentative compared with the precise analysis we are able to carry out on the incidence of changes to direct taxes, cash benefits and public sector pay. Even more tentative would be an analysis that attempted to include the effects of cuts in public services, which are discussed in the next section.

### Cuts in public services

The fiscal squeeze has undermined the proper funding of the public sector, adversely affecting essential public services and the “social wage”. Cuts in spending on public services have an impact on living standards either directly, or indirectly for those who have sufficient income to replace the public service with private consumption. Accounting for the effects of such cuts would provide a more comprehensive and therefore more comparable picture of the consequences of austerity measures for households in each country. While the issue of incorporating the distributional effects of social benefits in-kind (e.g. publicly-funded health care, child care, social care, education etc.) into EUROMOD has been addressed in recent work (see Paulus et al., 2010), applying these methods comprehensively for all types of service is not possible without a substantial amount of further research and some strong assumptions. Indeed, the challenges of modelling the incidence of *reductions* in spending would be considerable, given the assumptions that must be made about who benefits from the non-cash service in the first place (O’Dea and Preston, 2011). In addition, little is known about how cuts made at the level of a government department are being translated into cuts in specific services, and when and where these changes to service provision will be experienced.

The UK government’s own analysis (H.M. Treasury, 2010; Annex B) selects about a third of the expenditure cuts that can plausibly be allocated to households according to their characteristics. O’Dea and Preston (2011; Figure 8.2) show that these fall disproportionately on the second and third quintiles of the distribution of income including service provision. Overall, the distributional effect of expenditure cuts as a whole depends strongly on whether one assumes that cuts in spending on the remaining two-thirds of public expenditure have the same value to each member of the population of whether (for example) their value is in proportion to income (Joyce and Sibieta, 2011).<sup>26</sup> Nevertheless, it is worth noting that the scale of the effect of spending cuts has been shown to be larger than that of taxes and benefits (in the UK). Clearly the effect of austerity measures on living standards that is suggested by the analysis of the tax, benefit and public pay measures in this paper is not the end of the story.

### 5. Concluding remarks

The effects of the economic crisis and austerity on inequality are of great current relevance, not only because inequality, and any driver of growth in it, matters in its own right, but also because how the cost of the crisis is distributed has implications for the prospects for macroeconomic recovery and financial stability as well as the political acceptability of pathways in this direction. The analysis presented in this paper is not about the effects on inequality of the crisis as a whole, nor does it consider all aspects of economic welfare. Instead it focuses on the effects of austerity packages on

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<sup>26</sup> See also Horton and Reed (2010).

household incomes, leaving aside the potentially larger effects on income inequality from labour market developments and financial, macroeconomic and political disarray and on inequalities more generally from cuts in spending on public services. Other studies are attempting to explore some of these complex issues at the national level (for example see Matsaganis and Leventi (2011) for Greece, Brandolini et al. (2011) for Italy, Nolan et al. (2011) for Ireland and Joyce and Sibieta (2011) and Brewer et al. (2011) for UK).

It is important to assess and compare the effects of austerity measures across countries, even though their effects may in some cases be small and/or differ in distributional terms from the overall impact of the crisis. This is because the policies put in place as part of the budgetary retrenchment process are one arena in which governments can exert some direct control and can make choices. Macro-economic and labour market policies are blunt instruments in terms of their distributional effects. In the face of rising unemployment, worsening living standards and growing budget deficits, governments still have choices over the distributional properties of the austerity measures that they introduce. Direct tax and benefit changes as well as public pay cuts are sharp instruments in the sense that their incidence is clear (assuming no evasion or avoidance take place) and the distributional impacts of tax-benefit changes can be fine tuned.<sup>27</sup> Therefore while our analysis does not tell us who is suffering most because of the crisis, it does allow us to assess the extent to which any such pain may have been exacerbated or mitigated by policy choices over austerity measures. With that in mind we can conclude the following from our analysis:

- Except in Portugal and Estonia, high income households (top decile group) contribute a larger proportion of their income to public pay cuts, direct tax increases and cash benefit cuts than the bottom decile group (Fig. 4). The distribution of the burden of austerity on disposable income is clearly and strongly regressive in Portugal, quite flat across income decile groups in Estonia and Spain, mildly progressive in the UK, with a much bigger effect right at the top, also progressive in Ireland (although losses in the lower middle income groups, where pensioners are concentrated, are lower than those in the bottom decile group), and clearly and strongly progressive in Greece.
- Adding the approximate effect of VAT increases changes the shape in Greece, with the burden now larger at the bottom and the top than in the middle of the income distribution (Fig. 7). The regressive effect is similar but less strong in the UK and Spain.
- In all countries that we analyse, except Greece, the austerity measures fall less heavily on older people than on the population in general (Fig. 6). This is particularly clearly the case in Ireland and in Estonia but does not apply at low incomes in the UK or at higher incomes in Portugal. In Greece, pensions are not protected and face particular cuts, at each point in the income distribution.
- In all countries, except Greece, the measures have a larger effect on households with children than those without (Fig. 6). This applies particularly in Estonia (and dramatically at low incomes) and also in Portugal at low levels of income. In the UK, households with children in the bottom 20% of the distribution on average do not lose from the measures as a whole because of counter-balancing increases in means-tested payments for children. In Greece households with children tend to lose less of their disposable income than others, right across the income distribution and on average are better off than before in the third and fourth decile groups.

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<sup>27</sup> Raising VAT and cutting spending on services may be seen as necessary to generate the required revenue. But these too are relatively blunt instruments in terms of their incidence.

- Changes to benefits and/or pensions and benefits tend to hit those on low income the hardest (Fig. 5). This is strongest in Ireland and in Portugal but does not apply in Greece where the largest effect is in the middle of the distribution. Changes to taxes and contributions tend to affect those on high income the most. This is clearly true in Ireland and the UK and but less strongly so in Portugal. The effect is greatest in the upper-middle of the distribution in Spain while in Estonia it is greater in the bottom and the middle than at the top.
- In Greece the choice of a progressive reform to the income tax schedule which involves cuts in taxes for those on middle incomes and increases only at the top (including a small cut in revenue, even if there had been no other changes – Figs. 3 and 5) has served to mitigate the fall in incomes for those in the middle of the distribution due to the crisis as a whole (Matsaganis and Leventi, 2011).
- Using a fixed poverty threshold the effect of the austerity measures on the risk of poverty increases, especially in Ireland and Portugal. In line with the larger burden of austerity measures on households with children, risk of poverty among children rises particularly in Estonia and Portugal (and falls a little in the UK where there is some additional protection at low incomes). In Greece, where older people face a particular burden, risk of poverty among older people also rises by more than on average (Table 2).

In interpreting our analysis there are some caveats to be borne in mind.

Simulating the effects of the austerity measures on the pre-recession population as represented by data collected in 2007 and 2008 (Table 1) may not accurately describe their effect in a mid- (or post-) recession world. Our methodology implicitly assumes that demographic and labour market changes are not dramatic in the short term. While this is usually true, it is far less so at times of crisis. To the extent that these changes alter the underlying distribution of income against which the effects of the austerity measures are assessed – for example, if they reduce income at the lower end of the distribution – it means that the a further reduction resulting from the imposition of austerity measures would have a bigger proportional effect than shown here. Furthermore, a sharp rise in unemployment among primary earners has serious implications for the tax base and demand for social support. This might mean that we over-estimate the effects of tax increases and underestimate the effects of benefit cuts in the analysis here, though the extent of this under- and over-estimation might not be large.<sup>28</sup>

We have not taken account of tax evasion. In Greece particularly and in principle in all six countries the size and distribution of the tax changes would be somewhat different if we had been able to do this.

As explained above our analysis does not include the impact of cuts in in-kind benefits and services on households. This is for two reasons. First, the information requirements for a comparable analysis of six countries are considerable. Secondly, given the present state of research and knowledge in this area, any distributional results would be driven by the assumptions about valuation and incidence that would need to be made.

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<sup>28</sup> Results for Ireland which are calibrated to post-recession levels of employment and unemployment (Callan et al., 2010) are broadly similar to those reported here.

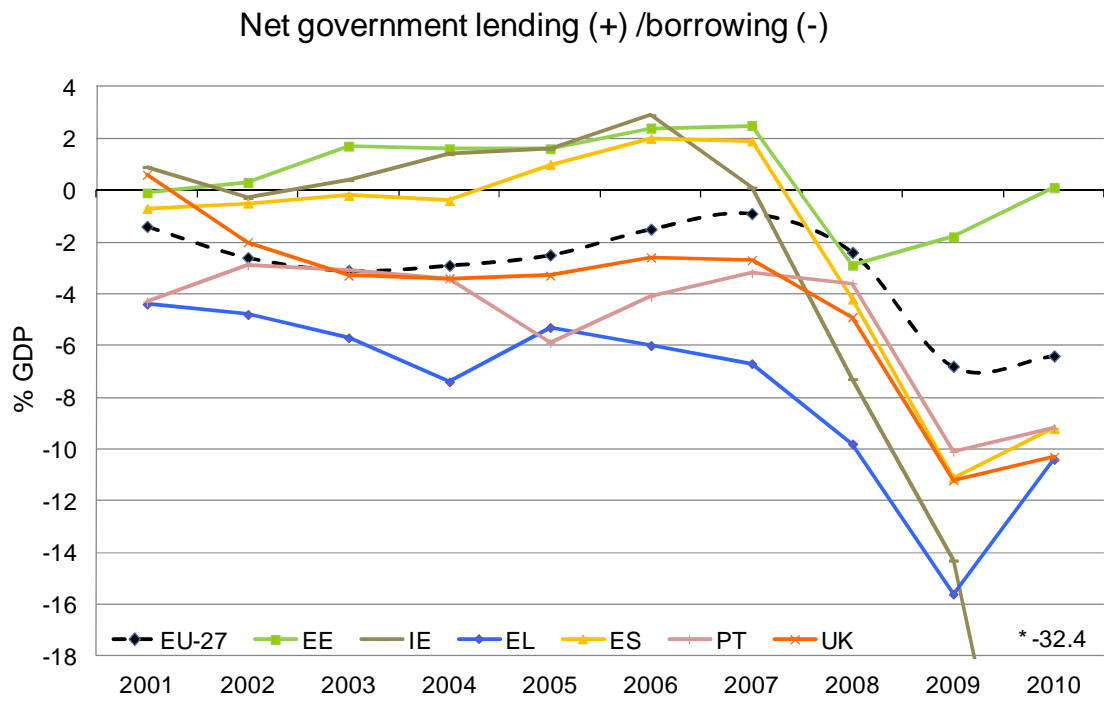
Finally, the story about fiscal consolidation through public sector pay and cash benefit cuts and tax increases, is not yet complete. For comparability reasons we have chosen to analyse changes that have already been implemented and not to include the effects of policies that have been, in some countries – particularly Greece and the UK– already announced for future implementation. This is because in other countries new austerity packages are being discussed and/or may be introduced at some point in time. Taking account of a longer period of changes is likely to show a larger aggregate effect and not necessarily with the same distributional pattern. In Greece the 2011 package is likely to prove highly regressive relative to the 2010 packages analysed here. Analysis of the changes in the UK announced up to 2015 (rather than 2011 as in this analysis) shows a much more regressive picture than indicated here (Browne and Levell, 2010) in which the number of people at risk of poverty is set to rise (Brewer et al, 2011 ).

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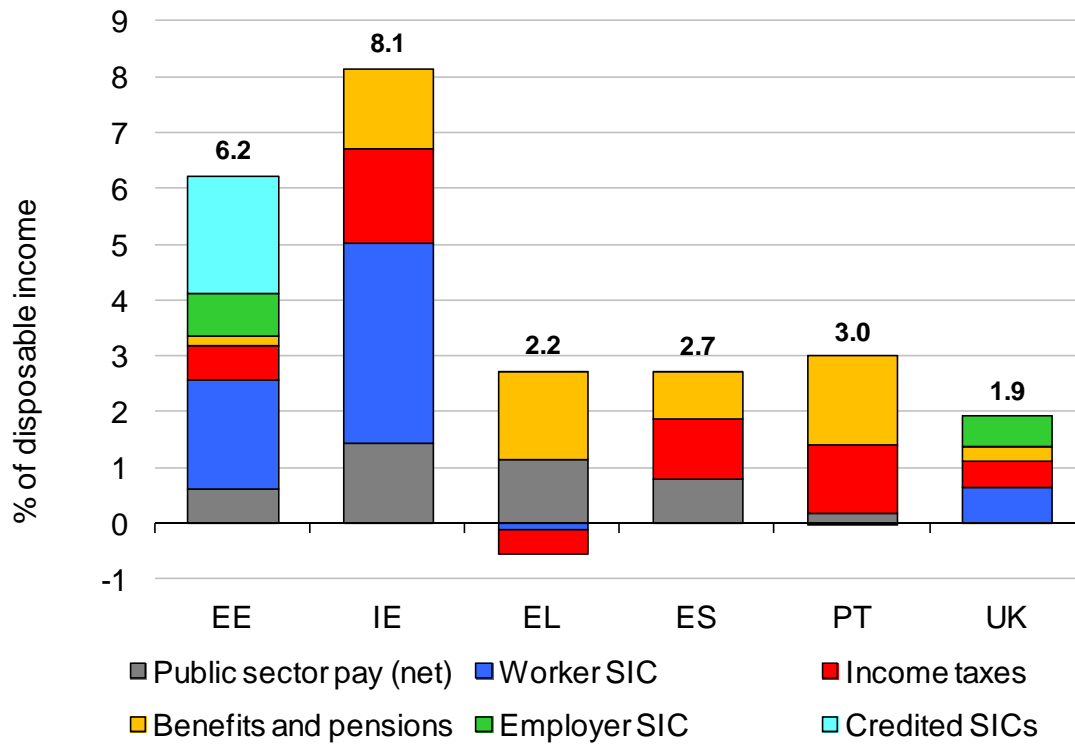
Figure 1 Government deficits as a percentage of GDP (2001-2010)



Source: Eurostat (last accessed on 16 September 2011).



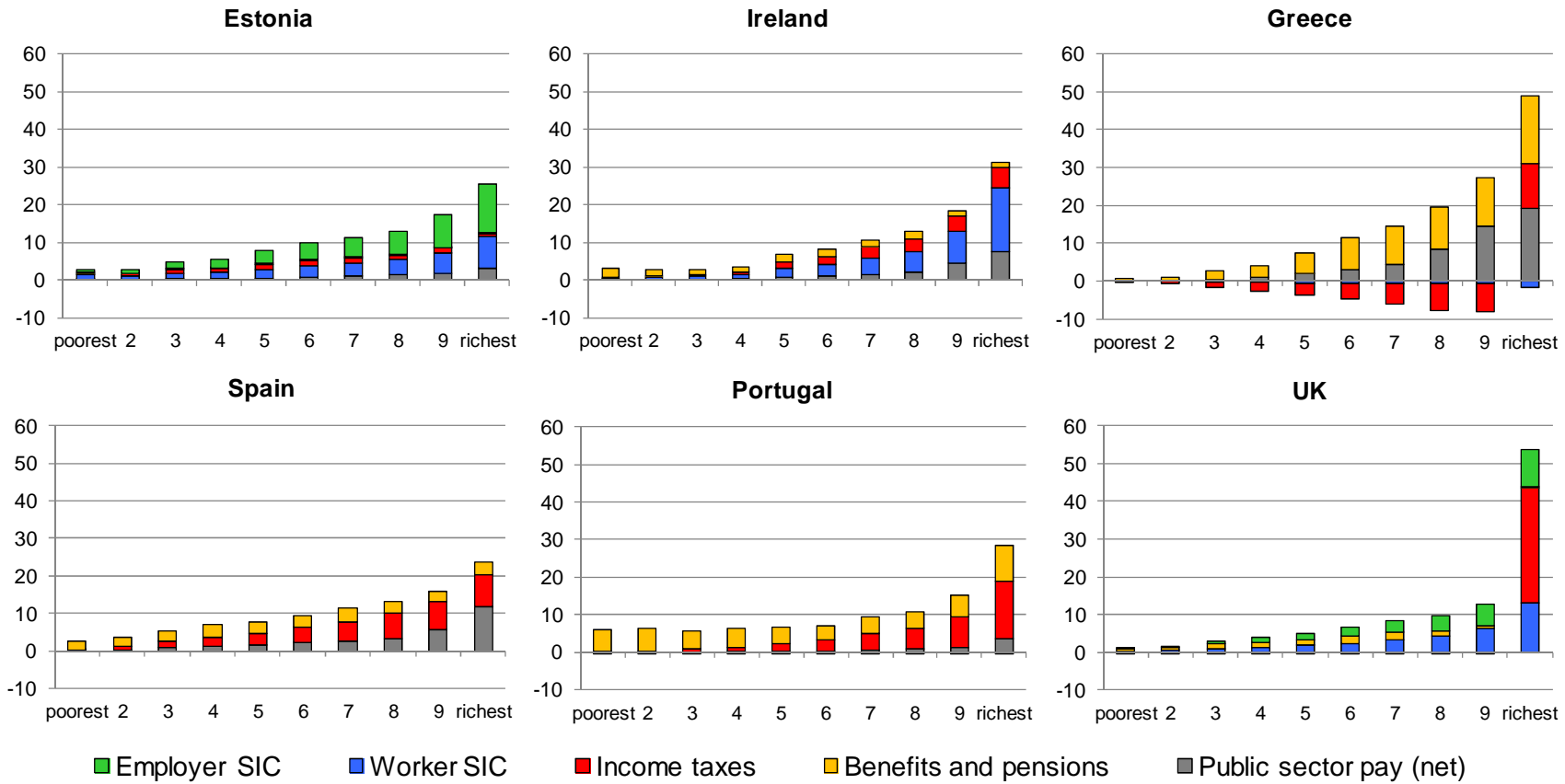
**Figure 2 Aggregate effect of simulated austerity measures as a percentage of total household disposable income, by type of policy**



Source: EUROMOD version F4.19 and SWITCH

Note: The austerity measures included here are limited to those that can be simulated with EUROMOD. Increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. The numbers shown on the chart are the aggregate net increase in the public budgetary balance as a proportion of total household disposable income in each country.

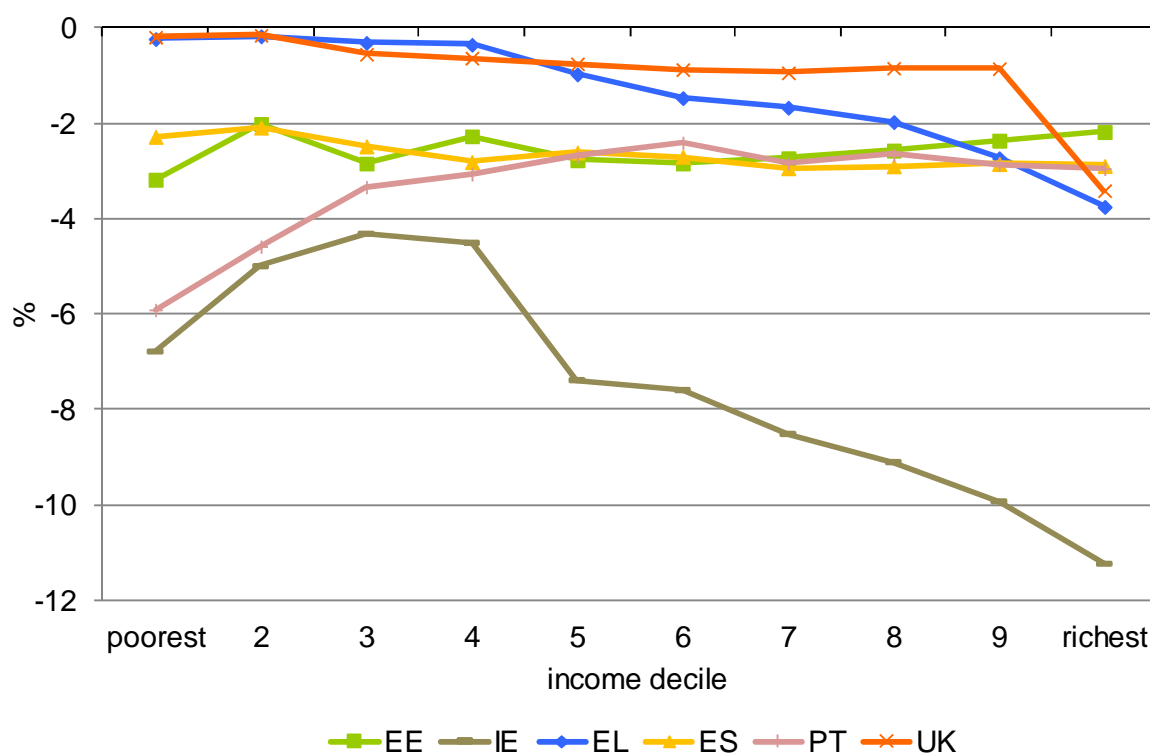
**Figure 3 Relative contribution to fiscal consolidation by type of austerity measure, by income decile group**



Notes: The austerity measures included here are limited to those that can be simulated with EUROMOD. Increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. In Estonia reductions in credited contributions are included with increases in employer contributions. It is assumed that increases in employer contributions are incident on the relevant employees and reductions in credited contributions affect current rather than future incomes, purely for the purposes of this Figure. Deciles are based on equivalised disposable income in the counterfactual (before austerity) scenario and constructed using the modified OECD equivalence scale to adjust incomes for household size.

Source: EUROMOD version F4.19 and SWITCH.

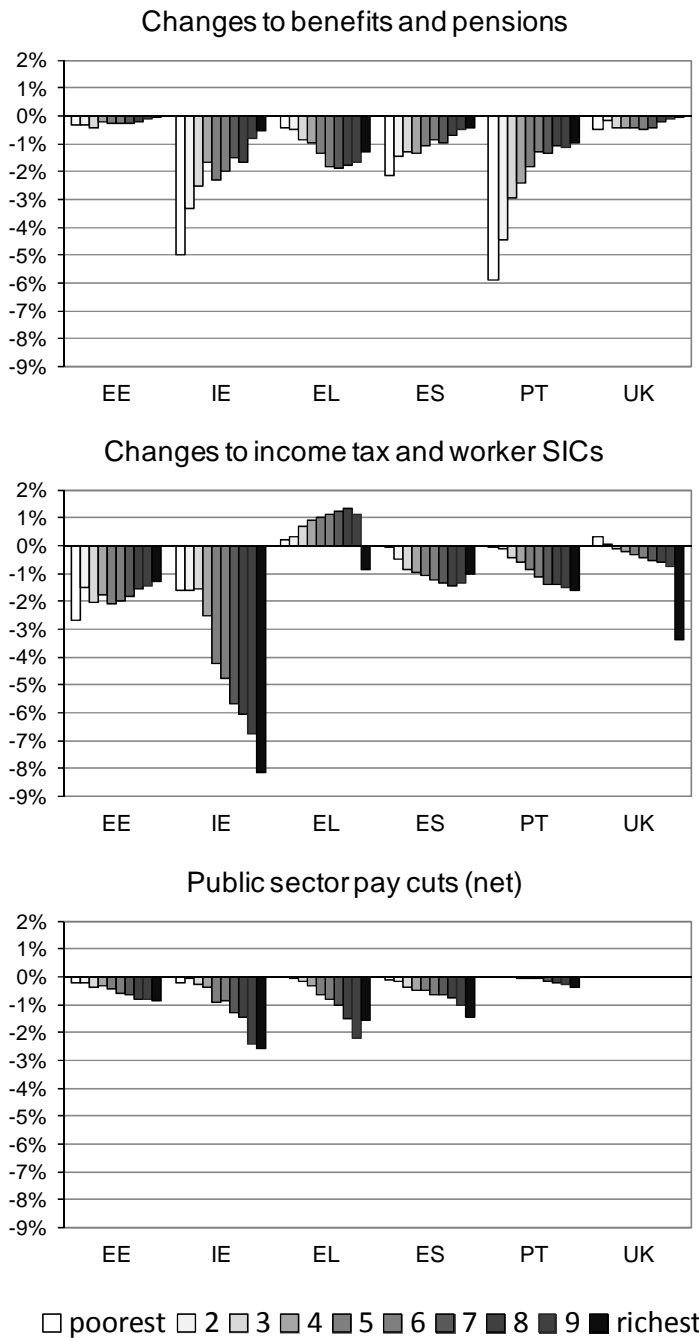
Figure 4 Percentage change in household disposable income due to austerity measures



Notes: The austerity measures included here are limited to those that have a direct effect on household disposable income (changes to direct taxes, cash benefits and public sector pay). They do not include changes to employer or credited contributions. In addition, increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. Deciles are based on equivalised disposable income in the counterfactual (before austerity) scenario and constructed using the modified OECD equivalence scale to adjust incomes for household size.

Source: EUROMOD version F4.19 and SWITCH.

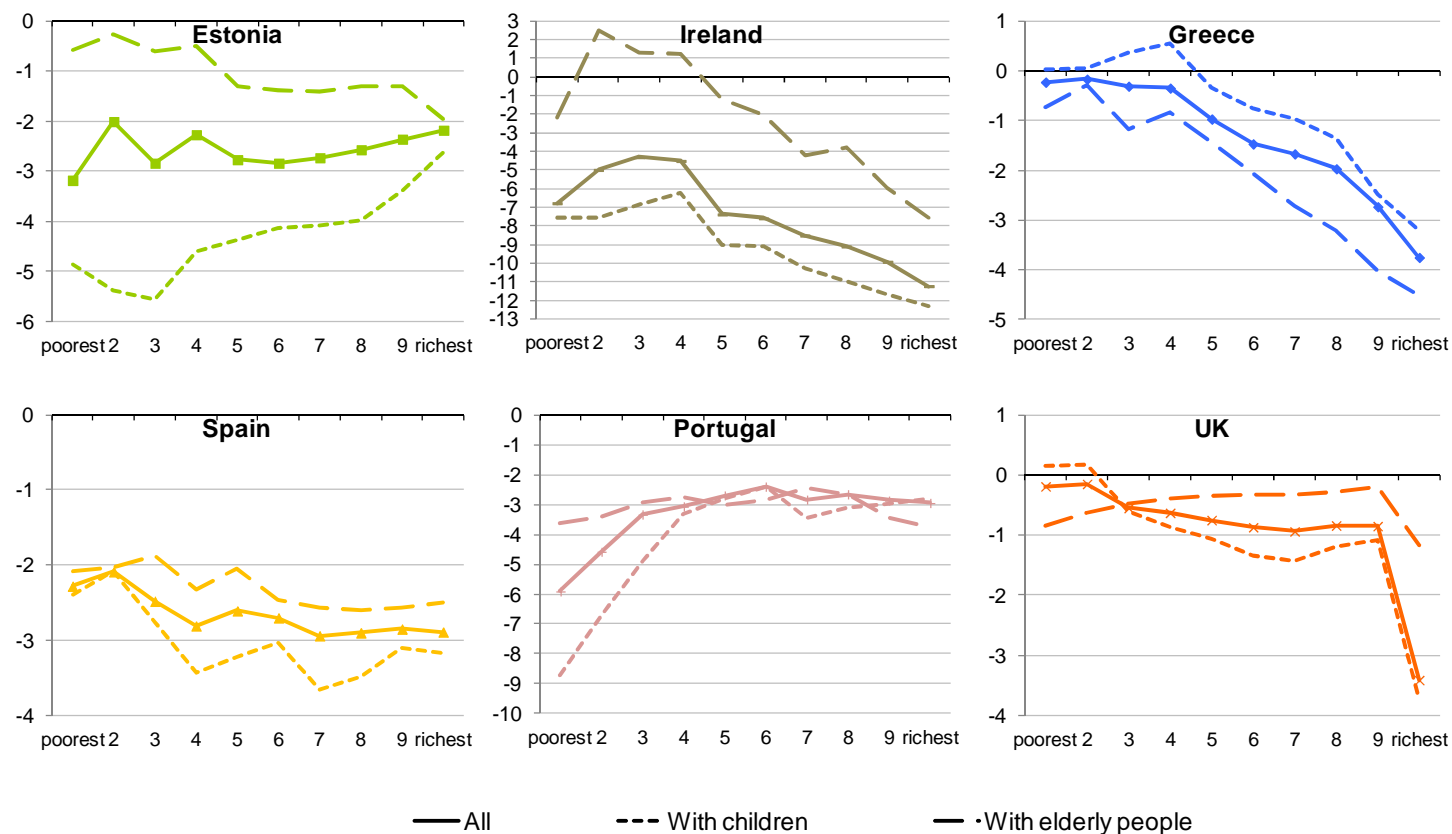
**Figure 5 Percentage change in household disposable income due to austerity measures: by type of measure**



Notes: The austerity measures included here are limited to those that have a direct effect on household disposable income (changes to direct taxes, cash benefits and public sector pay). They do not include changes to employer or credited contributions. In addition, increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. Deciles are based on equivalised disposable income in the counterfactual (before austerity) scenario and constructed using the modified OECD equivalence scale to adjust incomes for household size.

Source: EUROMOD version F4.19 and SWITCH.

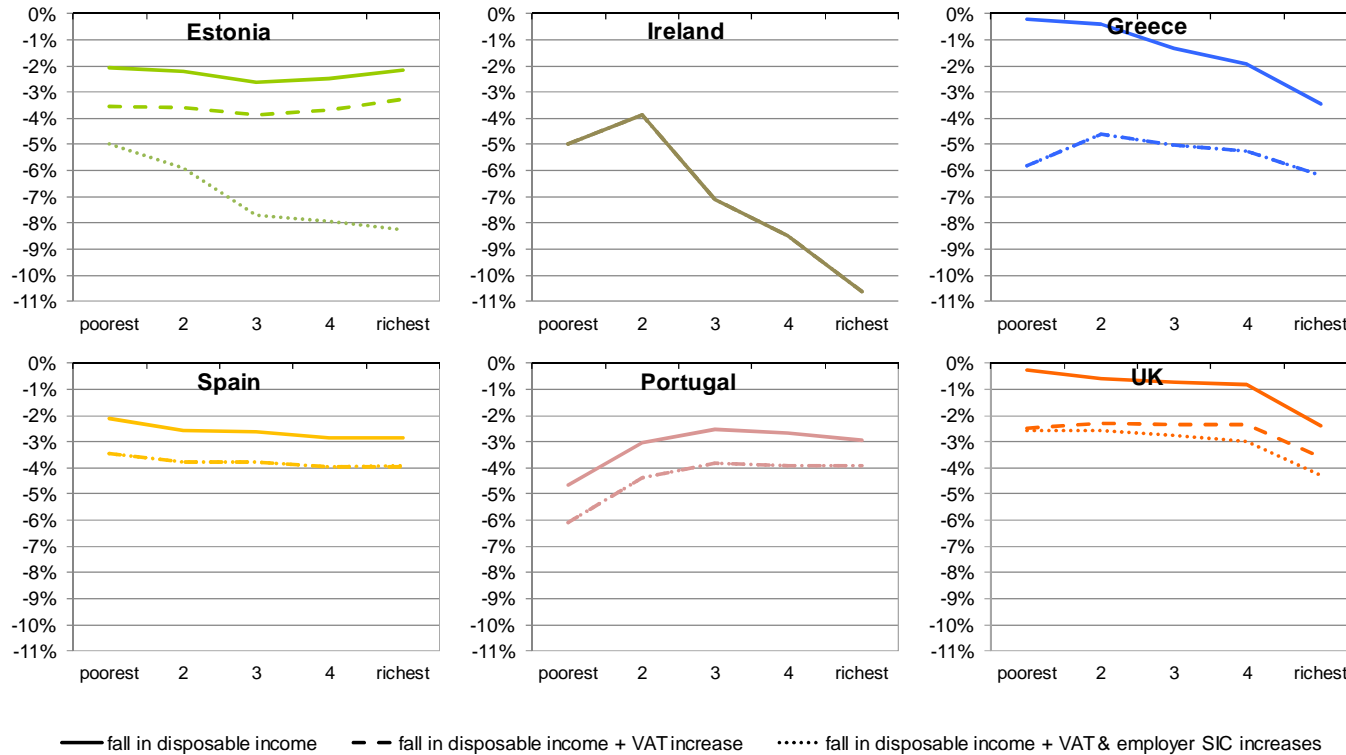
Figure 6 Percentage change in household disposable income due to austerity measures: by type of household



Notes: The austerity measures included here are limited to those that have a direct effect on household disposable income (changes to direct taxes, cash benefits and public sector pay). They do not include changes to employer or credited contributions. In addition, increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. Deciles are based on equivalised disposable income in the counterfactual (before austerity) scenario and 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 all 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: EUROMOD version F4.19 and SWITCH.

**Figure 7 Austerity measures as a percentage of household disposable income by quintile group: changes to income components, VAT increases and changes to employer contributions**



Notes: The austerity measures included here are: (a) limited to those that have a direct effect on household disposable income (changes to direct taxes, cash benefits and public sector pay), (b) VAT increases and (c) increases in employer contributions (in UK and Estonia) and reductions in credited contributions (Estonia only). Other increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. It is assumed that increases in employer contributions are incident on the relevant employees and reductions in credited contributions affect current rather than future incomes, purely for the purposes of this Figure. Quintiles are based on equivalised disposable income in the counterfactual (before austerity) scenario and constructed using the modified OECD equivalence scale to adjust incomes for household size.

Source: EUROMOD version F4.19 and SWITCH.

**Table 2: Risk of poverty rates before and after the introduction of austerity measures**

	EE	IE	EL	ES	PT	UK
Risk of poverty rate before	15.3	12.4	20.4	18.6	18.5	16.6
Risk of poverty rate after (fixed threshold)	16.2	16.0	21.1	19.6	20.5	16.6
Percentage point change in risk of poverty rate relative to base scenario by age						
All	1.0	3.7	0.7	1.0	2.0	0.0
0-17	2.2	5.0	0.3	1.2	3.2	-0.5
18-64	0.8	3.8	0.6	0.9	1.4	0.0
65+	0.1	-0.7	1.3	1.1	2.8	0.4
Change in median equivalised income (%)	-2.9	-7.6	-1.2	-2.7	-2.0	-0.8
Poverty rate after (relative threshold)	14.9	11.9	20.3	18.3	19.6	16.1
Percentage point change in risk of poverty rate relative to base scenario by age						
All	-0.4	-0.5	-0.1	-0.3	1.1	-0.4
0-17	1.0	-0.4	-0.6	-0.2	2.5	-1.1
18-64	-0.1	-0.2	-0.2	-0.1	0.8	-0.3
65+	-3.2	-1.9	0.7	-0.8	1.0	-0.2

Notes: The austerity measures included here are limited to those that have a direct effect on household disposable income (changes to direct taxes, cash benefits and public sector pay). They do not include changes to employer or credited contributions. In addition, increases in indirect tax, cuts in public services and some minor tax-benefit changes (see text) are not included. Risk of poverty rates are calculated as the percentage of people in the relevant group with equivalised household income below 60% of the median, using the modified OECD equivalence scale. The fixed threshold is calculated using equivalised disposable income in the base, or counterfactual (pre-austerity), scenario.

Source: EUROMOD version F4.19 and SWITCH.

## Appendix 1: Austerity measures in 2009-11

### Estonia

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The tax-benefit policy changes simulated in our analysis are the following (taking effect, unless otherwise specified, from 1 January 2009):

#### *Direct taxes and contributions*

- The increase in employer and employee unemployment insurance contributions (from 1 June 2009 and 1 August 2009)
- The increase in the minimum levels of pension and health insurance contributions
- The suspension of credited contributions and employee contributions to the 2<sup>nd</sup> pension pillar (between 1 June 2009 and 31 December 2010)

#### *Benefits and tax credits*

- The narrowing of eligibility conditions for income tax child allowance
- The abolition of child school allowance
- The narrowing of eligibility conditions for childcare allowance
- The increase in minimum levels of unemployment insurance benefit (from 1 July 2009)<sup>29</sup>

#### *Public sector pay*

- Public sector pay cuts (about 3.5% on average in 2009).

#### *Indirect taxes (in Figure 7 only)*

- Standard rate of VAT increased for 18% to 20% (in June 2010)

In addition there were the following changes in 2009-10 which are not simulated:

- Changes related to minor benefits: additional childcare leave for fathers and compensation of study loans was abolished, sickness benefit and severance pay was reduced, and the eligibility for dental care benefit was narrowed.
- The abolition of tax deduction for the following expenses: interest payments of study loans, donations and trade union membership fees (from 1 January 2010)
- Freezing of minimum pension (in 2010)
- Reduced rate of VAT increased from 5% to 9% (in June 2010)
- Alcohol, tobacco and fuel excise increases (July 2009 and January 2010)

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<sup>29</sup> Note that together with the suspension of employee contributions to the 2<sup>nd</sup> pension pillar, these are the only measures increasing rather than decreasing disposable income in Estonia.



## Ireland

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The following tax-benefit policy changes in 2009-11 are covered in our analysis:

### *Direct taxes and contributions*

- The tranche of income taxed at the standard, 20% rate (the “standard rate band”) was reduced from €35,400 to €32,800. There was an equivalent €2,600 reduction in the standard rate band for lone parents and for one-earner married couples. Two-earner married couples continued to receive a doubled standard rate band.
- The basic personal tax credit was reduced from €1,830 in 2008 to €1,650 in 2011. Precisely the same reduction applied to tax credits for lone parents and for employees (the “PAYE” tax credit)
- Special tax provisions for the elderly were scaled back: the age tax credit was reduced from €325 to €245 while the income tax exemption limits for those aged over 65 were reduced from €20,000 to €18,000
- Initially, a temporary income levy was introduced and then increased. By 2011 this had been replaced by a new Universal Social Charge (USC) which replaced both this temporary levy and the pre-existing Health Contribution. The new USC is a tax payable on gross income (before pension contributions). Income from social welfare payments or from deposit income on which retention tax (DIRT) has been paid is exempt. There is no allowance, but incomes below €4,004 per annum are exempt. The rates of Universal Social Charge are: 2% on the first €10,036, 4% on the next €5,980 and 7% on the balance.<sup>30</sup>
- The ceiling on employee and employer social insurance contributions (PRSI – Pay-Related Social Insurance) was abolished.
- The rate of pay-related social insurance contributions (PRSI) for the self employed was increased from 3% to 4%
- There were significant changes in the tax treatment of employee superannuation (pension) contributions. Until 2008, these had been excluded from gross income for tax purposes and similarly excluded for the purposes of calculating social insurance contributions. The upper ceiling on this relief from taxation was also very high. A number of restrictions on the extent of the implied tax relief were introduced

### *Benefits and tax credits*

- The universal Child Benefit payment was reduced from €166 to €140 per month (€203 to €172 per month for 3<sup>rd</sup> and higher order children), with a compensating increase being paid to welfare recipients as part of their welfare payment.
- Welfare payment rates were increased in the October 2008 Budget by a little over 3%. In subsequent years, payments to those of working age were reduced by about 4% in 2010 and a further 4% in 2011.
- Payments to those of pension age benefited from the initial increase but were then not reduced.
- Jobseeker’s Assistance payment rates for unemployed people aged under 25 were sharply reduced, by about 25% for those aged 22-24 and by 50% for the youngest unemployed.
- Family Income Supplement (FIS – an in-work benefit) was increased somewhat ahead of the rate of wage growth.

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<sup>30</sup> However the rate is capped at 4% for those on low incomes, who qualify for the means-tested full medical card, and for those aged 70 or over. There is a surcharge of 3% on individuals who have income from self-employment that exceeds €100,000 in a year, regardless of age.

- A cash benefit entitled the Early Childcare Supplement, with a value of €1,100 per annum, was abolished and replaced by a new, non-cash scheme of subsidisation of places in early child care for children aged 3 years of age.

### **Public sector pay**

- In early 2009, emergency legislation was enacted requiring public sector workers to make an additional “pay related deduction” in respect of their pensions (PRD, but more commonly referred to as the public service pension levy). The average rate of deduction was about 7-8 per cent of salary, but the structure was strongly progressive: the first €15,000 of income was zero-rated, the next €5,000 at 5%, a further €20,000 at 10% and the balance at 10.5%. This was widely seen as an attempt to reduce public sector pay without a reduction in nominal salary levels, and is frequently treated as an implicit salary cut.
- Budget 2010, announced late in 2009, implemented reductions in public service salaries as follows: 5% on the first €30,000 of salary, 7.5% on the next €40,000 of salary and 10% on the next €55,000 of salary.

This produced overall reductions in salaries ranging from 5% to just under 8% in the case of salaries up to €125,000. Reductions ranging from 8% on salaries of up to €165,000, 12% on salaries up to €200,000 and 15% on salaries of €200,000 or more were also implemented.

In addition there are the following changes that have taken place in the period 2009-2011 but have not been simulated in the present exercise because of data limitations:

- A new carbon tax was introduced, and there were some minor changes to other indirect taxes.
- The tax on deposit interest (DIRT – deposit interest retention tax) was increased over the period by about 5 percentage points up to 27 per cent.

## **Greece**

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The main policy changes that are simulated in this paper were as follows:

### **Direct taxes and contributions**

- Introduction of a one-off (retrospective) tax at 1% of personal annual incomes in 2009 over €100,000.
- The structure of personal income tax was made more progressive: nine tax brackets, including a personal allowance of €12,000 per year, and an increased top rate of 45% for annual incomes over €100,000.
- Introduction of ‘Pensioners’ Solidarity Contribution’, i.e. a special tax on pensions, with tax rates rising from 3% for pensions between €1,400 and €1,700 per month to 10% for pensions exceeding €3,500 per month. Pensions below €1,400 per month are exempt.
- The tax base was extended to include unemployment benefits, large family benefits and contributory disability benefits for individuals with taxable income over €30,000 a year.

### **Benefits and tax credits**

- The 13<sup>th</sup> and 14<sup>th</sup> monthly pension payments were abolished. In their place, flat-rate vacation allowances totalling €800 a year will be paid to pensioners aged 60 and over receiving a pension below €2,500 per month. Invalidity pensions, social pensions and farmers’ basic pensions are excluded (i.e. continue to be paid 14 times a year).

- Tax allowances and tax credits (from 1 January 2010). The child tax allowance was raised (to €1,500, €3,000 and €11,500 per annum for tax units with 1, 2 and 3 children respectively).
- Installation of eco-friendly energy systems tax allowance was made a tax credit at 20% of the relevant expenditure up to a maximum tax credit of €600 annually. Private insurance contributions tax allowance was also made a tax credit at 20% of the relevant expenditure up to a maximum tax credit of €240 annually for unmarried persons and €480 for married couples.

#### ***Public sector pay***

- The 13<sup>th</sup> and 14<sup>th</sup> salaries hitherto paid to civil servants and public utilities employees were abolished. In their place, flat-rate vacation allowances totalling €1,000 a year will be paid to public sector workers earning less than €3,000 per month.
- Public sector wages capped at €5,981 a month<sup>31</sup>.
- Special allowances paid to civil servants were reduced by 20%. Family, seniority, post-graduate studies and hard & arduous occupation allowances were excluded. Public utilities employees, whose special allowances other than family allowances are part of base pay, had the latter cut by 10%.

#### ***Indirect taxes (in Figure 7 only)***

- Increases in the standard rate of VAT from 19% to 23% and in the reduced rates also (increased from 4.4% to 5.5% and 9% to 11%).

In addition there were the following measures that are not simulated here:

#### ***Direct taxes and contributions***

- Charitable donations tax allowance, previously available at the marginal rate, was made a tax credit at 20% of the relevant expenditure, and capped at 10% of total taxable income. The household expenses tax credit was abolished.

#### ***Indirect taxes***

- Excise duty on tobacco, alcohol and fuel increased by 30%.
- Taxes on luxury items up by 20%.

## **Spain**

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The 2010-11 austerity measures that are simulated include:

#### ***Direct taxes and contributions***

- Addition of two 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).
- 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.

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<sup>31</sup> High-court judges excepted. This exception is not simulated.

### ***Benefits and tax credits***

- Elimination of universal birth grant from January 2011.
- Pension freeze for 2011, except for minimum and non contributory pensions.
- Freeze of Indicator for social benefits (IPREM) in 2011. The income tests of child benefit and unemployment insurance and assistance benefits are based in this indicator.
- Tightening of the eligibility conditions to the Temporary Unemployment Protection Program (Programa Temporal de Protección por Desempleo e Inserción)
- Reduction of child benefit for children aged 0 to 2 from €500 to €291, in 2011.
- Means-testing of the €400 personal tax credit from 2010.

### ***Public sector pay***

- Civil servants' pay cut up to 9.7% (5% in average) in 2010; pay freeze in 2011.

### ***Indirect taxes (in Figure 7 only)***

- From July 2010, the standard rate of VAT increased from 16% to 18%.

In addition there were the following measures that are not simulated here:

- From July 2010, reduced VAT rate also increased from 7% to 8%. Base rate was maintained at 4%.
- Some regional governments have eliminated or reformed (scaled-down) their benefits and tax credits.

## **Portugal**

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The 2009-11 austerity measures that are simulated include:

### ***Direct taxes and contributions***

- Increasing tax rates by 1 and 1.5 percentage points depending on income level.
- Adding a new bracket for incomes above € 153,300 per year, increasing the highest tax rate from 42% to 46.5%.
- Replacing the reference indicator for tax credits from the minimum wage (€485 in 2011) to the social benefit index (€419.22 in 2011) or the amount of the minimum wage in 2010 (€475), whatever is larger, while maintaining the same proportions of the reference indicator.
- Reducing the pension tax allowance.

### ***Benefits and tax credits***

- Freezing, between 2009 and 2011, the nominal value of the social benefit index (SBI) which is the base for most social benefits.
- Freezing, between 2010 and 2011, the nominal value of benefits not linked to the SBI (including pensions).
- Reducing the amount and tightening the eligibility conditions to family benefit.
- Freezing, between 2010 and 2011, the nominal value of the basic amount and reducing the generosity of the implicit equivalence scale of social assistance.

### *Public sector pay*

- Cutting the pay of civil servants up to 10%.

### *Indirect taxes (Figure 7 only)*

- From January 2011, the standard rate of VAT was raised from 20% to 23%.

In addition there were the following measures that are not simulated here:

- From January 2011, the reduced VAT rate was increased to 13% and the base rate to 6% (before the austerity measures these were 12% and 5%, respectively).

## **United Kingdom**

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The 2009-11 austerity measures that are simulated include:

### *Direct taxes and contributions*

- An increase in 2011 in all employees' and employers contribution rates of one percentage point.
- Introduction of a 50% tax band on incomes over £150,000 per year in 2011.
- Abatement of the personal allowance by £1 in every £2 of taxable income over £100,000 per year from 2010.
- Freezing of Council Tax (local taxation) in 2011, intended to mitigate the effects of the austerity measures.

### *Benefits and tax credits*

- Withdrawing the family element of the Child Tax Credit (CTC) from higher-income families at a faster rate and from a lower threshold than previously (in 2011).
- Increasing the rate at which tax credits are withdrawn in 2011 from 39% to 41%.
- Removing the baby element of the CTC in 2011.
- Working Tax Credit (WTC)/CTC first threshold frozen and second threshold reduced in nominal terms
- 30-hours addition in WTC frozen; 30-hours disregard in Housing Benefit (HB) and Council Tax benefit (CTB) also frozen in 2011.
- Basic amount of WTC/CTC frozen in 2011.
- Childcare addition to WTC reduced from 80% of costs to 70% in 2011.
- Child Benefit rates frozen in 2011.
- Real increases in the child element of the Child Tax Credit in April 2011 (intended to mitigate some of the cuts in support for children, for low income families)
- Freezing of savings credit maximum payments within Pension Credit in 2011.
- Deductions from benefit (Income Support, HB and CTB) for non-dependents uprated by the CPI in 2011 (previously frozen in nominal terms)
- Non-continuation of the Winter Fuel Allowance additions introduced by the previous government.

### *Indirect taxes (in Figure 7 only)*

- The standard rate of VAT was increased from 15% to 20%. This followed a VAT reduction from 17.5% to 15% as part of the earlier stimulus measures so according to the criteria adopted in this paper, only the increase from 17.5% to 20% is considered as an austerity measure.

This list excludes some changes introduced in the period 2009-11 that are judged to be not austerity measures. These are included in both the base and the reform in our simulations. We list them below, together with the justification for not counting them as austerity measures

- An increase to the income tax personal allowance for those aged under 65 by £1,000 per year in 2011. This amounted to a 10.4% real increase over the two year period and was offset by a reduction in the threshold to the higher rate of income tax and upper thresholds on contributions, to target the tax cut on standard rate taxpayers (part of the deal struck by the political parties forming the coalition government in 2010).
- Increases in the lower limits for employee and employer contributions (part of a long-term agenda to align income tax and social contribution thresholds).
- Real increases in the child element of the Child Tax Credit in April 2010 (part of the previous Government's strategy to reduce child poverty).
- WTC payable to people aged 60+ if they work more than 16 hours per week, from 2011; above inflation increases to the Pension Credit guarantee credit and Basic State Pension in 2010; an increase in the lower capital threshold in Pension Credit, HB and CTB from £6000 to £10,000 in 2010 for pension-age people (part of a restructuring of state incomes for pensioners).

In addition there are the following changes that have taken place in the period 2009-2011 but have not been simulated in the present exercise because of data limitations.

### *Benefits and tax credits*

- Changes to the way in which in-year changes are made to tax credit awards so that increases in income of more than £10,000 (rather than £25,000) in April 2011 will reduce tax credit payments and falls in income of up to £2,500 will not increase tax credit payments. Also, claimants will have to inform HMRC about changes in their circumstances more quickly.
- Housing benefit reform: Local Housing Allowance (LHA) rates will be set at the 30th percentile of local rents rather than the 50th percentile. Irrespective of local rents, there will be caps on the total amount of rent that can be claimed under LHA and rents will be capped at the 4-bedroom rate. The existing disregard of rent up to 15% more than LHA levels will be removed. Housing benefit will be reduced for those of working age living in social housing that is under-occupied. Finally, LHA will be limited to single-room levels for single people aged 25-35.