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Distributive Effects of the Crisis and Austerity in Seven EU Countries

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ABSTRACT

European welfare states are under considerable stress. On the one hand, the recession has caused unemployment to rise and household incomes to fall, which both raise the demand for social protection. On the other hand, austerity policies and programme reforms affect the capacity of welfare states to provide social protection. This paper aims to provide an early assessment of the distributional implications of the economic developments in Greece, Spain, Italy, Portugal, Latvia, Lithuania and Romania in the period 2009-13. Using a microsimulation model, we attempt to disentangle the first-order effects of tax-benefit policies from the overall effects of the crisis. Moreover, we estimate how the burden of the crisis has been shared across income groups, and how the differential impact of the crisis may have altered the composition of the population in poverty. We conclude by discussing the methodological pitfalls and policy implications of our research.

Keywords: austerity, crisis, income distribution, microsimulation, European Union

JEL codes: C81, D3, I3 H2, H31

1. INTRODUCTION

In recent years the world economy has been in turmoil. The global financial crisis of 2007-09 was followed by the sovereign debt crisis of 2011-13, interrupted by a modest recovery. Several authors have labelled this the 'Great Recession' (Jenkins et al. 2013), as it is affecting large areas of the globe, and because its duration and depth exceed those of previous downturns. In Europe, the combined GDP of the 27 EU member states contracted by 4.5% in 2009 relative to the year before. It subsequently recovered somewhat, but once again registered negative growth in 2012 and stagnated in 2013. On the whole, by 2013 the European economy had shrunk by 1.2% relative to its 2008 level.

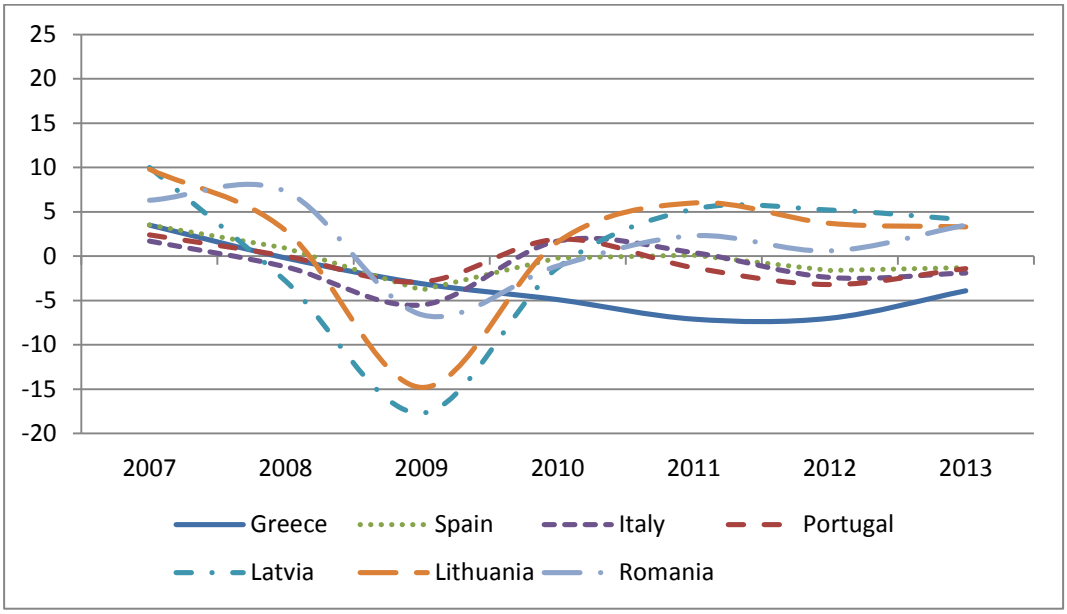
In this context, an abundance of research has accumulated on the macroeconomic effects of the Great Recession, and a growing debate on how fiscal consolidation packages have contributed to these effects (i.e. by lowering growth rates). Nevertheless, our understanding of how individual tax and spending policies have interacted with wider developments in the economy at country level, and how the combined effect of both has translated to changes in inequality and poverty, remains fairly limited. Given the political importance (and policy relevance) of the question, this is rather unfortunate. Effective policy making requires access to reliable and timely analysis at micro level, assessing how the material circumstances of different population groups have been affected by the crisis, establishing the extent to which changes in the distribution of incomes can be attributed to government policy rather than to developments in the wider economy, and disaggregating the distributional impact of the policy mix adopted in each country into progressive and regressive policy measures.

The aim of this paper is to provide an early assessment of the distributional implications of the Great Recession in seven European Union countries in 2009-13. Using a microsimulation model, we quantify the impact of tax-benefit policies (such as fiscal consolidation measures undertaken in several countries) and of developments in the wider economy (such as losses in jobs and earnings), on the income distribution. Moreover, we estimate how the burden of the crisis has been shared across income groups, and how the differential impact of the crisis may have altered the composition of the population in poverty.

1.1. THE GREAT RECESSION IN SEVEN EU COUNTRIES

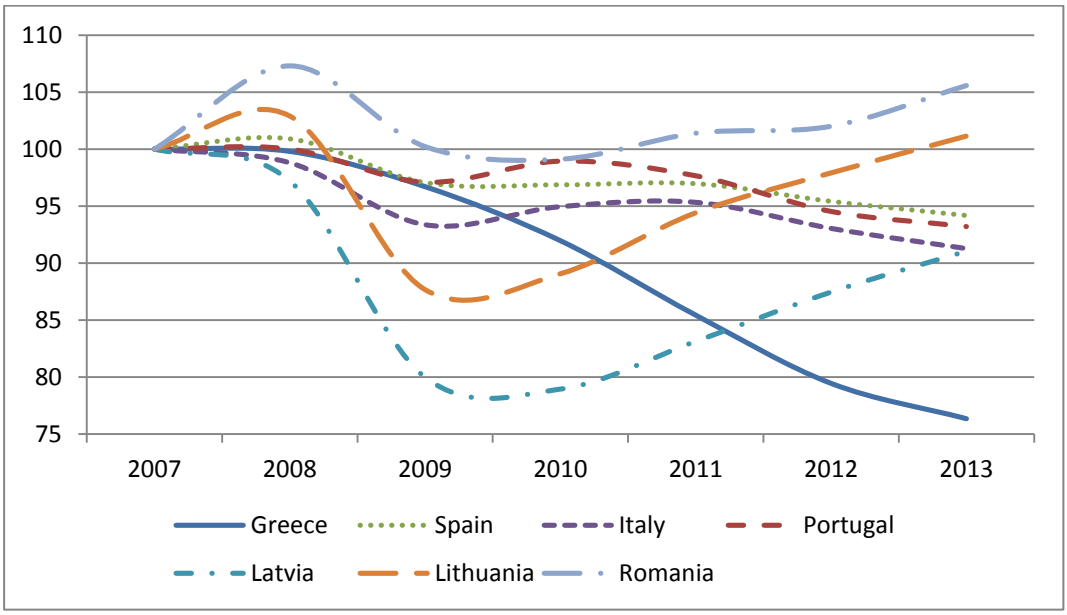
The paper estimates the distributional impact of the crisis in Greece, Spain, Italy, Latvia, Lithuania, Portugal and Romania. Our choice of countries was mostly driven by the significantly different ways the crisis unfolded in these countries. In a single year (2009), Latvia and Lithuania lost as much as 18% and 15% of their respective GDP. The Romanian economy shrank by 8% in 2008-2010. While these economies eventually recovered, further south the crisis was more protracted. In Spain the size of the contraction in 2007-2013 was around 6%, in Portugal 7%, in Italy almost 9%, while in Greece the size of the economy declined by nearly 24%. Forecasts for 2014 predicted near-zero growth in southern Europe, compared to +1.4% for the European economy as a whole. GDP growth rates are shown in Figures 1a and 1b.

FIGURE 1A. GDP GROWTH (2007-2013)



Note: Gross domestic product at market prices (percentage change on previous period).
Source: GDP and main components - volumes [nama_gdp_k]. Last update 28 March 2014. Extracted on 29 March 2014. Eurostat.

FIGURE 1B. GDP TRENDS (2007-2013)

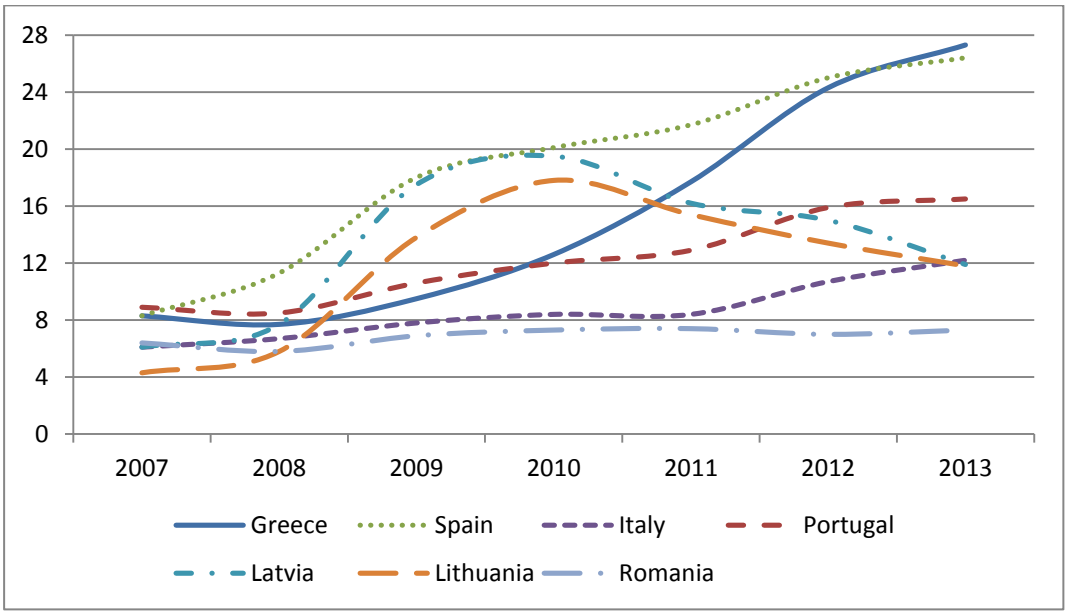


Note: Gross domestic product at market prices (index 2007=100).
Source: GDP and main components - volumes [nama_gdp_k]. Last update 28 March 2014. Extracted on 29 March 2014. Eurostat.

As a result of the Great Recession, unemployment in the EU rose since 2007 by 4 percentage points (to 10.9% in 2013). Again, things evolved very differently in the countries under consideration. In Greece, the unemployment rate in 2007-13 went up by no less than 19 percentage points (to 27.3%); in Spain by 18 percentage points (to 26.4%). Latvia and Lithuania also experienced sharp increases (by around 13.5 percentage points in 2008-10), although unemployment fell again as the economy

recovered. In Romania, on the other hand, changes in the unemployment rate were relatively limited. Trends in unemployment are shown in Figure 2.

FIGURE 2. UNEMPLOYMENT RATES (2007-2013)



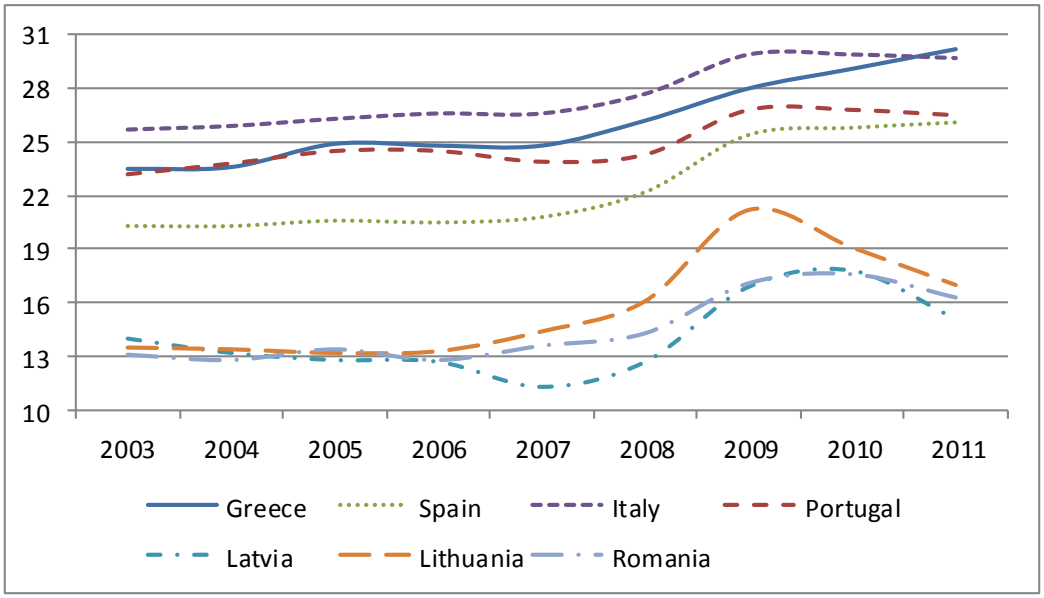
Note: Unemployment as a percentage of the workforce. Unemployed workers are defined as persons 15 to 74 years of age (16 to 74 years in Spain and Italy) who were not employed during the reference week, had actively sought work during the past four weeks and were ready to begin working immediately or within two weeks.

Source: Unemployment rate by sex and age groups - annual average, % [une_rt_a]. Not seasonally adjusted data. Last update 11 March 2014. Extracted on 29 March 2014. Eurostat.

In a recession, even a 'Great' one, social protection benefits act as automatic stabilisers, supporting the incomes of individuals and households experiencing job loss and/or income loss. As Castles (2010) has put it: 'Long lines of the unemployed caused by economic crises are the core business of the welfare state […]. These are precisely the kinds of emergencies that welfare state programmes and institutions are designed to deal with, so that when a financial crisis turns up we have routine mechanisms […] for coping with its consequences.'

Spending on social protection in the European Union as a whole did indeed increase in 2007-11, even though less than in other advanced economies, and considerably less than in the United States. As seen in Figure 3, social protection expenditure as a proportion of GDP in the EU peaked in 2009, levelled out in 2010, and decreased in 2011. There was considerable cross-country variation, with the four Southern European countries allocating a much higher share of their GDP to social protection than Latvia, Lithuania and Romania.

FIGURE 3. SOCIAL PROTECTION EXPENDITURE AS % OF GDP (2003-2011)



Note: Social protection expenditure as percentage of GDP.
Source: Expenditure: main results [spr_exp_sum]. Last update 24 January 2014. Extracted on 5 February 2014. Eurostat.

Even though 2011 was the last year for which official figures were available at the time of writing, a recent European Commission study (Bontout & Lokajickova 2013), drawing on national accounts data, found that the downward trend in social expenditure accelerated in 2012. In some countries, the recent fall in social protection spending was counter-cyclical, i.e. can be attributed to the recovery and subsequent employment growth, as in Latvia and Lithuania. However, significant pro-cyclical reductions in social expenditure also took place, in countries deep in recession, such as Greece and Portugal.

Cuts in social spending were often a component of fiscal consolidation packages. In response to the sovereign debt crisis, a bailout deal consisting of international financial assistance and debt relief was offered to the so-called 'Programme Countries'. In Greece, Portugal and Romania, the bailout programme was still operative in 2014. Latvia is now subject to 'post-programme surveillance', following the completion of a similar programme. In all of these countries, the bailout was made conditional upon satisfactory progress on a detailed set of austerity measures and policy reforms, formalised in 'Memoranda of Understanding' signed between national governments and a 'Troika' composed of representatives of the European Commission (EC), the European Central Bank (ECB) and the International Monetary Fund (IMF). The pressure resulting from external constraints was also unmistakeable in Spain and Italy, even though softer forms of conditionality prevailed there.

1.2. POSITION AND STRUCTURE OF THE PAPER

We believe that our paper adds to the existing literature in two ways. On the one hand, it clarifies the distinction between the distributional effects of government policies from those of wider developments that lie largely beyond the direct control of policy makers. On the other hand, it identifies policy measures whose first-order effect on the distribution of incomes has been inequality-reducing, in contrast with other policies having an inequality-increasing impact. We argue that our findings have important implications for the design of equitable fiscal consolidation programmes.

The paper is structured as follows. Section 2 provides a review of the literature on the distributional consequences of a crisis, and on the contribution of fiscal consolidation to the intensity of recessions, including key findings of microsimulation studies. Section 3 explains the methodology of our work. Section 4 presents our estimates of the distributional effects of the Great Recession in seven EU countries. Section 5 concludes by summarising the most important findings, and by reflecting on the policy implications of this research.

2. LITERATURE REVIEW

The capacity of policy makers to influence the distributional outcomes of a recession (for example, the effects of changes in market incomes, or in employment) may be limited. Nevertheless, their discretion in deciding the composition of fiscal consolidation packages is much more substantial. Therefore, there are good reasons for attempting to disentangle the impact of austerity policies from the overall distributional effects of a crisis. However, this is less straightforward than it seems, since fiscal consolidation interacts with both growth and inequality. In this section we attempt to clarify the relevant links, drawing on a large and growing literature.

2.1. INTERACTIONS OF AUSTERITY WITH GROWTH

There can be little doubt that fiscal consolidation interacts with growth. On the one hand, austerity policies cause aggregate demand to fall and therefore lead firms catering for the domestic market to reduce output, cut salaries and lay off personnel. On the other hand, the recession will weaken the deficit-reducing potential of austerity policies (e.g. lower tax receipts, higher spending on benefits) and may lead to calls for the adoption of harsher measures.

This raises the question of how austerity contributes to the intensity of the recession. This is at the heart of the controversy on 'fiscal multipliers', i.e. the output loss associated with fiscal consolidation. The issue gained increasing importance in the wake of the current crisis and initiated a heated debate. On the whole, international organisations such as the IMF and the OECD now accept that they have underestimated the size of fiscal multipliers and have overestimated growth prospects (IMF 2012, OECD 2014a). In contrast, the European Commission has suggested that forecast errors may be due to the negative response of investors towards heavily-indebted countries rather than an underestimation of the fiscal multiplier (EC 2012), while the European Central Bank has argued that the medium and long-term effects of fiscal consolidation more than compensate any short-term output losses (ECB 2012). This view is shared by IMF economists Olivier Blanchard and Daniel Leigh (2013), whose finding that the fiscal multiplier in countries worst hit by the crisis may have actually been in the range of 0.9 to 1.7, rather than 0.5 as assumed at the time of the first bailout deals (i.e. that a budget deficit reduction of €10 would lead to a reduction in GDP of €9 to €17 rather than €5 as previously thought), had launched the debate.

In general, the relationship between changes in government expenditure and growth is non-linear (Barro 1990). The actual effect will depend on a variety of factors. To start with, fiscal multipliers tend to be larger when the economy is in recession than when it is in expansion (Auerbach & Gorodnichenko 2012, Corsetti et al. 2012, Eyraud & Weber 2013). Also, output losses will be greater when efforts to improve fiscal balances take place simultaneously across several countries, as this will create negative spillover effects via international trade channels (Goujard 2013).

On the other hand, the policy mix of fiscal consolidation packages may also matter, although the evidence is mixed. Some authors (Romer & Romer 2010, Alesina & Ardagna 2012, Alesina et al. 2012)

have argued that declines in public spending may lead to stronger economic growth ('expansionary austerity hypothesis') than is the case with tax increases, while others (Jordà & Taylor 2013, Ball et al. 2013) have found that the medium term relationship of spending cuts with GDP growth is negative. Finally, the size of the multiplier will also depend on the characteristics of the economy under consideration (Favero et al. 2011). As argued by Alcidi & Gros (2012), output losses following fiscal consolidation will be inversely related to the savings rate, the average (effective) tax rate, and the degree of trade openness. The authors concluded that '[if] Greece had been able to increase the volume of its exports similarly to that of Spain or Portugal, i.e. by about 3 percentage points, this would have given a boost of about 5 percentage points to its GDP'.

What the literature on the relationship between fiscal consolidation and growth suggests is, among else, three things that are relevant to our paper: (a) austerity policies interact with wider changes in the economy, (b) the nature of this interaction depends on the size and content of fiscal consolidation as well as the characteristics of the economy in question, and (c) the direction and magnitude of the relevant effects remains a matter of debate.

2.2. INTERACTIONS OF AUSTERITY (AND GROWTH) WITH INEQUALITY

While economic crises are widely held to cause poverty and inequality to rise, establishing their distributional effects is less straightforward than appears at first sight. Their consequences may vary substantially, depending on the interaction between the earnings of those directly affected by the crisis, the socio-demographic structure of the population, the income and employment status of household members not directly affected, and the capacity of the tax-benefit system to absorb macroeconomic shocks (Atkinson 2009, Nolan 2009).

The aggregate redistributive effect of a tax-benefit system primarily hinges upon its overall size and the degree of progressivity of the policies it comprises. Distributional effects may also look different depending on the dimension considered. For example, average living standards typically decline in a crisis, but inequality need not rise, while effects on poverty will be less pronounced when the relevant threshold is set as a proportion of median incomes than when it is held constant in purchasing power terms (Jenkins et al. 2013).

Empirical evidence has shown that austerity does not necessarily have to be regressive. A recent survey of fiscal consolidation in 29 countries in 1971-2009 by Kaplanoglou et al. (2013) concluded that 'ameliorating the effects of adjustment, by supporting the weaker parts of society, is crucial for the success of fiscal consolidations and […] may provide the double dividend of enhancing the probability of success of the adjustment and of promoting social cohesion.' Similarly, a study of fiscal consolidation in 18 countries in 1970-2010 by Agnello and Souza (2012) found that income inequality may actually decline. However, an analysis of 173 episodes of fiscal consolidation in 17 countries over the past 30 years by Ball et al. (2011) showed that, on balance, adjustment costs were not shared equally, with lower-income groups experiencing heavier losses, and wages declining more than profits. The role of long periods of unemployment and non-participation in the labour market is particularly important in this respect.

The size and make-up of fiscal consolidation may be crucial in determining the distributional impact of the adjustment. Agnello and Souza (2012) found that the decline in income inequality following episodes of fiscal consolidation, discussed above, tended to take place where the policy mix relied more heavily on tax increases than on spending cuts. Ahren et al. (2011) showed that progressive taxation and generous unemployment benefits can smooth the distributional impact of a financial crisis and fiscal consolidation.

In other words, an insidious trade off may be at work: progressive policies such as raising personal income taxes may reduce inequality at the cost of damaging long-term growth, while regressive policies such as raising indirect taxes may have the opposite effect (OECD 2013). In view of that, and given that negative (or anaemic) growth tends to cause inequality to increase (as reduced demand for labour leads to falling employment and/or wages), the static effects of austerity policies may be at odds with their dynamic effects.

On the whole, little is known about the combined (static and dynamic) effect of individual policy measures. However, Woo et al. (2013), having analysed consolidation programmes in 17 countries in 1978-2009, concluded that spending cuts increase inequality more than tax increases. Crucially, the authors identified unemployment as an important channel through which consolidation causes inequality to increase.

In a context of uncertainty about the terms of the trade off between the effects of austerity policies on inequality and on growth, the search is on for policies that promote both equality and growth. Woo et al. (2013) proposed 'education and training among low- and middle-income workers', since high-skilled technological progress and trade openness tend to be associated with higher growth and lower inequality. In the same vein, Bastagli et al. (2012) identified 'reducing opportunities for tax evasion and avoidance, increasing the progressivity of income taxes over higher income brackets, cutting unproductive expenditures, and expanding means-tested programs' as the key ingredients of fiscal consolidation packages that successfully 'enhance or maintain the distributive effects of fiscal policy while supporting economic efficiency'. Finally, Rawdanowicz et al. (2013) suggested that policies aimed to increase asset taxation (especially real estate), reduce tax relief, to raise the retirement age and to improve efficiency in education and health care can enhance equity without adversely affecting growth.

In brief, the literature on the interaction of austerity (and growth) with inequality seem to offer three key insights: (a) periods of fiscal consolidation tend to be associated with rising inequality; (b) static effects of individual austerity policies may be offset by dynamic effects, such as those operating via rising unemployment; and (c) the design of fiscal consolidation packages can partly or fully neutralise adverse distributional effects, especially if policies that promote growth as well as equality can be identified and successfully implemented.

2.3. ESTIMATING DISTRIBUTIONAL EFFECTS VIA MICROSIMULATION

Microsimulation has been extensively used as a tool for assessing the distributional impact of the recent economic downturn, examining the effects of various austerity measures or projecting the shape of the income distribution in future years.

In a single-country setting, Callan et al. (2011) assessed the impact of public sector pay cuts in Ireland in 2009-10. These were found to be progressive relative to a counterfactual of a universal 4% cut in pay rates in both the public and private sectors. Nolan et al. (2013) expanded that analysis to include the overall distributional impact of tax and welfare changes over the period 2009–2011, and again found the result to be highly progressive. In Italy, Brandolini et al. (2013) replicated employment dynamics in 2007-10 and estimated the resulting variations in income flows. In the light of their findings they argued that the impact of the recent recession on inequality and poverty in the country has been fairly limited, despite the considerable fall in average income. Elderly households appear to have been better protected from the adverse effects of the crisis than non-elderly households. In Greece, Leventi and Matsaganis (2013) estimated how the burden of the crisis was shared across the population in 2009-12. Their findings suggest that relative poverty increased moderately. However, when using a fixed poverty threshold, poverty appears to have risen dramatically. The rise in

inequality began a year after the onset of the crisis, and gathered speed as the recession deepened. The main driver of growing inequalities appears to have been the recession, especially rising unemployment, rather than austerity policies *per se*. Finally, in Cyprus, Koutsampelas and Polycarpou (2013) assessed the distributional effects of the austerity measures introduced in 2011-12. Their analysis showed that most of the first-order effects of adjustment fell upon households located at the middle and upper part of the income distribution. In the UK, the effects of recent (and forthcoming) tax and benefit reforms were analysed by Browne and Levell (2010), Brewer et al. (2011), Brewer et al. (2013), and Joyce and Sibieta (2013). Their findings suggest that the timing and size of the impact of the recession varies widely across income groups.

In a comparative setting, Avram et al. (2013) simulated the distributional effects of fiscal consolidation measures up to 2012 in nine EU countries. The study showed that the burden of austerity was shared differently across the income distribution in these countries: in Greece, Spain, Italy, Latvia, Romania and the UK the rich lost a higher proportion of their incomes than the poor, whereas in Estonia, the opposite seemed to be the case. The burden of the Lithuanian and Portuguese fiscal consolidation fell more heavily on the poorer and the richer than it did on persons located in the middle of the income distribution. Moreover, Bargain et al. (2013) examined the distributional impact of the economic crisis in France, Germany, the UK and Ireland in the period 2008-10 and the contribution of tax and benefit policy changes. They found that in three out of the four countries studied (UK, France and especially Ireland) policy reactions contributed to stabilising or even reducing inequality and relative poverty. Finally, Ajwad (2013) analysed the impact of improving employment and education conditions in ten recent EU member states and found that the number of persons in poverty could decrease by more than 3.7 million by 2020 if countries achieved their national targets for employment and education.

3. METHODOLOGY

3.1. DEPARTURES FROM PREVIOUS RESEARCH

Given that microsimulation studies, such as the ones reviewed above, contribute to a policy debate that is more evidence-based than is usually the case, it is hardly surprising that their findings have generated considerable interest, nor that they have been extensively discussed in publications by international organisations, including the European Commission (EC 2013), the OECD (2014b), and the IMF (2014). Nevertheless, they have also been open to misinterpretation, which is unfortunate in a politically contested field.

For example, Avram et al. (2013) evaluated the distributional effects of policy changes from 2012 to 2009 on the assumption that 2009 policies were implemented on the 2012 market income distribution. This is a crucial assumption. When assessing the distributional impact of tax and benefit policies, the choice of the underlying (market) income distribution may not matter much most of the time. However, at times of major changes, it will matter a lot. In other words, our assessment of the progressivity or otherwise of individual policies, or of austerity packages as a whole, may differ significantly according to whether tax and benefit policies are assessed on the distribution of market incomes at the beginning or at the end of the period under consideration. Also, as the literature reviewed above suggests, tax and benefit policies affect market incomes and are in turn affected by them. This is both because dynamic effects of austerity on inequality via growth are significant, and because policy makers, when determining the content of tax and benefit policies in the coming

year(s), tend to take into account the state of the economy and income distribution in the current year.

On the whole, ignoring interactions between policies and changes in market incomes leaves out an important part of the picture. This is clearly acknowledged in many of the previously mentioned microsimulation studies, whose authors take pains to explain that the estimated effects of austerity policies on inequality are *first-order* only (i.e. they ignore indirect effects e.g. on employment). Nevertheless, the distinction is often muddled when their findings are reported by others. For example, a recent review of the evidence by the IMF (2014 p. 51) contents that 'micro-simulation studies indicate that these fiscal adjustments relied on progressive measures', even as it notes that 'these studies focus exclusively on the impact of spending and tax consolidation measures on household disposable income and consumption, and do not assess the impact of these measures on market income'.

Our approach departs from that of Avram et al. (2013), where broader developments (such as changes in the labour market) are carefully accounted for as part of the general economic context, but explicitly excluded from the scope of the fiscal consolidation measures being assessed. It also differs from the methodology of Brandolini et al. (2013), where changes in the income distribution are exclusively driven by flows into and out of employment, assuming that wages, self-employment earnings and pension entitlements have not changed during the period under examination.

In this paper we model the distributional effects of the crisis in the period 2009-2013 on a year-by-year basis, rather than cumulatively (i.e. 2009 vs. 2013). Also, we assess first-order policy effects between two consecutive years (say t-1 and t), rather than between the start and the end of a longer period. Moreover, we locate first-order policy effects within the full distributional impact of the crisis, rather than abstracting from that. Finally, unlike most of the studies reviewed above, we attempt to distinguish between inequality-reducing and inequality-enhancing items within the same policy package.

3.2. MODELLING THE DISTRIBUTIONAL EFFECTS OF THE CRISIS AND AUSTERITY

In principle, as economic activity slows down, policy makers may react by taking (counter-cyclical) measures to reduce taxes or increase public spending, including on social benefits. Alternatively, if the space for expansionary policies is limited, as is the case in countries with large deficit and/or debt, policy makers under pressure from financial markets may attempt (pro-cyclical) fiscal consolidation. Consequently, the distribution of incomes will change in two different ways: first, as a result of the impact of tax increases and spending cuts on the income distribution; second, as a result of developments in the wider economy, such as losses of jobs and earnings in the private sector, where the contraction in activity will inevitably cause market incomes to fall.

The full distributional impact of the crisis will be the combination of the two effects. Since these effects occur simultaneously, they are not observed as such. However, drawing on the decomposition approach developed by Bargain and Callan (2010), we approximate the first-order distributional effects of policies by simulating a hypothetical counterfactual scenario.

More formally, let *f(Y,P)* denote a distribution of household disposable income as a function of developments in the market economy *(Y)* and government policies *(P)*.

The full distributional impact of the crisis between two consecutive years, say t and t-1, can be denoted as:

$$C = f(Y_t, P_t) - f(Y_{t-1}, P_{t-1}) \quad (1)$$

Adding and subtracting the term $f(Y_{t-1}, P_t)$ we obtain:

$$C = f(Y_t, P_t) - f(Y_{t-1}, P_t) + f(Y_{t-1}, P_t) - f(Y_{t-1}, P_{t-1}) \quad (2)$$

This can be decomposed as the effect of changes in tax and benefit policies between years t and t-1, as assessed on the income distribution in year t-1:

$$A = f(Y_{t-1}, P_t) - f(Y_{t-1}, P_{t-1}) \quad (3)$$

plus the effect of changes in the income distribution between years t and t-1 as assessed on tax and benefit policies in year t:

$$B = f(Y_t, P_t) - f(Y_{t-1}, P_t) \quad (4)$$

In this paper we estimate A and C. As explained above, the latter represents the full distributional impact of the recession, while the former captures the effect of changes in government policies on the income distribution as observed before these policies are actually implemented (i.e. typically at the time policy changes are announced and/or legislated). Since this is the only distribution known to policy makers when they take decisions on policy changes, we believe that estimating this hypothetical scenario is of interest and relevance.

The market income distribution of the counterfactual scenario is constructed on the basis of:

(i) labour market status as in year t-1;

(ii) market incomes other than public sector pay as in year t-1.

This is equivalent to assuming that government policies in a given year alter public sector pay, public pensions, taxes and benefits, but leave nominal pre-tax market incomes and employment levels as in the year before.

Note that in our counterfactual scenario we do not allow for monetary parameters of taxes and benefits to grow from one year to another (by using for example CPI or growth in average market incomes), since no official indexation was applicable during the period considered in most of our seven countries.

At this point, a few clarifications seem in order.

To start with, fiscal consolidation policies often involve changes in monetary incomes (such as those resulting from public sector pay cuts, tax increases, or cuts in pensions and other social benefits), but also changes in non-monetary incomes (such as those resulting from cuts in the funding of public services. We omit the effect of changes in the funding of public services.

An additional complication is that developments in the wider economy (modelled here as part of the 'full effect' scenario) may on occasion be directly attributable to government policies, as in the case of changes in minimum wage legislation. We do not disentangle these effects from the overall distributional impact of the crisis.

Also, we use the shorthand term 'first-order effects' to warn against identifying the effects of our hypothetical scenario with the (unobservable) contribution of changes in government policies on changes in the income distribution. Note that this scenario does not coincide with first-order effects of government policies as commonly understood (i.e. as assessed on the income distribution observed after these policies are actually implemented). The latter can be formally obtained by adding and subtracting the term $f(Y_t, P_{t-1})$ from equation (1):

$$C = f(Y_t, P_t) - f(Y_t, P_{t-1}) + f(Y_t, P_{t-1}) - f(Y_{t-1}, P_{t-1}) \quad (5)$$

This can be decomposed as the effect of changes in tax and benefit policies between years t and t-1 as assessed on the income distribution in year t:

$$D = f(Y_t, P_t) - f(Y_t, P_{t-1}) \quad (6)$$

plus the effect of changes in the income distribution between years t and t-1 as assessed on tax and benefit policies in year t-1:

$$\mathrm{E} = f(Y_{\mathrm{t}}, P_{\mathrm{t-1}}) - f(Y_{\mathrm{t-1}}, P_{\mathrm{t-1}}) \quad (7)$$

Clearly $f(Y_{\mathrm{t}}, P_{\mathrm{t}}) - f(Y_{\mathrm{t}}, P_{\mathrm{t-1}}) \neq f(Y_{\mathrm{t-1}}, P_{\mathrm{t}}) - f(Y_{\mathrm{t-1}}, P_{\mathrm{t-1}}) \Rightarrow D \neq A$

It follows that assessments of the progressiveness or otherwise of fiscal consolidation packages might differ, depending on the choice of the underlying income distribution. In this exercise we opt for the use of scenario A, due to the fact that it is based on the market income distribution which is most commonly available to policy makers at the time decisions are made.

Finally, combining equations (2) and (5) it follows that:

$$\mathrm{B} = \mathrm{D} - \mathrm{A} + \mathrm{E} \quad (8)$$

We warn against interpreting B as equal to the (unobservable) independent effect of changes in market incomes over and above the effect of government policies (i.e. that would have occurred in the absence of changes in government policies). As can be seen from equation (8), B incorporates the difference between the effects of changes in government policies on the income distribution as observed before and after these policies are actually implemented as well as the effects of factors unrelated to government policies. We do not estimate B, since the distributional impact of this scenario does not seem to add to the purposes of this paper.

Finally, it is essential to remember that the depth and duration of the recession differed in the countries considered here, and the same goes for the size and nature of fiscal consolidation measures pursued.

3.3. MODEL AND DATA

We rely on the European tax-benefit model EUROMOD. The model uses survey data on gross incomes, labour market status and other characteristics of the individuals and households, which it then applies to the tax and benefit rules in place in order to simulate direct taxes, social insurance contributions and entitlements to cash benefits. The components of the tax–benefit system that cannot be simulated (for example, those depending on prior contributions) are read off the data. EUROMOD has been validated both at micro (i.e. case-by-case validation) and macro level and has been tested in several applications. For a comprehensive overview, see Sutherland and Figari (2013).

The underlying micro data for all countries are drawn from the 2010 European Union Statistics on Income and Living Conditions (EU-SILC), a dataset which is specifically designed to provide detailed and multidimensional information on income distribution and social inclusion (see Table A1 of the Appendix). For information on the sample design of EU-SILC 2010 used for calculations, see Goedemé (2010). For a discussion of the importance of testing the statistical significance of microsimulation results, see Goedemé et al. (2013).

The most important advantages of microsimulation in general, and EUROMOD in particular, are twofold: timeliness and attribution. Due to the complexity of income surveys, relevant income data only become available after considerable (i.e. 2-3 year) delay. In the meantime, EUROMOD can bridge the gap, by providing an early evaluation of changes in the income distribution of EU countries up to 2013. It can be used to disentangle the effects of each policy or other macroeconomic developments (such as the rise in unemployment) separately, taking into account the complex ways in which taxes interact with benefits and with each other. A direct analysis of actual data, when these become available, cannot do this as well.

3.4. ACCOUNTING FOR LABOUR MARKET DEVELOPMENTS

A standard practice in static microsimulation models is to assume that the labour market characteristics of the population remain unchanged. Although this is a plausible assumption for short term analysis in a stable macro-economic environment, it may bias the results in periods of rapid economic change. Given the magnitude of changes in most of the countries under examination, assuming away such a development would have been inappropriate for the purposes of this research.

Changes in labour market status were taken into account following the approach adopted in Leventi et al. (2013). The latter builds on previous research by Navicke et al. (2014) by refining the methodology, updating the underlying micro data and extending projections to 2013. This approach can be briefly summarised as follows. Observations are selected on the basis of conditional probabilities of being employed. A logit model is used for estimating probabilities for working age (16-64) individuals in the EUROMOD input data. The model is estimated separately for individuals with higher and lower levels of education, to allow for structural differences in the labour market situation of the two groups. The weighted total number of observations that are selected to go through transitions based on their probabilities corresponds to the relative net change in employment levels by age group, gender and education (a total of 18 strata) as shown in the macro level Labour Force Survey (LFS) statistics. Those in education and recipients of disability or retirement pensions are excluded from the estimation unless they report that they have been working for the whole year in the underlying data. Annual LFS employment rates are used for 2010-2012, and an average of 2012Q3-2013Q2 for 2013. Changes from short-term to long-term unemployment are also modelled based on a similar selection procedure as the one described above.

For internal consistency reasons, EUROMOD defines an individual's labour market status using information on their 2009 income sources rather than their 2010 employment status. Table A2 in the Appendix shows the effect of adjustments of the employment rates on the EUROMOD/LFS ratio. Differences in initial employment rates in EUROMOD and LFS data vary from 0.5 to 3.9 percentage points. These are mainly due to discrepancies in the structure of the underlying working age populations and the different way labour market status is measured. Hence, the aim of this adjustment is not to match the EUROMOD and LFS employment patterns in absolute terms but to account for *relative* changes in employment levels. Labour market characteristics and sources of income are adjusted for those observations that are subject to transitions. In particular, employment and self-employment income is set to zero for individuals moving from employment into unemployment; for individuals moving from unemployment into employment, earnings are set equal to the mean among those already employed within the same stratum.

An alternative way to deal with changes in employment status might have been to reweight the EU-SILC samples. The drawback of this approach is that it implicitly assumes that the characteristics of the new unemployed are similar to those already unemployed at the time of the survey. In the case of the countries studied, this can be quite misleading. In fact, the available evidence indicates that the characteristics of workers made unemployed in 2010-13 were quite different from those of unemployed workers in 2009. For example, long-term unemployment in 2009 represented a much lower share of total unemployment than it did in 2013, while in Greece, Spain and Portugal unemployment hikes disproportionally affected younger workers (Eurostat 2014).

3.5. UPDATING INCOMES AND SIMULATING POLICIES

The non-availability, at the time of writing, of 'real' data for the time period in question implied that a synthetic income distribution has to be created for these years. As is standard practice in

microsimulation, this involved two additional steps: updating incomes from EU-SILC income reference period (2009) to the latest policy year (2013) and simulating tax and benefit policies.

Updating incomes is performed by using factors based on the available administrative or survey statistics. Specific updating factors are derived for each income source, reflecting the change in their average amount between the income data reference period and the target year. Accurately capturing the evolution of employment income is of utmost importance for studying changes in the disposable income of households. In order to account for differential growth rates in employment income, updating factors are disaggregated by economic activity and by private and public sector in cases where such information is available in national statistics.

Simulations are then carried out on the basis of the tax-benefit rules in place on June the 30th of each policy year. Although substantial progress has been made towards incorporating non-monetary components into EUROMOD (Paulus et al. 2010, Verbist & Matsaganis 2014), the relevant module is not yet available. In view of the above, changes in the provision of social benefits in kind (such as publicly-funded health care, education, child care, and care for the elderly) are ignored in this study. Since EU-SILC provides no information on consumption, changes in indirect taxation are also beyond the scope of this analysis. The full list of factors used for the uprating of original incomes and non-simulated benefits as well as detailed description of the way in which tax-benefit policies are simulated can be found in the EUROMOD Country Reports (see https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/ country-reports).

3.6. ACCOUNTING FOR TAX EVASION AND BENEFIT NON TAKE-UP

In order to enhance the accuracy and credibility of our estimates, we made an effort to address the issues of tax evasion (e.g. in Greece and Italy) and benefit non take-up (e.g. in Greece). However, due to data limitations, such adjustments could not be implemented in all seven countries.

In accounting for tax evasion in Greece, we assume that individuals reveal their real net income to EU-SILC interviewers (though not necessarily in their tax forms). We focus on three income sources: salaries and wages, farming income and self-employment earnings. We separate the reported from the unreported part of gross income by applying rates of income under-reporting by source, set equal to the ratio of income reported in a sample of tax forms and in EU-SILC respectively (see Leventi et al. 2013). EUROMOD treats the former as subject to income tax and social insurance contributions (and in resource assessment for means-tested benefits), and adds the latter to individual disposable income.

In the case of Italy, drawing on Fiorio and D'Amuri (2005), self-employment income was split in two components, assuming that only part of total income was declared to tax authorities, and then grossed up. A calibration factor was applied in order to obtain an aggregate amount of the gross self-employment income corresponding to that reported in fiscal data.

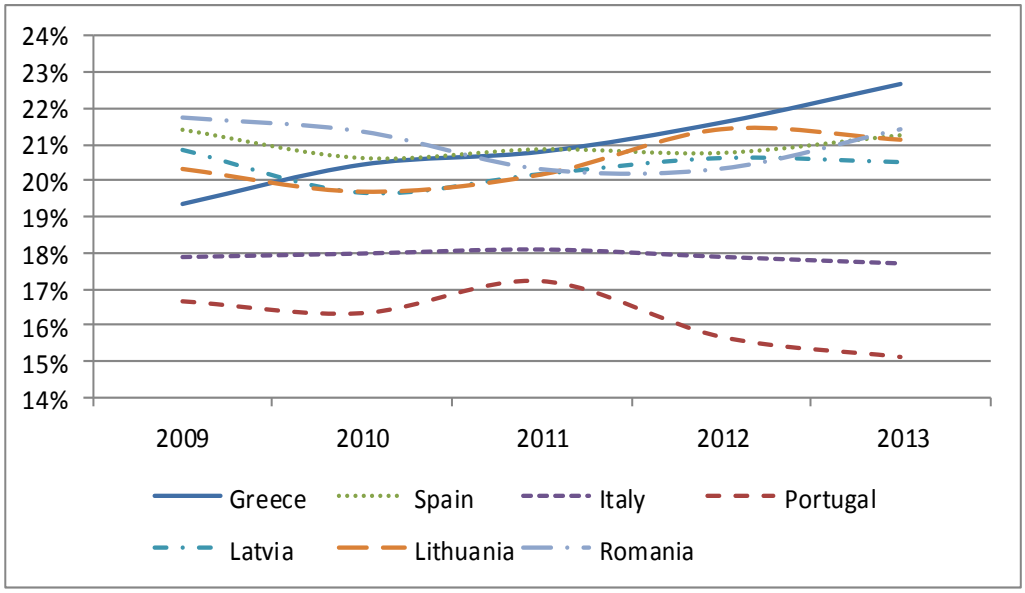
Non take-up corrections were applied in the case of two means-tested benefits in Greece: social pension, aimed for persons aged over 65 with insufficient contributions for a social insurance pension; and unemployment assistance for older workers, a benefit targeted at the long-term unemployed aged over 45 on low income. In the case of the former, social pension was only assigned to persons who declared receipt in the original dataset. In the case of the latter, non-take-up rates were calculated by comparing administrative data on benefit recipients with those simulated in EUROMOD. Unemployment assistance was then randomly assigned to the appropriate fraction of eligible recipients.

4. RESULTS

4.1. POVERTY

We assess poverty effects using two different indicators. The first is the relative poverty rate, measured in terms of the proportion of the population with a net income below 60% of median. The evolution of relative poverty rates in 2009-13 is shown in Figure 4 and, in greater detail, in Table 1, while that of the relative poverty line is provided in the Appendix (Table A3i).

FIGURE 4. RELATIVE POVERTY (2009-2013)



Note: Proportion of population below the relative poverty threshold, set at 60% of median equivalised disposable income. Standard error estimates, based on the Taylor linearization using the DASP module for Stata, are available upon request.
Source: EUROMOD version G1.0.

TABLE 1. CHANGES IN RELATIVE POVERTY BY SEX AND AGE (2009-2013)

	EL	ES	IT	PT	LV	LT	RO
all	3.3***	-0.2	-0.2	-1.5***	-0.3	0.8	-0.3
men	4.4***	0.2	0.1	-1.2**	-0.4	0.9	-0.4
women	2.3**	-0.5	-0.4*	-1.9***	-0.3	0.7	-0.3
0-17	3.2***	0.6	-0.2	-1.2	-0.8	3.2***	0.3
18-29	7.2***	3.0***	1.0*	1.0	-0.2	-0.8	-0.3
30-44	6.3***	0.1	0.2	-0.7	-1.6***	0.5	0.2
45-64	5.4***	0.4	-0.2	-1.5**	0.6	-0.1	-0.5
65+	-6.3***	-4.9***	-1.4***	-5.1***	0.1	1.9***	-1.8***

Note: Changes in relative poverty rates (2013 vs. 2009) in percentage points. Relative poverty rate defined as proportion of population below the relative poverty threshold, set at 60% of median equivalised disposable income, using the OECD modified equivalence scale. Estimated changes marked as statistically significant at 90% (*), at 95% (**), or at 99% confidence level (***). Information on the sample design of EU-SILC 2010 used for calculations derived following Goedemé (2010), using do file 'Svyset EU-SILC 2010' downloadable from http://www.ua.ac.be/main.aspx?c=tim.goedeme&n=95420. Standard errors around relative poverty estimates based on the Taylor linearization using the DASP module for Stata, downloadable from http://dasp.ecn.ulaval.ca/.

Source: EUROMOD version G1.0.

As can be seen, estimated relative poverty levels for the entire population moved up steadily in Greece, being 3.3 percentage points higher in 2013 than it was in 2009. Relative poverty rates in the other six countries went up as well as down, with the size of change being generally small.

Changes in sex- and age-specific relative poverty rates reveal interesting patterns. On the whole, they were less unfavourable for women than for men. In terms of age, the most remarkable finding is that relative poverty rates for the elderly (aged over 65) decreased very considerably in Greece, Spain and Portugal (by around five percentage points or more), as well as in Italy and Romania (even though by less), and only increased in Lithuania. On the other hand, relative poverty for young persons (aged 18-29) went up in southern Europe (especially in Greece and Spain), as did child poverty (aged 0-17) in Greece and Lithuania. Poverty rates also went up for the 30-64 age group in Greece, and fell for the 30-44 age group in Latvia. Other changes comparing 2013 to 2009 were small, with all differences being below one percentage point and also not statistically significant.

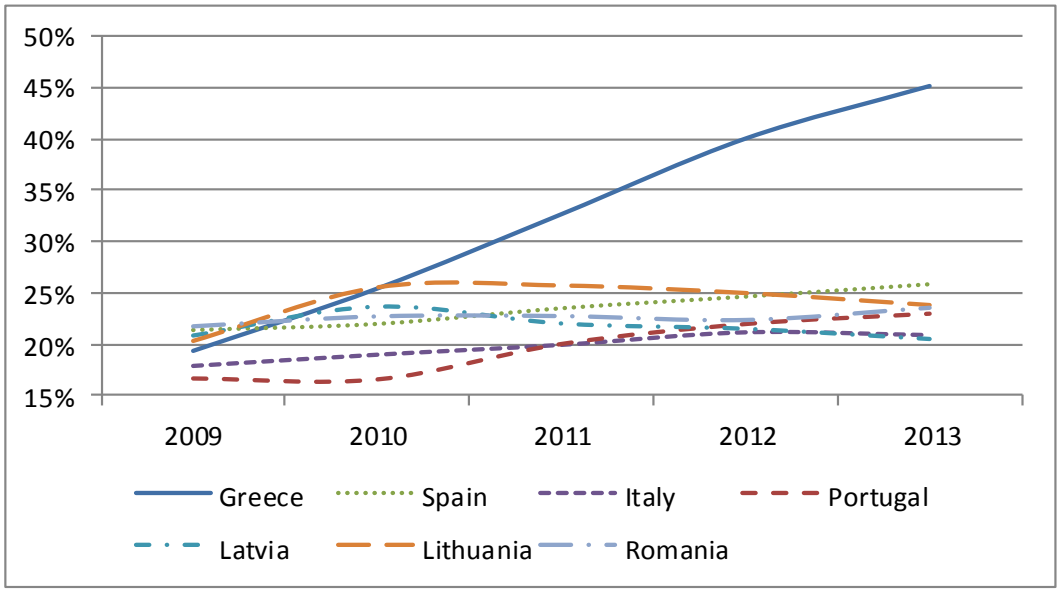
By construction, the relative poverty line, on which the above results are based, goes up as median incomes improve, and down as median incomes fall. All this is consistent with the concept of relative poverty, and may not matter much when income growth is slow either way.

Needless to say, the significant fall in median incomes has been *the* defining characteristic of the Great Recession: in 2009-13 that fall was massive in Greece (-36% in real terms), but was also substantial in Portugal (-14%) and Spain (-11%), as in Italy, Lithuania and Romania, even though to a lesser extent (-6% in all three countries). Only in Latvia, where incomes recovered since 2010, had the median in 2013 reached its 2009 level in real terms. In other words, the last years were a time of rapid change in living standards, when individuals tend to compare their material circumstances not just with those of 'the average person' in the society in which they live, but also with their own standard of living in a previous period.

To approximate the resulting sense of impoverishment, our second indicator fixes ('anchors') the poverty line at 60% of the median of the 2009 income distribution, in real terms. Clearly, this threshold moves up with inflation. In other words, the second indicator reports the proportion of

population that were unable to purchase in 2010-13 the goods and services that were just affordable to those with poverty line incomes in 2009. Note that this second poverty indicator is similar to the 'at-risk-of-poverty rate anchored at a fixed moment in time' (a Eurostat indicator of the social inclusion strand). Recent trends in anchored poverty rates are presented in Figure 5 and, by sex and age, in Table 2, while that of the anchored poverty line in 2009-13 is provided in the Appendix (Table A3ii).

FIGURE 5. ANCHORED POVERTY (2009-2013)



Note: Proportion of population below a fixed poverty threshold, set at 60% of the 2009 median equivalised disposable income, adjusted for inflation. Adjustment based on the harmonised index of consumer prices (accessed on 19 December 2013); values for 2013 based on the European Commission Spring 2013 forecast (http://ec.europa.eu/economy_finance/eu/forecasts/2013_spring/statistical_en.pdf). Standard error estimates, based on the Taylor linearization using the DASP module for Stata, are available upon request.
Source: Eurostat; EUROMOD version G1.0.

TABLE 2. CHANGES IN ANCHORED POVERTY BY SEX AND AGE (2009-2013)

	EL	ES	IT	PT	LV	LT	RO
all	25.8***	4.5***	3.0***	6.3***	-0.3	3.5***	1.8***
men	26.5***	4.7***	3.0***	6.1***	-0.4	2.9***	1.8***
women	25.2***	4.3***	3.0***	6.5***	-0.3	4.0***	1.8***
0-17	25.9***	5.6***	3.5***	7.2***	-0.8	6.3***	3.1***
18-29	32.4***	8.9***	3.7***	6.8***	-0.2	1.4	1.5**
30-44	25.9***	4.2***	2.9***	5.9***	-1.6***	3.1**	2.3***
45-64	25.9***	5.0***	2.1***	5.8***	0.6	1.7***	1.3***
65+	20.4***	-1.1***	3.5***	6.4***	0.1	6.3***	0.6*

Note: Changes in anchored poverty rates (2013 vs. 2009) in percentage points. Anchored poverty rate defined as proportion of population below a fixed poverty threshold, set at 60% of the 2009 median equivalised disposable income, adjusted for inflation. Adjustment for inflation based on the harmonised index of consumer prices (accessed on 19 December 2013); values for 2013 based on the European Commission Spring 2013 forecast (http://ec.europa.eu/economy_finance/eu/forecasts/2013_spring/statistical_en.pdf). Estimated changes marked as statistically significant at 90% (*), at 95% (**), or at 99% confidence level (***). Information on the sample design of EU-SILC 2010 used for calculations derived following Goedemé (2010), using do file 'Svyset EU-SILC 2010' downloadable from http://www.ua.ac.be/main.aspx?c=tim.goedeme&n=95420. Standard errors around anchored poverty estimates based on the Taylor linearization using the DASP module for Stata, downloadable from http://dasp.ecn.ulaval.ca/.
Source: Eurostat; EUROMOD version G1.0.

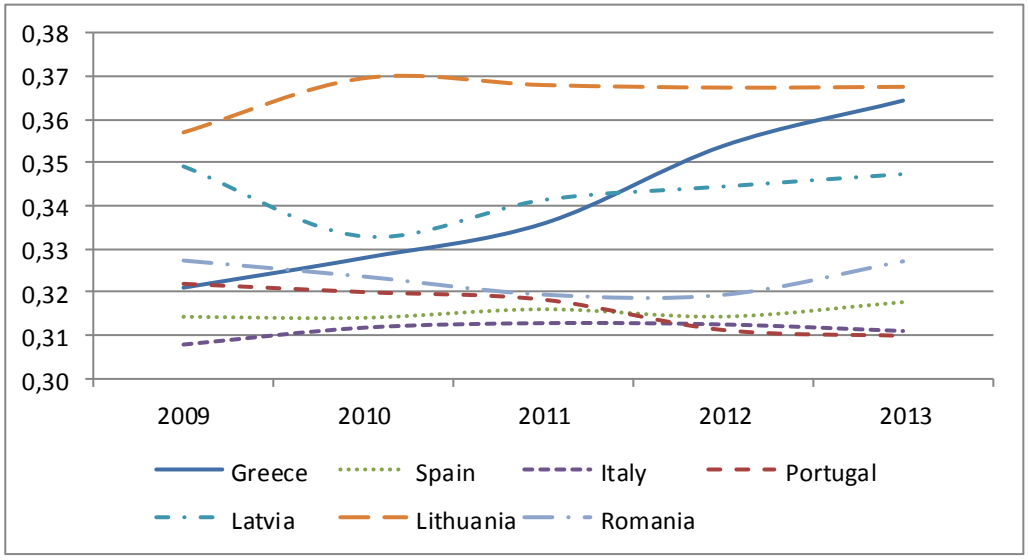
As might have been expected, changes in anchored poverty were much more dramatic. In Greece, the proportion of population with incomes in 2013 below the 2009 poverty line (in real terms) was over 45%, an increase by more than 25 percentage points. The magnitude of change was smaller in Portugal (+6.3 ppts), Spain (+4.5 ppts), Lithuania (+3.5 ppts), Italy (+3.0 ppts) and Romania (+1.8 ppts), but the difference was statistically significant in all cases. The reduction in anchored poverty estimated for Latvia (-0.3 ppts) was not statistically significant.

In terms of age, the groups experiencing the greatest increases in anchored poverty were the young (aged 18-29) in Greece, Spain and (by a smaller margin) in Italy, and children (aged 0-17) in Portugal, Lithuania and Romania. Nevertheless, the elderly also suffered considerable increases in anchored poverty, except in Latvia and Romania (where the relevant rate hardly increased), and Spain (where it actually fell).

4.2. INEQUALITY

We use two inequality indicators to determine whether the Great Recession has made the distribution of incomes more unequal. The first is the Gini coefficient, probably the most widely used inequality indicator, taking values ranging from 0 (total equality) to 1 (total inequality). The second inequality indicator is the income quintile share ratio S80/S20 (measuring the income share of the richest 20% relative to that of the poorest 20%). Note that the former is more sensitive to changes in the middle of the distribution, whereas the latter is more sensitive to changes at the two ends of the distribution.

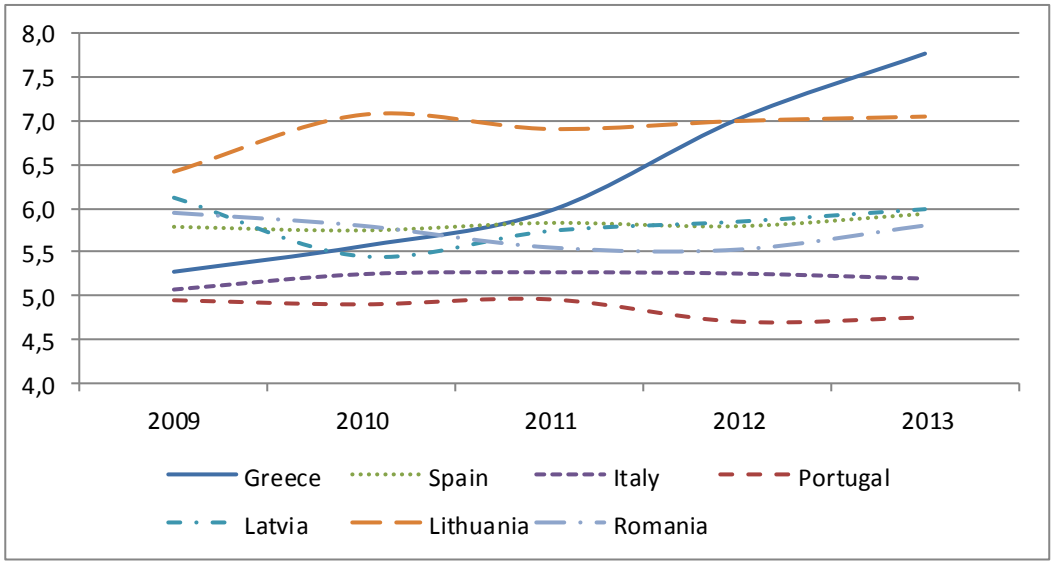
FIGURE 6. CHANGES IN INEQUALITY: GINI INDEX (2009-2013)



Note: The values of the Gini index vary from 0 (all persons have the same income) to 1 (one person has all the income). Standard error estimates, based on the Taylor linearization using the DASP module for Stata, are available upon request.
Source: EUROMOD version G1.0.

As seen in Figure 6, the value of the Gini index increased in 2009-13 very steeply in Greece (from 0.321 to 0.364, i.e. by 13%). It also went up a bit in Latvia (in 2011-13), in Lithuania (in 2010), in Spain and Romania (both in 2013), declined steadily in Portugal (in 2009-13), and hardly moved in Italy. In all cases, differences, whether annual or cumulative, were rather small. However, changes between 2009 and 2013 were statistically significant at the 1% level for 5 out of the 7 countries studied (i.e. all except Latvia and Romania).

FIGURE 7. CHANGES IN INEQUALITY: S80/S20 INDEX (2009-2013)



Note: S80/S20 is the income share of the richest 20% relative to that of the poorest 20% of the population.
Source: EUROMOD version G1.0.

The pattern was remarkably similar with respect to the S80/S20 index (shown in Figure 7). The income quintile share ratio went up very considerably in Greece (from 5.3 to 7.8, i.e. by 47%). Other

changes were small, except the rise of the S80/S20 index in Lithuania in 2010, and its fall in the same year in Latvia.

4.3. SOCIAL WELFARE

Recent debates on 'inclusive growth' have revived interest in an older line of inquiry, viewing improvements in living standards in the light of distributional concerns. Arguably, the 'big trade off' between increasing income and reducing inequality (Jenkins 1997) is also relevant in the Great Recession. If social welfare rises in line with average income and falls with inequality, the opposite must also be true – i.e. that, in social welfare terms, a more equal distribution may partly compensate for the decline associated with falling average incomes.

To measure changes in social welfare in the seven countries we have computed the values of the indicator proposed by Amartya Sen (1976):

$W = \mu(1 - G)$

where W is 'real national income' (Sen's measure of social welfare), μ is average household income, and G = the value of the Gini coefficient.

In the seven countries considered here, changes in the Sen index in 2009-2013 were driven mostly by changes in average income (adjusted for inflation). In particular, the value of the index fell by 40% in Greece, by around 12% in Portugal and Spain, 7% in Italy and Lithuania, and by 4% in Romania. It also rose slightly (by +1%) in Latvia.

4.4. INCOME CHANGES BY DECILE

The above raises a simple question: has the Great Recession made the rich richer (and the poor poorer)? This is an important question, with obvious political implications. Rather disappointingly to those hoping for a simple answer, it all depends on how the income distribution is analysed. Specifically, one of the effects of a crisis is that different social categories and income groups are affected differently. Over time, a considerable amount of re-ranking within the income distribution takes place, as a result of which the composition of income deciles changes. A detailed description of these transitions can be found in the Appendix (Tables A4i-A4vii).

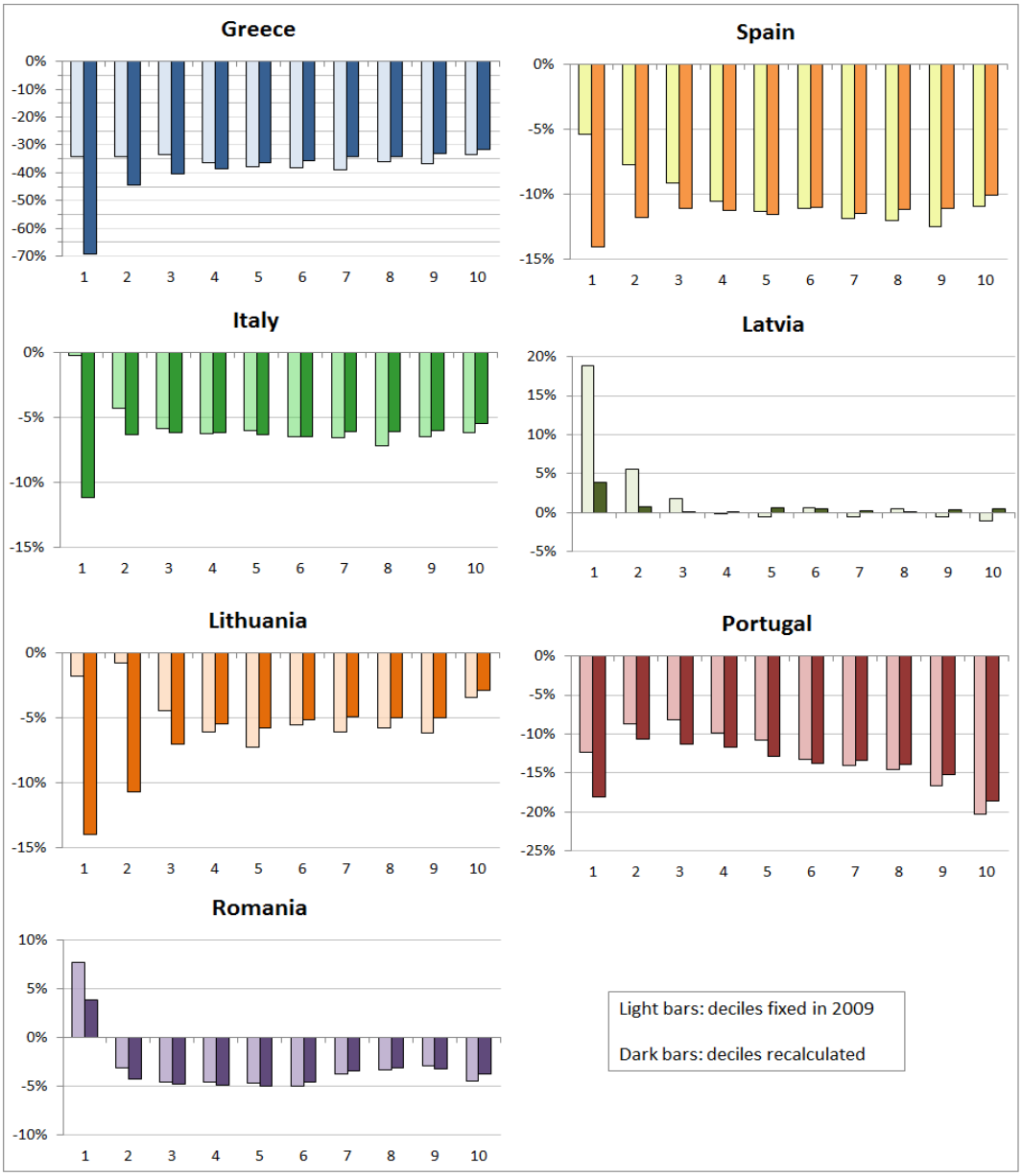
Changes associated with re-ranking were most pronounced in Greece (where 65% of the population moved income decile between 2009 and 2013), followed by Portugal and Spain (where that proportion was around 35%). By comparison, in Italy only 18% of the population were found in a different decile in 2013 relative to 2009. In the Baltic countries around a quarter of the population changed income decile between 2009 and 2013, while in Romania only one-sixth.

In terms of composition, in 2013 relative to 2009, the poorest 20% of the Greek population contained more unemployed workers (29% vs. 10%), fewer elderly persons (10% vs. 18%), and more city dwellers (40% vs. 35%). The bottom quintile also numbered more unemployed workers in Portugal (19% vs. 13%) and in Spain (16% vs. 8%), and to a lesser extent in Italy (8% vs. 5%) and in Romania (3% vs. 0%). Moreover, it included more residents of rural areas in Latvia (63% vs. 61%) and more children in Lithuania (24% vs. 22%). Other changes were marginal.

The effects of re-ranking in real disposable household income are shown in Figure 8. These can be seen clearly taking the example of Greece, the country where income losses have been most dramatic. When deciles are fixed in 2009 (i.e. not allowing for re-ranking), we find that by 2013 those in the poorest 10% of the population in 2009 had lost a smaller-than-average proportion of their income (34% vs. 36% in real terms). On the other hand, if deciles are recalculated each year (i.e.

allowing for re-ranking), we find that the income of those in the poorest 10% of the population in 2013 had fallen by as much as 69% relative to the income of their counterparts in 2009 (i.e. those who occupied the lowest income decile in that year).

FIGURE 8. CHANGES IN DISPOSABLE INCOME BY DECILE (2009-2013): RE-RANKING EFFECTS



Note: Household disposable income is measured in real terms (i.e. adjusted for inflation), averaged for each decile. It is equivalised according to the OECD modified equivalence scale. The dark bars show change in disposable income between 2009 and 2013 when the composition of deciles is allowed to change (i.e. by calculating average income per decile for 2009 and 2013, allowing for re-ranking, and then estimating the difference), while the light bars show average change in disposable income when deciles are fixed on the basis of the 2009 income distribution (i.e. not allowing for re-ranking). The charts are drawn to different scales, but the interval between gridlines is the same on each chart.
Source: EUROMOD version G1.0.

A similar pattern prevailed in Spain, Italy and Lithuania. In all of these countries, those in the bottom decile in 2009 had by 2013 lost a smaller proportion of their income than those in the top decile in 2009. Nevertheless, allowing for re-ranking, the poorest 10% of the population in 2013 found themselves much poorer than the poorest 10% in 2009. True, the richest 10% of population in these

countries were also less rich in 2013 than the richest 10% were in 2009. However, the decline of the poorest decile was greater than it was for the richest decile.

The pattern was slightly different in Portugal (where income changes allowing for re-ranking were similar for the top and bottom deciles), and more radically so in Romania and especially Latvia, where the poorest deciles actually gained in real terms in 2009-13. Even there, the relative gain was greater when deciles were fixed in 2009 than when they were recalculated each year.

Clearly, the above finding reflects changes in the composition of the population in poverty. Those already in poverty before the crisis (e.g. pensioners in southern Europe) were not fully protected, but generally lost less than the average citizen (at least in monetary terms). On the other hand, those falling below the poverty line during the crisis (e.g. unemployed youth) did so because they lost a far greater proportion of their income.

4.5. DISENTANGLING THE FIRST-ORDER EFFECTS OF TAX-BENEFIT POLICIES

Have adverse distributional changes taken place *because* of the austerity policies introduced by governments? Or, as sometimes is argued, *in spite* of these policies? In other words, have fiscal consolidation packages been designed to minimise the impact of the recession on the weakest groups in society? Again, the political importance of this question is obvious. Can it be answered?

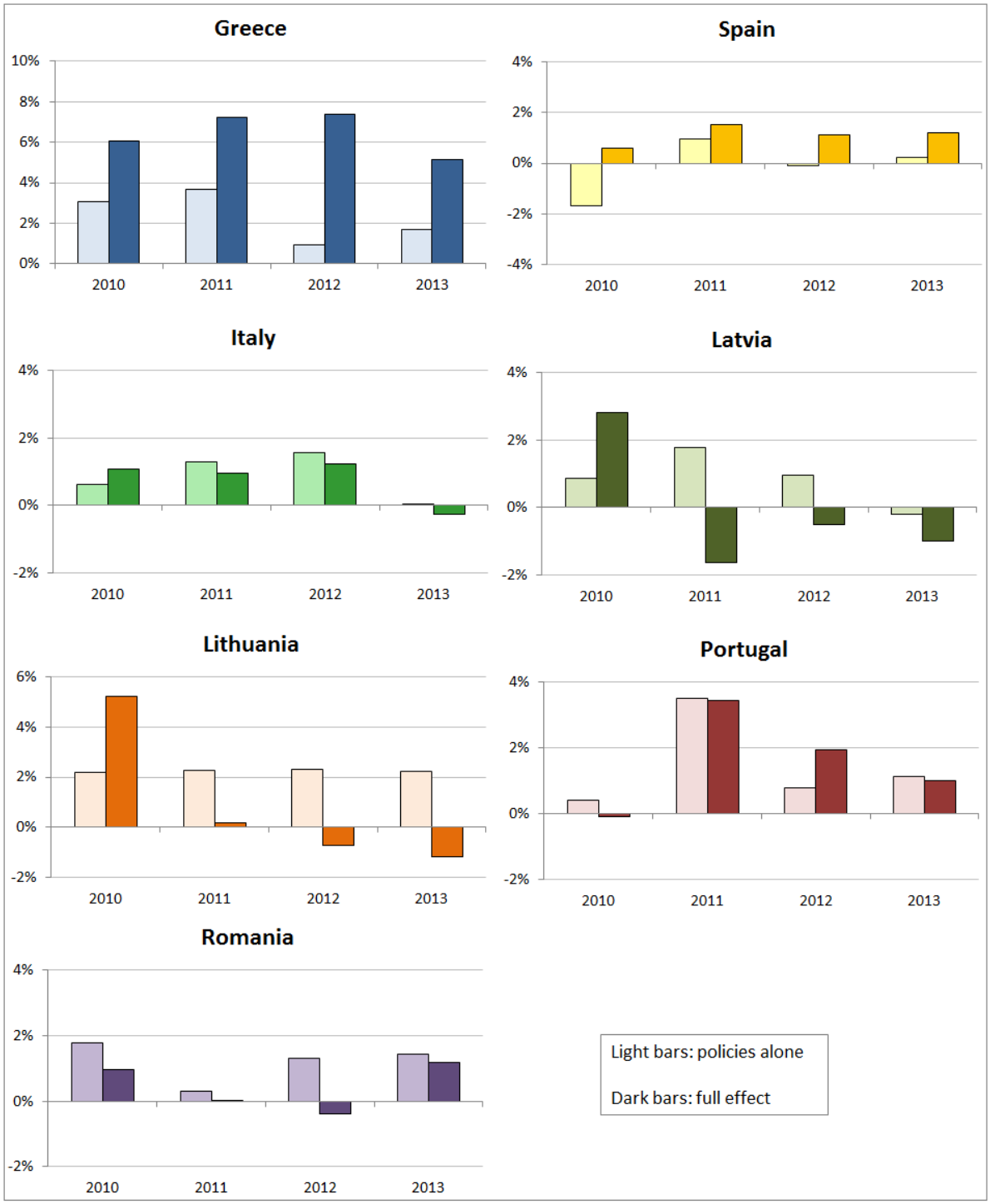
As a matter of fact, it can – provided we keep in mind that, as discussed previously, we only estimate first-order effects. In Figures 9 and 10 we attempt to estimate the yearly changes in poverty and inequality caused by policies alone (including those of the austerity, where applicable) vs. full effects (including those of the wider recession, again where applicable). A rather detailed account of policy changes in the seven countries in 2010-13 can be found in Appendix Tables A5i-A5vii. Poverty is defined as 'anchored' (i.e. by reference to a relative poverty line fixed to its 2009 level in real terms).

As seen in Figure 9, results varied significantly between countries. Our estimates suggest that in Greece about half of the total increase in anchored poverty in 2010 and 2011 can be attributed to the first-order effect of austerity policies; in 2012 and 2013 austerity policies explain a much smaller proportion of the total poverty increase (13% and 33% respectively). In Spain, policies alone had an important poverty-reducing effect in 2010. On the contrary, in 2011 they explained almost 65% of the total increase in anchored poverty. In 2012-13 the implemented policy changes seem to not have contributed to the overall rise in poverty.

In Italy (all years except 2010) and Portugal (all years except 2012) the first-order effect of tax-benefit policies was to raise anchored poverty more than the combination of policies with the changes in the wider economy did, with the latter effect being often negative (i.e. poverty-reducing). That was even more the case in the two Baltic republics (especially from 2011 onwards) and Romania (throughout the period).

Inequality effects, presented in Figure 10, were subtly different. In Greece and Spain the first-order effect of the policies pursued seem to have mostly compressed the income distribution, while the combined effect of policies with broader economic developments appears to have made it consistently more unequal, with that pattern being stronger in Spain than in Greece. The picture was similar in Italy, Portugal and Romania, where changes in inequality were generally not as great, with the inequality-reducing (first-order) effect of policies being occasionally rather strong (as in Portugal in 2012 or Romania in 2011). On the other hand, policy changes in the Baltic countries seem to have contributed to higher inequality in Lithuania in 2010 (i.e. just after the peak of the recession), while the first-order effect in Latvia was inequality-reducing. As the economy recovered, policy reversals in both Baltic countries seem to have driven increases in inequality.

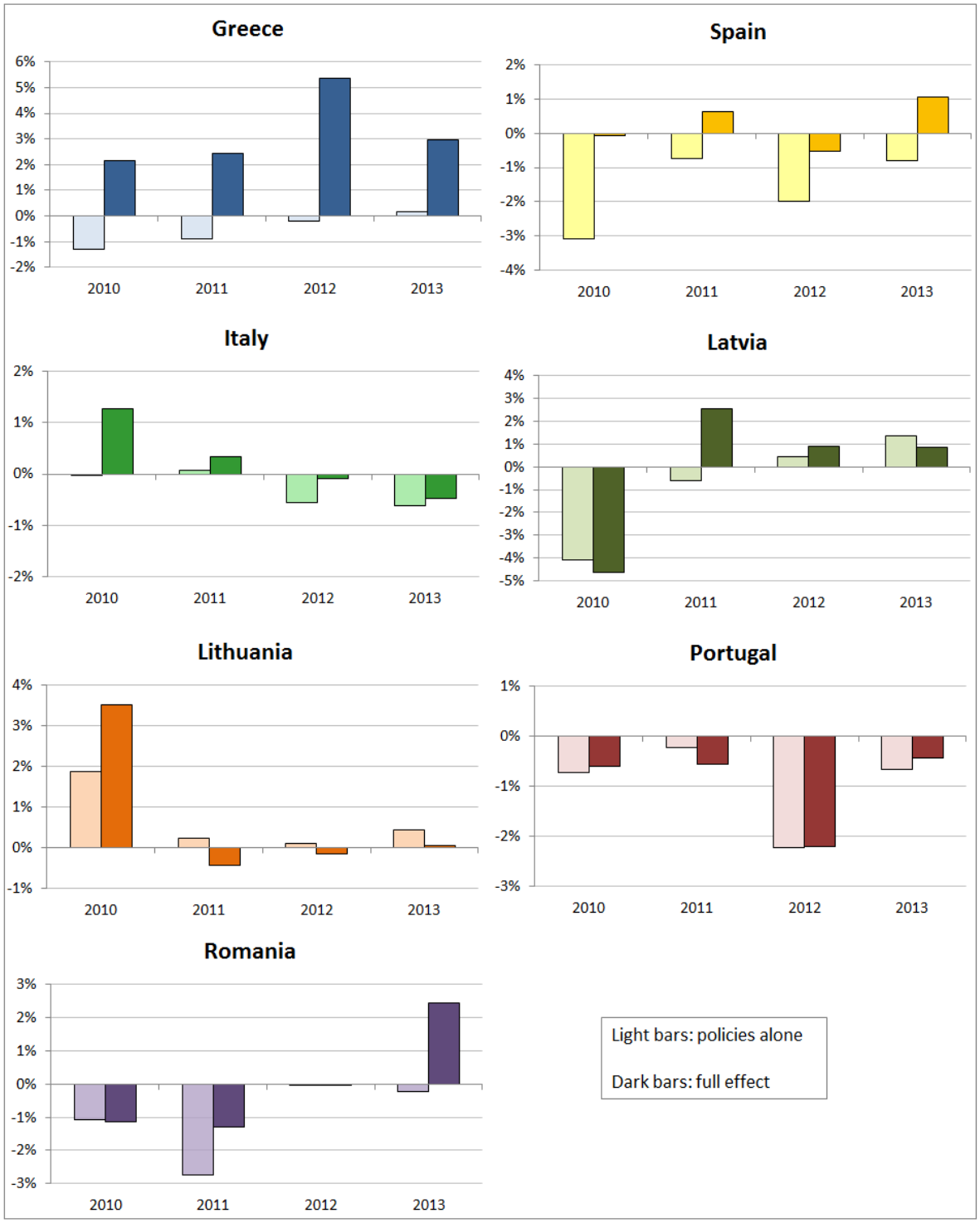
FIGURE 9. CHANGES IN ANCHORED POVERTY RATES: TAX AND BENEFIT POLICIES ALONE VS. FULL EFFECT



Note: Year-on-year changes in anchored poverty rates in percentage points. 'Policies alone' shows the first-order effect of changes in tax and benefit policies in year t on the income distribution in year t-1 (i.e. before their interaction with wider changes in the economy). 'Full effect' shows changes in income distribution in year t relative to year t-1. Anchored poverty rate defined as proportion of population below a fixed poverty threshold, set at 60% of the 2009 median equivalised disposable income, adjusted for inflation. Standard error estimates, based on the Taylor linearization using the DASP module for Stata, are available upon request.

Source EUROMOD version G1.0.

FIGURE 10. CHANGES IN THE GINI INDEX: TAX AND BENEFIT POLICIES ALONE VS. FULL EFFECT



Note: Year-on-year changes in the Gini index (%). 'Policies alone' shows the first-order effect of changes in tax and benefit policies in year t on the income distribution in year t-1 (i.e. before their interaction with wider changes in the economy). 'Full effect' shows changes in income distribution in year t relative to year t-1. Standard error estimates, based on the Taylor linearization using the DASP module for Stata, are available upon request.

Source: EUROMOD version G1.0.

4.6. IDENTIFYING THE EFFECT OF INDIVIDUAL POLICIES ON INEQUALITY

That some austerity policies *per se* (as distinct from the wider recession) may have actually reduced inequality seems at odds with established views about what is going on in the countries most affected by the crisis. In fact, our finding seems to be the combined effect of two opposing tendencies: some policies distributed the burden of austerity fairly and/or affected groups located towards the top of the income distribution, while other policies cut incomes across-the-board and/or affected low-income households more.

In order to reduce complexity, we group tax-benefit policies under four headings: public sector pay; taxes and social insurance contributions (SIC); pensions and related policies; and other social benefits. We then formally assess the first-order impact of each policy bundle on inequality by calculating the percentage change between the value of the Gini index if the policy bundle in question had remained as in year t-1 relative to its actual value after the implementation of the policy in year t. Positive (negative) values indicate that *ceteris paribus* the policy in question rendered the income distribution less (more) equal. We use the terms 'progressive' (or 'regressive') interchangeably with 'inequality-reducing' (or, respectively, 'inequality-enhancing'). The results are shown in Table 3.

It can be seen clearly that the impact of many policy changes, though no doubt significant for the groups affected, was actually quite negligible in terms of the distribution of incomes as a whole. The partial exceptions were as follows.

Cuts in public sector pay seem to have been progressive, especially in Greece (in particular in 2010 and 2013). This was also the case in Portugal (in 2011-12) and the Baltic republics (in 2010). The reversal of pay cuts in Portugal (2013) and Latvia and Lithuania (since 2011) seem to have had a regressive effect. This effect mostly stems from the fact that, as a combination of steady employment and assortative mating, civil servants tend to be located in the upper end of the income distribution. In 2009, 77% of civil servants in Portugal and 66% in Greece and were located in the top three income deciles, while in Latvia and Lithuania the corresponding figures were 48% and 53% respectively.

The first-order effect of changes in direct taxes and social insurance contributions (SIC) seemed mostly to have rendered the income distribution less unequal. This was especially so in Portugal in 2011 and even more so in 2013 and Romania in 2011 (due to the abolishment of SIC for self-employed workers with annual earnings below 4 average gross wages), but also in Greece (2010), Spain (2010 and 2012), Italy (2011) and Latvia (2010). On the contrary, the 2013 tax and SIC changes in Greece appeared to have had the opposite effect.

Pension cuts and related policies (such as special levies on pensions) seem to have had a progressive first-order distributional impact in Portugal, and also to a lesser extent in Greece (in 2010 and 2012). This effect mostly resulted from the actual design of these policies, which partly or fully protected those on low incomes. On the other hand, the across-the-board abolition of the flat-rate holiday allowance that took place in Greece in 2013 appears to have had significantly regressive effects.

Good examples of changes in social benefits having a progressive distributional effect were the improvements in minimum income and unemployment benefits in Latvia (2010), the introduction of a comprehensive child benefit scheme in Greece (2013), and the increase in the minimum income guaranteed in Romania (2010). By contrast, reductions in the generosity of minimum income in Portugal (in 2011 and 2013) obviously had a regressive impact. The same held for reductions in unemployment insurance benefit and changes in eligibility conditions and means-testing of child allowance in Lithuania (2010) and reductions in unemployment benefit and changes in family

allowances and heating benefit in Romania (2011). A detailed description of these policy changes can be found in the Appendix (Tables A5i-A5vii).

TABLE 3. INEQUALITY EFFECTS OF POLICY CHANGES

	change in the value of the Gini index (%)			
	2010	2011	2012	2013
Greece				
public sector pay	-0.57	-0.10	-0.31	-0.52
taxes / SIC	-0.84	-0.13	0.07	0.98
pensions and related policies	-0.30	-0.06	-0.41	0.90
other social benefits	0.35	-0.16	0.25	-1.47
Spain				
public sector pay	-0.12	-0.12	-0.23	:
taxes / SICs	-0.47	0.04	-1.11	-0.02
pensions and related policies	-0.06	-0.04	-0.04	-0.02
other social benefits	-0.30	-0.01	-0.23	0.07
Italy				
public sector pay	0.06	0.00	0.02	0.01
taxes / SICs	0.01	-0.52	-0.42	0.00
pensions and related policies	0.00	0.00	-0.01	0.00
other social benefits	-0.04	-0.06	-0.06	-0.20
Portugal				
public sector pay	:	-0.53	-1.04	0.96
taxes / SICs	-0.39	-1.93	-0.60	-3.67
pensions and related policies	-0.16	-0.01	-1.15	0.69
other social benefits	-0.18	1.97	-0.13	1.15
Latvia				
public sector pay	-0.95	0.43	0.39	0.15
taxes / SICs	-0.98	-0.32	0.01	0.42
pensions and related policies	:	:	:	:
other social benefits	-2.58	-0.56	0.14	0.86
Lithuania				
public sector pay	-0.50	0.24	0.19	0.36
taxes / SICs	0.19	0.01	0.00	0.00
pensions and related policies	:	:	0.00	-0.05
other social benefits	2.57	-0.04	0.35	-0.02
Romania				
public sector pay	n/a	n/a	n/a	n/a
taxes / SICs	0.04	-3.25	0.14	0.01
pensions and related policies	-0.11	-0.12	-0.11	-0.13
other social benefits	-1.25	0.82	-0.02	-0.01

Note: The table shows the percentage change between the counterfactual value of the Gini index if the policy in question had remained as in year t-1 relative to its actual value after the implementation of each policy in year t. Positive (negative) values indicate that the policy rendered the income distribution less (more) equal, not taking into account second-order effects of the policy in question. ':' indicates no policy changes between the two years.

Source: EUROMOD version G1.0.

5. CONCLUSIONS

We set out to the estimate distributional impact of the Great Recession in seven European countries. Our results can be summarized as follows.

To start with, Greece clearly stands out from the other six countries considered here. As a result of the current crisis, poverty and inequality there have risen to alarming levels. In some of the other

countries, for instance in Portugal and Spain, where median incomes declined considerably, anchored poverty (by reference to a poverty line fixed to its 2009 level in real terms) also went up, though by much less than in Greece. Our findings with respect to relative poverty and inequality were less straightforward, with improvements alternating with deteriorations and little overall change (again, except in Greece).

Looking at poverty by age group, the elderly seem to have improved their relative position in terms of income in Greece, Spain and Portugal (and to a lesser extent also in Italy and Romania). This is because older persons on low incomes, though not fully protected, suffered lower income losses (e.g. cuts in pensions) than other groups (e.g. the unemployed). Note, however, that funding cuts and other changes in health care (not considered here) may have raised the costs of services and others barriers to access for those depending on them, among which of course the elderly feature prominently.

On the whole, the Great Recession seems to have changed the composition of the population in poverty. Those at the bottom of the income distribution are younger than before the crisis, and more likely to be unemployed (or on low pay) than pensioners. As a result of that, income changes are less pronounced when deciles are fixed as in the base year (in this case, 2009) than when they are recalculated each year. Indeed, allowing for re-ranking makes it more evident that those in the bottom of the income distribution today are considerably poorer than those occupying the same position before the outbreak of the current crisis.

We have also attempted to clarify the various interactions between austerity, recession and inequality (or more generally, between tax-benefit policies, growth and income distribution). Specifically, tax-benefit policies act both directly (through their effect on the distribution of incomes as observed before the policies are actually implemented) and indirectly (through their effects on aggregate demand, and hence on firms and workers, i.e. on jobs and wages). As a result of these interactions, the full effects of tax-benefit policies cannot be reduced to the first-order effects estimated here.

Having said that, isolating the effects on poverty and inequality of tax and benefit policies *per se* from the total impact of the crisis is of some interest, as it may help identify policies that minimise adverse distributional effects while reducing budget deficits. In fact, some of the policies considered here seem to have had a more progressive first-order effect than others. This may be because special care was taken to make a particular policy 'fair' by design, as in the case of changes in income tax, cuts in pension benefits that partly or fully exempted those on low incomes, and improvements in means-tested social benefits. Alternatively, the progressive effect may stem from the fact that those adversely affected tended to be located towards the top of the income distribution, as in the case of public sector pay cuts in Greece and Portugal, which is consistent with findings from Ireland (Callan et al. 2011, Nolan et al. 2013).

While the impact of policies on inequality can be described as moderate (or even equality-enhancing), this is far from saying that fiscal adjustment programmes have been a success in overall distributional terms. Our estimates suggest that in most of the countries examined here poverty increased, and the policies implemented accounted for a major part of that increase. In some cases the first-order effect of policies raised anchored poverty more than the combined effect of policies and changes in the wider economy did, with the effect of the latter being often poverty-reducing.

Individual tax-benefit policies here were put together under four headings (public sector pay, taxes and social insurance contributions, pensions and related policies, and other social benefits). Although this was necessary in order to render the analysis more manageable, reducing complexity comes at a price. Progressive and regressive policies bundled together under the same heading will offset each other, obfuscating rather than illuminating policy options and their distributional effects. Moreover,

greater care is warranted when analysing the distributional impact of government policies vis-à-vis developments in the wider economy. In particular, changes in minimum wage legislation (as the 2012 cut in Greece) are bundled here together with changes in private sector earnings attributed to these wider developments, even though they are typically the result of government policy.

Beyond these caveats, a certain amount of caution is called for when interpreting our results. The main issues, to do either with our approach or with our assumptions, are briefly discussed below.

Accounting for tax evasion and non take up of social benefits is limited to some of the countries considered here. Clearly, a more uniform treatment of these issues in all countries examined would enhance the comparability and credibility of our findings. The same holds for the treatment of indirect taxation, ignored here. Taking into account changes in VAT and/or excise duties is not impossible, and has been done before (Decoster at al. 2010, Avram et al. 2013, Leventi & Matsaganis 2013). On the whole, increases in VAT tend to have a regressive effect, when assessed on the distribution of income. The main constraint is that EU-SILC is not an expenditure survey and contains no information on consumption patterns. Clearly, given the relative weight of indirect taxes in many tax systems, estimating their distributional impact directly (for instance, on Household Budget Survey data) would greatly enhance the accuracy of our results.

On another note, while austerity policies may adversely affect what was once called the 'social wage', benefits in-kind (such as publicly-funded health care, social care, child care, and education) are ignored here. This issue has been addressed in the context of EUROMOD (Paulus et al. 2010, Verbist & Matsaganis 2014). However, we still know too little about the actual effect of funding cuts on the quality and quantity of social services. Collecting the relevant information, and relating inputs to outputs, would require a substantial amount of further research – but the gains of that could be substantial.

Finally, whereas changes in the labour market were carefully taken into account, no similar adjustments were made to account for demographic changes. Arguably, the latter are less critical within the four-year time frame studied here, as major shifts are unlikely to happen in such short period. However, where the recent crisis has led to increases in migration flows (such as Latvia and Lithuania), the results will have to be interpreted with extra caution.

While we are fully aware that these weaknesses affect the accuracy of our results, we are confident that our research offers a good approximation of the first-order distributional impact of austerity policies and the wider recession in the seven countries considered here. Given the topicality of the questions addressed, and the public interest in the answers, we believe that work based on microsimulation is a good alternative to waiting until future waves of official statistics are released. Furthermore, if the research question involves identifying the effect of different changes taking place at the same time, distinguishing between progressive and regressive items within the same policy package (as is the case here), there is no alternative to microsimulation.

In the paper we have attempted to link the literature on the effects of fiscal consolidation on growth, including the analysis of fiscal multipliers, with that on its effects on inequality and poverty. We have noted that the static effects of fiscal consolidation policies may be at odds with their dynamic effects. Clearly, however, we still now too little to quantify the size and direction of the dynamic (second-order) effects of austerity on inequality via growth. More research into that interaction would enable us to identify policies that promote both growth and equality, even as the room for fiscal policy remains limited.

REFERENCES

Agnello L. & Souza R. (2012), 'Fiscal adjustments and income inequality: a first assessment', *Applied Economics Letters* 19 (16) 1627-1632.

Ahren R., Arnold J. & Moeser C. (2011), *The sharing of macroeconomic risk: who loses (and gains) from macroeconomic shocks?* OECD Economics Department Working Paper 877. Paris: Organisation for Economic Cooperation and Development.

Ajwad M. I. (2013), *Poverty prospects in Europe: assessing progress towards the Europe 2020 poverty and social exclusion targets in new European Union member states*. Washington DC: World Bank.

Alcidi C. & Gros D. (2012), *Why is the Greek economy collapsing? A simple tale of high multipliers and low exports*. CEPS Commentary (21 December 2012). Brussels: Centre for European Policy Studies.

Alesina A. & Ardagna S. (2012), *The design of fiscal adjustments*. NBER Working Paper 18423.

Alesina A., Favero C. & Giavazzi F. (2012) *The output effects of fiscal consolidations*. NBER Working Paper 18336.

Atkinson A. B. (2009), 'Stress-testing the welfare state'. In B. Ofstad, O. Bjerkholt, K. Skrede and A. Hylland (eds) *Rettferd og politikk: festskrift til Hilde Bojer på 70- årsdagen (Justice and Politics: Festschrift for Hilde Bojer on her 70th birthday)*. Oslo: Emiliar Forlag.

Auerbach A. & Gorodnichenko Y. (2012), 'Measuring the output responses to fiscal policy', *American Economic Journal – Economic Policy* 4 1–27.

Avram S., Figari F., Leventi C., Levy H., Navicke E., Matsaganis M., Militaru E., Paulus A., Rastringina O. & Sutherland H. (2013), *The distributional effects of austerity measures: a comparison of nine EU countries*. EUROMOD Working Paper EM2/13. Colchester: ISER, University of Essex.

Ball L., Furceri D., Leigh D. & Loungani P. (2013), *The distributional effects of fiscal austerity*. IMF Working Paper 13/151. Washington: International Monetary Fund.

Ball L., Leigh D. & Loungani P. (2011), 'Painful medicine', *Finance and Development* 20-23 (September).

Bargain O. & Callan T. (2010), 'Analysing the effects of tax-benefit reforms on income distribution: a decomposition approach', *Journal of Economic Inequality* 8 (1) 1-21.

Bargain O., Callan T., Doorley K. & Keane C. (2013), *Changes in income distributions and the role of tax-benefit policy during the great recession: An international perspective*. IZA Discussion Paper 7737.

Barro R.J. (1990), 'Government spending in a simple model of endogenous growth', *Journal of Political Economy* 98 (5) 103-126.

Bastagli F., Coady D. & Gupta S. (2012), *Income inequality and fiscal policy*. IMF Staff Discussion Note SDN/12/08. Washington: International Monetary Fund.

Blanchard O. & Leigh D. (2013), *Growth forecast errors and fiscal multipliers*. IMF Working Paper 13/1. Washington: International Monetary Fund.

Bontout O. & Lokajickova T. (2013), *Social protection budgets in the crisis in the EU*. European Commission DG EMPL Working Paper 1/2013. Luxembourg: Publications Office of the European Union.

Brandolini A., D'Amuri F. & Faiella I. (2013), 'Country case study – Italy'. In: S.P. Jenkins, A. Brandolini, J. Micklewright & B. Nolan (eds), *The Great Recession and the distribution of household income*. Oxford: Oxford University Press.

Brewer M., Browne J. & Joyce R. (2011), *Child and working-age poverty from 2010 to 2020*. IFS Commentary C121. London: Institute for Fiscal Studies.

Brewer M., Browne J., Hood A., Joyce R. & Sibieta L. (2013), 'The short- and medium-term impacts of the recession on the UK income distribution', Fisc*al Studies* 34 (2), 179-201.

Browne J. & Levell P. (2010), *The distributional effect of tax and benefit reforms to be introduced between June 2010 and April 2014: a revised assessment*. IFS Briefing Note 108. London: Institute for Fiscal Studies.

Callan T., Nolan B. & Walsh J. (2011), 'The economic crisis, public sector pay, and the income distribution'. In H. Immervoll, A. Peichl, & K. Tatsiramos (eds), *Who loses in the downturn? Economic crisis, employment and income distribution*. *Research in Labour Economics* (32), 207–225.

Castles F.G. (2010), 'Black swans and elephants on the move: the impact of emergencies on the welfare state', *Journal of European Social Policy* 20 (2), 91-101.

Corsetti G., Meier A. & Müller G. (2012), 'What determines government spending multipliers?', *Economic Policy* 27 (72), 521-556.

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 and Management* 29 326-350.

Duclos J.-Y. & Araar A. (2006), *Poverty and equity: measurement, policy, and estimation with DAD*. Boston/Dordrecht/London: Kluwer Academic Publishers.

EC (2012), *European Economic Forecast, Autumn 2012. European Economy 8/2012*. European Commission. Luxembourg: Publications Office of the European Union.

EC (2013), *EU Employment and Social Situation Quarterly Review (March 2013)*. European Commission. Luxembourg: Publications Office of the European Union.

ECB (2012), *Monthly Bulletin December 2012*. Frankfurt am Main: European Central Bank.

Eurostat (2014), *Online statistics database* (last accessed: March 2014), Luxemburg: Eurostat.

Eyraud L. & Weber A. (2013), *The challenge of debt reduction during fiscal consolidation*. IMF Working Paper 13/67. Washington: International Monetary Fund.

Favero C., Giavazzi F. & Perego J. (2011), 'Country heterogeneity and the international evidence on the effects of fiscal policy', *IMF Economic Review* 59 (4), 652-682.

Fiorio C.V. & D'Amuri F. (2005), 'Workers' tax evasion in Italy', *Giornale degli Economisti / Annali d'Economia* 118 (64), 247-270.

Goedemé T. (2010), *The standard error of estimates based on EU-SILC. An exploration through the Europe 2020 poverty indicators*. Working Paper 10 / 09. Antwerp: Herman Deleeck Centre for Social Policy, University of Antwerp.

Goedemé T., Van den Bosch K., Salanauskaite L. & Verbist G. (2013), 'Testing the statistical significance of microsimulation results: a plea', *International Journal of Microsimulation* 6 (3), 50-77.

Goujard A. (2013), *Cross-country spillovers from fiscal consolidation*. OECD Economics Department Working Paper 1099. Paris: Organisation for Economic Cooperation and Development.

IMF (2012), *World Economic Outlook: coping with high debt and sluggish growth*. Washington: International Monetary Fund.

IMF (2014), *Fiscal policy and income inequality*. IMF Policy Paper (23 January 2014). Washington: International Monetary Fund.

Immervoll H., Levy H., Lietz C., Mantovani D. & Sutherland H. (2006), *The sensitivity of poverty rates to macro-level changes in the European Union*. Cambridge Journal of Economics 30 181-199.

Jenkins S.P. (1997), 'Trends in real income in Britain: a microeconomic analysis', *Empirical Economics* 22(4), 483-500.

Jenkins S.P., Brandolini A., Micklewright J. & Nolan B. (2013*), The Great Recession and the distribution of household income*. Oxford: Oxford University Press.

Jordà Ò. & Taylor A.M. (2013), *The time for austerity: estimating the average treatment effect of fiscal policy*. Paper presented at the NBER Summer Institute.

Joyce R. & Sibieta L. (2013), 'Country case study – UK'. In: S.P. Jenkins, A. Brandolini, J. Micklewright & B. Nolan (eds), *The Great Recession and the distribution of household income*. Oxford: Oxford University Press.

Kaplanoglou G., Rapanos V.T. & Bardakas I.C. (2013), *Does fairness matter for the success of fiscal consolidation?* Economics Discussion Report 2013/6. Department of Economics, University of Athens.

Koutsampelas C. & Policarpou A. (2013), *Austerity and the income distribution: the case of Cyprus*. EUROMOD Working Paper EM4/13. Colchester: ISER, University of Essex.

Leventi C. & Matsaganis M. (2013), *Distributional implications of the crisis in Greece in 2009-2012*. EUROMOD Working Paper EM14/13. Colchester: ISER, University of Essex.

Leventi C., Matsaganis M. & Flevotomou M. (2013), *Distributional implications of tax evasion and the crisis in Greece*. EUROMOD Working Paper EM17/13. Colchester: ISER, University of Essex.

Leventi C., Navicke J., Rastrigina O., Sutherland H., Ozdemir E. & Ward T. (2013), *Nowcasting: estimating developments in the risk of poverty and income distribution in 2012 and 2013*. Research Note 1/2013. Social Situation Monitor: European Commission.

Navicke J., Rastrigina O. & Sutherland H. (2014), *Nowcasting indicators of poverty risk in the European Union: a microsimulation approach*. Social Indicators Research (forthcoming). DOI: 10.1007/s11205-013-0491-8.

Nolan B. (2009), *Background note for roundtable discussion on monitoring the effects of the financial crisis on vulnerable groups*. Paris: Organisation for Economic Co-operation and Development.

Nolan B., Callan T. & Maître B. (2013), 'Country case study – Ireland'. In: S.P. Jenkins, A. Brandolini, J. Micklewright & B. Nolan (eds), *The Great Recession and the distribution of household income*. Oxford: Oxford University Press.

OECD (2013), *How much scope for growth and equity-friendly fiscal consolidation?* OECD Economics Department Policy Notes 20. Paris: Organisation for Economic Cooperation and Development.

OECD (2014a), *OECD forecasts during and after the financial crisis: a post mortem*. OECD Economics Department Policy Notes 23. Paris: Organisation for Economic Cooperation and Development.

OECD (2014b), *Society at a glance 2014: the crisis and its aftermath*. Paris: Organisation for Economic Cooperation and Development.

Paulus A., Sutherland H. & Tsakloglou P. (2010), 'The distributional impact of in-kind public benefits in European countries', *Journal of Policy Analysis and Management* 29 243-266.

Rawdanowicz L., Wurzel E. & Christensen A. (2013), *The equity implications of fiscal consolidation*. OECD Economics Department Working Paper 1013. Paris: Organisation for Economic Cooperation and Development.

Reynolds M. & Smolensky E. (1977), *Public expenditure, taxes and the distribution of income: the United States, 1950, 1961, 1970*. New York: Academic Press.

Romer C. D. & Romer D. H. (2010), 'The macroeconomic effects of tax changes: estimates based on a new measure of fiscal shocks', *American Economic Review* 100 (3), 763-801.

Sen A. (1976), 'Real national income', *Review of Economic Studies* 43 (1), 19-39.

Sutherland H. & Figari F. (2013), 'EUROMOD: the European Union tax-benefit microsimulation model', *International Journal of Microsimulation* 6 (1), 4-26.

Verbist G. & Matsaganis M. (2014), 'The redistributive capacity of services in the EU'. In B. Cantillon & F. Vandenbroucke (eds), *Reconciling work and poverty reduction: how successful are European welfare states?* Oxford: Oxford University Press.

Woo J., Bova E., Kinda T. & Zhang Y.S. (2013), *Distributional consequences of fiscal consolidation and the role of fiscal policy: what do the data say?* IMF Working Paper 13/195. Washington: International Monetary Fund.

APPENDIX

TABLE A1. DATA DESCRIPTION

	input dataset	income reference period	number of households	number of individuals
Greece	National SILC 2010	2009	7,005	17,555
Spain	National SILC 2010	2009	13,597	36,922
Italy	National SILC 2010	2009	19,147	47,420
Portugal	EU-SILC version 2010-2	2009	5,182	13,334
Latvia	EU-SILC version 2010-3	2009	6,255	15,267
Lithuania	EU-SILC version 2010-2 plus additional national variables	2009	5,314	13,216
Romania	EU-SILC version 2010-2	2009	7,718	18,339

Source: Eurostat (EU-SILC, EU Statistics on Incomes and Living Conditions); ISTAT (IT-SILC, Italian version of EU-SILC); Lithuanian Department of Statistics (PGS, Lithuanian version of EU-SILC); ElStat (Greek SILC Production Database).

TABLE A2. EFFECT OF LABOUR MARKET ADJUSTMENT ON EMPLOYMENT RATES (2009-2013)

	year	LFS	employment rate (15-64), % EUROMOD		EUROMOD/LFS ratio of employment rates	
			adjusted	unadjusted	adjusted	unadjusted
EL	2009	61.2	59.5	59.5	0.97	0.97
	2010	59.6	57.9	59.5	0.97	1.00
	2011	55.6	54.1	59.5	0.97	1.07
	2012	51.3	49.8	59.5	0.97	1.16
	2013	50.0	47.9	59.5	0.96	1.19
ES	2009	59.8	57.7	57.7	0.97	0.97
	2010	58.6	56.3	57.7	0.96	0.99
	2011	57.7	55.2	57.7	0.96	1.00
	2012	55.4	52.9	57.7	0.96	1.04
	2013	54.6	51.3	57.7	0.94	1.06
IT	2009	57.5	57.0	57.0	0.99	0.99
	2010	56.9	56.3	57.0	0.99	1.00
	2011	56.9	56.3	57.0	0.99	1.00
	2012	56.8	55.8	57.0	0.98	1.00
	2013	56.2	55.5	57.0	0.99	1.02
PT	2009	66.3	60.2	60.2	0.91	0.91
	2010	65.6	59.4	60.2	0.91	0.92
	2011	64.2	57.9	60.2	0.90	0.94
	2012	61.8	55.6	60.2	0.90	0.97
	2013	60.8	54.0	60.2	0.89	0.99
LV	2009	60.9	57.0	57.0	0.94	0.94
	2010	59.3	55.1	57.0	0.93	0.96
	2011	60.8	56.0	57.0	0.92	0.94
	2012	63.0	57.2	57.0	0.91	0.90
	2013	64.3	57.6	57.0	0.90	0.89
LT	2009	60.1	61.0	61.0	1.01	1.01
	2010	57.8	58.3	61.0	1.01	1.06
	2011	60.3	59.9	61.0	0.99	1.01
	2012	62.2	61.2	61.0	0.98	0.98
	2013	63.0	61.9	61.0	0.98	0.97
RO	2009	58.6	57.9	57.9	0.99	0.99
	2010	58.8	58.0	57.9	0.99	0.99
	2011	58.5	57.2	57.9	0.98	0.99
	2012	59.5	57.8	57.9	0.97	0.97
	2013	59.4	56.9	57.9	0.96	0.98

Note: LFS employment rates for 2013 are averages of 2012Q3-2013Q2.

Source: Employment rates by sex, age and highest level of education attained (%) [lfsa_ergaed, lfsq_ergaed]. Labour Force Survey, Eurostat; EUROMOD version G1.0.

TABLE A3I. RELATIVE POVERTY LINES (2009-2013)

	2009	2010	2011	2012	2013
Greece	614.3	572.2	525.6	469.1	428.3
Spain	670.0	659.4	662.7	650.8	649.1
Italy	753.7	749.5	757.7	760.0	773.4
Portugal	453.6	456.0	446.9	431.1	424.5
Latvia	156.3	140.8	153.4	161.5	166.8
Lithuania	691.0	634.0	659.9	698.1	723.3
Romania	432.4	444.3	457.2	476.6	493.3

Note: Poverty lines are set at 60% of median equivalised disposable income, using the OECD modified equivalence scale. All amounts are monthly, in national currencies.
Source: Eurostat; EUROMOD version G1.0.

TABLE A3II. ANCHORED POVERTY LINES (2009-2013)

	2009	2010	2011	2012	2013
Greece	614.3	643.2	663.4	670.2	664.7
Spain	670.0	683.4	704.8	721.6	732.3
Italy	753.7	765.1	786.9	812.5	825.3
Portugal	453.6	459.9	476.3	489.4	493.1
Latvia	156.3	154.4	160.8	164.6	166.9
Lithuania	691.0	699.3	728.3	751.1	767.0
Romania	432.4	458.8	485.2	501.6	523.2

Note: Poverty lines are set at 60% of 2009 median equivalised disposable income, using the OECD modified equivalence scale, adjusted for inflation. Adjustment based on the harmonised index of consumer prices (accessed on 19 December 2013); values for 2013 based on the European Commission Spring 2013 forecast. All amounts are monthly, in national currencies.
Source: Eurostat; EUROMOD version G1.0.

TABLE A4I. TRANSITION MATRIX, 2009 VS. 2013: GREECE

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**4.6**	4.8	0.5	0.1	0.0	0.1	0.0	0.0	0.0	0.0
2	1.5	**2.0**	4.8	1.3	0.1	0.3	0.0	0.0	0.0	0.0
3	1.0	0.8	**1.6**	4.3	1.7	0.4	0.1	0.0	0.0	0.0
4	1.0	1.1	0.7	**1.5**	3.6	1.9	0.2	0.1	0.0	0.0
5	0.7	0.7	1.0	0.9	**1.7**	3.4	1.2	0.3	0.0	0.0
6	0.4	0.2	0.9	0.7	1.2	**2.4**	3.4	0.8	0.0	0.0
7	0.4	0.3	0.3	0.5	0.9	1.0	**3.1**	3.0	0.4	0.0
8	0.2	0.0	0.1	0.6	0.3	0.4	1.1	**4.0**	3.4	0.0
9	0.2	0.0	0.1	0.1	0.3	0.3	0.5	1.6	**5.4**	1.4
10	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.9	**8.5**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 4.8% of Greek population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 1.5% moved down from decile 2 to decile 1, while 4.6% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4II. TRANSITION MATRIX, 2009 VS. 2013: SPAIN

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**8.3**	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.1	**6.4**	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3	0.4	0.8	**5.9**	2.8	0.1	0.0	0.0	0.0	0.0	0.0
4	0.2	0.5	0.9	**5.4**	3.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.2	0.4	0.9	**5.4**	2.9	0.0	0.0	0.0	0.0
6	0.1	0.2	0.2	0.4	0.8	**5.6**	2.8	0.0	0.0	0.0
7	0.0	0.0	0.1	0.2	0.5	0.9	**5.7**	2.5	0.0	0.0
8	0.0	0.0	0.0	0.1	0.2	0.3	1.1	**6.5**	1.7	0.0
9	0.0	0.0	0.0	0.1	0.0	0.2	0.3	1.0	**7.8**	0.7
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	**9.3**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 1.7% of Spanish population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 1.1% moved down from decile 2 to decile 1, while 8.3% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4III. TRANSITION MATRIX, 2009 VS. 2013: ITALY

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**8.9**	0.8	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
2	0.5	**8.2**	1.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
3	0.3	0.5	**7.9**	1.3	0.0	0.0	0.1	0.0	0.0	0.0
4	0.1	0.2	0.6	**7.8**	1.3	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.2	0.6	**7.6**	1.4	0.1	0.0	0.1	0.0
6	0.0	0.1	0.2	0.1	0.6	**7.6**	1.2	0.0	0.1	0.0
7	0.0	0.0	0.1	0.1	0.2	0.7	**7.8**	1.0	0.1	0.0
8	0.0	0.0	0.0	0.1	0.2	0.1	0.7	**8.2**	0.7	0.1
9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.7	**8.5**	0.6
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	**9.3**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 0.8% of Italian population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 0.5% moved down from decile 2 to decile 1, while 8.9% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4IV. TRANSITION MATRIX, 2009 VS. 2013: PORTUGAL

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**8.3**	1.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.1	**6.2**	2.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
3	0.2	0.6	**5.7**	3.3	0.2	0.0	0.0	0.0	0.0	0.0
4	0.1	0.6	0.7	**4.9**	3.7	0.0	0.0	0.0	0.0	0.0
5	0.1	0.3	0.4	0.5	**5.2**	3.6	0.0	0.0	0.0	0.0
6	0.1	0.2	0.3	0.4	0.5	**5.4**	3.1	0.0	0.0	0.0
7	0.1	0.2	0.2	0.4	0.2	0.5	**5.9**	2.5	0.0	0.0
8	0.1	0.1	0.2	0.1	0.1	0.3	0.7	**6.3**	2.2	0.0
9	0.0	0.2	0.1	0.0	0.0	0.2	0.2	0.9	**7.3**	1.0
10	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.5	**8.9**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 1.6% of Portuguese population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 1.1% moved down from decile 2 to decile 1, while 8.3% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4V. TRANSITION MATRIX, 2009 VS. 2013: LATVIA

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**8.3**	1.1	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
2	1.4	**7.2**	0.6	0.0	0.2	0.2	0.2	0.1	0.0	0.0
3	0.1	1.3	**7.4**	0.7	0.1	0.2	0.2	0.0	0.0	0.0
4	0.1	0.4	1.4	**7.0**	0.8	0.1	0.1	0.1	0.0	0.0
5	0.0	0.1	0.1	1.8	**6.8**	1.1	0.1	0.0	0.0	0.0
6	0.0	0.0	0.2	0.1	1.6	**6.7**	1.1	0.2	0.0	0.1
7	0.0	0.0	0.0	0.1	0.3	1.5	**6.4**	1.4	0.1	0.1
8	0.0	0.0	0.0	0.0	0.0	0.1	1.6	**6.7**	1.4	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.4	**7.4**	1.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.9	**8.9**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 1.1% of Latvian population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 1.4% moved down from decile 2 to decile 1, while 8.3% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4VI. TRANSITION MATRIX, 2009 VS. 2013: LITHUANIA

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**9.1**	0.5	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0
2	0.6	**7.9**	0.5	0.1	0.3	0.3	0.2	0.0	0.1	0.0
3	0.1	1.4	**7.3**	0.6	0.0	0.1	0.2	0.2	0.0	0.0
4	0.2	0.1	1.5	**7.1**	0.9	0.0	0.1	0.1	0.0	0.0
5	0.0	0.1	0.3	1.9	**6.5**	1.0	0.0	0.1	0.0	0.0
6	0.0	0.0	0.3	0.0	1.5	**6.9**	1.0	0.3	0.0	0.0
7	0.0	0.0	0.1	0.0	0.5	1.4	**6.8**	0.9	0.2	0.0
8	0.0	0.0	0.0	0.0	0.2	0.2	1.5	**7.0**	1.2	0.1
9	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.3	**7.9**	0.4
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	**9.5**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 0.5% of Lithuanian population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 0.6% moved down from decile 2 to decile 1, while 9.1% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A4VII. TRANSITION MATRIX, 2009 VS. 2013: ROMANIA

income decile in 2009	income decile in 2013									
	1	2	3	4	5	6	7	8	9	10
1	**8.8**	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.1	**7.6**	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.1	1.0	**7.6**	1.2	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.1	0.8	**7.9**	1.2	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.1	0.6	**7.8**	1.3	0.0	0.0	0.0	0.0
6	0.0	0.1	0.1	0.1	0.9	**7.8**	0.9	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.1	0.7	**8.5**	0.5	0.1	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.5	**9.1**	0.4	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	**9.2**	0.4
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	**9.6**

Notes: Membership of income decile in 2013 relative to 2009, as proportion of total population. Interpretation: 1.2% of Romanian population moved up from (poorest) decile 1 in 2009 to decile 2 in 2013, but 1.1% moved down from decile 2 to decile 1, while 8.8% of population stayed in decile 1 in both years.

Source: EUROMOD version G1.0.

TABLE A5I. POLICY CHANGES (2010-2013): GREECE

	2010	2011	2012	2013
Public sector pay	reduced	reduced	reduced	reduced
Taxes and SICs				
personal income tax (S)	major revision (tax brackets added, top tax rate increased, zero tax bracket increased, tax allowances / credits changed)	major revision (tax brackets reduced, zero tax bracket reduced, tax allowances / credits reduced)	no change	major revision (different tax schedules per income source, abolition of most tax credits / allowances) (*)
tax on interest income (S)	no change	no change	no change	increased
extraordinary contribution (S)	introduced	abolished	n/a	n/a
solidarity contribution (S)	introduced	no change	no change	no change
self-employed and liberal professions SIC (S)	introduced	increased	increased	no change
emergency property tax (S)	n/a	introduced	no change	reduced
employer SIC (S)	no change	increased	no change	increase
employee SIC (S)	no change	increased	no change	increase
self-employed SIC (S)	no change	Increased	no change	increase
Pensions				
main old age pension (NS)	13^{th}-14^{th} pensions abolished	frozen	frozen	no change
supplementary pension (NS)	no change	frozen	frozen	reduced
survivor, invalidity, orphan and minor old age pensions (all NS)	13^{th}-14^{th} pensions abolished	frozen	frozen	frozen
compensation for abolition of 13^{th}-14^{th} pensions (S)	introduced	no change	no change	abolished
pensioners' solidarity contribution (S)	introduced (low pensions protected)	increased (low pensions protected)	increased (low pensions protected)	increased (low pensions protected)
Social benefits				
third child benefit (S)	increased	increased	no change	abolished
large family benefit (S)	increased	increased	no change	became means-tested
lifetime pension for mothers of 4+ children	increased	increased	no change	abolished
unified child benefit (S)	n/a	n/a	n/a	introduced
unemployment insurance benefit (S)	no change	no change	reduced by 22%	no change
unemployment assistance for older workers (S)	no change	no change	eligibility conditions relaxed	no change
minor unemployment benefits (NS)	no change	no change	reduced by 22%	no change
pensioners' social solidarity benefit (S)	reduced	higher income thresholds; benefit rate added	no change	no change
social pension (S)	increased	no change	no change	reduced
housing benefits (S)	suspension of main housing benefit	provision of main housing benefit	abolition of main housing benefit	no change
disability benefits (NS)	increased	increased	no change	no change
sickness benefits (NS)	reduced	reduced	reduced	reduced
maternity benefits (NS)	reduced	reduced	reduced	reduced
birth grant (S)	no change	no change	no change	abolished
lump sum benefit civil servants (NS)	abolished	n/a	n/a	n/a

	2010	2011	2012	2013
lump sum benefit low pensions (S)	n/a	introduced	abolished	n/a
lump sum heating allowance (S)	abolished	n/a	re-introduced with new rules (**)	no change

Notes:

(S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.

(*) For information on the 2013 personal income tax reform see EUROMOD Country Report: Greece.

(**) Not simulated in 2012-2013.

Source: EUROMOD Country Report: Greece. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

TABLE A5II. POLICY CHANGES (2010-2013): SPAIN

	2010	2011	2012	2013
Public sector pay	reduced	reduced	reduced	frozen
Taxes and SICs				
personal income tax (S)	(a) State PIT: €400 annual tax credit became means-tested, tax rates reduced, capital income tax increased (b) Autonomous communities PIT: tax rates increased in all regions, changes in tax credits (*)	(a) State PIT: introduction of two additional tax brackets for high incomes (b) Autonomous communities PIT: introduction of additional tax brackets for high incomes in Cantabria, Catalunya and Extremadura, changes in tax credits (*)	(a) State PIT: tax rates increased, introduction of one additional tax bracket for high incomes, capital income tax increased (b) Autonomous communities PIT: tax rates for high incomes increased in Andalusia, Murcia, Valencia, changes in tax credits (*)	(a) State PIT: no changes (b) Autonomous communities PIT: tax rates for high incomes increased in Asturias, changes in tax credits (*)
property tax (NS)	increased	increased		increased
employer SIC, employee SIC, self-employed SIC (all S)	contribution base increased	contribution base increased	contribution base increased	contribution base increased
Pensions				
contributory old age pension	increased	frozen	Increased	increased
disability pension	increased	increased	Increased	increased
other old age benefits	increased	increased	Increased	increased
contributory widow pension	increased	frozen	Increased	increased
other survivor pension	increased	frozen	Increased	increased
Social benefits				
national child benefit (S)	raised for disabled children over 18 and children aged 3-4	raised for children aged 3-4 and disabled children over 18	raised for disabled children over 18; income thresholds raised	raised for disabled children over 18; income thresholds raised
regional family benefits: universal and means-tested child benefit, universal and means-tested family benefit, universal and means-tested birth/adoption benefit (all S)	multiple birth grant introduced (Aragon, Canarias) birth grant introduced (Extremadura, Navarra) birth grant abolished (Asturias, Madrid) benefit for children <3 abolished (Extremadura)	benefit for children <3 abolished (Catalonia) benefit to fathers on reduced working time reduced (Galicia)	benefit for multiple birth abolished (Canarias, Castilla-La Mancha) large family benefit abolished (Castilla-La Mancha) lump-sum birth grant limited to third child (Navarra)	third child birth grant, multiple birth grant introduced (Andalucía) birth grant amount reduced and means-testing tightened (Extremadura) third child birth grant, universal multiple birth grant, benefit to working mothers with children <3 all abolished (Navarra)
national universal birth/adoption benefit (S)	no change	abolished	n/a	n/a
other child benefits (NS)	increased	increased	increased	Increased
unemployment insurance benefit (S)	no change	no change	no change	replacement rate from day 180 onwards reduced from 60% to 50%
temporary unemployment protection (S)	eligibility criteria changed	no change	no change	no change

	2010	2011	2012	2013
severance payment (NS)	increased	increased	increased	Increased
non-contributory old age pension benefits (S)	benefit rate and age limits changed	benefit rate changed	benefit rate changed	benefit rate changed
supplements to contributory old age and survivor pensions (S)	increased	increased	increased	Increased
social assistance benefits (NS)	increased	increased	increased	Increased
housing benefit (NS)	increased	increased	increased	Increased
sickness Benefit (NS)	increased	increased	increased	Increased
maternity benefit (NS)	increased	increased	increased	Increased
scholarships (NS)	increased	increased	increased	Increased

Notes:

(S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.

(*) For information on changes in tax credits in each autonomous community see EUROMOD Country Report: Spain.

Source: EUROMOD Country Report: Spain. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

TABLE A5III. POLICY CHANGES (2010-2013): ITALY

	2010	2011	2012	2013
Public sector pay	increased	reduced if over €90,000 p.a.	increased	reduced if over €90,000 p.a.
Taxes and SICs				
solidarity contribution (S)	n/a	n/a	introduced	no change
regional personal income tax (S)	increased in three regions (Lazio, Molise, Calabria); reduced in three regions (Bolzano, Veneto, Puglia)	increased in all regions	increased in one region (Toscana); reduced in one region (Lombardia)	increased in two regions (Marche, Piemonte); reduced in two regions (Friuli Venezia Giulia, Puglia)
tax on deposits (S)	no change	no change	reduced	no change
tax on non-government bonds and on dividends (S)	no change	no change	increased	no change
tax on main residence (S)	n/a	n/a	introduced	abolished
tax on other property (S)	no change	no change	new cadastral values; increased	no change
tax on rental income (S)	n/a	introduced	no change	no change
employer SIC and employee SIC (both S)	contribution base broadened; increase in contribution base upper limit and contribution rates for temporary workers	contribution base broadened; increase in contribution base upper limit for temporary workers	contribution base broadened; increase in contribution base upper limit and contribution rates for temporary workers	contribution base broadened; increase in contribution base upper limit for temporary workers
self-employed SIC (S)	no change	no change	increased	increased
Pensions				
old age and survivor pensions (NS)	increased	increased	increased (reduced) if under (over) €2,181 pcm	increased (reduced) if under (over) €1,295 pcm
invalidity and disability pensions (NS)	increased	increased	increased	increased
Social benefits				
social assistance (NS)	reduced	reduced	reduced	reduced
family benefits (S)	increased	increased	increased	increased
minor child benefits (NS)	increased	increased	increased	increased
unemployment benefits (NS)	increased	increased	increased	increased
severance pay (NS)	increased	increased	increased	increased
social pension (S)	increased	increased	increased	increased
housing benefits (NS)	increased	increased	increased	increased
maternity grants (NS)	increased	increased	increased	increased
scholarships (NS)	increased	increased	increased	increased

Notes:
(S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.
Source: EUROMOD Country Report: Italy. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

TABLE A5IV. POLICY CHANGES (2010-2013): PORTUGAL

	2010	2011	2012	2013
Public sector pay	frozen	reduced (frozen) if over (under) €1,500 pcm	reduced (frozen) if over (under) €600 pcm	reduced (frozen) if over (under) €1,500 pcm
Taxes and SICs				
personal income tax (S)	marginal tax rates increased, upper limit of tax brackets increased by 0.8%, introduction of one additional tax bracket for high incomes	marginal tax rates increased (apart from the lowest one),upper limit of tax brackets increased by 2.2%, extraordinary surtax and upper limits on tax credits introduced	pension tax allowances decreased; extraordinary surtax suspended; education and housing tax credits cut; tax credit upper limits lowered	number of tax brackets reduced (from 8 to 5), marginal tax rates increased; additional solidarity tax introduced; extraordinary surtax re-introduced; tax credit amounts and upper limits lowered
tax on investment income (S)	no change	no change	increased from 20% to 25%	no change
property tax (NS)	increased	increased	increased	increased
self-employed SIC (S)	no change	increase in compulsory minimum coverage rate	major revision (*)	no change
Pensions				
contributory old age, disability and survivor pensions (all NS)	frozen (increased) if over (under) €1,500 pcm	reduced (frozen) if over (under) €5,000 pcm	increased if under €419 pcm; extraordinary contribution if over €5,000 pcm; 13th-14th pensions abolished (but low pensions protected)	increased if under €419 pcm; extraordinary contribution if over €1,350 pcm; 13th-14th pensions restored
Social benefits				
child benefit (S)	no change	amounts reduced, means-testing tightened	no change	no change
other family benefits (NS)	increased	increased	reduced	increased
unemployment insurance benefit (S)	no change	no change	benefit amount 10% reduced from month 7 onwards, benefit duration reduced, minimum contribution period reduced, 10% bonus for recipients with children introduced	no change

	2010	2011	2012	2013
unemployment assistance benefit (S)	no change	family unit composition redefined (from couple plus dependent children to all persons living in the household), equivalence scale introduced, means-testing tightened	no change	no change
social pension (S)	means-testing relaxed, base amount and supplements increased	no change	base amount increased	base amount increased
supplement for older persons (S)	increased	no change	no change	reduced
sickness benefit	increased	increased	reduced	increased
social integration income	increased (due to means-testing relaxation)	reduced (due to changes in the equivalence scale used for means-testing, abolition of supplements for rent, 3rd and additional children and newborns)	no change	reduced (due to changes in the equivalence scale used for means-testing and new threshold indexation)

Notes:
(S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.
(*) For information on the 2012 self-employed SIC reform see EUROMOD Country Report: Portugal.
Source: EUROMOD Country Report: Portugal. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

TABLE A5v. POLICY CHANGES (2010-2013): LATVIA

	2010	2011	2012	2013
Public sector pay	reduced	increased	increased	increased
Taxes and SICs				
personal income tax (S)	tax rate for self-employment income increased from 15% to 26%; tax rate for employment income increased from 23% to 26%; 10%-15% tax for capital income introduced, non-taxable income allowance reduced, tax base broadened	tax rate for employment and self-employment income reduced from 26% to 25%; non-taxable income allowance increased	no change	tax rate for employment and self-employment income reduced from 25% to 24%
property tax (NS)	increased	increased	increased	increased
employer SIC (S)	reduced	increased	reduced	reduced
employee SIC (S)	reduced	increased	increased	reduced
self-employed SIC (S)	reduced	increased	increased	reduced
Pensions				
old age pension (NS)	frozen	frozen	frozen	frozen
old age social security benefit (NS)	frozen	frozen	frozen	frozen
survivor pension (NS)	frozen	frozen	frozen	frozen
survivor social security benefit (NS)	frozen	frozen	frozen	frozen
disability pension (NS)	frozen	frozen	frozen	frozen
disability social security benefit (NS)	frozen	frozen	frozen	frozen
Social benefits				
guaranteed minimum income benefit (S)	eligibility conditions relaxed, income test tightened, GMI level increased, maximum duration extended (from 9 months to indefinite), maximum limit on GMI amount abolished, additional GMI for small children introduced in Riga	eligibility conditions tightened	income test tightened	standard rate reduced
other social assistance benefits (NS)	reduced	increased	increased	increased
state family benefit (S)	reduced	no change	no change	no change
child care benefit (S)	no change	no change	no change	increased
maternity and paternity benefit (S)	upper limit on previous earnings abolished	reduced	no change	upper limit on benefit increased
parental benefit (S)	parents working during parental leave no longer eligible for the benefit	upper limit on benefit introduced	no change	benefit rates and upper limit increased
child birth benefit (S)	supplements abolished	no change	no change	no change
other family benefits	reduced	increased	increased	increased

	2010	2011	2012	2013
unemployment benefit (S)	upper limit on previous earnings abolished; duration extended	restrictions for those with a work below 20 years introduced	duration reduced	benefit level increased; duration extended
housing benefit (S)	eligibility conditions relaxed, income test tightened, housing costs upper limit reduced, GMI amount (used for this benefit's calculation) increased	eligibility conditions tightened, housing costs upper limit increased	income test tightened, housing costs upper limit increased	housing costs upper limit increased, GMI amount reduced
sickness benefit (NS)	reduced	increased	reduced	increased
non-taxable disability benefits	increased	increased	increased	increased
education allowances (NS)	reduced	increased	increased	increased
funeral benefit	reduced	reduced	increased	increased

Notes: (S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.

Source: EUROMOD Country Report: Latvia. Downloadable from: https://www.iser.essex.ac.uk/_euromod/resources-for-euromod-users/country-reports.

TABLE A5VI. POLICY CHANGES (2010-2013): LITHUANIA

	2010	2011	2012	2013
Public sector pay	reduced	increased	increased	increased
Taxes and SICs				
property tax (NS)	increased	increased	increased	increased
employer SIC (S)	rate for unemployment insurance increased, rate for employment injuries/ occupational diseases reduced	no change	rate for contributions to the guarantee fund increased	no change
self-employed SIC (S)	contribution base for those engaged in individual activities under business certificates changed from income tax to 50% of taxable income, owners of individual enterprises and members of agricultural communities excluded from paying sickness and maternity SIC	non-farmers: reduced SIC rate abolished farmers: reduced SIC rate increased from 8% to 16%	farmers: reduced SIC rate abolished	no change
Pensions				
old age (NS)	frozen	frozen	frozen	increased
disability (NS)	frozen	frozen	frozen	reduced
survivor (NS)	frozen	frozen	reduced	increased
early retirement (NS)	frozen	frozen	increased	reduced
Social benefits				
social benefit (S)	no change	no change	eligibility conditions broadened, income test tightened, introduction of equivalence scale for benefit calculation (more generous for single person households, same for two-person households, less generous for households with three or more persons)	no change
unemployment insurance benefit (S)	minimum amount reduced	no change	no change	no change
severance pay	increased	increased	increased	increased
child allowance (S)	eligibility conditions and means testing both tightened	no change	means testing tightened	no change

	2010	2011	2012	2013
maternity leave benefit (S)	minimum amount reduced	maximum amount reduced	benefit rate made independent of no. of children, minimum amount increased, maximum amount reduced	no change
maternity and paternity leave benefits (S)	minimum amount reduced; minimum contribution period increased	replacement ratios reduced	replacement ratios and upper limit on benefits both reduced; minimum amount increased	no change
paternity leave benefit (S)	minimum amount reduced	no change	minimum amount increased	no change
housing allowances (NS)	increased	reduced	increased	increased
sickness benefits	reduced	increased	increased	increased
municipal and NGO support (NS)	increased	increased	increased	increased

Notes: (S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.

Source EUROMOD Country Report: Lithuania. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

TABLE A5VII. POLICY CHANGES (2010-2013): ROMANIA

	2010	2011	2012	2013
Public sector pay (NS)	Public sector workers not identified in database (*)			
Taxes and SICs				
personal income tax (S)	upper limit on private pension contributions tax allowance lowered	upper limit on private pension contributions tax allowance lowered	no change	no change
property tax (NS)	increased	increased	increased	increased
health insurance contributions (S)	no change	introduction of lower limit	pensioners' SIC are only applied to the difference between the pension amount and the lower limit	no change
employer SIC (S)	no change	changes in SIC paid by pensioners and self-employed	no change	no change
employee SIC (S)	no change	upper ceiling introduced	no change	no change
self-employed SIC (S)	no change	abolished if annual earnings below 4 average gross wages	no change	no change
Pensions				
old age pension (NS)	increased	increased	increased	increased
survivor pension and benefits (NS)	increased	increased	increased	increased
disability pension (NS)	increased	increased	reduced	increased
Social benefits				
minimum guaranteed income (S)	minimum subsistence level increased	no change	no change	no change
means-tested family benefits (S)	no change	income threshold tightened, benefit amounts reduced for lone parents with 1 child, families with 1 child, families with 2 children and income more than 200 Lei/ increased for lone parents with 2+ children, families with 3 children and income below 200 Lei and families 4+ children	no change	no change
child raising benefit: mother working (S)	no change	increased	no change	no change
child raising benefit: mother non-working (S)	no change	amount reduced, upper limit introduced	no change	no change
contributory maternity benefit (NS)	increased	increased	increased	increased
allowance / outfit grant for new born children (S)	no change	abolished	n/a	n/a
contributory unemployment benefit (S)	no change	reduced by 15%	no change	no change
severance payments (NS)	increased	increased	increased	increased

	2010	2011	2012	2013
minimum social pension/ social allowance for pensioners (S)	increased	no change	no change	no change
contributory sickness benefit (NS)	increased	increased	increased	increased
non-contributory disability benefits (NS)	increased	reduced	increased	increased
means-tested heating benefit (S)	no change	tax unit changed from household to individual	percentage compensation increased for certain income brackets	no change
educational allowances (NS)	increased	increased	increased	increased

Notes:

(S): simulated policies in EUROMOD. Non-simulated policies (NS) are read off the data in 2009 and updated for 2010-2013 by using factors based on the available administrative or survey statistics. Changes in employer SIC do not affect disposable income.

(*) In July 2010 public sector pay was cut by 25% cut. In 2011 public sector salaries increased somewhat in monthly terms, but that was largely offset by the abolition of holiday bonus and of the 13th monthly salary per year. In 2012-2013 public sector pay remained frozen. As public sector workers cannot be identified in the Romanian database, none of these changes was modelled in EUROMOD.

Source: EUROMOD Country Report: Romania. Downloadable from: https://www.iser.essex.ac.uk/ euromod/resources-for-euromod-users/country-reports.

ImProvE: Poverty Reduction in Europe. Social Policy and Innovation

Poverty Reduction in Europe: Social Policy and Innovation (ImPRovE) is an international research project that brings together ten outstanding research institutes and a broad network of researchers in a concerted effort to study poverty, social policy and social innovation in Europe. The ImPRovE project aims to improve the basis for evidence-based policy making in Europe, both in the short and in the long term. In the short term, this is done by carrying out research that is directly relevant for policymakers. At the same time however, ImPRovE invests in improving the long-term capacity for evidence-based policy making by upgrading the available research infrastructure, by combining both applied and fundamental research, and by optimising the information flow of research results to relevant policy makers and the civil society at large.

The two central questions driving the ImPRovE project are:

> How can social cohesion be achieved in Europe?
>
> How can social innovation complement, reinforce and modify macro-level policies and vice versa?

The project runs from March 2012 till February 2016 and receives EU research support to the amount of Euro 2.7 million under the 7th Framework Programme. The output of ImPRovE will include over 55 research papers, about 16 policy briefs and at least 3 scientific books. The ImPRovE Consortium will organise three international conferences (November 2013, April 2014 and Winter 2015). In addition, ImPRovE will develop a new database of local projects of social innovation in Europe, cross-national comparable reference budgets for 6 countries (Belgium, Finland, Greece, Hungary, Italy and Spain) and will strongly expand the available policy scenarios in the European microsimulation model EUROMOD.

More detailed information is available on the website http://improve-research.eu.

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