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In the field of income, poverty, social exclusion and living conditions, the EU Statistics on Income and Living Conditions (EU-SILC) is the main source for statistical data at European level.

Over the last years, important progress has been achieved in EU-SILC as a result of the coordinated work of Eurostat and NSIs.

In June 2010, the European Council adopted a social inclusion target as part of the Europe 2020 Strategy: to lift at least 20 million people in the EU from the risk of poverty and exclusion by 2020. To monitor progress towards this target, the 'Employment, Social Policy, Health and Consumer Affairs' (EPSCO) EU Council of Ministers agreed on an 'at risk of poverty or social exclusion' indicator. To reflect the multidimensional nature of poverty and social exclusion, this indicator consists of three sub-indicators: i) at-risk-of-poverty (i.e. low income); ii) severe material deprivation; and iii) living in very low work intensity households.

In this context, the Second Network for the Analysis of EU-SILC (Net-SILC2) is bringing together National Statistical Institutes (NSIs) and academic expertise at international level in order to carry out in-depth methodological work and socio-economic analysis, to develop common production tools for the whole European Statistical System (ESS) as well as to ensure the overall scientific organisation of the third and fourth EU-SILC conferences. The current working paper is one of the outputs of the work of Net-SILC2. It was presented at the third EU-SILC conference (Vienna, December 2012), which was jointly organised by Eurostat and Net-SILC2 and hosted by Statistics Austria.

It should be stressed that this methodological paper does not in any way represent the views of Eurostat, the European Commission or the European Union. This is independent research which the authors have contributed in a strictly personal capacity and not as representatives of any Government or official body. Thus they have been free to express their own views and to take full responsibility both for the judgments made about past and current policy and for the recommendations for future policy.

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Eurostat databases are also available at this address, as are tables with the most frequently used and requested short- and long-term indicators.

TABLE OF CONTENTS

Using Euromod to nowcast poverty risk in the European Union

(Jekaterina NAVICKE, Olga RASTRIGINA and Holly SUTHERLAND [1])

Abstract: This paper explains how estimates of current (2012) income, risk-of-poverty and inequality ("nowcasts") can be made using 2008 EU-SILC data and the European Union (EU) tax-benefit microsimulation model EUROMOD. The method is illustrated for eight EU countries, among those experiencing the most volatile economic conditions in the period of the projection (2007-2012): Estonia, Greece, Spain, Italy, Latvia, Lithuania, Portugal and Romania. The method is evaluated by comparing results for 2008 to 2010 with statistics available from the EU-SILC corresponding to the same income reference periods. Nowcasts for 2011 and 2012 are also provided.

[1] Jekaterina Navicke, Olga Rastrigina and Holly Sutherland are from the Institute for Social and Economic Research at the University of Essex (United Kingdom). This work has been supported by the second Network for the analysis of EU-SILC (Net-SILC2), funded by Eurostat. The European Commission bears no responsibility for the analysis and conclusions, which are solely those of the authors. We are grateful to Tony Atkinson, Andrea Brandolini, Eric Marlier, Cathal O'Donoghue and other participants of the 2012 International Conference on Comparative EU Statistics and Living Conditions in Vienna for very helpful comments and suggestions; and to our colleagues Silvia Avram, Francesco Figari, Horacio Levy and especially Alari Paulus for useful advice and invaluable practical assistance. We also acknowledge the contribution of all past and current members of the EUROMOD consortium. The process of extending and updating EUROMOD is financially supported by the Directorate General for Employment, Social Affairs and Inclusion of the European Commission [Progress grant no. VS/2011/0445]. For Estonia, Latvia, Lithuania, Portugal and Romania we make use of micro-data from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat under contract EU-SILC/2011/55 and contract EU-SILC/2011/32; and for Greece, Spain and Italy we make use of the national EU-SILC data made available by respective national statistical offices. The usual disclaimers apply. Email address for correspondence: hollys@essex.ac.uk

1. Introduction

The Europe 2020 target for poverty and social exclusion has three components (income poverty, material deprivation, and work intensity). It is important to be able to monitor progress towards meeting the target, not only because of the need to understand what extra effort is required between now and 2020 but also because measures of current poverty and income distribution are a fundamental component of any evaluation of the social and economic situation of the EU population. However, the most recent estimates based on EU-SILC data are always out of date because of the time taken to collect, process and analyse the micro-data. For example in mid-September 2012 there were estimates available from the 2011 EU-SILC based on 2010 incomes for only 9 out of 27 Member States. For the remaining two thirds, there was still no EU-SILC based data for the current decade. Continuing in this way it will be 2023 before we know whether or not the Europe 2020 target has been reached. In the meantime it is necessary to wait three years in order to be able to assess the current state of play. What is needed is a method to forecast the present values of key income distribution and poverty indicators, a process that has become known as nowcasting. The toolbox of methods that might be used for nowcasting and forecasting are similar but nowcasts are informed by using macro-economic variables that are available with a short time lag, together with information about current policies. Forecasts must rely on other forecasts, projections or assumptions about the future economic situation and the evolution of policies.

Movement in indicators of risk of poverty depend on many factors and interactions between them. The way in which macro-economic changes affect households at different points in the income distribution depends on how policies mediate or mitigate the effects of the changes, which themselves might vary in their incidence depending on specific national circumstances. Movement in the headline AROP indicator of the number living in households with income below 60% of the contemporary median requires a prediction both of income at the median and of the lower end of the distribution of income. Since forecasts or nowcasts based on macro-level data will not capture the differential effects of policies at different points in the distribution, they are likely to be biased. Nowcasts based on micro-data will capture the variation in household circumstances but in order to take account of the interactions between policies and changing circumstances, microsimulation models are the appropriate tools (Immervoll et al., 2006).[(1)]

At national level, in some countries, microsimulation has been used for future scenario building, for example in the UK in order to predict child poverty in 2020 (Brewer et al., 2011) and in Ireland to nowcast the policy effects of the crisis (Keane et al., 2012). Implementation of such an exercise at the EU level using national models would be inhibited by the fact that suitable models do not exist (or are not generally accessible) in all countries. Even if they were available, considerable challenges would be associated with making the results comparable and with reconciling results using national data with those from the SILC. Here we make use of the EU-wide EUROMOD, which uses EU-SILC as input data.

EUROMOD was constructed with the purpose of analysing the impact of changes in tax-benefit policies on income poverty, the income distribution, work incentives and the public budget. It has immediate relevance for understanding the effects of changes in policy affecting current cash income on the low income component of the social inclusion target. Such changes in policy include those designed to reduce income poverty (e.g. a change to the rules of a minimum income scheme) and changes introduced for other reasons (e.g. a decrease in income tax thresholds intended to raise revenue during the budgetary retrenchment period). These effects include not only the change in the income poverty indicator but also the effects on work incentives of those affected by the reform, and the (first round) implications for the public budget.

(1) In the US predictions of poverty are more straightforward for two reasons. First, the US poverty line is not linked to the income distribution and the poverty threshold can itself be predicted using a price index. Secondly, the welfare policy system is smaller and simpler. See Isaacs and Healy (2012) for a prediction of US child poverty using regression techniques based on state-level data.

EUROMOD is a static tax-benefit microsimulation model. In order to capture the effects of changes in the characteristics of the population over time, some dynamic elements must be introduced.[2] We focus on a nowcast of household incomes and the income-based component of the AROPE indicator. Work intensity and material deprivation indicators are outside the scope of the paper.[3] The adjustments necessary to project EU-SILC micro-data forward to "now" consist of the following components:

1. Updating market incomes from the income data year to the point in time corresponding to the latest published indexes; and from the latest to "now" according to macro-level forecasts or assumptions.
2. Simulating policy changes between the income data year to those prevailing currently.
3. Data adjustments to account for important dimensions of actual labour market change between the data year and the most recently available information.
4. Data adjustments to account for actual and projected demographic and other compositional changes (e.g. household composition, household work intensity) between the data year and "now".
5. Ad hoc and specific adjustments that may be relevant for the effect of policies in the projection period (e.g. increasing the pension age).

In addition, since we are interested in change over time, we need to calibrate the model so that it predicts results for the past in line with those measured directly from EU-SILC. Differences arise for a combination of many reasons, including those related to the lack of all variables in the SILC that are necessary for precise tax-benefit simulations and the possibility that some income components are under-recorded in the EU-SILC (Figari et al., 2007; Figari et al., 2012).

The aim of this paper is to explore the methods in relation to "nowcasting", some 2-3 years before income data for 2012 are available directly from the SILC (SILC 2013). The following four sections explain the main components of the nowcasting process. Updating incomes and simulating policies are considered together because they are part of the standard functionality of EUROMOD and most other tax-benefit microsimulation models.[4] We then consider in turn and in some detail, calibration to the SILC and adjusting for labour market change, and then also adjusting for demographic and compositional change. The next section illustrates what can be done by describing the nowcast for 8 countries: Estonia, Greece, Spain, Italy, Latvia, Lithuania, Portugal and Romania. In order to be able to evaluate our methods we start with the 2008 (2007 incomes) SILC and nowcast 2012 incomes. Since SILC estimates are available for 2007-2010 incomes it is possible to compare our nowcast for these years with what is shown by SILC for the same years. It is worth noting that 2007 is a pre-crisis year when employment was relatively high in most of the countries considered. Using these data to nowcast the situation when unemployment is high 5 years later may be particularly challenging because greater adjustment is needed than if we were using (say) 2010 data with 2009 incomes.

The final section concludes by summarising the main features of our nowcast estimates and outlines plans and data requirements for future work, referring to a summary of recommendations for the content of the EU-SILC that will improve the quality of EUROMOD estimates in general and nowcasts in particular (provided in Annex 3). It also reflects on whether these methods can also be employed for forecasting, for example to 2020.

[2] An alternative approach would be to make comprehensive use of dynamic microsimulation modelling in which in each unit (person) is aged over time and processes such as fertility, household formation and dissolution as well as labour market behaviour are modelled explicitly (using transition probabilities derived from other sources). It is quite possible that such methods would result in better predictions 10 or so years ahead than the methods described in this paper. But these models are well-known to be laborious to construct, difficult to validate and can have problems with internal consistency. An EU-wide dynamic microsimulation model that also maintained cross-country comparability would be quite an enterprise (see Dekkers & Zaidi, 2011).

[3] See Ward and Ozdemir (2012) for a nowcast of EU work intensity using information from the EU Labour Force Survey to reweight EU-SILC data.

[4] Indeed it is worth noting that simulating current policies on updated incomes has been standard practice since tax-benefit microsimulation first began in the 1980s. Among many examples, see Atkinson and Sutherland (1988). The need to take account of changes in labour market activity and other changes to population characteristics in nowcasts has become more evident because of the large and sudden recent changes in some EU countries.

2. Updating incomes and simulating policies

EUROMOD mainly operates on anonymized EU-SILC cross-sectional micro-data which are available for research purposes about 15 months after the end of the data collection period, while the income reference period in EU-SILC for all the countries considered here is the previous calendar or tax year before the data collection year. Additional time is required to prepare the data to be used as an input for EUROMOD. This means that there is a minimum gap of about three years between the income data reference period and current policy year. Updating incomes and simulating policies up to the current state of affairs is the first task in order to "nowcast" disposable income and its distribution.

Disposable income in EUROMOD can be divided into two elements: income that is simulated by the model and income taken directly from the survey data.[(5)] Income elements simulated by the model include cash social insurance, universal and assistance benefits, social insurance contributions and personal direct taxes. Exceptions are those benefits and taxes that cannot be simulated due to the lack of necessary information in the underlying data. This mostly concerns benefits for which entitlement is based on previous contribution history (e.g. pensions) or unobserved characteristics (e.g. disability benefits).

In order to be able to simulate tax-benefit policies in a timely manner (within a current year) the rules of the simulated policies should refer to some fixed period prior to the end of the year. Currently all simulations are carried out on the basis of the tax-benefit rules in place on the 30th of June of the EUROMOD reference year. This approach makes it possible to simulate current-year policies, but also means that simulations do not reflect any reforms made after this reference date or those rules that were effective in the first half of the year, but changed before the 30th of June. It may thus result in discrepancies compared with the forthcoming annual administrative statistics or survey data.

Uprating of the non-simulated income sources beyond the income data reference period is carried out in EUROMOD using factors based on available administrative or survey statistics. Individual uprating factors are derived for different income sources, reflecting the change in their average amounts per recipient between the income data reference period and the target year. However both administrative statistics and household surveys other than EU-SILC face similar timeliness issues, while average annual statistics naturally cannot become available before the end of the year in question. In order to "nowcast" non-simulated income sources in EUROMOD official forecasts are used to derive updating factors for the current year. In cases where such forecasts are not available, estimations are made using quarterly data or updating by appropriate default factors (e.g. CPI).

In the exercise reported in this paper 2008 EU-SILC data with a 2007 income reference period are used to nowcast the 2012 distribution of disposable income. More precisely, this involves:

- Rules of the simulated tax and benefit policies are modelled as of June 30th, 2012.
- Benefits and taxes that are not simulated in EUROMOD due to lack of necessary information in the underlying data are uprated based on actual changes in rates, where appropriate, or evolution of average payments (e.g. in the case of benefits depending on previous earnings).
- Original incomes are updated from 2007 to 2012 using appropriate available indexes (earnings, CPI etc.) and official projections. Updating of original incomes is necessarily approximate, and is carried out using as much disaggregation as possible (e.g. of earnings by sector). As an illustration the factors used to update employment income and public pensions from 2007 to 2012 are documented in Annex 2 (Tables A12 and A13). These make best use of whatever information is available at national level; this varies considerably across countries.

Detailed information on the scope of simulations and updating factors is documented in EUROMOD Country Reports.[(6)] For further information on EUROMOD see Sutherland (2007), Lelkes and Sutherland (2009) and Lietz & Mantovani (2007).

[(5)] For further information on the EUROMOD concept of disposable income see section 3 of this paper.

[(6)] See for details: https://www.iser.essex.ac.uk/euromod/resources-for-euromod-users/country-reports.

3. Alignment of EUROMOD and the SILC

Before any adjustment the values of key AROPE indicators that are calculated using simulated incomes from EUROMOD may diverge from those calculated by Eurostat for the same year. There are many reasons why the two sets of estimates should not be expected to be identical (Figari et al., 2012). As explained in Avram and Sutherland (2012) these include:

- The release of EU-SILC: the version of EUROMOD used in this paper makes use of release 2 of 2008 SILC in most countries: see Annex 2. Statistics provided by Eurostat use the most recent release. To the extent that the relevant data change between releases, we would expect differences in the indicators from the two sources.
- The standard definition of household disposable income produced by EUROMOD is slightly different from the definition of the UDB variable (HX090) used for the official indicator calculations. In EUROMOD we do not include any non-cash employment income. However, in this paper we adjust the EUROMOD definition of household disposable income to the one used in the UDB EU-SILC, i.e. we add company car (PY021G).
- In the EUROMOD input database we drop observations (households) from the SILC where one or more persons in the household has missing data on income, and the imputation factor to correct for this is also missing. This is not necessary in many countries but where it is the number of such cases varies from a few to more than 50. We make no corresponding adjustment to the weights.
- In EUROMOD negative self-employment income is recoded to zero, while in the SILC it is not.
- In constructing the input information used in the calculation of tax liabilities and benefit entitlements it is important that the variables used are as consistent as possible. One adjustment we make to ensure that the information on the income reference period (and EUROMOD policy year) is consistent with the characteristics of the household (current at the time of the survey) is to exclude from the input database children born after the EU-SILC income reference period and before the interview. This will affect household composition and hence the equivalence scale and the calculation of household disposable income.
- While we have made every effort to avoid it, differences in the methods of calculating the indicators may explain differences in results. We are not aware of any differences in formulae, assumptions or definitions used.[7] We have not top- or bottom- coded the EUROMOD household disposable income variable. It is not clear whether Eurostat does this in their calculations of inequality indexes or mean income.
- Use of simulated values for benefits and taxes without allowing for the non take-up of benefits or tax evasion will tend to make the income distribution appear less unequal and, usually, risk of poverty rates lower than those calculated using the SILC directly. Adjustments that are made to account for non take-up or for tax evasion can only be approximate and in some cases involve random assignment within groups with particular characteristics.
- Other reasons for the over-simulation of some benefits include unobserved differences in rules at the municipality level and lack of information to simulate asset tests where these exist. It is worth noting that higher poverty estimates in the SILC may also be due to under-reporting of benefits in the data.
- Over-simulation of income taxes can lead to under-estimation of inequality and of median disposable income, and hence risk of poverty estimates. The main contributing factors are tax evasion, which is not typically captured, and the non-simulation of some tax deductions due to lack of necessary information (e.g. actual costs incurred by the self-employed; private health and

[7] We have followed Eurostat document LC-ILC/39/09/EN.

education expenditures).

In addition, it should be recognised that even if the values of headline AROPE indicators align perfectly, this does not necessarily mean that values of income at the household level also align: there may be discrepancies in both directions which happen to cancel each other out. Since they may not cancel out within sub-groups of the population, or after policy reforms, alignment or calibration needs to be carried out at the household rather than the indicator level.

In order to account for the discrepancies a calibration factor is calculated which brings the EUROMOD estimate of 2007 equivalized household disposable income for each household in the 2008 SILC in line with the value of the corresponding EU-SILC variable (HX090) for that household.[8] The same household specific factor can be applied to later policy years. Whether adding this factor means that the EUROMOD estimates continue to align well with the SILC estimates can be explored for the subsequent years for which SILC statistics are available. Table 1 shows the results of these experiments, comparing the values of the main indicators with those from 2009, 2010, and 2011 SILC. Results are shown as ratios between the EUROMOD result and that published by Eurostat using the SILC. Tables A1-A4 in the Annex 1 provide detailed results.[9]

Table 1: Ratio of EUROMOD and Eurostat indicators before and after calibration to the EU-SILC: Median equivalized disposable income, the at-risk-of-poverty rate and the GINI coefficient

	Median equivalized income				At-risk-of-poverty rate				GINI Coefficient			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Estonia												
EM	1.01	1.05	1.09	1.11	1.01	0.95	1.08	0.97	1.00	0.96	0.96	0.94
EM with calibration	1.00	1.04	1.08	1.10	1.00	0.96	1.07	0.95	1.00	0.96	0.96	0.94
Greece												
EM	1.03	1.01	1.00	1.04	0.99	1.04	1.06	0.99	1.00	1.02	1.04	1.00
EM with calibration	1.00	0.99	0.99	1.03	1.00	1.05	1.05	1.00	1.00	1.02	1.04	1.00
Spain												
EM	1.01	1.03	1.08	1.12	0.99	0.98	0.91	0.85	0.95	0.92	0.87	0.86
EM with calibration	1.00	1.03	1.08	1.12	1.00	1.00	0.93	0.84	1.00	0.96	0.91	0.90
Italy												
EM	0.98	1.01	1.00	1.00	0.96	0.97	0.98	0.91	0.98	0.96	0.96	0.94
EM with calibration	1.00	1.03	1.02	1.02	1.00	1.01	1.02	0.95	1.00	0.98	0.98	0.96
Latvia												
EM	0.92	0.97	1.11	1.10	0.99	0.94	0.94	0.94	0.98	0.99	0.97	0.95
EM with calibration	1.00	1.05	1.20	1.20	1.00	0.97	0.99	1.02	1.00	1.00	0.98	0.97
Lithuania												
EM	0.94	1.00	1.17	1.11	0.98	0.93	0.86	0.90	0.98	0.94	0.88	1.01
EM with calibration	1.00	1.05	1.22	1.16	1.00	0.92	0.85	0.86	1.00	0.95	0.88	1.01
Portugal												
EM	1.04	1.06	1.04	1.09	1.07	1.09	1.06	1.05	0.98	0.98	1.03	1.01
EM with calibration	1.00	1.02	1.00	1.04	1.00	1.03	1.02	1.02	1.00	1.01	1.05	1.03
Romania												
EM	0.99	1.07	1.09	1.05	1.01	1.05	1.12	1.03	0.98	1.02	1.05	1.04
EM with calibration	1.00	1.07	1.10	1.05	1.00	1.06	1.11	1.03	1.00	1.03	1.06	1.05

Note: Years refer to the income reference period. “EM” stands for EUROMOD simulation results.

[8] A small discrepancy still remains in some cases because: (1) EUROMOD uses the 2nd version of the EU-SILC, while EUROSTAT the most recent version; (2) total population in EUROMOD is slightly smaller than in the EU-SILC because children born after the income reference period are not included; (3) estimates are rounded.

[9] In these calculations no adjustment is made to the calibration factor for income growth over the period. Results adjusted for income growth using the simulated change in the median are only marginally different from those presented in Table 1, and therefore are not reported here.

Use of the calibration factors brings the EUROMOD estimates in line with the UDB SILC for 2007. However, the same adjustment for 2008-2010 does not always move EUROMOD results closer to the Eurostat SILC indicators. Adjustment is based on the assumption that EUROMOD deviates from the EU-SILC in the same way across the years. However, this is not the case for some of the countries where macroeconomic conditions, poverty and income inequality indicators exhibited high volatility over 2007-2010, e.g. Latvia and Lithuania. Typically for these countries EUROMOD underestimates median household equivalized disposable income in 2007 and overestimates it in 2008-2010. Calibration increases the over-estimation.[10]

For many of the other countries, calibration based on 2007 brings EUROMOD median closer to that estimated by Eurostat from the SILC for 2008-10, or makes no difference. Calibration generally improves to some extent the evolution of EUROMOD poverty and inequality indicators relative to SILC. There are small increases in the discrepancy between the two estimates of the Gini coefficient in Portugal and Romania but for the headline at-risk-of-poverty indicator the discrepancy in 2010 is narrowed in all cases except Lithuania.

However, some large discrepancies remain in several countries even after calibration. In all countries median incomes in 2010 are over-estimated by EUROMOD, in spite of calibration. This is most obvious in countries experiencing severe economic downturns in this period: the Baltic countries and Spain. The effect is less strong for Greece, Italy and Portugal. Risk-of-poverty is under-estimated by around 15 percent in Spain and Lithuania and inequality (Gini coefficient) is also underestimated for Estonia, Spain, and Italy. Tables A3 and A4 in Annex 1show how EUROMOD risk-of-poverty rates for population sub-groups diverge in 2010 from those measured using the EU-SILC. This applies particularly to elderly people in the Baltic countries, Spain and Romania. The next section considers whether adjusting for labour market change reduces these discrepancies.

[10] For Latvia and Lithuania 2007 was an exceptional year of high economic growth. It is very different from the following years 2008-2012. Therefore, alignment of income based on 2007 baseline does not move EUROMOD results closer to the EU-SILC in 2008-2010. Adjustment for changes in the labour market play more important role over this period of time (see section 4). However, if alignment to the EU-SILC is performed in a more stable time period, e.g. using 2009 as a baseline, the results are likely to improve.

4. Labour market change

There are two basic methods of adjusting micro-data for labour market change, each with its advantages and disadvantages. The first, re-weighting, involves re-calculation of cross-sectional weights to incorporate changed numbers of employed, unemployed etc., while holding other dimensions constant or allowing them to shift if information is available on how they should shift. The method is sometimes known a "static ageing" (Immervoll et al., 2005). The second method introduces an element of dynamic change into the static microsimulation approach, by explicitly simulating the transitions between labour market states.

Both approaches need timely and consistent data on labour market change and in this case we rely on information from the EU Labour Force Survey (LFS). Either approach needs to address the fact that labour market concepts do not align perfectly between the SILC and LFS and in particular that EUROMOD defines labour market status using information on income sources (2007) not 2008 status information, for internal consistency. Furthermore, the most up-to-date source of LFS information is the aggregate statistics published by Eurostat, which are made available quarterly. At the time of writing the most recently-available statistics are for 2012 Q3. These provide estimates by three sets of characteristics: age group, gender and education level (a total of 18 strata). An alternative would be to make use of LFS micro-data, which would allow for a greater choice of characteristics (industrial sector, region and labour market history being among the most relevant for risk of unemployment; household composition and duration of unemployment being the most relevant for the implications for household income) in combination with information on labour market transitions. Moreover, a multivariate econometric estimation of the probability of each individual labour market transition might provide a better prediction than the strata-based approach described below (Fernandez Salgado et al., 2012; Avram et al., 2011). However, LFS micro-data are available from Eurostat with a greater time lag than the published statistics. National LFS micro-data may be available more quickly in some cases but in others they are subject to greater delay and in others they are not available at all. Therefore there is a trade-off between the extent to which the nowcast is based on up-to-date information, and the relevance of the information itself. In this paper we use published statistics. For illustrative purposes we use 2007-2011 annual statistics and an average of the last four quarters (2011Q4-2012Q3) for 2012. We return to the issue of timely estimates in the concluding section of this paper.

4.1. Re-weighting

Re-calculation of household weights so that the weighted numbers of employed, unemployed and inactive by characteristics (age group, gender and education level) could provide a basic adjustment for such changes (Dolls et al., 2012; Immervoll et al., 2006). In order not to distort the distribution of other characteristics (number of children; population by region etc), these would need to be controlled for in the calculation of the new weights. However, because the precise method and information used to construct the original SILC weights is not known in all countries, this needs to be done by choosing the dimensions to control and deriving the corresponding control totals from weighted SILC micro-data.

The main disadvantage of this approach, in the context of a rapidly changing labour market, is that it assigns the characteristics of the "old" (2007 in this case) unemployed to the "new" unemployed (and of the old employed to the new employed). To the extent that the 2007 unemployed were long-term unemployed this will under-estimate the numbers of new unemployed in receipt of unemployment insurance benefits and over-estimate the extent to which incomes are lowered by unemployment.

Another general disadvantage of re-weighting is that it can result in very high weights for some observations which can distort the results of simulations affecting dimensions not controlled for.

While aggregate statistics and indicators can be straightforwardly calculated using the new set of weights, it is not possible to identify the effects on individuals or households who experience a change. For example, one cannot compare incomes before and after a labour market transition in order (for example) to calculate replacement ratios.

In this paper the method of explicitly modelling labour market transitions is used to nowcast the labour market situation.

4.2. Explicit simulation

Explicitly selecting people in the 2007 data to move from employment or self-employment to unemployment (and, where relevant, vice versa) allows the detailed tax-benefit implications to be captured in EUROMOD.

We build on the approach to adjusting for changes in employment status in the EUROMOD data used by Figari et al (2011). This involved the matching of observations for the new unemployed in the EU Labour Force Survey (EU-LFS) and EUROMOD data. In the current exercise the aim is to align the EUROMOD employment rates with the most recent statistics. The changes in employment between 2007 and 2012 were modelled, with 2007-2011 employment numbers based on the annual EU-LFS figures, and using an average of the last four quarters (2011Q4-2012Q3) for 2012. Employment adjustments were implemented in three stages described below: modelling employment transitions, modelling long-term unemployment and adjusting other labour market characteristics in the EUROMOD data.

When modelling employment transitions sample units considered at risk of transition out of employment[(11)] or into employment[(12)] in each country were defined and arranged into 18 strata based on the following characteristics associated with employment transitions: age (3 groups), gender and education (3 levels). The change in employment rates was modelled by randomly selecting observations to be moved out of employment or into employment within each stratum, the probability of selection being equal to a relative change in employment rate within strata according to the EU-LFS statistics during the period in question. Cross-sectional household weights were used for controlling modelled change in employment in the EUROMOD data so that it corresponds to that indicated at the population level by the EU-LFS statistics.

As explained above, EUROMOD defines labour market status using information on income sources (2007) for internal consistency reasons. In order to align EU-SILC based estimates of employment indicators with those derived using LFS data the weighted average number of months in work per person per year was taken into consideration.[(13)] Discrepancies in initial (2007) employment rates in EUROMOD and LFS data for the modelled countries on average amount to 3.6 percentage points. Table A5 in Annex 1 shows the relative percentage change in employment rates modelled within each stratum. Given the difference in the way labour market status is measured in the two sources, the aim was to correct for the relative change in employment, rather than matching the EUROMOD and LFS labour market patterns in absolute terms.

Figure 1 shows the effect of adjustments on the EUROMOD/LFS ratio of the employment rates. It shows how modelling employment transitions results in stabilization of EUROMOD/LFS ratios of employment rates (underlying data are provided in Appendix Table A6).

Deviations of the adjusted EUROMOD/LFS employment statistics in 2012 as compared to the base year are due to several main factors: differences in EUROMOD/LFS structure of the working age population in the base year; changes in the demographic structure beyond the base year which are not captured in EUROMOD; breaks in the LFS employment data between 2007-2012 (e.g. in Portugal); employment changes in small stratum that were ignored due to data reliability issues (e.g. in Estonia, Latvia, Lithuania). Despite of the limitations, the stabilizing effect of modelling employment transitions is considerable, especially where employment levels dropped most between 2007-2012 (e.g. Greece, Spain,

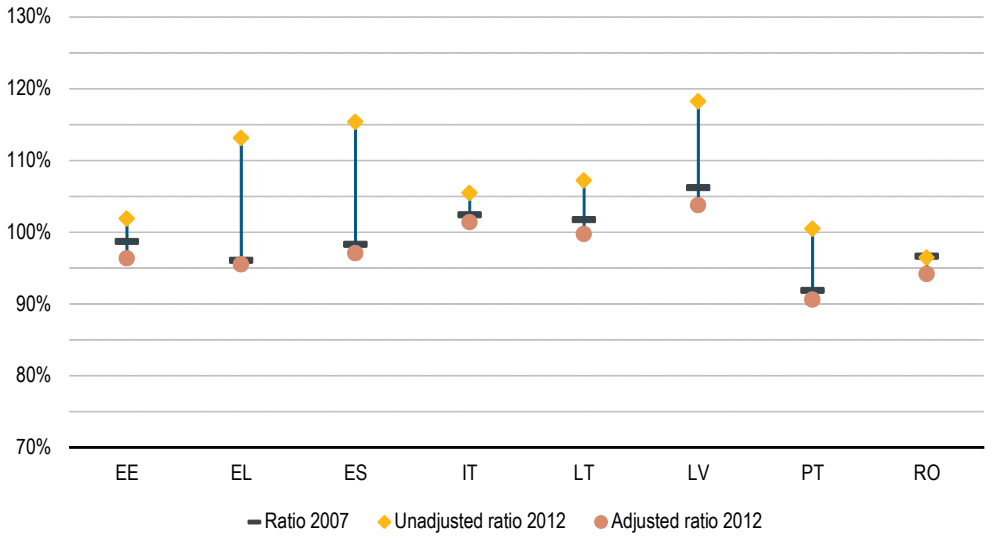
(11) Those at risk of transition out of employment were defined as employed people aged 15-74 with no unemployment spells during the observed period and who were not students, except if they were also working for the whole year.

(12) Those at risk of transition into employment were defined as people with no (self) employment income aged 15-74 with no employment spells during the observed period, whose status in not disabled. Women with children under two years old, pensioners, full-time students and those defined as inactive in the data were sorted to the end of the sample when selecting new employed – thus reducing their probability of transition.

(13) In LFS employed persons are persons aged 15 and over (16 and over in ES, UK and SE (1995-2001); 15-74 years in DK, EE, HU, LV, FI, NO and SE (from 2001 onwards); 16-74 in IS) who performed work, even for just one hour per week, for pay, profit or family gain during the reference week or were not at work but had a job or business from which they were temporarily absent because of, for instance, illness, holidays, industrial dispute, and education or training (Eurostat, 2006).

Latvia, Portugal and Lithuania).

Figure 1: The EUROMOD/LFS ratio of employment rates in the base year and 2012 with and without labour market adjustments



Source: Employment rates - LFS series (lfsa_emprt), calculations based on EUROMOD simulations. Employment rates for 2012 calculated as an average of 2011Q4-2012Q3 data.

Not all the people moving into unemployment who were entitled to unemployment benefits at the start of their spell will still be entitled by 2012. Corrections for long-term unemployment were implemented in order to account for disparities in the growth of unemployment and the numbers of actual recipients of unemployment insurance and/or assistance benefits. Long-term unemployment is measured in the LFS as the number of people who are out of work and have been actively seeking employment for at least a year (Eurostat, 2006).The long-term unemployment rate was modelled up to 2011 and kept constant for 2012 due to lack of more recent statistics.

The method to correct for the long-term unemployment is similar to that implemented for modelling changes in unemployment itself. Within each of 6 strata (based on age group if under 65 and level of education: gender was not used due to sample size restrictions) the unemployed were randomly selected to be long-term unemployed, according to the probability of this within the stratum as given by the EU-LFS statistics during the period in question.[14]

Finally, relevant characteristics of observations selected to be moved out of or into employment were adjusted as follows. Employment and self-employment income for the newly unemployed was set to zero and for the newly employed was set to mean employment income among those employed within the same stratum. Household income was re-calculated using EUROMOD, taking account of the changed employment status and sources of income for the individuals being put through a transition. In particular, entitlement to unemployment benefit was calculated using information on earnings and other relevant characteristics in the SILC data. For those deemed long-term unemployed (for one year or more) the rules in each country regarding duration of unemployment benefits were taken into account. Additional country specific adjustments were implemented in order to simulate transitions between unemployment insurance, assistance and temporary unemployment protection schemes in Spain and into the wage supplement scheme in Italy. In both cases national administrative statistics on benefit recipients were used to adjust

[14] Cross-sectional household weights were used for controlling the number of long-term unemployed in each stratum in the EUROMOD data. Unreliable cells within the core age group were aggregated to reach minimum data reliability levels. See Appendix Table A7 which shows modelled long-term unemployment as a percentage of the total unemployment by age and educational level, as well as the total long-term unemployment rate (proportion of unemployed who are long-term unemployed) in each country for the most recent year.

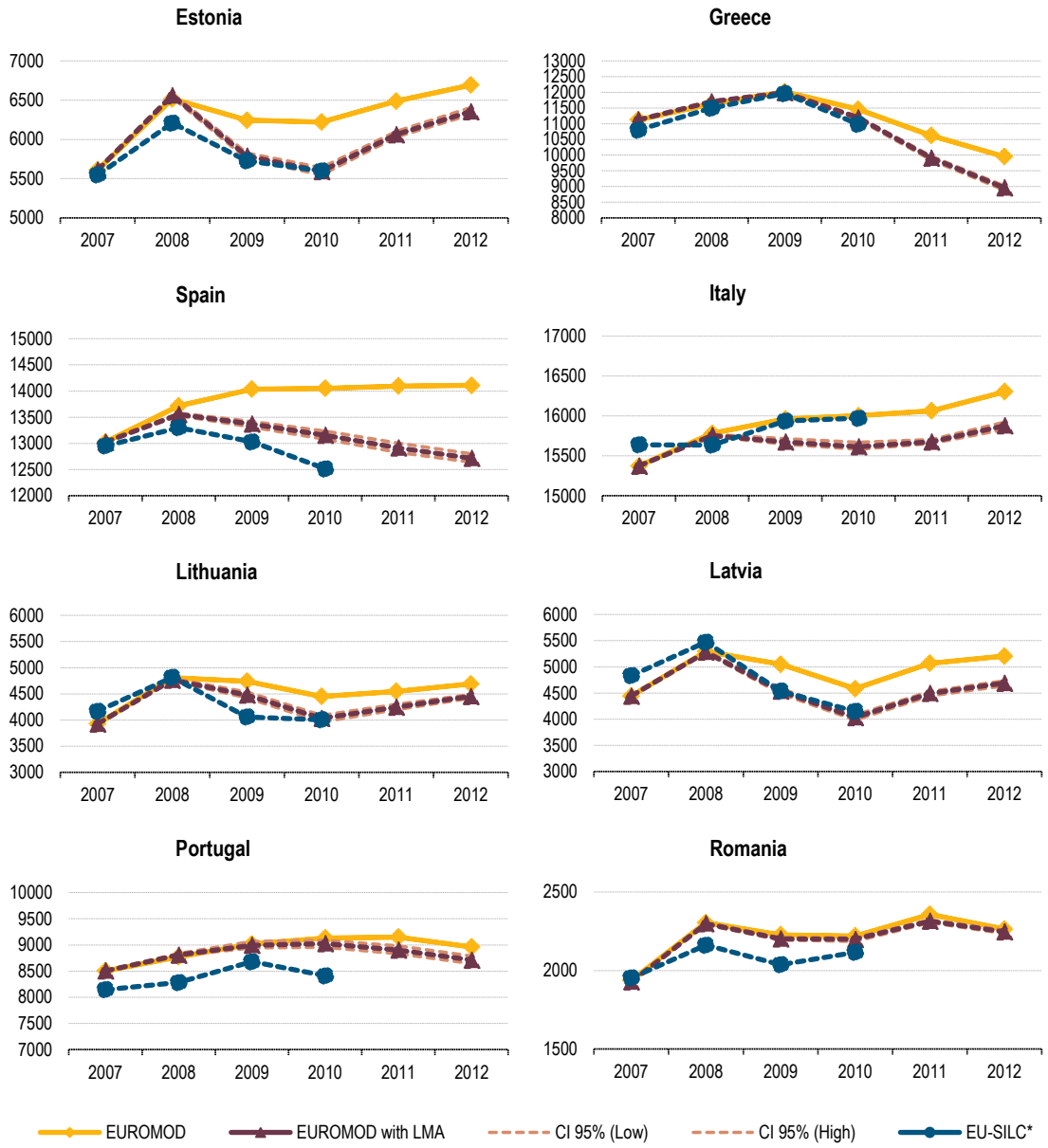
the input data.

The selection of individuals to make a labour market transitions and to be long-term unemployed are based on random assignment within any of the age-gender-education strata. Different selections will result in different effects on household income and on the nowcast indicators because of the wide range of factors that influences the result. Repeated random draws of these selections allows the extent of uncertainty to be assessed and for the nowcast to make use of the mean value from many estimates. Two hundred replications were carried out and Figure 2 shows the mean value of median equivalized disposable income, and the confidence interval (95% confidence level). This can be contrasted with the EUROMOD estimate without any labour market adjustment and (for the earlier years) the Eurostat statistic using SILC data for the corresponding income year.

Figure 2 shows a downward impact of employment adjustments on the median income in all countries, with a magnitude of change that differs across countries in a way that corresponds well with the relative magnitude of changes in the labour market indicated by Figure 1. The relative change in the number of employed over the years was highest in Greece, Spain and Latvia, and smallest in Romania (see Figure A1 in Annex 1). While employment adjustments bring EUROMOD estimates of median equivalized household disposable income closer to those reported based on EU-SILC in most cases, the adjustment does not lower the median sufficiently in Spain or Portugal, and does so too much in Italy (see Figure 2). In the other cases the adjusted estimate is close to that shown by the SILC for 2010 incomes. In all cases the confidence interval around the median resulting from the selection of those moving out of or into employment, is narrow.

Figure 3 shows the implications for the headline risk of poverty rate (using 60% of median, as shown in Figure 2, as the threshold) of the labour market adjustment. For more detailed results see Annex 1, Tables A8a and A8b.

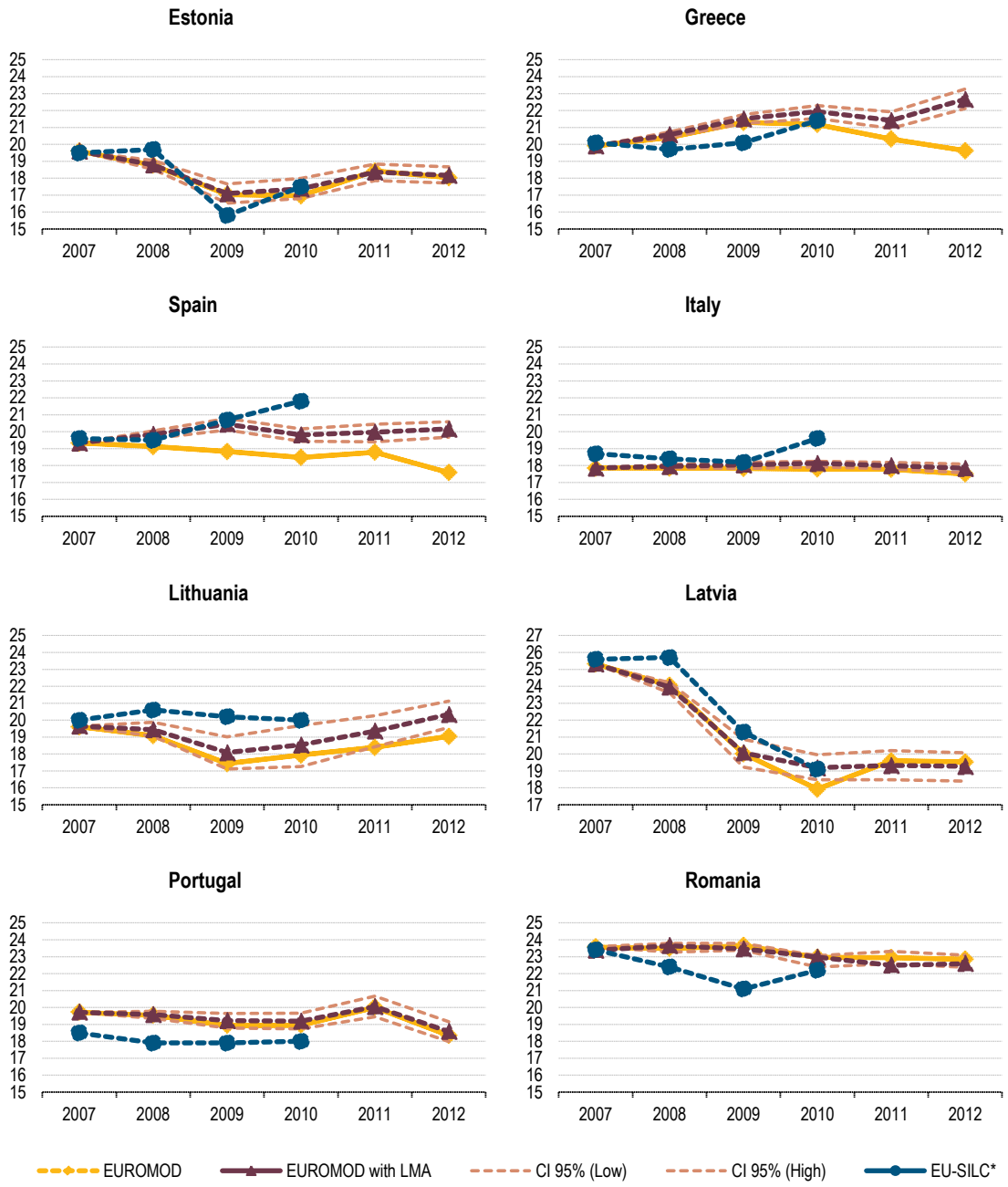
Figure 2: Median equivalized household disposable income using EU-SILC and EUROMOD with and without labour market adjustment



Notes: In Euro per year. Note that the charts are drawn to different scales and the gridline interval is always €500. Confidence intervals are due to a random element in the simulation of employment transitions and do not account for sampling variability.

* EU-SILC (ilc_di03) numbers are lagged by one year to correspond to the income reference year

Figure 3: Risk of poverty rates using EU-SILC and EUROMOD with and without labour market adjustment (threshold: 60% of median)



Note: See Appendix table A8a and A8b for more details. Confidence intervals are due to a random element in the simulation of employment transitions and do not account for sampling variability. * EU-SILC (ilc_li02) numbers are lagged by one year to correspond to income reference year

The width of the confidence interval around the EUROMOD estimate with labour market adjustment in Figure 3 shows that the effect of these adjustments on the risk of poverty rate is more uncertain than the impact on the median. As explained above people are selected at random within groups defined by gender, age group and education level to leave employment (or to enter it). These characteristics are associated to some extent with the risk of the person making the transition falling below (or rising above) the poverty threshold. But they are not sufficient to determine it. For example, a young woman with low educational qualifications may be at great risk if she lives alone or is a single parent and has not accumulated the right to unemployment insurance. But a similar woman qualifying for unemployment insurance benefit with a partner remaining in work and no dependent children faces a much lower risk. Averaging over many sets of selections provides a better indication of the likely effect than using just one. But it also highlights the degree of uncertainty. This is particularly large (shown at the 95% level) in Lithuania and also Latvia and non-negligible in all countries except Romania and Italy where the labour market adjustment is anyway small.

The labour market adjustment has a rather small effect on the EUROMOD risk-of-poverty estimates in Estonia and Portugal as well as Romania and Italy. It also makes only a small difference in Latvia, except in 2010. In Greece, Spain and Lithuania the adjustment results in higher estimates of the risk of poverty rate, in Spain and Lithuania, not as high as those recorded in the SILC (up to 2010) but in Greece suggesting a somewhat higher poverty rate than that observed.

In some countries the employment adjustment helps to simulate more accurately changes in the risk of poverty rates in sub-groups of population (see Tables A8a and A8b in Annex 1). In Estonia for example, employment adjustments help to simulate more accurately changes in the risk of poverty rates among the elderly population (age 65+), due to the correction in the median. For example the Eurostat SILC estimate of the at-risk-of-poverty rate using 2010 income is 13.1%. Without the adjustment the EUROMOD estimate is 25.3%. With the adjustment this falls to 13.5% (with a fairly wide confidence interval of +/- 0.8 percentage points). In general, however, the effect on sub-groups is mixed, relative to the SILC measures.

Clearly, accounting for the changes in labour market that are captured does not automatically align the statistics. The main sources of differences between the EUROMOD and EU-SILC based estimates were discussed in part 2 of this paper; obviously change in the labour market is but only one of them. In particular, the results for Portugal show that both the median and the risk of poverty estimates are too high using EUROMOD, relative to SILC, and the labour market adjustment makes little difference. Combining this with calibration to the SILC, as explained in section 3 seems like a promising direction to take. The effect of this is reported in section 6.

5. Demographic and compositional change

Currently the information on demographic characteristics of individuals, and the grouping of those individuals into households that is needed for EUROMOD simulations (e.g. age, marital status, household composition), is taken directly from the EU-SILC data and kept constant for subsequent policy years. Adjustments to original variables are kept to a minimum, except for some manipulations to align demographic, labour and socio-economic information with the income data reference period. These include dropping children born after the income data reference year from the input micro-data.

The demographic structure we observe in the SILC data used for simulations typically refers to the current situation lagged by about three years. Except in exceptional circumstances this should not pose a problem when simulating policy changes within a short-term time frame, as major demographic or compositional shifts are unlikely.

It is possible that in times of rapid economic change the effects of economic (return) migration or household (re-)formation might be large enough to have an impact on nowcast results. It is also possible that at any time fertility "bubbles" in the medium-term past (e.g. at the height of a boom) may need to be accounted for in the age structure of children. In such cases the appropriate methodology is re-weighting as an explicit simulation would require the full power of a dynamic microsimulation model.

Re-weighting for this kind of change requires up-to-date information on the dimensions to be changed. Further work is required to establish whether such information exists, how up-to-date and comparable across countries it is and whether it is available in a form that is consistent with corresponding variables in the EU-SILC. Experiments are needed to explore the effect of controlling for some dimensions (e.g. age and sex) while ignoring or holding constant others that may be equally as important (such as numbers of households with large numbers of children or "adult" children living with parents) but for which independent and up-to-date data are unlikely to be available. In this paper we assume demographic and household characteristics remain as in SILC 2008. It is worth noting therefore, that the 4-5 year lag used in the illustrations in this paper may in fact be vulnerable to relevant shifts in characteristics.

6. The nowcast

In order to nowcast median income, inequality and poverty statistics up to 2012 using 2008 EU-SILC we apply both labour market adjustments and calibration to the 2008 SILC incomes, in addition to the standard EUROMOD income updating and simulations of 2008, 2009, 2010, 2011 and 2012 policies.

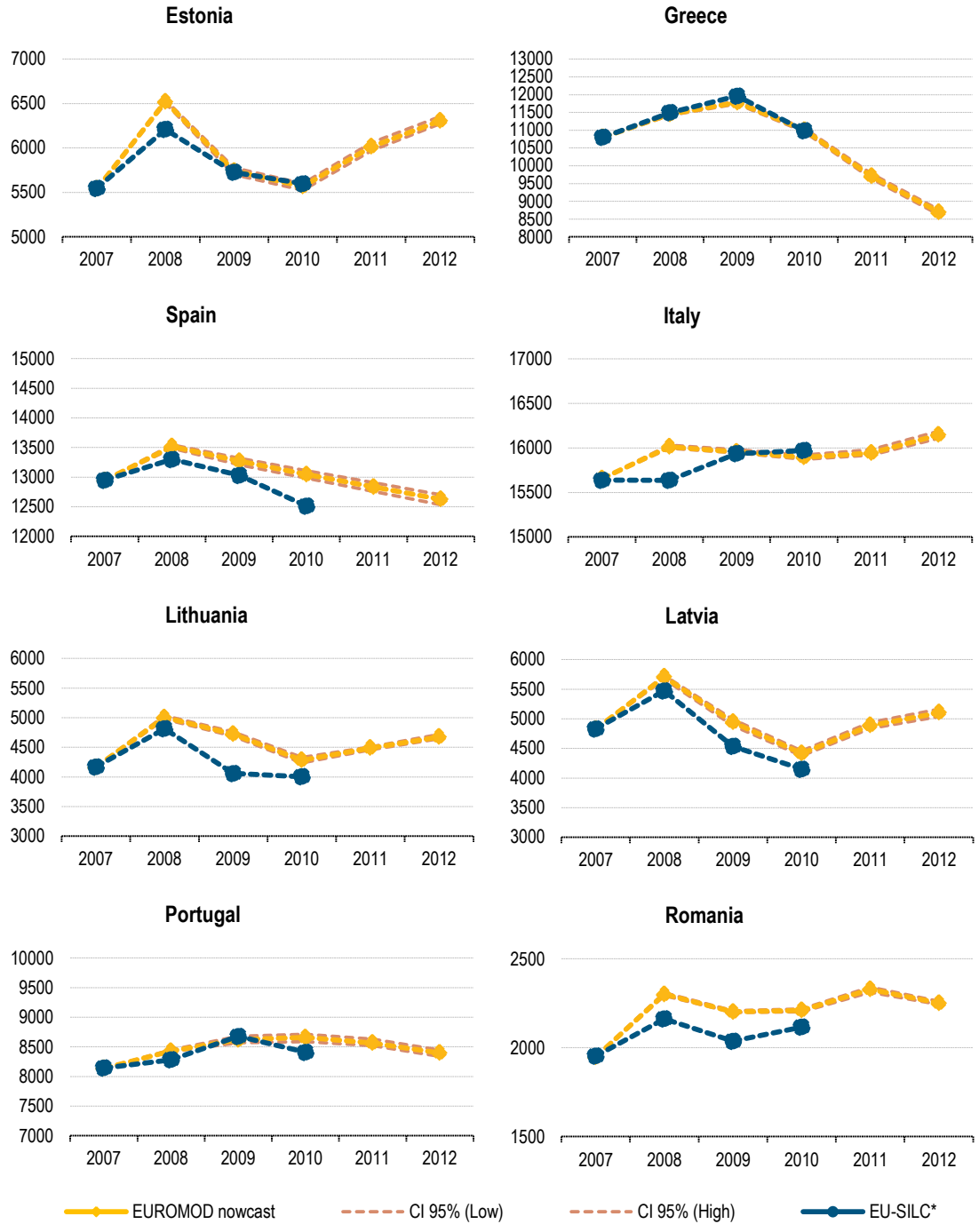
Figure 4 shows the evolution of median equivalized disposable income and Figure 5 shows the nowcast risk of poverty rate (using 60% of median as the threshold). Also shown are the Eurostat estimates using the EU-SILC for the income reference years.

The nowcast values of the median in Figure 4 track the SILC values up to 2010 quite successfully in Estonia, Greece and Portugal. In Lithuania and Latvia the nowcast does not fully reflect the SILC drop in the median partly because the calibration to 2007 SILC involves an increase in income that was not sustained into the downturn. In Spain, calibration has little effect but still the labour market adjustment does not fully capture the reduction in the median as revealed by the SILC. In Romania, where the changes are small the nowcast (and indeed EUROMOD without adjustments) performs reasonably well. The Italian results for median income show different trends compared to SILC statistics in 2008-2009, and stabilize in 2010.

For the two most recent years, when the nowcast is the only information currently available, we estimate an increasing median in Estonia, Latvia and less strongly in Lithuania and Italy in 2011-2012. In Portugal the median only starts falling in 2011 (the 2010 reduction revealed by the SILC not being captured by the nowcast). In Greece it falls steeply, continuing the trend since 2009. In Spain the median falls in both 2011 and 2012.[15]

[15] It should be noted that these 2011 and 2012 estimates are nowcasts of what will be shown by the SILCs of 2012 and 2013 respectively; the years refer to the income reference period.

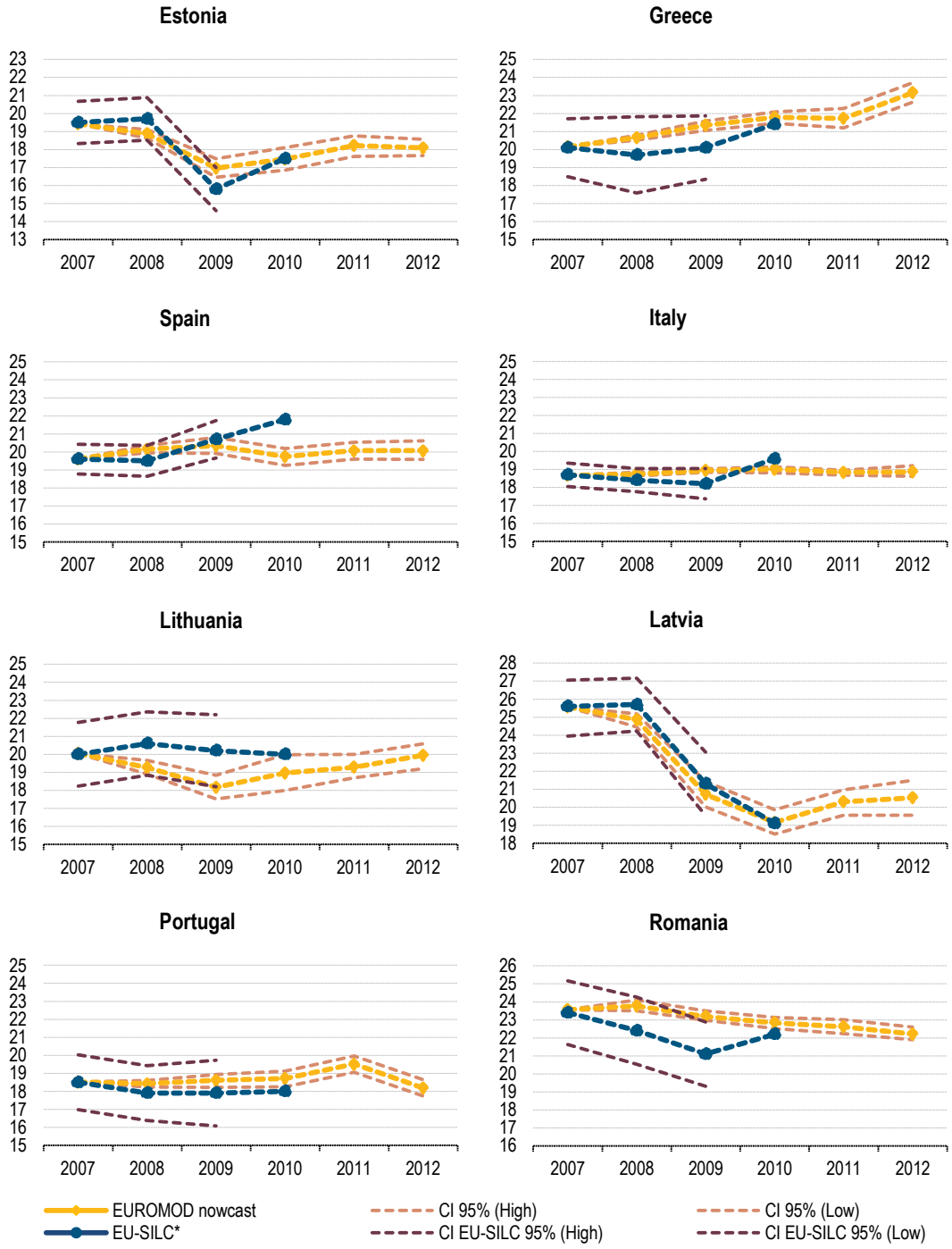
Figure 4: EUROMOD 2007 and nowcast 2008-2012: Median equivalized disposable income



Notes: In Euro per year. Note that the charts are drawn to different scales and the gridline interval is always €500. Confidence intervals are due to a random element in the simulation of employment transitions and do not account for sampling variability.

* EU-SILC (ilc_di03) numbers are lagged by one year to correspond to the income reference year

Figure 5: EUROMOD 2007 and nowcast 2008-2012: At risk of poverty rates (using 60% median as the threshold)



Note: * EU-SILC (ilc_di03) numbers are lagged by one year to correspond to the income reference year.

Confidence intervals for EU-SILC estimates of at risk of poverty rates are constructed based on the standard errors provided in Comparative EU Intermediate Quality Reports for EU-SILC 2008-2010 (Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/quality/eu_quality_reports). Confidence intervals for our estimates are due to a random element in the simulation of employment transitions and do not account for sampling variability.

Figure 5 shows that the nowcast up to 2010 captures the dramatic reduction in risk of poverty shown in the SILC for Latvia rather well. It also tracks quite closely the evolution of risk of poverty over the period in Estonia (where it fell and then rose again) and in Portugal.

On the other hand in Lithuania where the SILC indicator stays roughly constant, the nowcast shows a decline in 2009 and then a slight recovery; in Spain, Romania and Italy the nowcast does not capture the large increase in risk of poverty rates in 2009-2010 picked up by the SILC.

In the nowcast period of 2010-2012 EUROMOD shows little change in risk of poverty in most of the countries. Exceptions are a continuing rise in Greece and Lithuania, a reverse of direction from falling to rising in Latvia and a reduction (2011-12) in Portugal.

Results of the simulations for 2012 incomes are presented in detail in Table A10 in Annex 1. We compare these with results for 2010 (corresponding to the income year of the latest Eurostat SILC statistics) in Table A9. The nowcast is summarised in Table 2 which shows the change in each indicator since the latest Eurostat SILC-based estimate. It also applies this change to the latest Eurostat estimate, to show the nowcast values for 2012.

The nowcast suggests that average incomes in 2012 are higher than in 2010 in the three Baltic States, Romania and Italy, but have fallen in Spain, Portugal and especially Greece (see Table 2). Nowcast changes in inequality are generally small although the Gini coefficient has risen by 3 percentage points in Greece and fallen by about 1.4 percentage points in Portugal. In spite of the large reduction in the poverty threshold in Greece the headline poverty rate does not fall.[16] However, the nowcasts for population sub-groups reveal that poverty risk is estimated to have risen for children and prime age adults (by about 4 percentage points) and to have fallen dramatically for elderly people (by nearly 9 percentage points). This is because pensions have been frozen while other incomes have been falling in nominal terms.

In contrast, in both Estonia and Latvia as median income rise, the headline risk of poverty indicator also increases somewhat. In these countries the rise is particularly large for elderly people because of a combination of pension growth lagging behind that of other incomes and a concentration of elderly people with incomes around the poverty threshold. In both countries risk of poverty rises by more for women than men. This partly reflects the gender composition of the older population and also a return to the pre-crisis trend of the male population being less exposed to poverty in the Baltic countries – a direction of change that is not unexpected given the resumed growth in original income. In Lithuania the direction of change is also an increase in poverty, particularly for children where the risk-of-poverty rate is estimated to have risen by almost three percentage points. This is due to a combination of several factors, including policy measures such as tightening of eligibility conditions and reducing the levels of contributory and non-contributory family benefits, and the social assistance benefit for large families. On the other hand restoration of contributory pensions to their pre-crisis levels in Lithuania in 2012 makes the difference to poverty levels among the elderly, in particular if compared to Latvia where pensions are still frozen.

In Portugal and Spain, reductions in risk of poverty are estimated among the elderly (by about 2 and 4.5 percentage points respectively) while the headline indicator is estimated to change only a little in both countries. However while in Portugal risk of poverty rates remain relatively stable for other age groups, increase in risk of poverty rates among children and prime-age population is expected in Spain. In both cases earnings fell relative to pensions in this period (see Annex 2, Tables A12 and A13). Changes are small in Romania and Italy.

[16] It rises a little but the increase is within the confidence interval for the labour market-adjusted risk of poverty rate shown in TableA8a.

Table 2: Nowcast estimates of income, income inequality and risk of poverty for 2012

	Income, inequality				Poverty rates (60% of median)					
	Mean	Median	Gini	S80/ S20	All	Males	Fem-ales	Children (<18)	Prime-age	Elderly (65+)
Estonia										
Nowcast change	12.5%	13.3%	-0.46	-0.21	0.62	-0.77	1.80	-1.77	-1.57	9.79
Nowcast level 2012	7,394	6,340	31.4	5.1	18.1	16.8	19.2	17.7	14.3	22.9
Greece										
Nowcast change	-22.1%	-21.0%	3.06	3.04	1.38	1.85	0.91	3.94	4.08	-8.95
Nowcast level 2012	9,846	8,683	36.7	9.0	22.8	22.8	22.8	27.6	22.7	14.7
Spain										
Nowcast change	-2.9%	-3.2%	0.60	0.36	0.32	0.65	0.00	1.89	1.47	-4.54
Nowcast level 2012	13,837	12,111	34.6	7.2	22.1	21.8	22.4	29.1	21.9	16.3
Italy										
Nowcast change	2.0%	1.6%	0.14	0.04	-0.19	-0.22	-0.16	-0.10	-0.05	-0.15
Nowcast level 2012	18,425	16,225	32.0	5.6	19.4	18.1	20.6	26.2	19.1	16.9
Latvia										
Nowcast change	15.3%	15.6%	0.74	0.31	1.38	0.23	2.35	-0.28	-0.78	9.20
Nowcast level 2012	5,875	4,796	36.1	6.9	20.5	20.2	20.8	24.7	18.5	18.1
Lithuania										
Nowcast change	7.1%	9.2%	-0.20	0.10	0.98	0.81	1.13	2.82	0.00	1.81
Nowcast level 2012	4,938	4,373	32.7	5.9	21.0	20.6	21.2	27.1	19.8	13.9
Portugal										
Nowcast change	-6.5%	-3.0%	-1.39	-0.28	-0.52	-0.49	-0.55	-0.02	-0.29	-2.25
Nowcast level 2012	9,729	8,155	32.8	5.4	17.5	17.1	17.8	22.4	14.7	17.7
Romania										
Nowcast change	0.8%	1.8%	-0.61	-0.19	-0.63	-0.71	-0.55	-0.80	-0.84	-0.40
Nowcast level 2012	2,432	2,155	32.6	6.0	21.6	21.2	21.9	32.1	21.0	13.7

Notes: See tables A9 and A10 in Annex 1. Household incomes are equivalized using the modified OECD scale. The changes shown are percentage changes in the mean and median and percentage point changes in other indicators. The change is the difference in the EUROMOD nowcast estimates for 2012 compared with that corresponding to the latest available Eurostat SILC estimate (2010 incomes). The estimate of the level of the indicator is calculated by applying the change to the latest Eurostat estimate.

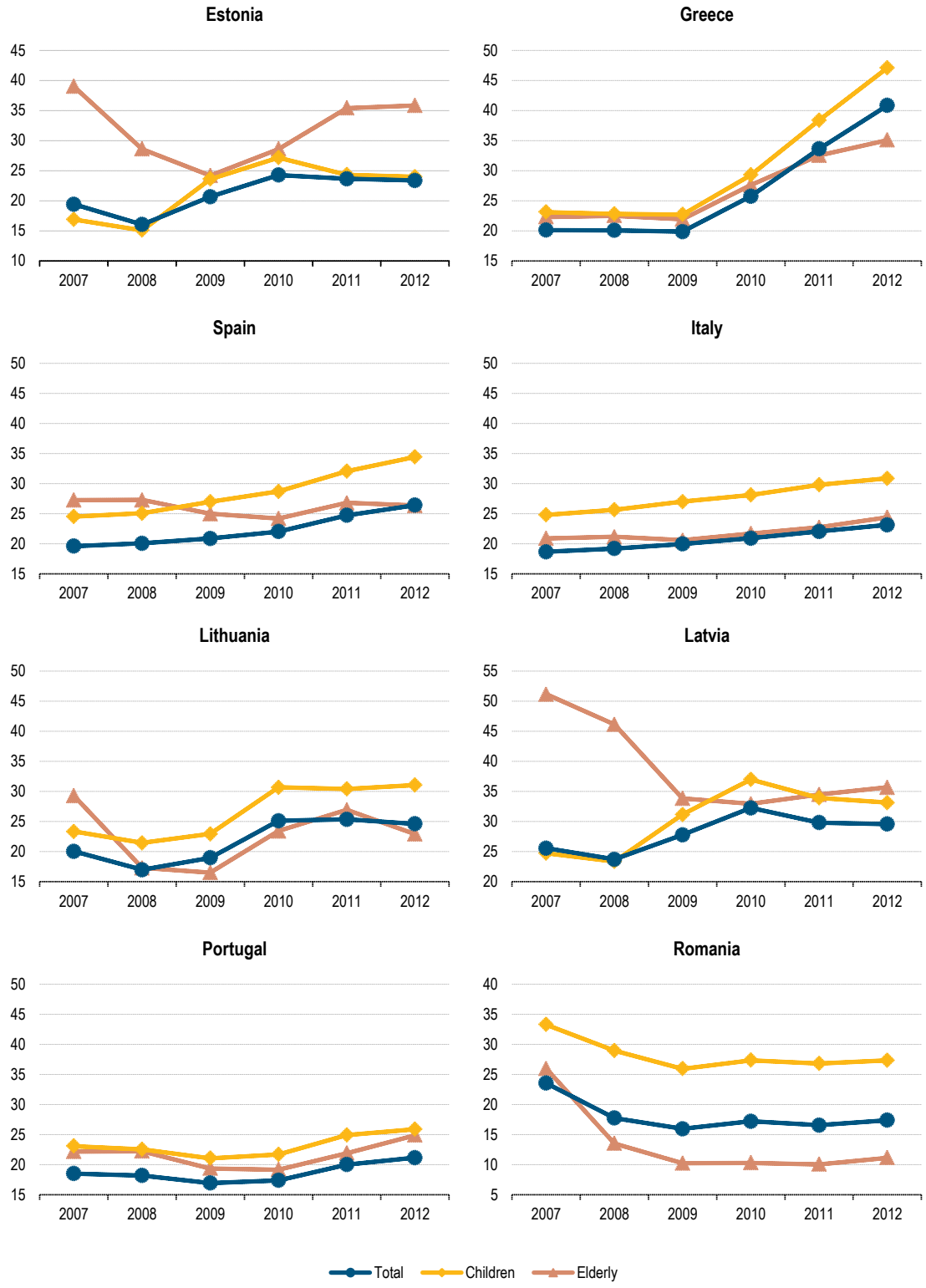
6.1 Nowcasting risk of poverty using a threshold anchored in time

Movement in the median is one of the main drivers of the results we have seen above. It is also of interest to be able to nowcast poverty risk based on a threshold that is fixed at a point in time and indexed according to price movements. To illustrate this, we fix the poverty threshold using 2007 incomes and update it in each year from 2008 to 2012 using the Harmonised Index of Consumer Prices, as given in Table A14 (see Annex 2). EUROMOD estimates for poverty risk using this threshold are shown in Figure 6. The evolution over the period 2007-2012 is shown for the total population and two age groups (0-17 and 65+). Since there are no Eurostat statistics corresponding to this version of poverty risk based on an anchored threshold, we cannot evaluate our results up to 2010 in the same way as our previous results. Instead we can contrast the evolution of poverty risk using a fixed and moving threshold (comparing Figure 6 with the nowcasts in Figure 5) and in particular contrast the direction of movement in poverty risk between 2010 and 2012 using the two thresholds.

Using the fixed threshold generally results in faster rising poverty risk than using the threshold based on the contemporary median because prices have continued to rise while incomes at the median have stagnated or fallen. The effect is most dramatic in Greece with more than 40% of the population estimated to be below the 2007 poverty line, indexed by prices, in 2012. In Lithuania, Latvia and Estonia anchored indicators of poverty risk reveal a common trend which is quite different from the estimates based on floating poverty threshold: risk of poverty falls (rather than rises) in 2008, increases remarkably in 2009-2010 and stabilizes thereafter. In Spain, Italy in Portugal poverty risk is estimated to rise in 2010-2012 based on the fixed threshold rather than stagnate or fall, as shown in Figure 5. Romania is the only

country where the anchored poverty risk indicators are below those shown in Figure 5 throughout 2008-2012: both market income and pension growth rates exceeded inflation within the period, especially in 2008-2009.

Figure 6: EUROMOD 2007 and nowcast 2008-2012: At risk of poverty rates (using 60% of the 2007 median as the threshold)



Note: The poverty threshold is 60% of median 2007 equivalised household income, indexed by the HCPI (see Table A14 in Annex 2).

The evolution of child poverty risk based on the fixed threshold generally follows that of the population as a whole although is rising faster in 2010-2012 in Greece, Spain and Lithuania. In Estonia and Latvia, the opposite is the case: child poverty is falling faster than poverty overall in 2010-2012. The anchored poverty rates reveal that children are considerably worse off in 2012 compared to 2007 in all countries except Romania, with a still increasing trend in Southern Europe: Greece, Spain, Italy and Portugal.

The situation of people aged 65 and over is very volatile in Estonia and Latvia, as discussed above. The poverty risk in these countries still shows an increasing trend for the elderly in 2010-2012 if based on the fixed threshold, however, the increase is smaller than in case the threshold is based on contemporary median. In Greece, Spain, Italy and Portugal poverty risk for the elderly rises in 2010-2012 (rather than falls or stagnates) if based on the fixed threshold.

The brief analysis above shows the potential of the nowcasting exercise to illustrate the implications of policy changes and economic developments on income distribution, inequality and poverty. More detailed analysis of the drivers of change in the estimates may be carried out in order to inform and stimulate policy debates at the national level.

7. Conclusions and future work

Our illustrative nowcast estimates indicate the direction of change in income distribution. Firstly, in three countries average and median income is predicted to fall, including quite sharply in Greece and also in Portugal and Spain. In the three Baltic countries average and median income is predicted to rise, recovering quite sharply in the case of Estonia and Latvia. Secondly, the nowcasts indicate diverse effects on measures of inequality (e.g. rising in Greece and falling in Portugal). Thirdly they show how the risk-of-poverty-rate is likely to change: generally rising in countries with rising incomes (e.g. Baltic countries) but not necessarily falling with falling incomes (e.g. Greece, Spain). We have also shown how children face an increasing risk in countries as diverse in other ways as Lithuania and Greece, and to a lesser extent in Spain. Limiting the growth of pensions results in risk of poverty rising among older people in countries with rising median incomes (Estonia, Latvia) but still allows it to fall in countries with falling incomes generally (Greece, Spain, Portugal).

Removing the effect of a median that falls and then, in some countries, rises again by using the alternative indicator of poverty risk based on the fixed poverty threshold (anchored in 2007 and indexed by prices) results in a prediction of faster rising poverty risk (2008-2012). This shows the extent to which prices have risen faster than household incomes at the median, and among other things indicates how standards of living among those at or near risk of poverty have fallen over the period 2007-2012, except in Romania.

The aim of the work reported here has been to establish a viable method for regularly using EUROMOD for nowcasting the current values of key indicators. Our calculations can be made more **precise and timely** in several ways.

First, we could make use of more recent EU-SILC data in EUROMOD. The aim is to regularly update the input database and 2010 data will be used in all countries by the end of 2013. The work involved in transforming the SILC micro-data into suitable input for EUROMOD is considerable and it will always be the case that there is some time lag between the micro-data being released and a version of EUROMOD making use of these data being ready to use. The time needed for the transformation could be reduced if the SILC design, and UDB content and documentation were modified in ways that would reduce the necessary work (see Annex 3 for some proposals). In addition, there is a time lag between first statistics being published by Eurostat and micro-data being made available. Given all of this, in the future it should be possible to be using income data from t-3 as the basis for a nowcast in year t (equivalent to using the 2010 SILC in 2012).

Secondly, as the method becomes further established we can, to a limited extent, improve the speed of the process by which new estimates are produced.

In addition, there is scope for further exploration and experimentation with the **data and methods**. This might include

- Making use of re-weighting instead of explicit simulation to capture the effects of labour market change; this could include controlling for long-term unemployment.
- Incorporating demographic and compositional changes into the weights, as well as labour market status.
- Improving the updating of market incomes in EUROMOD by increasing the degree of disaggregation (e.g. by updating earnings by sector, region, personal characteristics etc).

The main challenge in each case is in identifying sources of very up-to-date macro-level information on the dimensions of importance with a sufficient level of detail, which also needs to be defined in a way that is consistent with information in the SILC data.

If the nowcast is to be extended to many more countries than the eight illustrated here, or to the EU27 as a whole, then it is not possible to take an *ad hoc* and country-specific approach to finding and using macro-level statistics on which to base the nowcast. These data need to be common in form and

definition, and synchronised in terms of date of release and mode of publication, as are most of the LFS statistics that we have made use of in this paper. The information used on long term unemployment for most countries has to be specifically requested from Eurostat and that for Spain and Italy was extracted from national statistics. Ideally all the data required would be provided from a single database, access to which is provided in a stable and predictable way.

In addition, the precision of EUROMOD estimates can be improved if the design, content and documentation of the EU-SILC UDB micro-data could be made more informative (a) as an input database for a tax-benefit microsimulation model for general purposes and (b) to improve the simulation of incomes following labour market transitions. Annex 3 provides more information.

Finally, we return to the question of whether, having established a method of nowcasting, this could be extended to **forecast incomes in the future**. On the one hand the need to account for sharp changes in the labour market over the last 4 years is an important component of our nowcast but may be less critical for predicting a further 8 years ahead (to 2020, say). On the other hand demographic and compositional changes may matter more in the medium term than they do in the short term. Critically, micro-level forecasts must rely on assumptions or macro forecasts about the economic and demographic conditions in the future. The most important dimensions that require such information are:

- Growth in market incomes by source
- Employment and unemployment levels, by characteristics (ideally household as well as individual)
- The basis of the evolution of tax and benefit policy over time (indexation practice; long-term reform agendas)
- Changes in demographics and household composition.
- Specific characteristics such as patterns of housing tenure or membership of pension schemes.

In some countries there are sufficient data sources and official forecasts and assumptions for attempts to be made to forecast poverty: for the UK see for example Brewer et al. (2011). With a cross-country or EU perspective the challenges of gathering such information on a consistent basis are formidable. However, in the absence of the information for a full forecast, it is possible to build scenarios on the basis that characteristics in most dimensions stay constant, in order to draw out the implications of one or two changes for which information is available or assumptions can be made. In spite of its limitations such an exercise is potentially of great value in understanding progress within the Europe 2020 agenda as it could enable the relative importance of each component (labour market, household composition, demographics, macro-economy and social and fiscal policies) and the interactions between them to be established, and for differences in effects across countries to be identified.

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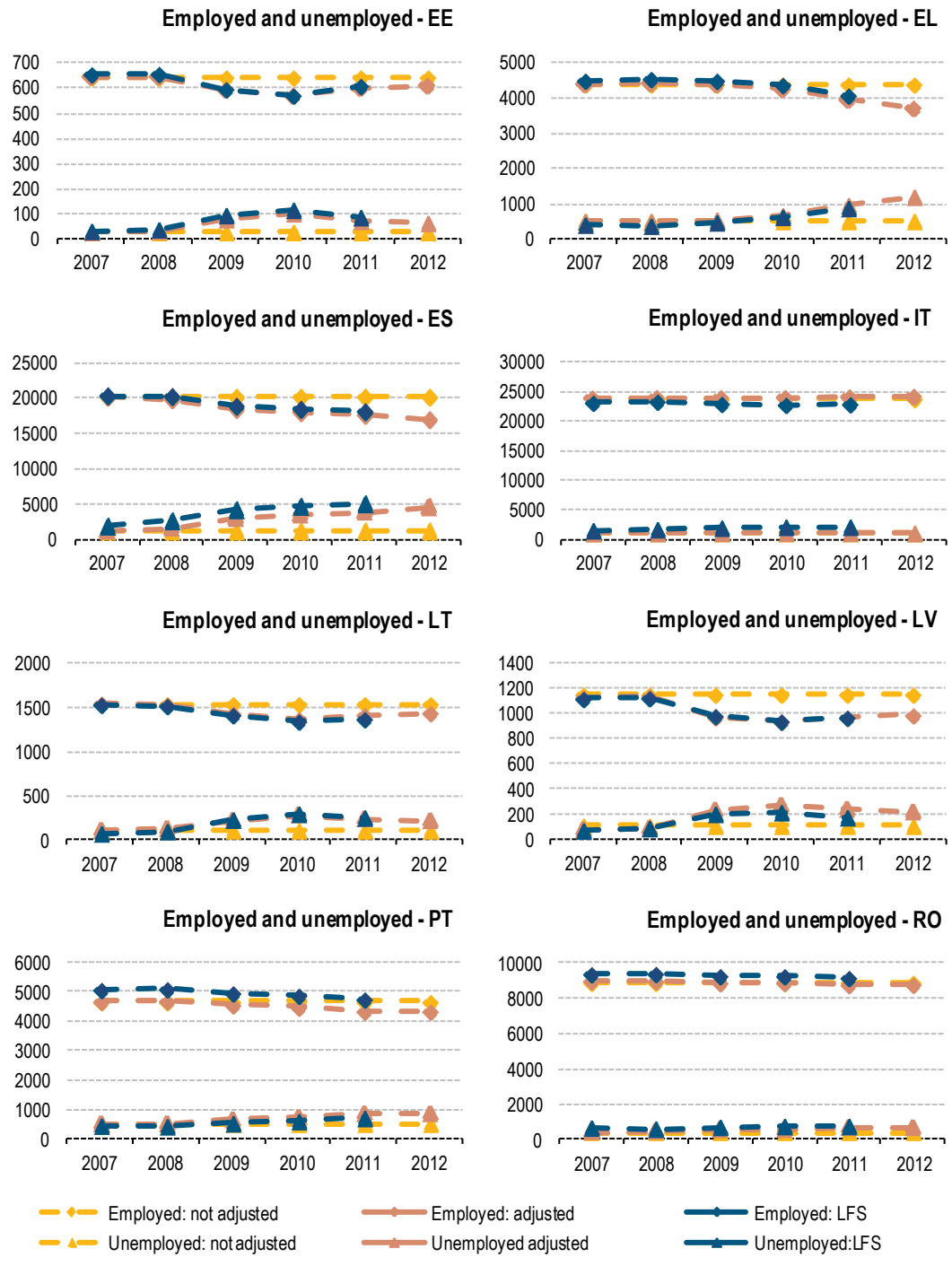
9. Annexes

Annex 1: Data - Figures and tables used in the analysis

Figure A1: Impact of labour market adjustments on the simulated number of employed and unemployed, thousands



Source: EUROMOD simulations, LFS statistics (lfsa_emp, lfsa_unemp)

Table A1: Mean and median equivalized income using EU-SILC and EUROMOD, before and after calibration (2007-2010)

	MEAN equivalized income (annual €)				MEDIAN equivalized income (annual €)			
	2007	2008	2009	2010	2007	2008	2009	2010
Estonia								
EM	6,398	7,422	7,137	7,108	5,611	6,516	6,244	6,221
EM with calibration	6,315	7,339	7,054	7,026	5,542	6,481	6,181	6,153
EUROSTAT	6,333	7,207	6,782	6,570	5,547	6,209	5,727	5,598
Greece								
EM	13,051	13,714	14,209	13,430	11,127	11,630	12,018	11,461
EM with calibration	12,769	13,432	13,927	13,147	10,800	11,389	11,809	11,276
EUROSTAT	12,766	13,505	13,974	12,637	10,800	11,496	11,963	10,986
Spain								
EM	14,429	15,263	15,635	15,595	13,023	13,716	14,035	14,052
EM with calibration	14,579	15,412	15,784	15,745	12,944	13,712	14,011	13,998
EUROSTAT	14,583	14,948	14,747	14,251	12,950	13,300	13,030	12,514
Italy								
EM	17,456	17,860	17,984	18,032	15,373	15,782	15,962	16,005
EM with calibration	17,748	18,152	18,276	18,324	15,656	16,039	16,205	16,269
EUROSTAT	17,734	17,963	18,136	18,056	15,639	15,637	15,937	15,972
Latvia								
EM	5,463	6,563	6,232	5,572	4,442	5,295	5,051	4,583
EM with calibration	5,941	7,040	6,707	6,044	4,826	5,722	5,453	4,976
EUROSTAT	5,942	6,625	5,517	5,093	4,832	5,474	4,537	4,150
Lithuania								
EM	4,630	5,710	5,588	5,299	3,926	4,812	4,742	4,451
EM with calibration	4,931	6,011	5,888	5,600	4,165	5,037	4,967	4,659
EUROSTAT	4,945	5,892	5,017	4,609	4,169	4,815	4,059	4,005
Portugal								
EM	10,693	11,017	11,319	11,417	8,504	8,774	9,016	9,133
EM with calibration	10,288	10,613	10,915	11,012	8,138	8,407	8,640	8,764
EUROSTAT	10,288	10,393	10,540	10,407	8,143	8,282	8,678	8,410
Romania								
EM	2,297	2,695	2,576	2,578	1,937	2,305	2,227	2,220
EM with calibration	2,324	2,719	2,597	2,599	1,954	2,307	2,232	2,228
EUROSTAT	2,323	2,516	2,374	2,413	1,953	2,162	2,037	2,116

Notes: EM – EUROMOD. EUROSTAT – Eurostat statistics based on EU-SILC. Years refer to income reference periods.

Table A2: Gini coefficient and S80/S20 ratio using EU-SILC and EUROMOD, before and after calibration (2007-2010)

	Gini coefficient				S80/S20 ratio			
	2007	2008	2009	2010	2007	2008	2009	2010
Estonia								
EM	30.8	30.2	29.9	29.9	4.9	4.7	4.6	4.6
EM with calibration	30.8	30.2	29.9	29.9	5.0	4.8	4.7	4.7
EUROSTAT	30.9	31.4	31.3	31.9	5.0	5.0	5.0	5.3
Greece								
EM	33.5	33.9	34.2	33.6	5.9	6.0	6.1	6.0
EM with calibration	33.4	33.9	34.2	33.6	5.9	6.0	6.1	6.0
EUROSTAT	33.4	33.1	32.9	33.6	5.9	5.8	5.6	6.0
Spain								
EM	29.7	29.6	29.5	29.2	5.0	5.0	4.9	4.8
EM with calibration	31.3	31.1	31.0	30.6	5.4	5.4	5.3	5.2
EUROSTAT	31.3	32.3	33.9	34.0	5.4	6.0	6.9	6.8
Italy								
EM	30.4	30.2	30.0	30.0	4.8	4.8	4.8	4.8
EM with calibration	31.0	30.9	30.7	30.6	5.1	5.1	5.1	5.0
EUROSTAT	31.0	31.5	31.2	31.9	5.1	5.2	5.2	5.6
Latvia								
EM	37.1	36.9	35.1	33.6	6.9	6.7	5.9	5.5
EM with calibration	37.8	37.3	35.4	34.3	7.3	7.0	6.2	5.8
EUROSTAT	37.7	37.4	36.1	35.4	7.3	7.3	6.9	6.6
Lithuania								
EM	33.4	33.5	32.4	33.1	5.7	5.6	5.2	5.5
EM with calibration	33.9	33.8	32.6	33.3	5.9	5.8	5.3	5.5
EUROSTAT	34.0	35.5	36.9	32.9	5.9	6.3	7.3	5.8
Portugal								
EM	35.0	34.8	34.6	34.4	5.7	5.7	5.6	5.5
EM with calibration	35.8	35.6	35.4	35.1	6.1	6.0	5.9	5.9
EUROSTAT	35.8	35.4	33.7	34.2	6.1	6.0	5.6	5.7
Romania								
EM	35.3	35.4	34.9	34.4	6.6	6.8	6.7	6.4
EM with calibration	36.0	35.9	35.2	34.7	7.0	7.2	6.9	6.6
EUROSTAT	36.0	34.9	33.3	33.2	7.0	6.7	6.0	6.2

Notes: EM – EUROMOD. EUROSTAT – Eurostat statistics based on EU-SILC. Years refer to income reference periods.

Table A3: Risk-of-poverty rate by gender using EU-SILC and EUROMOD, before and after calibration (2007-2010)

	Total				Males				Females			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Estonia												
EM	19.6	18.8	17.0	17.0	16.6	15.9	15.2	15.1	22.2	21.2	18.6	18.5
EM with calibration	19.4	18.8	16.9	16.7	16.4	15.9	15.1	15.0	22.0	21.3	18.4	18.1
EUROSTAT	19.5	19.7	15.8	17.5	16.5	17.5	15.4	17.6	22.0	21.6	16.2	17.4
Greece												
EM	19.9	20.4	21.3	21.2	19.0	19.6	20.6	20.6	20.8	21.2	21.9	21.8
EM with calibration	20.1	20.7	21.1	21.3	19.6	20.2	20.7	21.0	20.7	21.1	21.4	21.7
EUROSTAT	20.1	19.7	20.1	21.4	19.6	19.1	19.3	20.9	20.7	20.2	20.9	21.9
Spain												
EM	19.3	19.1	18.8	18.5	18.1	17.8	17.5	17.3	20.6	20.4	20.1	19.7
EM with calibration	19.6	19.5	19.2	18.4	18.3	18.2	17.8	17.2	20.9	20.8	20.5	19.5
EUROSTAT	19.6	19.5	20.7	21.8	18.3	18.3	20.1	21.1	21.0	20.6	21.3	22.4
Italy												
EM	17.9	17.9	17.8	17.8	16.4	16.4	16.5	16.4	19.2	19.2	19.1	19.1
EM with calibration	18.7	18.7	18.6	18.6	17.1	17.1	17.1	17.2	20.1	20.1	20.0	20.0
EUROSTAT	18.7	18.4	18.2	19.6	17.1	17.0	16.8	18.3	20.1	19.8	19.5	20.8
Latvia												
EM	25.3	24.1	20.0	17.9	23.0	21.6	18.1	17.3	27.3	26.1	21.6	18.4
EM with calibration	25.6	25.0	21.0	19.4	23.0	22.5	18.8	17.9	27.7	27.1	22.9	20.7
EUROSTAT	25.6	25.7	21.3	19.1	23.1	24.2	21.7	20.0	27.7	27.0	21.0	18.4
Lithuania												
EM	19.6	19.1	17.4	17.9	17.6	17.5	16.3	16.7	21.3	20.4	18.4	19.0
EM with calibration	20.0	18.9	17.2	17.3	17.7	16.9	15.6	15.7	22.0	20.6	18.6	18.6
EUROSTAT	20.0	20.6	20.2	20.0	17.6	19.1	20.7	19.8	22.0	21.9	19.8	20.1
Portugal												
EM	19.7	19.5	18.9	18.9	18.7	18.6	18.0	18.0	20.7	20.4	19.8	19.8
EM with calibration	18.5	18.5	18.2	18.3	17.9	17.8	17.5	17.5	19.1	19.1	18.9	19.0
EUROSTAT	18.5	17.9	17.9	18.0	17.9	17.3	17.3	17.6	19.1	18.4	18.4	18.4
Romania												
EM	23.6	23.5	23.6	23.0	22.9	22.8	23.3	22.8	24.2	24.1	24.0	23.1
EM with calibration	23.4	23.7	23.5	23.0	22.4	23.0	22.9	22.5	24.3	24.3	24.0	23.4
EUROSTAT	23.4	22.4	21.1	22.2	22.4	21.4	20.7	21.9	24.3	23.4	21.4	22.5

Notes: EM – EUROMOD. EUROSTAT – Eurostat statistics based on EU-SILC. Years refer to income reference periods.

Table A4: Risk-of-poverty rate by age groups using EU-SILC and EUROMOD, before and after calibration (2007-2010)

	Children (< 18)				Prime-age (25-49)				Elderly (65+)			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Estonia												
EM	16.7	16.1	17.1	17.1	12.5	12.3	13.0	12.9	39.9	36.7	25.5	25.3
EM with calibration	16.9	16.6	17.6	17.6	12.5	12.6	13.0	12.9	39.0	36.1	24.4	23.8
EUROSTAT	17.1	20.6	17.3	19.5	12.5	14.1	13.1	15.9	39.0	33.9	15.1	13.1
Greece												
EM	22.4	22.7	23.4	23.5	17.2	17.5	18.2	18.1	21.2	22.4	23.7	23.2
EM with calibration	23.1	23.4	23.7	24.0	17.9	18.3	18.5	18.8	22.3	23.0	23.8	24.4
EUROSTAT	23.0	23.7	23.0	23.7	17.9	17.9	18.1	18.6	22.3	21.4	21.3	23.6
Spain												
EM	23.6	22.7	22.3	21.8	15.1	14.8	14.4	14.1	27.3	27.6	27.6	26.7
EM with calibration	24.5	23.9	23.5	22.9	15.5	15.1	14.8	14.5	27.3	28.0	27.6	25.2
EUROSTAT	24.4	23.7	26.2	27.2	15.5	16.2	18.6	20.4	27.4	25.2	21.7	20.8
Italy												
EM	23.1	23.2	23.5	23.3	16.3	16.4	16.5	16.4	19.6	19.4	18.9	19.1
EM with calibration	24.8	24.9	25.0	24.8	16.9	17.0	17.1	17.0	20.9	20.6	20.1	20.6
EUROSTAT	24.7	24.4	24.7	26.3	16.9	16.9	17.7	19.2	20.9	19.6	16.6	17.0
Latvia												
EM	25.2	24.5	24.2	24.1	18.7	17.9	17.3	17.2	47.8	43.4	22.4	11.2
EM with calibration	24.7	24.6	24.2	24.3	17.6	17.5	17.2	17.0	51.2	48.1	27.5	18.7
EUROSTAT	24.6	25.7	26.6	25.0	17.7	19.2	19.9	19.3	51.2	47.5	18.8	8.9
Lithuania												
EM	23.4	24.0	21.0	22.7	15.1	15.3	15.2	15.7	25.1	20.4	15.0	15.1
EM with calibration	23.3	22.4	20.1	20.0	14.7	14.5	14.3	14.2	29.3	23.6	17.7	18.0
EUROSTAT	22.8	23.7	23.3	24.3	14.7	17.6	20.9	19.8	29.5	25.2	10.2	12.1
Portugal												
EM	23.8	22.7	21.3	21.3	16.3	16.0	15.4	15.3	26.4	27.3	26.6	26.8
EM with calibration	23.1	22.8	22.3	22.3	15.8	15.6	15.3	15.4	22.2	23.1	22.7	22.7
EUROSTAT	22.8	22.9	22.4	22.4	15.9	15.3	14.9	15.0	22.3	20.1	21.0	20.0
Romania												
EM	32.3	34.9	34.2	34.4	20.8	21.9	22.3	22.3	26.7	21.4	20.4	16.5
EM with calibration	33.0	35.3	34.8	34.8	20.6	22.0	21.9	22.1	26.1	21.6	20.4	17.1
EUROSTAT	32.9	32.9	31.3	32.9	20.6	20.7	20.3	21.8	26.0	21.0	16.7	14.1

Notes: EM – EUROMOD. EUROSTAT – Eurostat statistics based on EU-SILC. Years refer to income reference periods.

Table A5: Modelled percentage change in employment rates within strata (2007–2012)

Country	Age group	Education level					
		Males			Females		
		Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
EE	15 to 24 years	0.0*	-26.5	0.0*	0.0*	6.9	0.0*
	25 to 49 years	-16.3	-5.1	-6.0	0.0*	-6.5	-6.4
	50 to 74 years	0.0*	-3.0	-1.4	0.0*	-9.7	6.3
EL	15 to 24 years	-57.9	-34.2	-23.1	-51.7	-49.3	-27.2
	25 to 49 years	-21.0	-17.4	-11.4	-15.5	-13.1	-11.5
	50 to 74 years	-17.9	-11.5	-11.4	-3.8	2.3	-16.0
ES	15 to 24 years	-62.0	-59.8	-38.3	-56.4	-43.4	-27.9
	25 to 49 years	-27.6	-17.0	-9.5	-10.8	-11.6	-7.0
	50 to 74 years	-19.8	-8.2	-6.1	12.6	3.0	-1.2
IT	15 to 24 years	-34.0	-19.3	-18.9	-32.4	-16.1	1.7
	25 to 49 years	-8.8	-4.8	-2.7	-4.6	-4.5	-0.8
	50 to 74 years	6.8	-2.1	-6.0	10.9	8.0	2.4
LV	15 to 24 years	-49.8	-33.2	0.0*	0.0*	-38.7	-6.2
	25 to 49 years	-8.7	-7.0	-1.6	-20.8	-8.7	-0.3
	50 to 74 years	-44.3	-21.3	-2.9	-9.0	-17.7	0.6
LT	15 to 24 years	0.0*	-17.0	0.0*	0.0*	-11.0	0.0*
	25 to 49 years	-38.9	-9.7	-1.4	-16.0	-6.0	-1.7
	50 to 74 years	0.0*	-14.4	-3.2	0.0*	-7.4	7.2
PT	15 to 24 years	-39.2	-5.7	-51.2	-38.0	-18.2	-29.2
	25 to 49 years	-12.3	-4.9	-6.2	-6.5	-3.3	-1.0
	50 to 74 years	-10.3	5.9	-11.7	-13.8	10.3	-5.2
RO	15 to 24 years	-22.3	-8.3	-36.3	-4.1	-15.4	-33.4
	25 to 49 years	-1.7	3.9	-3.7	2.7	-2.8	-5.9
	50 to 74 years	-13.3	0.2	-12.1	-11.8	-2.4	-2.0

Source: calculated by authors based on the EU-LFS statistics (lfsa_ergaed).

Notes: Education levels: Level 1 – Pre-primary, primary and lower secondary education (levels 0-2 in ISCED 1997); Level 2 – Upper secondary and post-secondary non-tertiary education (levels 3-4 in ISCED 1997); Level 3 – Tertiary education (levels 5-6 in ISCED 1997)

*Employment rate change not modelled where EU-LFS figures are statistically unreliable at A and B reliability limits for EU-LFS annual results.

Table A6: Effect of employment adjustment on employment rates, 2007-2012

Country	Year	Employment rate (15-74)*, %			EUROMOD/LFS ratio of employment rates	
		LFS	EM adjusted	EM unadjusted	Adjusted	Unadjusted
EE	2007	62.9	62.1	62.1	0.99	0.99
	2008	63.2	62.1	62.1	0.98	0.98
	2009	57.6	57.1	62.1	0.99	1.08
	2010	55.4	54.9	62.1	0.99	1.12
	2011	59.4	57.8	62.1	0.97	1.04
	2012	60.9	58.7	62.1	0.96	1.02
EL	2007	54.1	52.0	52.0	0.96	0.96
	2008	54.6	52.2	52.0	0.96	0.95
	2009	54.2	51.8	52.0	0.96	0.96
	2010	52.7	50.3	52.0	0.95	0.99
	2011	49.1	46.7	52.0	0.95	1.06
	2012	45.9	43.9	52.0	0.95	1.13
ES	2007	58.8	57.8	57.8	0.98	0.98
	2008	57.7	56.7	57.8	0.98	1.00
	2009	53.7	52.7	57.8	0.98	1.08
	2010	52.6	51.4	57.8	0.98	1.10
	2011	51.7	50.4	57.8	0.97	1.12
	2012	50.1	48.6	57.8	0.97	1.15
IT	2007	51.4	52.6	52.6	1.02	1.02
	2008	51.5	52.6	52.6	1.02	1.02
	2009	50.4	51.4	52.6	1.02	1.04
	2010	49.9	50.7	52.6	1.02	1.05
	2011	50.0	50.7	52.6	1.01	1.05
	2012	49.9	50.6	52.6	1.01	1.05
LV	2007	62.0	65.8	65.8	1.06	1.06
	2008	62.6	65.4	65.8	1.04	1.05
	2009	55.0	56.9	65.8	1.03	1.20
	2010	53.1	54.8	65.8	1.03	1.24
	2011	54.0	56.6	65.8	1.05	1.22
	2012	55.7	57.8	65.8	1.04	1.18
LT	2007	58.4	59.4	59.4	1.02	1.02
	2008	57.8	58.8	59.4	1.02	1.03
	2009	54.0	55.1	59.4	1.02	1.10
	2010	51.6	52.7	59.4	1.02	1.15
	2011	53.5	54.4	59.4	1.02	1.11
	2012	55.4	55.3	59.4	1.00	1.07
PT	2007	62.3	57.2	57.2	0.92	0.92
	2008	62.7	57.4	57.2	0.92	0.91
	2009	60.9	55.6	57.2	0.91	0.94
	2010	60.1	54.7	57.2	0.91	0.95
	2011	58.6	53.1	57.2	0.91	0.98
	2012	57.0	51.6	57.2	0.91	1.00
RO	2007	55.1	53.2	53.2	0.97	0.97
	2008	55.3	53.2	53.2	0.96	0.96
	2009	54.7	52.6	53.2	0.96	0.97
	2010	54.9	52.6	53.2	0.96	0.97
	2011	54.6	52.0	53.2	0.95	0.97
	2012	55.2	52.0	53.2	0.94	0.96

Source: EU-LFS statistics (lfsa_ergaed), EUROMOD calculations.

Note: 2012 LFS employment rates are averages of the last four available quarterly figures (2011Q4-2012Q3)

Table A7: Modelled long-term unemployment (12 months or more) as a percentage of the total unemployment, 2012

Country	Age	Modelled rate by level of education			Total rate of long-term unemployment
		Level 1	Level 2	Level 3	
EE	15-24		39.4		56.8
	25-44	71.4	62.4	49.4	
	45-64				
EL	15-24	48.1	42.1	34.4	49.6
	25-44	50.5	49.1	52.1	
	45-64	47.8	58.7	51.8	
ES	15-24	37.4	26.5	18.1	41.6
	25-44	43.8	37.9	32.6	
	45-64	53.4	51.2	50.5	
IT	15-24		46.6		51.9
	25-44	55.4	50.8	44.8	
	45-64	55.2	56.6	47.5	
LV	15-24		32.9		54.6
	25-44	63.2	56.2	51.8	
	45-64		65.1		
LT	15-24		35.0		51.9
	25-44	58.6	53.2	45.6	
	45-64		61.7		
PT	15-24		26.5		48.1
	25-44	50.5	48.3	38.6	
	45-64	62.7	67.6		
RO	15-24		41.5		41.9
	25-44	37.5	40.4	47.7	
	45-64		47.6		

Source: Eurostat - LFS (lfsa_upgal), data on long-term unemployment by educational level obtained from Eurostat on request.

Note: Long-term unemployment level kept at 2011 level for 2012 due to lack of statistics

* Education levels: Level 1 – Pre-primary, primary and lower secondary education (levels 0-2 in ISCED 1997); Level 2 – Upper secondary and post-secondary non-tertiary education (levels 3-4 in ISCED 1997); Level 3 – Tertiary education (levels 5-6 in ISCED 1997).

Table A8a: Risk-of poverty indicators using the EU-SILC and EUROMOD with and without labour market adjustment (poverty threshold = 60% median): Total and by gender

	Total						Males						Females					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Estonia																		
EM	19.6	18.8	17.0	17.0	18.4	18.0	16.6	15.9	15.2	15.1	15.9	15.7	22.2	21.2	18.6	18.5	20.6	20.0
EM with LMA	19.6	18.8	17.1	17.4	18.4	18.2	16.6	15.7	16.3	17.1	16.9	16.5	22.2	21.4	17.7	17.6	19.7	19.5
CI 95% (low)	19.6	18.5	16.5	16.8	17.9	17.7	16.6	15.5	15.7	16.5	16.3	16.1	22.2	21.0	17.2	17.0	19.1	19.1
CI 95% (high)	19.6	19.0	17.7	18.0	18.8	18.7	16.6	16.0	16.9	17.8	17.4	17.1	22.2	21.7	18.3	18.3	20.1	20.1
EUROSTAT	19.5	19.7	15.8	17.5			16.5	17.5	15.4	17.6			22.0	21.6	16.2	17.4		
Greece																		
EM	19.9	20.4	21.3	21.2	20.3	19.6	19.0	19.6	20.6	20.6	19.6	18.9	20.8	21.2	21.9	21.8	21.0	20.3
EM with LMA	19.9	20.6	21.5	21.9	21.4	22.7	19.0	19.8	20.9	21.5	21.0	22.5	20.8	21.3	22.1	22.4	21.8	22.9
CI 95% (low)	19.9	20.4	21.2	21.5	20.9	22.1	19.0	19.6	20.6	21.0	20.5	21.9	20.8	21.2	21.8	22.0	21.3	22.2
CI 95% (high)	19.9	20.7	21.8	22.3	21.9	23.3	19.0	20.0	21.2	21.9	21.6	23.2	20.8	21.4	22.3	22.7	22.3	23.4
EUROSTAT	20.1	19.7	20.1	21.4			19.6	19.1	19.3	20.9			20.7	20.2	20.9	21.9		
Spain																		
EM	19.3	19.1	18.8	18.5	18.8	17.6	18.1	17.8	17.5	17.3	17.6	16.8	20.6	20.4	20.1	19.7	20.0	18.3
EM with LMA	19.3	19.8	20.4	19.8	20.0	20.2	18.1	18.7	19.5	19.5	19.8	20.2	20.6	20.9	21.4	20.1	20.1	20.2
CI 95% (low)	19.3	19.6	20.1	19.4	19.4	19.7	18.1	18.5	19.1	19.1	19.3	19.6	20.6	20.7	21.0	19.7	19.5	19.6
CI 95% (high)	19.3	20.0	20.8	20.2	20.4	20.6	18.1	19.0	19.9	19.9	20.2	20.6	20.6	21.1	21.7	20.5	20.7	20.7
EUROSTAT	19.6	19.5	20.7	21.8			18.3	18.3	20.1	21.1			21.0	20.6	21.3	22.4		
Italy																		
EM	17.9	17.9	17.8	17.8	17.8	17.5	16.4	16.4	16.5	16.4	16.3	16.1	19.2	19.2	19.1	19.1	19.1	18.9
EM with LMA	17.9	18.0	18.0	18.1	18.0	17.8	16.4	16.6	16.8	16.9	16.8	16.6	19.2	19.3	19.2	19.3	19.1	19.0
CI 95% (low)	17.9	17.9	17.8	17.9	17.8	17.6	16.4	16.5	16.5	16.7	16.5	16.3	19.2	19.2	19.1	19.1	19.0	18.7
CI 95% (high)	17.9	18.1	18.2	18.3	18.2	18.1	16.4	16.7	17.0	17.1	17.0	16.9	19.2	19.4	19.4	19.4	19.3	19.3
EUROSTAT	18.7	18.4	18.2	19.6			17.1	17.0	16.8	18.3			20.1	19.8	19.5	20.8		
Latvia																		
EM	25.3	24.1	20.0	17.9	19.6	19.5	23.0	21.6	18.1	17.3	17.9	17.7	27.3	26.1	21.6	18.4	21.1	21.1
EM with LMA	25.3	24.0	20.1	19.2	19.3	19.3	23.0	21.5	19.8	19.6	19.4	19.1	27.3	26.1	20.3	18.8	19.2	19.4
CI 95% (low)	25.3	23.6	19.2	18.5	18.5	18.4	23.0	21.1	19.0	18.8	18.6	18.2	27.3	25.7	19.3	18.1	18.3	18.5
CI 95% (high)	25.3	24.2	20.9	20.0	20.2	20.1	23.0	21.8	20.6	20.5	20.3	19.9	27.3	26.3	21.3	19.5	20.1	20.2

EUROSTAT	25.6	25.7	21.3	19.1			23.1	24.2	21.7	20.0			27.7	27.0	21.0	18.4		
Lithuania																		
EM	19.6	19.1	17.4	17.9	18.4	19.0	17.6	17.5	16.3	16.7	17.1	18.1	21.3	20.4	18.4	19.0	19.5	19.8
EM with LMA	19.6	19.4	18.1	18.5	19.4	20.3	17.7	17.9	17.6	18.6	18.9	20.0	21.4	20.8	18.5	18.5	19.7	20.6
CI 95% (low)	19.6	19.1	17.1	17.3	18.4	19.6	17.7	17.5	16.6	17.4	17.9	19.0	21.4	20.4	17.5	17.1	18.9	19.8
CI 95% (high)	19.6	19.9	19.0	19.7	20.3	21.1	17.7	18.4	18.7	19.9	19.8	20.9	21.4	21.1	19.4	19.6	20.6	21.3
EUROSTAT	20.0	20.6	20.2	20.0			17.6	19.1	20.7	19.8			22.0	21.9	19.8	20.1		
Portugal																		
EM	19.7	19.5	18.9	18.9	20.0	18.3	18.7	18.6	18.0	18.0	19.0	17.3	20.7	20.4	19.8	19.8	20.9	19.3
EM with LMA	19.7	19.6	19.2	19.2	20.1	18.6	18.7	18.7	18.3	18.3	19.3	17.8	20.7	20.4	20.1	20.0	20.7	19.3
CI 95% (low)	19.7	19.4	18.8	18.7	19.5	18.0	18.7	18.4	17.9	17.9	18.7	17.2	20.7	20.2	19.7	19.5	20.2	18.7
CI 95% (high)	19.7	19.8	19.6	19.7	20.7	19.2	18.7	18.9	18.8	18.9	19.9	18.4	20.7	20.6	20.5	20.5	21.4	19.9
EUROSTAT	18.5	17.9	17.9	18.0			17.9	17.3	17.3	17.6			19.1	18.4	18.4	18.4		
Romania																		
EM	23.6	23.5	23.6	23.0	22.9	22.8	22.9	22.8	23.3	22.8	22.7	22.6	24.2	24.1	24.0	23.1	23.2	23.1
EM with LMA	23.6	23.5	23.6	22.7	22.9	22.7	22.9	22.8	23.2	22.4	22.6	22.4	24.2	24.2	23.9	23.0	23.1	23.0
CI 95% (low)	23.6	23.3	23.4	22.4	22.6	22.4	22.9	22.5	23.0	22.0	22.3	22.0	24.2	24.0	23.7	22.7	22.8	22.6
CI 95% (high)	23.6	23.8	23.8	23.1	23.3	23.1	22.9	23.1	23.4	22.7	23.1	22.8	24.2	24.5	24.2	23.3	23.5	23.4
EUROSTAT	23.4	22.4	21.1	22.2			22.4	21.4	20.7	21.9			24.3	23.4	21.4	22.5		

Notes: External statistics based on EU-SILC (ilc_li02) lagged by one year to correspond to the income reference period. EM – EUROMOD. LMA - Labour market adjustments. CI 95% indicates the confidence interval around the risk of poverty estimate taking into account the uncertainty in the labour market adjustment.

Table A8b: Risk-of poverty indicators using the EU-SILC and EUROMOD with and without labour market adjustment (poverty threshold = 60% median): By age group

	Children (< 18)						Prime-age (25-49)						Elderly (65+)					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Estonia																		
EM	16.7	16.1	17.1	17.1	17.5	17.5	12.5	12.3	13.0	12.9	13.1	13.1	39.9	36.7	25.5	25.3	31.9	30.0
EM with LMA	16.7	16.2	20.4	21.5	19.8	19.5	12.5	12.5	15.7	16.5	15.4	15.0	39.9	37.2	17.0	13.6	23.1	23.9
CI 95% (low)	16.7	15.7	19.5	20.4	18.9	18.6	12.5	12.1	15.0	15.8	14.8	14.4	39.9	36.6	16.0	12.8	22.2	23.1
CI 95% (high)	16.7	16.7	21.5	22.8	20.9	20.5	12.5	12.8	16.4	17.2	16.0	15.6	39.9	37.5	18.1	14.5	24.0	25.0
EUROSTAT	17.1	20.6	17.3	19.5			12.5	14.1	13.1	15.9			39.0	33.9	15.1	13.1		
Greece																		
EM	22.4	22.7	23.4	23.5	22.8	24.0	17.2	17.5	18.2	18.1	17.9	18.2	21.2	22.4	23.7	23.2	20.8	16.4
EM with LMA	22.4	22.9	23.9	25.0	25.5	28.7	17.2	17.6	18.6	19.4	20.6	23.3	21.2	22.5	23.3	22.5	16.0	12.3
CI 95% (low)	22.4	22.7	23.3	24.4	24.5	27.4	17.2	17.4	18.3	18.9	20.0	22.6	21.2	22.3	23.0	22.1	15.3	11.7
CI 95% (high)	22.4	23.2	24.3	25.6	26.5	29.8	17.2	17.8	18.9	19.9	21.2	23.9	21.2	22.6	23.7	22.9	16.6	12.9
EUROSTAT	23.0	23.7	23.0	23.7			17.9	17.9	18.1	18.6			22.3	21.4	21.3	23.6		
Spain																		
EM	23.6	22.7	22.3	21.8	22.7	22.2	15.1	14.8	14.4	14.1	14.4	14.1	27.3	27.6	27.6	26.7	26.4	21.2
EM with LMA	23.6	23.9	25.3	25.6	26.5	27.1	15.1	15.8	17.0	17.5	18.1	18.6	27.3	27.5	25.7	19.8	18.4	17.0
CI 95% (low)	23.6	23.4	24.7	25.0	25.7	26.2	15.1	15.5	16.6	17.1	17.5	18.0	27.3	27.3	25.3	19.4	17.8	16.6
CI 95% (high)	23.6	24.3	26.0	26.5	27.3	28.1	15.1	16.0	17.4	17.9	18.6	19.1	27.3	27.7	26.1	20.2	19.1	17.5
EUROSTAT	24.4	23.7	26.2	27.2			15.5	16.2	18.6	20.4			27.4	25.2	21.7	20.8		
Italy																		
EM	23.1	23.2	23.5	23.3	23.3	22.5	16.3	16.4	16.5	16.4	16.4	15.9	19.6	19.4	18.9	19.1	19.0	19.4
EM with LMA	23.1	23.5	24.0	24.0	23.9	23.8	16.3	16.6	17.2	17.3	17.2	17.2	19.6	19.3	18.0	18.3	18.1	17.8
CI 95% (low)	23.1	23.4	23.6	23.5	23.6	23.2	16.3	16.5	17.0	17.1	17.0	16.9	19.6	19.2	17.9	18.2	17.9	17.6
CI 95% (high)	23.1	23.6	24.4	24.3	24.1	24.3	16.3	16.7	17.4	17.6	17.4	17.5	19.6	19.4	18.1	18.5	18.3	18.0
EUROSTAT	24.7	24.4	24.7	26.3			16.9	16.9	17.7	19.2			20.9	19.6	16.6	17.0		
Latvia																		
EM	25.2	24.5	24.2	24.1	24.6	24.0	18.7	17.9	17.3	17.2	17.1	17.0	47.8	43.4	22.4	11.2	20.0	21.0
EM with LMA	25.2	24.4	25.1	24.6	24.5	23.8	18.7	17.6	19.4	19.2	18.3	17.7	47.8	43.4	13.2	7.4	10.2	11.6
CI 95% (low)	25.2	23.9	23.9	23.5	23.3	22.6	18.7	17.3	18.5	18.5	17.5	16.8	47.8	42.8	12.0	6.6	9.2	10.5
CI 95% (high)	25.2	24.9	26.4	25.8	25.8	25.0	18.7	18.0	20.2	20.1	19.3	18.5	47.8	43.8	14.4	8.0	11.1	12.8

EUROSTAT	24.6	25.7	26.6	25.0			17.7	19.2	19.9	19.3			51.2	47.5	18.8	8.9		
Lithuania																		
EM	23.4	24.0	21.0	22.7	22.9	26.1	15.1	15.3	15.2	15.7	15.7	16.6	25.1	20.4	15.0	15.1	16.9	14.7
EM with LMA	23.5	24.5	22.3	23.4	23.7	27.6	15.1	16.0	17.2	18.6	18.2	19.1	25.1	20.2	12.1	8.9	13.0	12.3
CI 95% (low)	23.5	23.8	20.6	21.6	22.2	26.1	15.1	15.6	16.1	17.1	17.2	18.0	25.1	19.8	11.1	7.5	12.1	11.6
CI 95% (high)	23.5	25.3	24.1	25.6	25.2	29.1	15.1	16.6	18.3	19.8	19.3	20.0	25.1	20.4	13.2	10.3	14.0	12.9
EUROSTAT	22.8	23.7	23.3	24.3			14.7	17.6	20.9	19.8			29.5	25.2	10.2	12.1		
Portugal																		
EM	23.8	22.7	21.3	21.3	23.8	22.0	16.3	16.0	15.4	15.3	16.4	15.0	26.4	27.3	26.6	26.8	27.0	24.5
EM with LMA	23.8	22.8	21.8	22.1	24.3	22.8	16.3	16.0	15.8	16.0	17.2	15.9	26.4	27.4	26.7	25.6	24.4	22.0
CI 95% (low)	23.8	22.5	21.2	21.2	23.4	21.8	16.3	15.8	15.3	15.6	16.5	15.2	26.4	27.3	26.0	24.5	23.6	21.3
CI 95% (high)	23.8	23.1	22.4	22.8	25.2	23.7	16.3	16.3	16.2	16.5	17.8	16.5	26.4	27.6	27.6	26.4	25.5	23.0
EUROSTAT	22.8	22.9	22.4	22.4			15.9	15.3	14.9	15.0			22.3	20.1	21.0	20.0		
Romania																		
EM	32.3	34.9	34.2	34.4	34.9	34.8	20.8	21.9	22.3	22.3	22.1	22.0	26.7	21.4	20.4	16.5	17.0	16.7
EM with LMA	32.3	35.0	34.3	33.7	34.6	33.8	21.0	21.9	22.4	21.9	21.9	21.5	26.3	21.1	19.8	16.0	16.4	16.4
CI 95% (low)	32.3	34.6	34.1	33.1	34.0	33.2	21.0	21.6	22.1	21.6	21.6	21.1	26.3	20.8	19.6	15.6	16.0	16.2
CI 95% (high)	32.3	35.4	34.7	34.3	35.3	34.6	21.0	22.2	22.6	22.3	22.4	21.8	26.3	21.3	20.0	16.3	16.7	16.7
EUROSTAT	32.9	32.9	31.3	32.9			20.6	20.7	20.3	21.8			26.0	21.0	16.7	14.1		

Notes: External statistics based on EU-SILC (ilc_li02) lagged by one year to correspond to the income reference period. EM - EUROMOD. LMA - Labour market adjustments. CI 95% indicates the confidence interval around the risk of poverty estimate taking into account the uncertainty in the labour market adjustment.

Table A9: 'Nowcast' results from EUROMOD: income, inequality and poverty rates (60% of median) in 2010

	Income, inequality				Poverty rates (60% of median)					
	Mean	Median	Gini	S80/S20	Total	Males	Females	Children (<18)	Prime-age (25-49)	Elderly (65+)
Estonia										
EM	7,108	6,221	29.9	4.6	17.0	15.1	18.5	17.1	12.9	25.3
EM calibrated	7,026	6,153	29.9	4.7	16.7	15.0	18.1	17.6	12.9	23.8
EM with LMA	6,562	5,592	31.5	5.1	17.4	17.1	17.6	21.5	16.5	13.6
EM with LMA calibrated	6,479	5,567	31.6	5.2	17.5	17.4	17.5	21.8	16.8	13.0
EUROSTAT	6,570	5,598	31.9	5.3	17.5	17.6	17.4	19.5	15.9	13.1
Greece										
EM	13,430	11,461	33.6	6.0	21.2	20.6	21.8	23.5	18.1	23.2
EM calibrated	13,147	11,276	33.6	6.0	21.3	21.0	21.7	24.0	18.8	24.4
EM with LMA	13,110	11,193	34.6	6.5	21.9	21.5	22.4	25.0	19.4	22.5
EM with LMA calibrated	12,828	11,003	34.7	6.6	21.8	21.6	22.0	25.3	20.0	22.5
EUROSTAT	12,637	10,986	33.6	6.0	21.4	20.9	21.9	23.7	18.6	23.6
Spain										
EM	15,595	14,052	29.2	4.8	18.5	17.3	19.7	21.8	14.1	26.7
EM calibrated	15,745	13,998	30.6	5.2	18.4	17.2	19.5	22.9	14.5	25.2
EM with LMA	14,667	13,156	31.1	5.5	19.8	19.5	20.1	25.6	17.5	19.8
EM with LMA calibrated	14,817	13,046	32.6	6.0	19.7	19.3	20.1	26.2	17.5	20.0
EUROSTAT	14,251	12,514	34.0	6.8	21.8	21.1	22.4	27.2	20.4	20.8
Italy										
EM	18,032	16,005	30.0	4.8	17.8	16.4	19.1	23.3	16.4	19.1
EM calibrated	18,324	16,269	30.6	5.0	18.6	17.2	20.0	24.8	17.0	20.6
EM with LMA	17,641	15,615	30.6	5.0	18.1	16.9	19.3	24.0	17.3	18.3
EM with LMA calibrated	17,933	15,895	31.2	5.3	19.0	17.7	20.2	25.9	18.1	19.5
EUROSTAT	18,056	15,972	31.9	5.6	19.6	18.3	20.8	26.3	19.2	17.0
Latvia										
EM	5,572	4,583	33.6	5.5	17.9	17.3	18.4	24.1	17.2	11.2
EM calibrated	6,044	4,976	34.3	5.8	19.4	17.9	20.7	24.3	17.0	18.7
EM with LMA	5,042	4,030	35.2	6.0	19.2	19.6	18.8	24.6	19.2	7.4
EM with LMA calibrated	5,514	4,414	35.4	6.0	19.1	19.2	19.1	24.9	18.2	9.7

EUROSTAT	5,093	4,150	35.4	6.6	19.1	20.0	18.4	25.0	19.3	8.9
Lithuania										
EM	5,299	4,451	33.1	5.5	17.9	16.7	19.0	22.7	15.7	15.1
EM calibrated	5,600	4,659	33.3	5.5	17.3	15.7	18.6	20.0	14.2	18.0
EM with LMA	4,943	4,031	34.9	6.0	18.5	18.6	18.5	23.4	18.6	8.9
EM with LMA calibrated	5,243	4,283	34.7	5.9	19.0	18.4	19.5	23.5	17.9	13.1
EUROSTAT	4,609	4,005	32.9	5.8	20.0	19.8	20.1	24.3	19.8	12.1
Portugal										
EM	11,417	9,133	34.4	5.5	18.9	18.0	19.8	21.3	15.3	26.8
EM calibrated	11,012	8,764	35.1	5.9	18.3	17.5	19.0	22.3	15.4	22.7
EM with LMA	11,304	9,026	34.6	5.6	19.2	18.3	20.0	22.1	16.0	25.6
EM with LMA calibrated	10,900	8,660	35.4	6.0	18.7	18.1	19.3	23.1	16.3	21.5
EUROSTAT	10,407	8,410	34.2	5.7	18.0	17.6	18.4	22.4	15.0	20.0
Romania										
EM	2,578	2,220	34.4	6.4	23.0	22.8	23.1	34.4	22.3	16.5
EM calibrated	2,599	2,228	34.7	6.6	23.0	22.5	23.4	34.8	22.1	17.1
EM with LMA	2,556	2,199	34.3	6.4	22.7	22.4	23.0	33.7	21.9	16.0
EM with LMA calibrated	2,577	2,210	34.5	6.5	22.8	22.3	23.3	34.4	21.8	16.5
EUROSTAT	2,413	2,116	33.2	6.2	22.2	21.9	22.5	32.9	21.8	14.1

Notes: External statistics based on EU-SILC (Eurostat: ilc_li01, ilc_di03, ilc_di11, ilc_di12) lagged by one year to correspond to the income reference period. EM - EUROMOD. LMA - Labour market adjustments. Last available EU-SILC based Eurostat statistics refer to 2010 incomes.

Table A10: 'Nowcast' results from EUROMOD: income, inequality and poverty rates (60% of median) in 2012

	Income, inequality				Poverty rates (60% of median)					
	Mean	Median	Gini	S80/S20	Total	Males	Females	Children (<18)	Prime-age (25-49)	Elderly (65+)
Estonia										
EM	7,657	6,695	30.3	4.7	18.0	15.7	20.0	17.5	13.1	30.0
EM calibrated	7,575	6,620	30.3	4.8	17.8	15.6	19.7	17.9	13.2	28.8
EM with LMA	7,374	6,356	31.1	4.9	18.2	16.5	19.5	19.5	15.0	23.9
EM with LMA calibrated	7,292	6,305	31.2	5.0	18.1	16.6	19.3	20.0	15.2	22.8
Greece										
EM	11,511	9,950	33.1	5.9	19.6	18.9	20.3	24.0	18.2	16.4
EM calibrated	11,229	9,713	33.3	5.9	19.7	19.5	19.9	24.2	18.7	16.7
EM with LMA	10,278	8,957	37.0	9.0	22.7	22.5	22.9	28.7	23.3	12.3
EM with LMA calibrated	9,995	8,696	37.7	9.6	23.2	23.4	22.9	29.2	24.1	13.6
Spain										
EM	15,608	14,110	28.7	4.7	17.6	16.8	18.3	22.2	14.1	21.2
EM calibrated	15,757	14,049	30.2	5.0	17.9	17.0	18.8	23.4	14.5	22.6
EM with LMA	14,237	12,715	31.6	5.7	20.2	20.2	20.2	27.1	18.6	17.0
EM with LMA calibrated	14,387	12,626	33.2	6.3	20.1	20.0	20.1	28.1	19.0	15.5
Italy										
EM	18,436	16,305	30.0	4.8	17.5	16.1	18.9	22.5	15.9	19.4
EM calibrated	18,728	16,602	30.7	5.0	18.5	17.0	20.0	24.5	16.7	20.8
EM with LMA	18,008	15,880	30.8	5.1	17.8	16.6	19.0	23.8	17.2	17.8
EM with LMA calibrated	18,299	16,147	31.4	5.3	18.8	17.5	20.1	25.8	18.0	19.3
Latvia										
EM	6,331	5,205	34.1	5.7	19.5	17.7	21.1	24.0	17.0	21.0
EM calibrated	6,811	5,630	34.9	6.0	21.2	19.1	23.0	25.2	17.4	26.7
EM with LMA	5,881	4,689	35.7	6.2	19.3	19.1	19.4	23.8	17.7	11.6
EM with LMA calibrated	6,360	5,102	36.1	6.4	20.5	19.4	21.4	24.6	17.4	18.9
Lithuania										
EM	5,544	4,690	33.2	5.6	19.0	18.1	19.8	26.1	16.6	14.7
EM calibrated	5,845	4,898	33.4	5.7	18.0	16.6	19.2	23.2	14.8	16.9
EM with LMA	5,316	4,453	34.5	6.0	20.3	20.0	20.6	27.6	19.1	12.3
EM with LMA calibrated	5,617	4,677	34.5	6.0	19.9	19.2	20.6	26.4	17.9	14.9

Portugal										
EM	10,842	8,962	32.8	5.2	18.3	17.3	19.3	22.0	15.0	24.5
EM calibrated	10,438	8,577	33.6	5.5	17.2	16.5	17.9	21.4	14.5	20.3
EM with LMA	10,594	8,711	33.2	5.3	18.6	17.8	19.3	22.8	15.9	22.0
EM with LMA calibrated	10,189	8,397	34.0	5.7	18.2	17.6	18.7	23.1	16.0	19.3
Romania										
EM	2,610	2,264	33.9	6.2	22.8	22.6	23.1	34.8	22.0	16.7
EM calibrated	2,630	2,278	34.2	6.4	22.6	22.1	23.1	34.6	21.6	17.0
EM with LMA	2,577	2,247	33.7	6.2	22.7	22.4	23.0	33.8	21.5	16.4
EM with LMA calibrated	2,597	2,251	33.9	6.3	22.2	21.6	22.8	33.6	21.0	16.1

EM - EUROMOD. LMA - Labour market adjustments.

Annex 2: EUROMOD

Table A11: Input datasets used in the nowcast

Country	Input data
Estonia	EU-SILC version 2008-2
Greece	National SILC 2008
Spain	National SILC 2008
Italy	National SILC 2008
Latvia	EU-SILC version 2008-3
Lithuania	EU-SILC version 2008-2 (+ additional national variables)
Portugal	EU-SILC version 2008-2
Romania	EU-SILC version 2008-2

We are grateful for access to micro-data from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat under contract EU-SILC/2011/55, the Italian version of the EU-SILC (IT-SILC) made available by ISTAT, the Lithuanian version of the EU-SILC (PGS) made available by the Lithuanian Department of Statistics and variables from the Greek SILC Production Database (PDB) made available by the Greek Statistical Office.

Table A12: Updating factors for employment income 2007-2012

	Sectors	2007	2008	2009	2010	2011	2012	Note	Source
EE	**All sectors**	1	1.139	1.082	1.094	1.158	1.202	Average gross salary	Statistics Estonia database
EL	**Public enterprises**	1	1.082	1.165	1.101	1.014	0.918		
	Banking employees	1	1.000	1.037	1.018	1.019	0.943		
	Civil servants	1	1.071	1.127	1.031	0.980	0.908		
	Other private sector	1	1.065	1.095	1.063	1.045	0.939		EL.STAT
ES	**Private sector**	1	1.052	1.083	1.103	1.114	1.127		
	Public sector								
	< EUR 6307 per year	1	1.020	1.040	1.044	1.044	0.969		
	6307-6908	1	1.020	1.040	1.043	1.043	0.969		
	6908-9836	1	1.020	1.040	1.033	1.023	0.950		
	9836-11334	1	1.020	1.040	1.029	1.016	0.943		
	11334 - 13354	1	1.020	1.040	1.020	0.997	0.926		
	>13354	1	1.020	1.040	0.993	0.945	0.877	Labour cost	EUROSTAT
IT	**All sectors**	1	1.038	1.055	1.076	1.084	-		
	private	-	-	-	-	-	1.135		Bank of Italy 2012, Appendix Tab a9.
	public	-	-	-	-	-	1.094		
LV	**Private sector**	1	1.149	0.973	0.940	1.122	1.151	National accounts; in 2012 - HICP	EUROSTAT and IMF forecast
	Public sector	1	1.190	1.063	0.992	1.038	1.065	Enterprise register; in 2012 - HICP	CSB and IMF forecast
LT	**Private sector**	1	1.172	1.091	1.063	1.097	1.119		
	Public admin. and defence	1	1.232	1.114	1.050	1.075	1.106	Average monthly earnings; in 2012 - forecast of Ministry of Finance for the whole economy	
	Education	1	1.276	1.384	1.307	1.319	1.301		
	Health	1	1.212	1.188	1.140	1.223	1.219		Statistics Lithuania
PT	**Private sector**	1	1.033	1.059	1.080	1.094	1.069	Wages	PT Central Bank Annual Report
	Public sector	1	1.021	1.051	1.051	1.051	1.051	Nominal wage index	PT Annual Budget
RO	**All sectors**	1	1.282	1.362	1.313	1.456	-		
	private	-	-	-	-	-	1.494	Change in the nominal gross average wage	
	public	-	-	-	-	-	1.125		National Institute of Statistics, Labour Force Survey

Table A13: Updating factors for old-age pensions 2007-2012

	Benefit type/ brackets	2007	2008	2009	2010	2011	2012	Note	Source
EE	Old-age pension	1	1.210	1.267	1.268	1.263	1.315	Average pension increase; 2012 based on 7 months	Statistics Estonia database
EL	Old-age pensions	1	1.030	1.030	1.030	1.030	1.030		EL.STAT.
ES	Contributory pension	1	1.024	1.027	1.051	1.051	1.061	CPI (from Nov to Nov)	Statistics Spain
	Pension supplement	1	1.065	1.097	1.142	1.154	1.203	Statutory increase	State budget
	Non-contributory pension	1	1.036	1.079	1.094	1.105	1.152	Statutory increase	State budget
	Other old-age benefits	1	1.036	1.079	1.094	1.105	1.152	Statutory increase	State budget
IT	<= EUR 2181 per month	1	1.017	1.050	1.057				
	> EUR 2181 per month	1	1.013	1.037	1.043				
	<= EUR 1308 per month					1.057			
	EUR 1308 – 2181 per month					1.056			
	> EUR 2181 per month					1.054			
	<= EUR 1295 per month						1.085		INPS 2010 Rinnovo 2010, Tabella A2
	> EUR 1295 per month						1.057		
LV	Old-age pension	1	1.281	1.596	1.635	1.656	1.670	Average pension increase; 2012 based on 6 months	State Social Security Agency
LT	Old-age pension	1	1.299	1.388	1.388	1.388	1.388	Kept constant in 2010-2011 due to structural changes	Statistics Lithuania
PT	Non-contributory pension	1	1.027	1.057	1.070	1.070	1.104	Social Pensions Index	PT Law
	Contributory pension							Statutory pension indexation	PT Law
	<EUR 231 per month	1	1.024	1.054	1.067	1.067	1.100		
	231 - 597	1	1.024	1.054	1.067	1.067	1.067		
	597 - 612	1	1.019	1.049	1.059	1.059	1.059		
	612 - 618	1	1.019	1.044	1.054	1.054	1.054		
	618 - 2474	1	1.017	1.041	1.041	1.041	1.041		
	2474 - 4889	1	1.017	1.038	1.038	1.038	1.038		
	4889 - 5031	1	1.000	1.022	1.022	1.022	1.022		
	> 5031	1	1.000	1.000	1.000	1.000	1.000		
RO	Old-age pension	1	1.454	1.734	1.835	1.859	1.859	Average monthly pension	National Institute of Statistics

Table A14: Price index used to adjust 2007 poverty threshold for 2008-2012 (2007=100)

	2008	2009	2010	2011	2012
EE	110.6	110.8	113.9	119.7	124.8
EL	104.2	105.6	110.6	114.1	115.3
ES	104.1	103.9	106.0	109.2	112.0
IT	103.5	104.3	106.0	109.1	112.7
LV	115.2	119.0	117.6	122.5	125.5
LT	111.1	115.7	117.1	121.9	126.1
PT	102.7	101.7	103.1	106.8	109.9
RO	107.9	113.9	120.9	127.9	132.4

Source: Eurostat HICP data for 2007-2011 (annual average index) ; 2012 values based on the EC Autumn forecast: http://ec.europa.eu/economy_finance/eu/forecasts/2012_autumn/statistical_en.pdf p.156

Annex 3: EUROMOD and the EU-SILC: what do we need?

1. Improvements that would increase the quality and comparability of EUROMOD results and reduce the time and effort needed to build the input database from the EU-SILC:

(a) changes not requiring additional information from respondents

- The more detail that is available as harmonised income variables [PY090, PY100, PY110, PY120, PY130, PY140, HY050, HY060, HY070], the more precise EUROMOD's simulations of benefits and taxes will be. We have to impute the individual benefit payments back from the harmonised aggregate variable in order to separate out those that can be simulated by EUROMOD, and to make the correct tax treatment possible. This is a lot of work, which is not the same each year, and introduces error. The more disaggregated the UDB variables, the less difficult the procedure becomes. We would like to see some of the existing variables split into two, along the lines of ESSPROS categorisations.
- Linkage between the cross-sectional data and longitudinal data (or between waves of cross-sectional data) would result in, at least for some of the sample, more information on labour market and earnings history to draw on for the simulation of unemployment and other short-term contributory benefits.
- More generally the use of common identifiers for the same observations in different versions of SILC databases would allow better linkage; this is important for the calculation of calibration factors and nowcasting. This applies to different releases of the same data and, for the countries where it is permitted to link national SILC data to the UDB, to those datasets too. This is especially important for the countries where EUROMOD relies solely on national SILC data (for the 2008 wave: Greece, Spain, Italy, Austria, Slovakia).

(b) changes requiring additional/different information from respondents

- More information than provided by the calendar of main activities about variation in sources of income during the income reference period would improve precision. In particular knowing the number of months in which earnings [PY010] were received during the year would improve the simulation of unemployment, social assistance and other benefits.
- A variable to distinguish the sector of employment (public/private) would help to refine the updating of employment income and identifying those at risk of unemployment (e.g. for nowcasting).

2. Information that is essential for nowcasting

- For linkage with LFS statistics: gender, age, highest ISCED education level attained
- For simulation of income following labour market transition: main activity calendar information, current educational activity, the number of hours usually worked per week in all jobs, self-defined economic status and information on active search and availability for work.

3. Documentation and meta-information.

It would be very useful to have the following information for all countries:

- Which national benefits/pensions are included in which harmonised income variables (i.e. the precise content of each harmonised variable: PY090, PY100, PY110, PY120, PY130, PY140, HY050, HY060, HY070).
- Details on how net and gross incomes are imputed, including what use is made of tax information from registers or elsewhere.
- How the cross-sectional weights are calculated, including details on the sources of external information used for calibration.

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