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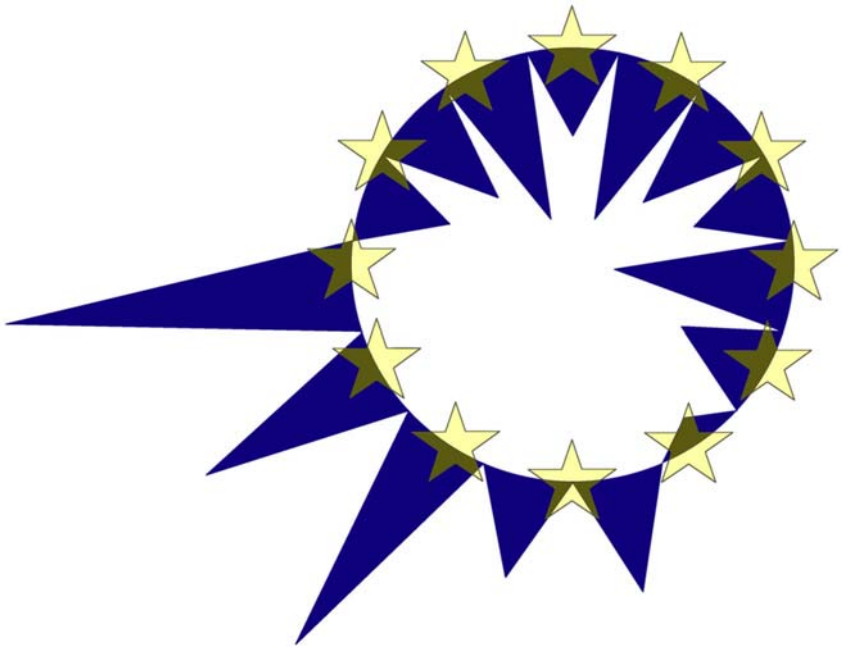

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HOUSEHOLD INCOMES AND REDISTRIBUTION IN THE EUROPEAN UNION: QUANTIFYING THE EQUALISING PROPERTIES OF TAXES AND BENEFITS

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Household incomes and redistribution in the European Union: quantifying the equalising properties of taxes and benefits

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Abstract
The systems of direct taxes and cash benefits in the Member States of the European Union vary considerably in size and structure. We explore their direct impacts on cross-sectional income inequality (termed "redistributive effect" for the purpose of this paper) using EUROMOD, a tax-benefit microsimulation model for the European Union. This relies on harmonised household micro-data representative of each national population together with simulations of entitlements to cash benefits and liabilities for taxes and social contributions. It allows us to draw a more comprehensive – and comparable – picture of the combined effects of transfers and taxes than is usually possible. We decompose the redistributive effect of tax-benefit systems to assess and compare the effectiveness of individual policies at reducing income disparities. The following categories of benefits and taxes are considered both individually and in combination: income taxes, social contributions, cash benefits designed to target the poor or redistribute inter-personally (through means-testing) as well as cash benefits intended to redistribute intra-personally across the lifecycle (through social insurance or contingency-based entitlement). We derive results for the 15 "old" members of the European Union and present them for each country separately as well as for the EU-15 as a whole.

JEL: C81, D31, H22, H55
Keywords: Income inequality, Redistribution, Microsimulation, European Union

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Introduction

Taxes and social benefits affect household income through several different channels and these effects can be assessed in a number of different ways. This paper focuses on the influence of social and fiscal policies on income inequality. In particular, we analyse how tax and benefit payments alter the distribution of household incomes in the European Union. Our aim is to provide evidence on the effectiveness of a wide range of different policy configurations at reducing disparities of household resources.

The novelty of the analysis is that it encompasses both taxes and benefits and that it is undertaken for all 15 'old' member countries of the EU. We employ a microsimulation approach, which allows us to address better some of the measurement problems normally encountered in comparative research on income inequality. Results are conceptually consistent and comparable across countries so that, in addition to country-specific results, inequality measures can be reported for the EU-15 as a whole. We analyse separately the distributive properties of different types of tax-benefit instruments, including income taxes, social contributions, public pensions as well as other non means-tested and means-tested benefits.

While the scope of this paper is wider than that of most previous studies, it shares a number of relevant conceptual choices. Two of them are worth noting in particular. First of all, taxes and benefit payments are assessed in terms of their *direct* impact on household resources. Focussing on observable tax and benefit payments in this way does, of course, provide a partial measure of how transfers between households and governments affect incomes (see Boadway and Keen, 2000) and this needs to be kept in mind when interpreting results and comparing them across countries. On the one hand, the existence of taxes and benefits

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EUROMOD relies on micro-data from twelve different sources for fifteen countries. These are the European Community Household Panel (ECHP) User Data Base made available by Eurostat; the Austrian version of the ECHP made available by the Interdisciplinary Centre for Comparative Research in the Social Sciences; the Panel Survey on Belgian Households (PSBH) made available by the University of Liège and the University of Antwerp; the Income Distribution Survey made available by Statistics Finland; the Enquête sur les Budgets Familiaux (EBF) made available by INSEE; the public use version of the German Socio Economic Panel Study (GSOEP) made available by the German Institute for Economic Research (DIW), Berlin; the Living in Ireland Survey made available by the Economic and Social Research Institute; the Survey of Household Income and Wealth (SHIW95) made available by the Bank of Italy; the Socio-Economic Panel for Luxembourg (PSELL-2) made available by CEPS/INSTEAD; the Socio-Economic Panel Survey (SEP) made available by Statistics Netherlands through the mediation of the Netherlands Organisation for Scientific Research - Scientific Statistical Agency; the Income Distribution Survey made available by Statistics Sweden; and the Family Expenditure Survey (FES), made available by the UK Office for National Statistics (ONS) through the Data Archive. Material from the FES is Crown Copyright and is used by permission. Neither the ONS nor the Data Archive bears any responsibility for the analysis or interpretation of the data reported here. An equivalent disclaimer applies for all other data sources and their respective providers cited in this acknowledgement.

generally causes changes in both market prices and household behaviour and therefore has an influence on pre tax-benefit market incomes (and economic welfare) which is not captured by looking at the amounts of taxes and benefits alone. On the other hand, in-kind transfers (to individual households or provided as collective goods and services) represent a significant portion of the resources transferred from governments to households.

Secondly, we measure incomes and inequality at a particular point in time. The analysis is therefore *static* and does not attempt to measure the distribution of lifetime incomes or separate the "within-cohort" and "between-cohort" components of cross-sectional inequality. This point is relevant because some of the tax-benefit instruments analysed here (pensions and other contingency- or insurance-based benefits as well as the taxes earmarked to finance them) are largely designed to redistribute across the life-cycle rather than across individuals. However, while the long-term or dynamic aspects of inequality are clearly of interest, the same is true for disparities observed at any given point in time. Policy instruments that are designed to redistribute inter-temporally can, as shown here, also have important consequences for cross-sectional inequality. Indeed, the perceived impact on the distribution of *current* incomes can have important implications for the political feasibility of introducing these measures in the first place. In addition, the extent of income disparities at any given point in time is a measure of the effectiveness of social policies providing financial assistance subject to certain contingencies.

The remainder of this paper is organised as follows. Section 1 provides some background by describing previous methods and existing sources of data for making international comparisons of the redistributive properties of tax and/or benefit systems. The advantages of using microsimulation methods are explained and section 2 goes on to describe in more detail the method, and the European model, EUROMOD. Section 3 introduces some of the key issues to be addressed when comparing redistributive effects across different underlying populations and introduces the definitions and assumptions to be used in the analysis which follows. The results are presented in three stages. The first, in section 4.1, illustrates the extent to which the components of tax and benefit systems vary in their importance across countries and according to the level of household disposable income. This is followed in section 4.2 by an analysis which shows that inequality before the operation of taxes and benefits varies *less* across the countries considered than it does after they take effect. It also shows how the relative equalising effects of the tax and benefit systems as a whole depend on whether public pensions are considered as part of the redistributive system. Finally, section 4.3 considers the redistributive roles of sub-components of the tax-benefit systems, focussing particularly on the contrasting effects of means-tested and non means-tested benefits. Section 5 concludes.

1. Sources and methods for the assessment and comparison of redistribution

International comparisons of social policies are often made using calculations based on model families (see e.g. Eardley, *et al.*, 1996; OECD, 2004) or macro indicators (e.g. share of social expenditures in GDP). While useful for understanding the structure and certain relevant features of complex policy measures, such studies say little about their distributional impact. Research based on representative micro-data is, on the other hand, often limited to one particular country. Comparisons of national datasets are difficult as available data are typically not designed to be comparable across countries (see, for instance, Smeeding and Grodner, 2000). International studies relying on these data – which can for instance differ in terms of population coverage, unit of analysis or the definition of individual income components – are then subject to these limitations (e.g. Burniaux, *et al.*, 1998; Deleeck, *et al.*, 1992).

In a recent study covering 27 OECD countries, Förster and Mira d'Ercole (2005) report household income inequality before and after taxes and social benefits. The analysis is based on indicators provided by individual country experts and is based on different types of micro-data. Standardised terms of reference are used to ensure consistency of concepts and definitions but due to the different data sources, comparability *across* countries is necessarily limited. Hence, Förster and Mira d'Ercole focus specifically on changes of income inequality *over time* and how the observed longitudinal patterns differ internationally. Several international studies of the redistributive effects of taxes also use country-specific data.[2] They ignore the role of social benefits, however, and generally also do not consider tax-like payments such as compulsory social contributions. Where a large number of countries are covered, results tend to be based on a mix of administrative data and different types of survey sources. As a result, the populations that these data represent differ between countries. In addition, the unit of analysis is often dictated by data collection methods and can therefore vary between countries as well. For instance household income, which is widely accepted as the appropriate measure of monetary well-being (Canberra Group, 2001), cannot be analysed where tax data do not contain information on the incomes of all household members.

Comparative research on income inequality has been greatly helped by efforts to harmonise national data sets ex-post (Luxembourg Income Study, LIS) and by prioritising comparability in the context of newly designed multi-country data collection activities, especially in the European Union (ECHP and SILC).[3] Atkinson *et al.* (1995) use LIS data for a comparison of income inequality in OECD countries. Results are also available from later waves of LIS data (Smeeding and Grodner, 2000). The ex-post harmonisation of the LIS data does, however, present some problems when analysing the redistributive effects of tax and benefit policies. Notably, the quality and level of detail of information about taxes paid vary considerably across countries. Researchers using the European Community Household Panel have to confront similar issues. While data are more detailed than LIS in some respects (more information is, for instance, provided separately for each household member), income variables tend to be more aggregated across sources of income. Most importantly, incomes are recorded *net* of taxes and information on tax liabilities is not provided. Redistribution studies therefore cannot consider the redistributive impact of taxes and have to focus on social transfers alone (e.g. Heady, *et al.*, 2001).

The approach used in the present paper addresses several of the problems described here and arguably provides more comprehensive and comparable results than previous studies. The main difference lies in the combination of partly harmonised micro-data with well-established simulation techniques. Rather than taking tax and benefit amounts directly from the data, the micro-data are instead used as a basis for *calculating* tax liabilities and benefit entitlements. This is done in accordance with detailed legal rules to ensure that results for each observation correspond as closely as possible to the taxes and benefits that would be determined by tax authorities and benefit agencies. For instance, income taxes are computed by first determining, for each taxpayer identified in the data, taxable income as well as other tax-

[2] Wagstaff and van Doorslaer (2001), Wagstaff, *et al.* (1999). Older studies are Berglas (1971), Kakwani (1977), and Zandvakili (1994). A recent study uses EUROMOD to estimate redistribution and progressivity characteristics of personal income taxes and social contributions for 15 EU countries (Verbist, 2004). O'Donoghue et al. (2004) make use of EUROMOD to consider redistribution of taxes and social benefits in the EU15, with a primary focus on the role of indirect taxes.

[3] For the member states of European Union (EU) the European Household Community Panel (ECHP) was established in the 1990s. See Eurostat (1996) for details on the methodology. The final wave of the ECHP was collected in 2001 and its successor, the Survey of Income and Living Conditions (SILC), is planned to provide data from 2004 onwards. For some countries doubts have been expressed about the accuracy of the ECHP data (see e.g. Cantillon et al., 2003; Peracchi, 2002).

relevant circumstances (employment status, number of children, etc.) and then applying legal income tax rules in order to find resulting tax liabilities.

Given limited information in available micro-data on detailed tax and benefit amounts, tax-benefit microsimulation models generally provide a richer basis for assessing the distributive impact of taxes and benefits. The most obvious advantage of this approach is that it permits an analysis of taxes and benefits based on datasets that do not provide information on these variables at all, or not with the desired level of detail.[4] Moreover, the simulation approach is particularly attractive in a comparative setting as it makes the analysis of taxes and benefits less dependent on the precise definition of these target variables, and less influenced by differences in these definitions across countries. By ensuring a consistent application of legal policy rules across countries, the resulting tax and benefit amounts are potentially more comparable than tax and benefit variables recorded in the micro-data itself. Finally, the simulation approach provides greater analytical flexibility as it allows categories of taxes and benefits to be defined consistently across countries and independently of definitions adopted by the data providers. While some countries have a long tradition of using microsimulation models for these types of analysis (e.g. Duclos, 1993), a conceptually consistent comparison across countries has so far been inhibited by the lack of suitable multi-country tax-benefit models.

2. Tax-benefit models and EUROMOD

A microsimulation model is a representation of a socio-economic reality aiming, among other things, to gain insights into the functioning of existing policies as well as the consequences of proposed policy changes (Krupp, 1986; Atkinson and Sutherland, 1988). Tax-benefit models (or "static" microsimulation models) are based on household micro-data from representative sources. They calculate disposable income for each household in the dataset. This calculation is made up of elements of income taken from the underlying micro-data (e.g. employee earnings) combined with components that are simulated by the model (taxes and benefits). The main advantages of such a microsimulation model is that it allows one to focus quite accurately on the objectives of social and economic policy, on the instruments employed, and on the precise change experienced by those to whom the measures apply. Regulations are incorporated into the model as accurately as possible, so that the impact on each unit (person, family, household) is identified. A particular advantage of this method is that it allows for the study of a set of policy measures from two distinct perspectives. On the one hand, one can focus on the net, cumulative effect of the various policy instruments, and therefore also on the impact of the entire set of transfer-oriented measures. On the other hand, a microsimulation model offers the possibility of dissecting complex measures (e.g. through a step-by-step tax calculation for a household), so that the impact of each step may be considered separately. The level of aggregation – both across units of analysis and across income components - may be chosen according to the question being posed.

All simulation models have inherent limitations. Most of them use empirical data that are obtained either from surveys or from administrative sources. As such, the accuracy of the results depends on the quality of the data. Generally these data do not refer to the period of interest and must be updated in some way, a process which is inherently prone to some error. Factors affecting the administrative effectiveness of tax and benefit systems cannot be

[4] For example, in an analysis of the redistributive characteristics of income taxes, Wagstaff *et al.* (1999) use simulated income tax amounts for a sub-set of the countries analysed.

captured precisely, meaning that the non- take-up of benefits and tax evasion may not be fully accounted for and are typically not accounted for at all.

In this paper we use EUROMOD, the static tax-benefit model covering the 15 Member States of the pre-May 2004 European Union.[5] It represents a concerted attempt to reduce the lack of comparability across datasets and to apply a consistent modelling strategy to these data. EUROMOD provides measures of direct taxes, social contributions and cash benefits, where benefits may be categorised according to function or other characteristics. The datasets used as the basis for the simulations in this paper are listed in Annex A. They were chosen on the grounds that they provide the best quality input for a tax-benefit model and are at the same time available and accessible to an international scientific project. Although they include data collected at various points in time 1993-1999, they have all been adjusted to 1998 prices and incomes and the policies simulated are those prevailing in mid-1998.

All benefits and taxes are computed based on the assumption that the legal rules apply and that the costs of compliance are zero. They do not take account of any non-take up of benefits or tax evasion that may occur in practice. In some countries EUROMOD is known to over-estimate taxes collected (e.g. Greece) and in others it over-estimates the amount of means-tested benefits paid (e.g. UK and Ireland and to some extent in Germany and Sweden). This is obviously more of an issue in countries that rely more heavily on these types of instrument. Mantovani and Sutherland (2003) provide a detailed assessment of the factors affecting the reliability of EUROMOD estimates of household disposable income.[6]

3. Measuring inequality and redistribution

We use a range of standard measures in order to explore the direct effects of tax and benefit payments on income inequality. For the purpose of this paper, and following common usage of the term in the literature, the reduction of inequality achieved by the tax-benefit system as a whole (or of individual components) is termed "redistribution" or "redistributive effect" which is therefore used synonymously with "equalising effect". It is worth emphasising that redistribution in this sense does not require anybody to be better off. A pareto-worsening policy measure (a progressive tax on everybody) thus constitutes "redistribution" in the technical sense of the term even before any of the tax revenues are redistributed in the form of transfers or collective goods or services.

[5] See Immervoll, *et al.* (1999), Sutherland (2000) and http://www.iser.essex.ac.uk/msu/emod for more information and access to EUROMOD Working Papers.

[6] Notable differences across countries in the underlying data sources that should be borne in mind when interpreting results include (a) for Sweden income is aggregated over the narrow family unit (single person or couple plus children aged under 18. i.e., individuals aged 18 or more are all treated as not living with their parents) whereas for other countries the data allow us to adopt a wider household definition – all people living in one dwelling and sharing some of the costs of living. Also for Sweden, income from capital gains is included, as are the incomes of people living for part of the year. These differences relative to the calculations for other countries are likely to lead to higher measured inequality in Sweden. Indeed, Comparison with estimates from the Swedish Ministry of Finance confirm that the Gini measure is sensitive to both household definition and inclusion of capital gains. If a comprehensive household definition were used and capital gains were excluded, these numbers suggest that the Gini coefficient would be lower by about 6 to 7 points. In future analysis, it is planned to show inequality measures using this latter definition. (b) The reference time period for incomes for most countries is one year, but for Ireland and the UK it is shorter (a month or a week for most sources of income). Detailed descriptions of the structure of tax-benefit systems as well as validations of EUROMOD results against available external statistics in each country can be found in individual "country reports" on the web-site http://www.iser.essex.ac.uk/msu/emod/countries.

In this paper, income redistribution is measured in relation to the standard Gini coefficient.[7] In particular, the redistributive effect, *RE* of taxes and/or benefits (TB) is measured as the difference between the Gini coefficients of income before (G_X) and after taxes and/or benefits (G_{X+TB}).

$$RE = G_X - G_{X+TB}$$

Since measuring the redistributive effect of a policy instrument involves a comparison of incomes before and after this instrument, it is evident that redistribution measures are sensitive to the definition of the "base" or "pre-instrument" income (*X* in our notation). For example, the redistributive effect of an income tax can differ significantly from what one might expect if pre tax and transfer market income is used as *X*. Since some benefits may be taxable, individuals with zero market income can have positive tax liabilities. As a result, income taxes will seem less redistributive if market income is taken as the base than if all of taxable income is the starting point.

One implication of this is that the assumed sequence of different instruments matters when decomposing the redistributive effect of the entire tax-benefit system into the contribution of each individual tax and benefit. Obviously, studies looking at only one type of instrument (e.g. taxes) do not encounter this problem. Given the wider scope of the present paper we do, however, have to make a decision on the appropriate sequence. Unfortunately, choosing any particular sequence would be arbitrary to some extent since different sequences will generally be appropriate in each country (for instance, means-tested benefits can be taxable in some countries but may depend on after-tax income in others). Any particular choice would be hard to justify and we therefore do not attempt to decompose effects of all tax benefit instruments simultaneously. Instead, we investigate the equalising properties of different types of instrument by focussing on one instrument at a time. Rather than assessing the contribution of each type of tax or benefit to the overall effect of the tax-benefit system, we ask for each type of tax and benefit: starting from a situation where this instrument does not exist, what are the distributive effects of introducing it? Hence, we measure the redistributive effect of individual taxes and benefits by comparing disposable income after all taxes and benefits (*X+TB* in the above notation) with disposable income minus the effect of the instrument of interest (*X*).

We exploit EUROMOD's capacity to identify individual taxes and benefits in order to explore the contribution of each main component of tax-benefit systems to redistribution. We use two different definitions of "base" or "pre tax-benefit" income as our starting points. One is "market income" as conventionally defined. This includes gross earnings (pre-tax and not including employer social contributions), self-employment income and income from capital plus private pensions and transfers from other households. The second starting point also includes income from public pensions. This dual perspective is taken for two reasons. First, one can argue that public pension income is not properly part of the redistributive system and should be considered as deferred earnings or compulsory savings. This applies particularly to insurance-based systems.

The second reason is more pragmatic. In some countries private pensions substitute for public pensions. This occurs under varying degrees of regulation, compulsion and state subsidy, and to varying extents. Drawing the line between "public" and private" is difficult. Our data do not allow us to identify private pension income with any precision and so this, together with

[7] The standard Gini indicator represents one of many possible approaches for aggregating observed income inequalities into one overall measure (using the same weight for each observation regardless of income level. See Donaldson and Weymark, 1980 and Yitzhaki, 1983). A planned extension of this paper will use the generalised version of the Gini index to explore the sensitivity of results to alternative weighting schemes giving, for instance, more weight to inequalities at lower income levels.

other income from capital, is included in market income under both starting points. For reasons of comparability the second starting point treats public pensions in the same way.

The transformation of market income to disposable income is defined in the following steps:

	(1) market income
+	(2) state pensions
+	(3) non means-tested benefits
+	(4) means-tested benefits
-	(5) employee and self-employed social insurance contributions
-	(6) income taxes
=	(7) disposable income

The first of our two starting points is market income (1) and the second is after the addition of public pension income (2). Public pension income is defined to be restricted to those aged 65 or more and to benefits specifically intended to provide income during old age or to replace earnings during retirement. Any other pensions paid to younger people or other benefits paid to the elderly are included in one or other of the cash benefit categories (3) or (4) rather than as pension income. Cash benefits have been sub-divided into those that are means-tested – designed to redistribute to low income individuals or households – and those that are not specifically targeted by income (or assets). In practice in some cases the distinction can be somewhat arbitrary, especially where a means test applies to a relatively minor top-up component of a more general benefit. Annex B discusses these definitions in more detail and lists the income components that are considered to be "pension" and "means-tested" benefits in each country. Remaining cash benefits are classified as non means-tested benefits (3). Employee and self-employed social contributions are deducted (5) as are direct taxes - mainly income taxes, but also including other direct, personal taxes that exist in some countries – (6).[8] This results in disposable income (7).

Throughout, income is aggregated across household members. When comparing average incomes across countries (as in section 4.1) income is aggregated across all (weighted) households, without adjustment for household size and composition. All distributional analysis is conducted at the person level, allocating household income and its components to each person in the household. For this purpose, incomes and income components are equivalised using the modified OECD scale.[9] Statistics for EU15 are constructed applying population weights and adjusting income for differences in purchasing power across countries.[10]

[8] Arguably, when adopting the starting point which includes public pension income in market income, the element of social contributions that covers pensions should also be deducted from market income rather then being considered as part of the redistributive system. This is not done in this version of the paper because of the difficulty in some countries in assigning a component of contributions to pensions.

[9] This assigns a weight of 1 to the household head, weights of 0.5 to every other adult in the household and 0.3 to each child (person aged below 14) in the household.

[10] Incomes in Euro are divided by the OECD purchasing power adjustment factors for GDP as follows: AT: 0.9401, BE: 0.9304, DK: 1.1369, FI: 0.9718, FR: 0.9284, GE: 1.0057, GR: 0.6652, IR: 0.8734, IT: 0.8019, LU: 1.0112, NL: 0.9103, PT: 0.6467, SP: 0.7344, SW: 1.0756, UK: 0.9341. For Denmark, Sweden and the UK respectively the following Euro exchange rates are used: 7.511, 8.807, 0.6783.

4. Results

This section considers in turn

(a) The size of the various components of the redistributive systems. The picture for average households is contrasted with that for the bottom and top quintiles.

(b) Income inequality and the redistributive effects of tax-benefit systems as a whole using the two alternative "starting points" (excluding and including public pensions).

(c) The redistributive effect of four main tax-benefit components (means-tested benefits, non means tested benefits, social contributions and income taxes).

4.1 The composition of household income across the income distribution

First we demonstrate the extent to which each income source varies in size across countries. Figure 1 shows the composition of disposable income in terms of market income, income taxes, social contributions and the three categories of benefits and public pensions that we consider. Incomes are not equivalised and are measured per household rather than across persons. This gives a "budgetary" perspective rather than a welfare perspective to the overall redistributive mechanisms. Nevertheless, it is important to note that these estimates should not be interpreted in terms of budget deficits or surpluses, as major parts of government revenue (e.g. employer contributions, indirect taxes, corporate taxes) and spending (in-kind benefits, spending on public services) are not included. One way of interpreting the information in Figure 1 is as showing the composition of 100 euro of disposable income. How much market income is necessary on average to achieve this level of disposable income, and how much is deducted as taxes and added as benefits?

For eight countries market income forms on average between 95% and 105% of disposable income. This means that in most countries the state "takes" about the same amount in income taxes and employee contributions[11] as it "gives" in cash benefits shown here. Market income makes up more than 105% of disposable income in Belgium, Denmark, the Netherlands, Germany and Sweden. This means that deductions from gross market incomes are significantly higher than the sum of all shown benefits; this is especially the case in Denmark, where non-cash benefits - which are not included - play an important role. Spanish and French households, on the other hand, receive on average notably more benefits than they pay in taxes, as their original income is less than 95% of disposable income.

Public pensions form more than 15% of average disposable income in Austria, France, Germany, Italy, Luxembourg, Spain and Sweden. On average, non means-tested benefits make up a much greater proportion of disposable income than means-tested benefits, except in the case of Ireland and the UK. On the burden side we find that income taxes are dominant in all countries, except France, the Netherlands and Greece where social contributions are relatively more important.

Low income households

Figure 2 shows the same information for low income households: those in the bottom quintile group of the distribution (defined on the basis of equivalised household disposable income at the person level). The situation is entirely different. In about half of the EU countries market income and state transfers each account for half of disposable income. Greece and Italy have a

[11] In most countries, total employer social insurance contributions, which are not included in the calculations, are of a similar or greater magnitude than employee-paid contributions (Austria, Belgium, Finland, France, Germany, Greece, Italy, Luxembourg, Portugal, Spain).

relatively higher share of market income (around 2/3). A considerably smaller share of market income is found in Belgium, Denmark, Finland and especially the UK and Ireland. In these latter two countries means-tested benefits form a large proportion of household income for those in the bottom quintile (in Ireland even more than 50%). In all other countries non means-tested benefits represent a larger share of household incomes than means-tested cash transfers, even for these low income households. Compared to average households, public pensions make up a larger share of household income in the bottom quintile, indicating that an important proportion of the low income population consists of pensioners.

Although most income tax systems are progressive, this does not mean that people with low incomes pay no taxes. Especially in Denmark and Sweden, the tax burden for the bottom quintile is relatively high. In the Netherlands they pay rather high social contributions; this follows from the fact that the Dutch also pay contributions on pensions and on an important part of their other state transfers (see also Verbist, 2005). Ireland is the only country where the group with the lowest 20% of incomes pays virtually no taxes or contributions.[12]

High income households

As might be expected, and as shown in Figure 3, market income is greater than 100% of disposable income in the top quintile (by 80% in Denmark). This is mirrored by the high level of taxes paid by these relatively rich households, especially in Denmark and Belgium. Contributions are far less important than for the average household, due to the upper limit on earnings that is applied in most social contribution systems.

Benefits only make up a small part of disposable income; they are particularly low in Ireland and the UK. Naturally, means-tested benefits are low. But they are not entirely absent, as means tests are usually applied to income of the couple or inner family rather than the household as a whole. Thus low income pensioners may receive means tested benefits while living in high income households. It is also striking that, except maybe for Austria, public pensions are far less important than for the other income groups (in Ireland and Denmark they are almost zero). This is consistent with studies that show how pensioners are underrepresented at the top of the income distribution (see e.g. Whitehouse, 2000).

4.2 Income inequality and the redistributive effect of tax-benefit systems

Clearly tax-benefit systems operate very differently for the rich and the poor across countries. In order to examine explicitly the redistributive effects of the systems as a whole, inequality levels before and after adding in taxes and benefits are shown in Figure 4 (and see Table 1). As explained in section 2, we use the standard Gini coefficient to measure inequality and this is plotted for three different income concepts: market income, market plus public pension income and disposable income. Countries are ranked by market income inequality. Confidence intervals, calculated using bootstrap techniques are also shown.[13] The differences between the square and circle shaped markers show the reduction in inequality that arises once public pensions are added to market income.

This is a graphical representation of calculating the redistributive effect as the difference between G_X and G_{X+TB}. The redistributive effect of all instruments, where X is market income and TB is the sum of all taxes and benefits, is given by the distance between the markers for market income and disposable income on Figure 4. The effect of all instruments except public

[12] In fact, 0.3% for both taxes and contributions.

[13] In most individual countries 1000 replications were used; for the EU-15 as a whole 100 replications were carried out.

pensions (i.e. X = market and public pension income, and TB = all taxes and benefits except public pensions) is given by the distance between the circle- and dot- shaped markers on Figure 4. An alternative picture is provided in Figure 5 which expresses the redistributive effect as a percentage of G_X in order to take account of country differences in the levels of market income inequality. In Figure 5 countries are ranked from high to low disposable income inequality. A third perspective is provided by Table 2 which shows the positions in the country ranking by level of inequality for the three measures of income.

Looking first at the overall impact of the tax-benefit systems including public pensions on market income inequality, we can see that all systems reduce income inequality substantially, though to very different extents. This is illustrated by the fact that the difference between the lowest and the highest levels of inequality is smaller for market income (a difference of 0.108 between the Gini coefficients for the Netherlands and Spain) than for disposable income (a difference of 0.125 between Austria and Portugal).

The tax-benefit system is highly redistributive in Finland, Denmark, Belgium, Austria, Luxembourg and Germany (*RE* of 45% or more relative to market income inequality – shown by the darker bars in Figure 5). These are also the countries with the lowest levels of disposable income inequality. Greece, Italy and Portugal on the other hand have a low degree of redistribution (*RE* of about 30% of market income inequality), and are the countries with the highest inequality of disposable incomes. France, Sweden, the Netherlands, Ireland, UK and Spain form a middle group in terms of the extent of redistribution, although the Netherlands starts with the lowest market income inequality and Spain starts with the highest market income inequality. The observation that countries with relatively equal distributions of disposable incomes tend to exhibit the largest redistributive effects illustrates the importance of redistributive mechanisms built into tax-benefit systems. [14]

The size of the redistributive effect is highly sensitive to whether public pensions are included as part of the redistributive system. Pensions play a particularly important role in reducing market income inequality in Austria, Germany, Luxembourg, France and Spain and a particularly minor role in Ireland the UK and to a lesser extent, Denmark. The ranking of the amount of redistribution achieved is therefore somewhat altered if public pensions are considered as part of market income and not part of the redistributive system. Belgium, Denmark and Finland remain in the group of the three most redistributive countries (*RE* of 36% or more), and Austria, Germany and Luxembourg now form an "upper-middle" group (with *RE* between 30% and 36%) along with three of the countries that are classified as middle-ranking when pensions are included in the redistributive system: Ireland, the Netherlands and the UK. Without public pensions the Spanish system is relatively less redistributive and joins the other southern countries in the low redistribution group (*RE* of under 25%). The remaining two countries – France and Sweden – achieve redistribution at an intermediate level between 25% and 30%.

Taking the EU-15 countries as a whole, "European" market income inequality lies between that of the 5th and 6th most equal countries (Germany and Luxembourg) once national levels of income have been adjusted for purchasing power differences. The redistributive effect of the system as a whole is similar to that of the middle-ranking group of countries and if public pensions are not considered as part of the redistributive system, the equalising effect is lower, and commensurate with that of Spain.

[14] To a degree this result also captures behavioural incentives associated with tax-benefit systems, where the presence of strong income replacement instruments can result in reduced labour supply by those with low earnings potential, and thus lower market income inequality.

Comparison of the measures with these two income concepts indicates that the equalising effect of pensions varies greatly over countries. In Ireland and the UK it turns out to be very small, which, as we have seen, are also the countries with the lowest proportion of public pensions in household income (as shown in Figures 1 to 3). This distinction emphasises the fact that pensions are primarily provided through the private sector in Ireland and the UK. Unsurprisingly, in countries where the state is a more important provider of retirement incomes, public pensions are more effective at reducing income disparities. Clearly, the accounting period is highly relevant here. Even if there was no inter-personal redistribution in state pensions over the lifetime at all (so that they would be equivalent to unsubsidised private pensions), pensions would appear highly redistributive in a cross-sectional perspective as they are often the main income source for the elderly.[15]

4.3. Redistributive effects of individual policy measures

In a similar way we now calculate the redistributive effect of each component of the tax-benefit systems separately. Thus *X* becomes market income including all taxes and benefits except the instrument concerned, i.e. in turn, non means-tested benefits (not including public pensions), means-tested benefits, social contributions and income taxes. As explained in Section 2 the question that we are asking is, starting from the situation without the instrument in question, how much is inequality reduced by introducing it? We ask this question for each of the four types of instrument in turn, and the results are shown in Figure 6 and, more detailed, in Table 3.[16]

Of these four instruments non means-tested benefits have a leading role in the redistributive process in almost all countries (and the EU-15 as a whole). Especially in the Scandinavian countries, Austria and Belgium these benefits have a very large equalising effect. In Ireland and the UK means-tested benefits are the most important redistributive instruments. The inequality reduction due to means-tested benefits is much smaller in all other countries although the redistributive effect can still be sizable and is larger than that of income taxes in France and Sweden.

Social insurance contributions have relatively the weakest redistributive power, as in most countries they are levied on a more or less proportional base, at least within the most relevant parts of the earnings distribution.

The contribution of income taxes to inequality reduction is relatively high in the countries with the most equal distributions of disposable incomes (Austria, Belgium, Denmark, Finland, Germany, Luxembourg and the Netherlands), and also in Ireland and Spain. It is interesting to relate these results to the relative importance of income taxes shown in Figure 1. Income tax burdens are high in Belgium, Denmark and Finland. Given the size of the tax burdens in these countries there is therefore considerable potential to alter the distribution of incomes and a progressive income tax will therefore tend to be highly redistributive. Yet Figure 6 also shows that the other countries with a highly redistributive income tax achieve a similar reduction of the Gini coefficient despite much lower income tax burdens, indicating a higher degree of tax

[15] Even when measured over the lifetime, public pensions tend to exhibit considerable inter-personal redistribution as a result of widely-used design features such as minimum pension guarantees and benefit ceilings in earnings-related pension schemes.

[16] Note that, using this approach, the sizes of the effects shown in Figure 6 do not sum to the overall *RE* shown in Figure 5.

progressivity in these countries.[17] A moderate degree of redistribution through income taxes is achieved in Greece, Portugal and the UK (in Portugal income taxes are nevertheless the most redistributive of all instruments). The redistributive effect of taxes is rather low in Italy, France and – despite large tax burdens – Sweden.[18]

Summarising, we find that countries with a relatively low level of disposable income inequality, are characterised by a high redistributive effect of both non means-tested benefits and income taxes. Countries with a relatively high level of disposable income inequality either show a low redistributive effect for all instruments (as is the case for Southern Europe) or a high redistributive effect for means-tested benefits only (Ireland and UK).

5. Conclusions

The variation in size and structure of direct taxes and cash benefits in the Member States of the European Union is one of the prime determinants of differences in income inequality across countries. In this paper we have investigated the role of different components of tax-benefit systems in the cross-sectional inequality of disposable household income. Unlike many other international studies the analysis encompasses both direct taxes and cash benefits, and it covers all 15 'old' member countries of the EU in a manner that provides results which are conceptually consistent and comparable across countries. A microsimulation approach is employed, which allows some of the measurement problems normally encountered in comparative research on income inequality to be addressed. The most obvious advantage is that this approach permits an analysis of taxes and benefits based on datasets that do not provide information on these variables at all, or not with the desired level of detail. More generally, it makes the analysis of taxes and benefits less dependent on the precise definition of these variables in the underlying data and differences in the definitions across countries. By ensuring a consistent application of the legal rules governing tax liabilities and benefit entitlements across countries, the resulting tax and benefit amounts are potentially more comparable than tax and benefit variables recorded in the original micro-data sources. Furthermore, the simulation approach provides greater analytical flexibility as it allows sub-categories of taxes and benefits to be defined consistently across countries and independently of definitions adopted by the data providers. Thus analytical choices are not simply driven by data availability. In this study we explore separately the effects of income taxes, social contributions, public pensions and other non means-tested and means-tested benefits. Finally, the generation of results at the micro-level for all 15 countries allows inequality measures to be reported for the EU-15 as a whole as well as for each country.

For the EU-15 as a whole the Gini coefficient for market income (0.47) is similar to that of Belgium, Finland, Germany or Luxembourg. Public pensions reduce this to 0.41 while the redistribution achieved by all tax and benefit components taken together reduces the European Gini to 0.30 – a degree of inequality that falls in-between that observed in France and the UK. The overall redistributive effect is in absolute terms of similar size to that in the Netherlands

[17] An analysis of the individual driving factors of the redistributive effect (size of the tax or benefit instrument, progressivity and re-ranking effect) in European tax-benefit systems is the subject of follow-up work to the present paper.

[18] The division of countries in high, moderate and low redistributive effect through taxes is close but not identical to that found by Verbist (2004) who also uses EUROMOD: the high *RE* countries are Austria, Belgium, Denmark, Finland, Germany and Luxembourg; the group with a moderate *RE* consists of Ireland, Netherlands, Portugal, UK; and those with a low *RE* are France, Greece, Italy, Spain, Sweden. This study investigates the effect of taxes and contributions in combination, rather than separately.

and the UK and in relative terms (taking account of the starting level of market inequality) closest to that of Spain.

Countries that achieve a high level of inequality reduction through their tax-benefit system do this mainly by using non means-tested benefits and taxes; this is the case for the Scandinavian countries and most of the continental welfare states. A low degree of redistribution is achieved in Southern Europe, except in the case of Spain if pensions are considered as part of the redistributive system. The redistributive effect of taxes and transfers is somewhat higher in Ireland and the UK, who mainly rely on means-tested benefits.

Pensions can be considered as a redistributive instrument between individuals at a point in time or as a means of saving by a single individual over time. Both aspects are present to some extent in all pension systems. While it is not possible to distinguish the savings function of pensions from the redistributive, we have shown that the equalising effect of public pensions within a particular year is rather small in Ireland and the UK, where pensions are primarily provided through the private sector. In all other countries, however, our results show that state pensions have a strong equalising effect, which justifies some consideration of their redistributive role at a moment in time.

The analysis presented here raises questions to be explored in further work. First of all, we have relied on the standard Gini coefficient to measure inequality. Other measures, with different sets of welfare preferences embodied in them, could result in different rankings of countries. Secondly, we have focussed on the redistributive, or equalising, properties of taxes and benefits without investigating the extent to which the size and design of the instruments play a role. Unpacking the redistributive effect into components corresponding to the progressivity of the instrument, the size of the instrument and the extent of re-ranking when the instrument is applied, would inform our understanding of how and why some systems are more equalising than others. Finally, the key equalising role of non means-tested benefits in many systems deserves further investigation. Non means-tested benefits consist mainly of unemployment benefits, pensions paid to the non-elderly and universal benefits (mainly child benefits) in most countries. It would be interesting to further "dissect" this group of benefits, as their distributional characteristics are likely to be different and to vary among countries.

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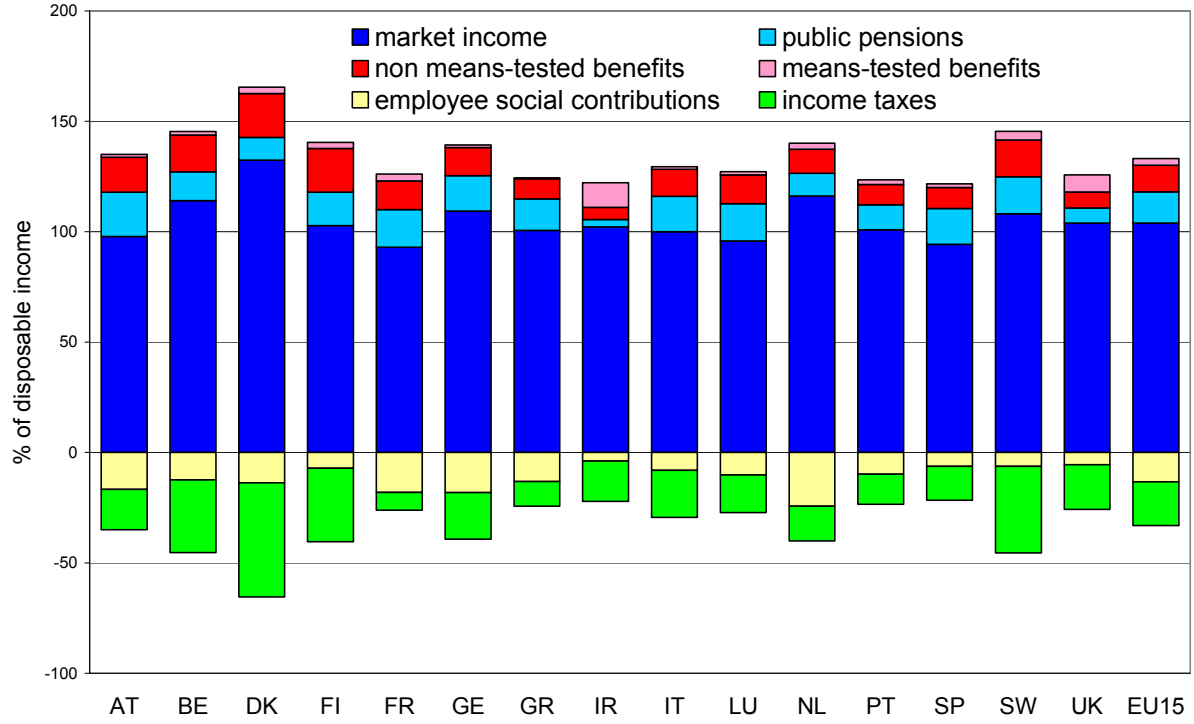
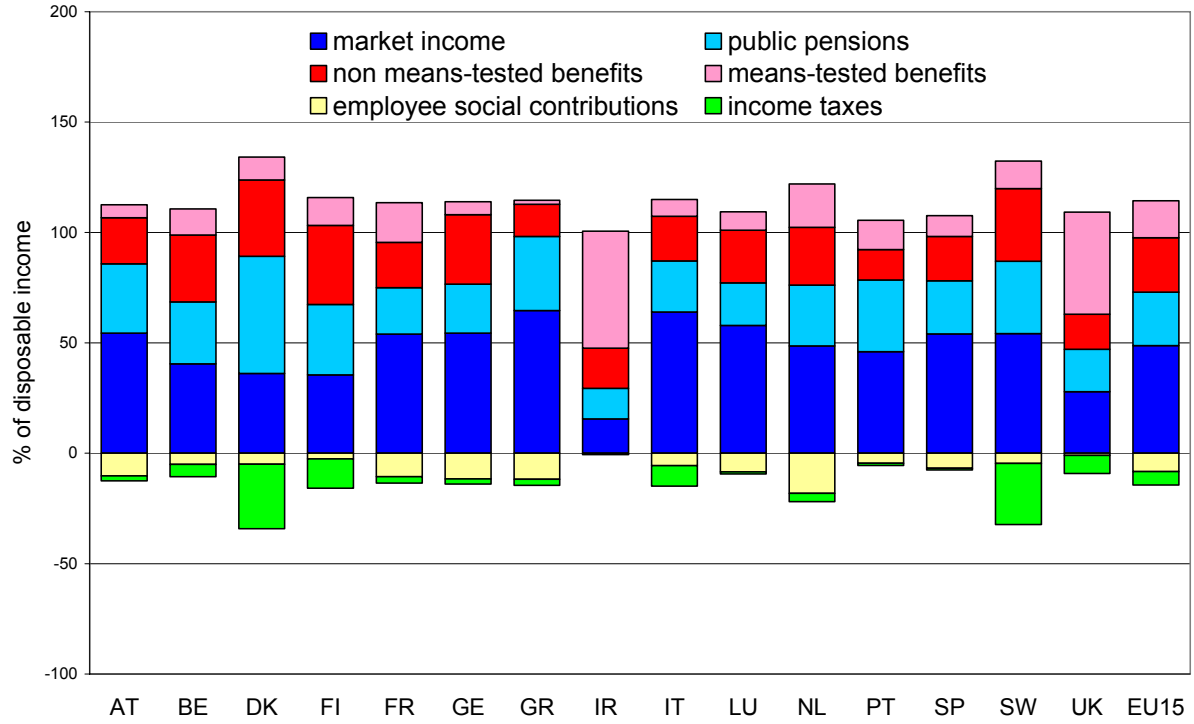
Figure 1: Income composition 1998: all households



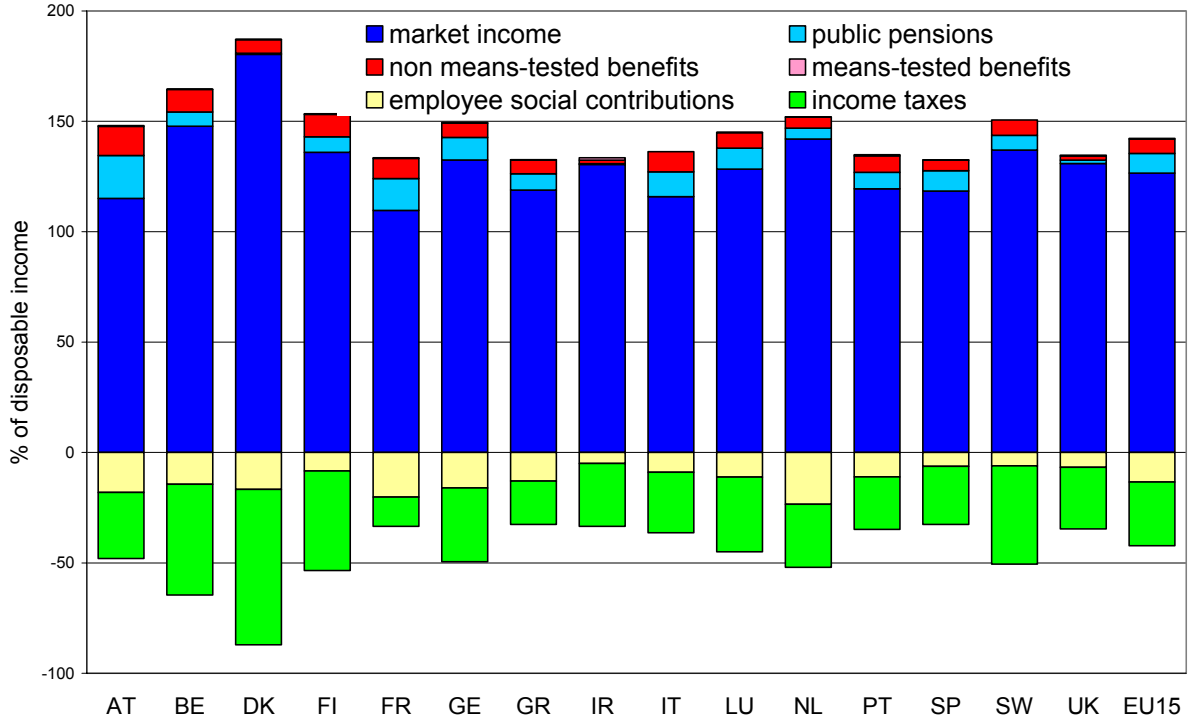
Source: EUROMOD (See http://www.iser.essex.ac.uk/msu/emod/emodstats/index.php)

Figure 2: Income composition 1998: bottom quintile



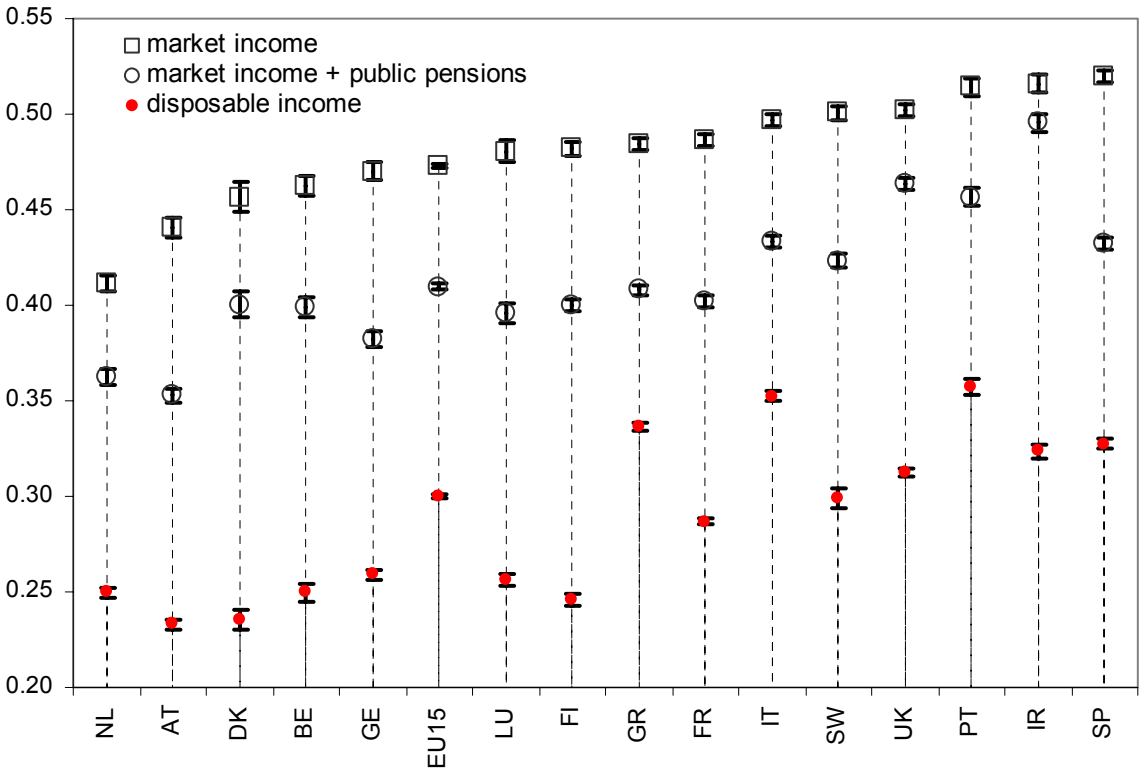
Source: EUROMOD (See http://www.iser.essex.ac.uk/msu/emod/emodstats/index.php)

Figure 3: Income composition 1998: top quintile



Source: EUROMOD (See http://www.iser.essex.ac.uk/msu/emod/emodstats/index.php)

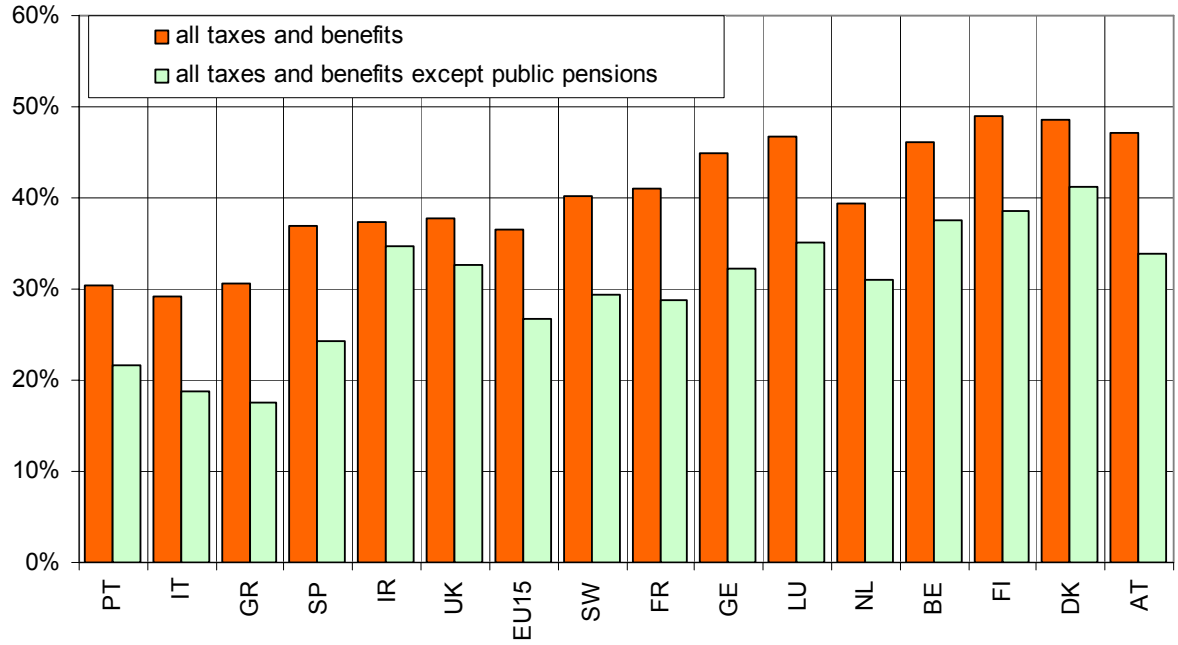
Figure 4: Income inequality 1998 (Gini coefficient)



Source: EUROMOD Countries are ranked by market income inequality

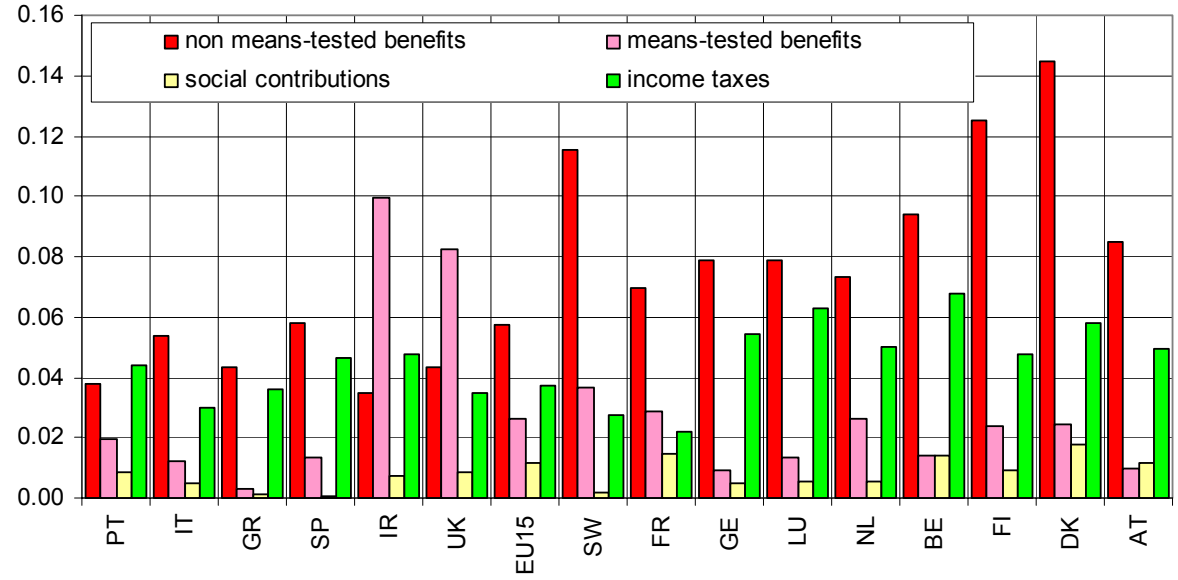
Note: The statistical reliability of the estimates is shown using confidence intervals that have been constructed to be significant at the 5% level: i.e.+/- 1.96 * estimated standard error.

Figure 5: Redistributive effect of tax-benefit systems 1998 (% change in Gini)



Source: EUROMOD
Countries are ranked in descending order of inequality of disposable income

Figure 6: Redistributive effect of tax-benefit instruments 1998 (change in Gini)



Source: EUROMOD
Countries are ranked in descending order of inequality of disposable income

Table 1: Gini coefficients for market income, market income including public pensions and disposable income, 1998

		Market income			Market income + public pensions			Disposable income		
			Confidence interval			Confidence interval			Confidence interval	
			min	max		min	max		min	max
Austria	**AT**	0.441	0.431	0.450	0.353	0.345	0.361	0.233	0.227	0.239
Belgium	**BE**	0.462	0.452	0.473	0.399	0.389	0.409	0.250	0.241	0.258
Denmark	**DK**	0.457	0.442	0.471	0.400	0.387	0.414	0.235	0.225	0.245
Finland	**FI**	0.482	0.474	0.489	0.400	0.393	0.407	0.246	0.240	0.252
France	**FR**	0.486	0.480	0.492	0.402	0.397	0.408	0.287	0.283	0.291
Germany	**GE**	0.470	0.461	0.479	0.383	0.375	0.391	0.259	0.253	0.264
Greece	**GR**	0.484	0.478	0.491	0.408	0.402	0.414	0.336	0.332	0.341
Ireland	**IR**	0.516	0.507	0.525	0.495	0.486	0.504	0.324	0.316	0.331
Italy	**IT**	0.497	0.490	0.504	0.434	0.427	0.440	0.352	0.347	0.358
Luxembourg	**LU**	0.481	0.470	0.491	0.396	0.386	0.405	0.256	0.250	0.263
Netherlands	**NL**	0.412	0.404	0.420	0.362	0.354	0.370	0.250	0.245	0.255
Portugal	**PT**	0.514	0.504	0.524	0.457	0.447	0.466	0.358	0.349	0.366
Spain	**SP**	0.520	0.514	0.526	0.433	0.427	0.438	0.328	0.323	0.332
Sweden	**SW**	0.501	0.493	0.508	0.423	0.416	0.430	0.299	0.289	0.309
United Kingdom	**UK**	0.502	0.496	0.508	0.464	0.458	0.469	0.313	0.309	0.317
	EU15	0.473	0.471	0.476	0.409	0.406	0.412	0.300	0.299	0.302

Source: EUROMOD
Note: The statistical reliability of the estimates is shown using confidence intervals that have been constructed to be significant at the 5% level: i.e.+/- 1.96 * estimated standard error.

Table 2: Inequality ranking of countries for market income and disposable income, 1998
(lower ranks have higher inequality)

	AT	BE	DK	FI	FR	GE	GR	IR	IT	LU	NL	PT	SP	SW	UK
market income (1a)	14	12	13	9	7	11	8	2	6	10	15	3	1	5	4
market income + pensions (1b)	15	11	9	10	8	13	7	1	4	12	14	3	5	6	2
disposable income (2)	15	12	14	13	8	9	3	5	2	10	11	1	4	7	6
re-ranking (1a) - (2)	1↓	↔	1↓	4↓	1↓	2↑	5↑	3↓	4↑	↔	4↑	2↑	3↓	2↓	2↓
re-ranking (1b) - (2)	↔	1↓	5↓	3↓	↔	4↑	4↑	4↓	2↑	2↑	3↑	2↑	1↑	1↓	4↓

Source: EUROMOD
Note: the first three rows show the position of each country in the ranking by inequality (Gini coefficient) using three measures of income and with the lowest rank indicating the highest inequality. The last two rows indicate with arrows the direction of movement in the country ranking when comparing the ranks under the two alternative market income measures with that for disposable income.

Table 3: Gini coefficients with confidence intervals (ci)

	disposable income (di)	di excl. pensions	di excl. all benefits	di excl. not means tested benefits	di excl. means tested benefits	di excl. social insurance contributions	di excl. taxes
AT	0.233	0.359	0.331	0.318	0.243	0.245	0.283
ci	0.230 0.236	0.353 0.365	0.326 0.335	0.313 0.322	0.240 0.246	0.242 0.248	0.279 0.286
BE	0.250	0.344	0.360	0.343	0.263	0.263	0.317
ci	0.245 0.254	0.339 0.350	0.355 0.365	0.338 0.349	0.259 0.268	0.259 0.267	0.312 0.322
DK	0.235	0.324	0.414	0.380	0.259	0.253	0.293
ci	0.230 0.240	0.318 0.331	0.407 0.420	0.374 0.386	0.254 0.265	0.248 0.258	0.287 0.300
FI	0.246	0.366	0.402	0.371	0.270	0.255	0.294
ci	0.243 0.249	0.361 0.370	0.398 0.406	0.367 0.375	0.267 0.273	0.252 0.258	0.291 0.297
FR	0.287	0.389	0.390	0.356	0.316	0.302	0.309
ci	0.285 0.289	0.386 0.391	0.388 0.392	0.354 0.359	0.314 0.318	0.300 0.304	0.306 0.312
GE	0.259	0.362	0.349	0.338	0.268	0.264	0.313
ci	0.256 0.262	0.358 0.366	0.345 0.353	0.334 0.341	0.265 0.271	0.261 0.266	0.309 0.317
GR	0.336	0.423	0.384	0.380	0.339	0.337	0.372
ci	0.334 0.339	0.420 0.426	0.381 0.386	0.377 0.383	0.337 0.342	0.335 0.340	0.369 0.375
IR	0.324	0.346	0.463	0.358	0.423	0.331	0.371
ci	0.320 0.327	0.342 0.350	0.459 0.468	0.354 0.362	0.419 0.427	0.327 0.334	0.367 0.376
IT	0.352	0.430	0.419	0.406	0.364	0.357	0.382
ci	0.349 0.355	0.426 0.433	0.416 0.422	0.403 0.409	0.361 0.367	0.354 0.360	0.379 0.385
LU	0.256	0.365	0.351	0.335	0.269	0.262	0.319
ci	0.253 0.260	0.360 0.370	0.347 0.355	0.331 0.339	0.266 0.273	0.259 0.265	0.314 0.324
NL	0.250	0.311	0.352	0.323	0.276	0.255	0.300
ci	0.247 0.252	0.308 0.315	0.348 0.356	0.319 0.326	0.273 0.279	0.253 0.258	0.296 0.304
PT	0.358	0.420	0.416	0.396	0.377	0.366	0.401
ci	0.353 0.362	0.415 0.424	0.412 0.421	0.391 0.400	0.373 0.381	0.362 0.370	0.397 0.406
SP	0.328	0.426	0.400	0.386	0.341	0.328	0.374
ci	0.325 0.330	0.423 0.429	0.398 0.403	0.383 0.388	0.339 0.344	0.326 0.330	0.371 0.377
SW	0.299	0.427	0.458	0.415	0.336	0.301	0.326
ci	0.294 0.304	0.422 0.432	0.454 0.463	0.409 0.420	0.331 0.340	0.296 0.305	0.322 0.330
UK	0.313	0.354	0.448	0.356	0.395	0.321	0.347
ci	0.310 0.315	0.352 0.357	0.445 0.451	0.353 0.358	0.392 0.397	0.319 0.323	0.345 0.350
EU15	0.300	0.376	0.388	0.358	0.327	0.312	0.338
ci	0.299 0.301	0.374 0.377	0.387 0.390	0.357 0.359	0.326 0.328	0.311 0.313	0.337 0.339

Source: EUROMOD

Note: The statistical reliability of the estimates is shown using confidence intervals that have been constructed to be significant at the 5% level: i.e.+/- 1.96 * estimated standard error..

Annex A: EUROMOD source data.

Country	Base Dataset for EUROMOD	Date of collection	Reference time period for incomes
Austria	Austrian version of European Community Household Panel	1998+1999	annual 1998
Belgium	Panel Survey on Belgian Households	1999	annual 1998
Denmark	European Community Household Panel	1995	annual 1994
Finland	Income distribution survey	1998	annual 1998
France	Budget de Famille	1994/5	annual 1993/4
Germany	German Socio-Economic Panel	1998	annual 1997
Greece	European Community Household Panel	1995	annual 1994
Ireland	Living in Ireland Survey	1994	month in 1994
Italy	Survey of Households Income and Wealth	1996	annual 1995
Luxembourg	PSELL-2	1999	annual 1998
Netherlands	Sociaal-economisch panelonderzoek	1996	annual 1995
Portugal	European Community Household Panel	1996	annual 1995
Spain	European Community Household Panel	1996	annual 1995
Sweden	Income distribution survey	1997	annual 1997
UK	Family Expenditure Survey	1995/6	month in 1995/6

Annex B: Categorisation of public pension and means-tested benefit income components

In this appendix we explain which variables are included in our concepts of *pension incomes* and *means tested benefits* and discuss the issues to be considered in such classifications.

Pension Incomes

Our understanding of pension income can be roughly defined as state enforced savings. This includes however not only the classical form of social insurance pensions but also general tax financed pension schemes, like for example the Danish old-age pension, received by almost all Danes reaching the age of 67 (lowered to 65 in 2004).

We do not consider means tested old age schemes as pensions, unless they are an integral part of the pension system. If low pensions are topped up to reach a certain minimum, we count these supplements as pension income. This distinction can be somewhat arbitrary in practice. Other means-tested schemes for the elderly are included as means-tested benefits (see below).

As in some countries early retirement pensions are used as a substitute for unemployment benefits we restrict our pension definition to retirement benefits granted to people aged 65 or older. In the same sense, invalidity pensions are not included in the pensions measure, as they are state insurance for another "risks" than old age. On the other hand we include non means tested survivor's pensions (for those aged 65+). Where invalidity pensions are paid instead of retirement pensions to people aged 65 or more, these are treated as pension income.

Finally, some non-pension benefits apply specific rules to the elderly. For example, rules are different for the elderly in Finnish and Danish housing benefits. Such benefits are not included in the pensions category.

The income components included for each country as pensions are listed below:

AUSTRIA
- minimum pension
- minimum pension for civil servants
- child bonus for pensioners
- child bonus for civil service pensioners
- civil servant's pension
- early retirement pension invalidity pension
- old age pension
- other old age related schemes or benefits
- survivor pension

BELGIUM
- anticipated pension
- other public pensions
- retirement pension
- survivor pension

DENMARK
- disability pension - basic amount plus supplement
- disability pension - special supplement plus incapacity amount
- disability pension - invalidity amount plus 'augmentation' plus special benefit for disabled with substantial earnings
- old age pension
- supplementary pension
- survivor pension

FINLAND
- gross state pension income *
- national (basic) pension increases

FRANCE
- minimum old age pension
- pension benefits
- alimony
- pre-retirement pension

GERMANY
- own old age pension
- miners' own pension
- civil servants' own pension
- farmers' own pension
- widow/orphan old-age pension
- miners' widow/orphan pension
- civil servants' widow/orphan pension
- farmers' widow/orphan pension
- accident widow/orphan pension

GREECE • farmers' pension • social solidarity benefit • state pension • invalidity pension (contributory) • state survivor's pension	**IRELAND** • deserted wife contributory benefits • occupational injury contributory pension • old age contributory benefits • retirement contributory benefits • survivor's contributory benefits	**ITALY** • public and private sector old age contributory pensions • public and private sector contributory disability pensions • public and private sector contributory survivor's pensions • supplement paid on old age pensions – public and private sector • supplement paid on disability pensions – public and private sector • supplement paid on survivor's pensions – public and private sector • foreign pension
LUXEMBOURG • disability pension • early retirement pension • pension received from employment in private sector • pension received from employment in public sector • private sector reversion pension • public sector reversion pension	**NETHERLANDS** • state pension • survivors' benefit	**PORTUGAL** • old-age insurance • old-age agricultural.insurance • survivors related benefits
SPAIN • old age pension supplement • widow pension supplement • old-age (insurance and early retirement) • survivors (widows or orphans, insurance)	**SWEDEN** • non-taxable pension • other taxable pensions	**UK** • widow benefit • basic retirement pension • state earnings related pension

* includes some occupational pension income.

Means Tested Benefits

Our definition of means tested benefits is intended to cover all benefits that depend on an assessment of current income. It includes all benefits with an earnings or income test, even if the limit does not confine entitlement to the poor or near-poor. Thus it includes "affluence-tested" benefits as well as those targeted on the lowest incomes. Similarly, benefits that are more generous to people with low income than to people with high income are included in the means tested category, even if the "rich" are in principle eligible for some amount. So benefits with non means tested basic amounts plus means tested supplements are defined here as means-tested. In practice the distinction can be rather arbitrary since there are examples of benefits that are essentially universal, with relatively small means-tested top-ups. Or benefits that apply in a similar way to different groups with means-testing only operating in some variants (the Belgian child benefit is an example). The list below shows the benefits that are considered as means tested for each country in this study:

AUSTRIA
- maternity allowance supplement
- new born health check bonus
- provincial family bonus
- social assistance
- small children benefit
- unemployment benefit
- housing benefits

BELGIUM
- income support
- income support for the elderly

DENMARK
- housing benefit
- day care subsidy
- housing allowance
- social assistance

FINLAND
- housing benefit
- home child care benefit
- social assistance benefit
- pensioners housing benefit

FRANCE
- disabled benefit
- young children allowance
- education related family benefits
- family complement
- housing benefits
- lone parent benefit
- minimum income

GERMANY
- housing benefit
- federal child raising benefit
- direct housing support
- provincial child raising benefit
- social assistance

GREECE
- child allowance
- large family benefit
- third child benefit
- unprotected child benefit
- social pension

IRELAND
- housing benefit
- blind persons non-contributory benefits
- carer's non-contributory benefits
- short term disabled contributory benefits
- long term disabled non-contributory benefits
- deserted wives non-contributory benefits
- family income supplement
- long term invalidity contributory benefits
- lone parent non-contributory benefits
- long term unemployed non-contributory benefits
- old age non-contributory benefits
- pre-retirement non-contributory benefits
- short term unemployed non-contributory benefits
- social minimum non-contributory benefits
- widow's non-contributory benefits

ITALY
- family allowances for single persons with no children
- family allowances for single person with children
- family allowances for couples with no children
- family allowances for couples with children

LUXEMBOURG
- education allowance
- housing benefit
- maternity allowance
- social assistance

NETHERLANDS
- housing benefit
- social assistance for unemployed aged 50-64 and disabled unemployed under 64 with children
- general social assistance for families with children
- social assistance for unemployed aged 50-64 and disabled unemployed under 64 without children
- general social assistance for families w/o children
- general social assistance, self-employed

PORTUGAL
- child benefits
- income supplement to ensure minimum income
- social assistance

SPAIN
- child benefit
- old age social assistance
- unemployed social assistance for those with family responsibility
- social assistance benefits

SWEDEN
- housing benefits
- housing benefit supplement for pensioners
- social assistance

UK
- housing benefit
- council tax benefit
- family credit
- income support