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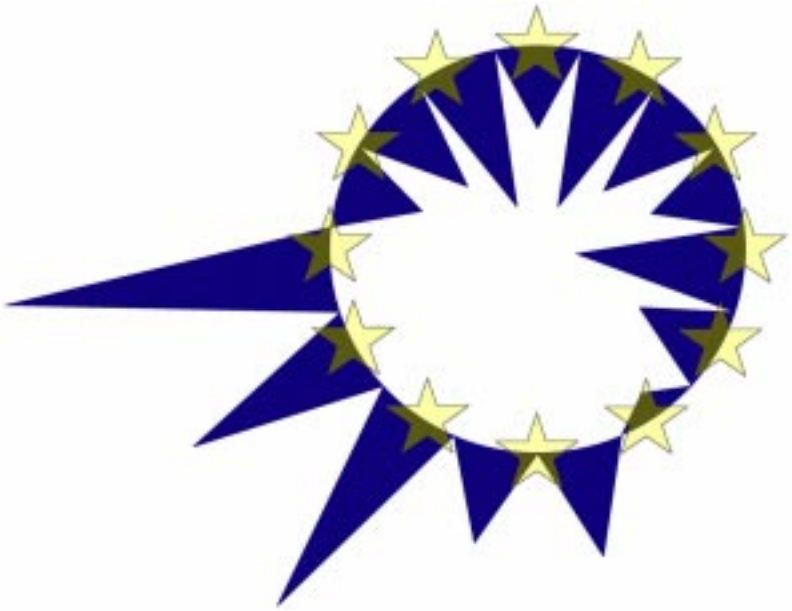

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**REDUCING CHILD POVERTY IN EUROPE: WHAT CAN STATIC MICROSIMULATION MODELS TELL US?**

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June 2001

# Reducing Child Poverty in Europe: what can static microsimulation models tell us?[1]

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**Abstract**

Static microsimulation models are based on household micro-data and are designed to estimate the revenue cost and distributional and incentive effects of tax and benefit policy changes. They are invaluable for the design and evaluation of policy reforms. Static models allow us to hold constant many variables so that we can focus on the aspects of interest. This paper illustrates the range of ways in which static microsimulation can help us to develop policy to reduce child poverty, with reference to some concrete simulation exercises. It also outlines the situations where other types of modelling are complementary and attempts to put all modelling in perspective. The first illustration shows how static microsimulation has been used to gauge the effect on child poverty of the recent UK tax-benefit reforms. The second illustration presents some early results from EUROMOD which explore the relationships between child poverty and the scale of cash benefits and tax concessions targeted on children in four countries of the European Union: Denmark, France, Spain and the UK.

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# Reducing Child Poverty in Europe: what can static microsimulation models tell us?

## Introduction

A tax-benefit model is a type of static microsimulation model that is designed to ask "what if" questions about the effects of changes to components of disposable household incomes, particularly personal taxes, social contributions and cash benefits. These models are based on household micro-data and the estimates of revenue costs and distributional and incentive effects that they produce are invaluable for the design and evaluation of policy reforms. A typical "what if" question might be: What would be the effect on the rate of child poverty if spending on child benefits were increased by 10%?

Static models allow us to hold constant many variables so that we can focus on the aspects of interest. Specifically, they allow us to separate the direct effects of changing tax and social security policy on incomes from all the underlying influences on income and from the other characteristics and behavioural patterns of a particular population.

There are a number of distinct ways in which static microsimulation methods can illuminate the problem of reducing poverty among children in developed economies. This paper illustrates them with reference to some concrete simulation exercises. Section 2 puts child poverty in the context of its empirical measurement, and discusses existing targets for reducing poverty. It also reviews some recent comparative European evidence on child poverty rates compared to the general risk of being poor. Section 3 explains some of the ways in which static microsimulation models can provide the information that policy makers need in order to design effective policy for poverty reduction and for setting achievable targets. Other types of modelling - often referred to as "dynamic" may be complementary. The relevance of various types of dynamic model is discussed and an attempt is made to put all such modelling in perspective.

Clearly microsimulation models can be very informative, but this may be as much because of the new issues and questions that they raise as through providing unequivocal answers. Models produce estimates that are uncertain – due at the very least to sampling error in the underlying data (see Pudney and Sutherland, 1994). Estimates may also be biased due to inability to capture correctly all relevant influences. As stated by a recent UK government report "Models do not give answers, they give insights". (PIU, 2000; page 62). With this in mind, section 4 shows how static microsimulation has been used to gauge the effect on child poverty of the recent UK tax-benefit reforms and section 5 presents an analysis of the potential for reducing child poverty using existing national tax-benefit systems, for four countries of the European Union. Section 6 concludes.

## 1 Child poverty in perspective

One of the key common social objectives within the European Union is the reduction of poverty and social exclusion. This goal has been given a fresh and powerful impetus by the Lisbon European Council in March 2000. The Presidency Conclusions identify children as one of the specific target groups for priority action and, of course, many Member States are paying particular attention to the position of children living in poor households. Poverty among children is important not only in its own right but also because it has a lasting and pervasive effect over the lifetime. As stated by UNICEF

> "Whether measured by physical and mental development, health and survival rates, educational achievement or job prospects, incomes or life expectancies, those who spend their childhood in poverty of income and expectation are at a marked and measurable disadvantage (UNICEF, 2000, page 3)"

There is concern that poverty in childhood not only affects chances in later life but also that it is transmitted from one generation to the next. A (now dated) study in the United Kingdom showed that children from a low income family in 1950 were 50% more likely, a quarter century later, to be in poverty themselves than if there were no intergenerational link (Atkinson *et al.*, 1983).

Some countries have set targets for the reduction of poverty in their country. In Ireland, a ten-year National Anti-Poverty Strategy was agreed in 1997. The overall goal was to reduce from 9%-15% to 5%-10% the numbers of people with incomes below 60% of the average *and* experiencing some basic deprivation (such as inadequate meals, heating or clothing) by 2007 (Nolan, 1999). In 1999 this target was revised to be less than 5% by 2004. In the UK, the target was set in 1999 in terms of reductions in children in poverty (using an income measure alone), by a half within 10 years and entirely within 20 years (Department of Social Security, 1999a).

Two key issues arise when considering child poverty. First is a question that applies to all empirical studies of poverty: whether the level of *cash income* is an adequate guide to the level of material well-being. The Irish poverty target suggests that it may not be, since it includes indicators of deprivation in the measures used. However, the links between policy to tackle deprivation and final outcomes are less clear cut than between systems of cash income maintenance and income itself. This paper confines itself to exploring changes in cash income: one important component of the wider picture. In what follows, for "poverty" read "income poverty".

The second issue is whether *child* poverty is best identified using measures of income for the whole household in which they live. 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 (Haddad and Kanbur, 1990; Jenkins, 1991). It is easy to imagine situations where poor parents sacrifice some of their own consumption to benefit their children. Clearly the reverse is possible too, and in one of the few studies on distribution within American households, Lazear and Michael (1988) suggest that the division of consumption

between parents and children is affected by the number of adults in the household: as the number of adults rises, the children's share declines proportionately. Household income may be a less good indicator of a child's material well-being than it is for adults.

This paper recognises that the distribution of resources within the household is an important issue. Throughout, the term "child poverty" should be taken as short-hand for "children living with poor parents". [2]

Member States differ in the degree to which children are over- or under-represented among all those in household income poverty. According to an OECD study, in some countries poverty is greater among children by as much as 25% (Oxley *et al.*, 2001). This may be contrasted with the Nordic countries, where poverty rates among children are significantly lower in relative terms (and hence absolutely much lower). However, assessing the relative risk of poverty for children is not entirely straightforward. Table 1 shows estimates from four cross-national studies and demonstrates that the rate of child poverty in relation to poverty as a whole varies according to the data source and the method of calculation. The choice of equivalence scale seems particularly important. Bradbury and Jäntti (1999) use an equivalence scale with a relatively high weight for children and find that child poverty exceeds general poverty in all countries examined. In contrast, comparisons using the modified OECD scale which assumes low weights for children and, in general, relatively small economies of scale (Mejer and Siermann, 2000; Immervoll *et al.*, 2000) show some countries to have child rates that are lower than all-person rates. Other factors which differ across the studies may also be important in explaining the different relative risks of poverty among children. Examples are the age range which defines "a child"; the level of the poverty line relative to national average incomes; and the data source and year to which it refers.

However, the four sets of estimates in Table 1 generally confirm that there are some EU countries where the risk of poverty is lower (or not much higher) for children than for others: Denmark, Finland, Greece and Sweden. There are other countries consistently identified as having higher relative child risk: Ireland, Italy and the UK. The remaining countries tend to have child rates that are somewhat higher than all-person rates. The question that the reminder of this paper addresses is what is the scope for *reducing* national child poverty rates using existing national tax-benefit systems, either to the level of general poverty, or more radically?

## 3 Reducing child poverty: what do we need to know?

*Understanding child poverty*

One component of any explanation of cross-country differences in the relative risk of poverty faced by children lies in differences in public policies targeted on children and the households in which they live. Static microsimulation can have a role to play in decomposing the contribution of differences in tax-benefit policies across countries from the contribution of demographic, economic and social differences. Modelling policy from another country, or a component of it, and comparing the impact on poverty with that due to actual national policy can be instructive.

[2] This term is also inadequate since in two-parent families the mother and father may not have an equal command over the household resources.

Examples of studies that have “borrowed” policy - or parts of it - from one country and applied it to another country’s population are: Atkinson *et al.* (1988) who apply the British tax system to the French population; De Lathouwer (1996) who compares unemployment schemes for Belgium and the Netherlands using data on the Belgian population; O’Donoghue and Sutherland (1998) apply stylised versions of European systems of the taxation of couples to the UK population; Redmond (1999) explores the effects of introducing a UK-style system of means-tested family benefits in Hungary; and Immervoll *et al.* (2000) “swap” systems of child benefit between the Netherlands and the UK.

*Policy for reducing child poverty*

Policy for reducing poverty can rely on increasing incomes directly through changes in the tax-benefit system, or through more indirect routes. The UK government’s strategy for welfare reform provides an example. It has the stated aim of "ensuring paid work for those who can, security for those who cannot". The principal measures to reduce child poverty have been conveniently divided into three categories:

1. Policies to alter income levels directly through the tax and benefit system. The aim is to provide direct financial support to families, recognising the extra costs of children.
2. Policies to promote paid work. The aim is to ensure that parents have the help and incentives they need to find work. Paid work is seen as the best long-term route to financial independence for families.
3. Measures to tackle long-term disadvantage. Some examples are: policies which attempt to reduce the number of teenage pregnancies; provision of support for parents of children aged under 5 in disadvantaged areas; attempts to raise basic standards of literacy and numeracy and tackle school truancy and exclusions.

These three types of policy provide a useful framework for considering the role that microsimulation analysis can play in policy development. Analysis of the first type is ideally suited to static microsimulation models since these are designed to identify the effect of detailed policy measures on disposable incomes - the models offer distinct "levers to pull" and "buttons to push" so that simulated changes translate directly into changes to actual policy rules that governments or other agencies can make.

The static approach is also useful in analysing the potential effect of policies to promote paid work through the calculation of incentives to take paid work (replacement rates) and to increase income from work (marginal effective tax rates). How much policy reforms improve incentives – and for which groups and individuals – is an important component of an assessment this second type of policy. Clearly models incorporating econometrically estimated behavioural responses - one type of “dynamic” model - are necessary if we are to predict *actual* changes in income due to changes in work behaviour.

The third type of policy takes a long time to have an impact on incomes (although there may be effects on other measures of well-being in the shorter term.) Understanding the impact of such things as childhood neglect, illiteracy and teenage pregnancy on later incomes requires suitable panel data and a longer-term perspective. One approach is to use dynamic microsimulation to construct lifetime profiles of individuals (Harding, 1990). Characteristics and activities in each period depend on past history. The effect at a point in the simulated

lifecourse of policies (or policy changes) having their initial impact at earlier stage(s) can be estimated. This type of dynamic model can be used independently of, or in combination with, models of individual behavioural response to policy changes (Mitton *et al*., 2000).

These three types of policy cannot be sustainable without a fourth: the handling of the macro economy. Welfare-to-work strategies depend for their success on jobs being potentially available. In most welfare systems it is the children of parents without paid work who run the greatest risk of living in poverty. Tax and welfare systems which aim to compensate these children are under most pressure when unemployment is high and the tax base is small. Programmes to tackle long-term disadvantage do not by their nature "deliver" quickly, and must be sustained over a long period. They may be particularly vulnerable to funding cuts when public finances are tight. Models that forecast macroeconomic changes can provide one part of the puzzle - prediction of aggregate changes - but *linking* these macro changes and the impact of macroeconomic management policies to individual living standards is more of a challenge (Atkinson, 1998).

In considering the direct effects of tax and benefit policy changes on child poverty, the information that a policy maker needs includes

- the net cost of the reform
- the reduction in the number of poor children (poverty rate)
- the reduction in the intensity of poverty (poverty gap).[3]

They may also be interested in the *efficiency* of the reforms in the sense of the proportion of the cost that reaches the poor. On the other hand they may also wish to target those "just above the line" and wish to measure the impact on their incomes.

Static microsimulation models are most useful if they are able to produce a range of outputs that provide consistent information corresponding to different objectives of policy reform. Cost-effectiveness in terms of immediate poverty reduction is one important dimension in the current context. It is this that is the primary focus of the empirical results reported in the remaining sections of this paper. However, it is worth noting that in designing or evaluating reforms, other effects are important and should also be assessed. These include the impact on the work incentives of parents and any re-distribution of incomes within the household that is implied by the changes (for example if a tax allowance allocated to the main earner is converted into a cash benefit paid to the main carer of children). Assuming the policy is not revenue-neutral, the method of financing must be considered and its effect analysed in combination with the poverty-reducing reforms. The likely level of take-up (or avoidance) as well as evasion (or fraud) is clearly important to the cost and effectiveness of the reform.

Such issues are particularly important when considering the sustainability of the reform. It is relatively easy to design policy to reduce child poverty in the short term, if this is the only goal. An unconditional benefit guaranteeing household income at the level of the poverty line (using the same income concept and implicit equivalence scale as the poverty line) would do the trick. Typically, policy has a broader range of objectives. The most obvious goal in this

[3] Of course they may also be interested in more complex indicators of poverty that illuminate specific aspects – this list is intended to be as general as possible.

context is a reduction in child poverty that is sustained over a long period. This is less straightforward to achieve. One example, again related to the UK, is illustrative. One of the components of the recent tax and welfare reforms in the UK was a cut in the standard rate of income tax of one percentage point (from 23% to 22%).[4] If this change were reversed and the revenue spent on increasing social assistance rates for children,[5] child poverty could be reduced by 6.1 percentage points.[6] This is a huge reduction - over one quarter of all child poverty before the recent reforms and equivalent to the UK government's target for poverty reduction for its whole first term of office. However, against the obvious attractions of such a policy must be set some drawbacks. First, the increase in out-of-work incomes would increase the depth of the unemployment trap, worsening incentives to take paid work or to stay in it. If in-work benefits were increased to maintain the current degree of continuity between in-work and out-of-work incomes, this would be very expensive. Furthermore, the differential between the child payments and those for dependent adults within social assistance benefits would be distorted. It would be difficult to argue that small children should receive the same (or more) minimum income as adults. Trade-offs such as those between the adequacy of minimum income levels and maintaining work incentives, and between the needs of different groups in the population are at the heart of the design of policy reforms. The use of microsimulation methods can help in assessing the relative sizes of the costs and benefits in each specific situation.

Finally, in evaluating a reform, the method of assessment, delivery and administration of the new policy components must be considered. These aspects, along with any account of the institutional framework and indeed historical context for welfare and taxes in any one country are usually not possible to capture directly using microsimulation models. However, sometimes the act of specifying the policy reform to the model usefully raises questions that are relevant to its administration. To which parent should the benefit be paid? How responsive should a means-test be to changing circumstances? Should the new instrument be taxable and is it taken account of in social assistance income assessments? Is this new instrument a cash benefit or a tax credit?

## 4 Microsimulation and poverty measurement

Tax-benefit models calculate disposable income for each household in a representative set of micro-data. This calculation is made up of elements of gross income taken from the survey data combined with elements of income – taxes and benefits - that are simulated by the model. The calculations are performed twice (or more), once for the current (or some other

[4] The UK "standard rate" is the band into which most income tax payer's taxable income falls. There is a narrow lower rate band (10%) and a higher rate (40%) that affects about 15% of income tax payers.
[5] Income support, housing benefit and council tax benefit.
[6] Using POLIMOD. See section 4 for more information about the method and assumptions used to obtain this estimate. It is certainly sensitive to assumptions about take-up of the benefits that are increased in scale. It is assumed that rates of non-take-up correspond to the proportions estimated by the UK Department of Social Security (1999c). However, it is not clear whether a higher rate of take-up would result in a larger or smaller number of children crossing the poverty line: on the one hand the revenue-neutral increase in benefit would be smaller, but on the other hand more poor children would benefit from the increase.

default) system, and again for each policy change, specified by the user. The first round effect of the change is the arithmetic difference in the "before" and "after" calculations.

The areas of policy for which changes can most straightforwardly be simulated in this manner include family benefits, social assistance benefits and other income-tested benefits, income taxes, social contributions, some forms of property taxes and indirect taxes. Some relevant changes to other elements, such as the uprating of social protection benefits that depend on contributions, and the level and coverage of minimum wages are also possible to model.

Baseline estimates of income poverty that are output from a microsimulation model can be constructed to look similar to published poverty statistics based on household micro-data. However, model outputs differ in one important respect: elements of household income are simulated using the microsimulation model, rather than being drawn directly from the household survey database. This means that the *status quo* can be compared with alternative policy scenarios, also simulated by the model. Simulated components will not be identical to the corresponding components drawn directly from the micro-data for a number of reasons:

- simulated incomes assume all the policy rules are adhered to and, where there is choice, that households operate so as to maximise their incomes; survey responses reflect non-take-up of benefits, avoidance of taxes, mistakes by the authorities in assessing eligibility or liability, mistaken reporting and possibly fraud or evasion on the part of households. If microsimulation estimates are to take account of these factors they must be modelled explicitly and the simulated departures from the rules will, on a case-by-case basis, not correspond exactly with what happens in practice;
- there may be a mis-match in the time period of the data used to simulate an income component and that used in reality by the national system and, more generally the model may simplify some parts of complex systems due to lack of data necessary to model details;
- households may be in a state of transition, meaning that the information collected from them may be a combination of that applying to the old situation and the new; simulations typically assume that one or other prevails.

## 5 Reducing child poverty: the case of the UK

The UK is one of the EU Member Sates to have recently prioritised the reduction of child poverty and to have set targets. The UK government is satisfied that the policy changes already introduced between May 1997 (when it was first elected) and March 2000 will be sufficient to meet its short-term goal of 700,000 children removed from poverty by 2002 (HM Treasury, 1999). It is clear that in some sense a feasible target was set with the impact of actual policy reforms in mind and it is very likely that the government's own static microsimulation model was used to devise the reforms and the target in combination. The official results are confirmed by an independent analysis using a different static model: POLIMOD.[7] This study takes the tax and benefit policy inherited from the previous government in 1997, and calculates the impact on child poverty of all the tax and benefit changes announced

[7] See Redmond *et al*. (1998).

up to April 2000, together with the introduction of the National Minimum Wage (Sutherland and Piachaud, 2001). As well as changes specifically targeted on children - such as introduction of the Working Families Tax Credit - the study also included general measures (such as reductions in income tax rates) and changes that resulted in net losses as well as net gains (such as the abolition of lone parent benefits).[8] Poverty measurement follows traditional UK national practice (Department of Social Security, 1999b) and therefore departs to some extent from the choices recommended by Eurostat: children are defined as in UK social policy (aged under 16 or under 19 if in full-time secondary education) rather than aged under 18; rather than the modified OECD equivalence scale, the McClements scale is used, which varies the weight of children according to age;[9] the poverty line is taken as 50% of mean household incomes (calculated over individuals) - which in this instance is almost exactly equal to 60% of the median, which is the Eurostat recommendation. The underlying micro-data are drawn from the Family Expenditure Surveys for 1994/5 and 1995/6, updated to 1999/2000 level of prices and incomes. Table 2 (top half) shows the main results which can be summarised as follows:

- The rate of child poverty falls from 26.3% to 17.0% - about 1.2 million children cross the poverty line.
- Higher proportions of children in lone-parent families are removed from poverty than are children in two-parent families. However, some children are in lone-parent families that become worse off.
- Baseline child (and all-person) poverty rates are similar to those found by Eurostat (see Table 1) using a different data source (collected in a similar period but updated to 1999/2000 in the case of the simulated estimates), and a different equivalence scale.
- In spite of a set of policies that target children, the post-reform relative risk of poverty remains higher for children than in general: the child poverty rate is 17.0% compared with an all-person rate of 14.8%.[10]

The UK study also explored the potential impact on child poverty of a successful outcome to the welfare-to-work strategy. Using static microsimulation it examined what would happen if *all* parents without caring responsibilities (full time care of invalid adults or children aged under 5) and without apparent reasons for not taking a paid job (disability, full-time student, already employed or self-employed, over retirement age) entered employment on the National Minimum Wage for 16 hours a week (the minimum to qualify for Working Families Tax Credit (WFTC)). The results are summarised in the bottom panel of Table 2. This simulation is very "static" in that it assumes no adjustment in the labour market or changes in participation by entrants' partners, and very "broad brush" in that it assumes that all new entrants are paid the same amount. However, it is a valuable exercise for the following reasons:

- it shows that the maximum effect of minimal employment is to reduce the child poverty rate by an additional 3.2 percentage points, such that the combination of tax-benefit changes and work entry roughly halves the rate of child poverty;

[8] For more details of the specific changes and modelling assumptions see Piachaud and Sutherland (2000).
[9] OECD: first adult =1.0; children aged under 14 = 0.3; other people = 0.5.
McClements: first adult = 0.61; spouse of first adult = 0.39; other 2nd adult = 0.46; 3rd adult = 0.42; 4th or further adults = 0.36; child 0-1 = 0.09; child 2-4 = 0.18; child 5-7 = 0.21; child 8-10 = 0.23; child 11-12 = 0.25; child 13-15 = 0.27; child 16-18 = 0.36.
[10] It is interesting to note that when the "alternative" policy (outlined in the previous section) of increasing child social assistance rates and not reducing the tax rate, is simulated in combination with the actual reforms, the child poverty rate does become lower than the general rate: 10.9% compared with 12.4%.

- it shows that the scale of job expansion that this work entry scenario implies - 1.5 million new jobs - is very large;
- it demonstrates that eliminating child poverty cannot rely on a welfare-to-work strategy alone: even with job-entry on a massive scale child poverty is by no means eradicated;
- it was quick to do, easy to explain and transparent in its effects and its limitations.

This type of static simulation can be complementary to simulations which estimate actual transitions in to (and out of) paid work. Blundell *et al.*. (2000) have estimated the effects of the WFTC on labour supply as modest: a net increase in participation of 30,000. Even if other welfare-to-work measures were included in the analysis it seems unlikely that the scale of entry into paid work would be such as to have a major effect on child poverty rates, at least in the short term.

## 6 Reducing child poverty in Europe by one third

The relationship between social benefits and taxes and poverty reduction is complex. Although it is clear that greater social spending as a proportion of GDP is generally associated with lower poverty rates, the relationship is not straightforward. For example, a recent analysis by UNICEF shows that Greece has only average levels of (relative) child poverty but low levels of social spending on children. On the other hand, the UK and Ireland have high levels of child poverty but relatively generous levels of expenditure (UNICEF, 2000; Figure 8). Furthermore, the general negative relationship between spending and poverty does not necessarily mean that countries with high poverty rates need to spend on the same scale as low-poverty countries to achieve the same low rate (Atkinson, 2000). The impact of national tax-benefit systems varies considerably. Marlier *et al.* (1999) and Cohen-Solal *et al.* (1999) find that the performance of social transfer systems varies noticeably in reducing the proportion of the population on a low income. A key finding of the UNICEF study, in relation to child poverty is that

> "Differences in tax and social expenditure policies mean that some nations reduce "market child poverty" by as much as 20 percentage points [e.g. France] and others by as little as 5 percentage points [e.g. Italy]. (UNICEF, 2000, page 2; examples in parentheses added)"

However, these comparisons tell us little about the most effective *structure* of social benefits and taxation for reducing poverty in any one national context. Nor do they tell us how to design the most effective *reforms* to existing systems. As well as the overall scale of spending, effectiveness depends on many other factors, including the way in which policy is targeted, whether it is conditional on certain activities, and the extent of take-up.

It is not clear that the policies adopted in the UK would have a corresponding impact in other countries. It seems unlikely. However, it would be instructive to use a static microsimulation approach examine the impact of changes *similar* to those being employed to meet specific targets. For example, the components of the UK strategy include increases in the universal child benefit, increases in social assistance benefits for families with children and a more generous system of subsidy for low paid parents. Each of these could translate into

appropriate specific changes in other countries of the European Union. At the same time, there may be existing policy or current reforms in continental Europe (and Ireland) from which the UK could learn.

The microsimulation results presented in this section represent a first stage of such an investigation. They examine the impact on child poverty of making existing national tax-benefit systems more (and less) generous to children. In doing so the aim is to explore whether child poverty in simply a matter of inadequacy in the level of the current payments and allowances, or whether there are other issues - such as the fact that the systems do not cover all poor households with children. Most of the effectiveness of the UK reforms lies in the increases to existing benefits. Although the introduction of the Working Families Tax Credit does explain 21% of the reduction in the poverty gap due to the recent package of reforms, by far the largest part of the reduction is due to increases in child benefit (a universal cash benefit) and income support (social assistance) and other means-tested benefits which explain 77% of the total reduction (Piachaud and Sutherland, 2000).

We make use of EUROMOD, a static microsimulation model of the European Union and examine the effect of scaling up or down the size of payments, allowances and deductions intended for children in each of 4 countries: Denmark, France, Spain and the UK. This model has been built to maximise comparability across countries and flexibility in conducting simulations (Immervoll *et al.*, 1999). The tax-benefit systems that we start with are those prevailing in 1998.[11] We apply scaling factors to "child elements" in the tax and contribution systems and the systems of cash social protection.[12] In practice it is not easy to distinguish these components on a consistent basis across countries. For example in the case of a family benefit paid only to families with children the approach has been to inflate (or deflate) the additional amounts per child. However, in the case of benefits that do not depend on the number of children, simply on the existence of any, it is unclear what to do. In practice a rather *ad hoc* approach has been adopted by asking the question "what would the family be entitled to if they had no children?" The difference between this and what they actually receive is the amount that is scaled up or down. The appendix describes the components of each national system that have been subjected to scaling. National tax-benefit systems and the ways they are modelled in EUROMOD are documented in EUROMOD Country Reports: Hansen (2001) for Denmark, Bargain and Terraz (2001) for France, Levy and Mercader Prats (2001) for Spain and Sutherland (2001) for the UK.

[11] Hence the results for the UK are not consistent with those in section 4 using the national model, POLIMOD, which are in terms of 1997 policy, updated to 1999/2000 levels of prices and incomes. Also, POLIMOD assumes a degree of non-takeup of means-tested benefits, based on estimates from the Department of Social Security (1999c), whereas EUROMOD assumes 100% take-up.

[12] There are some policy instruments that are not simulated by EUROMOD because of insufficient information being available in the underlying micro-data. Some of these do contain child-related elements that are not scaled up or down in this analysis. These include (a) for France, a higher rate of sickness benefit where the insured person has three or more dependent children; (b) for Spain, a higher minimum unemployment benefit if the insured person has at least 2 dependent children, and a higher unemployment assistance benefit if there are children; (c) for the UK, in the case of long-term sickness, invalidity, widowhood and old age, an additional flat-rate payment for each dependent child. There are no major child instruments for Denmark that are not simulated. (Missoc, 1998)

We take as given by the national system such factors as the definition of an eligible child and the coverage of the particular instrument. For example, it may be the case that social assistance is only available to unemployed people. Children with parents who have low incomes for other reasons would not be covered by this scheme. An effective way of reducing child poverty might be to extend the scheme to cover (for example) lone parents. But this possibility is not covered in the simulations that are done. Similarly, extending child-related measures to all children in the family instead of just the third and additional children, or instead of just young children might be an effective strategy. But these situations are not included.

EUROMOD uses micro-data from a range of sources. In the case of the four countries we consider two (Denmark and Spain) use single waves of the European Community Household Panel (ECHP) and two use income data from national household budget surveys based on representative samples (France and the UK).[13] In each case incomes and other monetary amounts are updated to 1998 levels. We use the poverty line as measured by 60% of the median household income (weighted by persons) and using the modified OECD equivalence scale, as recommended by Eurostat. Table 3 shows the baseline poverty rate estimates for all persons and for children. Children are defined as in the UK: those aged under 16 or under 19 if in full-time secondary education. In some respects this is a more comprehensive definition than in most of the studies summarised in Table 1 since it includes some children aged 18. But it excludes children aged 16-17 who have left education. Other definitions of a child might be expected to produce different results, as might other choices of equivalence scale, poverty line, and so on. For simplicity we confine ourselves to one definition of poverty and child poverty, but explore three alternative income concepts. The first is the (near) standard measure of household disposable income.[14] The other two are chosen on the basis that they may make comparisons across the four countries more illuminating. The first alternative excludes subsidies for child care (only modelled in Denmark) and the second also excludes housing benefit (a major component of the system in Denmark, France and the UK, but only a very minor component in Spain). The rationale is that both child care subsidy and housing benefit are designed to meet the cost of particular items of spending. While we might expect both to have a major direct or indirect role in preventing poverty in the countries where they exist, where they do not the corresponding services that they pay for (child care and housing) may be "free" (e.g. provided within the extended family) or subsidised.

The poverty line is calculated separately for each income concept within each country. The estimates of baseline 1998 all-person and child poverty rates shown in Table 3, using simulated components of income, are all within the (rather wide) range of estimates shown in Table 1.[15]

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[13] Denmark uses wave 2 (1994 incomes) N (households) = 3,215; Spain uses wave 3 (1995 incomes) N = 6,267; France uses 1994 data from the *Enquête sur le Budget des Familles* N =11,291; the UK uses data from the 1995/6 *Family Expenditure Survey*, N = 6,797.

[14] Market income (earnings, self-employment income, income from capital and property) plus private and public pensions, plus private transfers, plus cash social transfers, less social insurance contributions (employee, self-employed and others paid directly by persons), less income tax, less other personal direct taxes. See the work of the Canberra Group, for example Smeeding and Weinberg (1998).

[15] EUROMOD Country Reports provide further comparisons of EUROMOD poverty estimates with other sources of poverty statistics.

According to the figures in Table 3, using standard household disposable income, child poverty is somewhat higher than all person poverty in France, Spain and the UK. (This is in spite of the fact that the equivalence scale used includes a relatively low weight for children aged under 14 and hence makes it relatively unlikely that children will be counted as poor.) In Denmark the reverse is the case - the child poverty rate is less than two-thirds of the all person rate. Not surprisingly, when the childcare subsidy is deducted from the Danish income measure, child poverty rises (from 6.7% to 7.0%) and all-person poverty rises by a lesser extent. Excluding housing benefit from household income has a large effect in the three countries where it is an important component of the system: Denmark, France and the UK. The fact that poverty rates rise substantially when housing benefit is ignored is evidence of its relative importance to low income households compared with households in general.[16] However, the differential effects across countries on children are interesting. In Denmark, housing benefit appears to be more important to childless households: the all-person poverty rate rises proportionally by 38%, whereas the child poverty rate rises by only 17%. In France the reverse is true - the child poverty rate rises by a half, compared with a third for all people. In the UK omitting housing benefit causes the all-person rate to rise proportionally by a little more (26%) than the child rate (17%). This indicates the key role of housing benefit in keeping households with children out of poverty in France, while the impact is large, but less targeted on children in Denmark and the UK.

Of course, housing benefits in France may be particularly well-targeted in the sense that they may function by bringing households with children from just below the poverty line to just above it, rather than by raising incomes significantly, or by helping the very poor. To explore issues such as these, as described above, the national systems of child income maintenance and support are inflated (or deflated) and their impacts on child poverty and their cost are examined. By shifting the parameters of the systems we gain some insight into their sensitivities and rigidities. In doing so we have two particular questions in mind:

- First, how much would it cost to reduce child poverty by one third in each country using the existing systems for children?
- Second, can inflating (deflating) the differentials for children in existing systems bring child poverty rates down (up) to the level of all-person poverty? How much of an adjustment is needed?

Table 4 provides results using the standard household disposable income. (Table 5 uses income less child care subsidies and housing benefits.) Since child poverty is higher than all-person poverty in France Spain and the UK, child instruments are inflated by 10%, 20%, 30% and 50% in turn. Since an increase in child poverty relative to all-person poverty would be needed to equate the rates in Denmark child instruments are deflated by 20% as well as being inflated - in turn - by 10%, 20% and 30%.

The net cost of the changes can be compared across countries in terms of their aggregate impact on total household disposable income. In all countries the scaling up or down of

[16] The 60% of median poverty line falls by a relatively small amount when housing benefit is excluded from income - from 0.1% in Spain to 1.5% in the UK..

differential payments and allowances for children has a roughly proportional effect on the relative cost (i.e. the cost of scaling up by 20% is roughly double the cost of scaling up by 10%). This is not obviously going to be the case since interactions between different elements of the system may mitigate or exacerbate the effect of changing one instrument. (This explains why costs of the changes are not exactly proportional.)

The relative cost of scaling up is very similar indeed in Denmark and the UK. The cost of a 10% increase in child instruments is around 0.31% of total national disposable income in Denmark and 0.34% in the UK. (This suggests that the size of the existing system for children in relation to household incomes in these two very different countries is the same - an interesting finding in itself that deserves more examination.) The cost for France is higher - 0.44% of disposable income - reflecting the generosity of the French tax system to families with children. The cost for Spain is much lower - less than a third the size of the cost in Denmark and the UK. This is explained by the few elements that exist in the Spanish system in 1998 which take direct account of children. Those that exist are relatively small in size. This explains the very small effect of the changes on the Spanish child poverty rate. It falls from 22.4% to 21.6% even when child instruments are increased in size by 50%.

In absolute terms, the system for children in the UK is the most effective at moving households with children across the poverty line. If the system is inflated by 50% there is a reduction in child poverty rate of 14.8 percentage points. Figure 1 summarises the national relationships between spending and child poverty rates. Child poverty rates in the UK are reduced by half - from 29.3% to 14.5% - if the system for children is inflated by 50%. Put another way, high rates of child poverty in the UK could be reduced if the existing allowances for children relative to those for adults were made more generous.

The French system would also be effective at reducing the number of poor children if the differentials for children were increased: child poverty rates also fall by half - from 13.2% to 6.7% - on inflating by 50%. Starting from a lower base of child poverty, the Danish system naturally appears less successful in absolute terms but is very effective in proportional terms. Increasing the scale of the system by 20% reduces the rate of child poverty by 23% (from 6.7% to 5.1%), the corresponding proportional reductions for France and UK being 18% and 29% respectively. The existing scale of the Danish system for children also seems to be effective at protecting them from poverty: a reduction of 20% increases the rate of child poverty by 12% (from 6.7% to 7.6%). At the same time we can see that few children in Denmark are poor because of inadequate child payments and that few children would be made poor by reductions in the generosity of the system. On the other hand, the Danish system of protection may miss a small minority of children in very poor households. For each level of expansion in spending, the proportional reduction in total child poverty *gap* in Denmark is considerably smaller than the proportional reduction in poverty rate.[17] For example, for an expansion of 30% the gap reduction is 17% while the rate reduction is nearly double - 32%. This is in contrast with the situation in the other countries. In the case of France the gap reductions are somewhat smaller than the rate reductions whereas in the UK the reductions in

[17] The definition of child poverty gap that is used here is the total amount that would need to be spent to bring the income of all poor households with children up to the poverty line.

child poverty gap are substantially larger than the reductions in poverty rate (42% compared with 31%, for a 30% expansion).

How well the systems target poor children (or indeed are intended to address the problem of poverty at all) can be judged by comparing the proportion of the additional spending that reaches poor households with children. If the proportion of children in poverty is lower than the proportion of extra spending reaching poor households, then we can deduce that the systems do target the poor, and vice versa. Figure 2 summarises the information provided in Table 4. In Denmark and France the proportion of the spending associated with a 10% increase that reaches poor children is slightly higher than the poverty rate (7.3% compared with 6.7% for Denmark, 13.3% compared with 13.2% for France); in Spain it is lower (13.2% compared with 22.4%) and in the UK is it substantially higher (42.5% compared with 29.3%).

In all countries, as the scale of spending increases, its degree of targeting on poor households with children falls off somewhat. Compared with the UK, the relationship is relatively flat for the other three countries, suggesting that in these, the systems of payments and allowances for children are on average not strongly related to household incomes and that the reverse is true in the UK. (In France, some parts of the system are positively related to income and other parts are negatively related - the average effect is shown.)

Returning to our two central questions:

- How much would it cost to reduce child poverty by one third in each country using the existing systems for children?

The figures below show the scale of expansion of existing systems for children that would be needed to achieve a reduction of one third in the rate of child poverty and in the total child poverty gap.

| | DENMARK | FRANCE | SPAIN | UK |
|---|---|---|---|---|
| ***Child poverty rate reduced by one third*** | | | | |
| % expansion of system for children | 31.2 | 28.0 | - | 32.2 |
| % increase in total household income | 0.98 | 1.24 | - | 1.12 |
| ***Child poverty gap reduced by one third*** | | | | |
| % expansion of system for children | - | 35.4 | - | 22.2 |
| % increase in total household income | - | 1.57 | - | 0.75 |

**Source:** Derived from Table 4 using linear interpolation
- one third reduction cannot be achieved with expansion of existing system

The scale of expansion of the systems is roughly the same in Denmark, France and the UK in order to achieve the desired reduction in poverty rate (around 30%) although the cost of doing it varies from 0.98% of household disposable income in Denmark to 1.24% in France. On the other hand, reducing the poverty gap by a third requires much greater expansion in France (35%) than the UK (22%) and costs twice as much in France. Again, this is a reflection of the generosity of the French system to better off families with children, and the means-tested nature of much of the UK social security system. Figure 3 shows the proportional reduction in total child poverty gap for each level of increase in household disposable income. The UK

system, as modelled, is clearly very efficient in its potential ability to reduce the shortfall in incomes of the poor. The French system is the second most effective. Neither the Danish nor the Spanish systems are able to reduce the total gap by a third. However, it is worth noting that the UK system would look less effective at reaching the very poor if non-take-up of means-tested benefits were modelled in EUROMOD. To the extent that the poorest families do not receive their entitlements, the UK system would appear cheaper to expand and less effective in reducing the poverty gap. As things stand, the fact that the total gap is reduced by a greater proportion than the poverty rate in the UK suggests that the expansion of the system is increasing incomes among the poor, but not necessarily by enough to get them across the line.

- Can inflating (deflating) the differentials for children in existing systems bring child poverty rates down (up) to the level of all-person poverty? How much of an adjustment is needed?

Figure 4 shows the relationship between child and all-person poverty rates in each country for the various levels of expansion (contraction) of the existing systems. Points above the $45^{o}$ line show where all-person poverty exceeds child poverty; arrows indicate the baseline position and extra spending moves countries from right to left, reducing poverty rates. Again, expansion of the 1998 Spanish system is shown to have a minimal effect. For all levels of spending examined Danish child poverty remains substantially lower than the general poverty rate. In France, an increase in spending on children equivalent to 0.61% of total household disposable income (a 14% expansion of the existing system) would equalise the poverty rates. In the UK the figure is 1.9% (a 54% expansion).[18] It is interesting to note the similar gradients of all four national lines. This reflects the similar - although not identical - proportions of households with children in each country (27%, 34%, 39% and 30% respectively in Denmark, France, Spain and UK).

These results from EUROMOD allow us to make the following statements about the relative effects on child poverty of existing tax-benefit systems for children:

- In Spain the parts of the 1998 systems of tax and benefits that relate specifically to children are not designed to play a major role in reducing child poverty. Expanding them has little effect. Other approaches must be taken to reduce child poverty in Spain.

- In Denmark the child poverty rate is already substantially lower than general poverty rate. Reducing it further through expanding the existing system for children is expensive because so much of the extra spending falls on households who are not poor. The relative insensitivity of the poverty gap to increased spending suggests there may be some very poor children who are not covered by the existing systems that we experiment with. Developing policy specifically for these children may be the best way forward in Denmark.

[18] Using linear interpolation of the figures in Table 4.

- UK child poverty rates are highly responsive to increasing the generosity of the system for children. This can be explained by the extent of reliance on means-tested programmes in the UK. It suggests that amounts of benefit should be increased for children relative to adults (as indeed they have been to some extent since 1998).[19]

- French child poverty is also responsive to expansion of the system, but less so than in the UK. This is at least partly explained by a significant component of family support being delivered through the income tax system. The Quotient Familial (QF) increases in cash value as taxable incomes rise and is sufficiently generous to families with children to keep most low-to-middle income families out of income tax altogether. Increasing the QF does not benefit the poor at all, but explains the larger cost of expanding the system.

Clearly, further work could provide a more detailed and specific analysis of the role of each part of each system. The role of individual components (such as child benefits, housing benefits and income tax concessions) could be examined. The role of income-tested components and those that are not targeted by income could be explored separately. Systems could be changed in structure and coverage as well as size.

The analysis of changes in child poverty rates could also be elaborated. Sensitivities to the choice of equivalence scale and definition of a child could be explored. It would also be interesting to explore the effect of a *series* of changes to the systems, allowing the poverty line to adjust after each successive adjustment ("sequential" static microsimulation). Some policy reforms result in the poverty line shifting up (if median income is increased) and others may result in it shifting down (for example, if an increase in social assistance is paid for with a tax increase).

Finally, other dimensions of the purposes and operation of tax and benefit systems could be explored in the same framework: the impact of the changes in policy on work incentives and an analysis of ways of financing the expansion of spending are two important examples.

## 7 Concluding comments

There are a number of ways in which static microsimulation can help us understand child poverty and how best to reduce it. Those illustrated in this paper include:

- simulating the impact of policy changes on poverty measures, in order to
  - predict the effect of actual reforms in advance of contemporary micro-data becoming available
  - isolate the effect of tax-benefit policy changes from other influences
- for designing policy to meet specific targets, and for setting feasible targets
- calculating the potential effects of work entry (or work exit) on poverty measures
- using the activity of specifying simulated reforms to raise and confront detailed questions about policy design

[19] The UK findings are sensitive to the assumptions made about the rate of take-up of means-tested benefits.

- using equivalent simulations in different countries to explore and compare the characteristics, sensitivities and rigidities of national systems
- comparing the generosity of national systems in relation to poverty lines.

Other possibilities - not illustrated here - include:
- calculating possible incentive effects of policy and policy changes through replacement rates and effective marginal tax rates
- using simulated policies from different times and places to help decompose the influence of policy from other underlying influences
- "borrowing" policy ideas from one country and testing them in another
- exploring the effect on poverty measures of assumptions about dependency and income sharing within the household.

Two case studies have been provided. One, for the UK, shows that while the effect of the recent reforms will be to reduce child poverty considerably, the rate of poverty among children will remain above the general rate of poverty. It also shows that parental entry into the labour market on minimum wages has the potential to reduce child poverty rates still further, but that this strategy cannot eradicate child poverty and its success is conditional on sufficient jobs being (and remaining) available.

The second illustration uses EUROMOD to shift the parameters of four national tax-benefit systems in order to gain some insight into their characteristics with reference to child poverty. The purpose is to illuminate national differences in the relationships between some of the variables that are important for policy makers. Three particular questions were the focus:
(1) How well-targeted on poor children are child-related components in tax-benefit systems?
(2) How much would it cost to reduce child poverty by one third in each country using the existing systems for children?
(3) Can inflating (deflating) the differentials for children in existing systems bring child poverty rates down (up) to the level of all-person poverty? How much of an adjustment is needed?

We find that in some countries child poverty is highly sensitive to the scale of the existing tax-benefit system for children. The effect is particularly strong for the UK, which starts with very high rates of child poverty and also has a system that relies to a large extent (but not exclusively) on means-tested assistance. However, increasing the scale of the system for children by 50% only brings child poverty down to the level that is found in France under the existing (1998) system and fails to quite equate the UK child poverty rate with the general UK rate of poverty.

The French system overall is less targeted on poor children (due to generous family tax concessions), but it is possible to reduce child poverty by a third and to bring the child poverty rate to the level of poverty in general with relatively modest expansions of the child components in the system (28% and 14% respectively).

Child poverty is less responsive to the Danish and Spanish systems. In Spain, the 1998 system simply makes little difference to the incomes of poor households with children. In the case of

Denmark, the child poverty rate is already low and below the general rate. Expanding the scale of the system for children does reduce child poverty (in proportional terms, the reduction is large), but appears to leave a small minority of children unprotected.

Finally, by varying the definition of income used to measure poverty, we identify the importance of housing benefits in protecting people from poverty in Denmark, France and UK. They have a particular role in protecting children in France.

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**Table 1: The relative poverty risk of children in the European Union: previous comparative studies**

| Study: | Eurostat | | Immervoll *et al.* | | Oxley *et al.* | | Bradbury and Jäntti | |
|---|---|---|---|---|---|---|---|---|
| | All | Children | All | Children | All | Children | All | Children |
| Austria | 13.0 | 15.5 | - | - | - | - | 4.8 | 5.6 |
| Belgium | 17.0 | 20.0 | 10.6 | 10.9 | 7.8 | 4.1 | 5.7 | 6.1 |
| Denmark | 12.0 | 4.5 | 4.2 | 3.1 | 4.7 | 3.5 | 4.9 | 5.9 |
| Finland | - | - | 4.2 | 2.3 | 4.9 | 2.1 | 3.2 | 3.4 |
| France | 16.0 | 18.5 | 10.4 | 11.5 | 7.5 | 7.1 | 9.4 | 9.8 |
| Germany | 16.0 | 20.0 | 10.7 | 13.8 | 9.4 | 10.6 | 8.5 | 11.6 |
| Greece | 21.0 | 19.0 | 38.9 | 34.9 | 13.9 | 12.4 | - | - |
| Ireland | 18.0 | 24.0 | 27.8 | 35.3 | - | - | 12.2 | 14.8 |
| Italy | 19.0 | 23.0 | 26.6 | 30.7 | 14.2 | 18.7 | 15.6 | 21.2 |
| Luxembourg | 12.0 | 18.0 | 3.3 | 2.4 | - | - | 4.4 | 6.3 |
| Netherlands | 12.0 | 15.0 | 7.8 | 9.1 | 6.3 | 9.1 | 6.5 | 8.4 |
| Portugal | 22.0 | 23.0 | 46.9 | 51.8 | - | - | - | - |
| Spain | 18.0 | 23.5 | 34.9 | 39.0 | - | - | 10.3 | 13.1 |
| Sweden | - | - | 8.4 | 5.1 | 6.4 | 2.7 | 2.9 | 3.7 |
| UK | 19.0 | 25.0 | 15.7 | 22.2 | 11.9 | 18.6 | 15.1 | 21.3 |

**Notes:** All studies use household disposable income as the income concept (although there may be differences in interpretation of what this means in practice). All countries except Sweden use the wider household as the unit of income aggregation. Sweden uses the nuclear family, with children aged 18+ making up their own units.
- not available.
highlighted figures are those where child poverty is less than all-person poverty.

**Sources:**

***Eurostat***: Mejer and Siermann, 2000 Table 3.
Data: ECHP wave 3 (1995 incomes)
E-scale: modified OECD (children < 14)
Children: under 18.
Poverty line: **60%** national median

***Immervoll et al.*** (2000) Table 1.
Data: EU12: ECHP wave 2 (1994 incomes); Sweden and Finland: from national income distribution statistics for 1994.
E-scale: modified OECD (children < 14)
Children: **under 16**.
Poverty line: 50% mean **EU15 income** (national incomes adjusted by PPS).

***Oxley et al.*** (2001) derived from Table 15.9
Data: OECD questionnaire to national income distribution experts (various years 1993-1995)
E-scale: $N^{0.5}$
Children: under 18.
Poverty line: 50% national median

***Bradbury and Jäntti*** (1999) Table 3.6
Data: LIS data (various years **1987-1995**)
E-scale: $[Nadults + 0.7*Nchildren]^{0.85}$ (children < 18)
Children: under 18.
Poverty line: 50% national median

**Table 2: UK poverty rates before and after the Labour government's policies 1997-2001**

| | All persons | Children | | |
|---|---|---|---|---|
| | | All | One parent | Two parents |
| % poor, April 1997 policy | 19.1 | 26.3 | 42.5 | 21.8 |
| ***Tax-benefit policies*** | | | | |
| % poor | 14.8 | 17.0 | 24.4 | 14.9 |
| % point difference | 4.3 | 9.3 | 18.1 | 6.9 |
| Net no. removed from poverty | 2,480,000 | 1,230,000 | 510,000 | 720,000 |
| Moved out | 2,520,000 | 1,240,000 | 520,000 | 720,000 |
| Moved in | 40,000 | 10,000 | 10,000 | 0 |
| ***Tax-benefit policies plus parental work entry*** | | | | |
| % poor | 13.5 | 13.8 | 16.0 | 13.1 |
| % point difference | 5.6 | 12.5 | 26.5 | 5.7 |
| Net no. removed from poverty | 3,240,000 | 1,650,000 | 750,000 | 900,000 |

**Source**: Sutherland and Piachaud (2001; Table 3) and Piachaud and Sutherland (2001; Table 7) using the model POLIMOD.
**Notes:** poverty is defined as equivalised household incomes below 50% of the mean under 1997 policy and using the McClements equivalence scale.

**Table 3: Baseline estimates of child and all-person poverty rates using microsimulation: Denmark, France, Spain and UK, 1998**

| | Denmark | France | Spain | UK |
|---|---|---|---|---|
| *Household disposable income (standard measure)* | | | | |
| Poverty rate % | | | | |
| all persons | 11.1 | 11.7 | 18.4 | 20.0 |
| children | 6.7 | 13.2 | 22.4 | 29.3 |
| *Household disposable income less child care subsidy* | | | | |
| Poverty rate % | | | | |
| all persons | 11.2 | 11.7 | 18.4 | 20.0 |
| children | 7.0 | 13.2 | 22.4 | 29.3 |
| *Household disposable income less child care subsidy and housing benefits* | | | | |
| Poverty rate % | | | | |
| all persons | 15.5 | 15.6 | 18.5 | 25.2 |
| children | 8.2 | 19.7 | 22.7 | 34.4 |

**Source:** EUROMOD
**Notes:** poverty is defined as equivalised household income below 60% of the national median under 1998 (baseline) policy; using the modified OECD equivalence scale.

**Table 4: The effects on child poverty of changing the differentials for children in national tax-benefit systems: Denmark, France, Spain and UK, 1998**

*Standard household disposable income*

| | Denmark | France | Spain | UK |
|---|---|---|---|---|
| *Percentage increase in total household disposable income %* | | | | |
| -20% | -0.63 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 0.31 | 0.44 | 0.09 | 0.34 |
| +20% | 0.62 | 0.89 | 0.20 | 0.68 |
| +30% | 0.94 | 1.33 | 0.30 | 1.04 |
| +50% | - | 2.19 | 0.50 | 1.78 |
| *Child poverty rate %* | | | | |
| -20% | 7.6 | - | - | - |
| Baseline | 6.7 | 13.2 | 22.4 | 29.3 |
| +10% | 5.3 | 11.2 | 22.1 | 27.0 |
| +20% | 5.1 | 9.4 | 21.9 | 24.0 |
| +30% | 4.5 | 8.7 | 21.9 | 20.2 |
| +50% | - | 6.7 | 21.6 | 14.5 |
| *All-person poverty rate %* | | | | |
| -20% | 11.5 | - | - | - |
| Baseline | 11.1 | 11.7 | 18.4 | 20.0 |
| +10% | 10.6 | 10.8 | 18.2 | 19.0 |
| +20% | 10.5 | 10.0 | 18.1 | 17.8 |
| +30% | 10.3 | 9.7 | 18.1 | 16.3 |
| +50% | - | 8.9 | 18.0 | 14.1 |
| *Proportional reduction in child poverty %* | | | | |
| -20% | -12.4 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 20.8 | 15.5 | 1.4 | 7.8 |
| +20% | 23.4 | 28.8 | 2.3 | 18.2 |
| +30% | 32.3 | 34.4 | 2.4 | 31.0 |
| +50% | - | 49.0 | 3.3 | 50.5 |
| *Proportional reduction in total absolute poverty gap: households with children %* | | | | |
| -20% | -15.1 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 7.3 | 12.1 | 0.8 | 16.5 |
| +20% | 12.1 | 22.0 | 1.5 | 30.7 |
| +30% | 16.6 | 29.8 | 2.1 | 42.4 |
| +50% | - | 42.9 | 3.4 | 59.9 |
| *Proportion of extra resources reaching poor households with children %* | | | | |
| -20% | 7.5 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 7.3 | 13.3 | 13.2 | 42.5 |
| +20% | 6.1 | 12.1 | 12.7 | 39.4 |
| +30% | 5.5 | 10.9 | 12.4 | 35.9 |
| +50% | - | 9.6 | 11.8 | 29.6 |

**Source:** EUROMOD

**Notes:** poverty is defined as equivalised household income below 60% of the national median under 1998 (baseline) policy; using the modified OECD equivalence scale.

**Table 5: The effects on child poverty of changing the differentials for children in national tax-benefit systems: Denmark, France, Spain and UK, 1998**

*Household disposable income less child care subsidies and housing benefit*

| | Denmark | France | Spain | UK |
|---|---|---|---|---|
| *Percentage increase in total household disposable income %* | | | | |
| -20% | -0.58 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 0.29 | 0.41 | 0.09 | 0.36 |
| +20% | 0.58 | 0.80 | 0.20 | 0.71 |
| +30% | 0.87 | 1.19 | 0.30 | 1.08 |
| +50% | - | 1.97 | 0.50 | 1.85 |
| *Child poverty rate %* | | | | |
| -20% | 9.3 | - | - | - |
| Baseline | 8.2 | 19.7 | 22.7 | 34.4 |
| +10% | 7.7 | 18.5 | 22.3 | 32.8 |
| +20% | 7.7 | 17.4 | 22.1 | 29.6 |
| +30% | 7.1 | 15.2 | 22.1 | 27.6 |
| +50% | - | 12.0 | 21.8 | 25.2 |
| *All-person poverty rate %* | | | | |
| -20% | 15.9 | - | - | - |
| Baseline | 15.5 | 15.6 | 18.5 | 25.2 |
| +10% | 15.3 | 15.1 | 18.3 | 24.5 |
| +20% | 15.3 | 14.7 | 18.2 | 23.2 |
| +30% | 15.0 | 13.7 | 18.2 | 22.4 |
| +50% | - | 12.3 | 18.0 | 21.3 |
| *Proportional reduction in child poverty %* | | | | |
| -20% | -14.3 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 5.6 | 5.8 | 1.7 | 4.7 |
| +20% | 5.6 | 11.7 | 2.4 | 14.0 |
| +30% | 12.5 | 22.7 | 2.5 | 19.9 |
| +50% | - | 38.9 | 3.9 | 26.7 |
| *Proportional reduction in total absolute poverty gap: households with children %* | | | | |
| -20% | -13.2 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 5.7 | 9.2 | 0.7 | 10.9 |
| +20% | 11.3 | 18.3 | 1.5 | 20.5 |
| +30% | 16.8 | 26.7 | 2.1 | 28.8 |
| +50% | - | 38.8 | 3.4 | 43.6 |
| *Proportion of extra resources reaching poor households with children %* | | | | |
| -20% | 10.1 | - | - | - |
| Baseline | - | - | - | - |
| +10% | 8.8 | 21.2 | 13.3 | 51.1 |
| +20% | 8.7 | 21.4 | 12.8 | 47.8 |
| +30% | 8.6 | 21.0 | 12.4 | 44.3 |
| +50% | - | 18.4 | 11.9 | 39.2 |

**Source:** EUROMOD

**Notes:** poverty is defined as equivalised household income below 60% of the national median under 1998 (baseline) policy; using the modified OECD equivalence scale.

**Figure 1**

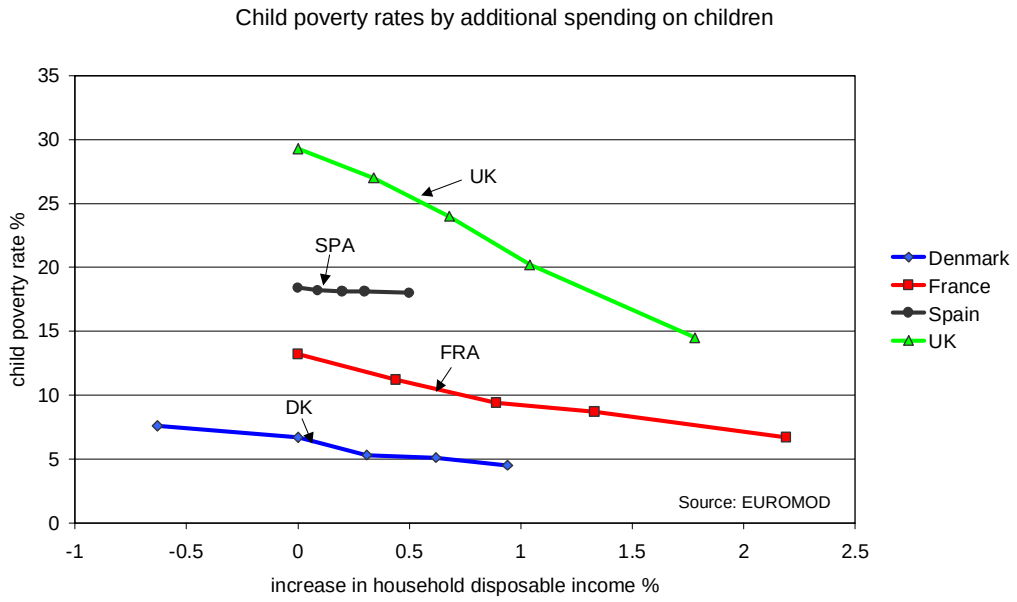
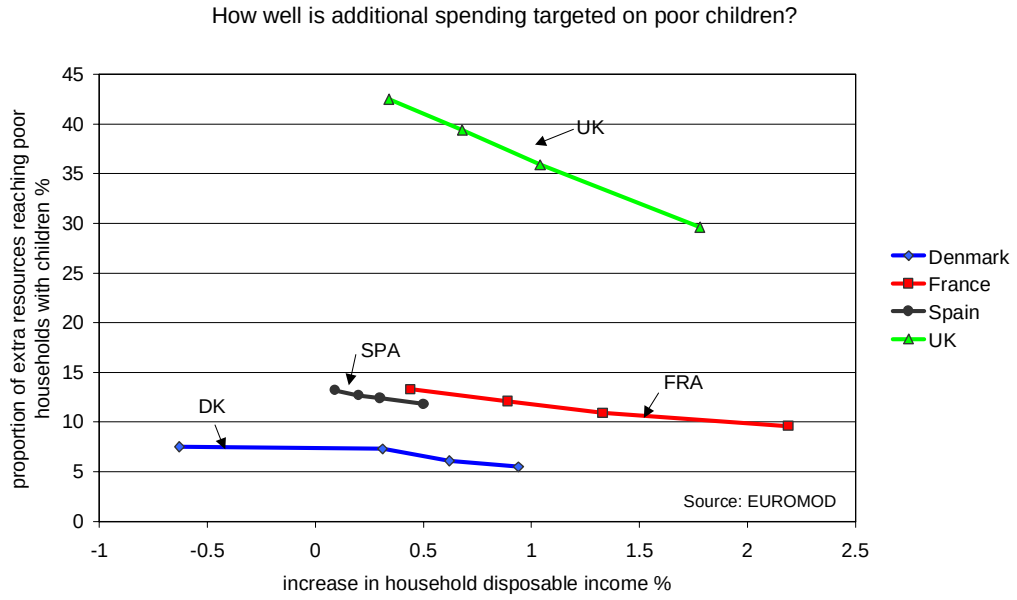
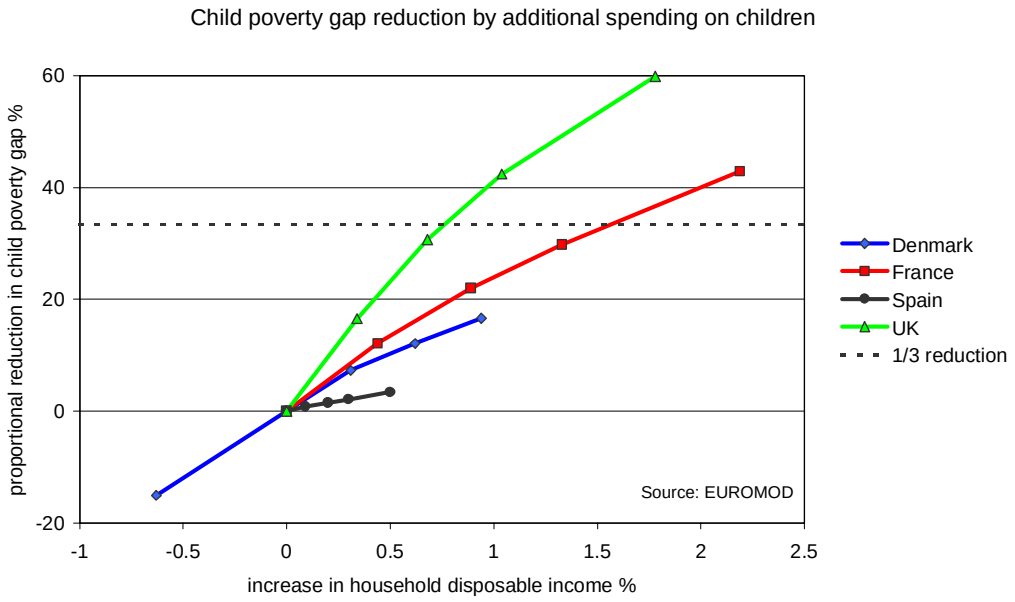


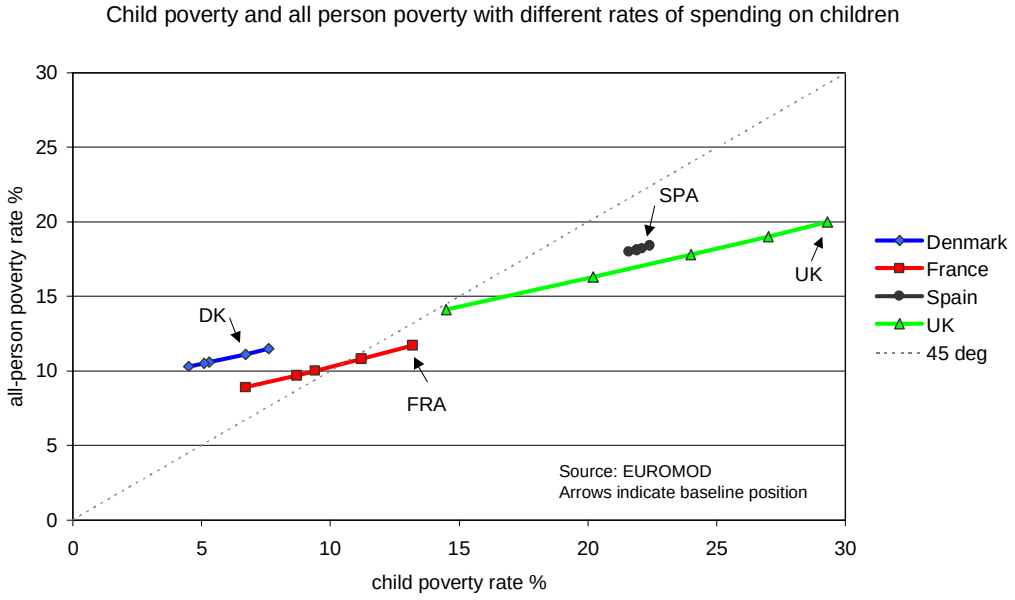

**Figure 2**



## Figure 3




## Figure 4



**Appendix: Child elements in four national tax-benefit systems, and simulated changes to them**

**DENMARK**

**1. Income tax**

Alimony is taxable but amounts for children are deductible. These amounts are changed proportionately in
***"Bottom" National Income Tax***
***Local Income Tax*** (incl. Average county, municipal and church tax)
***"Middle" National Income Tax*** *and* ***"Top" National Income Tax***

There is a young person's deduction in the "bottom" and local income taxes. This is not changed because it applies to independent under 25s as well as dependent children.

**2. Benefits**

***Family Allowance*** (per child, depending on age)
Amounts changed proportionately.

***"Ordinary" Child Benefit*** (lone parents and disabled parents, per child)
Amounts changed proportionately.

***"Extra" Child Benefit*** (lone parents, per family)
Amount changed proportionately.

***"Special" Child Benefit*** (lone parents/disabled, per child, income tested)
Amount changed proportionately.

***"Multi" Child Benefit*** (multiple births, lone parents/disabled, per child)
Amount changed proportionately.

***Day Care Subsidy***
The qualifying cost is estimated in the model because there are no data on actual payments. This depends on the age of child. It is not changed in the simulations.

There is an income limit below which 100% of costs are subsidised. This limit is not changed. There is a higher income limit below which 95% is covered. This limit is changed by adjusting proportionately the difference between the 100% income limit and the 95% income limit.

For incomes higher than the 95% limit, subsidy is withdrawn at a rate of 1% per unit amount of income. This unit amount is changed proportionately.

***Social Assistance for persons with children***
There are no child rates as such. The amount assumed to be allowed for children is the difference between the single person amount in this scheme and in the parallel scheme for families without children.

There is a calculation of maximum benefit. The assumed child element is changed proportionately.

There is an addition for inactive spouses. This is not changed.

The same adjustments are made to the actual payment calculation.
The proportional change is also made to a disregard calculation.

***Housing Allowance (part of Social Assistance)***
First the amount of own payment is calculated. This is a higher amount for parents than non-parents and then there is a reduction for each child after the first. So the proportional changes are applied negatively to the implicit first child amount in the parental own payment and positively to the child reductions.

***Housing Benefit - "Working Age"***
Maximum rent depends on number of children in household. Implicit child increments are changed proportionately.

In the calculation of HB there is an income disregard which includes a per child element. This is changed proportionately.

There is a maximum HB which, for no-child households, is a proportion of eligible rent. But for households with 1-3 children it is a flat rate amount and a higher flat rate amount for children with 4+ households. Thus it is impossible to calculate the implicit amount (or rate) per child. (The difference between the 1-3-child amount and the 4+ child amount is too big to take as the per child amount). It is assumed that the difference in the two amounts is (arbitrarily) the amount for 3 children and this is used as the amount to apply the proportional changes to (once for 1-3 children and twice for 4+ children).

***Housing Benefit - "Social Pension"***
Same changes as working age HB

***Old Age Pension***
Alimony is included in the income assessment but amounts for children are deductible. These amounts are changed proportionately.

**FRANCE**

**1. Income tax**

The family quotient (***Quotient Familial***) weights for children are increased proportionately. The maximum tax reduction due to quotient NOT increased (having the effect of making the allowance more generous but not for families already on maximum).[20]

**2. Social contributions**

Same increases in ***Quotient Familial*** operating in deductions to
***"Cottisations Social" CSG contribution for unemployment benefits***

[20] The family tax base, divided by the quotient is applied to the individual tax schedule. The resulting tax amount is multiplied by the quotient to arrive at the family tax liability.

***"Cottisations Social" CSG pension income social contributions***

**3. Benefits**

***Family Benefits: Allocation Familial*** (per child for families with 2+ children, more for older children, meanstested in 1998)
Increased proportionately
Income test not changed

***Family Benefits: Complement familial(CF)/Allocation pour Jeune Enfant(APJE)*** (2 benefits modelled together, both meanstested: CF is per child for 3+ children aged over 3 and APJE is for age 0-2.)
Increased proportionately
Income test not changed

***Education related Family Benefits: Aide à la Scolaire*** (age 11-16 meanstested)
Increased proportionately
Income test not changed

***Education related Family Benefits: Allocation de rentrèe scolaire*** (cost of school materials, annual lump sum age per child 6-18 under income threshold)
Amount increased proportionately
Income test not changed

***Housing benefits: Allocation de logement***
The housing benefit calculation depends on the number of "shares" which depends on family composition (the calculation is similar to that for the *Quotient Familial).* The total share increases with the number of dependent people (assumed to be children for our purposes). The increase for each additional dependent person is inflated. In addition, there is a maximum rent which increases with the number of dependants. These increases are also inflated. Finally, there is a deduction from the resources calculation for lone parents, which is larger for families with three or more children. The whole deduction is inflated proportionately.

***RMI:Means-tested employment benefit***
Per-child additions and lone parent addition increased proportionately

***Allocation de Parent Isolé: Means Tested Lone Parent Benefit***
Per family and per child additions increased proportionately

**SPAIN**

**1. Income tax**

***Child Tax Credit ("Por Descendientes Solteros Que Convivan")*** and ***Regional Child Tax Credits ("Por Descendientes Solteros Que Convivan")*** [21]

[21] Just four regional variations in child tax credits are modelled. (1) Castilla y Leon - it is assumed that this system of credits also covers Castilla y Mancha and Extremadura; (2) Catalunya - it is assumed that this system

All values increased proportionately

**2. Benefits**

***Child Benefits***
Increased proportionately.

**UK**

**1. Income tax**

Additional Personal Allowance (tax credit for unmarried parents) increased proportionately.

**2. Benefits**

***Child benefit*** (universal, per child, more for first children and lone parents)
Child Benefit and lone parent addition increased proportionately

***Family Credit*** (means-tested in-work benefit, only for families with children)
Rates for family and each child increased proportionately. Income threshold is not changed.

***Income support*** (comprehensive social assistance),
***Housing benefit*** and
***Council tax benefit*** (means-tested rebate against local tax)
Child additions, family premium and lone parent premium increased proportionately.
Non-dependent deductions not changed

of credits also covers Valencia and Iles Baleares; (3) Galicia - it is assumed that this system of credits also covers Asturias and Cantabria; and (4) Madrid.