

Research note 8/2010  
**Modelling the distributional effects  
of austerity measures:**  
The challenges of a comparative perspective



Social Situation Observatory – Income distribution and living conditions

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## Abstract

In this RN we compare the distributional effects of austerity measures that are being introduced in 4 EU countries in the period of economic retrenchment following the “great recession”. We explore the effects of policy changes presented as “austerity measures” in Estonia, Greece and Spain, using the EU microsimulation model EUROMOD. Moreover, we present comparable results for the United Kingdom, drawing on the work of the Institute for Fiscal Studies. We focus on the direct effects of proposed/implemented tax increases and spending cuts across the distribution of household incomes and on relative poverty risk. The four countries have chosen a different policy mix to achieve varying degrees of fiscal consolidation. Our analysis addresses the question of how socially fair that policy mix is. There is a range of important conceptual and comparative issues to be addressed when doing such analysis in a comparative setting. These include how to identify “austerity measures” in a consistent manner, the relevant time periods to consider, and the assumptions behind the counterfactual scenarios. Using empirical illustrations from our 4-country comparison we consider the relevance of these issues for comparative analysis of the micro-level effects of budget consolidation policies.

JEL: C81, H55, I3

Keywords: Austerity measures, European Union, Poverty, Microsimulation.



## Introduction

The economic crisis and the austerity measures to counter it are widely expected to cause poverty and inequality to rise sharply. In RN2/2010 we tested the resilience of five European welfare states with respect to one aspect of the economic crisis: unemployment and the consequent loss of income of those affected. In this RN8/2010 we ignore wider aspects of the economic crisis (of which unemployment risk is among the most relevant), and focus instead on austerity measures alone, comparing their distributional effects in four EU countries: Estonia, Greece, Spain and the United Kingdom.

The four countries are among the worst hit by the crisis (see Figure 1). However, the degree of fiscal consolidation they have set out to achieve varies, and so does the policy mix chosen to achieve it. Our analysis addresses the question of how socially fair that policy mix is.

We show the direct effects of proposed or already implemented tax increases and spending cuts across the distribution of household incomes, and on relative poverty risk. A range of important conceptual and comparative issues arise when doing such analysis in a comparative setting. These include how to identify “austerity measures” in a consistent manner, the relevant time periods to consider, and the assumptions behind the counterfactual scenarios. Using empirical illustrations from our 4-country comparison we consider the relevance of these issues for comparative analysis of the micro-level effects of budget consolidation policies.

We exploit information from a representative sample of each national population, using data from the European Union Statistics on Income and Living Conditions (EU-SILC) and the simulation in EUROMOD of the tax-benefit instruments in Estonia, Greece and Spain. Our analysis of the distributional effects of tax increases and spending cuts in the United Kingdom relies instead on recent work of the Institute for Fiscal Studies, and draws heavily on Browne and Levell (2010).

The structure of this RN is as follows. Section 2 discusses the various methodological issues and briefly describes the EU tax-benefit microsimulation model EUROMOD. Section 3 introduces the austerity measures taken in each country. Section 4 presents our tentative estimates of distributional effects, i.e. of how the burden of austerity measures is shared across income groups in the four countries. Section 5 discusses limitations of our approach and reflects on issues for further research.

## 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 country, depending on the nature 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 do not attempt to define an equivalent (comparable) simulation in each country. Instead, we have decided to take a national perspective and to consider the implications of methodological differences when interpreting results.



Among the methodological issues to be confronted are the following: Which measures count as austerity measures? What is the counterfactual; what do we assume would have happened without the austerity measures? Which measures can be simulated across the income distribution, with a reasonable degree of precision? To what extent 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 may also include increases in some benefits or reductions in taxes for certain groups to be protected. In any case, the package as a whole can be easily identified. In other countries it is not so clear how policy would have evolved in the absence of the budgetary crisis. In general our approach has been to model all the announced changes. In the UK there has been a change in government in mid 2010 and the change in approach to budgetary cuts includes, 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, under the guise of austerity. The UK results we cite here include all the announced changes even if some of them might have been made in the absence of a fiscal crisis.

In view of that, a key issue is whether to confine the measures to be simulated to changes in taxes and benefits only, or whether to also include the effects of public sector pay cuts (or pension cuts) if these have been implemented. If changes to original income are included, then the incidence of tax changes will be affected; this need to be taken into account when interpreting results. Furthermore, if the analysis were to be comprehensive one would want to include the effects of cuts in public services (as well as cuts in monetary payments).

A second issue is what reference time period to consider for the changes. In some cases measures are all announced and introduced within a single year (2009 or 2010). In other cases, for instance in the UK, measures are announced at one point (in 2009 or 2010) but will not be implemented until as late as 2014/15. There are two different types of phasing of tax increases and spending cuts: it may be intended to reduce the risk of another (or further) macroeconomic downturn and soften the blow for political feasibility reasons, or it may be related to the long term restructuring of the tax and welfare system. Distinguishing between these two types of phasing is difficult. Furthermore, it is possible that the medium term plans that are announced will be reversed or amended for political or other reasons before 2014. One of the changes in the UK that will have the largest effect, but only over time, is the change in the index used for indexation of benefits (from RPI to CPI) that is likely to have the effect of reducing benefits relative to other income. This effect can only be captured if a time period longer than a year is considered. The analysis of the UK reported here considers the changes announced for the whole period 2010-2014/15. Arguably this includes more than short term austerity measures. But it would be impossible to distinguish those in a non-arbitrary way and it is undoubtedly the case that the medium term package will have the effect of imposing austerity.

A third issue is the treatment of temporary fiscal stimulus measures that may have preceded or indeed overlapped with the austerity measures under consideration here. The question is whether to consider the starting point as the pre-crisis policies ignoring the effect of introducing and then abolishing stimulus measures (e.g. cuts in the rate of VAT) or



whether to treat any return to the pre-crisis status quo as part of the austerity package. This is especially relevant in the case of the UK, where we opted for the latter.

## The counterfactual

The way in which we simulate the base scenario (i.e. “what would have happened in the absence of the crisis”) is critical to the evaluation of the effects of the austerity measures.

In Estonia the austerity measures were introduced in 2009 and this policy regime is compared with that for 2008, applied to 2009 incomes. Thus the implicit question is “what is the effect of the 2009 austerity package compared with continuing with 2008 policies”.

In Greece the simulation compares 2009 policies on 2009 incomes with 2010 policies on 2010 incomes. The implicit question is therefore “what is the effect of the 2010 austerity package compared with continuing with 2009 policies”. We have to note that many of the 2010 austerity measures explicitly affected the underlying income distribution. Hence, original incomes such as market income and income from pensions had to be adjusted, taking into account the wage and pension cuts that were introduced. As discussed shortly, wider aspects of the recession are ignored here.

In Spain the changes to be introduced in 2011 are compared with 2010 policies (all using 2007 incomes with policies deflated using the CPI). In this case the counterfactual is that 2010 policies continue unchanged except for adjustment for inflation. The implicit question is “what is the effect of the 2011 austerity package compared with continuing with 2010 policies”.

In the UK simulations cited here the counterfactual is that the policies applying in April 2010 continue until April 2014 with indexation rules that applied in April 2010. Incomes are as in 2010 and the policy changes that have been announced for implementation up to April 2014 (for fiscal year 2014-15) are the measures under analysis. These include policies pre-announced before April 2010 but not implemented until after that time. Thus the implicit question is “what would be the effect of all policy announcements applying up to April 2014 if they were introduced in 2010 instead of the 2010 system?”

It is noticeable that the time periods not only span different lengths of time but also refer to different periods in time across countries, depending on the period in which austerity measures have been introduced (which itself depends on many factors, including the timing of the national macroeconomic and budgetary reactions to the financial crisis).

In each case the pre-tax and benefit income level and distribution is drawn initially from data from the recent, pre-crisis past. For Greece this is 2006 income data from the EU-SILC, for Estonia and Spain it is 2005 income data from the EU-SILC, and for the UK it is 2007/8 Family Resources Survey data. In each case the pre-tax and benefit incomes are updated appropriately to the policy simulation year for the baseline (to 2007 levels in Spain, 2009 in Estonia and Greece and 2010 in the UK). In Spain, Estonia and the UK these incomes are held constant and the counterfactual and reform scenarios are simulated on the same underlying income distributions. In Greece, the reform scenario also includes adjustments to the underlying incomes, some of which have been changed directly by the austerity measures.

In general it is important to note that the simulations are effectively measuring the effects of the austerity measures on populations with pre-crisis characteristics. The final effects on populations might be somewhat different once unemployment increases (and other changes due to the crisis directly or indirectly) have been accounted for. And, of course,



including these other effects as part of the change considered in the simulation will produce a different picture again.

### **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 (e.g. 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 mainly focus on the direct, first round effects of changes in cash payments and direct taxes and contributions. In addition to that, the effects of civil service pay cuts are captured in Greece. In Spain and Estonia (and in the UK to some extent) these changes are also relevant, but data limitations do not allow civil servants to be identified. In Greece and the UK the effects of increases in indirect taxes are captured (approximately). In the UK the effects of increases in employer contributions are included, assuming that the full effect is passed on by employers through reductions in employee earnings.

Furthermore, some of the changes are difficult to capture exactly either because our data are not sufficient or because precisely how the policy will be implemented is not yet known. Where possible, plausible approximations have been made.

Clearly the size and number of changes that are simulated vary across countries at least partly due to the differing time frames. In Estonia, Greece and Spain, the austerity measures that have been introduced by 2014 may well amount to the scale of those foreseen for the UK. So in making comparisons the aspect of interest is not the scale of changes so much as their differential effects across the income distribution and on different population groups. The key questions we address are: Is budgetary retrenchment being done in a progressive or regressive way? Are certain groups losing more than others?

### **Indirect and second order effects**

As mentioned earlier, our simulations are effectively measuring the effects of the austerity measures on populations with pre-crisis characteristics. We do not attempt to model here behavioural or macro-economic effects.

Specifically, 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. For instance, in Greece the unemployment rate for male workers aged 30-44 rose from 3.5% in 2008 to 8.1% in 2010. Moreover, the depression of the average disposable incomes of



pensioners and public sector workers is expected to have a knock-on effect on self-employment earnings<sup>1</sup>.

Furthermore, households facing income and/or job loss may adapt their behaviour in an attempt to compensate, at least partly, for such adverse changes in circumstances. For instance, those household members keeping their job may work longer hours or increase their labour supply in other ways.

The above issues are clearly crucial in capturing the full effects of the current crisis on household incomes. Nevertheless, this RN focuses on the effects of the austerity measures alone, under the assumption of other things being equal (even when it is clear that they are not). As a consequence, no account of such issues is taken here.

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

Our analysis in three of the four countries examined here makes use of EUROMOD, which simulates tax liabilities and benefit entitlements for the household populations of EU Member States. EUROMOD is a multi-country, Europe-wide tax-benefit microsimulation model that provides measures of direct taxes, social contributions and cash benefits as well as market incomes in a comparable way across countries. EUROMOD simulates non-contributory cash benefit entitlements and direct tax and social insurance contribution liabilities on the basis of the tax-benefit rules in place and information available in the underlying datasets. The components of the tax-benefit systems which are not simulated (e.g. benefits which depend on contribution history) are taken from the data, along with information on original incomes. See Sutherland (2007) and Lietz and Mantovani (2007) for further information.<sup>2</sup>

EUROMOD enables us to compute the household incomes of individuals under different scenarios, taking account of the operation of tax-benefit systems and the way they depend on the level of individual market income and personal/household characteristics. In this analysis EUROMOD does not take account of any non take-up of benefits<sup>3</sup> or tax evasion. It is implicitly assumed that legal rules are universally respected and that the costs of compliance are zero. This can result in the over-estimation of taxes and benefits.<sup>4</sup> Our results can be interpreted as measuring the intended effects of the tax-benefit systems.

<sup>1</sup> In our analysis of effects of austerity measures in Greece we assume that self-employment earnings in 2010 changed by the same rate as average earnings of dependent workers. The true change in self-employment earnings (in terms of the mean, let alone the variance) is too soon to know at this stage.

<sup>2</sup> EUROMOD is currently subject to a major updating process. The aim is to include all EU-27 countries in EUROMOD, using EU-SILC as underlying data, by 2012.

<sup>3</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).

<sup>4</sup> It can also result in the under-estimation of poverty rates although this depends on the relationship between the level of income provided by benefits and the poverty line (potential claimants may be poor whether or not they receive the benefits to which they are entitled). For a comparison of poverty rates estimated using simulated incomes from EUROMOD with those calculated directly from EU-SILC see Ward et al. (2009) and Figari et al. (2010).



## Simulating the austerity measures

### Estonia

The crisis hit Estonia in 2008. However, the government was very late to realise the extent of the crisis and react to those economic challenges. This was also evident in terms of tax-benefit policies which saw several benefits and tax concessions made more generous still. 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 – and, additionally, the flat rate element of public pensions received a lump-sum increase of more than 20%. Another benefit made notably more generous was the parental benefit which is paid (mostly) to mothers, providing compensation equal to 100% of their previous earnings (subject to a generous upper limit) while on maternity leave. The duration of that benefit was extended from 455 days to 575 days. Other, smaller scale increases took place for the subsistence benefit (i.e. social assistance) and additional childcare leave for fathers.

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. On the revenue side, social insurance contributions and indirect taxes were increased alongside with measures more of one-off nature like the sale of CO<sub>2</sub> quota and frontloading of EU grants from the Cohesion Fund. On the expenditure side, public sector investments and salaries/wages were reduced and public services cut down. It is quite remarkable that while pensions and several cash benefits were notably increased in the beginning of the crisis and a few years before (i.e. 2006-08), these have faced relatively small cuts by now (i.e. the end of 2010). In fact, the flat rate element of public pensions was even increased further as late as in April 2009.

Our analysis of the distributional effects of the austerity measures focuses on direct taxes, social insurance contributions and cash benefits. It is conceptually not possible to establish how the one-time revenue items mentioned above affect people individually. Moreover, we are unable to cover changes in indirect taxation and public salaries/wages (due to model and data limitations respectively). The former are not included in the model while the latter are inseparable from the salaries/wages in the private sector for Estonia. Note also that some minor benefits which cannot be simulated in the model were affected: additional childcare leave for fathers abolished, compensation of study loans abolished, sickness benefit reduced, the eligibility for dental care benefit narrowed and severance pay reduced.

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

#### Direct taxes and contributions

- a. the increase in unemployment insurance contributions (from 1 June 2009 and 1 August 2009)
- b. the increase in the minimum levels of pension and health insurance contributions



- c. the suspension of credited contributions to the 2<sup>nd</sup> pension pillar (between 1 June 2009 and 31 December 2010)<sup>5</sup>

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

- d. the narrowing of eligibility conditions for income tax allowance to families with children
- e. the abolition of tax deduction for certain expenses (from 1 January 2010)<sup>6</sup>
- f. the abolition of child school allowance
- g. the narrowing of eligibility conditions for childcare allowance
- h. the increase in minimum levels of unemployment insurance benefit (from 1 July 2009)<sup>7</sup>

Overall, the base scenario for Estonia is 2008 policy parameters with market income and non-simulated benefits updated to 2009 levels. Note that the increase of public pensions in 2009 is also included in the base scenario. The reform scenario is based on this, while additionally simulating the changes listed above.

### **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 12.5% and 115.1% of GDP respectively. Financial markets reacted by increasing spreads on Greek bonds and by lowering credit ratings.

In an effort to bring public finances back under control, 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, the country's sovereign debt crisis threatened to develop into a solvency crisis. To avert this, the government negotiated an unprecedented €110 billion rescue package with the European Commission, the European Central Bank and the International Monetary Fund, designed to cover Greece's borrowing requirements for the next three years. In return of the rescue package, the government signed a Memorandum of Economic and Financial Policies, ratified by Parliament in May 2010. The Memorandum commits the Greek government to sweeping spending cuts and steep tax increases over three years, aimed to reduce the fiscal deficit below 3% of GDP by 2014 (IMF 2010). In this context, a second austerity package was announced at the same time.

The main policy changes were as follows:

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

- a. Introduction of a one-off tax at 1% of personal annual incomes in 2009 over €100,000.

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<sup>5</sup> It is important to note that while the suspension of credited contributions did not affect 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 2<sup>nd</sup> 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, and hence reducing the funds available for current public pensions. Hence, halting temporarily such transfers has helped to fill the hole in the finances of the 1<sup>st</sup> pension pillar (i.e. PAYG system).

<sup>6</sup> More precisely, from 2009 onwards interest payments of study loans, donations and trade union membership fees were no longer tax deductible. The latter two are not covered in the model (due to data constraints), while the first is covered as part of education related expenses. Hence, in the analysis here, we simulated the change as if all education expenses could no longer be deducted from taxable income.

<sup>7</sup> Note that this is the only measure increasing rather than decreasing disposable income in Estonia.



- b. The structure of personal income tax was made less flat: 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.
- c. 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.
- d. 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.

#### **Indirect taxes**

- e. Excise duty on tobacco, alcohol and fuel increased by 30%.
- f. Taxes on luxury items up by 20%.
- g. Increases in the standard rate of VAT from 19% to 23%. Base and reduced rates also increased to 5.5% and 11% respectively.

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

- h. 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).
- i. 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). Mortgage interest tax credit was made available at a flat rate of 20% of the relevant expenditure irrespective of when the mortgage was taken out (mortgage tax relief is only available for the first €200,000 of the mortgage and the first 120m<sup>2</sup> of the housing unit). 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.

#### **Public sector pay**

- j. 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.
- k. 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%.
- l. Public sector wages capped at €5,981 a month (high-court judges excepted).
- m. Public sector wages frozen in 2010-2012 at their 2009 level (in nominal terms).

All of the above measures were simulated, with the exception of e, f and l. In the case of VAT changes, we applied the new rates to the consumption patterns established in earlier work<sup>8</sup>, using data from the Household Budget Survey 2004-5 (Decoster et al., 2010). Those

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<sup>8</sup> We thank Dirk Verwerff for carrying out the estimations of distributional effects of VAT changes for us.



incomes not directly affected by the austerity measures were updated to 2010 on the basis of estimates provided by a variety of sources.<sup>9</sup>

## Spain

In response to the economic crisis, the Spanish government introduced a fiscal stimulus in 2008-09, and a set of austerity measures in 2010.

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 at €400, a partial mortgage moratorium for the unemployed (50% of mortgage costs up to €500 per month for 24 months), the right to extend the duration of mortgage by two years free of charge, as well as various other measures.

The 2010 austerity measures partly reversed the fiscal stimulus and aimed to reduce public expenditure by €15 billion. These included:

### Direct taxes and contributions

- a. 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).

### Benefits and tax credits

- b. Pension freeze for 2011, except for minimum and non contributory pensions.
- c. Elimination of universal birth grant from January 2011.
- d. Elimination of €400 personal tax credit from 2010.

### Other

- e. Civil servants' pay cut by an average of 5% in 2010; pay freeze in 2011.
- f. Reduction in public investment.

All of the above austerity measures were simulated, with the exception of e and f.

## United Kingdom

There are three components to policy changes simulated in the UK: (i) those announced by the previous government to be introduced after 2010 (up to fiscal year 2014-15) and accepted by the new coalition government elected in May 2010; (ii) those announced in the June 2010 emergency budget by the incoming coalition government; (iii) those announced in the October 2010 Spending Review due to be implemented by fiscal year 2014-15.

The reform of the welfare system (and introduction of the so-called Universal Credit) which is due to be phased in between 2013 and 2017 is not included in this analysis. While the distinction between these elements is important within the UK for political reasons (see Browne and Levell, 2010 and Brewer, 2010) here we consider all the changes as one package. This includes:

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<sup>9</sup> Specifically: salaries of banking employees: +1.9%; other private sector wages: +1.2%; self-employment earnings: -3.7%. All changes relative to 2009, in nominal terms (Bank of Greece, 2010). Farmer incomes were assumed to return to their 2008 levels (we thank Stelios Katranides for this informed guess).



### Direct taxes and contributions

- a. An increase in all employees' and employers' contribution rates of 1%, offset by an increase in the threshold at which employees and employers start to pay contributions of £23 and £21 per week respectively.
- b. Real reductions in the point at which the higher rate of income tax starts to be paid in April 2011, April 2012 and April 2013 and a £1,000 cash increase in the income tax personal allowance for those aged under 65.
- c. Restricting tax relief on pension contributions to annual contributions of up to £50,000.

### Indirect taxes

- d. An increase in the standard rate of VAT from 15% to 20% and in the fuel, tobacco and alcohol duty escalators.

### Benefits and tax credits

- e. Increases in the child element of the Child Tax Credit in April 2011 and April 2012.
- f. Withdrawing the family element of the Child Tax Credit from higher-income families.
- g. Increasing the rate at which tax credits are withdrawn from 39% to 41%.
- h. Removing the baby element of the Child Tax Credit and various other cuts.
- i. Freezing Child Benefit rates for three years.
- j. 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 £20,000) in April 2011 and £5,000 in April 2013 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.
- k. Reforms to the medical test for Disability Living Allowance that are assumed to reduce the number of claimants by 20%.
- l. Remove Child Benefit from higher-rate taxpayers.
- m. Limit contributory Employment Support Allowance to 12 months unless very disabled.
- n. Cut spending on Council Tax Benefit (and localise).
- o. Freeze savings credit part of Pension Credit for 4 years.
- p. Cut Disability Living Allowance for people in care homes paid for by state.
- q. 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. Housing benefit will be reduced for those of working age living in social housing that is under-occupied. Local reference rents (the maximum rents that private sector tenants can claim) will increase in line with CPI rather than actual rents from April 2013. Housing benefit will be reduced by 10% for those who have been claiming Job Seekers' Allowance for more than a year. Finally, LHA will be cut for single people aged 25-35.



## General

- r. The expiry of a number of one-off giveaways (stimulus measures) for the financial year 2010–11, in particular a temporary real increase in some benefits and the income tax personal allowance.
- s. Using the CPI rather than the RPI or Rossi to uprate all benefits.
- t. Benefit cap of £500 per week (£350 per week if single with no children).

In some cases these changes cannot be simulated precisely with the information available. The Institute for Fiscal Studies has developed some approximations that allow the incidence of the effects across the income distribution to be estimated. See Browne and Levell (2010), appendix B.

## Distributional effects of the austerity measures

What are the effects of the austerity measures on the income distribution? Do these measures cause poverty to rise? How is the burden of austerity shared between income groups? In this section we attempt to provide some tentative answers to these questions.

Before that, let us note two important points. As explained earlier, the simulations in the case of Greece include pay cuts for public sector workers as part of austerity measures. In the other two countries this has not been possible as the underlying data do not permit the correct identification of public sector workers in the dataset. Also in the case of Greece, where the relevant effects have been simulated as a difference in the income distribution of 2009, the year before, relative to that of 2010, the year after the austerity measures, the poverty line has been fixed at  $x\%$  of the median of the pre-austerity distribution, adjusted for inflation. In the other two countries, such effects have been simulated within the same year, keeping the poverty line(s) fixed in pre-austerity terms. The implications of these two points are discussed later on.

## Poverty

We begin with poverty effects. The three parts of Table 1 show how poverty rates (with respect to a poverty line of 50%, 60% and 70% of median respectively) are affected by the austerity measures, other things being equal, in Estonia, Greece and Spain, as estimated using EUROMOD.

As shown in Table 1, median incomes declined in all three countries (by as much as 3.1% in Estonia, by 2.4% in Greece, and by only 0.6% in Spain), while estimated poverty rates rose in all three countries.

With respect to a low poverty standard (at 50% of median equivalised incomes), estimated poverty was highest to begin with in Greece (13.3%), where it increased further by 2.1 percentage points. In Estonia, where the estimated poverty rate was lowest pre-austerity (9.6%) it rose by 1 percentage point. In Spain the change was slight, from 11.3% to 11.5%.

Looking at effects on specific population sub-groups, the rise in poverty (with respect to a poverty line of 50% of median) in Estonia was above average for households with children, unemployed workers, "other households", and for households with a work intensity index<sup>10</sup> of 0.5 (i.e. typically one-earner couples with or without children). In Greece, the elderly,

<sup>10</sup> For an explanation of how the work intensity index, developed by the Network on Income Distribution and Living Conditions, was constructed see Ward and Özdemir (2009).



the unemployed, and households with a work intensity index of zero appeared to be worst hit. In Spain, where changes were less pronounced, poverty rates increased somewhat more in the case of children, unemployed workers, and households with a work intensity index of zero.

Using a standard poverty line of 60% of median equivalised incomes obtained very similar results. The estimated poverty rate went up the most in Greece, and the least in Spain. In terms of age-specific poverty, children suffered more than average in Estonia and Spain, the elderly in Greece. Households with pensioners or unemployed workers registered a hike in poverty in Greece. Households with medium work intensity were worse affected in Estonia and Spain, those with zero work intensity in Greece.

With reference to a higher poverty standard (at 70% of median equivalised incomes), our results in terms of specific population sub-groups were pretty much as before. It is notable that the overall poverty rate registered a greatest rise (+1.6 percentage points in Estonia, +3.4 in Greece, +0.4 in Spain).

Overall, relative poverty increased less than might have been expected, given the drop in average incomes. The starker result, in the case of Greece, can be partly attributed to the fact that the poverty line used was “anchored at a point in time”, namely at  $x\%$  of the median of the pre-austerity distribution of incomes, adjusted for inflation.<sup>11</sup> This may be a controversial choice of poverty standard, but can be defended as an attempt to capture the common perception of impoverishment when nominal incomes fall and prices rise (2010 inflation estimated at 4%). Note, however, that using the conventional poverty line (at  $x\%$  of the median of the post-austerity income distribution) would yield far less remarkable results: relative poverty in Greece estimated conventionally barely changed (Matsaganis and Leventi, 2010).

One possible explanation of the above may be that, somewhat paradoxically, as average incomes decline, the distribution of incomes also becomes more compressed. Does our work bring this out?

## Inequality

The effect of austerity measures on selected inequality indices is shown in Table 2. In terms of the Gini and Theil indices, inequality increases only slightly in both Spain and Estonia, while in terms of the entropy index (Duclos and Araar, 2006) it rises significantly in Spain but falls significantly in Estonia. Quite remarkably, austerity seems to cause inequality to decline in Greece (where it was the highest to begin with).

## Relative income share

Does austerity change the relative share of total income held by different income groups? Figure 2 attempts to capture this by showing changes in income share by income decile. Note that by definition changes are zero-sum.

In all three countries, all income deciles (fixed according to the distribution of pre-austerity equivalised income) suffered a loss in income. In relative terms, we found that in Greece deciles 1-8 actually improved their position, while the richest 20% of the population saw a

<sup>11</sup> As explained above, adjusting for inflation was not necessary in the other two countries, where changes were simulated within the same year. Nevertheless, poverty line(s) were kept fixed, with reference to the distribution of pre-austerity incomes, in Estonia and Spain as well.



relative (as well as absolute) decline. Our findings are less spectacular in the case of Estonia (where the top decile earned 25.09% of total income, compared to 25.02% before the crisis, a relative improvement achieved at the expense of the poorer and some other deciles), and especially Spain (where relative income shares barely changed at all).

Once again, note that pay cuts in the public sector were taken into account in Greece, but not (due to data deficiencies) in Estonia and Spain. To give an idea of the significance of this omission, the Spanish government hoped that the 2010 austerity measures would reduce the fiscal deficit by €15 billion, of which €4 billion was associated to pay cuts for civil servants and other public sector workers (by an average of 5%).

### Relative weight of taxes and benefits

Does austerity change the relative weight of taxes and benefits in total income? Figure 3a shows changes in the contribution of social benefits including pensions to each decile's total income, while Figure 3b depicts changes in the relative burden of taxes and social contributions, also by income decile, as a result of the austerity measures.

In terms of social benefits including pensions, Estonia (where pensions kept rising in spite of the crisis, and subsequently affected less by the cuts), benefits made up a greater share of the total income held by lower income groups after the austerity measures. For instance, social benefits including pensions accounted for 60.4% of the total income of the poorest decile, up from 58.6% before the measures. In Greece (where pensions were negatively affected, and higher pensions much more so in relative terms), the opposite effect can be observed: the contribution of social benefits to total income dropped across deciles (peaking at -1.6 percentage points for decile 7). In Spain, changes were smaller overall, but the relative contribution of social benefits was also reduced, especially for the poorest decile (where benefits made up 44.9% of total income, down from 45.5%).

In terms of taxes and social contributions, effects also varied between countries. In Estonia, all deciles faced an increase in the burden of taxes and social contributions to the tune of 2% to 3.4% of total income (which itself was reduced as a result of the austerity measures). In Spain the tax burden also increased, but only by 0.1% to 0.3% of disposable income by decile.

In the case of Greece, our analysis also accounted for VAT changes, albeit indirectly. In the interests of comparability across countries, Figure 3b shows the relevant effects both excluding and including changes in VAT rates. As can be seen, the decline in incomes, especially for public sector workers and pensioners, reduced the yield of income taxes<sup>12</sup> and social contributions (a sort of “fiscal drag” in reverse). However, from the point of view of fiscal consolidation, VAT changes saved the day: taking into account these as well, the tax yield increased very considerably. Of course, indirect taxation tends to be regressive (when considered in relation to income at a point in time): as a result of changes in VAT rates, the poorest decile faced an estimated extra burden of +6.5% of its income, compared to +2.5% in the case of the richest decile.

<sup>12</sup> Note that tax evasion was ignored in this RN, although was taken into account in Matsaganis and Leventi (2010). In general, tax evasion in Greece has been shown to reduce tax progressivity, and to increase income inequality (Matsaganis and Flevotomou, 2009).



## Relative contribution to fiscal consolidation

We now turn to a most crucial (and politically contested) question: how is the burden of austerity shared between income groups?

Figure 4 shows that, as might have been expected, the rich shouldered most of the total effort towards fiscal consolidation. Specifically, we found the richest 10% of the population accounted for 31% of the overall burden of the austerity measures in Greece, 22.5% in Estonia and 21% in Spain. Looking at the upper half of the income distribution, its share was 74% in Greece, 69% in Estonia, 62.5% in Spain.

Nevertheless, the contribution of lower incomes to the fiscal consolidation effort was far from negligible. That was especially evident in Spain, where the poorest decile contributed 6.3% of the total, compared to 4.3% in Estonia and 3.1% in Greece. Looking at the bottom quintile (poorest 20%), its share was around 11% in Spain, around 9% in Estonia, and around 7.5% in Greece.

## Absolute vs. relative income loss

Figure 5 is in four parts, one for each country, showing income effects by decile, both in absolute (i.e. in euros) and in relative terms (i.e. as a proportion of disposable income). At this point we compare our results for the three countries using EUROMOD with those for the UK drawing on analysis by the IFS.

In Estonia as a result of the austerity measures, households in the poorest decile are left €84 worse off, compared to €432 for those in the richest decile (all amounts are per year per "equivalent adult"). However, relative to their income, the loss is 3.8% for households in the bottom decile vs. 2.4% for those in the top decile (Figure 5a).

The resulting gradient by decile is also negative in Spain (Figure 5c). Relative income loss is 1.6% for the poorest decile, while in the rest of the distribution it fluctuates around 0.5% of income. In absolute terms, poorest households (decile 1) lose €60 per year per "equivalent adult", compared to €156 for those in the richest decile 10.

In Greece the bottom 4 deciles are set back by around 1% to 1.5% of their income. Further up the distribution, relative loss rises with income to reach 5% in decile 10 (from 3.6% in decile 9). In absolute terms, households in the poorest decile are left €41 worse off, while those in the top decile appear to lose as much as €1,892 per year per "equivalent adult". Note that these estimates exclude the effect of tax evasion and indirect taxation (Figure 5b).

In the case of the UK, we draw on the analysis carried out by the Institute for Fiscal Studies, using their tax-benefit model, TAXBEN.<sup>13</sup> Figure 5d shows that the overall distributional effect of the changes modelled reduces the incomes of low income households by a greater percentage than of high income households. The overall effect is clearly regressive when considering the bottom 9 deciles. While the top decile loses much more in absolute terms than any of the lower income groups, the proportional loss is still less than it is for the poorest 10%.

The IFS analysis (see Browne and Level, 2010) shows how this distributional picture changes somewhat taking the distribution of household expenditure rather than household income.

<sup>13</sup> We are grateful to James Browne and Mike Brewer for permission to use this material and for their helpful advice.



In terms of expenditure, the resulting gradient by decile is much less clear. Also, the top decile loses most proportionately, as well as in absolute terms. Even though it is not possible currently to rank expenditure using EUROMOD, arguably this would be more appropriate when considering changes to indirect taxes. Nevertheless, the example of the UK analysis serves as a reminder that there is more ways than one to evaluate distributional effects.

The IFS analysis also shows how the impact of the measures varies according to personal characteristics. Families with children lose most, particularly at the bottom and top of the income distribution. People over pension age lose less, and the proportional loss varies little with income level (Browne 2010).

## Concluding remarks

Our results can be summarized as follows. As a result of the austerity measures, poverty is expected to increase, especially in Greece and, to a lesser extent, Estonia. Changes in inequality are less pronounced, and may even go to the opposite direction. The relative weight of social benefits including pensions in total income has been reduced (except in Estonia), while that of taxes and social contributions has grown (in Greece only once VAT changes are taken into account). While higher income groups contribute the bulk of the total fiscal consolidation effort, the contribution of lower income groups is not negligible relative to their (low) income. Finally, income losses are greater in absolute terms (i.e. in euros) for higher income groups (except in Spain where the pattern is less clear). However, in relative terms (i.e. as a proportion of their income) lower income groups suffer a greater income loss (except in Greece, excluding the effect of tax evasion and indirect taxation).

While these findings are non-trivial, the estimated impact of austerity measures may seem less significant than expected. This may to some extent be related to the fact that in most cases policy packages were carefully designed to minimise losses for lower income groups and/or partly to compensate these groups through “sweeteners”.

In any case, caution is called for when interpreting our results. The main issues (either to do with our approach, or with our assumptions, or with the data we have had to rely upon) are briefly discussed below.

With respect to data, the original database offers an imperfect representation of reality. For instance, the Greek version of EU-SILC 2007 over-samples some population sub-groups (civil servants, public utility workers, banking employees), while it under-samples others (the self-employed, farmers, pensioners). If, as is often the case, the former have higher income than the latter, a composition effect arises, with the implication that poverty and inequality in the population could be higher than in the sample.

Moreover, uprating incomes from an earlier date to the present amounts to assuming that everybody’s income from a given source has risen over the relevant period by the same rate. This is clearly unrealistic, and may understate distributional changes. On the other hand, uprating some incomes (e.g. self-employed earnings, income from property etc.) is subject to an even greater degree of uncertainty.

With respect to our approach, the simulation of the tax-benefit system may be imperfect when e.g. income tax rules are too complex to be fully simulated. Furthermore, as already discussed earlier, assuming no tax evasion and full take-up of benefits, when this is clearly not the case, introduces bias. Accounting for tax evasion and non take-up in EUROMOD is possible, and has been achieved, albeit in a pilot study (see Matsaganis and Flevotomou,



2009, and Matsaganis et al., 2010). Integrating such improvements in the standard model would greatly enhance its accuracy and predictive power.

The same holds for effects of indirect taxation. Again, accounting for changes in VAT and other indirect taxes in EUROMOD is possible and has been done in the context of earlier research (see Decoster et al., 2010). In fact, we have drawn on findings from that research in order to estimate the likely impact of VAT changes in Greece, albeit in a rather crude manner. This was to some extent inevitable, given that EU-SILC is not an expenditure survey and contains no information on consumption patterns. Nonetheless, as shown in the results from Greece, where indirect taxes played a strong role in the fiscal consolidation effort, finding a way to account for changes in indirect taxation in the standard version of EUROMOD would be a huge step forward.

On another register, the fiscal squeeze undermines the proper funding of the public sector, adversely affecting essential public services and the “social wage”. Nevertheless, social benefits in-kind (e.g. publicly-funded health care, child care, social care, education etc.) are ignored here. Once again, the issue was addressed in recent work on incorporating non-monetary components into EUROMOD (see Paulus et al., 2010). What remains to be done is making available the relevant modules in the standard version of the model. Again, while this is not possible without a substantial amount of further research, the gains could also be substantial.

Clearly distinguishing the impact of austerity measures from that of the recession at large is not straightforward. The latter affects incomes in all sorts of ways, not always captured by the “austerity” tag (e.g. self-employed earnings reduced following the loss in purchasing power suffered by public sector employees). Moreover, the reduced demand for labour may formally result in either quantity effects (i.e. job losses), or price effects (i.e. wage reductions), or both. Predicting these effects is not easy, while uprating will address price effects alone.

Our methodology implicitly assumes that demographic and labour market changes are undramatic in the short term. While this is usually true, it is far less so at times of crisis. For example, a sharp rise in unemployment among primary earners (as in Greece, where the unemployment rate for men aged 30-44 rose from 3.5% in 2008 to 8.1% in 2010) will have serious implications for poverty.

We are fully aware that the above weaknesses affect the accuracy of our results. Yet, our work (and, more generally, the microsimulation approach) offers a good approximation of the distributional effects of austerity measures in the countries examined. In view of the topicality of the questions addressed, and the public interest in the answers, we believe that such work is a good alternative to waiting until data from future waves of EU-SILC are released. Besides, this RN is merely the first phase of work-in-progress on the distributional effects of the crisis. We hope to study more EU countries, improve our methods, and make use of better data, in the immediate future.



## References

- Bank of Greece (2010) Monetary Policy Interim Report. Athens: Bank of Greece.
- Brewer M. (2010) *Cuts to welfare spending: take 2*. IFS Post-Spending Review Briefing ([www.ifs.org.uk/publications/5312](http://www.ifs.org.uk/publications/5312)). London: The Institute for Fiscal Studies.
- Browne J. (2010) *Distributional analysis of tax and benefit changes* IFS Post-Spending Review Briefing ([www.ifs.org.uk/publications/5313](http://www.ifs.org.uk/publications/5313)). London: The Institute for Fiscal Studies.
- Browne J. and P. Levell (2010) *The distributional effect of tax and benefit reforms to be introduced between June 2010 and April 2014: a revised assessment*. IFS Briefing Note (doi: 10.1920/bn.ifs.2010.00108). London: The Institute for Fiscal Studies.
- Decoster A., Loughrey J., O'Donoghue C., Verwerft D. (2010) How regressive are indirect taxes? A microsimulation analysis for five European countries. *Journal of Policy Analysis & Management* 29 (2) 326-350.
- Duclos J.-Y. and Araar A. (2006), *Poverty and equity: measurement, policy, and estimation with DAD*. Boston/Dordrecht/London: Kluwer Academic Publishers.
- Figari F., Iacovou M., Skew A. and Sutherland H. (2010), "Approximations to the truth: comparing survey and microsimulation approaches to measuring income for social indicators", ISER WP 2010-13, Colchester: University of Essex.
- IMF (2010) Greece: staff report on request for stand-by arrangement. Country Report No. 10/110. Washington DC: International Monetary Fund.
- Lietz C. and Mantovani D. (2007), "A Short Introduction to EUROMOD: An Integrated European Tax-Benefit Model", in *Micro-simulation in action: Policy analysis in Europe using EUROMOD* edited by O. Bargain. Research in Labor Economics, Vol. 25. Elsevier.
- Matsaganis M. and Flevotomou M. (2010), Distributional implications of tax evasion in Greece. GreeSE Paper 31. Hellenic Observatory, London School of Economics.
- Matsaganis M. and Leventi C. (2010), Distributional effects of the austerity measures in Greece. Bank of Greece seminar (12 November 2010).
- Matsaganis M., Levy H. and Flevotomou M. (2010), Non take up of social benefits in Greece and Spain. *Social Policy & Administration* 44 (7) 827-844.
- Paulus A., Sutherland H. and Tsakloglou P. (2010), The distributional impact of in-kind public benefits in European countries. *Journal of Policy Analysis & Management* 29 (2) 243-266.
- Pudney S., Hancock R. and Sutherland H. (2006), Simulating the reform of means-tested benefits with endogenous take-up and claim costs. *Oxford Bulletin of Economics and Statistics* 68 (2) 135-166.
- Sutherland H. (2007), "EUROMOD: the tax-benefit microsimulation model for the European Union" in A. Gupta and A. Harding (editors) *Modelling our future: population ageing, health and aged care*. International Symposia in Economic Theory and Econometrics Vol. 16, Elsevier, Amsterdam: 483-488.
- Ward T. and Özdemir E. (2009), Measuring Work Intensity. Methodological Paper. European Observatory on the Social Situation and Demography, Network on Income Distribution and Living Conditions.
- Ward T., Lelkes O., Sutherland H. and Toth I. (eds.) (2009), *European inequalities – social inclusion and income distribution in the European Union*, TARKI, Budapest.



**Table 1a**

**Effect of austerity measures on poverty rates: poverty line at 50% of median**

	<b>Estonia</b>	<b>Greece</b>	<b>Spain</b>
Poverty rate before	<b>9,6</b>	<b>13,3</b>	<b>11,3</b>
Poverty rate after	<b>10,6</b>	<b>15,4</b>	<b>11,5</b>
Change in poverty rate relative to base year by <b>age</b>			
age 0-15	1,9	1,5	0,4
age 16-29	1,1	1,8	0,1
age 30-44	1,2	1,3	0,1
age 45-64	0,7	1,6	0,0
age 65+	0,3	4,3	0,1
Change in poverty rate relative to base year by <b>employment status</b>			
employee	0,7	0,6	0,1
self-employed	1,3	1,7	0,1
unemployed	1,7	3,3	0,2
pensioner	0,4	3,9	0,1
other	2,0	2,2	0,3
Change in poverty rate relative to base year by <b>work intensity</b>			
0	0,8	5,0	0,3
0.01-0.49	1,0	2,1	0,2
0,5	2,3	1,9	0,2
0.51-0.80	1,1	1,4	0,1
0.81-0.99	0,3	0,0	0,0
1	1,2	0,6	0,1
Change in median equivalised income (%)	<b>-3,1</b>	<b>-2,4</b>	<b>-0,6</b>

Note: In the case of Greece the poverty threshold is fixed at 50% of the median of the 2009 distribution of household disposable equivalised income, adjusted for inflation. Source: EUROMOD version F2.21.



**Table 1b**

**Effect of austerity measures on poverty rates: poverty line at 60% of median**

	<b>Estonia</b>	<b>Greece</b>	<b>Spain</b>
Poverty rate before	<b>16,6</b>	<b>20,4</b>	<b>18,3</b>
Poverty rate after	<b>18,0</b>	<b>23,1</b>	<b>18,5</b>
Change in poverty rate relative to base year by <b>age</b>			
age 0-15	2,2	1,8	0,5
age 16-29	1,9	3,6	0,2
age 30-44	1,2	1,6	0,2
age 45-64	1,2	2,5	0,0
age 65+	0,2	4,2	0,0
Change in poverty rate relative to base year by <b>employment status</b>			
employee	1,1	1,2	0,1
self-employed	1,9	1,7	0,0
unemployed	1,4	4,4	0,3
pensioner	0,6	3,7	0,1
other	2,4	3,4	0,3
Change in poverty rate relative to base year by <b>work intensity</b>			
0	0,0	5,1	0,2
0.01-0.49	2,7	2,8	0,3
0,5	3,2	2,8	0,5
0.51-0.80	2,6	3,1	0,3
0.81-0.99	1,5	0,9	0,0
1	1,0	0,4	0,0
<b>Change in median equivalised income (%)</b>	<b>-3,1</b>	<b>-2,4</b>	<b>-0,6</b>

Note: In the case of Greece the poverty threshold is fixed at 60% of the median of the 2009 distribution of household disposable equivalised income, adjusted for inflation. Source: EUROMOD version F2.21.



**Table 1c**

**Effect of austerity measures on poverty rates: poverty line at 70% of median**

	<b>Estonia</b>	<b>Greece</b>	<b>Spain</b>
Poverty rate before	<b>24,5</b>	<b>27,7</b>	<b>25,6</b>
Poverty rate after	<b>26,1</b>	<b>31,0</b>	<b>26,0</b>
Change in poverty rate relative to base year by <b>age</b>			
age 0-15	3,0	2,5	0,9
age 16-29	1,9	2,5	0,3
age 30-44	1,6	3,2	0,4
age 45-64	1,3	2,7	0,2
age 65+	0,2	5,7	0,1
Change in poverty rate relative to base year by <b>employment status</b>			
employee	1,4	2,0	0,3
self-employed	2,7	2,6	0,4
unemployed	0,9	3,4	0,3
pensioner	0,4	5,2	0,2
other	3,0	3,6	0,7
Change in poverty rate relative to base year by <b>work intensity</b>			
0	1,1	5,5	0,3
0.01-0.49	2,3	4,6	0,5
0,5	1,8	2,6	1,1
0.51-0.80	2,9	3,2	0,5
0.81-0.99	1,4	1,6	0,0
1	1,7	1,7	0,1
Change in median equivalised income (%)	<b>-3,1</b>	<b>-2,4</b>	<b>-0,6</b>

Note: In the case of Greece the poverty threshold is fixed at 70% of the median of the 2009 distribution of household disposable equivalised income, adjusted for inflation. Source: EUROMOD version F2.21.



Table 2

Effect of austerity measures on selected inequality indices

	Estonia	Greece	Spain
<b>Gini index</b>			
before	0,317	0,353	0,290
after	0,319	0,347	0,291
<b>GE(-1) index</b>			
before	0,210	0,261	0,633
after	0,182	0,252	0,684
<b>GE(0) index</b>			
before	0,174	0,210	0,162
after	0,174	0,203	0,163
<b>GE(1) index</b>			
before	0,200	0,219	0,141
after	0,202	0,210	0,141

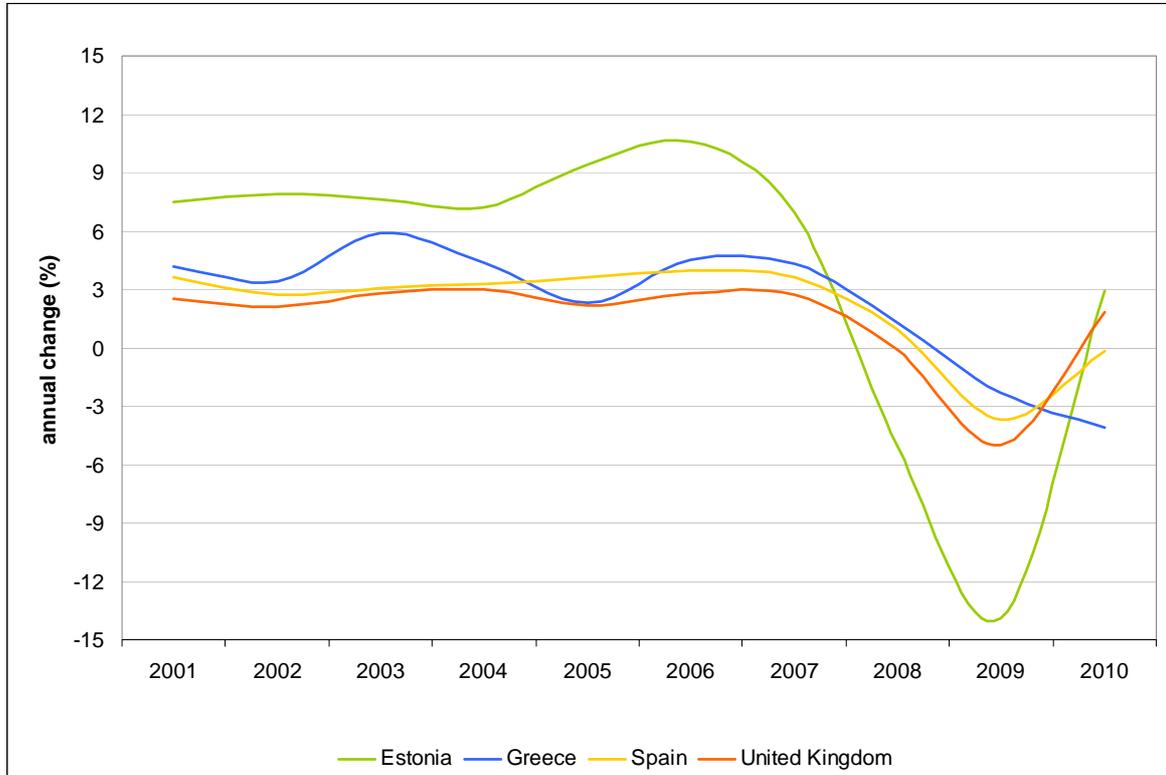
Notes: GE(-1) index: Entropy index. GE(0) index: Mean Log Deviation. GE(1) index: Theil index.

Source: EUROMOD version F2.21.



Figure 1

Annual rates of GDP growth in Estonia, Greece, Spain and the United Kingdom (2000-2010)

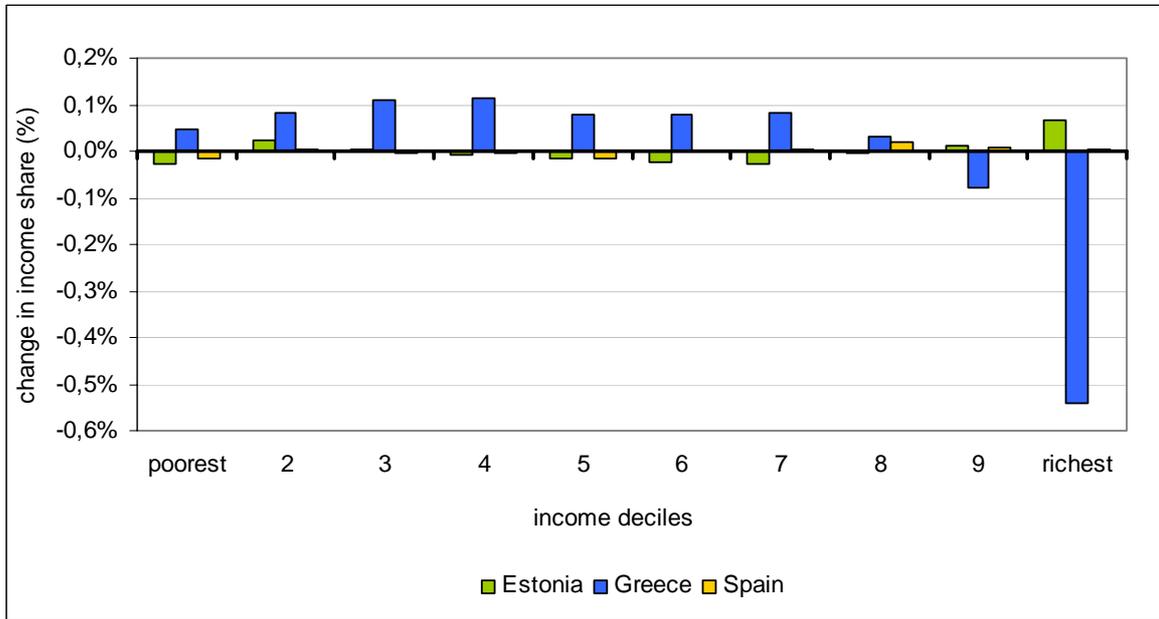


Source: Eurostat (last accessed on 1 December 2010).



**Figure 2**

**Change in relative income share by decile**

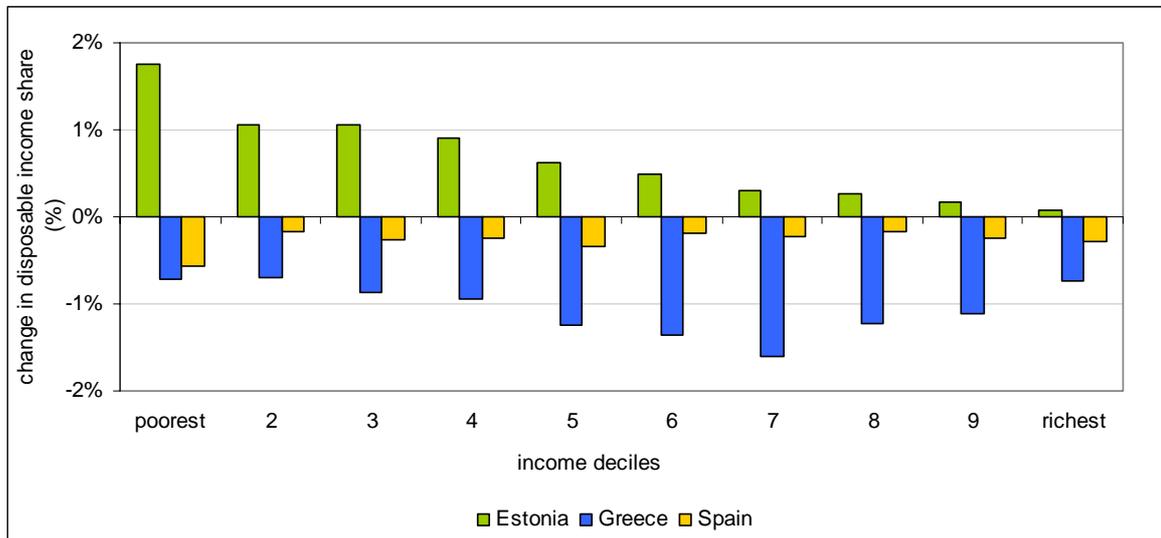


Notes: Change in the share of total unequivalised income held by each decile. Income deciles are based on equivalised disposable income in the base scenario. Source: EUROMOD version F2.2.



**Figure 3a**

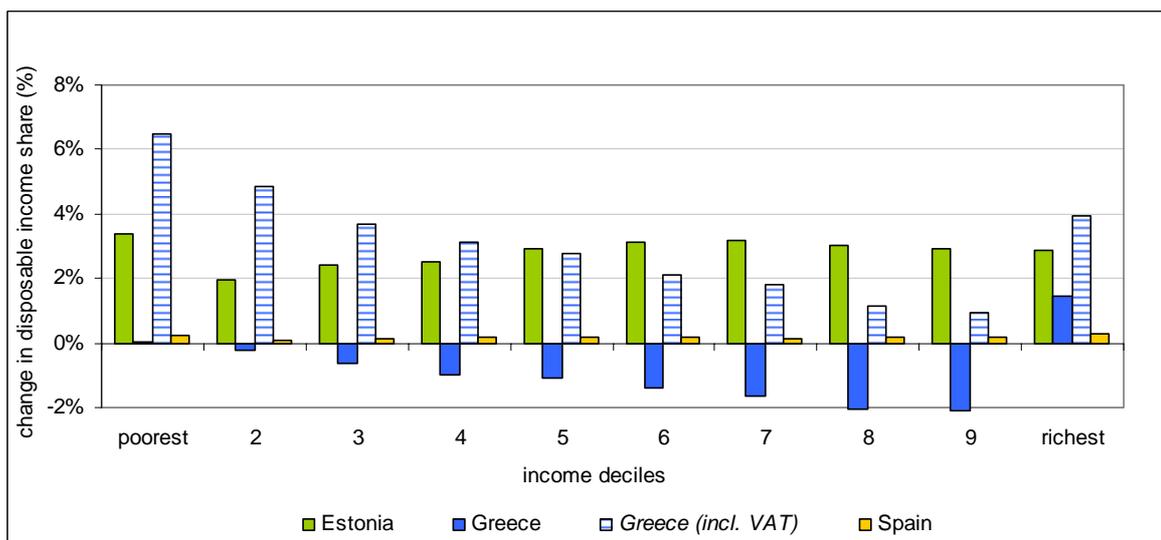
**Change in the weight of social benefits including pensions in total income by decile**



Notes: Change in the weight of social benefits including pensions in total unequivalised income by decile. Income deciles are based on equivalised disposable income in the base scenario. Source: EUROMOD version F2.2.

**Figure 3b**

**Change in the weight of taxes and social contributions in total income by decile**

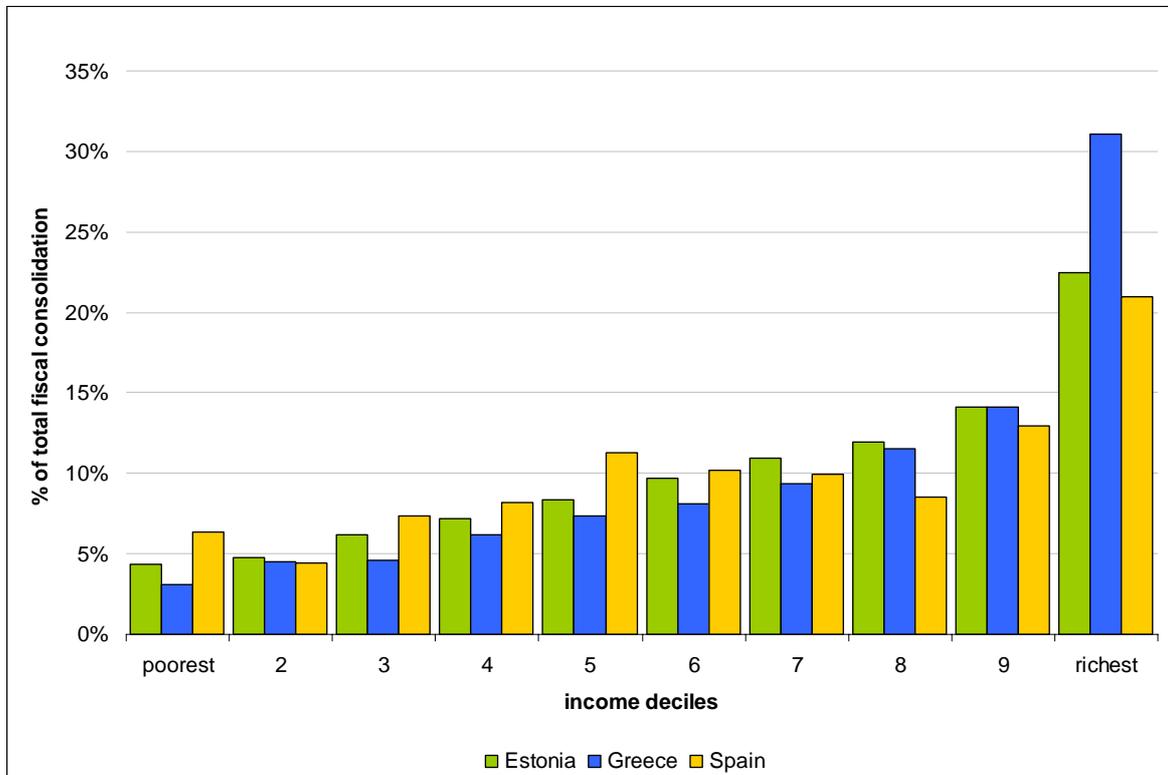


Notes: Change in the weight of social benefits including pensions in total unequivalised income by decile. Income deciles are based on equivalised disposable income in the base scenario. In the case of Greece, changes are shown separately according to whether VAT changes are included or not. Source: EUROMOD version F2.2.



**Figure 4**

**Relative contribution to fiscal consolidation by income decile**

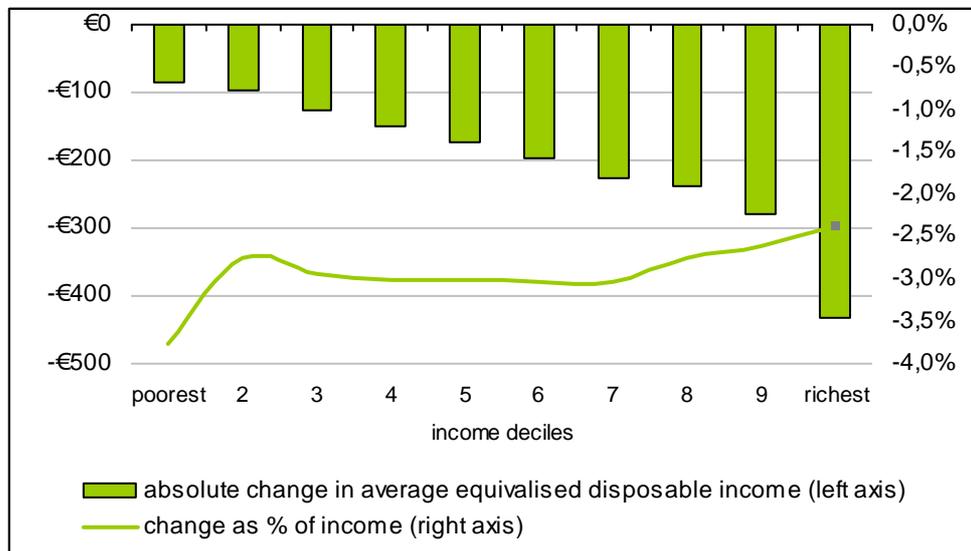


Notes: Contribution to fiscal consolidation in terms of unequivalised income. Deciles are based on equivalised disposable income in the base scenario. VAT changes are included in the case of Greece. Source: EUROMOD version F2.2.



**Figure 5a**

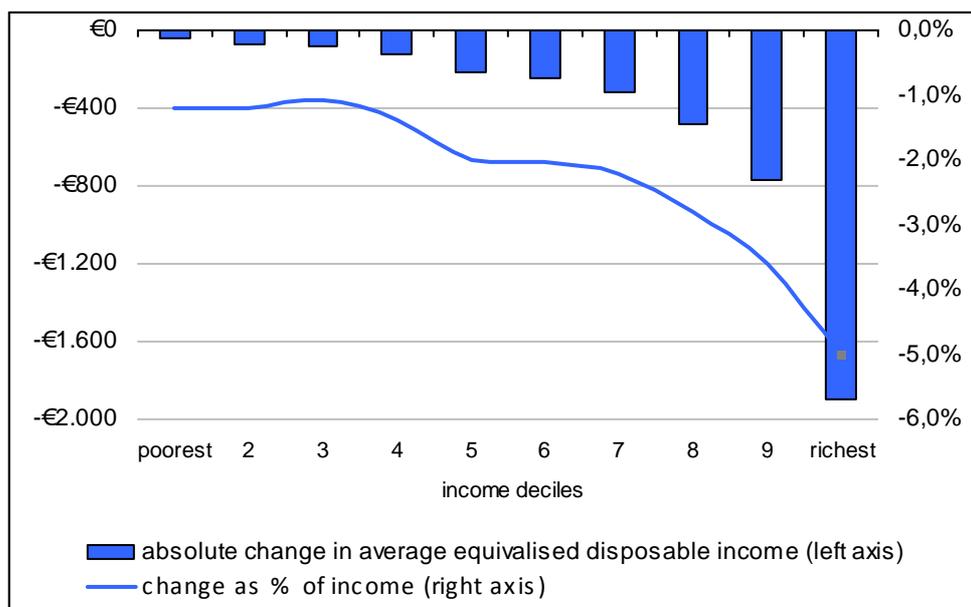
**Income effects of austerity measures in Estonia**



Notes: Changes in average equivalised disposable income per annum. Deciles were constructed using the OECD modified equivalence scale to adjust incomes for household size (as commonly used by Eurostat and in EUROMOD). Source: EUROMOD version F2.2.

**Figure 5b**

**Income effects of austerity measures in Greece**

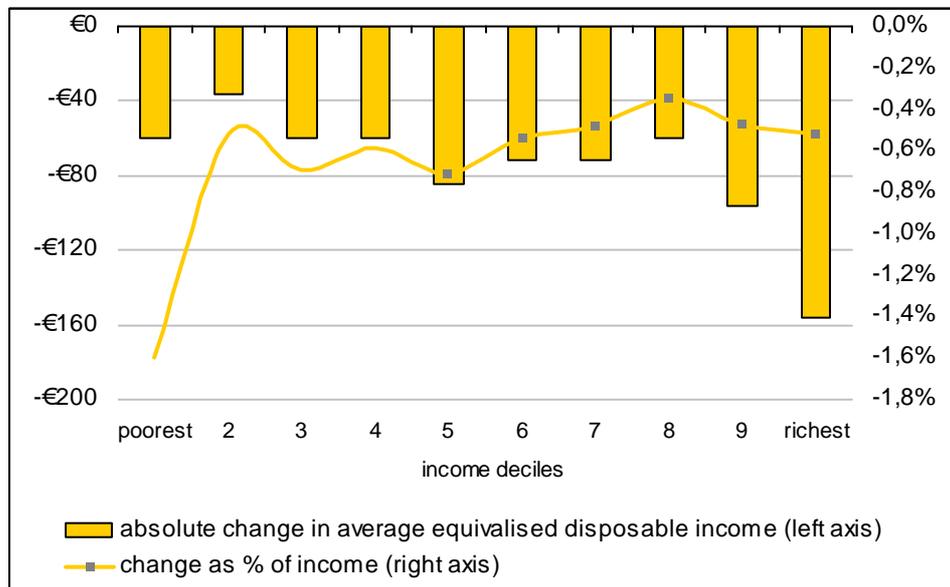


Notes: Changes in average equivalised disposable income per annum. Deciles were constructed using the OECD modified equivalence scale to adjust incomes for household size (as commonly used by Eurostat and in EUROMOD). Source: EUROMOD version F2.2.



Figure 5c

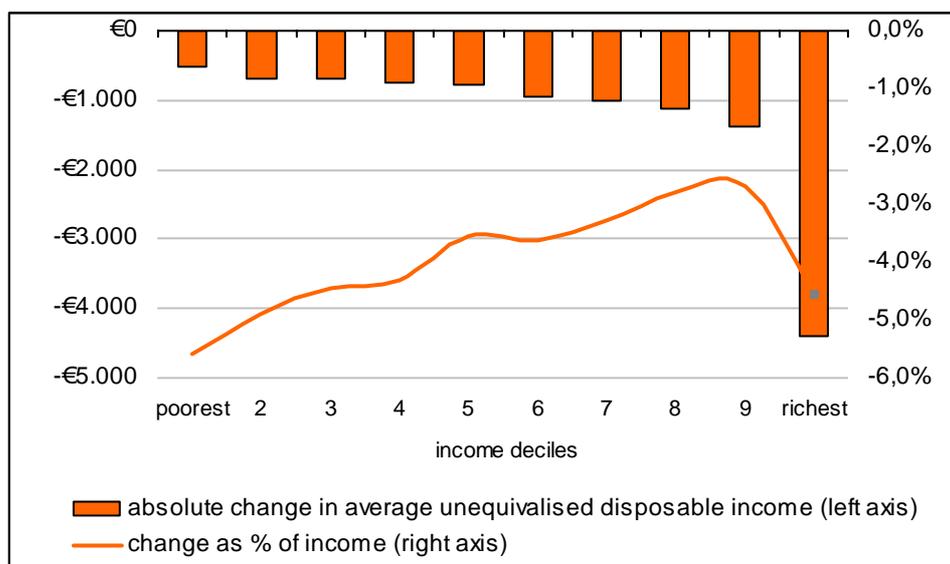
Income effects of austerity measures in Spain



Notes: Changes in average equivalised disposable income per annum. Deciles were constructed using the OECD modified equivalence scale to adjust incomes for household size (as commonly used by Eurostat and in EUROMOD). Source: EUROMOD version F2.2.

Figure 5d

Income effects of austerity measures in the United Kingdom



Notes: Income decile groups are derived by dividing all households into 10 equal-sized groups according to income adjusted for household size using the McClements equivalence scale. Increases in employer National Insurance Contributions are assumed to be passed on to employees in the form of lower wages. Source: Browne (2010), and IFS calculations using TAXBEN run on the 2007–08 Family Resources Survey (© Institute for Fiscal Studies).