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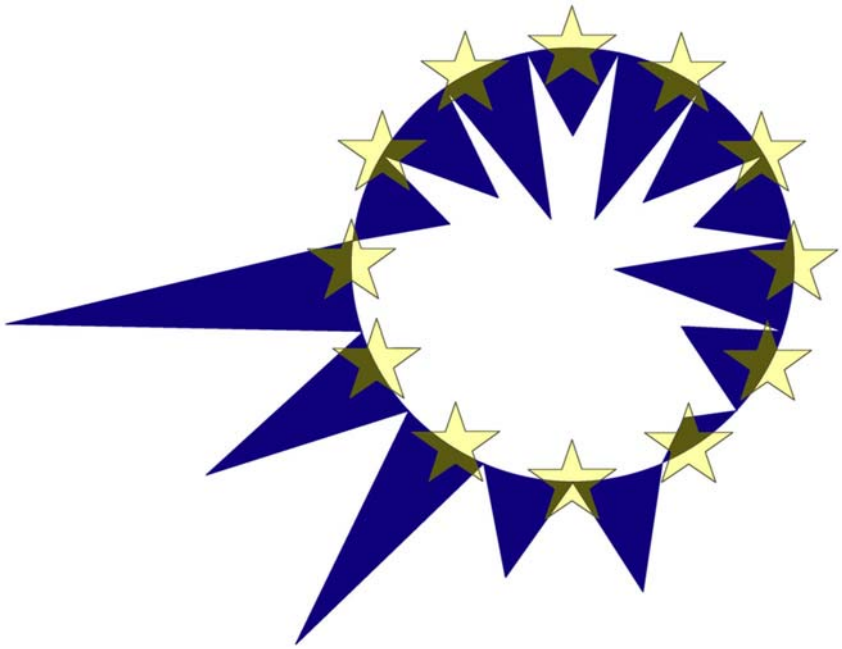

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MICRO-LEVEL ANALYSIS OF THE EUROPEAN SOCIAL AGENDA

COMBATING POVERTY AND SOCIAL EXCLUSION THROUGH CHANGES IN SOCIAL AND FISCAL POLICY

edited by
Holly Sutherland

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Micro-level analysis of the European Social Agenda

Combating poverty and social exclusion through changes in social and fiscal policy

A project financed by the *Improving Human Potential* programme of the European Commission

Final Report

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Annexes 7-9 contain administrative information and are not included in the Working Paper version of this report. They are obtainable, on request, by emailing mu@econ.cam.ac.uk

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Abstract

This project explored the impacts of national social and fiscal policies, and reforms to these policies, on poverty reduction. The project covered all 15 (pre-2004) Member States of the EU. It made use of the tax-benefit model, EUROMOD, which was updated and improved as part of the project. The model now operates with baseline policy rules for 2001 and, for 10 countries, 2003. The developing Social Agenda of the EU and the Social Inclusion process in particular, has provided the policy context and has shaped many of the project's activities. Highlights include:

Which policies make a difference? We have demonstrated that an assessment of the relative redistributive and poverty-reducing effects of national tax-benefit systems depend on which components are included in the "system". Including the effect of taxes can be important, through the counting of tax concessions as quasi benefits or through accounting for the taxation of benefits. Whether public pensions are included as part of the transfer system, and contributions as part of the tax system can have a large impact on conclusions from cross-country comparisons.

Policy learning across countries: Much can be learned from cross-country comparisons of the effects of common policies. Examination of ***pension reform*** scenarios under budgetary constraints in four countries shows that the variations in fiscal and distributive effects of a given reform can be very significant. The different starting points in terms of inequality among the elderly, the proportion of them below the national poverty lines, and existing pension arrangements, result in differential effects of some illustrative reform packages designed to protect the most vulnerable pensioners through a period of reform. Different paths for reform are necessary to achieve common objectives across countries.

Taking account of changes in labour supply following the adoption of systems from other countries - in this case, ***Making Work Pay*** policies – shows that labour market conditions in one country may make the design of a policy from a country with different conditions quite inappropriate or indeed damaging. For example, in France or Germany, the application of the British Working Families Tax Credit would have a net negative impact on employment since the strong decrease in the participation of married women (with working partners) would not be offset by a positive effect on single parents.

Replacing the minimal ***child-targeted social transfer systems*** of the countries of Southern Europe with child benefits "borrowed" from Northern European systems reduces child poverty significantly. While expensive if introduced on a universal basis, there is scope for designing non-meanstested benefits – for example those targeted on young children or large families – that can be cost effective in terms of child poverty reduction.

Macro changes and micro outcomes: Even when the rate is low, inflation can have a significant effect on both the equalising and revenue-generating properties of income tax and social contribution systems. More broadly, changes such as the level of unemployment, the extent of earnings inequality and the rate of real income growth can change the operation of tax-benefit systems and their effectiveness in reducing the risk of poverty. The size of the effect of such changes on relative poverty rates, and sometimes the direction of the effect varies across the 15 countries. If relative poverty rates are to be used as generally accepted indicators of the outcomes of policy, then it is important that these differential sensitivities are fully understood.

Inequality and policy at the regional level: National tax-benefit systems appear particularly efficient at inequality reduction in the poorer regions in a country but much less so in the richer regions. Since some of the new forms of poverty are associated with richer and more urban regions, this calls for further intervention at the level of the regional governments. At the same time, "similar" regions in Europe in terms of economic performance and levels of original income inequality achieve quite different degrees of income inequality once the redistributive role of the national tax-benefit system is accounted for. This may provide an argument on equity grounds for EU intervention in the design of tax-benefit policies.

1 Executive summary

1.1 Objectives

The aim of this project was to explore the impacts of national social and fiscal policies, and reforms to these policies, on poverty reduction. It covered all 15 (pre-May 2004) Member States of the European Union. The project made use of the tax-benefit microsimulation model, EUROMOD, so some of the project tasks involved development and updating of this model. The project as a whole had a rationale that was guided by the following points:

1. The nature of EUROMOD and of the micro-data that underlie it limit the scope of the project to monetary poverty and the impact on personal incomes of changes in cash social benefits and personal taxation. This emphasis on monetary measures is a first and important stage in the understanding of the role of social and fiscal policy in combating poverty, deprivation and social exclusion.
2. An analysis and an understanding of the influences of taxes and benefits on the income distribution as a whole are necessary to understand how to improve the situation of the poor.
3. While the primary focus is on understanding how to improve the situation of the poor, this requires an analysis and an understanding of the influences of taxes and benefits on the income distribution as a whole.
4. The standard baseline consists of estimated risk-of-poverty rates using definitions and assumptions as recommended by Eurostat: the proportion of people living in households whose disposable income, adjusted for household size, is less than 60% of the median in the Member State. However, alternative perspectives may be informative, and are explored in the following ways:
    - The standard view is of poverty as a household-level phenomenon, assuming a degree of income-sharing within the household which may not take place. Little is known about the distribution of resources within the household, or the impact of policy changes on this distribution. A range of assumptions about sharing and the incidence of taxes and benefits within the household can be adopted. Policy changes can then be analysed with a gender perspective.
    - Poverty and inequality are generally viewed as national phenomena. However, in some countries there may be significant disparities between regions. Such disparities are a function not only of differential economic conditions but also of the effectiveness of policy in responding to them.
5. The relationship between social benefits, social contributions and taxes and poverty reduction is not straightforward. As well as the overall scale of spending, effectiveness depends on many other factors, including the way in which policy is targeted. Policies may be based on universal strategies, targeted on people in vulnerable situations or with higher living costs or targeted on people living on low incomes, conditional on being in employment or not being in employment.
6. The effect of policies on incentives to change behaviour is also important. In devising strategies for "making work pay" there are two distinct policy concerns. The first relates to the incentive to work at all, which stems from a wider concern about unemployment. Combinations of high social benefit incomes when out of work and low in-work incomes lead to the *unemployment trap*, where the effective tax rate on wages that might be earned is so high that work is not regarded as worthwhile. One approach to this is to offer wage

supplements of various sorts to low waged workers. However, the withdrawal of the supplement as earnings rise combined with tax and contribution rates can result in high marginal effective tax rates, or the *poverty trap.*

7. The way in which social policies are financed cannot be separated from their impact or design because (i) the social benefits may themselves be taxed; (ii) tax concessions may play a similar role as cash benefits in other countries; (iii) social benefits must be paid for, but the form of taxation may itself have an impact on the incomes of the poor, and more generally will have an impact on income inequality as a whole.
8. Economic change can compromise the objectives of fiscal and social policy if the tax-benefit system is not adjusted to compensate. Unless macro-level changes are taken into account by policy makers, the tax-benefit system may work in ways that contravene the originally intended policy objectives.
9. The evolving policy context is relevant. The relationship between EUROMOD and the developing Social Agenda of the EU in general, and the Social Inclusion process in particular, has provided the policy context for the MICRESA project and has shaped many of its activities.

The subject matter that EUROMOD addresses is the impact of social and fiscal policies, and this impact is commonly measured using indicators such as those adopted at Laeken, other complementary measures of outcomes (in terms of poverty or income inequality), or indicators that are informative about the relationship between policies and outcomes, for example those which describe incidence and incentives. EUROMOD allows the application of these measures at national level, aggregated to the level of the EU or disaggregated to regional level. They can be applied to existing policies, prospective actual policies or policy ideas under development or designed for illustrative purposes. Policies can be designed to have a particular (first-round) budgetary effect, including budget-neutrality. They can be applied to populations with current characteristics or under changed conditions (such as after inflation, earnings growth or increased employment). This is especially important in view of the need to link the Social Inclusion process with the European Employment process.

1.2 Results

First, results arising from the various uses of EUROMOD within MICRESA are summarised, on a workpackage-by-workpackage basis (WP2 to WP7). Then the work done in revising, updating and improving EUROMOD is briefly described, together with an evaluation of the quality of its results and an assessment of its use (WP1, WP8, WP9).

1.2.1 Poverty reduction in the EU and Social Protection (WP2)

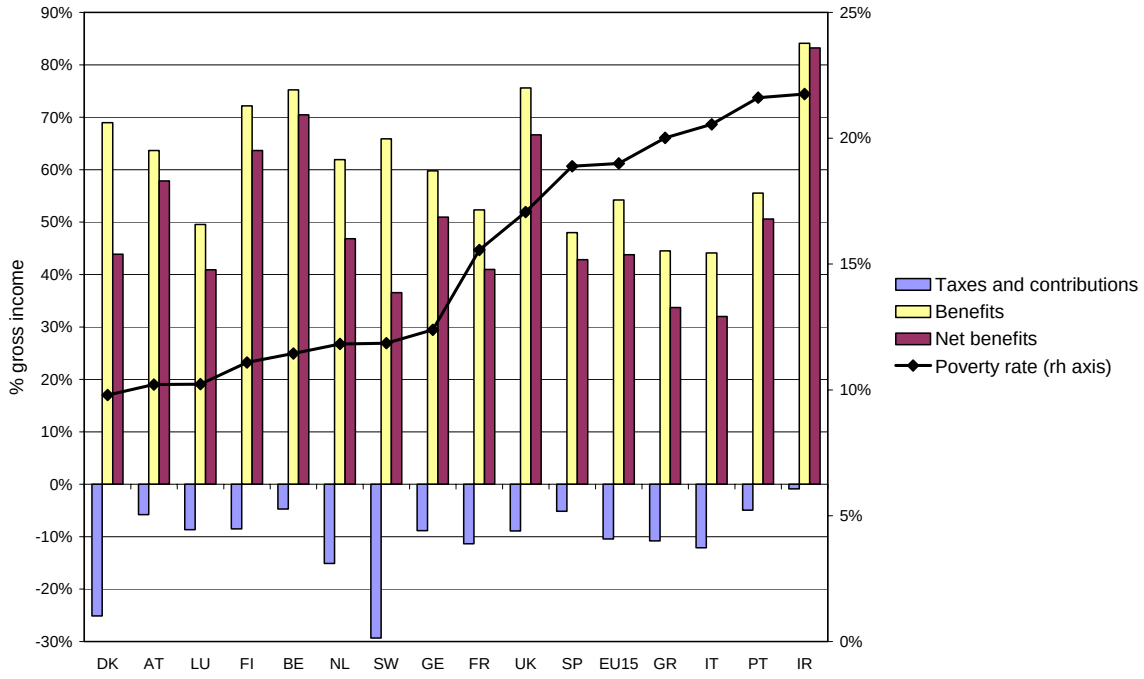
The objective of this workpackage (WP2) was to examine the relationships between financial poverty and social transfers. The main deliverables which discuss these issues in general and forward-looking terms and in relation to the European Social Agenda as a whole, are presented below under Policy Implications.[1] A number of additional empirical studies were carried out focussing on particular issues, particular vulnerable groups in the population or particular countries and these are summarised here.

[1] Atkinson A. B., 2002, "Evaluation of the National Action Plans on Social Inclusion: the Role of EUROMOD", EUROMOD Working Paper No. EM1/02
Atkinson A.B., 2005, "EUROMOD and the development of EU social policy", EUROMOD Working Paper No. EM1/05.

While the Joint Reports on Social Inclusion produced by the Commission have highlighted the relationship between poverty rates and total spending on social protection, we need to go behind these aggregate figures in order to understand the operation of policy. Only in this way can we learn from the successful experience of some Member States in reducing the risk of poverty. The MICRESA project has done this in a number of ways. One example is illustrated in Figure 1 which shows (with the pale bars) the proportion of gross incomes of the households below the poverty line that are made up of benefits (including public pensions). There is apparently no clear relationship with the poverty rate, which is plotted as the black line using the right-hand axis.[2]

Also shown are the taxes and contributions paid by poor households, indicated by the negative bars, and the net effect which in all cases is a positive component of income. Not only does the proportion vary across countries, but the picture is rather different than that obtained using gross benefits alone. In Sweden and Denmark particularly, but also in the Netherlands, Italy, France and Greece, the poor pay a significant amount in taxes and/or contributions. In some cases these taxes may be levied on the benefits themselves, or they may simply be levied on other sources of income. Clearly to establish the relative impact of social transfers on the poor across countries, account needs to be taken of the effect of taxes and contributions as well as cash transfers. Typically, sources of data on income components such as the European Community Household Panel and many other income surveys on EU countries do not collect information on taxes and other deductions. The EUROMOD database, which contains simulated liabilities for taxes and contributions, does permit such an analysis.

Figure 1 The effect of taxes and benefits on incomes in poor households, 2001



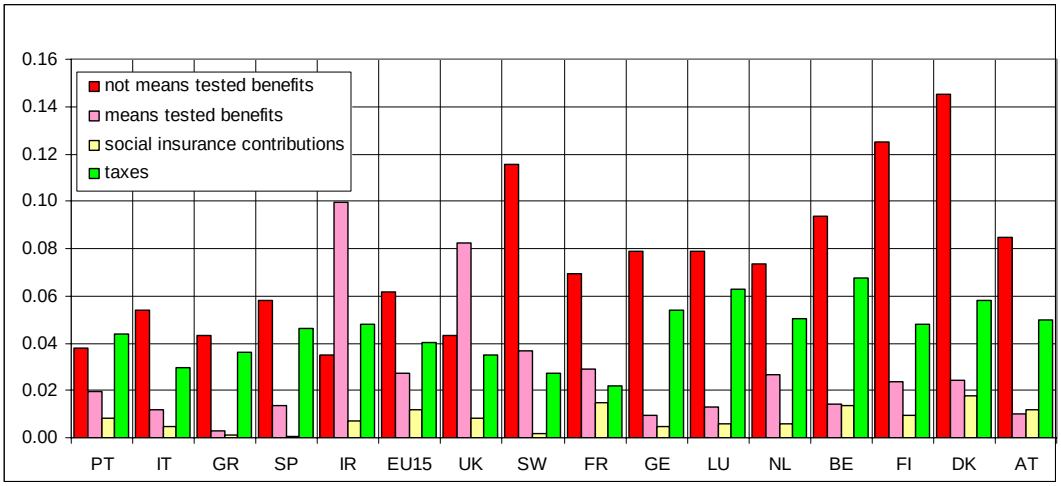
Source EUROMOD. Statistics on the Distribution and Decomposition of Disposable Income accessed at http://www.econ.cam.ac.uk/dae/mu/emodstats/DecompStats01.pdf on 12/02/05 using version 27A.

[2] Here and throughout, unless otherwise specified, household incomes are equivalised using the modified OECD equivalence scale (1/0.5/0.3) and risk-of-poverty is defined as having equivalised household income below 60% of the national median. The terms "poverty" or "poor" are used for convenience instead of "risk of poverty" or "at risk of being poor".

In seeking to learn from the experience of different countries, it is important to consider the *form* of social protection. There are potentially large differences between countries that rely on social insurance and those that seek to target benefits via income and asset-testing. Systems that rely on means-testing might appear to be the most effective with regard to poverty reduction but this deserves to be investigated further. The UK provides a case in point, with its increasing reliance on a means-tested pensioner credit, rather than on a national state pension. Interestingly it is not the case that the UK achieves the most in terms of poverty reduction. It is the 9th most effective out of 15.

Focussing on inequality rather than poverty, we analyse separately the redistributive effects of 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).[3] We find that 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, as shown in Figure 2.

Figure 2: Redistributive effect of 1998 tax-benefit instruments
proportional change in Gini



Source: EUROMOD (Immervoll, Levy et al, 2004)
Countries ranked in descending order of inequality of disposable income

In this example, public pensions are not included in the analysis. Including them as part of the redistributive system makes a difference to the cross-country assessment of the extent of redistribution. The difference is marked in the case of Spain.

Pensions, and the need for pension reform to take account of inadequacy of pensions among low income elderly populations, are considered in an exercise which focuses on four countries with very different pension systems: Denmark, Germany, Italy and the UK.[4] We compare four pension systems and analyse their characteristics by discussing a number of illustrative EUROMOD simulations with the aim of highlighting cross-country differences and similarities and suggesting nationally appropriate directions for reform. In doing so, we make use not only of the capacity of EUROMOD to simulate the effects of policy **changes**, but also

[3] Immervoll H., H. Levy, C. Lietz, D. Mantovani, C. O'Donoghue, H. Sutherland and G. Verbist, 2004, "The effects of taxes and transfers on household incomes in the European Union" EUROMOD Working Paper, forthcoming.
[4] Mantovani D., F. Papadopoulos, H. Sutherland and P. Tsakloglou, 2005, "Pension Incomes in the European Union: Policy Reform Strategies in Comparative Perspective" EUROMOD Working Paper No. EM5/05.

of its ability to help us identify combinations of reforms that are **budget-neutral,** at least in the first round. The effect of introducing a common minimum pension scheme (set at 40% of current average earnings in each country) financed by country-specific policy changes is examined.

The effectiveness of the minimum pension in reducing poverty in Denmark and the UK is due to the already near-comprehensive nature of the basic pension schemes in both countries. Given the relatively high inequality among pensioners in Germany, the scheme could be financed at least in part by redistribution within the pensioner population. In Italy there are significant gaps in public pension provision, which make the minimum pension in the form we have simulated it less effective in this country than in the others.

Other studies of relevance to WP2 include:

- An exploration of the impact of policy changes over the 1998 to 2001 period for Austria, Greece, Ireland Portugal and the UK.[5] The paper argues that a "distributionally neutral" benchmark, which can be approximated by indexation of tax and welfare parameters in line with growth in wages, provides a more accurate picture of the distributional impact of policy than methods relying on the assumption that all incomes change with prices.
- A national study for Austria which estimates the effects on poverty of reforms introduced in the period 1998-2003.[6] The effect on young children is dramatic, virtually abolishing poverty in this group.
- The calculation and interpretation of effective tax rates paid on marginal increases in earnings, for those in work.[7]

1.2.2 Implications of macro-level changes for social objectives (WP3)

Work in this area analysed changes that affect the economy as a whole (the 'macro-level') and their impact on the income situation of individual households (the 'micro-level'). Macro-level changes can reinforce or weaken policy measures designed to attain certain outcomes at the household level. Understanding these links is therefore particularly important in the context of policy evaluation and monitoring.

Principles and practice in adjusting policy parameters for changes in income

First, the tax-benefit indexing practices across 15 EU countries were investigated.[8] To our knowledge, this survey is the first attempt to include information on indexing practices applied to income taxes, social insurance contributions (SICs) and benefits across 15 EU countries. The main findings are:

- The law varies greatly across countries. At one extreme, in Ireland there is no statutory or customary indexation. At the other, in Belgium there is a near-comprehensive legally-specified system of indexation.
- In many systems, parts of the tax or benefit formulae are not indexed regularly, even where the main thresholds are adjusted.

[5] Callan T., 2005, "Assessing the impact of recent tax/transfer policy changes on poverty" EUROMOD Working Paper, forthcoming.
[6] Fuchs M. and C. Lietz, 2005, "The Effects of Changes in Tax-Benefit Policies in Austria 1998-2003", EUROMOD Working Paper, forthcoming.
[7] Immervoll H., 2004, "Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors", EUROMOD Working Paper EM6/04.
[8] Gutierrez R., H. Immervoll and H. Sutherland, 2005, "How European Union Member States adjust tax and benefit systems for inflation" (mimeo)

- Where it exists in most cases statutory indexation adjusts for changes in the price level. Exceptions include Denmark and the Netherlands where parts of the system are indexed by earnings.

Overall there appears to have been a significant amount of departure in practice from the legal rules for indexation. Statutory indexation may be suspended or policy reform may have a much larger impact than indexation on its own would achieve. To establish what has actually happened over a particular period empirical investigation is needed.

Taxes and Inflation

The second study carries out such an investigation, focussing on the influences of inflation on the operation of the tax system in Germany, the Netherlands and the UK.[9] It finds that both equalising and revenue-generating properties of existing income tax and social contribution systems can be altered significantly, even at inflation rates as low as 2%. At moderate inflation rates of 4% per annum, the phenomenon known as "bracket creep" (where inflation-induced nominal income increases cause people to be taxed at ever-increasing rates if the tax system is left unadjusted) is found to cause cumulative additional tax burdens of up to 30% of annual tax receipts over a four-year period.

Existing inflation adjustment schemes in the Netherlands and the UK perform well in immunising tax systems' distributional and revenue-generating properties from inflation-induced distortions. The size of these corrections suggests that these properties can be seriously affected in countries, such as Germany, where no automatic inflation adjustments exist. Discretionary adjustments will only be effective in preventing these changes if implemented on a regular, or quasi-automatic, basis.

Implications of macro-level changes for a wider set of social policy instruments and objectives

The third study takes into account influences of macro-level changes on the operation of both taxes and social benefits.[10] EUROMOD is used to establish baseline rates of relative poverty for 15 Member States and then to explore their sensitivity to (a) an increase in unemployment, (b) real income growth and (c) an increase in earnings inequality. The size and, in some cases, also the direction of the effect varies across countries. The authors conclude that if the social inclusion indicators are to be used as generally accepted measures of the outcomes of policy, then it is important that differences in responsiveness are fully understood.

An additional report describes a methodological exercise to investigate different ways of approximating demographic and economic changes as a way of "updating" or "ageing" micro data.[11]

1.2.3 Impact of taxes and benefits within the household (WP4)

It is difficult to derive general conclusions concerning the empirics of intra-household decision making and in particular on individual incentives for supplying labour.[12] However, the literature suggests that the relevant sharing rule may be inferred from the respective

[9] Immervoll H., 2005, "Falling up the stairs. The effects of bracket creep on household incomes", *Review of Income and Wealth* 51(1) 37-62.
[10] Immervoll, H., H. Levy, C. Lietz, D. Mantovani and H. Sutherland, forthcoming, "The sensitivity of poverty rates in the European Union to macro-level changes", *Cambridge Journal of Economics.*
[11] Immervoll, H, K Lindström, E Mustonen, M Riihelä and H Viitamäki, 2005, "Static data "ageing" techniques. Accounting for population changes in tax-benefit microsimulation models", EUROMOD Working Paper No. EM7/05.
[12] Le Cacheux J, 2005, "Sharing and choosing within the household: A survey", EUROMOD Working Paper, forthcoming

bargaining power of each household member. Building on this intuition, an analysis of the effects of the tax-benefit system on the intra-household distribution of income and consumption has been carried out.[13] Assuming that there is no "public good" component of household consumption, the sharing rule is derived from a power index based on the relative contribution of each household member to total household's well being, or - borrowing from analogies in game theory – power is based on the strategic weight of each player in a winning coalition, and is measured by the amount of the loss for the coalition as a whole, if each player were to exit from the coalition. This provides a simple and straightforward way of taking an explicit account of the rules of the tax-benefit system.

Four countries (Finland, Germany, Italy and the UK) are considered. The power indexes calculated for each household member show significant differences across household types and across countries. In particular, there is a notable difference along gender lines, but this difference is not of the same magnitude in all four countries: it is very small in Finland and considerably higher in Italy. Female bargaining power varies according to the employment status of the female spouse and according to the income level of household. While the power of females in employment is similar across all four countries, it varies significantly when female spouses do not work, suggesting that a crucial role is played by the tax benefit systems. Similarly, children's "bargaining power" differs according to family size, average income, and varies from country to country.

Poverty rates can be calculated on the basis of the unequal sharing rule. In all four countries poverty is higher than under the traditional full sharing assumption, especially for female spouses and children. However, the size of the effect varies. For children this depends on the extent to which they are supported through the tax-benefit system. In Italy, Finland and the UK the "poverty risk" for children is as high as 80-90 per cent while in Germany it is 65 per cent.

1.2.4. Role of increased labour market participation (WP5)

Our research has examined the potential dual role for in-work benefits and wage subsidies in reducing the risk of low income and raising employment. This study is one of the very first cross-country analyses of tax-benefit reforms affecting labour supply conducted in a truly comparative way.[14] Three countries are considered: Finland, France and Germany. Firstly, female labour supply estimations are carried out using datasets that have been rendered homogeneous across countries. Secondly, tax-benefit analysis is performed using EUROMOD. Thirdly, the microsimulation is combined with structural discrete choice models in order to predict potential behavioural responses to the reforms. Differences in "framework conditions" across countries are emphasized throughout the analysis, notably the differences in income and wage rate distributions and the way tax-benefit reforms interact with the national systems in force. These issues turn out to be crucial in explaining the differences in the effects of each reform across countries.

The two reforms considered represent two kinds of in-work policies that have been applied in some countries. The first instrument is a working tax credit in the fashion of the British WFTC, that is, means-tested on family income, while the second is a simple wage subsidy, that is, a purely individualised policy. As is the case for all instruments conditioned on household income, the former is known to yield disincentive effects for women whose partner

[13] Orsini K. and A. Spadaro, 2005, "Sharing Resources within the Household: A multi-country microsimulation analysis of the determinants of intrahousehold `strategic weight' differentials and their distributional outcomes", EUROMOD Working Paper No. EM3/05

[14] Bargain O. and K Orsini, 2004, "In-work policies in Europe: killing two birds with one stone?", EUROMOD Working Paper EM4/04.

is employed. Indeed, we find that overall female employment decreases after the introduction of the tax credit; the participation of married women declines in all three countries and especially in France, where labour supply is slightly more elastic; this is only partially offset by a positive effect on single women's labour supply in Germany and Finland. With the individual wage subsidy, married women are clearly encouraged to take up a job, especially in France. The total positive effect on female labour supply remains small however.

Neither poverty reduction nor increased employment appear to be achievable through "making work pay" policies in Finland, because of very low labour supply elasticities. Policy intervention aimed at enhancing employment should attempt leverage through the demand side by reducing the cost of low-productive work for employers, as indeed is currently being considered by the Finnish authorities.

In terms of the numbers of women entering the labour market, the wage subsidy clearly performs better. Yet, it is noticeable that a large proportion of poor households (around 70% in France and Germany) are single individuals. Interestingly enough, a substantial number of poor single women are induced to work by the working tax credit in Germany. This has the effect of also reducing poverty in that country. Without allowing for changed behaviour, both the family-based tax credit and the individual wage subsidy achieve significant poverty reduction in France, but less so in Germany. Surprisingly, the tax credit performs only slightly better than the wage subsidy. Once allowance is made for German women moving into employment under the tax credit, the gap between the performances of the two reforms increases.

As well as this study, work has continued on the calculation and interpretation of indicators of work incentives: of replacement rates while out of work,[15] and effective tax rates paid on marginal increases in earnings for those in work.[16]

1.2.5 Child poverty from a range of perspectives (WP6)

Three studies were carried out, the first of which focuses on one country, Spain. It provides analysis within an EU perspective by comparing the effect of actual Spanish reforms with those of systems of child-targeted support "borrowed" from other countries.[17] Spain has one of the lowest expenditures on family social protection, the third highest child poverty and the second lowest fertility rate in the EU. The objective was to identify and assess tax-benefit reforms that could improve this situation by comparing the child-targeted policies of four EU countries to recent Spanish reforms. The effect that the policies of these countries would have if applied in Spain is also addressed. Results show that recent reforms have increased considerably the expenditure on child-targeted policies. However, in contrast to the other analysed countries (Denmark, France, Germany and UK) the new Spanish system mainly benefits higher income families and has a low poverty reduction effect.

Reforming the Spanish system following the systems in use in the other European countries would dramatically reshape the child-related benefits in Spain. On the one hand, they would cost considerably more than the present system. On the other, they would significantly reduce child poverty.

[15] See Immervoll H. and C. O'Donoghue, 2003, "Employment Transitions in 13 European Countries. Levels, Distributions and Determining Factors of Net Replacement Rates", EUROMOD Working Paper EM3/03.
[16] Immervoll H., 2004, "Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors", EUROMOD Working Paper EM6/04.
[17] Levy H., 2003, "Child-targeted tax-benefit reform in Spain in a European context: a microsimulation analysis using EUROMOD", EUROMOD Working Paper EM2/03.

The second study focuses on the other countries of Southern Europe as well as Spain.[18] The drive to reduce child poverty is of particular interest in southern Europe, where the subsidiary role of the State in matters of family policy has implied that programmes of public assistance to poor families with children are often meagre or not available at all. The effect of family transfers (used broadly to include contributory family allowances, non-contributory child benefits and tax credits or allowances) on child poverty is examined in Greece, Italy, Spain and Portugal. First the distributional impact of existing family transfers is assessed and found to be weak. The scope for policy reforms is then explored. By way of illustration, universal child benefit schemes similar to those in Britain, Denmark and Sweden are simulated. The impact of such schemes on child poverty is shown to be considerable, but their fiscal cost correspondingly substantial. The Danish scheme clearly emerges ahead of the others in terms of generosity: it would be the costliest, but also the one with the highest impact on child poverty in all countries of Southern Europe. Expenditure on family transfers is currently so low in Southern Europe that it is unrealistic to expect that a simple reallocation within this policy area would bring about significant improvements in terms of poverty reduction.

The third exercise covers all EU 15 countries and focuses in more detail on the methodology of child poverty measurement.[19] The composition of the population of poor children by household type shows some notable differences across countries. In the UK a relatively large proportion of poor children live with lone parents. The highest percentages of poor children in the Southern European countries are found among couples with 2 children. In the remaining countries most poor children live in couple families with at least three children.

Country rankings are mildly sensitive to different relative poverty lines but more sensitive to the choice of the poverty index. The ranking across countries is not the same when using either the income gap ratio or the Foster, Greer and Thorbecke index. The ranking of countries according to the child poverty rate is hardly affected by the choice of equivalence scale.

1.2.6 Poverty and policy in a geographical perspective (WP7)

Research has focused on the impact of tax and benefit systems on income inequality within EU regions.[20] Statistical tools and graphical devices provide a comprehensive description of income inequality levels in a set of 100 EU regions before and after the operation of the tax-benefit system. We have found that tax-benefit systems in Europe substantially reduce market inequality in all EU regions and that the size of this reduction (i.e. redistributive effect) depends crucially on: (i) the market inequality level of the region, (ii) the country to which the region belongs, and its economic performance and (iii) the relative economic performance of the region in the country.

Firstly, the size of the redistributive impact is larger in regions with higher inequality of market income.

Secondly, systems that are more redistributive at the national level also show a larger redistributive impact within regions. The best performing systems in terms of internal regional inequality reduction appear to be those of Finland, Germany, Austria and Belgium. The lowest redistributive impact takes place in Greece, Portugal and Italy. EU regional

[18] Matsaganis M, C O'Donoghue, H Levy, M Coromaldi, M Mercader-Prats, C Farinha Rodrigues, S Toso and P Tsakloglou, 2004, "Child Poverty and Family Transfers in Southern Europe", EUROMOD Working Paper EM2/04.

[19] Makovec M., C. O'Donoghue and S. Toso, "Child poverty in Europe: methodological and policy issues", EUROMOD Working Paper, forthcoming.

[20] Mercader-Prats M. and H. Levy, 2004, "The Role of Tax and Transfers in Reducing Personal Income Inequality in Europe's Regions: Evidence from EUROMOD", EUROMOD Working Paper EM9/04

evidence suggests a positive co-movement between the country's economic performance and the inequality reduction: the richer a country is, the larger is the redistributive impact on regional inequality.

Thirdly, the richer the region in the country, the more limited is the redistributive impact. The redistributive impact is particularly high for the poorest regions in a country, but particularly weak in the wealthiest ones, often urban regions including the capital city of the country. Some of the new forms of extreme poverty are particularly associated with "richer" and more urban regions.

The analysis also provides new evidence on the relationship between inequality and economic performance in the EU regions. While for the 100 EU regions taken together we find a negative relationship between market income inequality and economic performance (this is also the case for the majority of individual countries), it is not the case when disposable income inequality is considered. Poor economic performance is associated with lower levels of inequality of disposable income. Moreover, while regional market inequality levels appear to be rather independent of the country in which the regions belong, the country factor explains more than two thirds of the variance of the regional disposable income inequality.

1.2.7 Developing EUROMOD (WP1)

Much of the analysis carried out within MICRESA and summarised in the preceding sections relied heavily on development work on EUROMOD that was carried out in parallel. This involved the following:

i. Building new versions of the model using 2001 and (for 10 countries) 2003 policy rules

ii. Implementing up-to-date sources of micro-data for the majority of countries, including several updates for selected countries

iii. Revising updating procedures and exploring improvements

iv. Documenting these new versions of the model and validating national baseline results for 2001 (and 2003) on a country-by-country basis in Country Reports

v. Validating statistics drawn from the baselines for 1998 and 2001 with statistics produced by Eurostat and national statistical offices for all 15 countries and EU15 as a whole.

vi. Improving the internal coherence and consistency of the model.

vii. Adding features and functions, extending the capacity of the model including (i) optional currency conversion, (ii) modules which allow the effect of changes in household composition on household income to be measured, (iii) provision of standardised default definitions of commonly-used income concepts, (iv) greater choice of output statistics.

A quality assessment of the baseline social indicator statistics for 1998 and 2001 concluded that statistics using EUROMOD are broadly in line with what might be expected from other evidence; and therefore that the baseline provides an adequate starting point for policy simulation experiments.[21] Users of the baseline statistics, and of the model as a basis for evaluating policy changes should bear the following qualifications in mind:

- We should not expect EUROMOD results to be identical to those from other sources. There is no certain benchmark against which to make comparisons; no platinum bar

[21] Mantovani D. and H. Sutherland, 2003, "Social Indicators and other Income Statistics using the EUROMOD Baseline: a Comparison with Eurostat and National Statistics", EUROMOD Working Paper No. EM1/03.
Lietz C. and H. Sutherland, 2005, "Social Indicators and other Income Statistics using EUROMOD: an assessment of the 2001 baseline and changes 1998-2001" EUROMOD Working Paper, forthcoming

against which to calibrate our scales. Furthermore, all the statistics involved in comparisons are subject to sampling error to some degree.

- Measures of very low incomes – such as proportions of populations below 40% and 50% of the median, and the poverty gap - may differ from other studies in countries where benefits subject to non-take-up are prevalent. The simulation method currently assumes full take-up and hence under-estimates the numbers on very low incomes even if the estimates at 60% of the median show little distortion. This is apparent for Ireland and the UK, and may also apply in other cases.
- We would generally expect income inequality to be somewhat lower using simulated incomes compared with incomes measured in surveys (due to the former not accounting for tax evasion as well as benefit take-up).
- Poverty headcounts may be particularly sensitive to concentrations of people near the poverty line, hence causing large differences in headcount due to small differences in data or method. For Ireland the 1998 poverty rate for older people in EUROMOD is much lower (17%) than that of Eurostat (34%). The explanation for this lies in the concentration of pensioners on the same level of pension incomes near the poverty line.
- There are some specific national points, illustrating wider issues, including
    - In the case of Spain, the quality of the ECHP data in 1999 on child benefits is known to be poor: simulations of benefit receipt in EUROMOD produce results that are closer to administrative statistics.
    - The income reference period for the UK is the current month, whereas most national data and the ECHP use the previous year. Poverty rates for the 16-24 age group are higher in EUROMOD than in the ECHP. The use of the previous year's annual income for current students in the ECHP statistics is a likely contribution to the explanation for this.
    - The 1998 EUROMOD estimates for Sweden use the non-standard narrow family as the unit, treating all people aged 18+ as their own unit. This group includes some young people who are in fact be dependent on their parents but who will appear in the statistics with low income. This is the probable explanation for a very high EUROMOD estimate for poverty in the 18-24 age group and for the size of the poverty gap in Sweden.

1.2.8 Using EUROMOD (WP8, WP9)

EUROMOD has been built with comparability in mind by maximising flexibility in many dimensions. This approach provides the model user with a much greater range of choice and than is customarily available in national models or – we believe – in any other existing tax benefit model. While EUROMOD's scope and flexibility, together with its coverage of 15 national populations and sets of institutional rules, make it complex to use, this is in common with any powerful method or complex data source (and it is both). It requires some initial investment of time and attention to produce customised results and original research. Within MICRESA we have concentrated on maintaining flexibility while developing training and documentation to support prospective users, improving the internal coherence of the model, providing a rudimentary interface to help users through some common initial steps, and providing detailed summary statistics from the EUROMOD baselines for users who want simple statistics, without needing to learn the model at all.

Using EUROMOD does not require any specialist programming or IT skills. An executable version of the model is available for downloading from the project intranet site. The model code is available on request. Our work is in the public domain in the same way as a scientific paper. We expect any use or re-use of it to be cited and credit given as appropriate. The micro-data on which the model relies are not available in the same way because their use is governed by 12 sets of data access conditions included in contracts agreed with data providers. Prospective users of EUROMOD need to secure their own access permission.

The prospects for establishing remote access to EUROMOD have begun to be explored.[22] This would have the twin benefits of being able to guarantee security for data held in a central location and allowing users to access the most up-to-date version of the model. There are significant technical challenges to be overcome and the cost of any system and its maintenance to be considered, but the initial study judges the effort to be worthwhile in the longer term.

1.3 Policy implications

The relationship between EUROMOD and the developing Social Agenda of the EU in general, and the Social Inclusion process in particular, has provided the policy context for the MICRESA project and has shaped many of its activities. The potential for EUROMOD is clearly enormous and the MICRESA project has necessarily been selective in the policy-relevant analysis that has been carried out. We can highlight the following:

Which policies make a difference?

In assessing the relative redistributive or poverty-reducing effects of national systems it makes a difference what components of the tax and social benefit systems are included in the "system". Including the effect of taxes can be important, through the counting of tax concessions as quasi benefits or through accounting for the taxation of benefits. Whether public pension systems are included as part of the transfer system, and contributions as part of the tax system can have a large impact on conclusions from cross-country comparisons. On the basis that they are included, we find that the countries whose transfer and tax systems achieve most in terms of bringing people above the poverty line are those of Luxembourg, Austria and the three Scandinavian countries. The five systems achieving least in this respect are those of the four Southern European countries and Ireland. There is some relationship between the poverty reduction effect and the achieved poverty rate (countries with low poverty rates based on disposable income tend to be those with high poverty reduction through the net transfer system).

Interestingly it is not the case that countries that rely to a greater extent on means-tested transfer systems (UK and Ireland) achieve the most in terms of poverty reduction or re-distribution. On the contrary, 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).

Common reforms across countries?

Examination of pension reform scenarios under budgetary constraints in four countries shows that the variations in fiscal and distributive effects of a given reform can be very significant. The very different starting points in terms of inequality among the elderly, the proportion of them below the national poverty lines, and existing social pension arrangements, result in

[22] Grabka M.M., 2005, "Access solutions for EUROMOD", Mimeo.

differential effects of the common reform packages. Quite clearly, different paths for reform are necessary in order to achieve common objectives across countries. Such an objective might be to secure minimum pension levels at some common proportion of national average earnings. But the way of financing this guarantee, and the pathway to achieving the desired level of protection would have to be adapted to national circumstances.

At the other end of the lifecycle, studies of social transfers to support children in Southern Europe show that while systems of child benefit "borrowed" from other countries with well-developed protection systems may be effective at reducing child poverty, they are expensive if introduced on a universal basis. This is at least partly because they replace very minimal child-targeted systems that exist at present, particularly in Spain and Greece. Nevertheless, some structures of non-meanstested benefits – for example those targeted on young or large families – can be more cost effective than others in terms of child poverty reduction.

Taking account of changes in labour supply following the adoption of systems from other countries - in this case, Making Work Pay (MWP) policies - indicates another type of underlying conditions that are important to account for in thinking about "transplanting" a policy judged as successful in one country into another. Labour market conditions in one country may make the design of policy from a country with different conditions quite inappropriate or indeed damaging. In Finland, neither poverty reduction nor social inclusion (i.e. a increase in employment) seem achievable through MWP policies, the main problem being very low labour supply elasticities.

Simulations for France and Germany suggest that increase in the employment rate may be achievable, but public spending per job created is extremely high (from 50,000 to over 130,000 euro). In this respect, targeted measures aimed at increasing labour market integration of workers with low earning capacity (for example by investing in training and/or reducing fixed costs of labour supply) may well prove to be more effective.

European Union, Member State or Region?

Imposing common policy arrangements across countries is generally not the most appropriate or effective approach to meeting common objectives. To what extent do, or could, sub-national policies make a positive difference? Firstly, we find that national systems appear particularly efficient in inequality reduction in the poorer regions in a country but the effectiveness is significantly reduced in the richer regions. Since some of the new forms of poverty are particularly associated with "richer" and more urban regions, this calls for further intervention at the level of the regional governments.

Secondly "similar" regions in Europe in terms of economic performance and original income inequality levels achieve quite different degrees of income inequality once the redistributive role of the national tax-benefit system has had an effect. This may provide an argument on equity grounds for further EU intervention in the design of tax-benefit policies.

How much do underlying macro conditions matter?

From a tax-benefit angle, many types of macro-level change can be considered 'exogenous', at least in the short term. However, a more comprehensive perspective is often required, particularly in the context of wider social objectives. Different policy areas are not independent from each other and most macro-level variables are the subject of targeted policy measures aiming, for instance, to further income growth or lower unemployment rates. Understanding how these initiatives may impact, through their effect on tax liabilities and benefit entitlements, on other objectives such as increasing social inclusion is therefore a pre-requisite for improving co-ordination between different policies and devising consistent policy 'packages'.

EUROMOD has been used to examine the sensitivity of poverty in the 15 Member States to (a) an increase in unemployment, (b) real income growth and (c) an increase in earnings inequality. The simulations indicate that poverty rates are indeed vulnerable to such "macro level" changes: the size (but in some cases also the direction) of the effect varies across countries. The main conclusion is that if changes in social inclusion indicators are to be used as generally accepted measures of the outcomes of social policies, then it is important that differences in responsiveness to other pressures are fully understood.

How can changes be monitored meaningfully?

Firstly, the influence of macro-level changes on calculated indicators illustrates the dangers of relying on one particular measure (here relative income poverty) as a single indicator and highlights the importance of maintaining a portfolio which includes

- indicators that relate directly to individual labour market experience (such as unemployment or low wages) as well as household incomes;
- indicators of changes in real income level; and
- indicators calculated for population sub-groups defined by economic status and household composition, as well as by demographic characteristics.

Secondly, if indicators of the risk of relative income poverty are to monitor progress and to assist policy makers in making decisions, then it is important to examine how past policy choices have affected relative income poverty, and to develop methods which show how different options for future policy may affect future risks of poverty. It is argued that a "distributionally neutral" benchmark, which can be approximated by indexation of tax and welfare parameters in line with growth in wages, provides a more accurate picture of the distributional impact of policy than methods relying on the assumption that all incomes change with prices.

1.3.1 The role of EUROMOD

As the Social Inclusion process matures and develops a stronger link needs to be built between the policies described in the NAPs of individual Member States and their contribution to progress as measured by the social indicators. The indicators need to be embedded in the policy process so that one can ask whether announced policies lead to significant improvement in social indicators. In order to answer this question, one needs to model the implications of the policy for individual households. Rather than relying on national models (which exist in many, although not all of the Member States) there are several reasons why an EU-wide model, such as EUROMOD, is necessary. [23]

1. Comparability is important. The open method of coordination is based on peer review. For this purpose a common basis for evaluation in each country seems essential.
2. It is important that the model be accessible. The fourth Objective of the Social Inclusion process is "the mobilisation of all relevant actors". The availability of tax benefit models to the general public is in itself a means to assist wider participation in the policy formation process. An EU-wide model at the disposal of the Commission is a vehicle that would allow them to further this key objective.

[23] Atkinson A. B., 2002, "Evaluation of the National Action Plans on Social Inclusion: the Role of EUROMOD", EUROMOD Working Paper No. EM1/02
Atkinson A.B., 2005, "EUROMOD and the development of EU social policy", EUROMOD Working Paper No. EM1/05.

3. An EU-wide model facilitates policy learning. The EU Social Inclusion process has led a number of Member States to look critically at their own policies in those dimensions where they are performing below the EU average.
4. Such a model is a natural step towards considering the impact on the EU as a whole. We need to be able to add up across Member States.

At the EU level, EUROMOD can contribute to the analysis of "what works" in terms of policy intervention. Such questions may take several forms.

Policy and indicators

First, we need to know the impact on EU-wide social indicators (e.g. risk of poverty) of changes in policy by individual Member States. EUROMOD brings together these changes in policy parameters at a highly detailed level with the relevant household characteristics in each country. At the most basic level, this allows estimates to be made of the cost of different proposals. The net effect on the government budget depends on the interaction between different elements. An integrated tax benefit model is necessary to take account of these feedback effects.

As well as the assessment of budgetary cost EUROMOD can be used to calculate the implications of policy changes for household disposable incomes and hence for the direct calculation of three of the primary indicators agreed at Laeken: (1) proportion below 60% of the median, (2) ratio of top quintile share to bottom quintile share, and (4) median poverty gap.

Indicators and policy

Secondly, we may need to know what changes in policy are necessary to achieve a specified improvement in different social indicators. EUROMOD allows us to work back from the desired improvement to the changes necessary. It allows us to see whether, indeed, a target is feasible. To this end, Member States free to choose under the principle of subsidiarity, decide on the appropriate policy reforms in the specific national context. Using EUROMOD, it would be possible to assess the extent to which the Member State policies would achieve the desired improvement in the indicator(s). The amount of spending of different types or through alternative approaches needed to produce a given improvement in each country could be established. Behind the aggregate picture lies the detail of tax and benefit systems. The fine structure of policy can be very important in determining its impact. EUROMOD allows users to experiment with changes in the institutional details of transfers and taxes, seeking the most effective combination to achieve the targets in particular country settings.

EUROMOD as a European research tool

EUROMOD is an example of European social science infrastructure. Its subject matter is naturally relevant to Europe as a whole. The fact that national expertise from each Member State is an essential input to maintaining and developing the model means that the EUROMOD enterprise is inherently a European research activity.

One of the achievements of MICRESA has been the continuation of the process of bringing the state of the art up to the level of that existing in some countries, across all 15. This has been done in spite of the activity taking place in very different contexts across countries. Some countries had no tax-benefit modelling tradition before the construction of EUROMOD. During the course of MICRESA in four of these countries the work done with EUROMOD has stimulated national model-building programmes: in Austria, Greece, Luxembourg and Portugal.

It is to be expected, therefore, that MICRESA will have a long-lasting indirect effect on the quality of national analysis of policy and social inclusion in these countries, as well as a direct effect cross-nationally and at the European level through the work carried out within its framework and subsequent research using the improved and updated version of EUROMOD.

EUROMOD enables an exceptionally wide range of questions about the impact of social and fiscal policy on the population of the EU to be answered, and allows a large variety of conceptual frameworks and assumptions to be adopted. It has been deliberately constructed to be independent of any single theoretical or disciplinary perspective. This is to ensure that it will be of use in many contexts over a long period of time. It can be seen as a *platform* on which users are able to implement their own chosen approaches.

Of course, EUROMOD will need maintenance on a continuous basis if the policy rules are to be kept up-to-date and the underlying database refreshed with recent micro-data. Keeping EUROMOD up-to-date involves meeting two vital conditions:

1. ***Resources must be found to support the routine updating of EUROMOD if the model is to remain useful and relevant.***
2. ***Access to suitable micro-data must be available.***

While it is to be hoped that the EU-SILC may be a suitable database for EUROMOD, it is not, at the time of writing, clear that these data will be made available under appropriate conditions at the micro level for all countries covered. This uncertainty around the replacement for ECHP becomes all the more critical at a time when some of the national data on which EUROMOD and the MICRESA project have relied are no longer being collected.

As a multi-country microsimulation model EUROMOD is unique. The human effort and financial resources that have been invested in EUROMOD through MICRESA are considerable. Any researcher wanting to conduct the kind of cross-national empirical social science that it supports will want to use EUROMOD rather than construct some alternative. Therefore not only is it efficient to develop the infrastructure to facilitate wider access, it would also be very wasteful not to do so.

If EUROMOD is to be accessible to the wider social science research community then securing permission for all potential users to access the underlying data through the model is an essential pre-condition.

Future directions for research

There remains considerable scope to carry out a wide range of policy-relevant exercises of the sort that have been conducted as part of MICRESA using the existing version of EUROMOD. There are also many ways in which the work done in MICRESA has demonstrated that the capacity of EUROMOD could be extended to enable new forms of analysis and better comparability. These include

- The extension of EUROMOD to cover the 10 New Member States and the accession and candidate countries.[24]
- EUROMOD is limited by the data sources it draws on to a narrow definition of cash income. This not only fails to capture some important aspects of policy affecting cash incomes (such as child care subsidies) it introduces distortions in cross-country comparisons because some countries rely more heavily than others on publicly-provided non-cash benefits. Accounting for non-cash incomes more generally – such as income

[24] First steps toward this goal are being taken in the I-CUE Design Study, due to start mid-2005.

from owner occupation – can provide a better-founded basis for making comparisons (within as well as between countries).

- The issues of how to account for and model non-take-up of benefits and tax evasion remain to be resolved within a cross-national framework.
- While access in the future to suitable and up-to-date micro-data remains an unresolved issue in some countries, and until the labour-intensive task of constructing EUROMOD input databases is adequately resourced, developing ways of updating "old" data to represent current populations will be a priority.
- Incorporation of the effects of behavioural reactions to policy change, either through econometric estimation or calibration, in a manner that allows analysis that is comparable across countries but at the same time allows for national differences, is of great relevance particularly for the analysis of policies that are *intended* to change behaviour.
- Developing the capacity to conduct gendered analysis of the impact of policy changes remains an ambition.

Some of these ideas present major challenges at a theoretical or conceptual level, or require data that are not easily available. Many are of general relevance beyond the framework of EUROMOD or microsimulation modelling more generally. Taking this agenda forward involves strengthening existing links and making new links with relevant cutting edge economic and social science research, and offering access to EUROMOD's microsimulation capacity to a wider group of researchers.

EUROMOD Working Papers	http://www.econ.cam.ac.uk/dae/mu/emod3.htm
Country Reports	http://www.econ.cam.ac.uk/dae/mu/emodcty.htm
Redistribution statistics	http://www.econ.cam.ac.uk/dae/mu/emodstats/index.htm
Other information	http://www.econ.cam.ac.uk/dae/mu/emod.htm
Contact	Email: mu@econ.cam.ac.uk

2 Background and objectives of the project.

The aim of this project was to explore the impacts of national social and fiscal policies, and reforms to these policies, on poverty and on the feasibility of meeting a range of possible targets for poverty reduction. It covered all 15 (pre-May 2004) Member States of the European Union. The project made use of the tax-benefit microsimulation model, EUROMOD, so some of the project tasks involved development and updating of this model. The project as a whole had a rationale that was guided by the following points:

1. The nature of EUROMOD and of the micro-data that underlie it limit the scope of the project to monetary poverty and the impact on personal incomes of changes in cash social benefits and personal taxation. This emphasis on monetary measures is seen as a first and important stage in the understanding of the role of social and fiscal policy in combating poverty, deprivation and social exclusion.

2. An analysis and an understanding of the influences of taxes and benefits on the income distribution as a whole are necessary to understand how to improve the situation of the poor.

3. The standard baseline consists of estimated risk-of-poverty rates using definitions and assumptions as recommended by Eurostat: the proportion of people living in households whose disposable income, adjusted for household size, is less than 60% of the median in the Member State. However, alternative perspectives may be informative, and are explored in the following ways:

    - Examination of the sensitivity of indicators to a range of alternative sets of assumptions including such things as the choice of equivalence scale, whether to use mean or median incomes, the specific income concept and so on.

    - The standard view is of poverty as a household-level phenomenon, assuming a degree of income-sharing within the household which may not take place. Little is known about the distribution of resources within the household, or the impact of policy changes on this distribution. A range of assumptions about sharing and the incidence of taxes and benefits within the household can be adopted. Policy changes can then be analysed with a gender perspective, allowing not only a gendered analysis of gainers and losers, but also an appreciation of the adjustment in the distribution of income *within the household* that is implied by a particular change.

    - Poverty is generally viewed as a national phenomenon and relative poverty measures are calculated in terms of national income distributions. However, in some countries there may be significant disparities between regions. This means that relative poverty within a particular region may be very different from regional poverty measured relative to national incomes.

4. The relationship between social benefits, social contributions and taxes and poverty reduction is not straightforward. As well as the overall scale of spending, effectiveness depends on many other factors, including the way in which policy is targeted, for example whether the policies are based on universal strategies, targeted on people in vulnerable situations or with higher living costs or targeted on people living on low incomes, conditional on being in employment or not being in employment.

5. The effect of policies on incentives to change behaviour is also important. In devising strategies for "making work pay" there are two distinct policy concerns. The first relates to the incentive to work at all, which stems from a wider concern about unemployment. Combinations of high social benefit incomes when out of work and low in-work incomes lead to the *unemployment trap*, where the effective tax rate on wages that might be earned is so high that work is not regarded as worthwhile. One approach to this is to offer wage supplements of various sorts to low waged workers. However, the withdrawal of the supplement as earnings rise combined with tax and contribution rates can result in high marginal effective tax rates, or the *poverty trap.*

6. The way in which social policies are financed cannot be separated from their impact or design because (i) the social benefits may themselves be taxed; (ii) tax concessions may play a similar role as cash benefits in other countries; (iii) social benefits must be paid for, but the form of taxation may itself have an impact on the incomes of the poor, and more generally will have an impact on income inequality as a whole.

7. Economic change can compromise the objectives of fiscal and social policy if the tax-benefit system is not adjusted to compensate. Unless macro-level changes are taken into account by policy makers, the tax-benefit system may work in ways that contravenes the originally intended policy objectives.

8. The evolving policy context is relevant. At the time the MICRESA proposal was written the European Council has just called upon the Commission to co-ordinate work on indicators for social cohesion and upon Member States to formulate national action plans. Part of the purpose of this project was to analyse proposed changes in social and fiscal policies proposed by Member States with reference to these plans, and also to any targets that were set.

One of the important ways in which the project re-orientated its focus during its lifetime was in response to actual developments in the process of making and monitoring social policy at the EU and national levels. In the event, specific targets for poverty reduction were not adopted. Two phases of the new process of EU Social Inclusion have occurred with National Action Plans being submitted in 2001 and 2003 with Joint Reports being co-ordinated by the European Commission (European Commission, 2002; 2003). As a result there has been less emphasis in the project on the achievement of targets and more discussion of the process of the development of EU social policy, as well as more consideration given to the analytical requirements of such a process and the potential roles for EUROMOD within it (Atkinson, 2002; Atkinson, 2005; Atkinson and Meulders, 2004; Sutherland 2002).

Two of the planned pieces of analysis have departed in specific ways from the original proposal, in both cases because the original plan was not fully feasible, and more useful and relevant exercises were identified and carried out instead. These related to poverty within regions (where inequality rather than poverty became the focus) and within-household effects (where a more focussed exercise was carried out, in combination with a detailed review of the theoretical literature). More detail is provided in the relevant sections below.

There were, in addition, many instances where the rather general objectives set out above were met through specific pieces of analysis that address specific policy issues, rather than attempting a comprehensive response. In doing so they might focus on a selection of countries or a sub-set of issues within the general topic. In some cases the selection of the issues on which to focus responded to emerging policy concerns at the European level. One example is

the issue of pensions and pension reform which is addressed in a paper described in chapter 3.2. Another is the interest in policies for "making work pay" where our response was to focus our work under the general heading of "the role of increased labour market participation" on an exploration of the potential of "making work pay" policies in three countries using two contrasting policy approaches.

In other circumstances, major additional pieces of work, not anticipated at the outset, were carried out in addition to those promised at the outset. For example, the investigation of the effects of macro-level changes on social objectives aimed to document the ways in which tax-benefit parameters are adjusted in response to macro-level changes such as inflation, and to explore how actual practice impacts on poverty indicators, given changes in underlying incomes. A survey of actual practice and a detailed investigation of the effect of inflation in a selection of countries were carried out. In addition, the effect of increasing unemployment, earnings growth and changing earnings inequality across the EU 15 countries was studied, and at a technical level, methods for updating "old" survey data to represent the population at a later point in time were explored. See section 3.2.6 for more details.

A number of other studies were carried out in parallel with MICRESA that were not part of the MICRESA work plan but which were relevant to it. These are referred to in this report, although less detail is provided than in the case of MICRESA deliverables.

3. Scientific description of the project results and methodology

3.1 Structure of the project and structure of this report

The project addressed three types of interlinked issues. The first is the effect of actual and potential national social and fiscal policies on poverty, inequality and social inclusion in each of the 15 Member States and in the EU15 as a whole. The second is the development of the EUROMOD model and its capacity to analyse these and related questions in a robust, relevant and convenient manner. The third is an exploration of the ways in which EUROMOD may be used to address the emerging and developing social agenda at the European level, and – as part of the Lisbon process – at the national level. Many of the outputs address more than one of these issues and in all cases where the model was used for analysis, there was a feedback effect between the questions asked of the model and improvements made to the quality and scope of the results obtained.

The project was divided into workpackages, as shown in Table 1. This indicates whether the main (and other) outcome(s) relate to

(a) the effect of tax and transfer policies on social inclusion,

(b) developing EUROMOD or

(c) EUROMOD and the social agenda.

This report is structured into three main parts, based on these three topics under the following headings:

Policy and Inclusion

Developing EUROMOD

EUROMOD and the European Social Agenda

In each case there is cross-referencing to the other parts. Some workpackages and some project deliverables are relevant under more than one heading.

Table 1 MICRESA workpackages

No	Workpackage Title	Main (and other) issue	Section(s) of report	Deliverables
1	Poverty in the EU: establishing baselines and methods	b (c)	3.3	DL1, DL3, DL12
2	Poverty reduction in the EU and Social Protection	a (c)	3.2.1, 3.4	DL2, DL6
3	Implications of macro-level changes for social objectives	a (b, c)	3.2.6, 3.3	DL4
4	Impact of taxes and benefits within the household	a	3.2.5	DL5
5	Role of increased labour market participation	a	3.2.4	DL7
6	Child poverty from a range of perspectives	a	3.2.2	DL8
7	Poverty and policy in a geographical perspective	a	3.2.3	DL9
8	Training in the operation and effective use of EUROMOD	b (c)	3.3.4.2	DL10
9	Access solutions	b (c)	3.3.4.5	DL11

3.2 Policy and Inclusion

This chapter summarises the work done and the main findings under sub-headings corresponding to project workpackages.

3.2.1 Poverty reduction in the EU and Social Protection

The objective of this workpackage (WP2) was to examine the relationships between financial poverty and social transfers. The main deliverables discuss these issues in general terms and in relation to the European Social Agenda as a whole, and these are described in more detail in chapter 3.3 below. In addition, a number of empirical studies were carried out focussing on particular issues, particular vulnerable groups in the population or particular countries and these are presented here.

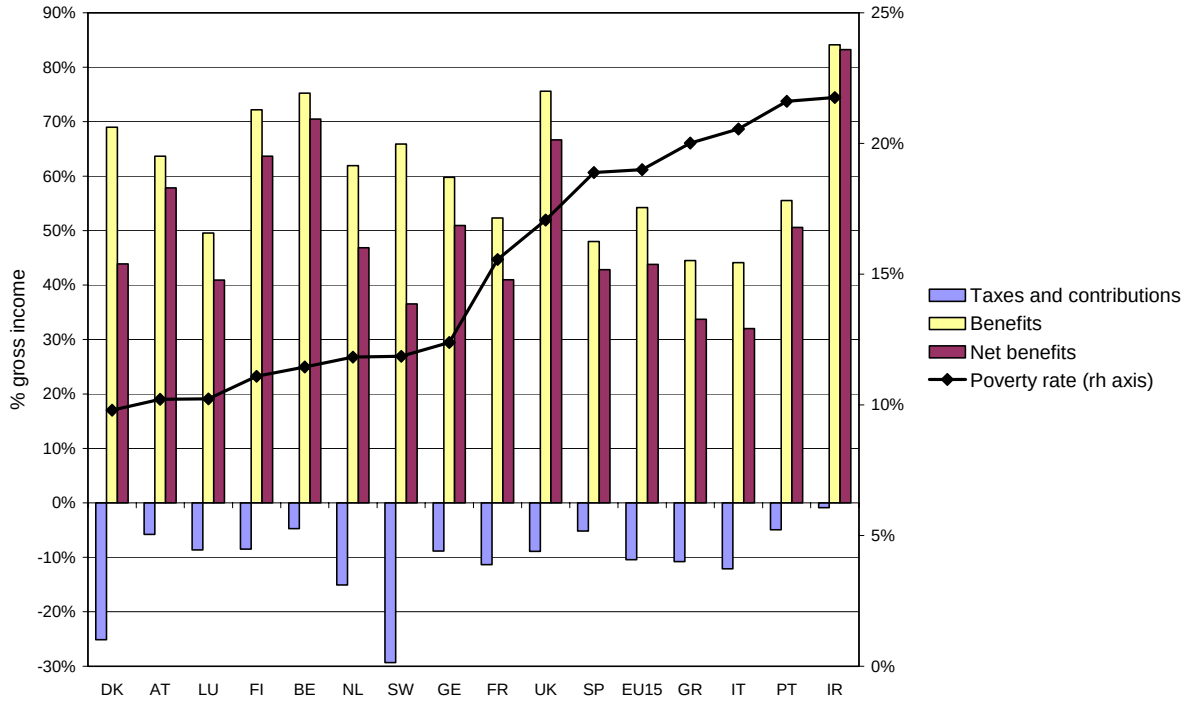
First, EUROMOD has been used to establish a descriptive picture of the extent to which systems of taxes and transfers have an impact on the incomes of poor households. While the Joint Reports on Social Inclusion produced by the Commission have highlighted the relationship between poverty rates and total spending on social protection, we need to go behind these aggregate figures in order to understand the operation of policy. It is only in this way that we can learn from the successful experience of some Member States in reducing the risk of poverty. Figure 3.1 shows countries in order of their poverty rate (measured using EUROMOD and standard EUROSTAT assumptions), which is plotted as the black line using the right-hand axis.[25] The chart shows (with the pale bars) the proportion of gross incomes of the households below the poverty line that are made up of benefits (including public pensions). There is apparently no clear relationship between this and the poverty rate.

Also shown are the taxes (including social contributions) paid by poor households, indicated by the negative bars, and the net effect (net benefits) which in all cases is a positive component of income. Not only does the proportion vary across countries, but the picture is rather different than that obtained using gross benefits alone. In Sweden and Denmark particularly, but also in the Netherlands, Italy, France and Greece, the poor pay a significant amount in taxes. In some cases these taxes may be levied on the benefits themselves, or they may simply be levied on other sources of income. Clearly to establish the relative impact of social transfers on the poor across countries, account needs to be taken of the effect of taxes as well as cash transfers. This is a good example of how Member States can learn from each other, but it requires a sufficiently rich analysis. Typically, sources of data on income components such as the European Community Household Panel and many other income surveys on EU countries do not collect information on taxes and contributions. The EUROMOD database, which contains simulated liabilities for taxes, does permit such an analysis.[26]

[25] For more discussion of the nature and accuracy of estimates of poverty and income distribution using EUROMOD, see chapter 3.3.2. Here and throughout, unless otherwise specified, household incomes are equivalised using the modified OECD equivalence scale (1/0.5/0.3) and risk-of-poverty is defined as having equivalised household income below 60% of the national median. The terms “poverty” or “poor” are used for convenience instead of “risk of poverty” or “at risk of being poor”.

[26] The Luxembourg Income Study also imputes taxes for some countries, but does not currently cover all the EU15 countries. Verbist (2004) uses EUROMOD to analyse the redistsributive effects of taxes and contributions themselves and Verbist (2005) focuses on the effects of taxes on replacement incomes.

Figure 3.1 The effect of taxes and benefits on incomes in poor households, 2001



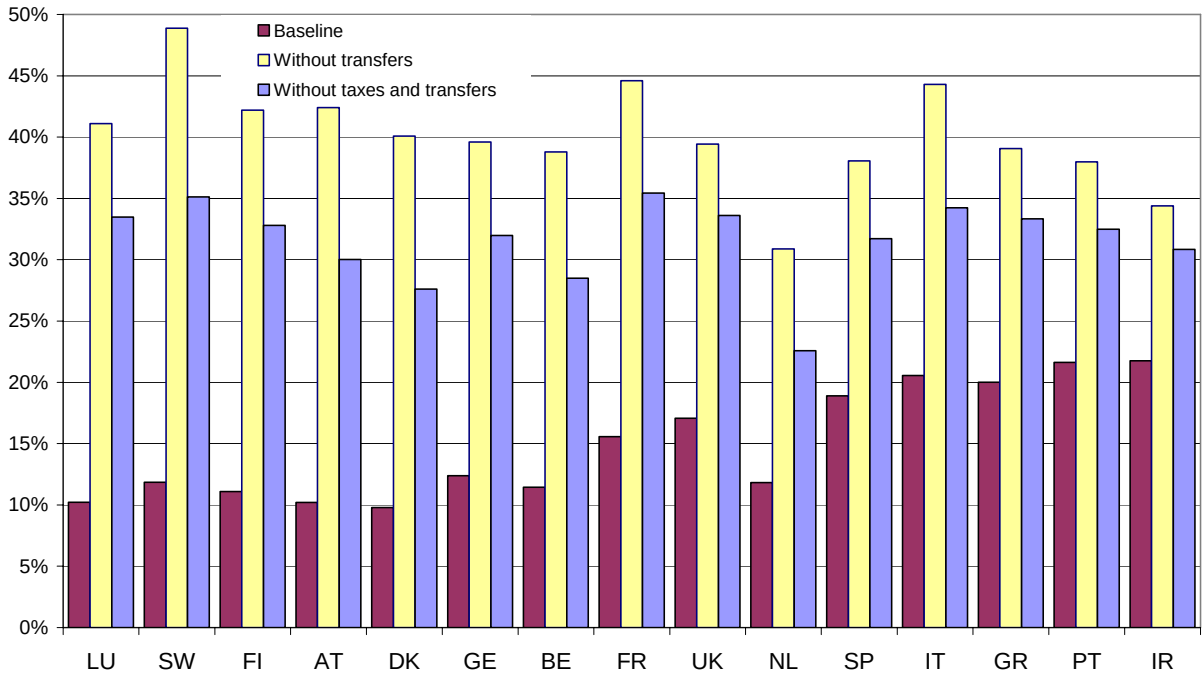
Source EUROMOD. Statistics on the Distribution and Decomposition of Disposable Income accessed at http://www.econ.cam.ac.uk/dae/mu/emodstats/DecompStats01.pdf on 12/02/05 using version 27A.

We have also explored the varying extent to which the social transfer and tax systems play a role in poverty reduction. Figure 3.2 shows the amount by which poverty rates would rise if social transfers were not included in income. Poverty rates based on income including transfers and after taxes are shown by the dark bars; poverty rates using the same poverty line, but not including transfers are shown by the pale bars. This is the type of comparison usually used to indicate the contribution of the social transfer system to poverty reduction. In common with analyses that compare indicators of income and poverty before and after benefits (Chen and Corak 2005; Dennis and Guio 2004; Heady et al., 2001) we make no adjustment for changes in behaviour that may take place if there were suddenly no income associated with transfers. The "no transfers" counterfactual is purely a descriptive or accounting device intended to identify the extent to which the transfer systems bring incomes above the poverty line. However, taking away the transfers without giving back the taxes paid on them will over-estimate the impact of the transfer system on poverty reduction. In some countries people at risk of poverty pay a substantial proportion of their non-transfer income in taxes, in others, rather little or none at all. So Figure 3.2 also shows the net effect of both transfer and tax (including contribution) systems and the countries are ranked according to the proportional reduction in poverty achieved by the combined system. In all cases adding taxes back in reduces the scale of the effect (compared with examining transfers on their own) but the degree to which this occurs varies. This is another justification for accounting for taxes deducted as well as transfers received in assessing the impact of policies on poverty.

The countries whose transfer and tax systems achieve most in terms of bringing people above the poverty line are those of Luxembourg, Austria and the three Scandinavian countries. The five systems achieving least in this respect are those of the four Southern European countries (Greece, Portugal, Italy and Spain) and Ireland. There is some relationship between the

poverty reduction effect and the achieved poverty rate (countries with low poverty rates based on disposable income tend to be those with high poverty reduction through the net transfer system). Nevertheless the countries with the highest poverty rates before transfers or taxes are Sweden, France and Italy (from the high, medium and low poverty reduction groups, respectively). The countries with the lowest poverty rate before transfers and taxes – cases where the systems have least to do to achieve low poverty rates for disposable income - are Denmark, Netherlands and Belgium. Some care is needed in the interpretation of these results since the definition of social transfers used here includes public pensions. In some countries this is the only source of income for many of the elderly, so the effects shown in Figure 3.2 may be dominated by the elderly automatically being counted as poor if their pension income is not counted.

Figure 3.2 The poverty rate in EU15 in 2001, with and without transfers and taxes



Source: EUROMOD (version 28A)
Note: Countries are in descending order of proportional reduction in the poverty rate due to taxes and transfers

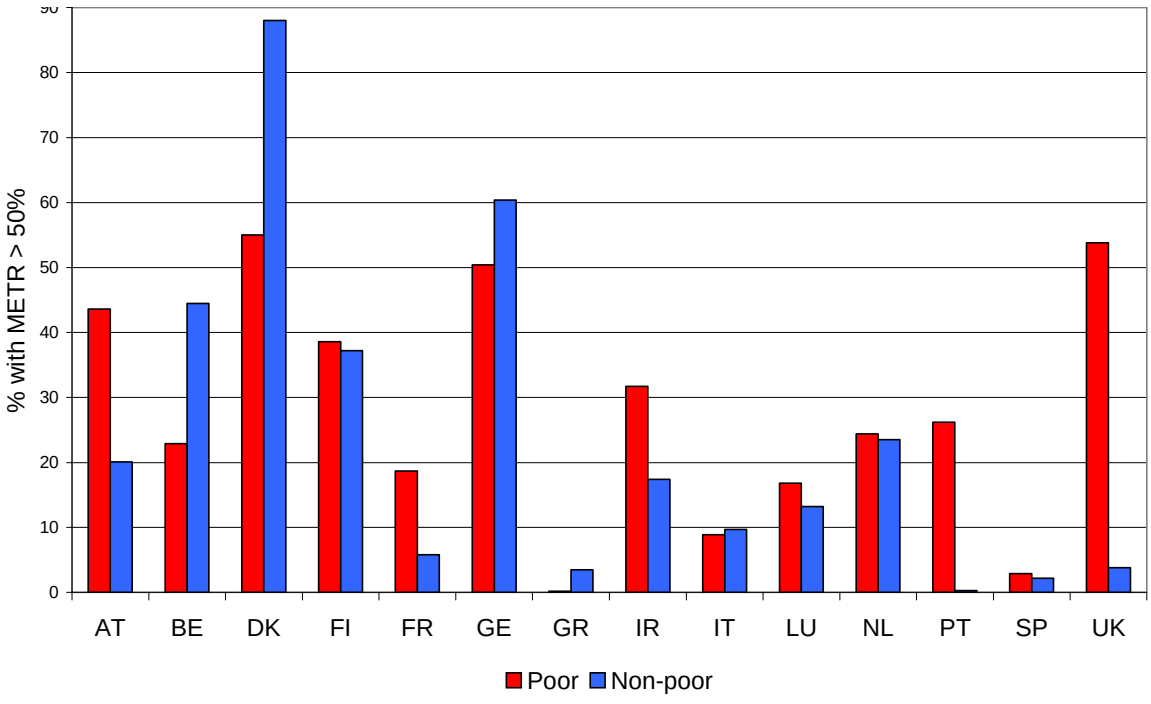
In seeking to learn from the experience of different countries, it is important to consider the *form* of social protection. There are potentially large differences between countries that rely on social insurance and those that seek to target benefits via income and asset-testing. The UK provides a case in point, with its increasing reliance on a means-tested pensioner credit, rather than on a national state pension. Interestingly it is not the case that countries that traditionally rely to a greater extent on means-tested transfer systems (UK and Ireland) achieve the most in terms of poverty reduction. They are often considered as being the most effective types of system in this regard but this deserves to be investigated further. This has been done using EUROMOD in two ways. First, the effect of social transfer and tax systems on incentives to take paid work, or to seek more income from work is relevant to understanding cross-country differences in the size of the non-elderly population who are poor because of low (or zero) incomes from work. Secondly, decomposing the redistributive effects of transfers as a whole into transfers of different types provides a picture of the relative role of each type in each country. These two perspectives are considered in turn.

Work incentives

In the context of high replacement rates (a deep unemployment trap) and low entry wages, one approach to policy is to offer wage supplements of various sorts to low waged workers. This has the effect of reducing the replacement rate and making work more attractive. However, the withdrawal of the supplement as earnings rise leads to the second policy concern - the *poverty trap.* Benefit withdrawal combined with tax and contribution rates can result in high marginal effective tax rates (METRs) for those in low-waged work. Incentives to work more or to find promotion are low and very large increases in gross earnings may be necessary to secure significant or worthwhile increases in disposable incomes. Furthermore, since these types of wage top-up typically depend on an assessment of *family* income, the "tax rate" applies not only to additional earnings by existing workers, but also to the earnings of other family members if they seek employment.

In some countries people face high marginal effective tax rates – reductions in the value of marginal income increases due to the net combination of the application of taxes and contributions and withdrawal of means-tested benefits – if they are high paid and face high marginal rates of tax. In other countries it is the poor or those at risk of poverty who face high METRs because of withdrawal of benefits that are tested against current income. Figure 3.3 contrasts the proportion of the poor and non-poor employed populations who faced high METRs (defined as 50% or more) under the 1998 tax-benefit systems.[27]

Figure 3.3: Adults in paid work with high (>50%) marginal effective tax rates 1998



Source: EUROMOD (Immervoll, 2002)

[27] Taken from data in Immervoll (2002). A revised and shortened version is available as Immervoll H, 2004, "Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors", EUROMOD Working Paper EM6/04

Clearly, the numbers of working poor are smaller in some countries than others and the sample numbers (those influencing the dark bars) are very small in some cases. While the statistical significance therefore differs across countries, it is striking to see the extent to which it is the poor who at greater risk than the non-poor of facing high marginal effective tax rates in some countries (particularly the UK but also in Austria, Portugal, France and Ireland). Depending on the administrative arrangements that apply to the benefits or taxes that explain these high METRs, we might expect the result of low incentives to earn more to inhibit mobility out of low income.

In other countries, particularly Belgium, Denmark and Germany the risk of facing high METRs is lower for the working poor compared to the non-poor (but nevertheless, especially in Denmark and Germany, higher than in most other countries).

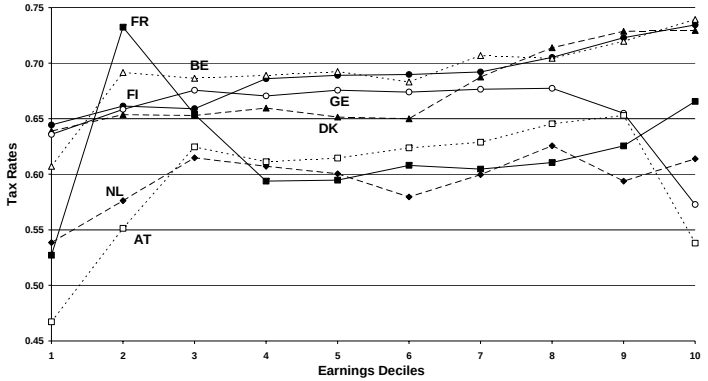
A more comprehensive picture of the way marginal effective tax rates vary by earnings level is provided in Figure 3.4 (for 14 countries – Sweden is omitted from this analysis).[28] Countries are divided into two groups of seven countries. The first group contains most of continental and northern Europe (Austria, Belgium, Denmark, Finland, France, Germany, and the Netherlands). As shown on Figure 3.4a, tax rates for this group are high. The second group (Figure 3.4b) is composed of all the other countries with lower tax rates: southern Europe (Greece, Italy, Portugal, and Spain), Anglo-Saxon European countries (Ireland, the United Kingdom), and Luxembourg. METRs are shown by earnings decile group of these countries. Marginal effective tax rates are indicators at the *intensive margin* of the incentive to earn more given that the person is already in work. Also shown, in Figure 3.4c and Figure 3.4d, are indicators of the amount of in-work income that is "taxed away" when moving into work, as a proportion of earnings. This is termed the "participation tax rate" and is a measure of work incentives on the *extensive margin.*

In a number of countries, the structure of tax rates across earnings decile groups is strikingly flat. For example, in the Netherlands the participation tax rate is between 56% and 62% for all decile groups. Belgium, Finland, Germany, Italy, and Portugal have also relatively flat rate structures. Marginal rates generally do not simply increase monotonically with earnings. There are several reasons for this. Firstly, joint tax systems as in France or Germany can result in very high marginal income tax rates for low-wage spouses of high-income earners. Secondly, the withdrawal of income-related benefits can increase marginal tax rates at the bottom. Finally, social insurance contribution schedules are often characterised by discontinuities such as earnings thresholds which can give rise to very high marginal rates (as well as participation tax rates) for some low-wage earners. At the same time, caps on the contribution base can result in lower marginal contribution rates for the highest decile groups. In France, earners of very low wages benefit from reduced employers' contributions which considerably lower marginal rates in decile group 1. For higher earnings, however, these reductions are withdrawn adding to overall marginal rates and contributing to a marked increase between decile groups 1 and 2.

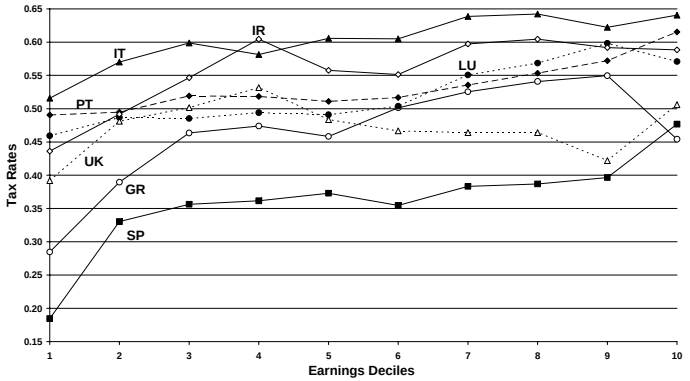
[28] These results are taken from Immervoll, Kleven *et al* (2004).

Figure 3.4: Marginal Effective Tax Rates and Participation Tax Rates in 14 EU countries, 1998

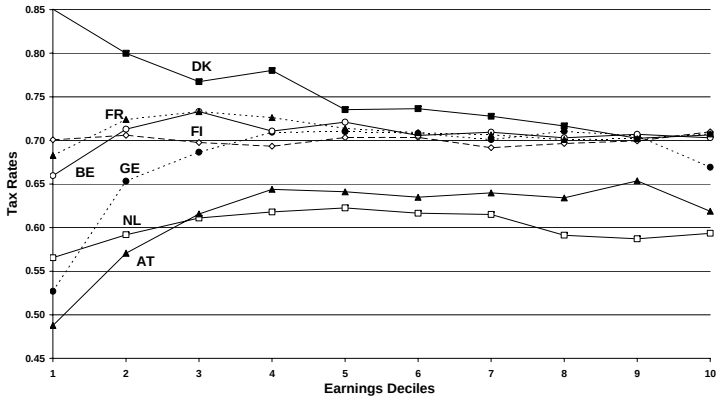
(a) Marginal effective tax rates in High Tax countries



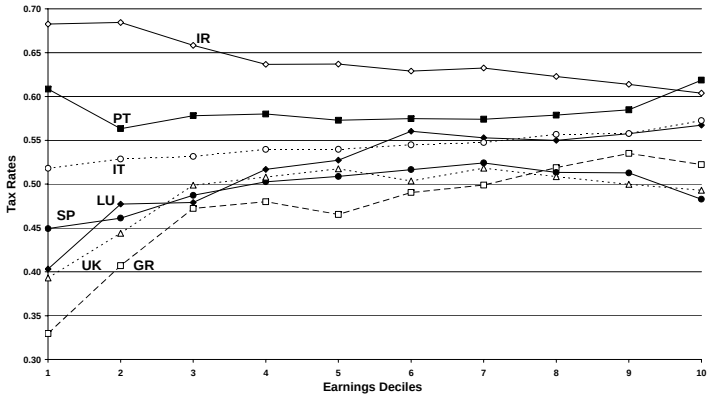
(b) Marginal effective tax rates in Low Tax countries



(c) Participation tax rates in High Tax countries



(d) Participation tax rates in Low Tax countries



Source: EUROMOD (Immervoll, Kleven *et al*, 2004).

Note: The earnings deciles are based on individual earnings of those aged 18 to 59 who have been working the full year. The marginal effective tax rate is computed by increasing earnings of the individual by 3% and measuring the change in all taxes and benefits relative to the increase in earnings. The participation tax rate is computed by setting earnings equal to zero and measuring the change in all taxes and benefits as a share of the actual earnings of the individual. Earnings deciles relate to total gross earnings, including any social contributions paid by the employer. Changes in taxes and benefits are assessed for the household as a whole (capturing the fact that an individual's earnings can influence the taxes paid and benefits received by another household member). Taxes considered include income taxes and mandatory contributions paid by either employee or employer. They also include consumption taxes. For computing the participation tax rate, those making a transition into work, the withdrawal of all relevant out-of-work benefits are included, taking into account that some non-employed individuals receive insurance-based benefits while others are entitled to income-related transfers. See Immervoll, Kleven *et al.* (2004) for details.

In some countries such as Denmark, participation tax rates are largest at the bottom because of the existence of relatively generous minimum income benefits the loss of which on entering employment adds to the effective tax on in-work income. Also, unemployment benefits are subject to a floor (i.e. small entitlements are made up to a higher minimum level of payment) meaning that replacement rates can in some cases be very high. In contrast, countries such as Greece, Luxembourg, Spain, and the UK have relatively lower tax rates at the bottom because minimum income programmes do not exist or are modest relative to in-work earnings, because tax burdens on employment incomes are small and/or because they operate in-work benefits which counter-balance the loss of social assistance or unemployment benefits.

Redistributive effects

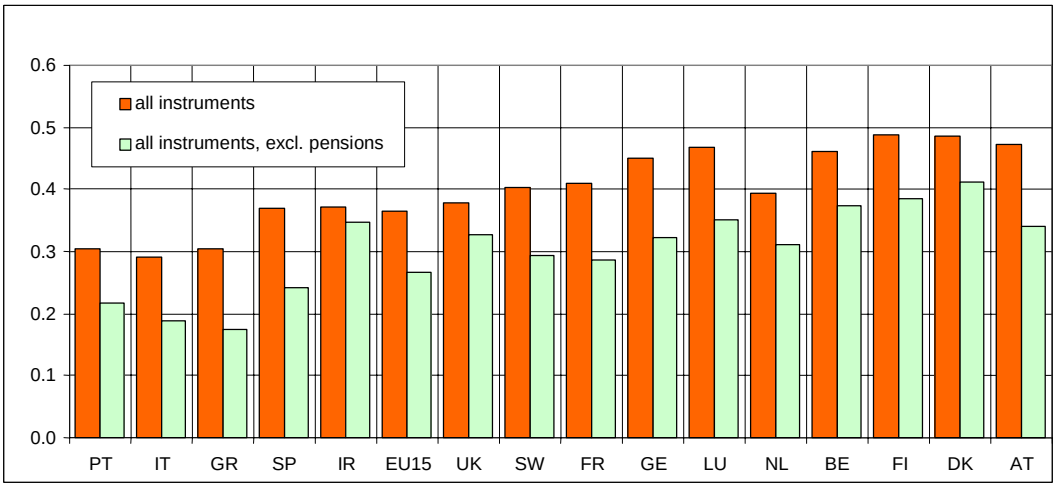
The role of different types of transfer can be explored by using EUROMOD to decompose the effect of the tax and transfer systems according to categories of benefits and taxes that are considered to be of particular relevance. Focussing on inequality rather than poverty, we analyse separately the redistributive effects of 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).[29] Public pensions are distinguished from other benefits.

Pensions can be considered as a redistributive instrument or as a means of saving. Both aspects are present in the notion of pensions for the elderly, and both the private and the public sector can have a role. While it is not easy to distinguish the savings aim of pensions from the redistributive, Figure 3.5a shows that the effect of the redistributive systems differs considerably across countries depending on whether or not public pensions are included. The equalising effect of public pensions 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 the consideration of their redistributive role, instead of merely the savings aim.

While one might expect that social transfer systems that involve a high degree of targeting by income ("means-tested" systems) are the most equalising, we find that, on the contrary, 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, as shown in Figure 3.5b. A low degree of redistribution is realised in Southern Europe (except in the case of Spain if pensions are considered as part of the redistributive system). Compared to these countries, the redistributive effect of taxes and transfers is indeed somewhat higher in Ireland and the UK, who mainly rely on means-tested benefits.

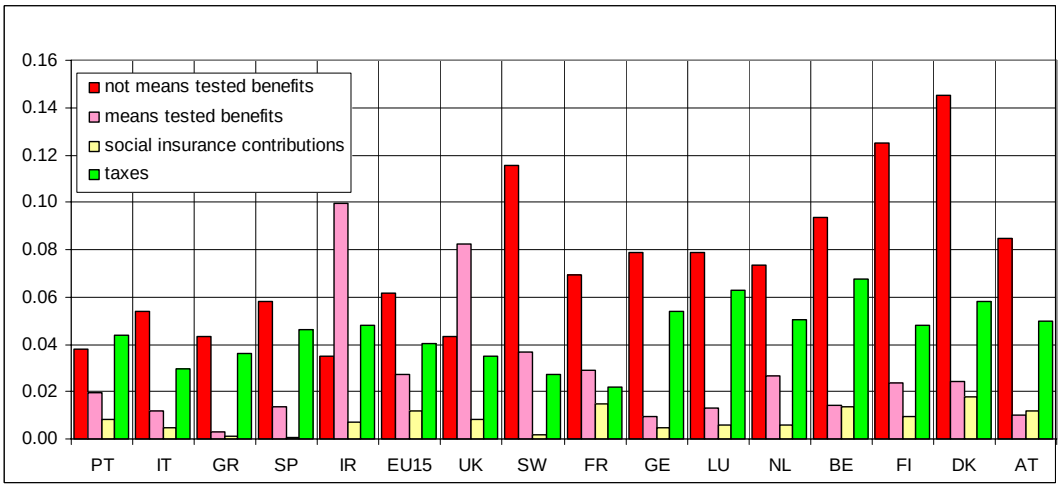
[29] Immervoll H., H. Levy, C. Lietz, D. Mantovani, C. O'Donoghue, H. Sutherland and G. Verbist, 2004, "The effects of taxes and transfers on household incomes in the European Union" EUROMOD Working Paper (forthcoming).

Figure 3.5a: Redistributive effect of 1998 tax-benefit systems (proportional change in Gini)



Source: EUROMOD (Immervoll, Levy et al, 2004)
Countries ranked in descending order of inequality of disposable income

Figure 3.5b: Redistributive effect of 1998 tax-benefit instruments (proportional change in Gini)



Source: EUROMOD (Immervoll, Levy et al, 2004)
Countries ranked in descending order of inequality of disposable income

Pensions, and the need for pension reform to take account of inadequacy of pensions among low income elderly populations, are considered in an exercise which focuses on four countries with very different (current) pension systems: Denmark, Germany, Italy and the UK.[30] Four pension systems are compared and their characteristics analysed by discussing a number of illustrative EUROMOD simulations with the aim of highlighting cross-country differences and similarities, suggesting nationally appropriate directions for reform. In doing so, we make use not only of the capacity of EUROMOD to simulate the effects of policy **changes**, but also of its ability to help us identify combinations of reforms that are **budget-neutral,** at least in

[30] Mantovani D., F. Papadopoulos, H. Sutherland and P. Tsakloglou, 2005, "Pension Incomes in the European Union: Policy Reform Strategies in Comparative Perspective" EUROMOD Working Paper No. EM5/05.

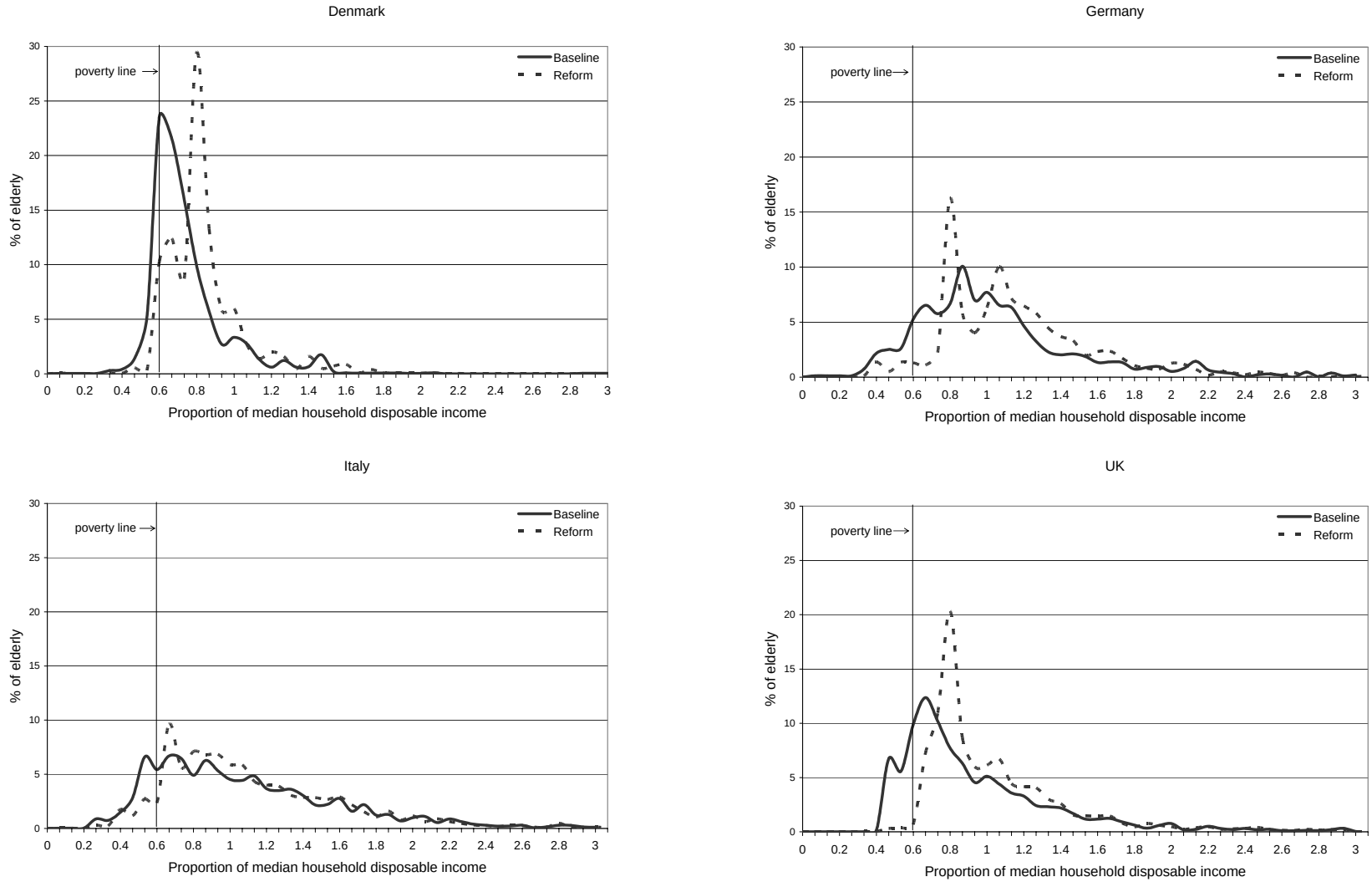
the first round. After experimenting with some common reform elements in each country, the study selects a common minimum pension scheme (set at 40% of current average earnings in each country) for each pensioner, and a method of financing such a policy, based on the results of the experiments. In Italy this is a proportional cut in existing public pensions (such as might be achieved through non-indexation or a revision to the pension formula); in Denmark it is an increase in tax rates; and in UK and Germany it is a combination of the two. The results, in terms of their impact on the distribution of the household incomes of the elderly are shown in Figure 3.6. This shows the very different starting points (in terms of inequality among the elderly and the proportion of them below the national poverty lines) as well as the effects of the reform packages.

The effectiveness of the minimum pension in reducing poverty in Denmark and the UK is due to the already near-comprehensive nature of the basic pension schemes in both countries. Given the relatively high inequality among pensioners in Germany, we find that the scheme could – within the normative framework adopted in this paper - be financed at least in part by redistribution within the pensioner population. In Italy there are significant gaps in public pension provision, which are duplicated in the coverage of the minimum pension that we have simulated and make it, in some ways, less effective in this country than in the others. The latter might be exacerbated by the fact that in Italy a relatively high proportion of non-elderly persons live with and depend on the pensions received by elderly household members.

The major challenge identified by most commentators is the growing pressure on the public finances due to pensions. So a critical issue is the cost of the reform in relation to its beneficial effects. But cost is not the only consideration. Equal cost policies may have different effectiveness in reducing the risk of poverty. Attention needs to be given to the design of reforms that increase effectiveness while reducing the cost: i.e. making progress in both directions. We explore revenue neutral packages as a way of illustrating the different trade-offs across systems and countries. In the future, if the dependency ratio is higher or private pension income has grown, the conditions will be different. The approach we have taken – exploring reform components individually and in combination – allows us to anticipate the effects of packages that are designed to raise revenue or release resources. For example, setting the minimum pension at 30% rather than 40% of average earnings would release revenue corresponding to about 1% of average disposable income (more in Germany and the UK). Poverty reduction would still be considerable.

This capacity to explore a range of options, taking account of multiple constraints and objectives is highly relevant when considering the need to balance competing priorities. The illustration of a minimum pension designed to offer protection to the most vulnerable during a period of adjustment and reform focuses attention in this respect on one group in the population. We might also wish to consider options that seek a different balance between resources targeted on the elderly and the young (Atkinson, 2005; European Commission, 2004). While this has not been done explicitly within MICRESA for all countries a dedicated workpackage has focused on children, which is described in section 3.2.2.

Figure 3.6 Distributions of household income for the elderly before and after a revenue-neutral package of reform, 1998
(minimum pension at 40% average earnings financed by proportional cut in all pensions (Italy) or increase in contributions/taxes (Denmark) or a combination of both (Germany and UK)

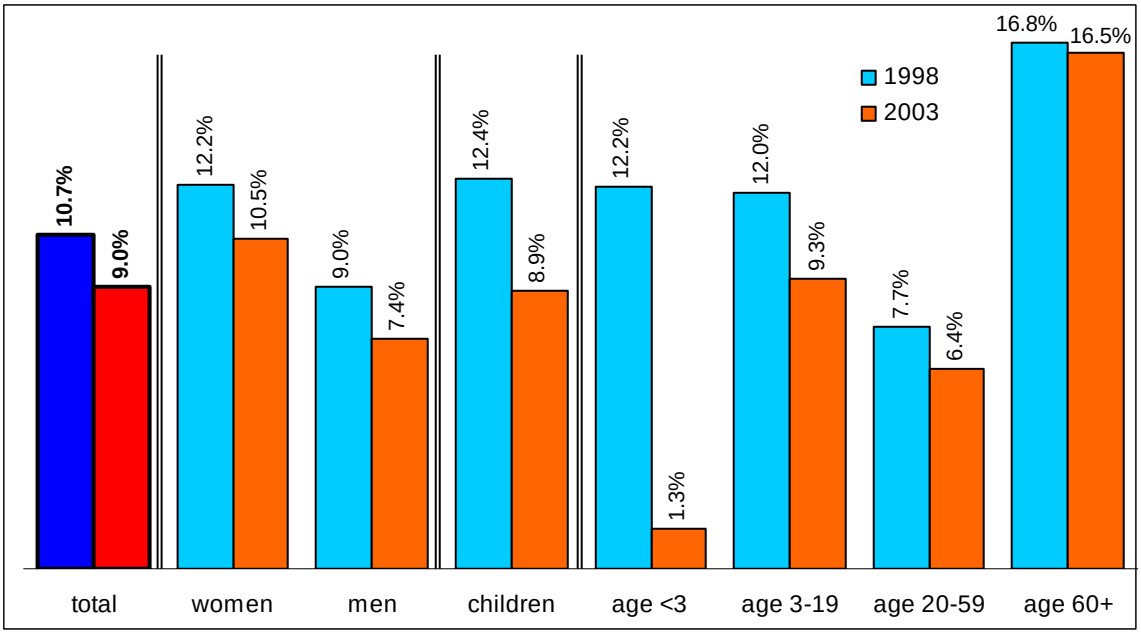


Source: EUROMOD (Mantovani et al, 2005). Note that the upper tails of the distributions have been truncated at 3 times median income. The proportions of the elderly not shown in each country are 0.05% (Denmark), 0.39% (Germany), 3.98% (Italy) and 1.45% (UK).

In addition a national study for Austria demonstrates that a re-balancing has been carried out within that country. This exercise estimates the effects on poverty of reforms introduced in the period 1998-2003.[31] These include the tax reform 2000 and the introduction of the universal child care benefit ("Kinderbetreuungsgeld") as well as increases in family-targeted benefits and tax reliefs. The key objective of the Austrian welfare system is not poverty reduction. As the first Austrian National Action Plan (NAP) for Social Inclusion states, "family policy is based on the principle of horizontal compensation, with state benefits being redistributed away from persons without dependent children to those who have childcare obligations" (Republic of Austria 2001, 18). However, the second NAP points out that "in Austria there is a general consensus that combating poverty and social exclusion are central matters of political concern for society" (Republic of Austria 2003, 3).

Figure 3.7 shows that the effect of the policy changes on poverty among young children is dramatic, virtually abolishing poverty in this group. Poverty among children in general also falls. However, the effect on the elderly is virtually non-existent. In spite of an aggregate increase in net public spending on transfers, the elderly as a group are net losers (not shown).

Figure 3.7: Change in poverty rates due to policy changes in Austria 1998-2003 by age group



Source EUROMOD (Fuchs and Lietz, 2005)
Notes: Children are defined according to the eligibility criteria of family allowance (Familienbeihilfe) i.e. below 18 or below 26 and in full-time education and not exceeding a certain income limit.
Poverty rate: share of people living in households with disposable income below the poverty line
Poverty line: 60% of median equivalised disposable income in 1998

This example for one country of an assessment of the effect of policy changes introduced over time raises a general question about what assumptions such assessments should make about what would have happened without the policy changes. More broadly, if indicators of the risk of relative income poverty are to monitor progress and to assist policy makers in making

[31] Fuchs M. and C. Lietz, 2005, "The Effects of Changes in Tax-Benefit Policies in Austria 1998-2003", EUROMOD Working Paper, forthcoming.

decisions, then we must examine how past policy choices have affected relative income poverty, and develop methods which show how different options for future policy may affect future risks of poverty. Callan (2005) uses EUROMOD to examine the "first-round" impact of policy changes over the 1998 to 2001 period for selected countries.[32] The paper argues that a "distributionally neutral" benchmark, which can be approximated by indexation of tax and welfare parameters in line with growth in wages, provides a more accurate picture of the distributional impact of policy than methods relying on the assumption that all incomes change with prices.

Over the 1998 to 2001 period, four out of the five countries analysed (Austria, Greece, Portugal and the UK) experienced tax-transfer policy changes which were particularly favourable to lower income groups. Ireland was the exception, where welfare payments failed to keep pace with rapid growth in wages, and the first-round impact of policy changes was to raise relative income poverty risks. The greatest gains for low income groups were in Greece and the UK, Correspondingly, these were the countries for whom relative income poverty rates were most reduced - with a reduction of between 2 and 3 percentage points in the UK. The exercise represents an interesting new direction in cross-country analysis of the distributional impact of policy, and helps to broaden the scope for comparisons of "best practice" in national policies to promote social inclusion to include system-wide comparisons rather than just individual schemes.

3.2.2. Child poverty from a range of perspectives

S. Toso

The aim of this workpackage (WP6) was twofold: (i) to measure the degree of poverty among children both at a national level and at the EU level, as a whole, adopting various methodologies and assumptions; (ii) to evaluate, in a comparative perspective, the effectiveness of hypothetical new policies aimed to combat poverty among children.

The main deliverables consist of three parts which are considered in turn below:

1) *Child Targeted Tax-Benefit Reform in Spain in a European Context: A Microsimulation analysis using EUROMOD*, by H. Levy, EUROMOD Working Paper No. EM2/03;

2) *Child poverty and Family Transfers in Southern Europe* by M. Matsaganis, C. O'Donoghue, H. Levy, M. Coromaldi, M. Mercader-Prats, C. Farina Rodrigues, S. Toso and P. Tsakloglou, EUROMOD Working Paper No. EM2/04;

3) *Child poverty in Europe: methodological and policy issues* by M. Makovec, C. O'Donoghue and S. Toso.

The first study focuses on one country, Spain, and uses EUROMOD to provide analysis within an EU perspective by comparing the effect of actual Spanish reforms with those of systems of child-targeted support "borrowed" from other countries.[33] The study analyses how

[32] Callan T., 2005, "Assessing the impact of recent tax/transfer policy changes on poverty" EUROMOD Working Paper, forthcoming.
[33] Levy H., 2003, "Child-targeted tax-benefit reform in Spain in a European context: a microsimulation analysis using EUROMOD", EUROMOD Working Paper EM2/03.

reforming child-related tax-benefit schemes would affect public expenditure, income redistribution and child poverty in Spain. After comparing the child-related tax-benefit schemes in five EU countries (Denmark, France, Germany, Spain and UK), the paper examines two types of reform: firstly, the reforms implemented in Spain in recent years with respect to children; secondly, what would have happened if, as a counterfactual, Spain had adopted the benefits that are used in the other countries considered in the paper.

The first main finding of the paper is that the child-related tax-benefit system in Spain is much smaller than in the other EU countries analysed there. In particular, Spain appears to be the only country of those considered that uses tax reliefs as the main child-targeted policy. Since this type of policy mainly benefits better-off households, the Spanish system is particularly inadequate at protecting poor children. In contrast, child-related policies play an important role in redistributing income and combating child poverty in the other countries considered.

In more detail, the paper shows that, despite the substantial increase after the recent (2003) reform, the expenditure on child-related policies in Spain is well below other EU countries, and that this increase was mainly due to higher tax reliefs. The 2003 reform has also introduced for the first time a non-income-related benefit in Spain. However, since this new benefit is targeted on working mothers with children aged under 3, its coverage is limited and reinforces the apparently regressive distribution of child protection. As a result, after the reform the Spanish child-related policies are less efficient at reducing child poverty and redistribute income towards the better-off children.

The second major finding of the paper is that reforming the Spanish system along the lines typical of the systems currently in use in some other European countries would dramatically reshape the child-related benefits in Spain. On the one hand, they would cost considerably more than the present system. Therefore, the cost of such simulated reforms makes them hardly feasible for the Spanish government in the short run. However, the evidence of recent reforms suggest that there may be resources to further increase the expenditure on child-related policies in the medium-long term.

In a static and narrow framework, the paper suggests that income-related benefits, such as the British Family Credit, are the most attractive and efficient policies to redistribute income and reduce child poverty. However, due to problems of targeting errors, administrative costs and work disincentives, this type of selective policy is not exempt from criticism when analysed from a wider perspective. In this respect, non-income-related benefits, such as the Danish family allowance and the German and British child benefit, are less likely to face this criticism. Nevertheless, they would cost noticeably more to reach a similar reduction of child poverty.

The second study focuses on four countries of Southern Europe.[34] It evaluates the impact of existing family transfers in Greece, Italy, Portugal and Spain, taking into account both cash benefits and tax reliefs. By using EUROMOD, the paper also simulates the distributive effect of reforms in the shape of variants of a universal child benefit.

The first main result is that existing arrangements in this policy area in Southern Europe leave much to be desired. Too many poor families with children are ineligible for income support

[34] Matsaganis M, C O'Donoghue, H Levy, M Coromaldi, M Mercader-Prats, C Farinha Rodrigues, S Toso and P Tsakloglou, 2004, "Child Poverty and Family Transfers in Southern Europe", EUROMOD Working Paper EM2/04.

under social security, as is the case in Greece and in Italy, or receive low benefits, as in Spain and in Portugal. This effect, often due to the categorical nature of the schemes under investigation, is even more pronounced with respect to the so-called tax expenditures, as non-refundable schemes exclude poor families by design.

As far as the vertical and horizontal efficiency of current schemes are concerned, it is found that family cash benefits are better targeted than child tax relief. In particular, it emerges that family transfers as a whole are better targeted in Italy and Portugal. In the case of Greece, current policy seems to fail low-income families with children on both counts. In Spain, cash benefits appear to exemplify the textbook case of stringent means-testing: reserved for the poorest families alone, but not adequate enough to improve their living standards to the extent that they are no longer poor.

Would a universal benefit improve on the anti-poverty performance of existing schemes? Benefits similar to the actual schemes of Denmark, Sweden and the UK are examined, along with two stylised schemes which (a) cost the same as existing policies and (b) have the same poverty reducing properties. The Danish structure is more generous to young children; the Swedish scheme pays more per child in large families and the British benefit pays (somewhat) more to the first child. In each of these cases the level of the benefit is set as the same proportion of male full-time earnings as in the "country of origin". Among these five variants, the Danish scheme clearly emerges ahead of the others in terms of generosity: it would be the most costly, but also the one with the highest impact on child poverty in all southern Europe countries. On the other hand, the British and Swedish scheme, although very different in terms of internal logic (the former paying a higher rate to the elder child, the latter, rising in value with family size), would have quite similar effects on child poverty and budgetary costs in the four countries studied.

Throughout a trade off between fiscal cost and poverty reduction is evident (see Table 2). Not surprisingly, more generous universal child benefit schemes have stronger distributive effects at a higher fiscal cost. However, the point is that expenditure on family transfers is currently so low in southern Europe that it is unreasonable to expect that a simple reallocation within this policy area would bring about significant improvements in terms of poverty alleviation. In view of that, combining a universal (albeit low) child benefit with more targeted (but not-categorical) policies could be a more effective way to reduce child poverty at a reasonable cost.

The third exercise covers all EU 15 countries and is divided in two main parts. The first provides, as a background, an overview of recent trends and developments of child poverty in the EU15 between 1995 and 2001 based on existing official statistics (Eurostat, etc.). This part also investigates how child poverty relates to family structure and household composition, and to what extent poverty incidence differs across age groups. Further, some of the most recent empirical evidence on the effectiveness of social protection systems in tackling child poverty is reviewed. Finally the paper briefly discusses how child poverty might depend on factors influencing integration in the labour market, such as female employment and the wage distribution.

Table 2: Impact of simulated reforms on child poverty and budgetary cost in Southern Europe, 1998

		Greece	Italy	Spain	Portugal
child poverty rate (%)	existing family transfers	17.0	26.5	21.6	23.1
	reform I: poverty neutral UCB	17.0	26.5	21.6	23.1
	reform II: budget neutral UCB	17.1	28.4	22.5	25.4
	reform III: British CB	16.0	28.1	18.9	23.5
	reform IV: Danish CB	15.5	27.1	17.9	19.6
	reform V: Swedish CB	15.9	28.1	18.9	23.2
Budgetary cost	existing family transfers	0.9	1.3	0.5	1.5
	reform I: poverty neutral	0.9	2.2	0.7	1.9
	reform II: budget neutral	0.9	1.3	0.5	1.5
	reform III: British CB	1.6	1.4	1.8	1.8
	reform IV: Danish CB	2.1	1.8	2.4	2.3
	reform V: Swedish CB	1.7	1.4	1.8	1.8

Source: EUROMOD (Matsaganis et al, 2004 Tables 15 and 21).
Notes: All reforms involve the replacement of existing family assistance for children aged 0-17 by a universal child benefit.
In the case of reforms I-II, the (flat) rate of benefit in each country has been chosen so as to match exactly (in terms of impact on child poverty and on fiscal costs respectively) existing family assistance.
In the case of reforms III-V, the level of benefit in each country has been chosen so as to be exactly equivalent (as a proportion of average earnings of male full-time employees) to the British, Danish and Swedish child benefits.
Budgetary costs are expressed as proportion of aggregate (non-equivalised) disposable income.
As reforms are simulated the poverty line is held constant at 60% of national median equivalent disposable income after all existing family transfers. The equivalence scale used is modified OECD, assigning a value of 1.0 to the first adult, of 0.3 to children below 14 and of 0.5 to other household members. The poverty rate is the headcount ratio. The FGT index for $\alpha=2$ attaches greater weight to larger poverty gaps.

The second part of the paper tackles the same set of issues making use of EUROMOD and focuses in more detail on the methodology of child poverty measurement and on the policy implications of the main findings. Wherever possible, the answers are provided by reconciling the empirical evidence reviewed in the first part with the results obtained in the second one.

The report indicates that evidence obtained with EUROMOD is in line with the findings coming from other official sources. In particular, it is possible to select three different clusters of countries in EU15 by child poverty level: a first group of nations, the Anglo-Saxon countries and Southern Europe, with a child poverty above 20%, an intermediate set of countries, given by continental Europe, and finally a third cluster, the Scandinavian countries plus Germany, where the child poverty rate is lower than 10%. Child poverty is higher than total poverty in almost half of the EU15. The high child poverty rates of the Anglo-Saxon and the South European countries seem to stem from a high overall poverty rate.

All countries appear to share some common features. In particular, the household types in which particularly high child poverty rates are evident are couples with at least three children and lone parents. In almost all countries child poverty among couple families with one or two children is less than the child poverty rate calculated on total population of children. The presence of children within the household is a risk factor of poverty only as much as the number of children is relatively high (three or more).

The composition of the population of poor children by household type shows some notable differences across countries. For example, in the UK a relatively large proportion of poor children live with lone parents, while the corresponding percentage in the other countries is far lower. The highest percentages of poor children in the southern European countries are

found among the couples with 2 children. In Ireland the absolute majority of poor children live in couples with at least 3 children. The picture shown by the countries with the lowest child poverty rate, the Scandinavian countries, is more uniform. Most of poor children live in couple families with at least three children. This is also the case for the countries with an intermediate child poverty rate (continental Europe, with the exception of Germany).

Children are at a higher risk of poverty than the elderly in most of the old EU member states. Only in Denmark, Finland, Germany, Greece, Ireland and Portugal are people aged more than 65 years more likely to be poor than children, while in France the two figures appear substantially the same. Furthermore, child poverty among youngest children (0-11 years) is systematically higher than among children of higher age (12-17). Portugal is the only country with an increasing poverty rate with respect to the age of children.

Child poverty statistics in EU15 appear mildly sensitive to different relative poverty lines. Child poverty statistics also appear sensitive to the choice of the poverty index. The ranking across country according to the headcount ratio, is only partially consistent when using either the income gap ratio or the Foster, Greer and Thorbecke (FGT) index. For example, the UK, which shows the highest percentage of poor children on total population of children according to the headcount ratio, is only fifth in the ranking when the FGT index is used, or even eighth if poverty is measured by the income gap ratio. The countries for which the findings seem more robust to the choice of different poverty measures are Italy and Finland.

The sensitivity of child poverty statistics with respect to the choice of the equivalence scale has been also tested. The results show that, as far as the child poverty incidence is concerned, the ranking of the countries is hardly affected when different equivalence scales are used. This confirms the findings already existing in the literature. The absolute level of child poverty, more than the ranking across countries, appears to be sensitive to the choice of the equivalence scale. This is the case if one adopts the parametric form (No. of adults + 0.7 × No. of children)$^{0.85}$. Using this scale makes the measure of child poverty in all EU15 countries increase, as a consequence of using a scale allowing lower economies of scale than implicit in the baseline assumptions (using the modified OECD equivalence scale).[35]

3.2.3 Poverty and policy in a geographical perspective

M.Mercader and C.F.Rodrigues

The workpackage “Poverty and policy in a geographical perspective” (WP7) had two main aims: to provide a regional view based on alternative poverty standards and to explore the possibilities of developing regionally-based policy initiatives.

The main deliverable is a paper on the impact of tax and benefits systems on income inequality within EU regions.[36] The aim of this paper is to provide empirical evidence on income inequality in Europe regions. We use statistical tools and graphical devices in order to give a comprehensive description of income inequality levels in a set of 100 EU regions at the

[35] Such scales (varying the value of the parameters) are used extensively in the literature on international comparisons. See for example Bradbury et al (2001).

[36] Mercader-Prats M. and H. Levy, 2004, “The Role of Tax and Transfers in Reducing Personal Income Inequality in Europe’s Regions: Evidence from EUROMOD”, EUROMOD Working Paper EM9/04

end of the 20th century before and after the operation of the tax-benefit system using EUROMOD.

As promised in the work plan, the paper contains:

- A very detailed analysis describing the regional information available in EUROMOD, including statistics on average population per region, average original/disposable income per region.[37]

- Extensive inequality analysis within EU regions, following the methodology recommendations of Laeken.

- A systematic analysis of the relationship between inequality levels and regional economic performance.

- Several "maps" of EU regions summarizing their internal inequality level (and tax-benefit redistributive effect) identifying regions with similar inequality (and redistributive) levels

- The policy implications in terms of regional, national and EU tax-benefit policy.

Departures from our original work plan

The planned outputs depart to some degree from the original intentions set out in the work programme in two respects. We decided to focus on an analysis which covered all the EU regions that could be identified in EUROMOD, rather than focussing on a set of EU regions only. So, our analysis is wider in geographical scope than we originally promised. Secondly, the main focus is on inequality rather than poverty. This allows the analysis to take direct account of differences in income level between regions as well as in income dispersion within regions. (A poverty analysis must treat the issue implicitly by drawing (relative) poverty lines at the regional, national or EU level[38]). Moreover, the fact that there is not much comparative empirical evidence of inequality in EU at regional level and that it was the first time the regional dimension of EUROMOD was studied, led us to focus only on the inequality analysis, rather than producing too many indicators. Finally, rather than examine specific policy reforms at the regional level, we provide analysis that informs policy makers how policy reform at the regional level might be approached. We do this by drawing out lessons about the varying degrees of effectiveness of national tax-benefit systems at reducing inequality at the regional level.

The main findings of this paper can be summarized as follows:

Both market and disposable regional inequality levels differ significantly in the different EU regions but in very different ways. We have found that tax-benefit systems in Europe reduce market inequality in all EU regions and that the size of this reduction (i.e. the redistributive effect) depends crucially on:

(i) the market inequality level of the region

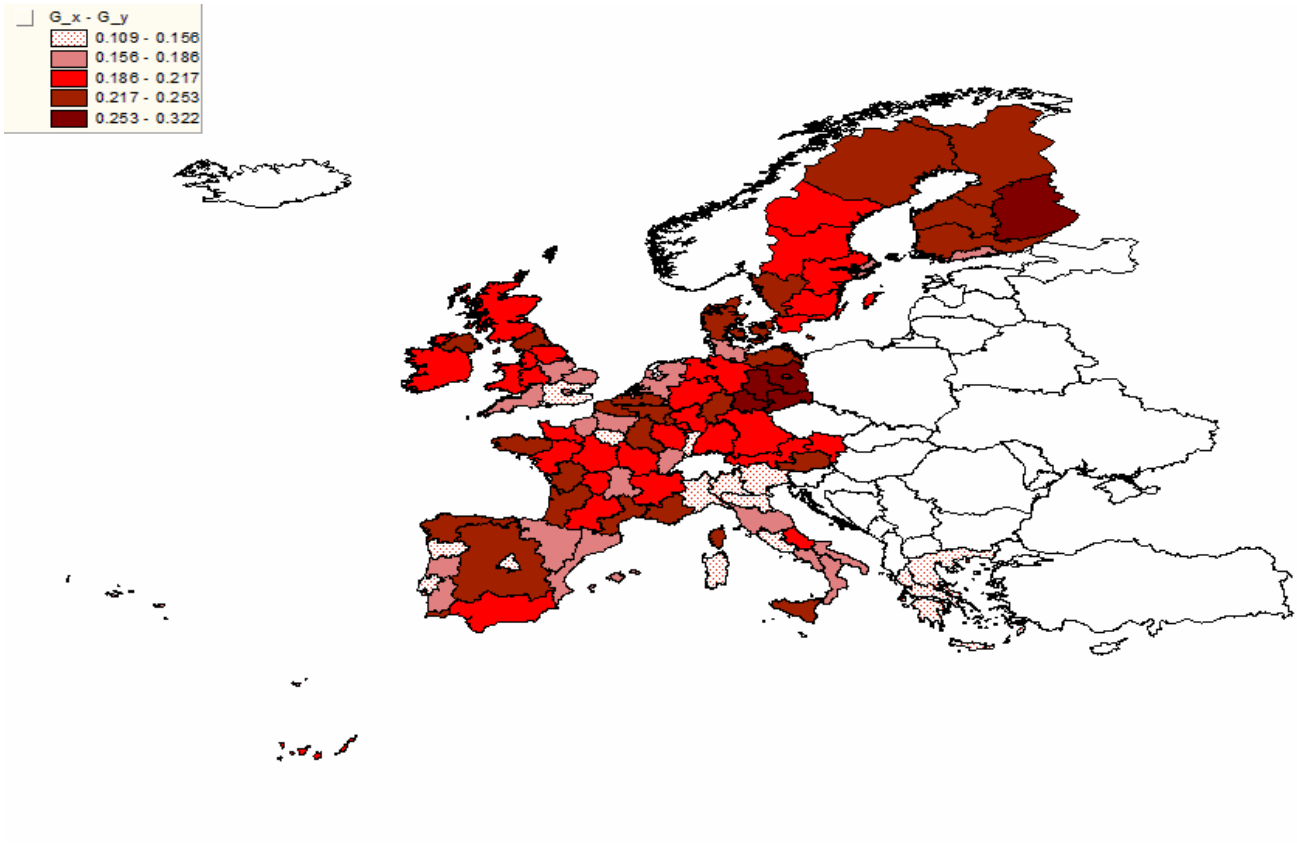
[37] In four countries no sub-national regional information is available: Luxembourg, Netherlands, Ireland and Denmark.
[38] To some extent the poverty analysis has been covered in Berthoud (2004)

(ii) the country to which the region belongs, and its economic performance

(iii) the relative economic performance of the region within the country.

Firstly, the size of the redistributive impact is larger in more unequal regions in terms of market income. Secondly, more redistributive systems at the level of the whole country show a larger redistributive impact in its territorial units. The best performing systems in terms of internal regional inequality reduction appear to be those of Finland, Germany, Austria and Belgium. The tax-benefit systems of Sweden and France would make up the 2nd best performing group. The 3rd would be Spain and the UK. Finally, the lower redistributive impact groups the systems in Greece, Portugal and Italy. Moreover, EU regional evidence suggests a positive co-movement between the country's economic performance and the inequality reduction: the richer a country is, the larger is its redistributive impact on regional inequality. We have emphasised that differences in the redistributive effect among countries cannot be attributable only to the size and structure of the tax-benefit system but also to systematic differences in other country specific characteristics such as income data quality. A map of the redistributive effect within regions, measured by the difference in Gini coefficient for original and disposable incomes, is shown in Figure 3.8

Figure 3.8: Redistributive effect in EU regions



Source: EUROMOD (Mercader Prats and Levy, 2004; Map 3)

Thirdly, the richer the region is in the country, the more limited is the redistributive impact. The redistributive impact turns out to be particularly high for the poorest regions in a country, but particularly weak in the wealthiest ones, often urban regions including the capital city of the country. Paradoxically, some of the new forms of extreme poverty and wealth are particularly associated to "richer" and more urban regions.

Our analysis also provides new evidence on the relationship between inequality and economic performance in the EU regions. This relationship turns out to depend on the income distribution chosen (market or disposable income). While for the 100 EU regions taken together, we find a negative relationship between market income inequality and economic performance (this is also the case for the majority of individual countries) it is not the case when disposable income inequality is considered. Moreover, interestingly, while regional market inequality levels appear to be rather independent of the country in which the regions belong, the country factor explains more than two thirds of the variance of the disposable regional income inequality.

From a policy perspective our results indicate:

1. As we could probably expect, national systems appear particularly efficient in inequality reduction in the poorer regions in a country, but the effectiveness is significantly reduced in the richer regions. Since some of the new forms of poverty are particularly associated with "richer" and more urban regions, this calls for further intervention at the level of the regional governments.

2. "Similar" regions in Europe in terms of economic performance and original income inequality levels achieve quite different degrees of income inequality once the redistributive role of the national tax-benefit systems have had an effect. On equity grounds this may provide a reason for further EU intervention in the design of tax-benefit policies.

3.2.4. Role of increased labour market participation

O. Bargain and K.Orsini

Research under this heading (WP5) has mainly focused on the potential dual role for in-work benefits and wage subsidies in reducing the risk of low income. It is reported in a paper which is summarised below.[39] As well as this study, work has continued on the calculation and interpretation of replacement rates while out of work,[40] and on the calculation and interpretation of the effective tax rates paid on marginal increases in earnings, for those in work.[41]

Earning an income is probably the best way of avoiding poverty and social exclusion, hence the recent trend of promoting employment through in-work transfers in OECD countries. Yet, the relative consensus on the need for `making work pay' policies is muddied by a number of concerns related to the design of the reforms and the treatment of the family dimension. We simulate two types of in-work benefits. Both reforms are built on the same cost basis (after behavioural responses) and simulated in three European countries which experience severe poverty traps caused by generous social assistance schemes, namely Finland, France and Germany. We assess the potential labour supply responses to the reforms and the subsequent

[39] Bargain O. and K Orsini, 2004, "In-work policies in Europe: killing two birds with one stone?", EUROMOD Working Paper EM4/04.
[40] See Immervoll H. and C. O'Donoghue, 2003, "Employment Transitions in 13 European Countries. Levels, Distributions and Determining Factors of Net Replacement Rates", EUROMOD Working Paper EM3/03; and Immervoll and O'Donoghue (2004)
[41] Immervoll H., 2004, "Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors", EUROMOD Working Paper EM6/04.

redistributive impacts for each country. We compare how both reforms achieve poverty reduction and social inclusion (measured as the number of transitions into activity).

This study is one of the very first cross-country analyses of tax-benefit reforms affecting labour supply conducted in a truly comparative and comprehensive way. Firstly, female labour supply estimations are carried out using datasets that are rendered homogeneous across countries. Secondly, tax analysis is performed using the integrated microsimulation of European tax-benefit systems EUROMOD. Thirdly, the microsimulation is combined with structural discrete-choice models in order to predict potential behavioural responses to the reforms. Estimations make use of a similar specification across countries to compare the determinants of labour supply and predict differences in labour supply responsiveness to exogenous changes on the budget constraints. Lastly, differences in `framework conditions' across countries are emphasized throughout the analysis, notably the differences in income and wage rate distributions and the way tax-benefit reforms interact with national systems in force. These issues turn out to be crucial in explaining the differences in the effects of each reform across countries. They are important issues to be dealt with when designing tax-benefit reforms aimed at reshaping work incentives at the national level.

The two reforms considered in the paper represent the two kinds of in-work policies that have been applied in some countries and illustrate the typical distinctions between family-based instruments and individual transfers, which characterize recent trends in `making work pay' policies in OECD countries. The first instrument is a working tax credit in the fashion of the British WFTC, that is, means-tested on family income, while the second is a simple wage subsidy, that is, a purely individualized policy. As all instruments conditioned on household income (WFTC, EITC, etc), the former is known to yield disincentive effects for women whose partner is employed. Indeed, we find that overall female employment decreases after the introduction of the tax credit; the participation of married women declines in all three countries and especially in France, where labour supply is slightly more elastic; this is only partially offset by a positive effect on single women's labour supply in Germany and Finland. With the individual wage subsidy, married women are clearly encouraged to take up a job, especially in France. The total positive effect on female labour supply remains small however.

The outcomes in terms of effects of interest to policy makers are summarised in Table 3. Neither poverty reduction nor social inclusion seem achievable through `making work pay' policies in Finland, the main culprit being very low labour supply elasticities. Policy intervention aimed at enhancing employment should attempt leverage through the demand side by reducing the cost of low productivity work for employers. However, such a policy should be recommended only if demand side elasticities are large enough; Böckerman and Jäntti (2004) confirm the importance of demand side aspects. As a matter of fact, the Finnish authorities are currently considering possible reductions in employer social security contributions for low-wage jobs.

For Germany and France, final conclusions on the design of in-work transfers and on the treatment of the family dimension depend necessarily on policy objectives. We have defined the **social inclusion** objective as the number of female workers encouraged to enter the labour market. In this respect, the wage subsidy performs unambiguously better. Yet, it is noticeable that a large proportion of poor households (around 70% in France and Germany) are single individuals. Interestingly enough, a substantial number of poor single women are induced to work by the working tax credit in Germany. As a result, this reform cannot be rejected if indeed social inclusion now means encouraging employment of the poorest, even at the price of creating disincentives for second-earners in couples. Such definition of social inclusion

also implies positive externalities not accounted for here, as described by Phelps (2000). These include the enlargement of a person's social network, the promotion of self-esteem and the encouragement of the values of self sufficiency and responsibility in younger household members. Moreover, these results justify the need for measures better targeted towards sub-groups of the population.

Table 3: Policy effects of two alternative "making work pay" reforms in France, Germany and Finland

	France	Germany	Finland
Working Tax Credit			
Nb of households out of poverty due to the reform	150,121	54,654	583
in % of total population	***0.65%***	***0.14%***	***0.02%***
Nb of households out of poverty due to behav. resp.	5,984	39,748	242
in % of total population	***0.03%***	***0.10%***	***0.01%***
Nb of households back to work	-160,937	-51,284	-687
in % of total population	***-0.70%***	***-0.13%***	***-0.03%***
Cost per household out of poverty (EUR/year)	52,638	131,230	888,575
Low-wage subsidy			
Nb of households out of poverty due to the reform	127,528	49,685	1,882
in % of total population	***0.55%***	***0.13%***	***0.08%***
Nb of households out of poverty due to behav. resp.	6,980	9,937	235
in % of total population	***0.03%***	***0.03%***	***0.01%***
Nb of households back to work	125,569	80,477	3,119
in % of total population	***0.55%***	***0.21%***	***0.13%***
Cost per household out of poverty (EUR/year)	62,143	145,902	276,239
Cost per household back to work (EUR/year)	63,112	90,077	166,690

Source: EUROMOD (Bargain and Orsini, 2004)

Both the family-based tax credit and the individual wage subsidy achieve significant **poverty reduction** in France, less so in Germany. Surprisingly, the tax credit performs only slightly better than the wage subsidy. To echo the previous argument relative to the social inclusion of the poorest households, note that increased participation of poor single women induced by the tax credit contributes substantially to poverty reduction in Germany; once accounting for this effect, the gap between the performances of the two reforms increases. Naturally, the poverty criterion is only one among several distributional aspects; it must not be forgotten that the working tax credit achieves an important transfer to the bottom half of the income distribution, with the exception of the very first decile group, in all three countries.

We finally mention two ideas on which future research could build.

Firstly, our approach could fruitfully be compared to the strategies of Spadaro (2004) or Immervoll, Kleven et al. (2004) who acknowledge the lack of consensus in the literature regarding the size of elasticities and simply postulate different levels of labour supply responsiveness to analyze the impact of tax reforms on social welfare. In the present paper, we rely more traditionally on the econometric approach, which is intrinsically dependent (i) on the conceptual framework modelling labour supply behaviour (in our case a "male

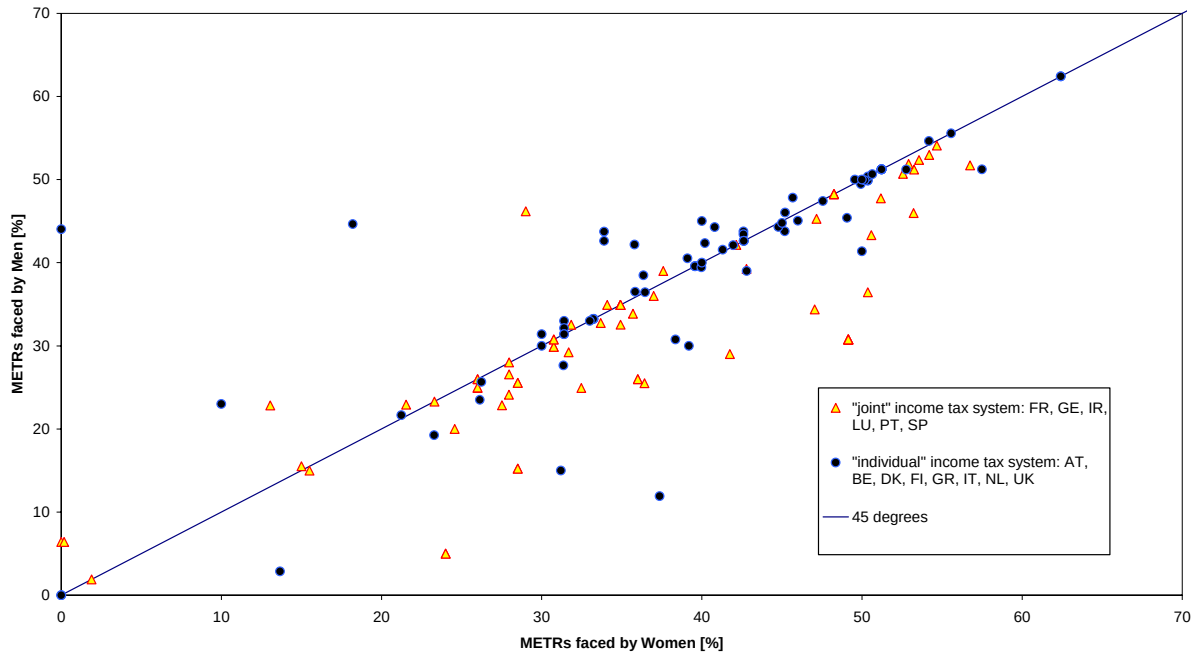
chauvinist" approach, where female labour supply choices are conditional on and follow from the male labour supply strategy); (ii) on the actual functional form used (quadratic in consumption and leisure) and (iii) on the ex ante definition of available working options (inactivity, part time and full time). This approach enables us to capture discrepancies in labour supply sensitivity across countries which turn out to be prominent in explaining the difference in results for an identical tax reform. An interesting complementary exercise, left for future research, would consist of assuming identical elasticities across countries in order to capture what relates specifically to institutional factors (existing tax-benefit systems, wage/income structures etc.) in explaining cross-country discrepancies in the effects of each reform.

Secondly, if social objectives consisted simply of fighting poverty, an increase in social assistance would unambiguously perform better by targeting the poorest. The moderate size of participation elasticities found in this paper as well as in related studies conveys the idea that subsequent disincentive effects may not be that large, which weakens the `inactivity trap' thesis. Then, it remains to find how "Rawlsian" the social planner has to be in order to prefer welfare to workfare policies. In other words, determining what degree of importance a society attaches to the individuals/households in the bottom of the distribution in order to prefer a strongly redistributive increase in minimum income schemes (with its consequent effect on labour supply of less productive workers) over the weak redistributive/incentive effect of MWP measures. This `old debate' is examined by Immervoll, Kleven et al. (2004). Ultimately, the ranking of policy objectives then depends on social preferences, which are unfortunately unknown. Following Spadaro (2004), we could draw conclusions for a broad range of values measuring social aversion towards inequality and find out the range over which one reform is socially preferred to the other. This type of analysis implies additional assumptions and in particular interpersonal utility comparisons, which means a lot of work involved still. More pragmatically, we have focused here on policy criteria often retained by decision-makers and which ground the debates on the reform of European welfare systems.

Differences by gender

We have seen important gender differences in labour supply response in the three country study discussed above, We might expect a similar analysis covering more countries to find such differences (both by gender and the scale of the effect across countries) also to be significant. Some indication of the importance of tax-benefit policies in this area can be gauged through comparisons of marginal effective tax rates (METRs) by earnings level and gender. While across the working population as a whole, METRs are generally lower for women, a more diverse picture emerges once one controls for earnings differentials between men and women. In most couples, working women have lower earnings than their partner. In countries with joint income tax filing, these women therefore tend to face higher METRs than men at the same earnings level (France, Germany, Ireland, Luxembourg, Portugal, Spain). For some decile groups, noticeable gender differences also exist in countries that, while not formally employing a joint tax base, allow sizable parts of unused tax concessions to be transferred from the lower- to the higher-earning spouse (Belgium, Denmark, the Netherlands). This is illustrated in Figure 3.9 which plots, for each earnings decile group in each country, the average METR faced by women compared with the average faced by men. Points below the 45^{o} line indicate where the average for women is higher than the average for men, with the same earnings level.

Figure 3.9: Marginal effective tax rates for men and women in the same earnings decile groups, 1998



Source: EUROMOD (Immervoll, 2004)

3.2.5 Impact of taxes and benefits within the household

J. Le Cacheux and K. Orsini

The initial objectives of WP4 were the consistent calculation of individual marginal effective tax rates (METRs), family unit income and individual incomes according to a range of assumptions about the incidence of taxes and benefits and income sharing within the household, as well as to establish a set of coherent and consistent global assumptions as alternatives to the traditional global assumption of equal sharing. It became clear that these ambitions were out of reach given the theoretical and practical difficulties involved. It was therefore decided to concentrate on two feasible aspects of the endeavour: a survey of existing literature on intra-household choices, with the twin objectives of identifying state-of the-art ways of specifying income sharing rules and of pointing to the limitations;[42] and to devise a sharing rule that – while being simple - may still be regarded as the lower bound of a more complex rule that accounts for each spouse's contribution to household production, public goods and possible behavioural responses in case of household dissolution (including labour supply reaction and alimony obligations). The approach not only relies on EUROMOD, to determine individual power (which is based on a simulated counterfactual), but also to investigate the resulting individual income distributions and poverty rates, as well as the ways

[42] Le Cacheux J, 2005, "Sharing and choosing within the household: A survey", EUROMOD Working Paper, forthcoming

in which existing tax-benefit systems affect these distributional outcomes. A summary of the literature review is provided in appendix 4.

Individual bargaining power and intra-household sharing

Based on existing literature, it appears difficult to derive general conclusions concerning the empirics of intra-household decision making and in particular on individual incentives for supplying labour. However, the literature suggests that the relevant sharing rule may be inferred from the respective bargaining power of each household member.

Building on this intuition, an analysis of the effects of the tax-benefit system on the intra-household distribution of income and consumption has been carried out.[43] Assuming that there is no "public good" component of household consumption, the sharing rule is derived from a power index based on the relative contribution of each household member to total household's well being, or – using analogies from game theory – power is based on the strategic weight of each player in a winning coalition, and is measured by the amount of the loss for the coalition as a whole, if each player were to exit from the coalition. This provides a simple and straightforward way of taking an explicit account of the rules of the tax-benefit system.

The sharing rule is derived and applied used microdata and the microsimulation model EUROMOD. Four countries (Finland, Germany, Italy and the UK) are compared along various dimensions. First, it appears that the power indexes calculated for each household member according to the method described display significant differences across household types and across countries: in particular, there is a significant difference along gender lines, but this difference is not of the same magnitude in all four countries: it is very small in Finland and considerably higher in Italy; female bargaining power – in particular - varies according to the employment status of the female spouse and according to the income level of household, but while the power of females in employment is similar across all considered countries, it varies significantly when female spouses do not work, suggesting that a crucial role is played by the tax benefit system. Similarly, children's "bargaining power" differs according to family size, average income, and varies from country to country.

More interesting still from our point of view are thus the results obtained when comparing the power indexes calculated on the basis of gross incomes with those resulting from the use of net –after tax and benefit—disposable incomes. In all four countries in our sample, but to varying degrees, the tax-benefit system tends to raise the bargaining power of non-working spouses and that of children. It also tends to flatten the distribution of power as compared to the income distribution, raising the bargaining power of low income individuals and (slightly) reducing that of higher incomes individuals, though this effect is small in all four countries studied. However, because old-age pensions are included in the net transfer calculation, the effects are on average stronger for households with no children, a category containing a disproportionate share of households in retirement. In order to better understand the sources of the observed variations in power indexes, an analysis is then performed by distinguishing taxes from benefits; the results are relatively difficult to interpret, but they tend to confirm that in the four countries studied the changes in individual bargaining powers within the

[43] Orsini K. and A. Spadaro, 2005, "Sharing Resources within the Household: A multi-country microsimulation analysis of the determinants of intrahousehold `strategic weight' differentials and their distributional outcomes", EUROMOD Working Paper No. EM3/05

household come more from the benefit structure than from the tax system, the latter tending to have a negligible effect in most instances.

Turning to the consequences of sharing rules, it is possible to compare poverty rates calculated on the basis of the unequal sharing rule used in this paper with those obtained by assuming equal income sharing within households. In all four countries, poverty is higher especially for female spouses and children. The latter would face a poverty risk ranging from 80 to 90% if income were distributed according to their power. Only the German tax-benefit system seems to attach a higher weight to children, although poverty risk would still be in the range of 65%.

Of course this exercise is but one step in the direction of looking into the "black box" of households sharing and decision making. The proposed sharing rule provides a lower bound which probably exaggerates the inequality resulting at the individual level. In particular, this is so because it ignores public good consumption and scale economies within the household. If these were taken into account, the sharing would be less severely unequal, especially in households with children. Finally, it would be desirable to complete the analysis with an investigation of individual choices, especially with regard to labor market participation, within the household, and how individual incentives are modified by the tax-benefit system. This extension is however far from straightforward, and is a subject for further research.

3.2.6 Implications of macro-level changes for social objectives

H. Immervoll

Work in this area (WP3) has consisted of four in-depth studies analysing changes that affect the economy as a whole (the 'macro-level') and their impact on the income situation of individual households (the 'micro-level'). Macro-level changes can reinforce or weaken policy measures designed to attain certain outcomes at the household level. Understanding these links is therefore particularly important in the context of policy evaluation and monitoring.

When assessing the effectiveness of specific policy measures, it is necessary to separate the 'direct' effects of policy from intervening influences that are not necessarily within the scope of the policies that are being evaluated. At the same time, one possible criterion for evaluating particular policy instruments (e.g. the tax system) is the extent to which they manage to achieve outcomes they are designed for (such as the reduction of income inequalities) independently of changes in macro-level variables (such as inflation or demographic changes). However, for stabilisation purposes, policies may also be explicitly or implicitly designed to react elastically to specific macro-level changes.[44]

Principles and practice in adjusting policy parameters for changes in income

In this report, we investigate tax-benefit indexing practices across 15 EU countries based on information provided in a questionnaire addressed to the national research teams of the countries participating in the MICRESA project.[45] This methodology allows us to benefit

[44] Mabbett (2004) uses data from EUROMOD to consider the role of adjustments in taxes and transfers in the stabilisation of macro-economic variables.

[45] Gutierrez R., H. Immervoll and H. Sutherland, 2005, "How European Union Member States adjust tax and benefit systems for inflation" (mimeo)

from information provided by experts on the tax-benefit systems in each country. In some cases it was not possible to find the information in the form requested and for this reason, the comparisons in this paper are not comprehensive for all countries. To our knowledge, this survey is the first attempt to include information on indexing practices applied to income taxes, social insurance contributions (SICs) and benefits across 15 EU countries. Previous attempts have focussed mainly on income taxes. The main findings are:

- Practice, as defined by the law, varies greatly across countries. At one extreme, in Ireland there is no statutory or customary indexation: the default position is the previous year's nominal values. At the other extreme, in Belgium there is a near-comprehensive legally-specified system of indexation.

- Nevertheless, even where statutory indexation is well established, indexation may be suspended as a way of reducing public deficits. This occurred in Belgium in the 1990s.

- And similarly, thresholds and levels may be increased by more than inflation as part of an attempt to eliminate fiscal drag if earnings (or other incomes) are growing in real terms.

- In most countries, where components of the system are indexed this is done according to changes in the price level. An exception is Denmark where parts of the system are indexed by earnings, and parts by a composite index of prices and earnings. Another is the Netherlands where the public pension and social assistance is linked to the minimum wage, which is in turn linked to a general earnings index. Where price indexation is used, indexes may be constructed excluding some expenditure items (e.g. alcohol and tobacco in Belgium or housing in the UK).

- In many systems parts of the tax or benefit formulae are not indexed regularly, even where the main thresholds are adjusted. This may apply to individual instruments, such as the Luxembourg housing benefit, or to components of instruments such as capital limits in benefit formulae in the UK.

- In many countries the lack of automatic indexation is made up for by regular but discretionary changes in thresholds and benefit levels that – de facto – have the same effect. The fact that Ireland has no statutory indexation does not mean that adjustments to tax and benefits are not made, simply that the effect of such changes can be claimed as "improvements" even if their effect in real terms remains constant.

- In many countries, whether or not there is an indexation formula, the actual uprating and/or the amount of uprating is agreed as part of the political process. In some countries, such as Germany, uprating must be agreed by parliament; in others, such as Portugal, there are wider discussions involving consultation with the social partners.

- The formula for the index and the timing of its application vary too. However, the significance of these differences is relatively minor compared with effects due to indexation at all, or lack of it. In periods of high or changing inflation such factors as the lag between the reference period for the index and its application, smoothing of changes and the frequency of changes, would assume more importance.

- Some inflation adjustments are applied annually based on past inflation. In Spain the adjustment uses expected inflation. If actual changes differ from expectations, further

adjustments are made. Other adjustments use a trigger – so that if inflation rises above a particular level, an adjustment is triggered.[46]

Overall there appears to have been a significant amount of departure in practice from the legal rules for indexation. Statutory indexation may be suspended (Austria, Belgium, Sweden) or policy reform may have a much larger impact than indexation on its own would achieve. To establish what has actually happened over a particular period empirical investigation is needed.

Taxes and inflation

The second study carries out such an investigation, focussing on the influences of inflation on the operation of the tax system in selected EU countries (Germany, the Netherlands and the UK).[47] The author finds that both equalising and revenue-generating properties of existing income tax and social contribution systems can be altered significantly, even at inflation rates as low as 2%. At moderate inflation rates of 4% per annum, the phenomenon known as "bracket creep" (where inflation-induced nominal income increases cause people to be taxed at ever-increasing rates if the tax system is left unadjusted) is found to cause cumulative additional tax burdens of up to 30% of annual tax receipts over a four-year period.

More specifically, it is found that real income tax burdens rise and social insurance contribution burdens fall when nominally defined tax rules are not adjusted for inflation. While theoretical results do not provide unambiguous answers about how inflation-induced erosions of tax band limits, deductions and tax credits combine to alter the degree of progressivity built into tax systems, simulations employing the EUROMOD tax-benefit model show that, in unadjusted tax systems, overall progressivity is reduced in all three countries. Despite this flattening of the distribution of tax burdens, the equalising properties of income tax and social insurance contributions combined are enhanced as a result of increasing total tax burdens. That is, fiscal drag reduces real household incomes but, due to the overall progressive nature of tax burdens, causes them to be more equally distributed than before inflation.

Existing inflation adjustment schemes in the Netherlands and the UK perform well in immunising tax systems' distributional and revenue-generating properties from inflation-induced distortions. The size of these corrections suggests that these properties can be seriously affected in countries, such as Germany, where no automatic inflation adjustments exist. Discretionary adjustments will only be effective in preventing these changes if implemented on a regular, or quasi-automatic, basis.

Implications of macro-level changes for a wider set of social policy instruments and objectives

The scenarios considered in Immervoll (2005) assume that all incomes increase in line with inflation. Given these assumptions, estimates of the extents of fiscal drag and the resulting reduction of progressivity are likely to be conservative. One reason is that social transfers may not in fact be fully indexed to the price level so that individuals who depend on benefit payments may be particularly hard-hit. And second, average incomes may increase at a faster

[46] See also Immervoll (2000).
[47] Immervoll H., 2005, "Falling up the stairs. The effects of bracket creep on household incomes", *Review of Income and Wealth* 51(1) 37-62. Also available as EUROMOD Working Paper EM3/04.

rate than prices, and thereby further accelerate a decline in progressivity – even if comprehensive inflation-adjustment mechanisms are in place.

Addressing some of these additional dimensions, a third study takes into account influences of macro-level changes on the operation of both taxes and social benefits.[48] It also considers variations of a wider range of macro-variables than inflation, including real income growth, earnings inequality and unemployment rates. These variables have shown marked variation over time and across countries in recent years. If tax-benefit systems are sensitive to these changes then this may considerably alter the effectiveness of social and fiscal policies – and policy objectives that depend on their operation. From a tax-benefit angle, many types of macro-level changes can be considered 'exogenous', at least in the short term. However, a more comprehensive perspective is often required, particularly in the context of wider social objectives. Different policy areas are not independent from each other and most macro-variables are, in fact, the subject of targeted policy measures aiming, for instance, to further income growth and lower unemployment rates. Understanding how these initiatives may impact, through their effect on taxes and benefit, on other objectives is therefore a pre-requisite for improving co-ordination between different policies and devising consistent policy 'packages'.

The authors of the paper frame the analysis in terms of the set of commonly agreed indicators for social inclusion adopted at the EU-level, which includes poverty measured as income relative to percentages of the median. EUROMOD is used to establish baseline rates of poverty for 15 Member States and then explore their sensitivity to (a) an increase in unemployment, (b) real income growth and (c) an increase in earnings inequality. The simulations indicate that poverty rates are indeed vulnerable to such "macro level" changes. In line with expectations, the size (but in some cases also the direction) of the effect varies across countries. The authors conclude that if the social inclusion indicators are to be used as generally accepted measures of the outcomes of policy, then it is important that differences in responsiveness are fully understood.

The sometimes unexpected influence of macro-level changes on calculated income distribution measures (e.g. decreasing poverty rates in some countries as certain patterns of unemployment become more common) illustrate the dangers of relying on one particular measure (here the relative poverty rate) as a single indicator and highlight the importance of maintaining a portfolio which includes

- indicators that relate directly to individual labour market experience (such as unemployment or low wages) as well as household incomes;
- indicators of absolute changes in real income level; and
- indicators calculated for population sub-groups.

[48] Feres P., H. Immervoll, H. Levy, D. Mantovani and H. Sutherland, 2002, "Indicators for Social Inclusion in the European Union: how responsive are they to macro-level changes?", EUROMOD Working Paper EM3/02 and Immervoll, H., H. Levy, C. Lietz, D. Mantovani and H. Sutherland, forthcoming, "The sensitivity of poverty rates in the European Union to macro-level changes", *Cambridge Journal of Economics.*

Taking account of population changes when analysing tax-benefit policies

As illustrated by the studies discussed above, it is often desirable to investigate the effects of certain population changes on taxes, benefits and household incomes. Frequently, however, the data necessary for doing so may not be available. For instance, detailed household data for a given year may not yet be available. Or one may, as in the paper above, actually be interested in studying hypothetical or predicted population changes rather than observed ones. As a methodological background to the empirical studies described above, an additional report has investigated different ways of approximating an existing or hypothetical population for which detailed micro-data are not available.[49] This is considered in more detail in chapter 3.3.3, along with other experiments with technical improvements.

[49] Immervoll, H, K Lindström, E Mustonen, M Riihelä and H Viitamäki, 2005, "Static data "ageing" techniques. Accounting for population changes in tax-benefit microsimulation models", EUROMOD Working Paper No. EM7/05.

3.3 Developing EUROMOD

Much of the analysis summarised in the preceding chapters of this report made use of a version of EUROMOD that was considerably more developed than the version available at the start of the project.[50] This "development" involved the following:

i. Building new versions of the model using 2001 and (for selected countries) 2003 policy rules

ii. Implementing more up-to-date sources of micro-data for the majority of countries, including several updates for selected countries

iii. Revising updating procedures and exploring improvements

iv. Documenting these new versions of the model on a country-by-country basis in Country Reports

v. Validating national baseline results for 2001 (and 2003) and documenting this exercise in the Country Reports

vi. Validating statistics drawn from the baselines for 1998 and 2001 with statistics produced by Eurostat and national statistical offices.

vii. Improving the internal coherence and consistency of the model

viii. Adding features and functions, extending the capacity of the model

ix. It has also been important to extend the community of users (and hence also the range of uses of EUROMOD) by

x. Training members of the EUROMOD consortium, involved in MICRESA, in the use of the model and developing user documentation

xi. Developing the user interface; improving internal model documentation and labelling

xii. Providing detailed statistics output from the model, to be accessed on the web

xiii. Considering how to provide remote access to EUROMOD

These developments are considered below under the following headings

The current version of EUROMOD (i, ii, iii)

A quality assessment (v, vi)

Special technical issues (iii, viii, vii)

Using EUROMOD and EUROMOD estimates (iv, ix, x, xi, xii)

[50] The "starting point" is described in Sutherland (2001).

3.3.1 The current version of EUROMOD

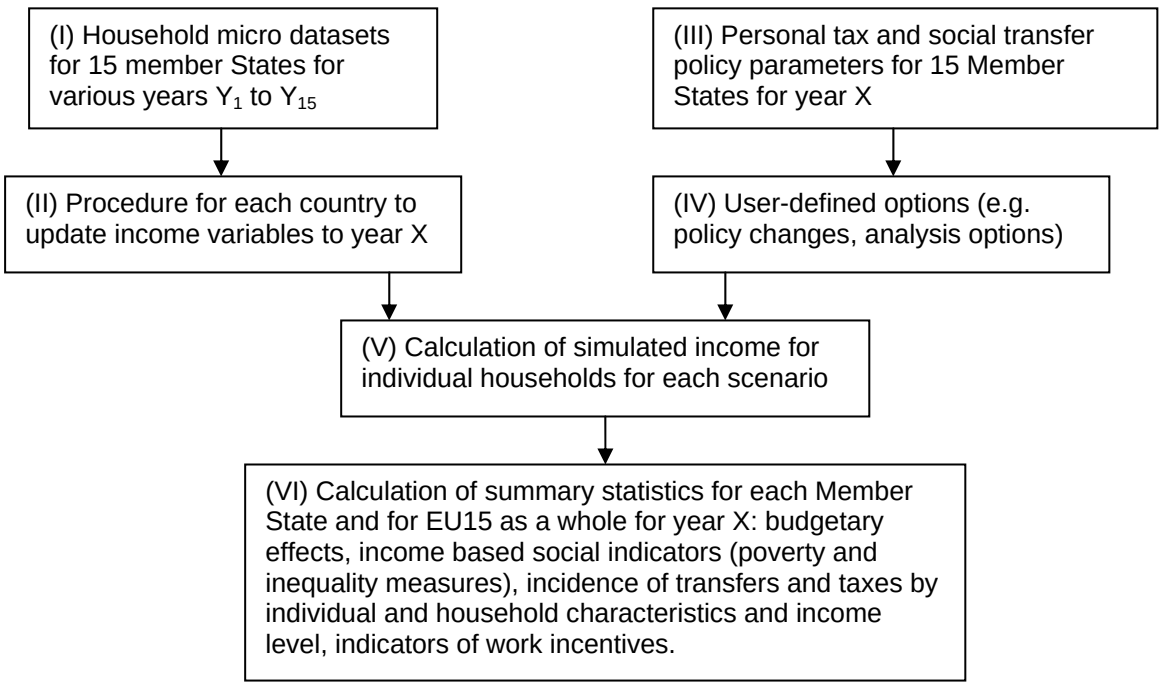
EUROMOD is updated continuously, either in terms of the databases it can access, the policy rules that are incorporated in the baseline or in terms of corrections and technical additions or improvements. This section describes the state of play regarding available input databases and the policy years for which systems have been implemented and tested. This builds on previous work and does not repeat the detailed explanations given elsewhere. See Sutherland (2001), particularly in relation to the techniques lying behind model construction.

Generally the aim is to make use of micro-datasets that are as recent, or as close to the policy year of interest, as possible. Generally too the most recent policy year is likely to be the most heavily used and of most interest. However, "old" policy years (and databases) are retained within the model so that analysis can make use of them (for example to explore the effects of policy changes introduced over a recent period) and as a "library" of tax-benefit routines that may be called upon when designing new policy options.

In order to be able to replicate results from past uses of the model, and to avoid confusion between the many versions of the model, version numbers are now allocated and selected versions are made available for use. For example, the current version of the web statistics (see section 3.3.4.4) uses EUROMOD version 27A. This report refers to results obtained from a number of different versions of the model, since they were derived at various times throughout the 3-year duration of the MICRESA project. The version number, or the paper from which the results are cited, are provided as a reference.

A simplified representation of the operation of EUROMOD is illustrated by Figure 3.10 and the discussion in the following sections elaborates on each of the components, shown in boxes in the figure.

Figure 3.10: EUROMOD



3.3.1.1 Datasets (I)

The main datasets that have been used in EUROMOD are shown in Table 4a (for the 2001 baseline) and Table 4b (for the 1998 baseline, where different). Table 4c shows new datasets that are in the process of being incorporated or tested with the 2003 baseline.[51] Table 5 summarises the current options both for data and for policy years. The choice of dataset has been based on judgement of national experts in the project consortium of the most suitable dataset available for scientific research. The criteria taken into account are shown in the box.

Issues affecting choice of EUROMOD datasets

- **Quality**
- **Reference date** for incomes. There are two main considerations to take into account.
  - the most recent data is the best choice for modelling current policies
  - comparability of vintage is important
- **Availability**: we need to be able to secure flexible access permission for the whole team.
- **Replicability**, the existence of outside reference points and validation possibilities are important (this point argues against using synthetic combinations from different sources)
- **Minimising work load** - argues in favour of using datasets with which the team is

Where possible new and more up-to-date data have been introduced into EUROMOD during the course of the project. This has not always been possible. The amount of effort required to process the data can be very significant, particularly in countries where the original data needs a great deal of manipulation and enhancement before it is suitable as an input database into a microsimulation model. Sutherland (2001) describes this process. In addition recent data of adequate quality may simply not have been available within the required timeframe. In all countries, even where new data were not incorporated, the dataset wave in use has been cleaned, improved and tested. In addition, the format of documentation of the EUROMOD database has been significantly improved, using an electronic format making use of Microsoft Excel, instead of a paper format.[52]

3.3.1.2 Updating (II)

In most cases the input datasets refer to a period (Y_i) a few years prior to the policy year of interest (X) and the original incomes derived from them are updated to this date. This process relies on indexing each income component (that is not simulated) by appropriate growth factors, based on actual changes over the relevant period.[53] In general no adjustment is made for changes in population composition.[54] Results are thus in some sense a hybrid of policy year and the data year.

[51] In most cases it is possible for each policy year to use any of the datasets, along with appropriate updating factors (see section 3.3.1.2). This flexibility can cause confusion and users are recommended to document the choice of datasets used as well as the version of EUROMOD.

[52] A copy of the template is available on request. This was originally developed by Horacio Levy as part of his work with the Spanish team.

[53] This process is documented in EUROMOD Country Reports. See www.econ.cam.ac.uk/dae/mu/emodcty.htm

[54] One exception is the case of Ireland, where weights adjust to the 2001 population when the 2001 policy year is used.

Table 4a: EUROMOD base datasets used for the 2001 baseline

Country	Base Dataset	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households	1999	annual 1998
Denmark	European Community Household Panel	1995	annual 1994
Germany	German Socio-Economic Panel	2001	annual 2000
Greece	European Community Household Panel	1995	annual 1994
Spain	European Community Household Panel	2000	annual 1999
France	Budget de Famille	1994/5	annual 1993/4
Ireland	Living in Ireland Survey	1994	month in 1994
Italy	Survey of Households Income and Wealth	1996	annual 1995
Luxembourg	PSELL-2	2001	annual 2000
Netherlands	Sociaal-economisch panelonderzoek	2000	annual 1999
Austria	Austrian version of European Community Household Panel	1999	annual 1998
Portugal	European Community Household Panel	2001	annual 2000
Finland	Income distribution survey	2001	annual 2001
Sweden	Income distribution survey	2001	annual 2001
UK	Family Expenditure Survey	2000/1	month in 2000/1

Table 4b: EUROMOD base datasets used for 1998 baseline, where different

Country	Base Dataset	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households	1998	annual 1997
Germany	German Socio-Economic Panel	1998	annual 1997
Spain	European Community Household Panel	1996	annual 1995
Luxembourg	PSELL-2	1999	annual 1998
Netherlands	Sociaal-economisch panelonderzoek	1996	annual 1995
Portugal	European Community Household Panel	1996	annual 1995
Finland	Income distribution survey	1998	annual 1998
Sweden	Income distribution survey	1997	annual 1997
UK	Family Expenditure Survey	1995/6	month in 1995/6

Note: In Tables 6 and 9 which follow the Belgian baseline statistics for 1998 use the same data as the 2001 baseline. In Table 7 the dataset shown in Table 4b is used.

Table 4c EUROMOD base datasets used for 2003 baseline, where different, and new base datasets under construction

Country	Base Dataset	Date of collection	Reference time period for incomes
Belgium	Panel Survey on Belgian Households	2001	2000
Germany	German Socio-Economic Panel	2002	2001
Greece	Household Budget Survey	1998/9	1998/9
France	Budget de Famille	2000/1	1999/2000
Ireland	Living in Ireland Survey	2000	2000
Austria	First wave of Austrian SILC	2003	2002

3.3.1.3 Policy years (III)

Throughout we consider policies as they existed on June 30th of the relevant policy year. It is necessary to specify a precise date because the timing within the year of regular uprating and other adjustments to tax-transfer systems varies across countries. Table 5 shows the policy years that are available, by country. Updating to cover 2003 policies remains underway in a selection of countries. In all countries, both the original 1998 and the 2001 policy years have been significantly improved as the model has been used for more applications. Errors have been corrected and clarity improved. In fact, the effort devoted to improving internal clarity and in comparable treatment across countries will significantly reduce the effort and special skills required for implementing new policy years in the future. See section 3.3.4.5 for more discussion of this. Nevertheless updating policy rules, and their validation will always remain a significant task at times when major or complex reforms are implemented.

At the time of writing the 2001 policy year is coded, working, validated and in use for all EU15 countries. The 2003 policy year is coded and working and has been used for the following countries: Austria, Belgium, Finland, Germany, Greece, Luxembourg, the Netherlands, Portugal, Spain and the UK.[55] However, model estimates are always subject to revision as each use of EUROMOD can reveal problems at the level of detail or identify new ways of refining the calculations.

3.3.1.4 Policy and other changes, user defined assumptions (IV)

EUROMOD has been designed to maximise comparability across countries through several mechanisms including offering the user a very wide range of choice over assumptions and definitions. Typically, national models "hard wire" national assumptions about such things as the definition of a child. This inhibits comparable analysis across models (countries) and is the main justification for the original decision to construct EUROMOD as a model with comparability as its main purpose (Callan and Sutherland 1997). As well as changes to policy parameters EUROMOD can be used to explore the implications of changes in household characteristics or original income. Several of the studies described in part 3.2 of this report make use of this facility. Among the other new options that have been developed are:

[55] In many cases independent information on 2003 incomes is not yet available to validate 2003 outputs.

Table 5: State of play with EUROMOD updating

	1998	2001	2003 (1)	available datasets (3)	new datasets
Austria	ready	ready	ready	1998+1999(1998)	planned 1st wave of SILC for Austria
Belgium	ready	ready	ready	1997(1996), 1999(1998)	2001 (2000) in progress
Denmark	ready	ready (2)	not planned	1995(1994)	none planned
Finland	ready	ready	ready	1998, 2001(4)	none planned
France	ready	validation in progress waiting for new data	not planned	1994/5(1993/4) (5)	2000/1(1999/00) planned
Germany	ready	ready	ready	1998(1997), 2001(2000), 2002(2001)	none planned
Greece	ready	ready	coded	1995(1994)	1998/9 (HBS) in progress
Ireland	ready	final validation in progress	planned	1994	2000 planned
Italy	ready	ready	not planned	1996(1995)	none planned
Luxembourg	ready	ready	coded	1999(1998), 2001(2000)	none planned
Netherlands	ready	ready	ready	1996(1995), 2000(1999)	none planned
Portugal	ready	ready	ready	1996(1995), 2001(2000)	none planned
Spain	ready	ready	ready	1996(1995), 2000(1999)	none planned
Sweden	ready	ready	partially coded	1997 (5), 2001	none planned
UK	ready	ready	ready	1995/6, 2000/1	none planned

(1) for 2003 "ready" does not necessarily mean fully validated or documented; "coded" means "ready" except for updating factors

(2) validation based on hypothetical households only

(3) where income is from one year earlier this year is given in brackets

(4) also 1996 and 1997

(5) data have been updated to 1998 prior to implementing in the EUROMOD database (so updating factors=1 for 1998 system)

- Euro-conversion and ability to produce output in Euro or national currency (in principle automatic updating or converting of monetary parameters is possible).
- Modules which exclude units from database based on user-specified criteria (to facilitate examining the effect of changes in household composition on household income).
- Provision of standardised "income lists" for well-used income concepts (such as original income, disposable income, all benefits, simulated benefits, all taxes, simulated taxes, employee and employer contributions).
- Summary output modules for redistribution statistics (e.g. Kakwani index and its components)
- Improved updating facilities, allowing for coherent updating of income variables with sub-components
- Making baseline outputs available with each EUROMOD version so that users can check they can replicate standard results

3.3.1.5 Simulated income (V)

The basic output from EUROMOD is household disposable income and the micro-level change in the value of this as a result of changes to any of the determinants of direct personal taxes including contributions or cash transfers: for example, policy rules, levels of original income, household composition.

3.3.1.6 Summary statistics (VI)

Analysts using EUROMOD have the option of inputting the EUROMOD output micro-database into their chosen statistical software package or using the special-purpose summary output routines that have been developed for use with EUROMOD. These permit an ever-growing number of summary statistics to be generated, based on a wide range of user-defined assumptions.

It is, of course, not possible to demonstrate on paper the range of combinations of possibilities, either in terms of output statistics or indicators, or in terms of the definition of simulated incomes from which they are derived. As some indication, Table 6 shows calculations of selected social indicators using Eurostat-recommended assumptions, for 1998, 2001 and where possible, 2003. Discussion of these estimates in comparison with other sources is provided on the next chapter, 3.3.2.

Note that the estimates in each shade of grey are based on databases from different periods, for the same country. Thus comparisons over time between estimates shaded in the same way use a common database and show the direct effects of policy changes on incomes. Comparisons between 1998 estimates that are shaded and later estimates that are shaded differently take some account of changes in the population and their interaction with policy changes, as well as the policy changes themselves. They may not capture all the changes in population over the period between the estimates, and the use of different databases may introduce differences due to quality differentials in the underlying data, and will introduce a greater degree of sampling error.

One can, for example, deduce from Table 6 that policy changes between 1998 and 2003 in Austria, and between 2001 and 2003 in the UK has the effect of reducing poverty rates among children by 2 percentage points (in the UK) and 4 points (in Austria, over the longer period). Whether child poverty rates actually fall to this or a greater or lesser extent also depends on changes in the national populations over the periods.

Table 6: Social indicators using the EUROMOD baseline 1998, 2001, 2003

1998	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
Persons living in households with disposable income < 60% median	11	10	10	20	18	13	21	21	12	10	11	22	9	6	20
Children (<16) living in households with disposable income < 60% median	8	5	10	17	21	15	26	26	17	12	12	23	6	4	30
Elderly (65+) living in households with disposable income < 60% median	27	28	15	35	17	14	28	18	9	7	18	40	14	5	23
Persons living in households with disposable income < 40% median	3	2	3	10	7	2	2	8	1	2	2	6	1	3	2
Persons living in households with disposable income < 50% median	6	4	6	14	12	6	11	13	4	4	4	14	3	4	10
Persons living in households with disposable income < 70% median	18	19	19	28	26	23	31	29	21	21	18	29	18	11	29
Relative median at-risk-of-poverty gap	20	11	18	32	25	14	18	24	11	11	12	23	12	32	16
Gini coefficient	25	23	25	34	33	29	32	35	26	25	23	36	25	27	31
Quintile share ratio	2.9	2.4	3.4	5.6	5.9	4.4	4.3	6.5	4.2	3.4	3.4	5.6	2.5	2.7	4.9
2001															
Persons living in households with disposable income < 60% median	11	10	12	20	19	16	22	21	10	12	10	22	11	10	17
Children (<16) living in households with disposable income < 60% median	9	6	15	17	25	19	26	26	15	13	11	29	10	9	21
Elderly (65+) living in households with disposable income < 60% median	27	24	16	31	23	16	31	19	7	13	19	33	17	13	21
Persons living in households with disposable income < 40% median	3	2	3	9	6	2	2	8	0	2	2	5	1	3	2
Persons living in households with disposable income < 50% median	6	4	6	13	11	7	10	13	4	4	4	14	5	5	8
Persons living in households with disposable income < 70% median	18	18	21	27	26	24	30	29	18	22	18	29	20	18	27
Relative median at-risk-of-poverty gap	20	11	17	29	24	15	16	25	11	12	12	23	14	17	16
Gini coefficient	25	23	25	33	31	29	32	35	24	25	23	36	27	24	31
Quintile share ratio	2.9	2.3	3.3	5.3	4.7	4.7	4.6	6.3	4.1	3.5	3.2	6.4	2.8	2.6	4.7
2003															
Persons living in households with disposable income < 60% median	10		13	20	19				9	12	9	22	13		16
Children (<16) living in households with disposable income < 60% median	7		15	17	25				14	13	9	28	11		19
Elderly (65+) living in households with disposable income < 60% median	28		16	30	24				3	13	19	35	19		19
Persons living in households with disposable income < 40% median	3		3	8	6				0	2	1	4	2		2
Persons living in households with disposable income < 50% median	6		6	13	12				3	5	3	12	6		7
Persons living in households with disposable income < 70% median	17		21	26	26				18	21	17	29	21		26
Relative median at-risk-of-poverty gap	22		16	27	24				8	12	11	18	15		15
Gini coefficient	25		27	32	31				24	25	22	36	27		31
Quintile share ratio	3.1		3.6	5.1	4.7				4.1	3.5	3.1	6.2	2.9		4.5

Source: EUROMOD using version 30A

Within countries, estimates shaded in the same way are based on the same datasets.

3.3.2 A quality assessment

EUROMOD baseline output statistics on income, inequality and poverty can be compared with other sources of corresponding information. The main aims of such an exercise are (a) to provide background information about the quality and comparability of EUROMOD baseline results, to aid the interpretation of results from applications of the model and (b) to highlight aspects of the model that may require further development in order to improve quality and comparability in the future. Two studies were carried out. The first focuses on the baseline for 1998 and makes comparisons with a series of national sources of statistics as well as with statistics from the European Community Household Panel (ECHP). It also provides an extensive discussion of the practical difficulties in making such comparisons.[56] The second study carries out some similar comparisons for 2001 and also examines whether the EUROMOD estimates of *changes* between 1998 and 2001 correspond to those shown by other statistics.

In summarising these studies, this chapter of the report first outlines the likely reasons for differences between EUROMOD results and other estimates. The second and third parts compare EUROMOD estimates for 1998 and 2001 respectively with the statistics published by Eurostat, based on incomes from the closest available points in time. For the 1998 comparisons these data are from the European Community Household Panel (ECHP) collected in 1999, with incomes from 1998. The comparisons for 2001 use ECHP data collected in 2001, using 2000 incomes from the final wave, representing the best source for comparison across EU15 until data from the EU-SILC becomes available.[57] The fourth part of the chapter considers changes between 1998 and 2001. Finally, we draw some conclusions about the quality of EUROMOD results and consider the factors that must be borne in mind when carrying out simulations of changes (i.e. using results that depart from the baseline).

3.3.2.1 Making comparisons

The EUROMOD "baseline" is the micro-level distribution of household incomes that is output from EUROMOD for the policy year in question (1998 or 2001 in this instance). It makes use of simulated values for taxes and benefits combined with information taken from the original data on market incomes and household characteristics. In comparisons with ECHP statistics the definition of Household Disposable Income (HDI) that is used is the same as (or as close as possible to) that used by Eurostat. In calculating summary statistics incomes are equivalised using the modified OECD scale,[58] and households are weighted by their size, unless otherwise stated.

There are, however, a number of reasons why we might expect EUROMOD estimates to differ from the statistics with which we compare them. Here we simply list those which have particular relevance to comparisons with the statistics provided by Eurostat based on the 1999 ECHP (Dennis and Guio, 2003) and the 2001 ECHP (Dennis and Guio, 2004).

Source of data
EUROMOD is based on ECHP in five countries and on cross-sections from related national panels in a further five countries. The remaining five countries use data from entirely different

[56] Mantovani D. and H. Sutherland, 2003, "Social Indicators and other Income Statistics using the EUROMOD Baseline: a Comparison with Eurostat and National Statistics", EUROMOD Working Paper No. EM1/03.
[57] Mantovani and Sutherland (2003) also make comparisons with national data sources.
[58] This assumes single person=1; additional people aged 14+ = 0.5; additional people aged under 14 = 0.3.

sources. See Table 4a for details of currently used EUROMOD datasets for the 2001 baseline and Table 4b for the data used for 1998, where these are different. On the other hand, in 2001 Eurostat statistics are based on ECHP data for only 13 out of 15 countries. In the case of Denmark the Law Model Database is used (whereas Denmark is one of the countries for which EUROMOD does make use of ECHP) and in the case of Sweden the Income Distribution Survey (HEK) is used, the same source as EUROMOD. In 1998 the "ECHP" statistics also use a national data source for Sweden (the Level of Living Survey (ULF)), since no ECHP survey data were collected for that country.

Point in time

The 2001 EUROMOD baseline refers to mid-2001 prices and incomes. The output statistics are derived from input data that were collected in different years for different countries (the earliest being 1993 incomes for France and the most recent 2001 incomes for Finland). With the exception of Finland the income data have been updated from the data year to 2001 using a range of appropriate indexes. But this process can only be approximate. Furthermore, the composition of the samples has not been adjusted in any way for demographic or labour market changes. These may have been considerable over the period 1993-2001. Thus while 2001 would be the most appropriate comparison data year, it must be recognised that compositional changes may to some extent contribute to differences between the estimates. (Similar issues apply to the 1998 baseline.)

In addition, for the 2001 comparisons, the 2001 ECHP estimates refer to one year earlier than we would wish. They measure the effect of 2000 policies on 2000 incomes whereas EUROMOD measures the effect of 2001 policies on simulated estimates of 2001 incomes. To the extent that policy changes were introduced in 2001 affecting incomes this one-year discrepancy introduces a further source of difference.[59]

Unit of income aggregation

With one exception all the ECHP and EUROMOD statistics refer to incomes of whole households, where the definition of household is similar if not identical in all cases: people living together in one dwelling and sharing some domestic arrangements. In the case of Sweden the EUROMOD database for the 1998 estimates does not enable this definition to be used. The traditional Swedish unit of analysis is the narrow family unit: single people or couples and any children aged under 18. Older children or other people living within the same household are treated as separate units in the analysis. Clearly, inclusion of these units is likely to increase poverty rates in the 18-25 age group since many of them will be students on low or zero income. More generally, the use of the narrower unit will result in higher poverty rates for some groups, particularly those more likely to be financially dependent on other household members, such as the young and the old. The effect on the overall relative poverty rate cannot be anticipated a priori, but it is likely that inequality will be higher when using the narrower unit.[60]

[59] For example, significant increases in the generosity of social assistance for the elderly were introduced in the UK in April 2001. These particularly affected incomes in the region of the 60% median cut-off. We might therefore expect risk of poverty estimates for UK elderly to be lower in EUROMOD than in the ECHP for 2001 for the UK.

[60] The database used for 2001 estimates takes advantage of the Swedish Statistical Office's recent development of data organised around the standard European household definition.

Simulation
EUROMOD calculates tax liabilities and benefit entitlements. For many reasons we would not expect recorded amounts to be the same as simulated amounts. There are two particularly important issues:

1. The treatment of taxes is very different. ECHP simply collects post-tax income variables (in most cases). In EUROMOD we impute gross incomes - using a variety of methods - and then simulate taxes based on these imputations. See Sutherland (2001). In some cases there might be a few inconsistencies between the process adopted to impute gross incomes and the programming of the tax-benefit system. Both procedures are to some extent approximate.

2. Modelling benefit take-up and tax evasion (as well as some legitimate tax reliefs) is difficult. Generally speaking, EUROMOD will over-estimate both benefits and taxes because of lack of information that allows us to mimic exactly the processes of benefit claiming and tax declaration. For this reason in some countries for some uses of EUROMOD we tie social assistance entitlement to recorded receipt in the data. The results shown in the tables below do not do this, unless explicitly mentioned.

Reference time period
Irish and UK EUROMOD results are effectively measured over a shorter time period than in other countries, or in ECHP statistics. We would expect this to cause larger measured inequality in these two countries, although *a priori* the direction of the effect on the poverty rate (the proportion with incomes below 60% of the median) is not obvious.

Sampling error
Finally, it is worth emphasising that even accounting for the factors discussed above, we should not expect EUROMOD results to be identical to those from other sources. There is no certain benchmark against which to make comparisons; no platinum bar against which to calibrate our scales. As well as the reasons for difference that are set out above, all the statistics that we cite below are subject to sampling error to some degree. If we had drawn a different ECHP sample then the comparisons that follow would look different. A very conservative estimate for the confidence interval around most of the poverty estimates reported here would be +/- 1 percentage point, and this would be larger for sub-groups (see Mantovani and Sutherland, 2003). The magnitude of differences between poverty rate estimates from EUROMOD and other sources should be compared with the +/- 2 percentage points that might arise when comparing rates calculated from any two samples of typical size from the same population.

3.2.2.2 Comparing estimates of social indicators from ECHP with those from the EUROMOD baseline for 1998

Table 7 provides comparisons of some selected social indicators calculated from both sources using 1998 incomes.[61] The first panel of the table shows the headline social indicator: the population headcount of people living in households with equivalised disposable incomes below 60% of the national medians. In most countries the statistic is within one percentage point from the two sources. In two countries (Belgium and Italy) the EUROMOD estimate is higher than the estimate taken from ECHP, but the difference is only 2 percentage points. In two countries (France and Finland) the EUROMOD estimate is lower: by 3 percentage points in the case of France and by 2 points in Finland. The explanation for the Italian and French

[61] Note that this table gives estimates for 1998 from an earlier version of EUROMOD than those shown in Tables 5 and 9.

difference may be the fact that entirely different samples are being compared. Generally, the similarities for this headline statistic are reassuring. However, these may be coincidental: the Swedish estimates are close but we know that a different unit of income aggregation is in use in the two sources; estimates for Ireland and the UK are close but we know that a different reference time period is used. The picture may be different for statistics that capture other characteristics of the income distributions. Table 7 also shows comparisons for:

- The proportions of populations living in households with less than 40%, 50% and 70% of median incomes;
- The proportions of children (aged under 16) and the elderly (aged 65 and over) living in households with less than 60% of median incomes;
- The median poverty gap;
- Two measures of income inequality: the Gini coefficient and the quantile share ratio.

Figure 3.11 summarises the main differences in a selection of poverty headcount indicators from the two sources (not all indicators are shown in Table 7), classifying difference in terms of ranges of the absolute percentage point difference.

Figure 3.11: Percentage point differences in estimates of the poverty headcount indicator (<60% of the median): comparisons between ECHP and EUROMOD, 1998 incomes

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
All															
Males															
Females															
Age 0-15															
Age 16-24															
Age 65+															

Range of difference in poverty rate

< 2
2-3
4-9
10+

We draw the following conclusions:

1. Large and consistent differences across indicators seem to be confined to countries where the data source used by EUROMOD is entirely distinct from the ECHP. This is particularly clear in France and Italy although it is not necessarily the case: the results for the UK are generally quite close, in spite of the use of distinct and different datasets. In cases where EUROMOD uses versions of the ECHP as the database (Austria, Denmark, Greece, Spain and Portugal), results tend to be close.

Table 7: Social indicators using the 1998 EUROMOD baseline, compared with ECHP 1998 incomes

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
	All with household disposable income **< 60% of the median**														
EUROMOD 1998	15	11	10	20	18	12	18	20	12	10	11	22	9	8	20
ECHP 1998 incomes	13	11	11	21	19	15	18	18	13	11	12	21	11	9	19
Difference	*2*	*0*	*-1*	*-1*	*-1*	*-3*	*0*	*2*	*-1*	*-1*	*-1*	*1*	*-2*	*-1*	*1*
	All with household disposable income **< 40% of the median**														
EUROMOD 1998	3	2	2	11	7	1	1	7	1	2	2	8	1	4	2
ECHP 1998 incomes	3	2	3	9	7	4	4	7	2	3	4	7	2	3	7
Difference	*0*	*0*	*-1*	*2*	*0*	*-3*	*-3*	*0*	*-1*	*-1*	*-2*	*1*	*-1*	*1*	*-5*
	All with household disposable income **< 50% of the median**														
EUROMOD 1998	7	4	5	15	11	5	9	13	4	4	4	15	3	6	10
ECHP 1998 incomes	7	6	6	14	13	8	11	12	6	6	6	13	5	5	11
Difference	*0*	*-2*	*-1*	*1*	*-2*	*-3*	*-2*	*1*	*-2*	*-2*	*-2*	*2*	*-2*	*1*	*-1*
	All with household disposable income **< 70% of the median**														
EUROMOD 1998	23	20	18	27	26	22	30	28	21	21	19	29	18	14	29
ECHP 1998 incomes	22	18	17	28	26	24	28	26	22	18	20	28	19	17	27
Difference	*1*	*2*	*1*	*-1*	*0*	*-2*	*2*	*2*	*-1*	*3*	*-1*	*1*	*-1*	*-3*	*2*
	Age 0-15 with household disposable income < 60% of the median														
EUROMOD 1998	15	6	8	16	21	13	26	25	17	12	13	23	4	5	30
ECHP 1998 incomes	12	6	13	17	25	17	21	22	19	14	14	26	7	10	29
Difference	*3*	*0*	*-5*	*-1*	*-4*	*-4*	*5*	*3*	*-2*	*-2*	*-1*	*-3*	*-3*	*-5*	*1*
	Age 65+ with household disposable income < 60% of the median														
EUROMOD 1998	21	28	14	34	17	12	17	18	9	7	17	39	18	6	23
ECHP 1998 incomes	22	31	11	33	16	19	34	14	8	7	24	33	17	8	21
Difference	*-1*	*-3*	*3*	*1*	*1*	*-7*	*-17*	*4*	*1*	*0*	*-7*	*6*	*1*	*-2*	*2*
	Relative median at-risk-of-**poverty gap**														
EUROMOD 1998	14	11	17	36	24	13	17	24	11	11	12	24	10	35	16
ECHP 1998 incomes	18	18	20	28	27	18	21	27	15	19	18	23	16	19	22
Difference	*-4*	*-7*	*-3*	*8*	*-3*	*-5*	*-4*	*-3*	*-4*	*-8*	*-6*	*1*	*-6*	*16*	*-6*
	Gini coefficient														
EUROMOD 1998	25	24	25	33	32	28	33	34	26	25	24	36	23	26	31
ECHP 1998 incomes	29	23	25	34	33	29	32	30	27	26	26	36	25	23	32
Difference	*-4*	*1*	*0*	*-1*	*-1*	*-1*	*1*	*4*	*-1*	*-1*	*-2*	*0*	*-2*	*3*	*-1*
	Quintile share ratio														
EUROMOD 1998	3.2	2.4	3.4	5.9	5.8	4.2	4.8	6.0	4.2	3.4	3.4	5.8	2.3	2.8	5.0
ECHP 1998 incomes	4.2	3.2	3.6	6.2	5.7	4.4	4.9	4.9	3.9	3.7	3.7	6.4	3.4	3.2	5.2
Difference	*-1.0*	*-0.8*	*-0.2*	*-0.3*	*0.1*	*-0.2*	*-0.1*	*1.1*	*0.3*	*-0.3*	*-0.3*	*-0.6*	*-1.1*	*-0.4*	*-0.2*

ECHP data from Dennis and Guio (2003). EUROMOD baseline results from Mantovani and Sutherland (2003). Swedish estimates tie benefit eligibility to receipt in the data.

2. Measures sensitive to very low incomes – such as proportions of populations below 40% and 50% of the median, and the poverty gap - may differ in countries where benefits subject to non-take-up are prevalent. The simulation method currently assumes full take-up and hence under-estimates the numbers on very low incomes even if the estimates at 60% median are close. This is apparent for Ireland and the UK, and may also apply in other cases. Nearly everyone is in principle entitled to some form of minimum income in these two countries, meaning that the numbers simulated to have very low incomes (below the minimum level) are small. In reality however, take-up is a problem and this is reflected in differences at low levels of poverty threshold. The problem is less obvious at the 60% or 70% level because (under the assumptions, equivalence scale, etc. used here) means-tested benefit levels are not sufficient to lift many above the 60% median poverty threshold. Entitled people are poor whether or not they are recipients.

3. However, take-up is not always the reason for ECHP poverty rates to be lower than those of EUROMOD. In the case of Spain, the quality of the ECHP data in 1999 on child benefits is known to be poor (as reported in Dennis and Guio, 2003): simulations of benefit receipt in EUROMOD produce results that are closer to administrative statistics. Similar explanations may apply elsewhere.

4. We would generally expect income inequality to be somewhat lower using simulated incomes compared with incomes measured in surveys (due to the former not accounting for tax evasion as well as benefit take-up). While this is generally the case for both measures of inequality shown, it is not universally so. In Italy EUROMOD shows higher inequality using both measures; the Gini is higher (by 3 percentage points) in Sweden. The Swedish difference can be explained by a difference in the unit of income aggregation. The EUROMOD estimates use the narrow family as the unit, whereas the Eurostat figures use the wider household. The Gini coefficient is larger by about 3 points using the narrower unit in a Swedish national comparison using a common dataset for 1999. (See Manovani and Sutherland, 2003.)

5. While differences in headline indicator estimates may be small, this may conceal differences in estimates for sub-populations that cancel each other out. One of the main discrepancies in the UK statistics is in the 16-24 age group where poverty rates are higher in EUROMOD than in the ECHP. The use of the previous year's annual income for students in the ECHP statistics, as against current income in the EUROMOD database is a likely contribution to the explanation for this. For most of the population two other factors seem to balance out: (i) take-up has the effect of increasing measured poverty in ECHP compared with EUROMOD and (ii) the use of annual income (in ECHP) which we would expect to result in *lower* inequality (and hence relative poverty) compared with income measured over a shorter reference period (as in the UK EUROMOD database). The specific effect on students – increasing their income in ECHP relative to EUROMOD – results in the noticeable age group discrepancy.

6. The main source of discrepancy in the Swedish estimates is the age group 16-24. In EUROMOD the 1998 estimate is 11 percentage points higher (31% compared with 20%) than that of Eurostat. Again, the explanation lies in the different unit of income aggregation that is used in the two sets of statistics. The EUROMOD estimates for Sweden use the non-standard narrow family as the unit, treating people aged 18+ as their own unit. Many of these young people will in fact be dependent on their parents but will

appear in the statistics with low income. This is the probable explanation for the very high EUROMOD estimate for the poverty gap in Sweden.

7. Poverty headcounts may be particularly sensitive to concentrations of people near the poverty line, hence causing in large differences in headcount due to small differences in data or method. For Ireland the poverty rate for older people in EUROMOD is much lower (17%) than that of Eurostat (34%). The explanation for this lies in the concentration of pensioners on the same level of pension incomes near the poverty line. In some sources and on some definitions the large group of pensioners counts as poor; in other cases, with a slightly lower line, they are above it and do not count as poor. Such effects may also help explain other differences between statistics based on EUROMOD and ECHP.

3.2.2.3 Comparing estimates of social indicators from ECHP with those from the EUROMOD baseline for 2001

Table 8 and Figure 3.12 show corresponding information for the 2001 baseline.[62] In this case it is important to remember that the ECHP income data refer to one year earlier (2000).[63] This may help explain why differences in the headline indicator diverge a little more for the 2001 baseline than for the 1998 baseline.

Figure 3.12: Percentage point differences in estimates of the poverty headcount indicator (<60% of the median): comparisons between ECHP (2000) and EUROMOD (2001)

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
All															
Males															
Females															
Age 0-15															
Age 16-24															
Age 65+															

Range of difference in poverty rate

< 2
2-3
4-9
10+

[62] Lietz C. and H. Sutherland, 2005, "Social Indicators and other Income Statistics using EUROMOD: an assessment of the 2001 baseline and changes 1998-2001" EUROMOD Working Paper, forthcoming

[63] In addition Eurostat estimates for Sweden and Denmark are not derived from ECHP itself but from national sources of income distribution data.

Table 8: Social indicators using the 2001 EUROMOD baseline, compared with ECHP 2000 incomes

	B	DK	D	EL	E	F	IRL	I	L	NL	A	P	FIN	S	UK
	All with household disposable income **< 60% of the median**														
EUROMOD 2001	11	10	12	20	19	16	22	21	10	12	10	22	11	10	17
ECHP 2000 incomes	13	10	11	20	19	15	21	19	12	11	12	20	11	9	17
Difference	*-2*	*0*	*1*	*0*	*0*	*1*	*1*	*2*	*-2*	*1*	*-2*	*2*	*0*	*1*	*0*
	All with household disposable income **< 40% of the median**														
EUROMOD 2001	3	2	3	9	6	2	2	8	0	2	2	5	1	3	2
ECHP 2000 incomes	2	2	3	8	7	4	5	8	3	4	3	6	2	2	5
Difference	*1*	*0*	*0*	*1*	*-1*	*-2*	*-3*	*0*	*-3*	*-2*	*-1*	*-1*	*-1*	*1*	*-3*
	All with household disposable income **< 50% of the median**														
EUROMOD 2001	6	4	6	13	11	7	10	13	4	4	4	14	5	5	8
ECHP 2000 incomes	6	4	6	14	13	9	15	13	6	6	6	13	6	5	11
Difference	*0*	*0*	*0*	*-1*	*-2*	*-2*	*-5*	*0*	*-2*	*-2*	*-2*	*1*	*-1*	*0*	*-3*
	All with household disposable income **< 70% of the median**														
EUROMOD 2001	18	18	21	27	26	24	30	29	18	22	18	29	20	18	27
ECHP 2000 incomes	21	19	19	28	27	23	29	27	21	19	19	28	20	17	26
Difference	*-3*	*-1*	*2*	*-1*	*-1*	*1*	*1*	*2*	*-3*	*3*	*-1*	*1*	*0*	*1*	*1*
	Age 0-15 with household disposable income < 60% of the median														
EUROMOD 2001	9	6	15	17	25	19	26	26	15	13	11	29	10	9	21
ECHP 2000 incomes	12	7	14	18	26	18	26	25	18	16	13	27	6	7	24
Difference	*-3*	*-1*	*1*	*-1*	*-1*	*1*	*0*	*1*	*-3*	*-3*	*-2*	*2*	*4*	*2*	*-3*
	Age 65+ with household disposable income < 60% of the median														
EUROMOD 2001	27	24	16	31	23	16	31	19	7	13	19	33	17	13	21
ECHP 2000 incomes	26	24	12	33	22	19	44	17	7	4	24	30	23	16	24
Difference	*1*	*0*	*4*	*-2*	*1*	*-3*	*-13*	*2*	*0*	*9*	*-5*	*3*	*-6*	*-3*	*-3*
	Relative median at-risk-of-**poverty gap**														
EUROMOD 2001	20	11	17	29	24	15	16	25	11	12	12	23	14	17	16
ECHP 2000 incomes	15	13	19	28	24	19	24	28	17	20	19	22	17	17	23
Difference	*5*	*-2*	*-2*	*1*	*0*	*-4*	*-8*	*-3*	*-6*	*-8*	*-7*	*1*	*-3*	*0*	*-7*
	Gini coefficient														
EUROMOD 2001	25	23	25	33	31	29	32	35	24	25	23	36	27	24	31
ECHP 2000 incomes	28	22	25	33	33	27	29	29	27	26	24	37	24	24	31
Difference	*-3*	*1*	*0*	*0*	*-2*	*2*	*3*	*6*	*-3*	*-1*	*-1*	*-1*	*3*	*0*	*0*
	Quintile share ratio														
EUROMOD 2001	2.9	2.3	3.3	5.3	4.7	4.7	4.6	6.3	4.1	3.5	3.2	6.4	2.8	2.6	4.7
ECHP 2000 incomes	4.0	3.0	3.6	5.7	5.5	4.0	4.5	4.8	3.8	3.8	3.5	6.5	3.5	3.4	4.9
Difference	*-1.1*	*-0.7*	*-0.3*	*-0.4*	*-0.8*	*0.7*	*0.1*	*1.5*	*0.3*	*-0.3*	*-0.3*	*-0.1*	*-0.7*	*-0.8*	*-0.2*

ECHP data from Dennis and Guio (2004). Estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey EUROMOD baseline results from Lietz and Sutherland (2005) using EUROMOD version 30A

The main difference in the EUROMOD estimates, in terms of how comparisons are made, is that the Swedish estimates use the same household definition as the rest of the EU15 countries, and the same household as used in the Eurostat statistics (which are in fact, derived from the same source as the EUROMOD database). This is reflected in much closer results for Sweden in the 2001 comparisons.

Generally, the picture is similar to that shown for the 1998 baseline. The following additional points can be noted:

1. Larger differences in the age breakdowns for **Finland** emerge in the 2001 comparison. Generally these are not cause for concern because the data used by EUROMOD for Finland are more detailed and are more likely to be accurate than the ECHP. Comparisons of EUROMOD results with national data and with the Finish national model are reassuring. See Viitamäki (2004) for more information.

2. The discrepancy in child poverty rates in **Spain** observed for 1998 no longer applies in the 2001 comparison. The most likely explanation is that ECHP information on benefits for children has been improved.

3.2.2.4 Changes 1998-2001

Changes in the value of income-based social indicators calculated using ECHP data are made use of in monitoring changes in social inclusion. Changes in indicators using EUROMOD can be used in the same way, although it should first be made clear exactly what elements of income are changing. One type of calculation is analogous to those provided by ECHP and involves not only the policy rules changing between the two points in time (say 1998 and 2001), but also the population characteristics and the distribution of pre- tax and transfer income following those in the population, as captured by the survey data. The second type of calculation focuses only on the effect of policy changes, keeping the population characteristics (and hence the underlying database) constant. (The value of original incomes in the database is adjusted to reflect average actual changes over the period, by source.) This type of calculation focuses attention on the changes in the indicators that may be directly attributed to changes in policy. We should not expect changes in the value of indicators calculated on this basis to match the change in value calculated from two waves of ECHP data. Policy changes are one component of changes in income. Other components, and their interactions with policy parameters, would need to be accounted for if the full change between periods of time is to be captured.

Table 9 shows changes for two groups of countries. The EUROMOD estimates in the first group of eight are calculated using two different databases, a later one for the 2001 estimates than the 1998 estimates. This group of calculations take some account of changing population characteristics 1998-2001. However, in no case except Finland do the two datasets refer to 1998 and 2001 incomes, and typically the data are two or three years out of date. In spite of updating procedures one would not expect an exact match with the ECHP-based estimates of change. (In the case of Finland, the original datasets are in any case different.)

The second set of seven countries use a common database for the 1998 and 2001 estimates. In each case original incomes are updated to the policy year and the policy rules for that year are applied. The effect is an estimate of what would have happened if policy changes were made in an unchanging world.

Table 9 focuses on just four indicators: proportions of populations below 60% and 50% of the national median income, the Gini coefficient and the quintile share ratio. In many cases the comparisons of the changes in indicators among the countries in the left-hand side of the chart show the movement in the EUROMOD indicator to be similar to that using the ECHP (over a shorter period). Exceptions include Finland, the Netherlands and the UK where the ECHP estimates of poverty rates are stable using 60% median for the first two countries, and using 50% of the median for the UK. EUROMOD indicates that corresponding poverty rates are increasing in Finland and the Netherlands and falling in the UK. In each case the discrepancy in the change is two percentage points, which is not large, especially given the fact that the ECHP estimates in fact cover a two- rather than three-year period. Similar discrepancies occur in Germany for the Gini coefficient and Spain for the quintile share ratio, with EUROMOD estimating an increase in inequality in the former case and a reduction in the latter (ECHP estimates again suggesting stability). Some quite large changes are evident for Sweden but in this case these are driven by the change in EUROMOD unit of analysis between the years.

The comparisons shown on the right-hand side of Table 9 are difficult to interpret since on the one hand the EUROMOD estimates only show the "policy effect". On the other hand, we have seen that modest discrepancies between EUROMOD and ECHP estimates that are otherwise broadly comparable are to be expected. So it is not possible to interpret with any certainty the discrepancies in this part of the table as *measuring* the policy effect. At the same time it is quite possible that the reduction of one percentage point in the Irish population below 50% of the median that EUROMOD suggests would have occurred due to policy changes alone has been offset by other changes in the population, increasing the overall (ECHP-estimated) poverty rate from 11% to 15%. Indeed if the policy changes had not happened the ECHP overall estimate might have been larger.

3.3.2.5 The baseline and policy simulation

Comparisons of EUROMOD estimates with ECHP statistics may be seen as particularly useful because the harmonised definitions and assumptions provide a common framework which can be replicated in EUROMOD. At the same time, ECHP is known to be problematic in specific respects and is not always the main national reference point. So comparisons with other sources are necessary but sometimes involve the introduction of conflicting evidence. It is then difficult to assess the weight we should give to the outcome of such comparisons as against those that appear to be made on a consistent basis (Mantovani and Sutherland, 2003). So, for brevity we have focussed in this summary on ECHP comparisons. However, we can conclude that statistics summarising the EUROMOD baseline are broadly in line with what might be expected from other evidence; and therefore that the baseline provides an adequate starting point for policy simulation experiments.

As we have seen, headline indicator statistics may compare well; but this may mask many underlying differences. The potential explanations for difference in estimates were discussed in section 3.3.2.1. Only a very laborious exercise could establish with any certainty which explanations are relevant for each discrepancy in the comparison of statistics. Generally a combination of factors is the cause and it is usually not entirely clear that one estimate is "right" and the other "wrong".

Table 9: Change in selected social indicators using EUROMOD (1998-2001) and Eurostat statistics (1998-2000 incomes)

	Two different EUROMOD databases								Common EUROMOD database						
	D	**E**	**L**	**NL**	**P**	**FIN**	**S**	**UK**	**B**	**DK**	**EL**	**F**	**IRL**	**I**	**A**
% with household disposable income < 60% of the median															
EUROMOD 1998	10	18	12	10	22	9	6	20	11	10	20	13	21	21	11
EUROMOD 2001	12	19	10	12	22	11	10	17	11	10	20	16	22	21	10
Change	1	1	-1	2	0	2	4	-3	0	-1	0	3	1	0	0
ECHP 1998 incomes	11	19	13	11	21	11	9	19	13	11	21	15	18	18	12
ECHP 2000 incomes	11	19	12	11	20	11	9	17	13	10	20	15	21	19	12
Change (ECHP)	0	0	-1	0	-1	0	0	-2	0	-1	-1	0	3	1	0
Difference in change	1	1	0	2	1	2	4	-1	0	0	1	3	-2	-1	0
% with household disposable income < 50% of the median															
EUROMOD 1998	6	12	4	4	14	3	4	10	6	4	14	6	11	13	4
EUROMOD 2001	7	11	4	5	15	5	5	8	6	4	13	7	10	13	4
Change(EUROMOD)	0	0	0	1	1	1	1	-2	0	0	-1	2	-1	0	0
ECHP 1998 incomes	6	13	6	6	13	5	5	11	7	6	14	8	11	12	6
ECHP 2000 incomes	6	13	6	6	13	6	5	11	6	4	14	9	15	13	6
Change (ECHP)	0	0	0	0	0	1	0	0	-1	-2	0	1	4	1	0
Difference in change	0	0	0	1	1	0	1	-2	1	2	-1	1	-5	-1	0
Gini coefficient															
EUROMOD 1998	25	33	26	25	36	25	27	31	25	23	34	29	32	35	23
EUROMOD 2001	29	31	24	25	36	27	24	31	25	23	33	29	32	35	23
Change	4	-2	-2	0	1	2	3	0	0	0	-1	0	-1	0	0
ECHP 1998 incomes	25	33	27	26	36	25	23	32	29	23	34	29	32	30	26
ECHP 2000 incomes	25	33	27	26	37	24	24	31	28	22	33	27	29	29	24
Change (ECHP)	0	0	0	0	1	-1	1	-1	-1	-1	-1	-2	-3	-1	-2
Difference in change	4	-2	-2	0	0	3	2	1	1	1	0	2	2	1	2
Quintile share ratio															
EUROMOD 1998	3.4	5.9	4.2	3.4	5.6	2.5	2.7	4.9	2.9	2.4	5.6	4.4	4.3	6.5	3.4
EUROMOD 2001	3.0	4.7	4.1	3.5	6.4	2.8	2.6	4.7	2.9	2.3	5.3	4.7	4.6	6.3	3.2
Change(EUROMOD)	-0.4	-1.3	-0.1	0.1	0.8	0.2	0.1	-0.2	0.0	0.1	-0.3	0.2	0.3	-0.2	-0.2
ECHP 1998 incomes	3.6	5.7	3.9	3.7	6.4	3.4	3.2	5.2	4.2	3.2	6.2	4.4	4.9	4.9	3.7
ECHP 2000 incomes	3.6	5.5	3.8	3.8	6.5	3.5	3.4	4.9	4.0	3.0	5.7	4.0	4.5	4.8	3.5
Change (ECHP)	0	-0.2	-0.1	0.1	0.1	0.1	0.2	-0.3	-0.2	-0.2	-0.5	-0.4	-0.4	-0.1	-0.2
Difference in change	-0.4	-1.1	0	0	0.7	0.1	-0.1	0.1	0.2	0.2	0.2	0.6	0.7	-0.1	0

1. ECHP data from Dennis and Guio (2003) and Dennis and Guio (2004) 2000 estimates for Denmark are from the Law Model Database and for Sweden from the Income Distribution Survey
2. EUROMOD 2001 estimates are calculated using EUROMOD version 28A. Swedish estimates tie benefit eligibility to receipt in the data.

Some comparisons allow us to focus on particular aspects. At one extreme we can compare EUROMOD results with those for the same policy year from national policy simulation models based on the same data. This does not test the accuracy of EUROMOD estimates in relation to what actually happens in the country, but generally national model results have already been validated against national statistics and administrative information. This type of comparison has been done for Spain, Ireland and the UK (Mantovani and Sutherland, 2003). In principle it should be possible to get exactly the same results. In practice discrepancies are explained by differences in assumption, level of detail or coverage of simulated income components.

Another example of a comparison that limits the possible sources of difference is where we can compare simulated 1998 incomes with 1998 incomes drawn directly from the same dataset. This is done for Austria and Luxembourg in the 1998 comparisons above and highlights differences between simulated incomes and those drawn directly from the database. Tax evasion and benefit non-take-up will give rise to differences, as will any other feature of tax payment or benefit receipt that cannot be fully captured in simulations using the available data.

When the comparison is made with data drawn from a different source then many other factors may introduce discrepancy, in addition to those mentioned above. Such comparisons are more stringent tests of the accuracy of EUROMOD results. However, at the same time, differences in estimates do not necessarily imply that the quality of EUROMOD results is poor. First, there may be deficiencies in the non-EUROMOD data source (as is the case for the early waves of the ECHP data for Spain) which may be known or unknown. Secondly, if data are taken from an earlier period they may not provide a good basis of comparison – actual changes in the characteristics of the population may be driving differences in statistics.

EUROMOD is intended as a tool for measuring the distributional effects and costs of changes to tax and benefit systems. The baseline is only the starting point and it is important that the model can also capture accurately the effects of changes. On the one hand it is possible that defects in the baseline will be netted out when looking at the effects of changes. On the other hand accurate policy simulations depend on variables that do not necessarily contribute directly to the baseline.

The main challenge to validating the policy simulation capacity of EUROMOD is that there are typically no sources of information on the distributional effects of policy changes with which to compare. The exception is where we have access to national tax-benefit models. A second problem is that some of the social indicator statistics considered here may be very sensitive to certain types of small change. We have seen this in the case of Ireland where, for example, a small increase in pension income may either have a very large or rather small effect on pensioner poverty, depending on the position of the poverty line in relation to pre-reform pension incomes. EUROMOD Country Reports provide detailed comparisons and discussion where these are possible.[64]

In the absence of national model results from policy simulations with which to compare, the main tools are (a) the comparison of aggregate expenditures and revenue (as well as number of recipients or taxpayers) under the baseline systems and (b) the change in these numbers following actual policy changes. Comparisons of the type (a) have been carried out for some countries and are documented in EUROMOD Country Reports. However, it should be clear

[64] See Annex 1.

that they are not always straightforward and that inherent differences between administrative statistics and survey based simulations need to be taken into account. Key issues include differences in reference time period and the treatment of the non-household and non-resident populations.

3.3.3 Special technical issues

In this chapter we consider three special technical issues which have emerged as key areas for development, were anticipated in the work programme, and which have been addressed to some extent or another. These are:

Re-weighting as a technique to update databases

Accounting for benefit take-up

Improving internal model design and coherence

3.3.3.1 Re-weighting as a technique to update databases

Having the facility to use data from the recent past – rather than the immediate past - as a database for EUROMOD is important for two reasons. Firstly, database construction is a time-consuming and costly business which must be done on a country-specific basis making use of national expertise. If, between periodic updates, "old" data can be used satisfactorily then this reduces the cost and effort involved in maintaining EUROMOD through time. The second reason is that data are not always available for scientific use in a timely fashion. Indeed, with the demise of the ECHP and, at the time of writing, uncertainty about the content and access arrangements for its successor at the EU level, EU-SILC, it is not clear whether suitable data will be available for some countries in the near future. Relying on techniques to update "old" data may become a necessity rather than a choice. These issues are discussed again in chapter 4. Here, we summarise a case study that was carried out as part of WP3.[65]

A study was carried out to consider methods for "ageing" micro-data used as input for tax-benefit microsimulation models. This points out that the scope, purpose and quality of such "ageing" techniques depend on a number of factors that are very specific to the research task at hand. As a result, it can be difficult to discuss the different methods in a systematic way and there have been few attempts to do so. Addressing this gap, a conceptual framework for thinking about different types of data adjustments is presented and then the mechanics of data ageing are illustrated in a case study using EUROMOD in conjunction with detailed Finnish household micro-data from two periods (1996 and 1998). The case-study evaluates the performance of one particular ageing technique by comparing results from the 1998 dataset with those derived from aged 1996 data. The main conclusions are as follows.

- There is no "one-size-fits-all" ageing technique. When aligning existing data to information from a different period, one needs to have a clear idea about the types of changes one would like to capture. For instance, controlling for changes in aggregate group sizes cannot generally be expected to improve the match for distributional patterns. Ageing techniques also should not be applied mechanically over different

[65] Immervoll, H, K Lindström, E Mustonen, M Riihelä and H Viitamäki, 2005, "Static data "ageing" techniques. Accounting for population changes in tax-benefit microsimulation models", EUROMOD Working Paper No. EM7/05.

time-periods since structural changes in the population or the tax-benefit system will to a large extent determine whether a given set of alignments is appropriate or not.

- When using the aged dataset as an input for tax-benefit microsimulation models, it is essential that the choice of reference values used in the calibration process reflect the population characteristics underlying the mechanics of tax-benefit rules. The precision of simulated tax-benefit amounts will, for instance, rest on a good representation of those age-groups, family circumstances and employment situations that play a crucial role in determining tax burdens and benefit entitlements.

- When implementing ageing techniques in practice, a large number of data and definitional issues need to be addressed. Obviously, the external reference values used as calibration controls need to be conceptually similar to the variables recorded in the micro-data. On a more technical level, one needs to distinguish between changes group sizes and changes in the characteristics of a group as different calibration methods (adjusting the statistical weights versus adjusting recorded variable values) will be appropriate in each case.

3.3.3.2 Accounting for benefit take-up

One technical problem encountered in simulating receipt of social assistance benefits is the fact that they are often subject to non-take-up. Assuming that all those calculated to be entitled do in fact receive the benefits over-estimates their cost and under-estimates measures of poverty. This is of particular importance in comparative perspective since social assistance is an important component of some social protection systems but only a minor part of others. Also, while evidence is sparse, it is reasonable to expect that some social assistance systems achieve higher levels of take-up than others. The process that leads to a successful claim will vary across systems and the factors that influence take-up behaviour, as well as the characteristics of entitled potential claimants, are also not common across countries. It is therefore most unlikely that a uniform approach to the problem would result in comparable estimates. A first step towards being able to incorporate non-take-up in EUROMOD simulations has been made. Some empirical experiments are underway using Finnish data in order to assess the feasibility of accounting for non-take-up and of modelling take-up explicitly. The choice of Finnish data was made because it is largely drawn from registers and is therefore subject to less of the measurement error that often complicates studies of take-up. Nevertheless it has become clear that a "one-size-fits-all" approach is not adequate to the task and could potentially be misleading. The problem requires an in-depth study which takes account of differences as well as similarities across countries. We return to this in part 4.

3.3.3.3. Improving internal model design and coherence

EUROMOD is innovative in providing an infrastructure that covers 15 different tax-benefit systems, societies and economies in a consistent and integrated manner. Though model building has been based on extensive experience – by making use of a methodology, already in use in many individual countries and national expertise – as a multi-country microsimulation model it is unique. Consequently its construction had to resort to "learning by doing" without prior or parallel experience to build or draw on. In the process the various lessons that have been learned have led to numerous design improvements within the MICRESA project, which enhance coherence and facilitate the work of the model builders and maintainers as wells as for (other) users. Two sets of activities can be summarised under the headings "transparency and comprehensibility" and "standardisation".

Transparency and comprehensibility

During the original development and test application phase many new features (for example parameters describing policy reform scenarios) were added to the model in an "ad hoc" manner, i.e. they were integrated into the basic model regardless of whether they solely served to answer an immediate research question alone, or if they could be foreseen as useful for other applications. This approach was appropriate at the time but had two main drawbacks: firstly the model became increasingly opaque and secondly updating to new policy years was complicated, as it was unclear if and how those additions should be handled. In the longer term it was seen as essential to improve transparency in the existing model and find ways of developing it so that different people could work on the model at different times. As a first step to overcome the problem a cleaning process was carried out: unnecessary or un-used additions were removed while some features which promised to be of further use were saved separately. The remaining core model is now much easier to maintain and to comprehend, especially for less experienced users. Currently, however it is rather time-consuming to make use of the "out-sourced" features. Therefore it is planned to develop an "add-on" mechanism for "plugging them in" as required.

A second ongoing activity is increasing the scale of "parameterising" the model or – to put it simply – avoiding the need for "hard-coding" wherever reasonable. A lot has been achieved during MICRESA in making procedures going on inside the model visible and changeable via parameters, resulting in significant improvement in the ease of using and maintaining EUROMOD. This process is continuing.

A third ongoing activity, the developing of "common modules", is a pre-requisite to make "parameterising" work efficiently. Policy instruments (taxes, benefits) are implemented in EUROMOD using building blocks, known as modules – technically they are functions written in C++ which can be operated via parameters.[66] There are two types of module: *country specific* and *common* modules. The purpose of common modules is to provide a general structure which can be seen as using a standardised language to describe policy instruments (or their sub-components). Two examples of common modules are a general benefit calculator and a module which determines eligibility for benefits or liability for taxes. A crucial point in developing this standardised language is to identify common "elements" of tax-benefit systems and to find the right compromise in grouping elements showing similarities together in one common module, but also recognising when elements are different enough to be handled separately. This identification process requires considerable experience of which a lot has been gained during MICRESA, resulting in the improvement of existing common modules, the development of new ones, the replacement of country specific modules as far as possible and many ideas for further developments in this context.

The fact that the development of EUROMOD is an ongoing task leads to many program versions as well as versions of micro data that have to be administered. Many improvements of the rudimentary "version management" have been made, including a more efficient numbering of model and databases versions, the creation and maintenance of a "change log", providing descriptions of changes from one model version to another and the setting up of rules for what is termed as "merging": the procedure by which the model developers integrate their changes into the core model in a coherent way.

[66] See Immervoll and O'Donoghue (2001) for an explanation of EUROMOD terminology.

Standardisation

Standardisation of model components and documentation aids the production of results that are comparable across countries (or helps identify sources of non-comparability). One important step has been an attempt to improve the documentation of the large EUROMOD database, consisting of several waves of micro data for the 15 countries. Originally the documentation was in paper format, meaning that there are numerous documents describing the data, which are – though based on a common template – not necessarily consistent across countries or dataset. One important step to unify and simplify the database documentation has been to provide an electronic template making use of Microsoft Excel. Several data descriptions are already converted to this new format.

Other efforts have aimed to standardise further income concepts (like what is summarised under the headings "original income", "disposable income", "benefits", "taxes" or "social insurance contributions") and model output (as a default with each model run two standardised micro outputs, a "small" and an "extended", are produced).

In addition, several code enhancements have helped to considerably improve model performance. A model run now takes about half the time it did at the beginning of MICRESA (using the same hardware and operating system).

3.3.4. Using EUROMOD and EUROMOD estimates

EUROMOD is an enormously powerful tool for the analysis of the effects of public policies and policy reform. The MICRESA project has revealed the many ways in which it could potentially be used but which are, as yet, untapped. EUROMOD has involved a very large effort by large numbers of people to build it and to develop it into a useable social science research resource. It therefore makes sense for it to be as widely accessible as possible. It was one of the MICRESA objectives to make sure that all those participants in the project who wished to could become fluent users of the model. While access outside of the consortium was not a stated aim, it is to be hoped that what has been learned within the project team can usefully inform activities which promote and facilitate wider access in the future.

"Access" has many dimensions and "use" has several meanings. The issues, activities and achievements are discussed under the following headings:

The complexity of using EUROMOD

Training through "learning-by-doing" workshops

EUROMOD user documentation

EUROMOD statistics available on the web

Future developments: the possibilities for remote access

How to access EUROMOD now

3.3.4.1 The complexity of using EUROMOD

EUROMOD's scope and flexibility, together with its coverage of 15 national populations and sets of institutional rules, make it inherently complex to use. EUROMOD has been built with comparability in mind. Use of national tax-benefit models for comparative purposes has been shown to be highly problematic: national model design and options reflect national priorities,

interests and conventions.[67] EUROMOD has reduced these difficulties by maximising flexibility in many dimensions, including allowing the user to specify:

- the income base for each tax and benefit (or sub-component),
- the unit of assessment or entitlement for each tax and benefit, and the unit of analysis,
- the effective equivalence scales inherent in social benefit payments,
- the definition of the output income measure,
- the currency

as well as the more standard choices including:

- the default (starting) tax-benefit system,
- the rules related to benefit entitlement and tax liability,
- thresholds and amounts of benefit and tax concession

This approach allows each national system to be modelled in a manner that is comparable to existing national practice or in a way that is comparable across countries. It also provides the model user with a much greater range of choice and greater flexibility than is customarily available in national models or – we believe – in any other existing tax benefit model.

Making national tax-benefit models user-friendly is a relatively straightforward task. Some of the existing national models in the EU have sophisticated and well-designed user-interfaces that guide both expert and novice users through the options and choices they must make.[68] Even in these cases, however, the user is offered a *selection* of possible options. The choices are limited to the ones that the model developers anticipate that users will require. To some extent, flexibility is sacrificed to facilitate user-friendliness. This has been proved appropriate in the context of one country and one tax-benefit system. However, a model that aims to cover 15 (or more) tax-benefit systems and make use of a variety of national datasets is problematic to make accessible in this way. This is for a number of related reasons:

- Users need to understand each national system and the options for changing them: typically their knowledge is of one system (their own).
- Users also need to understand how to make comparable changes across several or all countries.
- Flexibility must be maintained if national differences are to be captured.
- Reducing flexibility reduces the number of ways in which EUROMOD can be used.
- Simplification is not itself straightforward in a cross-national context.

[67] Examples include the "hard wiring" of the definition of a child, a tax unit and the reference time period. See Callan and Sutherland (1997).

[68] See, for example, the Spanish national model, EspaSim (available at: http://selene.uab.es/espasim) and the Irish national model, SWITCH (Callan et al, 1996).

The long run objective is to achieve *both* user-friendliness *and* flexibility. Within MICRESA we have concentrated on maintaining flexibility while developing training and documentation to support prospective users, improving the internal coherence of the model to help the developers help the users, providing a rudimentary and limited user interface to help users through some common initial steps, and providing detailed summary statistics from the EUROMOD baselines for users who want simple statistics, avoiding having to learn the model at all.

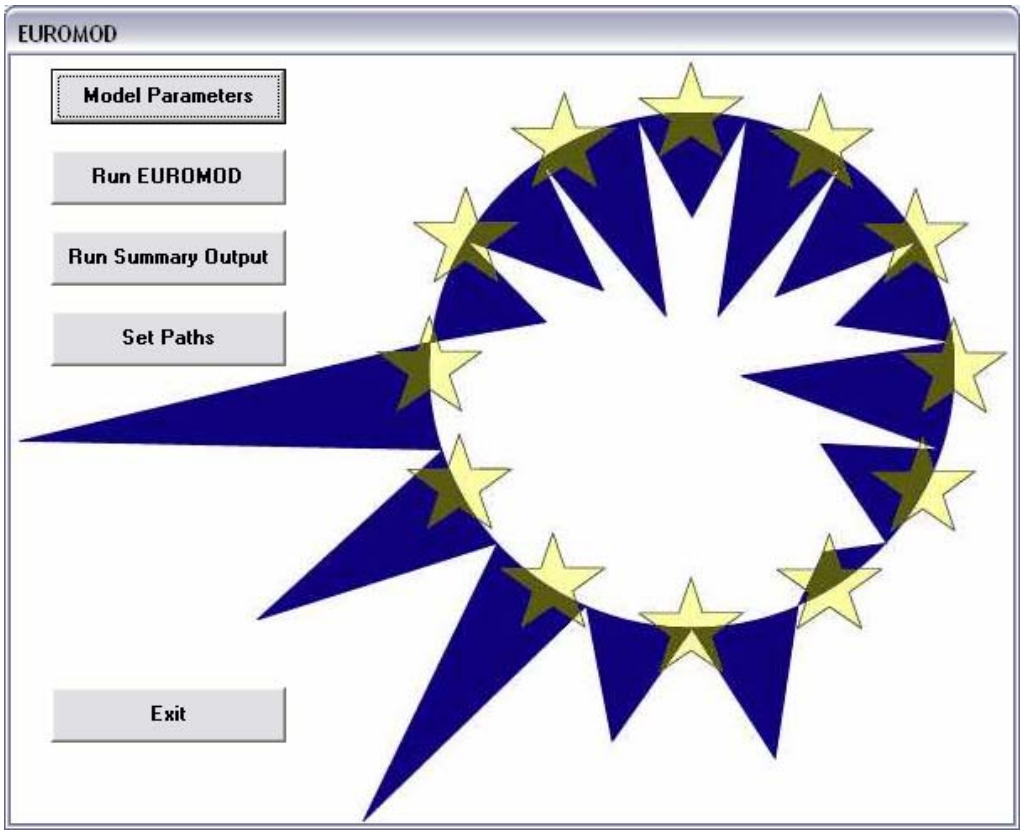
While complex, using EUROMOD does not require any special programming or IT skills. The user only needs to know how to use Microsoft Excel since all the parameter files, which control the operation of the model, are presented to the user for modification in spreadsheet form. Advanced knowledge of Excel makes using EUROMOD quicker. While the model itself is written in C/C++ and the data are held in Microsoft Access, there is no need to use this software for most applications. Indeed, knowledge of C/C++ is itself not sufficient to understand the structure of the model.

3.3.4.2 Training through "learning-by-doing" workshops

Three workshops were held in the first half of each of the three project years. Each of the national teams attended one workshop per year which lasted for 2-4 days. Participant teams were grouped together according to their fields of interest and the workpackages in which they were involved. All the workshops were lead by the co-ordinator and her team. Annex 8 provides a list of dates, locations, topics and participants. The workshops had several functions as well as training (including opportunities to discuss strategic and technical issues in smaller groups; opportunities to discuss bilaterally specific national problems with model development and use; discussion of workpackage topics). The training function took several forms. In the first set of workshops a structured series of training exercises were devised. After introductory lectures and demonstrations, this involved participants in hands-on exercises which had been designed to introduce them to using the model. Where possible these were devised to focus on aspects of the model that were likely to be of interest to the participant group, and to the substance of the workpackages in which they were engaged.

By the second phase of workshops in the second year some participants had become fluent in using EUROMOD and others needed a refresher course in the basics. Open ended exercises were provided and participants worked at their own speed, with the support of the co-ordinator's team and practiced participants. The third phase of workshops focused more on bilateral discussions of issues related to national model components and workpackage tasks.

Experience at the first set of three workshops led the co-ordinator's team to devote some modest resources to providing short cuts for the model user, which helps them to minimise the number of errors made. This is done using Excel as an integral part of the process of setting up parameter files. Whilst falling far short of a full-blown user-friendly interface (which was beyond the scope of this project) the intention is to aid model use by non-novice users. The way the interface looks is illustrated below.



3.3.4.3 EUROMOD user documentation

User documentation takes the following forms.

- EUROMOD user manuals
- Country Reports
- EUROMOD working papers

EUROMOD user manuals
In the course of running the workshops and diffusing the capacity to use EUROMOD among the project consortium many documents have been written. These comprise user guides to aspects of the model, overviews of how the model works, documentation of components of the model and training materials (such as instructions for hands-on training exercises). These have been assembled together and are made available as an indexed package of documents, downloadable from the EUROMOD web site. This is not quite the same as a stand-alone comprehensive training manual, which was the planned deliverable. This is for a number of distinct reasons based on experience:

- Prospective users have a variety of training needs. For example, fluent EUROMOD users make use of high level skills in Excel for the efficient manipulation of parameter sheets. Some users start with this skill and some do not. The MICRESA group could not offer training in Excel.

- EUROMOD is still being developed and is being made easier to use both for novices and for expert users. Thus any manual would quickly become out of date. Given limited resources an *ad hoc* approach is more efficient.

- In the course of thinking about the design, form and content of a manual it became clear that this requires professional skills (and corresponding resources) that we do not have. Again, an *ad hoc* approach based on learning-by-doing seems most appropriate.

- Furthermore, we have found it more efficient – for both users and mantainers of the model - to devise ways of automating the updating of documentation and of embedding documentation within the model itself. While falling short of a professional "help system" (for the same reasons as given above), the model does itself generate documentation about some of its components ("common modules"). In addition, descriptions of some of the commonly-used parameters are automatically generated as part of the parameter files (as seen by the user) and these files also contain a large amount of country specific description and information which supplement what is provided in Country Reports.

The package contains:

1. Index to EUROMOD Training Manuals

Basic Manuals

2. Downloading and Installing EUROMOD
   Explains how to download the model from the Internet and how to install it.

3. EUROMOD Operational Guide
   Describes how to carry out baseline simulations with EUROMOD and how to make changes to the parameter files so that reform simulations can be carried out.

4. Producing Output in EUROMOD
   Explains how to produce micro-output in EUROMOD, describes the EUROMOD "Summary Output" program and provides the information needed to use it for analysing micro-data such as that generated by EUROMOD.

Manuals for advanced users

5. EUROMOD Module User Guide, Part 1: EUROMOD Common Modules
   Describes how to use EUROMOD "common modules". EUROMOD common modules are building blocks with the purpose of providing a general structure which can be seen as using a standardised language to describe policy instruments of their sub-components.

6. EUROMOD Module User Guide, Part 2: Computing Benefits in EUROMOD
   Describes the two most important common modules: a module for determining whether a pre-defined unit (household, family, individual …) is entitled to receive a benefit or obligated to pay a tax, and a module calculating effective "equivalence scales" involved in calculating entitlement/liability, based on characteristics of assessment units.

How-To-Use-EUROMOD examples

7. Simulating Policy Reforms with EUROMOD
   Provides an example of a EUROMOD application, by giving detailed instructions on how to simulate a simple minimum income scheme.

8. Simulating Policy Reforms with EUROMOD User Interface
   An extension to the previous manual, introducing the prototype EUROMOD user interface by describing how the minimum income scheme can be implemented using the user interface.

Manuals on EUROMOD extended applications

9. Validation of EUROMOD Calculations using Hypothetical Household Data
   Describes how to produce 'budget constraint' graphs based on micro output produced by EUROMOD using a hypothetical dataset that varies certain important household characteristics (in particular original income).

10. Computing Effective Tax Rates and Replacement Rates
    Explains how to use EUROMOD to calculate average and marginal effective tax rates as well as replacement rates.

Country Reports

Country Reports are available for each country and are an invaluable source of information about the national tax-benefit system, the way it is simulated, the source of micro-data that is used, adjustments that are made to these data, including imputations, weights and updating. An assessment of the quality of the outputs is given, usually in terms of comparisons of output statistics (aggregates of income sources; social indicators) with independent statistics. In most cases separate Country Reports are available for the 1998 and 2001 (and 2003) baselines; in some cases they are combined into a single report. Country Reports are available on the web (http://www.econ.cam.ac.uk/dae/mu/emodcty.htm) and the new versions produced as part of MICRESA are listed in Annex 1.

EUROMOD Working Papers

Some of the Working Papers provide background information that is helpful in understanding how some EUROMOD features work. These are accessed from the web site (http://www.econ.cam.ac.uk/dae/mu/emod3.htm) and a full list is provided in Annex 5.

3.3.4.4 EUROMOD statistics available on the web

Requests for relatively simple statistics estimated from the baseline, but nevertheless unobtainable elsewhere, led us to provide some selected statistics downloadable from the web site. These are currently available for the 1998 and 2001 baseline and are updated occasionally. See (http://www.econ.cam.ac.uk/dae/mu/emodstats/index.htm). The statistics show the composition of income by decile group of household income in terms of taxes, social contributions and benefits, including public pensions. This information is shown for each country individually and for EU15 as a whole. Also provided are statistics on household composition by income decile, and all statistics are also given for people in households with income below 60% of the equivalised median.

There are 31 pages in each set of statistics, which are provided in pdf format and they are not reproduced here. An example is shown for one country in Annex 6. The tables are sent to users in Excel format, on request. Part 5 describes some of the ways in which these publicly-available statistics have been used.

3.3.4.5 Future developments: the possibilities for remote access

M. M. Grabka

The use of EUROMOD is confronted with 2 typical access problems.

- The first problem is the integrity of the model and the respective results. During the term of the MICRESA project many improvements to EUROMOD have been carried out. It is very likely that the most recent update of EUROMOD is not employed by every user, when EUROMOD is copied on several computers. Centralising the model and allowing remote access could be one solution to this problem.

- The second problem is data security. The whole EUROMOD model is based on various micro-data sets from different countries with varying data access permissions. We must ensure that no unauthorised access is possible. Again centralising the model could be an appropriate solution, allowing more people to have access without compromising data confidentiality.

An alternative to online-access is the controlled use of the model in a centralised "Research Data Centre" (RDCs). Integrity and data-security would also be ensured in such a centre. But the big disadvantages are travel costs and time for the researchers who go to an RDC. Besides these two aspects there will be also technical and legal problems in establishing RDCs across Europe.

The aim of WP9 was therefore to consider how to develop a user friendly remote access solution to run EUROMOD at one central institution.[69]

Such an online-access itself is a fourfold problem:

- First of all it must be feasible in terms of speed of access.

- Secondly an electronic user support must be permanently available.

- Thirdly online access must be safe in the sense of data protection.

- Fourthly unlike with a database, EUROMOD users need to have the possibility to modify the model. The extent to which there is a trade-off between allowing users to modify the model, thus guaranteeing full flexibility, and a limited access to the data needs to be investigated.

One successful example of an online remote access is in particular the Luxembourg Income Study System (LISSY) developed in its current version by Marc Cigrang and John Coder (2003). It is developed under academic direction and can in principle be acquired by purchase in contrast to the other remote access systems. The aim of LISSY is to provide easy remote access to statistical datasets through a simple email.

The processing system automatically accepts these requests, checks them, processes them, and then returns the results via email back to the inquirer. This is a fully automated system

[69] This section summarises Grabka M.M., 2005, "Access solutions for EUROMOD", Mimeo.

capable of running 24 hours a day. It has been programmed in the JAVA programming language. Therefore it can be run on almost any recent operating platform.

LISSY Methodology

- retrieves an email with STATA program from user
- authenticates users electronically (researchers submit a proposal and sign a contract and confidentiality pledge)
- keeps restricted files at the agency
- processes accepted jobs in batch mode
- examines output file for confidentiality and checks for permitted cell size
- returns output by email without allowing micro data retrieval
- provides usage logs for review.

Because LISSY proved to be powerful (LIS receives more than 35,000 programs from about 200 users worldwide per year), DIW Berlin decided to purchase it and installed LISSY in early 2004. The full implementation at DIW Berlin shows that it is possible to set up the LISSY system in a stable manner within three weeks. The following observations are relevant to EUROMOD:

1. Currently the system installed at DIW Berlin supports only STATA programs.
2. Multiple requests are possible, but in the current version only 4 output files can be held simultaneously
3. LISSY is currently able to store micro output on the remote server. However, all output is stored in one single directory only, where all users of LISSY can read the output of the others (this aspect is of interest for EUROMOD when running reform options). Given the stored micro output, users of EUROMOD could run further analyses using typical statistics software like SPSS, SAS, or STATA. However the storage is restricted to a specific timeframe – at present about 30 days – to clean the disk and ensure full service capability.
4. LISSY is not able to deliver output in graphics or in formatted tables, thus, all results are sent as simple text files in an email body
5. LISSY is currently only able to handle requests written in typical software languages such as SPSS, SAS and STATA. It will be necessary to revise the remote access process for EUROMOD because it reads parameters from ASCII files only. The problem is however, how do users produce those ASCII files? Assuming no change to EUROMOD's current structure and wanting to make sure the user applies the most recent version, the first step would have to be the sending of up-to-date parameter files, via LISSY, from the model to the user. Then users could make their policy changes and apply the macro (delivered with parameter files) that converts parameter sheets into appropriate text files. Those text files could then be sent back to make EUROMOD work on them. It may be that this two-way traffic may be better managed with some sort of interface.

6. Problems will arise from the number of parameters and parameters files used in EUROMOD. LISSY is currently only able to handle information in one single email body. LISSY should therefore be enhanced to read and process all parameter files as attachments in the email-request.

7. Another aspect is that often, microsimulation analysts need to see individual cases to understand what is going on in the simulation process. In principle, this is not a technical problem, but a major legal privacy problem. The holder of the EUROMOD system has to guarantee that no unauthorised access is possible and that all conditions of data protection are ensured. Thus the data protection officer of the DIW Berlin allows only limited use, where in principle no re-identification of a respondent is possible.

8. One central problem in using LISSY for EUROMOD is that LISSY is designed for the UNIX operating system, whereas EUROMOD is currently based on Windows operating systems only. The conversion of the windows-based EUROMOD system into a UNIX-based system requires a re-compilation of the core EUROMOD modules.

Conclusion

- Centralising the EUROMOD model will assure integrity of the model and the results respectively.

- Data security can be assured by strict access permissions.

- Costs are an important issue: an independent computer architecture is necessary to run the LISSY system and furthermore a continuous support by the computer staff is needed.

- The expansion of LISSY to include EUROMOD appears feasible, but problems will arise from the complex model structure, the different software language and the different operating system used by EUROMOD.

3.3.4.6 How to access EUROMOD now

An executable version of the model is available for downloading from our project intranet site. The model code is available on request. Our work is in the public domain in the same way as a scientific paper. We expect any use or re-use of it to be cited and credit given as appropriate. The micro-data on which the model relies are not available in the same way because their use is governed by 12 sets of data access conditions included in contracts agreed with data providers. Prospective users of EUROMOD need to secure their own access permission. Given evidence that permission has been obtained, the customised database for EUROMOD is provided through an appropriate secure route. In some cases this involves using the model in Cambridge. In others the access conditions simply involve registration with the data provider.

3.4 EUROMOD and the European Social Agenda

A.B Atkinson

The relationship between EUROMOD and the developing Social Agenda of the EU in general, and the Social Inclusion process in particular, has provided the policy context for the MICRESA project and has shaped many of its activities. This relationship, and the possible forms it could take, has been discussed in three papers.[70] The importance of investment in social science research infrastructure, and in a forward thinking approach to this has been emphasised. This applies not only to EUROMOD itself but also to the data on which modelling for five countries depends, the European Community Household Panel.

The Social Inclusion process has so far involved the submission of National Action Plans (NAP)/inclusion by the 15 MS in 2001 and then again in 2003 (In 2004, the ten new Member States submitted their first NAPs.) The European Commission co-ordinates the production of the Joint Inclusion Report (European Commission, 2002 and 2003). The NAP follow a format laid down by the Social Protection Committee. Each of them contains an analysis of the national situation. All countries describe the recent evolution of poverty and social exclusion in qualitative terms, and in some cases this is supplemented by quantitative series covering a number of years.

A key element in linking the different parts of the NAP and the process as a whole is the set of social indicators agreed by Heads of State and Government at the Laeken European Council in December 2001. These indicators were the result of work by the Sub-Group on Social Indicators established by the Social Protection Committee (European Commission, 2001; see also Atkinson et al, 2002). The indicators encompass financial poverty, income inequality, regional variation in employment rates, long-term unemployment, joblessness, low educational qualifications, low life expectancy and poor health. In each case there are breakdowns, showing for example poverty among men and women, or breakdowns by age groups. The social indicators are used to measure progress towards achieving the objectives of the Social Inclusion process. They are concerned with outcomes, and not with the methods by which the outcome is achieved. This reflects the fact that policies to achieve social inclusion are the responsibility of Member States, under the subsidiarity principle. The objectives of policy have been agreed, but Member States are free to choose the methods by which these objectives are realised.

The Joint Reports contain values of these indicators in the Statistical Annexes. The data are drawn from the Labour Force Survey for the employment-related indicators and the European Community Household Panel (ECHP), referred to above, for the income-related indicators, health and other indicators. The ECHP is to be replaced by the EU Statistics on Income and Living Conditions (EU-SILC), which will become the EU reference source for income and social exclusion statistics.

[70] Atkinson A. B., 2002, "Evaluation of the National Action Plans on Social Inclusion: the Role of EUROMOD", EUROMOD Working Paper No. EM1/02
Atkinson A.B., 2005, "EUROMOD and the development of EU social policy", EUROMOD Working Paper No. EM1/05.
Atkinson A.B. and D Meulders, 2004, "EU Action on Social Inclusion and Gender Mainstreaming", EUROMOD Working Paper EM8/04.
See also Sutherland (2002).

While the adoption of an initial common set of social inclusion indicators represents a major achievement, if the process is to be meaningful and credible, many believe that targets are essential. Targets at the EU level have yet to be agreed but the need for targets at all has been recognized with the Common Outline for the 2003/2005 NAPs/inclusion explaining that national targets are important for several reasons. National targets are 'a significant political statement of purpose'; they provide 'a goal against which to measure progress' (European Commission, 2003, Appendix I). The targets should also promote awareness of social inclusion policies and provide a focus for policy-makers.

The logic of agreeing common indicators in the first place is that Member States should be working towards a situation where targets are framed in terms of those commonly agreed indicators, or are at least systematically linked to some of these (even if the targets themselves are set nationally). This would facilitate mutual learning and exchange of good practices between Member States, which is a key rationale of the open method of co-ordination.

To understand this further, a stronger link needs to be built between the policies described in the NAPs of individual Member States and their contribution to progress as measured by the social indicators. The indicators need to be embedded in the policy process so that one can ask whether announced policies lead to significant improvement in social indicators.

In order to answer this question, one needs to model the implications of the policy for individual households. The capacity to model policy impact exists within Member States; countries have microsimulation models, albeit of varying degrees of development. It would be possible in this context for the Commission to evaluate the NAP by relying on national models. There are however several reasons why a EU-wide model, such as EUROMOD, may be necessary.

The first reason for a EU-wide model is that the open method of coordination is based on peer review and mutual learning. For this purpose a common basis for evaluation seems essential. While the Commission could attempt to specify in great detail the way in which policy should be modelled, if this stops short of full model specification then there will always be the possibility that differences across Member States reflect differences in modelling and not in reality. The experience with the construction of EUROMOD has underlined the enormous scope for variation in assumptions and data handling. We have to recognise that any microsimulation model is a representation, and that there could be a number of different representations corresponding to any set of data. Predictions of the effect of policy changes are conditional on the representation adopted. In some cases these are explicit. For example we may assume 100% take-up of tax credits. In most cases however the assumptions are implicit and their significance is unclear. For this reason, it seems desirable that peer review should be based on results from the same playing field, a playing field that is not necessarily level but where the results for each Member State are affected by the same bumps. (The location of the bumps may, of course, affect some Member States more than others.)

The second reason is that it is important that the model be accessible. The fourth Objective of the Social Inclusion process is "the mobilisation of all relevant actors". The availability of tax benefit models to the general public is in itself a means to assist wider participation in the policy formation process. A EU-wide model at the disposal of the Commission is a vehicle that would allow them to further this key objective.

The third reason is that a EU-wide model facilitates policy learning. The EU Social Inclusion process has led a number of Member States to look critically at their own policies in those

dimensions where they are performing below the EU average. A good example is provided by the study by Callan et al (2004) of "Why is relative income poverty so high in Ireland?" In this study, they consider the implications of introducing a welfare system closer to that of Denmark, a country which has a low relative poverty rate.[71]

The final reason for a EU-wide model is that such a model is a natural step towards considering the impact on the EU as a whole. We need to be able to add up across Member States. At the EU level, EUROMOD can contribute to the analysis of "what works" in terms of policy intervention. Such questions may take several forms.

Policy and indicators

First, we need to know the impact on EU-wide social indicators (e.g. risk of poverty) of changes in policy by individual Member States. Atkinson (2005) illustrates this with the example of the EU deciding to give priority to children living at risk of poverty. Additional financial help could be provided in a variety of ways, and different Member States would make different choices. Tax allowances for children can be increased, or introduced; they can be accompanied by tax credits for those not subject to income tax. Child benefit, a universal cash benefit, is the most direct form of cash transfer. Child credits, income tested, may appear a more targeted mechanism, although such credits in practice suffer from incomplete take-up. Targeting may also be achieved by concentrating increased benefits on families already in receipt of social insurance or social assistance, although this may reduce the incentive to return to work. EUROMOD brings together these changes in policy parameters with the household characteristics. At the most basic level, this allows estimates to be made of the cost of different proposals. The net effect on the government budget depends on the interaction between different elements: for example, an increase in child benefit may be partly offset by reduced social assistance payments. An integrated tax benefit model is necessary to take account of these feedback effects.

As well as the assessment of budgetary cost EUROMOD could be used to calculate the implications for household disposable incomes and hence for the direct calculation of three of the primary indicators agreed at Laeken: (1) proportion below 60% median, (2) ratio of top quintile share to bottom quintile share, and (4) median poverty gap. In order to predict changes in labour market indicators (indicators 5-7) EUROMOD must be linked to assumptions about, or a model of, labour market behavioural change.[72]

Indicators and policy

Secondly, we may need to know what changes in policy are necessary to achieve a specified reduction in different social indicators. Suppose that the Commission had been asked – what measures need to be taken to achieve a halving of the poverty rate for children? Here again EUROMOD is useful in that it allows us to work back from the target to the changes necessary. It allows us to see whether indeed the target is feasible. To this end, Member States free to choose under subsidiarity, decide on the method to provide a minimum level of income for children. Member States could choose to employ different instruments (child benefit, tax credits, benefits in kind, employer-mandated benefits). Using EUROMOD, it would be possible to monitor the extent to which the Member State policies would achieve the desired reduction in risk of poverty. The amount of spending of different types or through alternative

[71] Within the MICRESA project papers that experiment with "swapping" policies across countries include Levy (2003) and Matsaganis et al (2004)
[72] See chapter 3.2.4 of this report

approaches needed to produce a given reduction in poverty in each country could be established. It would give a first-round measure of the policy change necessary to achieve a specified reduction in the risk of child poverty. Behind the aggregate picture lies the detail of tax and benefits systems. The fine structure of policy can be very important in determining its impact. EUROMOD allows users to experiment with changes in the institutional details of transfers and taxes, seeking the most effective combination to achieve the targets in particular country settings. Of particular interest is the "swapping" of benefit and tax systems, so that we can see the impact in country A of applying the system of country B, as discussed above. Again this can be extended to the EU as a whole, using the consistent framework provided by EUROMOD.

4 Conclusions and policy implications.

This chapter of the report describes the state of the art and the contribution of MICRESA in two separate respects. The first relates to the type of policy analysis and the increase in information and understanding that may be provided by comparative microsimulation studies such as MICRESA. Here, we summarise the main findings from MICRESA of relevance to social policy and social policy development in Europe, identify further work to be done and also highlight potentially fruitful areas for new research making use of EUROMOD.

The second aspect is the contribution of an EU-wide collaborative project to build and use a comparative model such as EUROMOD. The second part of this chapter reflects on the process of building the model and obtaining useful results, and considers options for future development based on experience so far and the new research directions identified in the first part of the chapter.

4.1 Implications for the European Social Agenda and social policy development in EU countries.

As described in the previous chapter the relationship between EUROMOD and the developing Social Agenda of the EU in general, and the Social Inclusion process in particular, has provided the policy context for the MICRESA project and has shaped many of its activities. The subject matter that EUROMOD addresses is the impact of social and fiscal policies, and this impact is commonly measured using indicators such as those adopted at Laeken, other complementary measures of outcomes (in terms of poverty or income inequality), or indicators that are informative about the relationship between policies and outcomes, for example those which describe incidence and incentives. These measures can be applied at national level, aggregated to the level of the EU or disaggregated to regional level (see section 3.2.3). They can be applied to existing policies, prospective actual policies or policy ideas under development or designed for illustrative purposes. Policies can be designed to have a particular (first-round) budgetary effect, including budget-neutrality. They can be applied to populations with current characteristics or under changed conditions (such as after inflation, earnings growth or increased employment).

The potential is clearly enormous and the MICRESA project has necessarily been selective in the policy-relevant analysis that has been carried out. Without repeating the detailed descriptions set out earlier in this report, we can highlight the following:

Which policies make a difference?

In assessing the relative redistributive or poverty-reducing effects of national systems it makes a difference what components of the tax and social benefit systems are included in the "system". Including the effect of taxes can be important – through the counting of tax concessions as quasi benefits or through accounting for the taxation of benefits. Whether public pension systems are included as part of the transfer system, and contributions as part of the tax system can have a large impact on conclusions from cross-country comparisons. On the basis that they are included we find that the countries whose transfer and tax systems achieve most in terms of bringing people above the poverty line are those of Luxembourg, Austria and the three Scandinavian countries. The five systems achieving least in this respect are those of the four Southern European countries (Greece, Portugal, Italy and Spain) and

Ireland. There is some relationship between the poverty reduction effect and the achieved poverty rate (countries with low poverty rates based on disposable income tend to be those with high poverty reduction through the net transfer system).

Interestingly it is not the case that countries that rely to a greater extent on means-tested transfer systems (UK and Ireland) achieve the most in terms of poverty reduction or re-distribution. They are often considered as being the most cost-effective types of system in this regard. On the contrary, 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).

Common reforms across countries?

Examination of pension reform scenarios under budgetary constraints in four countries shows that the variations in fiscal and distributive effects of a given reform can be very significant. The very different starting points in terms of inequality among the elderly, the proportion of them below the national poverty lines, and existing social pension arrangements, result in differential effects of the common reform packages. Quite clearly, different paths for reform are necessary in order to achieve common objectives across countries. Such an objective might be to secure minimum pension levels at some common proportion of national average earnings. But the way of financing this guarantee, and the pathway to achieving the desired level of protection would be different across countries.

At the other end of the lifecycle, studies of social transfers to support children in Southern Europe show that while systems of child benefit borrowed from other countries with well-developed protection systems may be effective at reducing child poverty, they are expensive if introduced on a universal basis. This is at least partly because they replace very minimal child-targeted systems that exist at present, particularly in Spain and Greece. Nevertheless, the alternative of means-tested targeted support, while cheaper in the first instance, may have long run negative consequences. Some structures of universal benefits – for example those targeted on young or large families – can be more cost effective than others in terms of child poverty reduction.

Taking account of changes in labour supply following the adoption of systems from other countries (in this case, Making Work Pay policies) indicates another level of underlying conditions that are important to account for in thinking about “transplanting” a policy judged as successful in one country into another. Labour market conditions in one country may make the design of policy from a country with different conditions quite inappropriate or indeed damaging. In Finland, neither poverty reduction nor social inclusion (i.e. a increase in employment) seem achievable through `making work pay' policies, the main problem being very low labour supply elasticities. Policy intervention aimed at enhancing employment may be more successfully brought about through leverage of the demand side by reducing the cost of low-productive work for employers, as is currently being considered by the Finnish authorities (through possible reductions in employer social security contributions for low-wage jobs).

Simulations for France and Germany suggest that increase in the employment rate may be achievable, but public spending per job created is extremely high (from 50,000 to over 130,000 euro). In this respect, targeted measures aiming at increasing labour market

integration of workers with low earning capacity (for example by investing on training and/or reducing fixed costs of labour supply) may well prove more effective in some labour markets.

European Union, Member State or Region?

Imposing common policy arrangements across countries is generally not the most appropriate or effective approach to meeting common objectives. To what extent do, or could, sub-national policies make a positive difference? Firstly, we find that national systems appear particularly efficient in inequality reduction in the poorer regions in a country but the effectiveness is significantly reduced in the richer regions. Since some of the new forms of poverty are particularly associated to "richer" and more urban regions, this calls for further intervention at the level of the regional governments.

Secondly "similar" regions in Europe in terms of economic performance and original income inequality levels achieve quite different degrees of income inequality once the redistributive role of the national tax-benefit system has had an effect. On equity grounds this may provide a reason for further EU intervention in the design of tax-benefit policies.

Households or individuals?

Conventionally, poverty is measured using household income and more generally income is assumed to be shared by household members. A comprehensive attempt to assess poverty at an individual level without assuming full sharing would involve identifying "sharing rules" that account for each spouse's aversion to intra-household inequality, their contribution to household production, the existence of "public" goods and possible behavioural responses in case of household dissolution (including labour supply reactions and alimony obligations) as well as the intervention of the tax-benefit system. As a start we devise a simple sharing rule based on the relative contribution of each household member to total household income. This may be regarded as the lower bound of a more realistic rule that accounts for the issues listed above. The approach not only relies on EUROMOD to determine individual "power" (which is based on a simulated counterfactual), but also to investigate the resulting individual income distributions and poverty rates, as well as the ways in which existing tax-benefit systems affect these distributional outcomes.

It finds that in the four countries considered (Finland, Germany, Italy and the UK) the power indexes calculated for each household member display significant differences across household types and across countries. In particular, there is a significant difference along gender lines, but this difference is not of the same magnitude in all four countries: it is very small in Finland and considerably higher in Italy. Female bargaining power in particular varies according to the employment status of the female spouse and according to the income level of household, but while the power of females in employment is similar across all four countries, it varies significantly when female spouses do not work, suggesting that a crucial role is played by the tax benefit system. In all four countries, but to varying degrees, the tax-benefit system tends to raise the bargaining power of non-working spouses and that of children.

How much do underlying macro conditions matter?

From a tax-benefit angle, many types of macro-level change can be considered 'exogenous', at least in the short term. However, a more comprehensive perspective is often required, particularly in the context of wider social objectives. Different policy areas are not

independent from each other and most macro-level variables are the subject of targeted policy measures aiming, for instance, to further income growth or lower unemployment rates. Understanding how these initiatives may impact, through their effect on tax liabilities and benefit entitlements, on other objectives such as increasing social inclusion is therefore a pre-requisite for improving co-ordination between different policies and devising consistent policy 'packages'.

EUROMOD has been used to examine the sensitivity of poverty in the 15 Member States to (a) an increase in unemployment, (b) real income growth and (c) an increase in earnings inequality. The simulations indicate that poverty rates are indeed vulnerable to such "macro level" changes: the size (but in some cases also the direction) of the effect varies across countries. The main conclusion is that if changes in social inclusion indicators are to be used as generally accepted measures of the outcomes of social policies, then it is important that differences in responsiveness to other pressures are fully understood.

How can changes be monitored meaningfully?

Firstly, the influence of macro-level changes on calculated indicators illustrates the dangers of relying on one particular measure (here relative income poverty) as a single indicator and highlight the importance of maintaining a portfolio which includes

- indicators that relate directly to individual labour market experience (such as unemployment or low wages) as well as household incomes;
- indicators of absolute changes in real income level; and
- indicators calculated for population sub-groups defined by economic status and household composition, as well as by demographic characteristics.

Secondly, if indicators of the risk of relative income poverty are to monitor progress and to assist policy makers in making decisions, then it is important to examine how past policy choices have affected relative income poverty, and develop methods which show how different options for future policy may affect future risks of poverty. It is argued that a "distributionally neutral" benchmark, which can be approximated by indexation of tax and welfare parameters in line with growth in wages, provides a more accurate picture of the distributional impact of policy than methods relying on the assumption that all incomes change with prices.

4.2 Future directions for research

First, there remains considerable scope to carry out a wide range of policy-relevant exercises of the sort that have been conducted as part of MICRESA using the existing version of EUROMOD. A non-exhaustive and illustrative list could include

- An explicit investigation of the nature of intergenerational balance in the tax and social transfer systems – bringing together reform proposals for children and the elderly into one exercise. This would build on the work done in WP2.
- Also following on from WP2:

  - The key equalising role of non-means-tested benefits that has been identified in many systems deserves further investigation, breaking down this category of transfers into those for the unemployed, sick, disabled and those intended for the support of children and considering the net effects of the benefits after tax (where this is charged).
  - An exploration of the (first order) effects of introducing and/or replacing various forms of means tested benefits (such as a Guaranteed Minimum Income) for (near) poor households and the associated taxes or contributions to finance them.
  - An exploration of the (first order) effects on the income distribution of revenue neutral tax reforms increasing direct taxes and decreasing indirect taxes and vice versa.

- An investigation of whether the gender pay gap explains some of the differences in employment rate. What would be the employment rate in the rest of Europe if the pay gap was brought to the level it is in Scandinavian countries? This would involve using a structural model of labour supply, building on the work done in WP5.
- A systematic analysis of the efficiency-equity trade-offs involved in tax and benefit reforms in the European Union taking account of incentives on both the extensive and intensive margins. This would use the framework provided by Immervoll, Kleven et al (2004) which can readily be extended to consider more complex reform proposals as well as updated to incorporate future findings from empirical labour supply research.
- An examination of the role of (assumed) within-household sharing of incomes in protecting certain groups from poverty. For example, to what extent does pension income protect children from living in households below the poverty line? What role do young adults still living at home with their parents play in determining household living standards, and what contribution do tax and benefit systems make in this respect?

There are also many ways in which the capacity of EUROMOD could be extended to enable new forms of analysis and better comparability. These include

- Most obviously, extension of EUROMOD analysis to cover the 10 New Member States and the accession and candidate countries.[73]
- EUROMOD is limited by the data sources it draws on to a narrow definition of cash income. This not only fails to capture some important aspects of policy affecting cash incomes (such as child care subsidies) it introduces distortions in cross-country comparisons because some countries rely more heavily than others on publicly-provided non-cash benefits. More generally, accounting for non-cash incomes – such as income from owner occupation – can provide a better-founded basis for making comparisons (within as well as between countries).
- The issues of how to account for and model non-take-up of benefits and tax evasion remain to be resolved within a cross-national framework.

[73] First steps toward this goal are being taken in the I-CUE project. See section 5.2.

- While access to suitable and up-to-date micro-data remains an unresolved issue in some countries, and until the labour-intensive task of constructing EUROMOD input databases is adequately resourced, developing ways of updating "old" data to represent current populations remains a priority (building on the work done in WP3 in MICRESA). Until the situation with regard to access and suitability of EU-SILC is clear, this is a vital component of a strategy for EUROMOD over the next few years.

- Building on the work done in WP5, finding ways of incorporating the effects of behavioural reactions to policy change, either through econometric estimation or calibration, in a manner that allows analysis that is comparable across countries but at the same time allows for national differences, is of great relevance.

- Developing the capacity to conduct gendered analysis of the impact of policy changes remains an ambition. Work done in WP4 demonstrates the potential.

Some of these ideas present major difficulties at a theoretical or conceptual level, or require data that are not easily available. Many are of general relevance beyond the framework of EUROMOD or microsimulation modelling more generally. Taking this agenda forward involves strengthening existing links and making new links with relevant cutting edge economic and social science research, and offering access to EUROMOD's microsimulation capacity to a wider group of researchers.

4.3 EUROMOD as a European research tool

EUROMOD is an example of European social science infrastructure. Its subject-matter is naturally relevant to Europe as a whole. The fact that national expertise from each Member State is an essential input to maintaining and developing the model means that the EUROMOD enterprise is inherently a European research activity.

One of the achievements of MICRESA has been the continuation of the process of bringing the state of the art up to the level of that existing in some countries, across all 15 countries. This has been done in spite of the activity taking place in very different contexts across countries.

In some cases, EUROMOD stands alongside a corresponding national model, of which the national team has intimate knowledge. These national models have been a valuable resource in constructing EUROMOD, although typically the extent of transformation of the organisation and structure of the modelling has been large and the similarities with the national model are only apparent in comparing results. In these cases the problems to be solved have been those relating to comparability with other countries and departures from national modelling traditions. Countries that fall into this group include Finland, France, Ireland, Italy, Spain, Sweden and UK.[74]

At the other extreme some countries had no tax-benefit modelling tradition before the construction of EUROMOD. During the course of MICRESA in four of these countries the work done with EUROMOD has stimulated national model-building programmes: in Austria, Greece, Luxembourg and Portugal.

[74] It should be clear that EUROMOD is seen as performing a parallel and complementary role to national models, not as trying to substitute for them.

As a multi-country microsimulation model EUROMOD is unique. Since 1997 (and since 2001 within MICRESA) the process of its construction, development and use has been based on "learning by doing" without prior or parallel experience to build or draw on. Unforeseen challenges have been encountered and unanticipated research applications for the model have been identified. Both the challenges and the opportunities have been managed through an informal and co-operative process that has succeeded in balancing the interests of academic inquiry with the demands of establishing a reliable resource. This "balance" has been difficult to sustain with the limited resources available to us and it is quite possible that many members of the consortium feel that the priorities have been too far one way (research) or another (resource). While this tension has helped MICRESA to be enormously productive in both directions, it is difficult to see how this situation can continue for much longer without both parts being properly resourced, particularly if EUROMOD's coverage is to be extended to include the New Member States.

4.4 Future directions for EUROMOD

EUROMOD enables an exceptionally wide range of questions about the impact of social and fiscal policy on the population of the EU to be answered, and allows a large variety of conceptual frameworks and assumptions to be adopted. It has been deliberately constructed to be independent of any single theoretical or disciplinary perspective. This is to ensure that it will be of use in many contexts over a long period of time. It can be seen as a *platform* on which users are able to implement their own chosen approaches.

The human effort and financial resources that have been invested in EUROMOD are considerable. Any researcher wanting to conduct the kind of multi-country empirical social science that it supports will want to use EUROMOD rather than construct some alternative. Therefore not only is it efficient to develop the infrastructure to facilitate wider access, it would also be very wasteful not to do so.

Of course, EUROMOD will need maintenance on a continuous basis if the policy rules are to be kept up-to-date and the underlying database refreshed with recent micro-data. It is clear from the updating work carried out during MICRESA that this will remain a labour intensive task, and one where the size of the task will always be difficult to anticipate. In some instances updating existing policies from one year to the next involves only updating the parameters that describe the tax-benefit system and the factors by which original incomes are updated. In others, where policy reforms involve new structures or a new database is essential, the work can be considerable. Keeping EUROMOD up-to-date involves meeting two vital conditions:

3. **Resources must be found to support the routine updating of EUROMOD if the model is to remain useful and relevant and the initial investment is to pay off.**

4. **Access to suitable micro-data must be available.**

In this context "suitable" means

- Referring to a recent period in time,
- Including all the main variables of relevance,

- Using a sample broadly representative of the household population, large enough so that analysis can be carried out for sub-groups of interest,

- Accessible by scientific researchers beyond the confines of a secure data lab (to allow interaction between the data and the model).

While it is to be hoped that the EU-SILC may be a suitable database for EUROMOD, it is not, at the time of writing, clear that these data will be made available under appropriate conditions at the micro level for all countries covered. This uncertainty around the replacement for ECHP becomes all the more critical at a time when some of the national data sources on which EUROMOD and the MICRESA project have relied are no longer being collected.[75] It may be that EUROMOD has to rely on "old" data (such as the final wave of the ECHP), updated using techniques such as those discussed in section 3.3.3.1 of this report, until new sources of household income data are developed or released for research purposes. This issue of availability of household income micro-data is likely to be a concern shared with many others engaged in comparative and EU-wide economic and social research.

If EUROMOD is to be accessible to the wider social science research community then securing permission for all potential users to access the underlying data through the model is an essential pre-condition.

Extension to cover the 10 New Member States will be explored as part of the I-CUE Design Study. The prospect of a 25- (or 28-) country infrastructure and calculations involving EU25 (or more) raises two speculative questions.

EU25 or fewer?

Analysis which takes account of 25 different national situations is not easy to present or summarise. This is already the case with 15 countries. As with some of the analysis carried out in MICRESA, it may increasingly happen that analysis focuses on a sub-group of countries with common features (as in the paper on child support in Southern Europe, described in section 3.2.2) or a selection of diverse countries (as in the paper on pension reform, described in section 3.2.1). While within MICRESA and the earlier development of EUROMOD it has been seen as essential to include all EU15 in EUROMOD, and for key pieces of analysis to cover all of them, this may not be sustainable in EUROMOD25. If not, then it is likely that some "new" Member States are incorporated in the model and some "old" ones not included in analysis. Those "excluded" (either old or new) are most likely to be those for which good data are not available, or where resources are not available for updating old versions of the model.

An alternative, cost-cutting way of selecting would be according to the size of the country. For example, a version of EUROMOD could represent about 89% of the EU25 population for ***half*** the cost of covering all of it (but would fail to cover the populations of Malta, Luxembourg, Cyprus, Lithuania, Latvia, Estonia, Finland, Austria, Sweden, Denmark, Slovenia, Slovakia or Ireland).[76] There are some instances where this would be a reasonable approach (if, for example, approximate estimates at the level of European Union were what was required) but in general this approach would severely limit the applicability of EUROMOD.

[75] This applies to the panel surveys for the Netherlands and Belgium.
[76] Calculated from population estimates for 2003 from Eurostat (2004; table 1).

Ideally, all 25 countries would be covered and the choice of countries to be analysed would depend on the particular research question. With gaps in essential inputs or in resources in general, this may not be possible.

EU25 or wider?

We might also ask whether countries outside the EU could be included. While not relevant for all types of EUROMOD analysis (such as that for the EU as a whole) comparisons between individual EU countries, or the EU as a whole and other European countries (such as Norway) other developed countries (such as the US, Canada, Israel or Australia) or developing countries with microsimulation modelling capacity (such as South Africa or Brazil) is of considerable international interest.

In these cases the most appropriate way of organising a facility to provide comparable estimates may not be to aim for an integrated model. Since the main aim would be comparability of results rather than integrated results a less ambitious route might be to discuss and agree a set of working assumptions, concepts and methods, with each modeller producing results to an agreed specification. This has been route taken in a project organised by the OECD to compare selected EU countries (mainly using EUROMOD) and with non-EU countries (e.g. with the US). Underlying the specification of assumptions and required results was a common "language" of terms and concepts based on the EUROMOD framework. Earlier attempts at comparing national microsimulation model results did not have the advantage of the common language. This way of working deserves to be explored further.

5. Dissemination and exploitation of results.

The general strategy for the dissemination of results during the project has been to present papers based on project research at academic seminars and conferences and to policy-interested audiences, making use of opportunities as they arose rather than organising project-specific dissemination. Academic presentations have been to national, European and international (worldwide) audiences. Policy presentations have been at the national and EU level. More detail is provided in Annex 2.

One exception was a special seminar jointly organised with DG-Research in September 2004 in Brussels, with the explicit intention of disseminating results to European Commission officials and to other European policy-interested organisations. The programme for this seminar included the following presentations:

A brief introduction to EUROMOD and the MICRESA project
Holly Sutherland, EUROMOD co-ordinator, University of Cambridge

EUROMOD and the development of EU social policy
Sir Tony Atkinson, Nuffield College, University of Oxford

Family assistance and child poverty in Southern Europe
Manos Matsaganis, University of Crete

In-work policies in Europe: killing two birds with one stone?
Olivier Bargain, DELTA, Paris and IZA, Bonn

Assessing the impact of recent tax/transfer policy changes on poverty
Tim Callan, ESRI, Dublin

More highlights from the MICRESA project including pension reform and current pensioners, statistics on distribution, redistribution and work incentives and future plans
Holly Sutherland

All papers making use of EUROMOD are published as EUROMOD Working Papers. These are made available from the EUROMOD web site.
http://www.econ.cam.ac.uk/dae/mu/emod3.htm

New papers are announced through an email list. Bound paper copies are made available on request. A list of these papers produced as part of the MICRESA project, together with other publications is given in Annex 1. A full list of all EUROMOD Working Papers produced to date is given in Annex 5

The web site also provides access to Country Reports
http://www.econ.cam.ac.uk/dae/mu/emodcty.htm

and to EUROMOD statistics on the redistributive properties of tax and benefit systems across EU15
http://www.econ.cam.ac.uk/dae/mu/emodstats/index.htm

5.1 Other parallel uses of EUROMOD, exploiting the developments made within MICRESA

As well as activities under the MICRESA work programme, EUROMOD is being made use of and developed in collaboration with users from outside the MICRESA group of participants. This has enhanced the work done within MICRESA since it can draw on results from these associated studies. All EUROMOD applications are published in due course in the EUROMOD Working Paper series.

Co-operation with the OECD

A project in co-operation with the OECD on the welfare implications of social protection systems is being carried out and is due for completion and publication in 2005. An early publication will be:

- Dang T-T., H. Immervoll, D. Mantovani and K. Orsini, 2005, "Age and economic well-being in OECD countries: Anatomy of incomes, taxes and benefits in the late 1990s", forthcoming, OECD Social, Employment and Migration Working Paper, OECD, Paris.

EUROMOD results have also been used in a paper looking at the "representativeness" of the OECD's typical household calculations:

- Immervoll H., P. Marianna and M. Mira D'Ercole, 2004, "Benefit Coverage Rates and Household Typologies: Scope and Limitations of Tax-Benefit Indicators", OECD Social, Employment and Migration Working Paper No. 20, OECD, Paris.

A project with UNICEF

A project joint with the UNICEF Innocenti Research Centre, part-funded by the UK Nuffield Foundation, on "Tax/Transfer Systems and Strategies to Reduce Child Poverty in the European Union" is in the process of completion in early 2005. The work contributes to the UNICEF Report Card No 6 on 'Child Poverty in Rich Countries, 2005' which was launched around the world on 1st March 2005. An in depth study is published as.

- Corak M., C. Lietz and H. Sutherland, 2005, "The Impact of Tax and Transfer Systems on Children in the European Union", Innocenti Working Paper No. 2005-04. Florence, UNICEF Innocenti Research Centre. http://www.unicef.org/irc [Also published as EUROMOD Working Paper EM4/05]

Other co-operation

Joint work with colleagues from National Bureau of Economic Research (US) and Economic Policy Research Unit (Denmark) on "Welfare Reform in European Countries".

- Immervoll H., H.J. Kleven, C.T. Kreiner and E. Saez, 2004, "Welfare Reform in European Countries: a micro-simulation analysis", EUROMOD Working Paper EM1/04. [Also published as CEPR Discussion Paper No. 4324]

This paper has been presented at:

- A seminar on "Welfare State Reform in Europe", EPRU Network and Danish Welfare Reform Commission, University of Copenhagen, November 2004.

- A workshop on The Welfare State in an Intertemporal Perspective, CRISS - The Network for the Economics of the Welfare State and the J. Monnet Chair in European Macroeconomics at the University of Siena, Italy, September 2004,
- The National University of Ireland, Galway, October, 2004.
- The Economics department at the OECD

A visit by Gerlinde Verbist of the University of Antwerp (UFSIA) to Cambridge (August-November 2003) with support from the Flemish Fund for Scientific Research.. During this time she wrote two papers using EUROMOD.

- Verbist G., 2004, "Redistributive effect and progressivity of taxes. An International Comparison across the EU using EUROMOD", EUROMOD Working Paper EM5/04.
- Verbist G., 2005, "Replacement Incomes and Taxes: A distributional analysis for the EU-15 countries", EUROMOD Working Paper No. EM2/05

Deborah Mabbett of Brunel University, UK has, with assistance from the co-ordinator's team, used the results from the exercise reported in EM3/02 as input into a paper:

- Mabbett D., 2004, "Fiscal Stabilisers in Europe: Estimating the Responsiveness of Tax and Benefit Systems to Macro-Level Changes", EUROMOD Working Paper No. EM7/04

Cathal O'Donoghue (University of Galway) and colleagues are exploring the prospects for using EUROMOD as the basis for labour supply modelling.

- Colombino U. and C. O'Donoghue "Labour Supply Modelling Using EUROMOD", presented to a seminar on *Guaranteed Income: A Fundamental Step in Social Policy in Europe*, Turin December 2, 2004

Uses of the web statistics

By their nature we cannot know about all the uses that have been made of the web statistics (see chapter 3.3.4.4). Two known uses are indicative:

- Morley J., T. Ward and A. Watt, 2004, "The State of Working Europe" http://www.thestateofworkingeurope.org/
- Boeri T. and A. Brandolini, 2005, "The Age of Discontent: Italian Households at the Beginning of the Decade", mimeo.

Other projects by MICRESA national teams

EUROMOD results contributed to an **Irish** study:

- Callan T., M. Keeney, B. Nolan and B. Maitre, 2004, *Why is Relative Income Poverty so High in Ireland?* Policy Research Series No. 53. ESRI, Dublin.

While average income per head has risen dramatically in the last 10 years, the number falling below 50% of average income is well above the EU average. What can Ireland learn from countries that have done better at achieving social inclusion, notably Denmark and the Netherlands? The options are examined in this publication.[77]

[77]http://www.esri.ie/advsearch.cfm?t=Find%20Publications&mId=2&detail=1&id=2072

The **Netherlands** partner used information collected in country reports for Belgium and Denmark in a report on minimum incomes for the Dutch Ministry of Social Affairs.

- De Vos K. and A.G.C. van Lomwel, 2003, "Minimum inkomen internationaal, Eindrapport", CentER Applied Research, Tilburg.

PhD and Masters theses

Several completed and successful theses have used EUROMOD

Herwig Immervoll of the Austrian team (and also associated with the co-ordinator's team) made extensive use of EUROMOD in his PhD.

"The Effects of Inflation on the Taxation of Income in Europe. An Empirical Investigation Using Microsimulation" Vienna University of Economics, 21 December, 2002.

This thesis won the "Franz Weninger" Prize from the Austrian Central Bank (OeNB) for "**outstanding PhD theses in the field of monetary theory and monetary policy"**.

Horacio Levy, of the Spanish team, included a chapter using EUROMOD (based on a revised version of his paper published as EM2/03) in his PhD thesis successfully defended at the University Autonoma de Barcelona in March 2004.

Levy H. (2004) *Tax-benefit reform in Spain in a European Context: A non-behavioural and integrated microsimulation analysis*. Madrid: Instituto de Estudios Fiscales. (ISBN: 84-8008-162-4).

Kristian Orsini, of the Belgian team, used EUROMOD for his Masters Thesis

Orsini K. "The 2001 Belgian Tax Reform: Equity and Efficiency", Master's thesis, DULBEA, Free University of Brussels, August 2004.

The paper was presented at the CES-seminar (Centrum voor Econommische Studien), KU Leuven, 1December 2004.

Facilitating the development of national models

In some countries national tax-benefit models do not exist and work done by national teams on EUROMOD has helped start the process of building such national resources for social science research and policy making. This activity has been initiated through a combination of acquiring the appropriate technical skills and experience, and the "demonstration effect" of EUROMOD showing the usefulness of such models.

Austria

The Austrian team has secured funding from the "Jubiläumsfonds" of the Austrian Central Bank for a project entitled "Verteilungswirkungen von Änderungen im Steuer/ Transfer-System in Österreich 1998 bis 2005" (Distributional effects of tax / benefit policy changes in Austria 1998-2005). The project consists of two major parts. In a first step the impact of policy changes implemented in Austria between 1998 and 2005 (e.g. introduction of a universal child-care-benefit, tax reform 2004/5), with a focus on income distribution, poverty and inequality, will be analysed. The second will aim to answer specific "What if" questions about hypothetical policies aimed at alleviating poverty and their potential distributional

effects, for example measures proposed in the Austrian National Action Plan for Social Inclusion such as the introduction of a means-tested minimum pension.

Greece

A Greek tax-benefit model based on EUROMOD will be built in the near future within the framework of a doctoral dissertation that will be carried out under the supervision of Manos Matsaganis and Panos Tsakloglou.

Luxembourg

Since no microsimulation model existed in Luxembourg before EUROMOD, the Ministry of Social Security represented by the General Inspection of the Social Security, has been extremely interested by the model. MICRESA has played the role of a lever for looking at the feasibility of implementing a micro-simulation model for the social programme using administrative data of the Social Security instead of survey data. The structure of EUROMOD is taken as the starting point for this project.

The first stage of this project is to analyse all administrative data to find out the similarities and the differences between these data and the variables necessary to run a model like EUROMOD. This stage is underway. The second stage will be the construction of a data set that combines the information from the different administrative files. Finally, the third stage will be the implementation of the "constructed data set" using a structure like EUROMOD, and the validation of the model.

Portugal

A Portuguese tax-benefit model based on EUROMOD will be developed at CISEP. The main objective of this model is to evaluate social policy in Portugal and its effects on poverty and inequality. Its use by policy makers is under discussion at present.

5.2 Plans for future exploitation activities

As well as the continuation of some of the above activities, two specific new uses for EUROMOD and the products of MICRESA are in their initial stages:

DG-EMPL Social Situation Observatory: Social Inclusion and Income Distribution

EUROMOD will be used to inform the work of the Observatory in the Social Inclusion and Income Distribution area.

FP6 Research Infrastructures Design Study on “Improving the Capacity and Usability of EUROMOD” (I-CUE)

This new 3-year project is in the final stages of negotiation with DG-Research. This project involves centrally the MICRESA co-ordinator (now based at the University of Essex) and the Austrian team (at the European Centre in Vienna). They will be working on ways to make EUROMOD easier to use and maintain, and on the first steps to including the 10 New Member States (NMS) in the model. This will be in association with researchers from the NMS and with the co-operation of the MICRESA (EU15) team.

Table 10 summarises the major concrete ongoing or future exploitation intentions, and the partners involved. **Many other collaborations, project proposals and development ideas are being actively discussed.**

Table 10: Concrete ongoing and future exploitation intentions

	Activity	Time frame (approximate)	Central involvement
1	I-CUE design study	3 years 2005-8	Co-ordinator's team (Holly Sutherland, Christine Lietz, Daniela Mantovani), Austrian team (Michael Förster, Michael Fuchs, Herwig Immervoll, Orsolya Lelkes, Mattia Makovec)
2	Social Situation Observatory	2005 and then re-negotiated	Co-ordinator's team (Holly Sutherland, Christine Lietz, Daniela Mantovani), Irish team (Tim Callan), Greek team (Manos Matsaganis), Spanish team (Magda Mercader and Horacio Levy), Olivier Bargain (formerly of the French team, now at IZA, Bonn).
3	OECD project on Welfare Implications of Social Protection Systems	2005	Co-ordinator's team (Holly Sutherland, Christine Lietz, Daniela Mantovani), Kristian Orsini (of the Belgian team at DULBEA, now at Leuven)
4	UNICEF project: comparison of reforms for children in Austria, Spain and UK	June 2005	Co-ordinator's team (Holly Sutherland, Christine Lietz) and Spanish team (Horacio Levy)
5	Austrian National Model	2005-06	Austrian team (Orsolya Lelkes, Michael Fuchs, Mattia Makovec) and Christine Lietz
6	Greek National Model	Indefinite	Greek team (Manos Matsaganis and Panos Tsakloglou)
7	Luxembourg National Model	Indefinite	Luxembourg Team (Pierre Hausman and Frédéric Berger)
8	Portuguese National Model	Indefinite	Portuguese team (Carlos Farinha Rodrigues, Jose Luis Albuquerque and Rita Fernandes)

6. Acknowledgements and References

6.1 Data acknowledgements

The original datasets on which EUROMOD is based have been collected by, or on behalf of, a number of agencies including Eurostat, national statistical offices and non-governmental institutions. The project recognises its debt to the collectors, providers and owners of the copyright in these data (as well as to the respondents to the surveys). We are committed to applying a stringent code of conduct to the use of the original data and to the variables derived from it that are stored in the model at the micro-level.

Acknowledgement for use the data sources is given in EUROMOD publications, as follows.

EUROMOD relies on micro-data from 12 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 bear 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.

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7. Annexes.

1 MICRESA publications
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7 Agendas for MICRESA project meetings
8 MICRESA workshops
9 MICRESA project team: names and contact details

Annex 1 MICRESA publications

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B Feres P., H. Immervoll, H. Levy, D. Mantovani and H. Sutherland, 2002, "Indicators for Social Inclusion in the European Union: how responsive are they to macro-level changes?", EUROMOD Working Paper EM3/02

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D Levy H., 2003, "Child-targeted tax-benefit reform in Spain in a European context: a microsimulation analysis using EUROMOD", EUROMOD Working Paper EM2/03.

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M Mercader-Prats M. and H. Levy, 2004, "The Role of Tax and Transfers in Reducing Personal Income Inequality in Europe's Regions: Evidence from EUROMOD", EUROMOD Working Paper EM9/04

N Gutierrez R., H. Immervoll and H.Sutherland, 2004, "How European Union Member States adjust tax and benefit systems for inflation", mimeo.

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Levy H. and M. Mercader-Prats, 2003, "EUROMOD Country Report: **Spain** 2001"

Sutherland H. and R. Gutierrez, 2004, "EUROMOD Country Report: **United Kingdom** 2001".

Other Outputs

User Manual: see section 3.3.4.3. Downloadable from
http://www.econ.cam.ac.uk/dae/mu/euromodfiles/modeldoc.zip

Web statistics: see section 3.3.4.4. Downloadable from
http://www.econ.cam.ac.uk/dae/mu/emodstats/index.htm

Annex 2 MICRESA presentations

Paper B (and later, in its revised form as **Paper S**) was presented at
- a workshop on "Income Distribution and Welfare," University of Bocconi, Italy May/June 2002
- the 27th General Conference of the *International Association for Research in Income and Wealth*, Djurhamn, Sweden, August 2002
- the General Assembly Meeting of the European Centre for Social Welfare Policy and Research, December 2002
- the *Welfare Policy and Analysis* seminar at the London School of Economics, May 2003.
- the WIDER Conference on *Inequality, Poverty and Human Well-being*, Helsinki, Finland, May 2003.

Paper C was presented at
- a conference organised by the Belgian Presidency "*Indicators for Social Inclusion: Making European Objectives Work"* in Antwerp in September 2001 (just before the MICRESA project started, and in anticipation of it)

Paper E was presented at:
- the CESifo workshop on "*Tax Policy and Labour Market Performance*", at Venice International University, San Servolo, July 2003

Paper H was presented at
- Bocconi University Milan, January 2004
- the final conference of COST-A15 "Reform of social protection systems in Europe" in Nantes, May 2004
- the 28th *International Association for Research on Income and Wealth* General Conference, Cork, August 2004
- the 10th BIEN Congress, Barcelona, September 2004.
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.

And will be presented at
- the Welfare Policy and Analysis seminar at the London School of Economics, March 2005
- the Institute for Social and Economic Research seminar, University of Essex, May 2005.
- the International Conference on Policy Modelling (EcoMod2005), Istanbul, June/July 2005.

Paper J was presented at
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.

Material from **Paper K** has been presented at
- a seminar on *Gender and Individualisation*, University of Oxford, October 2002
- the *7th Nordic Seminar on Microsimulation Models* in Helsinki, Finland, June 2003
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.[78]

and will be presented at a workshop on "Indicators And Policies To Make Work Pay", organised by the European Commission DG Economic and Financial Affairs, March 2005

[78] Material from this paper was cited in an article about US tax reform in the *Christian Science Monitor* (January 10th 2003).

Paper M has been presented at
- the Department of Applied Economics of the UAB
- the Spanish Congress "XII Encuentro de Economía Pública" in Mallorca in February 2005.

Paper P was presented at
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.

Paper R was presented at
- the *International Microsimulation Conference on Population Ageing and Health*, Canberra, Australia in December 2003.
- the 28th *International Association for Research on Income and Wealth* General Conference, Cork, August 2004.
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.

Paper W was presented at
- the conference "*The Distributional Effects of Government Spending and Taxation*" at The Levy Institute of Bard College, USA, October 15-16 2004
- a seminar at the Institute for Social and Economic Research at the University of Essex, November 2004.

Paper Y was presented at
- a seminar organised by DG-Research in Brussels to disseminate the MICRESA project findings, September 2004.

Presentations and demonstrations of the EUROMOD model were made to
- two seminars for officials from the European Commission Services, held in Brussels and organised by DG-EMPL, in October 2001 and January 2003
- the Austrian Ministry for Social Security and Generations, Vienna, January 2002
- government economists at the Austrian Ministry of Finance, Vienna, February 2002.
- a seminar for government economists from UK HM Treasury, organised by the University of Cambridge, March 2002
- a meeting on the use of ECHP-data organised by the Interdisciplinary Centre for Comparative Research in the Social Sciences (ICCR), Vienna, April 2002
- at the OECD, Paris, April 2002.
- a seminar on "Monitoring EU tax/benefit systems" organised by DG-EMPL in Brussels, June 2002
- the *International Microsimulation Conference on Population Ageing and Health*, Canberra, Australia, December 2003

A presentation "EUROMOD and Policy Development and Analysis in the European Union" was made to a plenary session of the *International Microsimulation Conference on Population Ageing and Health*, Canberra, Australia, December 2003.

Sir Tony Atkinson (MICRESA partner 3) included a discussion of EUROMOD in the 13th Annual Lecture for the UK Economic and Social Research Council entitled "Social Europe and Social Science", October 17th 2002.[79]

[79] See http://www.esrc.ac.uk/esrccontent/DownloadDocs/2002AnnualLecture.pdf

In addition, presentations of preliminary versions of these and other papers were made at the three annual project meetings. See Annex 7

Annex 3: Deliverables

Deliverable No	Planned deliverable title (from the work programme)	Actual deliverable(s)	Delivered?	Additional related outputs	Paper references (see Annex 1)
1	Preliminary report reconciling baseline poverty estimates with those of Eurostat and other national estimates (WP1)	EUROMOD Working Paper EM1/03	Y		G
2	Preliminary report on the impact of social protection policy on poverty in Europe (WP2)	EUROMOD Working Paper EM1/02	Y	- Sutherland (2002)	A, C
3	Updated, working, validated EU tax-benefit model (WP1)	Version 30A of EUROMOD	available on request (see 3.3.4.6)	- Statistics on redistribution, available on the web (see 3.3.4.4) - Country Reports (see Annex 1)	AA
4	A report on the sensitivity of the effect of tax-benefit systems to changes in incomes (WP3).	(a) EUROMOD Working Paper EM3/02[80] (b) EUROMOD Working Paper EM3/04 (c) Gutierrez et al (2004)	Y Y Y	- EUROMOD Working Paper EM7/05	B, R, I, N, AA
5	Paper examining the impact of social and fiscal policy within the household (WP4)	(a) EUROMOD Working Paper EM3/05 (b) LeCacheux (2005)	Y April 2005		Q, X
6	Final report on the impact of social protection policy on poverty in Europe (WP2)	EUROMOD Working Paper EM1/05	Y	**Cross-national studies:** - EUROMOD Working Paper EM8/04 - EUROMOD Working Paper EM5/05 - Immervoll, Levy et al (2005) - Callan (2005) - EUROMOD Working Paper EM6/04 **National studies:** - Berger (2003) - Fuchs and Lietz (2005)	F, K, L, P, S, T, Y, Z

[80] Note that a peer-reviewed and revised version of this paper is forthcoming in the *Cambridge Journal of Economics*

Deliverable No	Planned deliverable title (from the work programme)	Actual deliverable(s)	Delivered?	Additional related outputs	Paper references (see Annex 1)
7	Report on the role of labour market participation in poverty reduction (WP5)	EUROMOD Working Paper EM4/04	Y	- EUROMOD Working Paper EM3/03 - Immervoll and O'Donoghue (2004) - EUROMOD Working Paper EM6/04	E, J, K, O
8	Report on alternative policies for reduction in child poverty using alternative measures (WP6)	(a) EUROMOD Working Paper EM2/03 (b) EUROMOD Working Paper EM2/04 (c) Makovec et al (2005)	Y Y May 2005	- Fuchs and Lietz (2005)	D, H, V, Z
9	Paper on regionally-based policy reforms and their impact on poverty at a regional level (WP7)	EUROMOD Working Paper EM9/04	Y		M
10	Training manual for operating the European tax-benefit model (WP8)	Package of manuals (see 3.3.4.3)	Y[81]		
11	At least one workable solution for access to the model (WP9)	Grabka (2004)	Y		W
12	Revised report reconciling baseline poverty estimates with those of Eurostat and other national estimates (WP1)	Lietz and Sutherland (2005)	Y		U

[81] Downloadable from http://www.econ.cam.ac.uk/dae/mu/euromodfiles/modeldoc.zip

Annex 4: Sharing and choosing within the household: a survey

J. Le Cacheux

The economist's traditional approach to household decision-making considers the household as a homogeneous group which shares identical preferences and pools resources: it behaves as if it were a single agent (Samuelson, 1956). In this framework, the intrahousehold choices are independent of which member receives resources, as well as of which member consumes the goods. It obviously does not allow us to take the effects of a social or fiscal policy within the household into account. For instance, if all income is pooled, what does it matter if a child allowance is paid to the father or to the mother? And what would be the distributional consequences of individualizing the tax system in countries where there is income splitting?

This approach also raises theoretical difficulties. On the one hand, the assumption of common preferences which leads to the maximization of a single utility function is in conflict with methodological individualism. On the other hand, this framework ignores issues such as the distribution within the household. Moreover, this framework neglects the question of household formation and stability, an important aspect in contemporary European societies.

1.1. Behavioral hypotheses

The usual microeconomics considers egoistic agents who aim to maximize their utility. But such an assumption may not be relevant when analyzing intrahousehold distribution and choices: insofar as love may be an important factor that explains marriage, the economist has to take other behavioral hypotheses into account as well. These behavioral hypotheses are caring and altruism.

To begin with, an agent is said to be egoistic if she maximizes her own utility function, depending on her own consumption and leisure. An agent is said to be caring when his or her utility depends on the utility of the other members of the household as well as her own consumption and leisure. The "full caring" case will occur if the agent cares as much about the others as about herself. The agent who cares about the other members of her family will maximize her own utility function and transfer resources to the others. In fact, a household member i is assumed to maximize a welfare index W^i which takes her own egoistic utility U^i and the utility of the others U^j into account. This index has the following shape: $W^i[U^i(x^i, l^i, x_0), U^j(x^j, l^j, x_0)]$ (x^i is private consumption, l^i is leisure and x_0 is a public good) (Becker, 1974).

In contrast to the caring assumption, an altruistic agent will maximize her own utility function, which depends as well on her own consumption and leisure as on the others' consumption and leisure. Preferences are then interdependent and there is at least one positive partial cross derivative. Negative partial cross derivatives would mean that a member aims to improve her own consumption and leisure and to minimize the others' consumption and leisure. Such a case is likely to be irrelevant when focusing on families. It would be a dictatorial and strictly egoistic case.

Egoistic, caring or altruistic preferences and the nature of goods consumed by the household are not independent. If all goods are public, there is no difference between egoism and altruism. In the altruistic case, the distinction between public and private goods vanishes, since private goods provide utility for the whole family.

1.2. A taxonomy of household decision making models

In intrahousehold decision models, each household member has a utility function and leisure and goods consumption does not only depend on the total amount of resources available. The control of resources by each spouse is taken into account. However, no common analytical framework has emerged.

1.2.1. Cooperative bargaining models

A priori, a household should behave cooperatively and cooperative bargaining games are indeed the leading framework to analyze intrahousehold choices. Cooperation makes it possible to reach equilibria which are Pareto-efficient. However, to what extent will socio-fiscal policies alter the stability and durability of the cooperative equilibrium?

Let us focus on the threat point and on the shape of the budget constraint (e.g., joint budget constraint, separate constraints). It is indeed through both these channels that socio-fiscal policies ought to act upon intrahousehold choices

All cooperative decision processes can be described in two steps. To begin with, agents share the total income between them. Then, each agent maximizes her own utility function (reflecting egoistic, caring or altruistic preferences) subject to her own budget constraint (Chiappori, 1988; Bourguignon, Browning, Chiappori and Lechène, 1991)

Household choices derive from the maximization of the product of gains from living together. These gains are the differences between utilities inside and outside the marriage. The weight of preferences of each household's member is therefore an increasing function of her "threat point": this intuition will allow for the building of power indexes (see below). The threat point is given by a noncooperative Cournot-Nash equilibrium within the household.

The noncooperative equilibrium emerges if the gains from cooperation are lower than the cost of breaking up the marriage. In this setting, tax and social policies such as a child allowance can alter the threat point *and* the cooperative equilibrium, *even if* such a social policy would not modify the threat point defined as the indirect utility outside the family (Lundberg and Pollak, 1993).

However, it is also possible to focus on Pareto-efficiency without assuming a bargaining rule, but instead postulating a sharing rule, as in the "collective approach" developed by Chiappori (1988 and 1992), which provides a more general setting, since the sharing rule is predetermined. The only assumption is that outcomes are Pareto-efficient[82].

1.2.2. Noncooperative bargaining models

Cooperative intrahousehold bargaining models raise some difficulties: for instance, in the Nash cooperative bargaining setting, the household is assumed to maximize the product of both household's members' gains from being married. However, the reason why the members should respect this program is not explained and the stability of the solution is not guaranteed, since each player within the household could turn off course (Bourguignon, 1984). Of course cooperation seems to be obvious because we focus on family. In a repeated game nevertheless, noncooperative behaviors could occur if the household's members had divergent interests that they failed to reconcile.

[82] See Udry (1996) for an illustration of this approach.

Few noncooperative bargaining models of allocation within the household have been developed. Bourguignon's seminal contribution focuses on labor supplies within a two-member household (Bourguignon, 1984). The preferences of the household's members are egoistic and depend on their own leisure and consumption. The amount of goods consumed by each member depends on a sharing rule taking account of wages, labor time and exogenous resources. The interest of being married rests on some economies of scales and on some public goods consumed within the household. The noncooperative solution leads here to a Cournot-Nash equilibrium. As a consequence, each person in the household is assumed to maximize their own utility function subject to the joint budget constraint and to the time constraint while considering the behavior of the other member as given. Both members' reaction functions are derived from this program and the final outcome corresponds to their intersection.

In a simple repeated game with a single household public good (Lundberg and Pollak, 1994), each spouse can contribute to the supply of this public good. Marriage cannot be broken up and the spouses are assumed to maximize their discounted values of infinite streams of utilities. Moreover, the spouses are assumed not to discount the future too much. Preferences are egoistic, so that utility functions depend on the amount of public and private goods consumed by each member. Both spouses decide simultaneously to what extent they aim to contribute to the public good purchase. Lundberg and Pollak stress the fact that "in the repeated game, the voluntary contribution game is a "stage game" played in each period, for ever". There is no borrowing or saving.

In the one-shot game, the Cournot-Nash equilibrium corresponds to the intersection of the public goods reaction functions. As a consequence, each member maximizes his or her own utility function subject to his or her own private budget constraint depending on his or her exogenous resources and considering the voluntary contribution of the other member as given. The reactions functions derive from this program. The equilibrium is not Pareto-efficient.

In this repeated game however, other equilibria are possible. Since each spouse can punish the other, a Pareto-efficient equilibrium may be reached (Folk theorem). The "punishment points" are defined as the security levels each spouses would achieve if the other refused to contribute to the public good. A social policy can alter these punishment points in favor of one spouse. For instance, "A redistribution of resources from husband to wife shifts the set of equilibria in favor of the wife in the sense that, if the equilibrium were chosen randomly from this set, then the expected utility of wives would be higher and the expected utility of husbands lower" (Lundberg and Pollak, 1994, p. 135). The punishment is based on lower contribution to the public good.

Noncooperative bargaining models follow another path to look into the effects of social policies upon the household decision making. Control over resources becomes essential. The separate-spheres bargaining model aims to take account of noncooperative bargaining models by defining the threat point inside marriage.

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Browning M, Bourguignon François, Chiappori Pierre-André, Lechène Valérie (1994), "Income and Outcomes: A Structural Model of Intrahousehold Allocation", *The Journal of Political Economy*, 102, n°6, December, pp. 1067-1096.

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Annex 5: Complete list of EUROMOD Working Papers

NUMBER	TITLE	AUTHORS	PUBLICATION DATE
EM0/99	**An Introduction to EUROMOD**	H Immervoll, C O'Donoghue and H Sutherland	September 1999
EM1/99	**Integrating Output in EUROMOD: An Assessment of the Sensitivity of Multi-Country Microsimulation Results** Also published in Mitton L, H Sutherland and M Weeks (eds), *Microsimulation Modelling for Policy Analysis: Challenges and Innovations*, Cambridge University Press, 124-148.	C O'Donoghue, H Sutherland and F Utili	September 1999
EM2/99	**Microsimulation and the Formulation of Policy: A Case Study of Targeting in the European Union** Also published in Atkinson, A B, H Glennerster and N Stern (eds) *Putting Economics to Work: volume in honour of Michio Morishima*, STICERD Occasional Paper 22, LSE, 2000. A revised version is in *Economica* , 2002, 69, 229-243 as `Microsimulation of Social Policy in the European Union: Case Study of a European Minimum Pension'.	A B Atkinson, F Bourguignon, C O'Donoghue, H Sutherland and F Utili	September 1999
EM1/00	**Child Poverty and Child Benefits in the European Union** Also published as `Reducing child poverty in the European Union: the role of child benefits', chapter 16 in Vleminckx K, and T M Smeeding, (eds.), *Child Poverty, Child Well-being and Child Policy in Modern Nations: What Do We Know?*, The Policy Press, Bristol, 2001.	H Immervoll, H Sutherland and K de Vos	February 2000
EM2/00	**The Impact of Inflation on Income Tax and Social Insurance Contributions in Europe**	H Immervoll	May 2000
EM3/00	**A European Social Agenda: Poverty Benchmarking and Social Transfers**	A B Atkinson	July 2000
EM1/01	**Imputation of Gross Amounts from Net Incomes in Household Surveys: An Application using EUROMOD**	H Immervoll and C O'Donoghue	June 2001
EM2/01	**Towards a Multi-Purpose Framework for Tax-Benefit Microsimulation: a discussion by reference to MMEANS, a software system used for constructing EUROMOD, a tax-benefit model for the European Union**	H Immervoll and C O'Donoghue	December 2001
EM3/01	**The Impact of Tax-Benefit Systems on Low Income Households in the Benelux Countries. A Simulation Approach Using Synthetic Datasets** Also published in *Schmollers Jahrbuch,* 121 (2001) 313-352.	F Berger, M Borsenberger, H Immervoll, J Lumen, B Scholtus and K De Vos	July 2001

NUMBER	TITLE	AUTHORS	PUBLICATION DATE
EM4/01	**Welfare benefits and work incentives: an analysis of the distribution of net replacement rates in Europe using EUROMOD, a multi-country microsimulation model**	H Immervoll and C O'Donoghue	June 2002
	A version published as: Immervoll, H and C O'Donoghue, "What Difference does a Job Make? The Income Consequences of Joblessness in Europe" in D Gallie (ed.) *Resisting Marginalisation: Unemployment Experience and Social Policy in the European Union*, Oxford University Press, Oxford, pp. 105-139, 2004.		
EM5/01	**Reducing Child Poverty in Europe: what can static microsimulation models tell us?**	H Sutherland	June 2001
	A version in Spanish is published as "Reducción de la Pobreza Infantil en Europa: ¿Qué nos Pueden Aportar los Modelos de Microsimulatión Estácia" in Labeaga Azcona J. M. and M. Mercader Prats (eds) *Desigualdad, Redistribución y Bienestar: una Aproximación a Partir de la Microsimulación de Reformas Fiscales,* Instituto de Estudios Fiscales, Madrid, 2001		
EM6/01	**The impact of means tested assistance in Southern Europe**	C O'Donoghue, J Albuquerque, M Baldini, O Bargain, P Bosi, H Levy, D Mantovani, M Matsaganis, M Mercader Prats, C Farinha Rodrigues, A Spadaro, S Toso, I Terraz, P Tsakloglou	August 2002
	A version in Italian is published as "L'impatto distributivo della spesa pubblica per assistenza nell'Europa Meridionale" in CNEL (Consiglio Nazionale dell'Economia e del Lavoro), *Sesto Rapporto sulla Distribuzione e Redistribuzione del Reddito in Europa. 2000-2001*, Report edited by V. Atella (CEIS), CNEL, Roma, 2002.		
EM7/01	**Modelling the Redistributive Impact of Indirect Taxes in EUROPE: An Application of EUROMOD**	C O'Donoghue, M Baldini and D Mantovani	June 2004
EM8/01	**Indicators of Social Exclusion in EUROMOD**	F Papadopoulos and P Tsakloglou	June 2001
EM9/01	**EUROMOD: an integrated European Benefit-tax model, Final Report**	H Sutherland (ed)	June 2001
EM1/02	**Evaluation of the National Action Plans on Social Inclusion: the Role of EUROMOD**	A B Atkinson	July 2002
EM2/02	**The Distribution of Average and Marginal Effective Tax Rates in European Union Member States**	H Immervoll	October 2002

NUMBER	TITLE	AUTHORS	PUBLICATION DATE
EM3/02	**Indicators for Social Inclusion in the European Union: how responsive are they to macro-level changes?** – A summary version has been published in Hungarian as "Közpolitika-vàltozások vs. a társadalmi-gazdasági környezet megváltozáza: mennyire érezékeny a jelenlegi európai teljesitmény a makrogazdasági környezet változására?" in *Kapocs*, February 2003, pp4-6 – A revised version to be published as Immervoll, H., H. Levy, C. Lietz, D. Mantovani and H. Sutherland, forthcoming, "The sensitivity of poverty rates in the European Union to macro-level changes" *Cambridge Journal of Economics*	P Feres, H Immervoll, C Lietz, H Levy, D Mantovani and H Sutherland	December 2002
EM1/03	**Social Indicators and other Income Statistics using the EUROMOD Baseline: a Comparison with Eurostat and National Statistics**	D Mantovani and H Sutherland	July 2003
EM2/03	**Child-targeted tax-benefit reform in Spain in a European context: a microsimulation analysis using EUROMOD**	H Levy	July 2003
EM3/03	**Employment Transitions in 13 European Countries. Levels, Distributions and Determining Factors of Net Replacement Rates** Also circulated as CESifo Working Paper No. 1091.	H Immervoll and C O'Donoghue	December 2003
EM1/04	**Welfare Reform in European Countries: a micro-simulation analysis** Also circulated as CEPR Discussion Paper No. 4324.	H Immervoll, H Jacobsen Kleven, C Thustrup Kreiner and E Saez	February 2004
EM2/04	**Child Poverty and Family Transfers in Southern Europe**	M Matsaganis, C O'Donoghue, H Levy, M Coromaldi, M Mercader-Prats, C Farinha Rodrigues, S Toso and P Tsakloglou	July 2004
EM3/04	**Falling up the stairs. An exploration of the effects of "bracket creep" on household incomes.**	H Immervoll	July 2004 revised October 2004
EM4/04	**In-work policies in Europe: killing two birds with one stone?**	O Bargain and K Orsini	October 2004
EM5/04	**Redistributive effect and progressivity of taxes An International Comparison across the EU using EUROMOD**	G Verbist	October 2004

NUMBER	TITLE	AUTHORS	PUBLICATION DATE
EM6/04	**Average and marginal effective tax rates facing workers in the EU. A micro-level analysis of levels, distributions and driving factors** This is a revised version of EM2/02.	H Immervoll	October 2004
EM7/04	**Fiscal Stabilisers in Europe: The Macroeconomic Impact of Tax and Benefit Systems**	D Mabbett	November 2004
EM8/04	**EU Action on Social Inclusion and Gender Mainstreaming**	A B Atkinson and D Meulders	December 2004
EM9/04	**The Role of Tax and Transfers in Reducing Personal Income Inequality in Europe's Regions: Evidence from EUROMOD**	M Mercader-Prats and H Levy	December 2004
EM1/05	**EUROMOD and the development of EU social policy**	A B Atkinson	January 2005
EM2/05	**Replacement Incomes and Taxes: A distributional analysis for the EU-15 countries**	G Verbist	January 2005
EM3/05	**Sharing Resources within the Household: A multi-country microsimulation analysis of the determinants of intrahousehold "strategic weight" differentials and their distributional outcomes**	K Orsini and A Spadaro	January 2005
EM4/05	**The Impact of Tax and Transfer Systems on Children in the European Union** Also circulated as Innocenti Working Paper No. 2005-04, UNICEF	M Corak,, C Lietz and H Sutherland	March 2005
EM5/05	**Pension Incomes in the European Union: Policy Reform Strategies in Comparative Perspective**	D Mantovani, F Papadopoulos, H Sutherland and P Tsakloglou	March 2005
EM6/05	**Social Indicators and other Income Statistics using EUROMOD: an assessment of the 2001 baseline and changes 1998-2001**	C Lietz and H Sutherland	March 2005
EM7/05	**Static data "ageing" techniques. Accounting for population changes in tax-benefit microsimulation models**	H Immervoll, K Lindström, E Mustonen, M Riihelä and H Viitamäki	March 2005

Forthcoming

NUMBER	TITLE	AUTHORS	PUBLICATION DATE
	Sharing and choosing within the household: A survey	J Le Cacheux	
	Assessing the impact of recent tax/transfer policy changes on poverty: Evidence for Selected EU Countries	T Callan	
	The Effects of Changes in Tax-Benefit Policies in Austria 1998-2003	M Fuchs and C Lietz	
	The effects of taxes and transfers on household incomes in the European Union	H Immervoll, C Lietz, D Mantovani, C O'Donoghue, H Sutherland and G Verbist	
	Child poverty in Europe: methodological and policy issues	M Makovec, C O'Donoghue and S Toso	

Annex 6 Sample page from the EUROMOD web statistics on redistribution

AUSTRIA 2001

Mean of Income and Income-Components per Decile Group, EURO

Decile Group	Disposable Income	Original Income	of which Cur. Earned Inc.	All Benefits incl.Pub.Pen.	All Taxes	Social Ins. Contrib.	Simulated Benefits	Simulated Taxes
1	921	356	326	621	-13	69	30.4%	100.0%
2	1,498	910	878	807	46	174	18.9%	100.0%
3	1,736	1,229	1,167	842	106	229	16.6%	100.0%
4	1,917	1,510	1,441	849	163	278	14.6%	100.0%
5	2,254	2,141	2,061	717	221	383	19.0%	100.0%
6	2,341	2,190	2,121	849	309	390	13.0%	100.0%
7	2,647	2,684	2,605	857	412	483	8.4%	100.0%
8	2,938	3,208	3,153	846	548	567	8.5%	100.0%
9	3,300	3,864	3,792	848	743	669	8.3%	100.0%
10	4,578	5,371	5,146	1,581	1,589	786	2.6%	100.0%
All	**2,408**	**2,345**	**2,267**	**885**	**421**	**401**	**12.6%**	**100.0%**
Poor*	928	358	328	627	-12	69	30.6%	100.0%

Mean of Income and Income-Components per Decile Group, Euro adjusted for Purchasing Power Parities

Decile Group	Disposable Income	Original Income	of which Cur. Earned Inc.	All Benefits incl.Pub.Pen.	All Taxes	Social Ins. Contrib.	Simulated Benefits	Simulated Taxes
1	988	382	350	666	-14	74	30.4%	100.0%
2	1,606	976	941	865	50	186	18.9%	100.0%
3	1,862	1,318	1,251	902	113	245	16.6%	100.0%
4	2,056	1,619	1,545	910	175	298	14.6%	100.0%
5	2,417	2,296	2,210	769	237	411	19.0%	100.0%
6	2,510	2,349	2,274	910	332	418	13.0%	100.0%
7	2,838	2,879	2,794	919	442	518	8.4%	100.0%
8	3,151	3,440	3,381	907	588	608	8.5%	100.0%
9	3,539	4,144	4,067	909	797	718	8.3%	100.0%
10	4,909	5,760	5,518	1,696	1,704	843	2.6%	100.0%
All	**2,582**	**2,515**	**2,431**	**949**	**451**	**430**	**12.6%**	**100.0%**
Poor*	995	384	352	672	-13	74	30.6%	100.0%
							PPP	0.9326

Share of Income and Income-Components received/paid by each Decile Group

Decile Group	Disposable Income	Original Income	of which Cur. Earned Inc.	All Benefits incl.Pub.Pen.	All Taxes	Social Ins. Contrib.
1	4.8%	1.9%	1.8%	8.9%	-0.4%	2.2%
2	5.8%	3.6%	3.6%	8.5%	1.0%	4.1%
3	6.8%	4.9%	4.8%	9.0%	2.4%	5.4%
4	7.7%	6.2%	6.1%	9.3%	3.7%	6.7%
5	8.1%	7.9%	7.9%	7.0%	4.6%	8.3%
6	9.5%	9.1%	9.1%	9.3%	7.2%	9.5%
7	10.5%	10.9%	11.0%	9.3%	9.4%	11.5%
8	11.9%	13.3%	13.6%	9.3%	12.7%	13.8%
9	14.1%	17.0%	17.2%	9.9%	18.2%	17.2%
10	20.8%	25.0%	24.8%	19.5%	41.3%	21.4%
Poor*	4.9%	2.0%	1.9%	9.1%	-0.4%	2.2%

Poor: HH at risk of poverty i.e. equ.disp.inc.< 60% of Median (see also Legend)

original income	employment income + investment income + private pension benefits + other private transfers + self-employment income
taxes (sim.)	withholding tax on capital income (kest) + national income tax
employee sics (sim.)	employees' contrib. to housing subsidy (wohnbaufoerderungsbeitrag) + employees' compulsory union contrib. (kammerumlage) + self-employed contrib. to disability insurance + employee health soc.ins.contrib. + self-employed contrib. to health insurance + employee pension soc.ins.contrib. + self-employed contrib. to pension insurance + employee unemployment soc.ins.contrib.
benefits (sim.)	maternity allowance supplement (zuschuss zum karenzgeld oder zur teilzeitbeihilfe) + minimum pension (ausgleichszulage) + minimum pension for civil servants (ergaenzungszulage) + child bonus for pensioners (kinderzuschuss (asvg)) + child bonus for civil service pensioners (kinderzulage (pg)) + child benefit (fbh) + new born health check bonus (mutter-kind-pass-bonus) + addition to child benefit for disabled children (erhoehte familienbeihilfe, flag par. 8 (4)) + provincial family bonus (familienzuschuss der bundeslaender) + long term maternity benefit kaernten (kaerntner kinderbetreuungsgeld) + social assistance (sozialhilfe) + small children benefit (kleinkindbeihilfe)
benefits (data)	caring benefit (pflegegeld) + civil servant's pension (ruhebezuege) + early retirement pension (vorzeitige alterspension, pv) + invalidity pension (invalidenpension, pv) + maternity allowance / allowance for parental leave (wochengeld / karenzgeld) + old age pension (alterspension, pv) + sickness benefit (kranken- und unfallversorgung) + other old age related schemes or benefits + survivor pension (hinterbliebenenpension (=witwen- u. waisenpension)) + unemployment benefit (notstandshilfe) + unemployment payment (arbeitslosengeld) + student payments + housing benefits