The Distributional Impact of Austerity and the Recession in Southern Europe

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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 gross domestic product (GDP) of the 27 European Union (EU) member states contracted by 4.5 per cent in 2009 relative to the year before. It subsequently recovered somewhat, but once again registered negative growth in 2012 and stagnated in 2013. Overall, by 2013 the European economy had shrunk by 1.2 per cent relative to its 2008 level.

The recession was an archetypal asymmetric shock, as some countries were affected much more than others. In Greece the size of the economy declined by over 23 per cent in 2007–13. In Portugal and Spain, the size of the contraction from peak (2008) to trough (2013) was around seven per cent, in Italy almost nine per cent (in 2007–13). Unemployment in the EU rose by 3.6 percentage points (ppts) in 2007–13 (Eurostat 2014). Again, things were much worse in those countries worst hit by the crisis, and especially in Greece and Spain, where the unemployment rate went up by as many as 19 and 18 ppts, respectively (in 2007–13).

Spending on social protection in the EU (as percentage of GDP) peaked in 2009, levelled out in 2010 and decreased in 2011 (Eurostat 2014). Based on national accounts data, Bontout and Lokajickova (2013) found that the downward trend in social expenditure accelerated in 2012. The fall in social spending since 2011 can be partly attributed to the recovery and subsequent employment growth, as experienced in some parts of the EU. However, reductions in social expenditure were also significant in countries that were still deep in recession, such as Greece and Portugal. This is in sharp contrast to the notion that, in a crisis, social benefits can act as 'social stabilisers' (Dolls, Fuest & Peichl 2012; Salgado et al. 2014).

As a matter of fact, cuts in social protection were often a component of austerity policies. In response to the crisis, bailout deals were offered to Ireland, Greece, Cyprus, Latvia, Hungary, Portugal and Romania. These were made conditional upon satisfactory progress on a detailed set of fiscal cuts and policy reforms. The pressure resulting from external constraints was also unmistakeable in Spain and Italy, even though softer forms of conditionality prevailed there.

The aim of this paper is to provide an early assessment of the distributional implications of the Great Recession in 2009–13 in four southern European countries severely affected by it: Greece, Spain, Italy and Portugal. Using a microsimulation model, we attempt to quantify the impact of tax–benefit policies (such as fiscal consolidation measures) and of some of the most important developments in the wider economy (namely changes in individuals' labour market status and market incomes) on income distribution. Moreover, we estimate how the burden of the crisis (taken from now on to signify the combined effect of tax–benefit policies and broader economic developments) has been shared across income groups, and how the differential impact of the crisis may have altered the composition of the population in poverty.

The paper is structured as follows. We first provide a review of the literature on the interactions of fiscal consolidation with inequality and growth, including key findings of microsimulation studies. We continue by explaining the methodology of our work. We then present our estimates of the distributional effects of the Great Recession in Greece, Spain, Italy and Portugal. We conclude by summarising the most important findings, and by reflecting on the policy implications of this research.

Literature Review

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 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 International Monetary Fund (IMF) (2012) and the Organisation for Economic Cooperation and Development (OECD) (2014) now accept that they have underestimated the size of fiscal multipliers and have overestimated growth prospects. In contrast, the European Commission (EC) 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 (ECB) has argued that the medium- and long-term effects of fiscal consolidation more than compensate for any short-term output losses (ECB 2012).

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, Meier & Müller 2012; Eyraud & Weber 2013). Also, output losses will be greater when efforts to improve fiscal balances take place simultaneously across several countries (Goujard 2013).

On the other hand, the policy mix of fiscal consolidation packages may also matter, although the evidence here is mixed. Some authors (Romer & Romer 2010; Alesina & Ardagna 2012; Alesina, Favero & Giavazzi 2012) have argued that declines in public spending may lead to stronger economic growth 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. As argued by Alcidi and Gros (2012), output losses following fiscal consolidation will be inversely related to the savings rate, the average tax rate and the degree of trade openness.

Interactions of Austerity with Inequality

While fiscal consolidation policies are widely held to cause poverty and inequality to rise, establishing their distributional effects is less straightforward than appears at first sight. Empirical evidence has shown that austerity does not necessarily have to be regressive. A study of fiscal consolidation in 18 countries in 1970−2010 by Agnello and Sousa (2012) found that fiscal adjustment programmes that took care to minimise adverse distributional effects had a higher probability of being successful. However, an analysis of 173 episodes of fiscal consolidation in 17 countries over the past 30 years by Ball, Leigh and Loungani (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 size and make-up of fiscal consolidation may be crucial in determining the distributional impact of the adjustment. Agnello and Sousa (2012), mentioned above, found that the decline in income inequality following episodes of fiscal consolidation

tended to take place where the policy mix relied more heavily on tax increases than on spending cuts. Woo et al. (2013) came to the same conclusion after analysing consolidation programmes in 17 countries in 1978–2009. Ahren, Arnold and Moeser (2011) found 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 could 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 this, the static effects of austerity policies may be at odds with their dynamic effects.

Estimating Distributional Effects via Microsimulation

Microsimulation has been extensively used as a tool for assessing the distributional impact of the recent economic downturn and examining the effects of various austerity measures on income distribution.

In a single-country setting – Ireland – Callan, Nolan and Walsh (2011) assessed the impact of public sector pay cuts in 2009–10. These were found to be progressive against a counterfactual scenario of a four per cent cut in both public and private sector pay. Nolan, Callan and Maître (2013) expanded that analysis to include the overall distributional impact of tax and welfare changes over the period 2009–11, and again found the result to be highly progressive. In Italy, Brandolini, D'Amuri and Faiella (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. 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 the rise in inequality began a year after the onset of the crisis, and gathered speed as the recession deepened. 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 in the middle and upper part of the income distribution. In the UK, the effects of recent tax–benefit reforms were analysed by Browne and Levell (2010), Brewer, Browne and Joyce (2011) and Joyce and Sibieta (2013). Their findings suggest that those with the lowest incomes were the biggest losers from these policy changes.

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 in very different ways in the countries considered. Finally, 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–benefit policy changes. They found that in all countries but Germany policy reactions contributed to stabilising or even reducing inequality and relative poverty.

Methodology

Departures from Previous Research

In assessing the distributional impact of tax–benefit policies, most of the time the choice of the underlying (market) income distribution may not matter much. However, at times of major changes, the assessment of the progressivity or otherwise of policies may differ significantly according to whether these are assessed on the distribution of market incomes at the beginning or at the end of the period under consideration. In Avram et al. (2013) the distributional effects of policy changes from 2009 to 2012 were evaluated on the assumption that 2009 policies were implemented on the 2012 market income distribution. In this paper we model the distributional effects of policies in the period 2009–13 on a year-by-year basis, rather than cumulatively. Policy changes between two consecutive years, say $t - 1$ and t, are assessed on the income distribution of year $t - 1$.

Also, as the literature reviewed above suggests, tax–benefit policies clearly affect market incomes. Ignoring these dynamic (indirect) policy effects leaves out an important part of the picture. Our approach departs from most of the studies reviewed above, where broader economic developments are explicitly excluded from the scope of the analysis. Rather than abstracting from them, this research attempts to locate first-order policy effects within the broader distributional effects of the crisis, by taking into account two important aspects of the latter: changes in market incomes and labour market transitions. By doing so, it also differs from Brandolini, D'Amuri and Faiella (2013), who assume wages, self-employment earnings and pension entitlements to have remained unchanged during the period under examination.

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 individuals and households, which it then applies to the tax–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. The underlying micro data for all countries are drawn from the 2010 European Union Statistics on Income and Living Conditions (EU-SILC), reporting incomes earned in 2009. EUROMOD has been validated at both micro and macro level and has been tested in several applications. For a comprehensive overview, see Sutherland and Figari (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 years') 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, 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.

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 in a stable macro-economic environment, it may bias the results in periods of economic turbulence. Given the magnitude of changes in the countries under examination, disregarding such a development would have been inappropriate for the purposes of this research. Linking economy-wide changes to micro-level analysis is not a new idea. Elaborate simulation methodologies and techniques have been developed by the World Bank and have been used in several applications (see Bourguignon, Bussolo & Da Silva 2008).

In this paper changes in labour market status were taken into account following the approach adopted by Leventi et al. (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 to estimate probabilities for working age individuals in the EUROMOD input data. The model is estimated separately for individuals with higher and lower levels of education. 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 as shown in the Labour Force Survey (LFS) statistics. Changes from short-term to long-term unemployment are also modelled based on a similar selection procedure as the one described above.

Labour market characteristics and sources of income are adjusted for those observations that are subject to transitions. In particular, employment/self-employment income is set to zero for individuals who become unemployed. For individuals moving from unemployment into employment, earnings are set equal to the mean among those already employed within the same stratum.

It should be noted that initial (i.e. 2009) employment rates do not align perfectly between EU-SILC and the LFS. Differences 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. Moreover, although focusing on net changes in employment rates allows EUROMOD to capture the employment dynamics shown by LFS, it does not fully capture compositional changes in the population of employed and unemployed which may have taken place within the period of analysis.

Finally, whereas changes in the labour market were carefully taken into account, no similar adjustments were made to account for demographic changes or changes in characteristics of the population such as education level or household structure. Arguably, these adjustments are less critical within the time frame studied, as major shifts are unlikely to happen in such a short period.

Updating Market 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 had to be created for these years. As is standard practice in microsimulation, this involved two additional steps: updating incomes from the EU-SILC income reference period (2009) to the latest policy year (2013) and simulating tax–benefit policies.

Updating incomes is performed 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 sector and by private and public sector in countries where such information is available.

Since EU-SILC provides no information on consumption, changes in indirect taxation are beyond the scope of this analysis. Changes in the provision of benefits in kind (such as health care, education, child care, etc.) are also not considered in this study. Simulations are carried out on the basis of the tax–benefit rules in place on 30 June of each policy year. In order to enhance the credibility of estimates, an effort has been made to address issues such as tax evasion (e.g. in Greece and Italy) and benefit non-take-up (e.g. in Greece). However, such adjustments are not possible to implement in all countries due to data limitations.

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 (EUROMOD 2014).

Modelling the Distributional Effects of Austerity and the Crisis

Drawing on the decomposition approach developed by Bargain and Callan (2010), we can approximate the *first-order* distributional effects of policies by simulating a hypothetical counterfactual scenario, capturing the effect of changes in 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 policymakers when they take decisions on policy changes, we believe that estimating this hypothetical scenario is of interest and relevance.

More formally, household disposable income in our counterfactual scenario is constructed on the basis of:

(i) individuals' labour market status in year $t-1$;
(ii) market incomes (other than public sector pay) in year $t-1$;
(iii) tax and benefit polices in year t.

This is compared with the situation where all variables are set as in year $t - 1$. Note that in this counterfactual scenario we do not allow monetary parameters of taxes and benefits to grow from one year to another (by using for example consumer price index [CPI] or growth in average market incomes), since indexation during the period considered was rather ad hoc in the four countries.

The broader distributional effects of the crisis between years t and $t - 1$ (capturing together the effects of changes in policies, market incomes and employment status) are modelled by comparing the distribution of household disposable income in year t with that in year $t - 1$.

It is important to note that changes in employment incomes may on occasion be directly attributable to government policies, as in the case of changes in minimum wage legislation. However, we have not been able to disentangle these effects from the broader distributional impact of the crisis.

Results

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 disposable income below 60 per cent of median. By construction, the relative poverty line goes up as median incomes improve, and down as median incomes fall. Needless to say, the significant fall in median incomes has been *the* defining characteristic of the Great Recession: in 2009–13 that estimated fall was massive in Greece (−36 per cent in real terms), but was also substantial in Portugal (−14 per cent), Spain (−11 per cent) and to a lesser extent Italy (−6 per cent).

To approximate the resulting sense of impoverishment, our second indicator fixes ('anchors') the poverty line at 60 per cent of the median of the 2009 income distribution, in real terms. By doing so, it reports the proportion of population who were unable to purchase in 2010–13 the goods and services that were just affordable to those with poverty line incomes in 2009.

The evolution of relative and anchored poverty rates in 2009–13 is shown in Figures 1 and 2 and, in greater detail, in Table 1.

Estimated relative poverty levels for the entire population moved up steadily in Greece, being 3.3 ppts higher in 2013 than in 2009. Relative poverty rates in the other three countries went up as well as down, the size of change being generally small. As might have been expected, changes in anchored poverty were more remarkable. In Greece, the proportion of population with incomes in 2013 below the 2009 poverty line (in real terms) was over 45 per cent, i.e. a dramatic increase by more than 25 ppts. The magnitude of change was smaller in Portugal (+6.3 ppts), Spain (+4.5 ppts) and Italy (+3.0 ppts).

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,
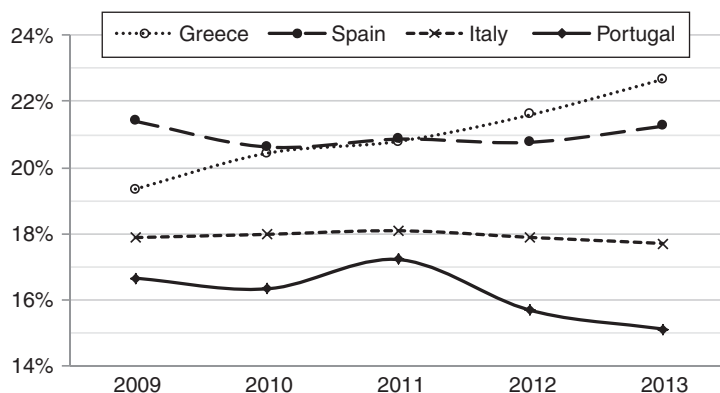
Figure 1 Relative Poverty (2009–13)
Source: EUROMOD version G1.0.
Note: Proportion of population below the relative poverty threshold, set at 60 per cent of median equivalised disposable income.

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 ppts or more), as well as in Italy (even though by less). On the other hand, relative poverty for young people (aged 18–29) went up in all four south European countries (especially in Greece and Spain). Poverty rates also went up for the 0–17 and the 30–64 age groups in Greece. This is because older people on low incomes, though not fully
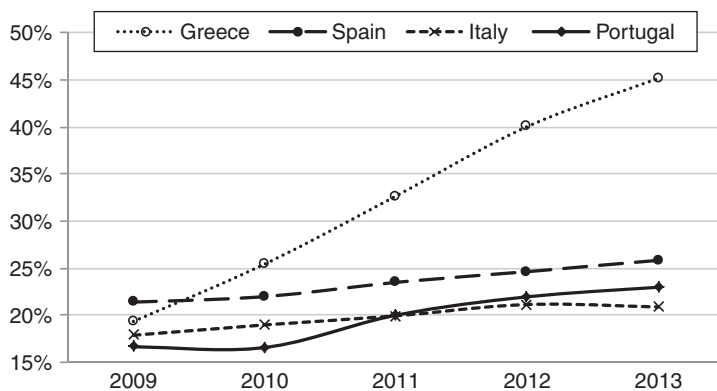

Figure 2 Anchored Poverty (2009–13)
Source: EUROMOD version G1.0.
Note: Proportion of population below a fixed poverty threshold, set at 60 per cent of the 2009 median equivalised disposable income, adjusted for inflation. Adjustment based on the harmonised index of consumer prices (accessed on 19 December 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).

Table 1 Changes in Relative and Anchored Poverty by Sex and Age (2013 vs. 2009)

	Greece		Spain		Italy		Portugal	
	Relative	Anchored	Relative	Anchored	Relative	Anchored	Relative	Anchored
All	3.3***	25.8***	− 0.2	4.5***	− 0.2	3.0***	− 1.5***	6.3***
Men	4.4***	26.5***	0.2	4.7***	0.1	3.0***	− 1.2**	6.1***
Women	2.3**	25.2***	− 0.5	4.3***	− 0.4*	3.0***	− 1.9***	6.5***
0–17	3.2***	25.9***	0.6	5.6***	− 0.2	3.5***	− 1.2	7.2***
18–29	7.2***	32.4***	3.0***	8.9***	1.0*	3.7***	1.0	6.8***
30–44	6.3***	25.9***	0.1	4.2***	0.2	2.9***	− 0.7	5.9***
45–64	5.4***	25.9***	0.4	5.0***	− 0.2	2.1***	− 1.5**	5.8***
65 +	− 6.3***	20.4***	− 4.9***	− 1.1***	− 1.4***	3.5***	− 5.1***	6.4***

Source: EUROMOD version G1.0, Distributive Analysis Stata Package (DASP) Version 2.3.
Note: Changes in relative and anchored poverty rates (2013 vs. 2009) in percentage points. Relative poverty rate defined as proportion of population below the relative poverty threshold, set at 60 per cent of median equivalised disposable income, using the OECD modified equivalence scale. Anchored poverty rate defined as proportion of population below a fixed poverty threshold, set at 60 per cent of the 2009 median equivalised disposable income, adjusted for inflation.
  Estimated changes marked as statistically significant at 90 per cent (*), 95 per cent (**) or 99 per cent confidence level (***). Information on the sample design of EU-SILC 2010 derived following Goedemé (2010).

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 whom the elderly feature prominently.

The age groups experiencing the greatest increases in anchored poverty were the young (aged 18–29) in Greece, Spain and (by a smaller margin) Italy, and children (aged 0–17) in Portugal. Nevertheless, the elderly also suffered considerable increases in anchored poverty, except in Spain, where the relevant rate actually fell.

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, 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 per cent relative to that of the poorest 20 per cent). 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.

As seen in Table 2, in 2009–13 the value of the Gini index increased very steeply in Greece (from 0.321 to 0.364, i.e. by 13 per cent). Elsewhere changes were not as large. Gini also went up a bit in Spain (in 2013), declined steadily in Portugal (in 2009–13) and hardly moved in Italy. In all three countries, differences, whether annual or cumulative, were rather small. The pattern was remarkably similar with respect to the

Table 2 Inequality Indices (2009–13)

	Greece		Spain		Italy		Portugal	
	Gini	S80/S20	Gini	S80/S20	Gini	S80/S20	Gini	S80/S20
2009	0.321	5.27	0.314	5.79	0.308	5.07	0.322	4.95
2010	0.328	5.57	0.314	5.75	0.312	5.25	0.320	4.90
2011	0.336	5.97	0.316	5.83	0.313	5.27	0.318	4.96
2012	0.354	7.02	0.314	5.80	0.313	5.25	0.311	4.70
2013	0.364	7.77	0.318	5.94	0.311	5.20	0.310	4.75

Source: EUROMOD version G1.0.

S80/S20 index. The income quintile share ratio went up very considerably in Greece (from 5.3 to 7.8, i.e. by 47 per cent). Changes in other countries were limited.

Income Changes by Decile: Re-ranking Effects

Over time, a considerable amount of re-ranking takes place, as a result of which the composition of income deciles changes. In Greece an estimated 65 per cent of the population moved income decile between 2009 and 2013; in Portugal and Spain that proportion was around 35 per cent, whereas in Italy only 18 per cent of the population were found in a different decile in 2013 relative to 2009.

In terms of composition, in 2013 relative to 2009, the poorest 20 per cent of the Greek population contained more unemployed workers (29 per cent vs. ten per cent), fewer elderly people (ten per cent vs. 18 per cent), and more city dwellers (40 per cent vs. 35 per cent). The bottom quintile also numbered more unemployed workers in Portugal (19 per cent vs. 13 per cent) and in Spain (16 per cent vs. eight per cent), and to a lesser extent in Italy (eight per cent vs. five per cent). Other changes were marginal.

The effects of re-ranking in real disposable household income are shown in Figure 3. 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 ten per cent of the population in 2009 had lost a smaller-than-average proportion of their income (34 per cent vs. 36 per cent 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 ten per cent of the population in 2013 had fallen by as much as 69 per cent relative to the income of their counterparts in 2009 (i.e. those who occupied the lowest income decile in that year).

As seen in Figure 3, a similar pattern prevailed in Spain and Italy. In both countries, those in the bottom decile in 2009 had by 2013 lost a smaller proportion of their income than had those in the top decile in 2009. Nevertheless, allowing for re-ranking, the poorest ten per cent of the population in 2013 found themselves much poorer than the poorest ten per cent in 2009. True, the richest ten per cent of the population in these countries were also less rich in 2013 than the richest ten per cent were in 2009.
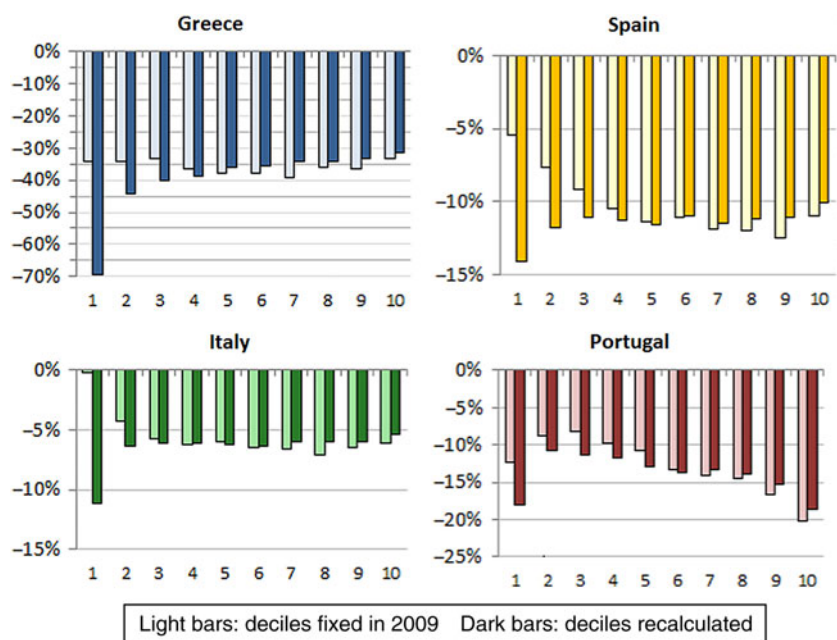
Figure 3 Changes in Disposable Income by Decile (2009–13): Re-ranking Effects
Source: EUROMOD version G1.0.
Note: Household disposable income is equivalised according to the OECD modified equivalence scale and measured in real terms (i.e. adjusted for inflation). The charts are drawn to different scales, but the interval between gridlines is the same on each chart.

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. Even there, the relative gain was greater when deciles were fixed in 2009 than when they were recalculated each year.

Disentangling the First-Order Effects of Austerity 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 4 and 5 we attempt to estimate the yearly changes in anchored poverty and inequality caused by policies alone vs. overall effects (i.e. that also include the effects of changes in individuals' labour market status and market incomes). Crucially, we warn against interpreting the difference between these
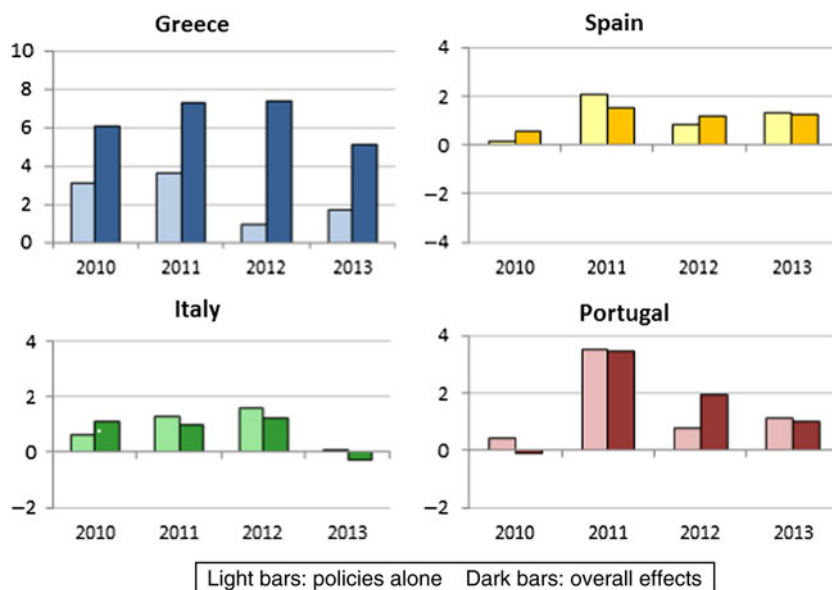
Figure 4 Changes in Anchored Poverty Rates: First-order Effect of Policies vs. Overall Effect of the Crisis
Source: EUROMOD version G1.0, DASP Version 2.3.
Note: Changes in anchored poverty rates in percentage points. Anchored poverty rate defined as proportion of population below a fixed poverty threshold, set at 60 per cent of the 2009 median equivalised disposable income, adjusted for inflation. Estimated changes in poverty due to policies alone are statistically significant for all years in Greece and Portugal, in 2011–13 in Spain and in 2010–12 in Italy. Estimated changes in poverty due to the overall effect of the crisis are statistically significant for all years in Greece, Spain and Italy and in 2011–13 in Portugal (a = 0.05).

two estimates as equal to the (unobservable) broader economic developments over and above the effect of government policies (i.e. that would have occurred in the absence of changes in government policies). A detailed description of policy changes can be found in the Appendix (Tables A1–A4).

As seen in Figure 4, 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 per cent and 33 per cent, respectively).

In Spain, austerity policies alone had a very limited effect on poverty in 2010. In contrast, in 2012 they explained more than 70 per cent of the total increase in anchored poverty. In 2010 and 2012 they raised anchored poverty more than the combination of policies with changes in the wider economy did.
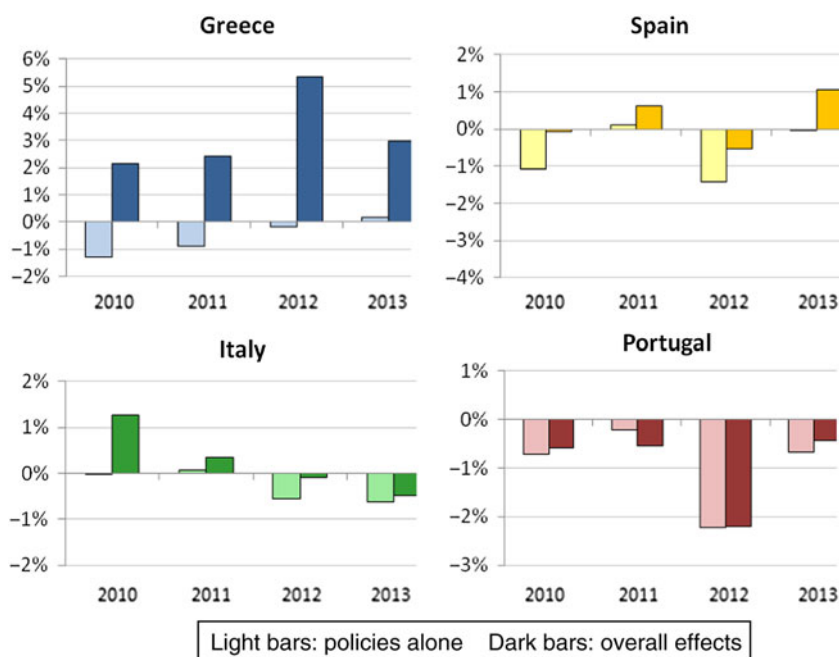
Figure 5 Changes in the Gini Index: First-order Effect of Policies vs. Overall Effect of the Crisis
Source: EUROMOD version G1.0, DASP Version 2.3.
Note: Percentage year-on-year changes in the Gini index. Estimated changes in inequality due to policies alone are statistically significant for all years in Spain, in 2010–12 in Greece, in 2011–13 in Italy and in 2010 and 2012–13 in Portugal. Estimated changes in inequality due to the overall effect of the crisis are statistically significant for all years in Greece and Portugal, in 2011–13 in Spain and in 2010–11 and 2013 in Italy (a = 0.05).

The latter was also the case in Italy (all years except 2010) and Portugal (all years except 2012). In these countries the combined effect of policies with broader economic developments was often negative (i.e. poverty-reducing).

Inequality effects, presented in Figure 5, were subtly different. In Greece and Spain the first-order effects 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, that pattern being stronger in Greece than in Spain. The picture was similar in Italy and Portugal, 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).

Identifying the Effect of Individual Policies on Inequality

That some austerity policies *per se* 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.

Tax—benefit policies are grouped under four headings: public sector pay; taxes and social insurance contributions (SICs); pensions and related policies; and other social benefits. Note that, although this grouping was necessary in order to render the analysis manageable, bundling some policies under the same heading will inevitably offset some of them against each other, obfuscating policy options and their distributional effects.

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 term '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.

Table 3 Inequality Effects of Policy Changes

	Change in 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	n.a.
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	n.a.	− 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

Source: EUROMOD version G1.0.
Note: Percentage changes in the Gini index. 'n.a.' indicates no policy changes between the two years.

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), where the reversal of pay cuts in 2013 seems 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 at the upper end of the income distribution.

The first-order effect of changes in direct taxes and SICs seemed mostly to have rendered the income distribution less unequal (*ceteris paribus*). This was especially so in Portugal in 2011, but also in Greece (2010), Spain (2010 and 2012) and Italy (2011). In contrast, the 2013 tax and SIC changes in Greece appeared to have the opposite effect.

Pension cuts and related policies (such as the special levies) appear to have had a more mixed distributional impact. Some of these changes were progressive, as in Portugal (in 2012) and to a lesser extent in Greece (in 2010 and 2012). This effect mostly resulted from the design of these measures, which partly or fully protected those on low incomes. On the other hand, the across-the-board pension cuts in Greece, and the restoration of the 13th and 14th pension payments in Portugal, both in 2013, appear to have had significantly regressive effects.

Examples of changes in social benefits having a progressive distributional effect were few and far between. We may mention here the (late) introduction of a means-tested child benefit scheme in Greece (in 2013). By contrast, reductions in the generosity of minimum income in Portugal (in 2011 and 2013) obviously had a regressive impact.

Conclusions

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

To start with, Greece clearly stands out from the other three 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, improvements alternating with deteriorations and little overall change (again, except in Greece).

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 at 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 government policies, growth and income distribution. Specifically, tax–benefit policies act both

directly (through their effect on the distribution of incomes) 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–benefit policies *per se* from the overall 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. Alternatively, it may stem from the fact that those adversely affected tended to be located towards the top of the income distribution.

While the impact of policies on inequality can be described as moderate (or even equality-reducing), 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 policies alone raised anchored poverty more than the combined effect of policies and changes in the wider economy did.

A certain amount of caution is called for in 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 would enhance the comparability and credibility of our findings. The same holds for the treatment of indirect taxation, ignored here. Given the relative weight of indirect taxes in many tax systems, estimating their distributional impact 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 are ignored here. This issue has been addressed in the context of EUROMOD (Paulus, Sutherland & Tsakloglou 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 from that could be substantial.

Although significant progress has been made towards accounting for macro-economic aspects of the crisis, much remains to do to capture the impact of the recession more fully. Examples include modelling wage dynamics across sectors and occupations, capturing additional labour market transitions (such as from full-time to part-time employment) and adjusting for demographic changes, especially in countries where the crisis has led to significant migration flows.

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 impact of the crisis in the four 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 our 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 know 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 while the room for fiscal policy remains limited.

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