Reducing Child Poverty in Europe: what can static microsimulation models tell us?\footnote{This paper was written as part of the EUROMOD project, financed by Targeted Socio-Economic Research programme of the European Commission (CT97-3060). I am indebted to my colleagues Herwig Immervoll and Cathal O’Donoghue for invaluable assistance in the use of EUROMOD, to Isabelle Terraz for advice about French benefits, and to Hans Hansen, François Bourguignon and Magda Mercader Prats, respectively EUROMOD project participants for Denmark, France and Spain. Thanks are due for access to microdata from the European Community Household Panel (ECHP) for Denmark 1995 (second wave) and Spain 1996 (third wave) made available by Eurostat; the Enquête sur le Budget des Familles for France, which has been made available by INSEE, and the UK Family Expenditure Survey (FES), which has been made available by the 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 to the other data sources and their respective providers. Section 4 of this paper is based on joint work with David Piachaud and I am grateful to him and to the UNICEF Innocenti Research Centre, Florence who financially supported this research. It makes use of POLIMOD, the tax-benefit microsimulation model constructed by the Microsimulation Unit, originally funded by the ESRC (R000 23 3257). POLIMOD is also based on the UK FES. All errors and views expressed are my own responsibility.}

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Preliminary: not for quotation. Comments welcome

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. The term “static” that is used to describe the method might suggest that such modelling is inferior to methods described as “dynamic”. However, in many contexts, a static model is exactly what is needed. Static models allow us to hold constant many variables so that we can focus on the aspects of interest. This paper aims to illustrate the range of ways in which static microsimulation can help us to understand child poverty and to develop policy to reduce it, 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.
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%?

The term “static” that is used to describe the type of microsimulation method might suggest that such modelling is inferior to methods described as “dynamic”. However, in many contexts, a static model is exactly what is needed. 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 aims to illustrate them with reference to some concrete simulation exercises and to suggest further developments. 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 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 targets. It also outlines the situations where other types of modelling are complementary and attempts 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 some early results from EUROMOD, 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)”

Furthermore, there is concern that poverty 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 (between 9% and) 15% to (between 5% and) 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, except in cases of publicly-provided goods in kind that directly counter particular forms of deprivation - such as soup kitchens or housing improvements - the use of static microsimulation to explore reductions in deprivation is not straightforward. 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) reveal that the division of consumption between parents and children alters radically with 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”.  

Member States differ in the degree to which children are over- or under-represented among 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., 2000). 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 large economies of scale (Mejer and Sierrmann, 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. 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

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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.

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 estimated behavioural responses 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 take effect. The impact on incomes that may happen eventually will be through a complex process which may be difficult to identify. Dynamic microsimulation models – and suitable information about the impact of such things as childhood neglect, illiteracy and teenage pregnancy on later incomes – are needed for an analysis of the potential contribution of long term policies on income poverty.

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 at particular risk of 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 to reduce 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).

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 the "nearly poor" 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 poverty reduction 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 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%). If this change were reversed and the revenue spent on increasing social assistance rates for children, child

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

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.
poverty would be reduced by 6.1 percentage points.\textsuperscript{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 advantages 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 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.

\textsuperscript{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.
Baseline estimates of income poverty that are output from a microsimulation model can be constructed to look similar to published poverty statistics. 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.

Apart from measurement issues, microsimulation models that have been constructed for use in a variety of contexts tend to be flexible by design and such features as the unit of income aggregation, the income concept, the choice of equivalence scale and weighting of units, and the poverty line itself may be chosen by the user.

5 Reducing child poverty: the case of the UK

The UK is one of the EU Member States 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 it's election in 1997 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 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

Poverty measurement is along the lines of 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; 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%.

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;
• 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;

8 For more details of the specific changes and modelling assumptions see Piachaud and Sutherland (2000) and Sutherland (2000).
9 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 increasing child social assistance rates outlined in the previous section 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 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: an 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.

In the medium term child poverty reduction targets are vulnerable to increases in unemployment. As well as changes in tax-benefit policy, microsimulation models can be used to explore the implications of changes in the characteristics of the underlying population, or in specific changes such as those to the levels and distributions of income. One way of gauging the scale of the effect of a growth in unemployment or inactivity on child poverty - and the public finances - is to use static microsimulation methods to create a model database that corresponds to a new “higher unemployment” scenario. To do this properly requires a dynamic approach that can predict which of the current employed would lose their jobs and what other effects there would be on the labour market. But a re-weighting of the database to increase the numbers of unemployed relative to the employed in various plausible (and transparent) ways - perhaps by industrial sector, region, occupation or age group - could be an illuminating first step.

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.\textsuperscript{11} We apply scaling factors to “child elements” in both the tax and contribution systems and the systems of cash social protection.\textsuperscript{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

\textsuperscript{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.

\textsuperscript{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)
receive is the amount that is scaled up or down. Appendix 1 describes the components of each national system that have been subjected to scaling.

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 (France and the UK). 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. As described in section 2 this includes a relatively low weight for children aged under 14 and hence makes it relatively likely that children will be counted as poor. 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. 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 not 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.

There are also some reasons quite specific to this study that lead us to be concerned about the sensitivity of results to the treatment of these items of income. In the UK there is a child care

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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).
credit that is not modelled due to lack of data. In comparisons with Denmark the value of child care subsidies should either be included or excluded on both sides. The treatment of housing benefit in France is problematic. Nearly all households in receipt of housing benefit contain dependent children but there is no parameter describing the system that allows housing benefit to be increased only for households with children. It is therefore not changed explicitly in the simulated reforms. It is interesting therefore to compare results for household incomes that do not include housing benefits and which are therefore both comparable across countries and able to provide an illuminating contrast with incomes including housing benefits.

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 range of estimates shown in Table 1. The UK poverty rate is lower than often found, particularly for children. An explanation for this lies in the EUROMOD assumption that all mainstream benefits are received by all those who are calculated to be entitled. In the UK there is a well-known problem of non-takeup of means-tested benefits (Department of Social Security, 1999c). Thus, as it stands, EUROMOD over-estimates receipt of these benefits. Since they are received disproportionately by households on less than median incomes this leads to a poverty line that is not too much higher than it should be. However, it also results in too few households with very low incomes and hence a lower poverty headcount.

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. 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 6.8% to 7.6%) 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. 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 by a third, whereas the child poverty rate rises by only a tenth. In France and the UK the reverse is true - child poverty rates rise, both proportionally and absolutely, by more. In France the child poverty rate rises by 40% (compared with 28% for all people) and in the UK while the all person rate increases by a half, the child rate nearly doubles. This indicates the key role of housing benefit in keeping households with children out of poverty in these two countries.

Of course, housing benefits in France and the UK may be particularly well-targeted in the sense that they 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, but these results are not discussed.)
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 inflated by 10%, 20% and 30% in turn, and also deflated by 20%.

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
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. (The fact that
the changes are not exactly proportional is explained by this.) The relative cost of scaling up
is very similar indeed in Denmark, France and the UK. The cost of a 10% increase in child
instruments is 0.33% of total national disposable income in each case. (This suggests that the
size of the existing system for children in relation to household incomes in these three very
different countries is the same - an interesting finding in itself that deserves more
examination.) The cost for Spain is much lower - a quarter the size. 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 22.0% 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. Figure 1 summarises the relationship
between spending and child poverty rates. Child poverty rates in the UK are reduced by 10
percentage points - from 18.6% to 8.6% - if the system for children is inflated by 50%.15 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 fall by 5.6 percentage points -
from 13.5% to 7.9% - on inflating by 50%.16 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

15 This may be less clearly the case if non-takeup of benefits were allowed for.
16 The curves for France and the UK are similar in shape to those found by Atkinson (2000) for all person
poverty rates and all benefit spending.
poverty by 26% (from 6.8% to 5.1%), the corresponding proportional reductions for France and UK being 18% and 25% 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 nearly 17% (from 6.8% to 8.0%). 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 a 20% increase in spending, the proportional reduction in child poverty gap in Denmark (11%) is smaller than the reduction in either France (17%) or the UK (25%).

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 the proportion of children that are poor. If the child poverty rate is lower than the proportion of spending reaching the poor, 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 (7.4% compared with 6.8% for Denmark, 15.3% compared with 13.5% for France); in Spain it is slightly lower (19.6% compared with 22.0%) and in the UK is it substantially higher (26.0% compared with 18.6%). In all countries with the exception of Spain, as the scale of spending increases, its degree of targeting on poor children falls off. These figures define poor children as those who are poor before any change. Thus the effects shown are not due to the additional spending shifting poor children above the poverty line. They are due to a greater proportion of the new spending falling on households who are above the fixed poverty line. Apart from Spain, the relationship is the flattest for Denmark and steepest for the UK suggesting that the system of payments and allowances for children in Denmark are relatively unrelated to household incomes and that the reverse is true in the UK. France is an intermediate case.

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?

Figure 3 shows the relationship between child poverty reduction and the scale of expansion of existing systems for children. A reduction of one third is achieved with an expansion of 31% in Denmark (corresponding to an increase in spending as a proportion of household incomes of 1.02%); 39% in France (a spending increase of 1.28%); and 26% in the UK (a spending increase of 0.84%). The 1998 Spanish system is not able to reduce child poverty by this extent: either instruments targeted on working age adults should be changed or new child instruments would be needed.

- 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?

\[\text{Using linear interpolation of the figures in Table 4.}\]
Figure 4 shows the relationship between child and all person poverty in each country for the various levels of expansion (contraction) of the existing systems. Points above the 45° 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 0.78% of total household disposable income (a 26% expansion of the existing system) would equalise the poverty rates. In the UK the figure is 0.87% (a 27% expansion).\textsuperscript{18}

These results from EUROMOD are preliminary but allow us to make the following tentative statements about the relative effects on child poverty of existing 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 solutions must be found to reducing 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.

- 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).

- 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 part of the 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 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

\textsuperscript{18} Using linear interpolation of the figures in Table 4.
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). There are some households that can be moved out of poverty relatively easily (by making existing instruments slightly more generous) but there are others - either the very poor or those not covered by existing systems - who remain below the poverty line. 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. These include:

- using simulated policies from different times and places to help decompose the influence of policy from other underlying influences
- 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 possible incentive effects of policy and policy changes through replacement rates and effective marginal tax rates
- calculating the potential effects of work entry (or work exit) on poverty measures
- exploring the effect on poverty measures of assumptions about dependency and income sharing within the household
- exploring the scale of the effect of changes in the population (ageing) or the macro-economy (unemployment)
- using the activity of specifying simulated reforms to raise and confront detailed questions about policy design

With a multi-country model the possibilities also include:

- “borrowing” policy from one country and testing it in another
- 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.

Two illustrations have been provided, one for the UK which 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 key for policy makers.

It is hoped that these illustrations not only provide concrete examples of the uses of static microsimulation but also give a flavour of the wide range of additional applications that are possible.

References


Blundell R, A Duncan, J McCrae and C Meghir, 2000, `The labour market impact of the working families’ tax credit’, Fiscal Studies, 21, 1, pp. 75-104.


Department of Social Security (1999a), Opportunity for All: Tackling poverty and social exclusion, Cm4445. London: TSO.


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

<table>
<thead>
<tr>
<th>Study:</th>
<th>Eurostat</th>
<th>Immervoll et al</th>
<th>Oxley et al</th>
<th>Bradbury and Jäntti</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Children</td>
<td>All</td>
<td>Children</td>
</tr>
<tr>
<td>Austria</td>
<td>13.0</td>
<td>15.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Belgium</td>
<td>17.0</td>
<td>20.0</td>
<td>10.6</td>
<td>10.9</td>
</tr>
<tr>
<td>Denmark</td>
<td>12.0</td>
<td>4.5</td>
<td>4.2</td>
<td>3.1</td>
</tr>
<tr>
<td>Finland</td>
<td>-</td>
<td>-</td>
<td>4.2</td>
<td>2.3</td>
</tr>
<tr>
<td>France</td>
<td>16.0</td>
<td>18.5</td>
<td>10.4</td>
<td>11.5</td>
</tr>
<tr>
<td>Germany</td>
<td>16.0</td>
<td>20.0</td>
<td>10.7</td>
<td>13.8</td>
</tr>
<tr>
<td>Greece</td>
<td>21.0</td>
<td>19.0</td>
<td>38.9</td>
<td>34.9</td>
</tr>
<tr>
<td>Ireland</td>
<td>18.0</td>
<td>24.0</td>
<td>27.8</td>
<td>35.3</td>
</tr>
<tr>
<td>Italy</td>
<td>19.0</td>
<td>23.0</td>
<td>26.6</td>
<td>30.7</td>
</tr>
<tr>
<td>Luxembourg</td>
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<td>18.0</td>
<td>3.3</td>
<td>2.4</td>
</tr>
<tr>
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<td>15.0</td>
<td>7.8</td>
<td>9.1</td>
</tr>
<tr>
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<td>23.0</td>
<td>46.9</td>
<td>51.8</td>
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<td>18.0</td>
<td>23.5</td>
<td>34.9</td>
<td>39.0</td>
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<tr>
<td>Sweden</td>
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<td>-</td>
<td>8.4</td>
<td>5.1</td>
</tr>
<tr>
<td>UK</td>
<td>19.0</td>
<td>25.0</td>
<td>15.7</td>
<td>22.2</td>
</tr>
</tbody>
</table>

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. 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.
E-scale: modified OECD (children < 14)
Children: under 16.
Poverty line: 50% mean EU15 income (national incomes adjusted by PPS).

**Oxley et al (2000)** derived from Table 9
Data: OECD questionnaire to national income distribution experts (various years 1993-1995)
E-scale: N0.5
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: Poverty rates before and after the UK Labour government's policies 1997-2001

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

**Source:** Sutherland (2000; Table 2) and Piachaud and Sutherland (2001; Table 7) using the model POLIMOD.

**Note:** 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 1998.

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household disposable income (standard measure)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty rate %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all persons</td>
<td>11.3</td>
<td>12.2</td>
<td>20.0</td>
<td>16.3</td>
</tr>
<tr>
<td>children</td>
<td>6.8</td>
<td>13.5</td>
<td>22.0</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Household disposable income less child care subsidy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty rate %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all persons</td>
<td>11.7</td>
<td>12.2</td>
<td>20.0</td>
<td>16.3</td>
</tr>
<tr>
<td>children</td>
<td>7.6</td>
<td>13.5</td>
<td>22.0</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Household disposable income less child care subsidy and housing benefits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty rate %</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all persons</td>
<td>15.7</td>
<td>15.7</td>
<td>20.1</td>
<td>25.3</td>
</tr>
<tr>
<td>children</td>
<td>8.5</td>
<td>19.2</td>
<td>22.0</td>
<td>34.8</td>
</tr>
</tbody>
</table>

**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. **These results are preliminary and should not be quoted without permission.**
Table 4 The effects on child poverty of changing the differentials for children in national tax-benefit systems

*Standard household disposable income*

<table>
<thead>
<tr>
<th>Percentage increase in total household disposable income %</th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20%</td>
<td>-0.65</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Baseline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+10%</td>
<td>0.33</td>
<td>0.33</td>
<td>0.08</td>
<td>0.32</td>
</tr>
<tr>
<td>+20%</td>
<td>0.64</td>
<td>0.66</td>
<td>0.16</td>
<td>0.65</td>
</tr>
<tr>
<td>+30%</td>
<td>0.97</td>
<td>0.99</td>
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<td>0.04</td>
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<table>
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<tr>
<th>Child poverty rate %</th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
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<tr>
<td>-20%</td>
<td>8.0</td>
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<td>-</td>
<td>-</td>
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<tr>
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<td>12.0</td>
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<td>5.1</td>
<td>11.0</td>
<td>21.9</td>
<td>14.0</td>
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<tr>
<td>+30%</td>
<td>4.6</td>
<td>10.0</td>
<td>21.8</td>
<td>11.4</td>
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<tr>
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<td>7.9</td>
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<table>
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<tr>
<th>All-person poverty rate %</th>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Baseline</td>
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<td>12.2</td>
<td>20.0</td>
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</tr>
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<td>11.6</td>
<td>20.0</td>
<td>15.3</td>
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<tr>
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<td>10.6</td>
<td>11.2</td>
<td>20.0</td>
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</tr>
<tr>
<td>+30%</td>
<td>10.3</td>
<td>10.7</td>
<td>19.9</td>
<td>13.4</td>
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<tr>
<td>+50%</td>
<td>-</td>
<td>9.8</td>
<td>19.8</td>
<td>12.2</td>
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<table>
<thead>
<tr>
<th>Proportional reduction in child poverty %</th>
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<th>France</th>
<th>Spain</th>
<th>UK</th>
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</thead>
<tbody>
<tr>
<td>-20%</td>
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<td>-</td>
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<tr>
<td>Baseline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+10%</td>
<td>11.1</td>
<td>11.2</td>
<td>0.4</td>
<td>12.9</td>
</tr>
<tr>
<td>+20%</td>
<td>25.9</td>
<td>18.4</td>
<td>0.6</td>
<td>25.0</td>
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<td>2.0</td>
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<table>
<thead>
<tr>
<th>Proportional reduction absolute poverty gap: households with children %</th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
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</thead>
<tbody>
<tr>
<td>-20%</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Baseline</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
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<td>6.3</td>
<td>9.0</td>
<td>0.6</td>
<td>13.6</td>
</tr>
<tr>
<td>+20%</td>
<td>10.9</td>
<td>16.5</td>
<td>1.1</td>
<td>25.4</td>
</tr>
<tr>
<td>+30%</td>
<td>14.6</td>
<td>23.4</td>
<td>1.6</td>
<td>34.9</td>
</tr>
<tr>
<td>+50%</td>
<td>-</td>
<td>34.2</td>
<td>2.7</td>
<td>49.1</td>
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</table>

<table>
<thead>
<tr>
<th>Proportion of extra resources reaching poor households with children %</th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20%</td>
<td>8.1</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Baseline</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+10%</td>
<td>7.4</td>
<td>15.3</td>
<td>19.6</td>
<td>26.0</td>
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<tr>
<td>+20%</td>
<td>6.5</td>
<td>14.1</td>
<td>19.6</td>
<td>23.9</td>
</tr>
<tr>
<td>+30%</td>
<td>5.8</td>
<td>13.3</td>
<td>19.6</td>
<td>21.5</td>
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<tr>
<td>+50%</td>
<td>-</td>
<td>11.7</td>
<td>19.5</td>
<td>17.7</td>
</tr>
</tbody>
</table>

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. These results are preliminary and should not be quoted without permission.
Table 5 The effects on child poverty of changing the differentials for children in national tax-benefit systems

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

<table>
<thead>
<tr>
<th>Percentage increase in total household disposable income %</th>
<th>Denmark</th>
<th>France</th>
<th>Spain</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20%</td>
<td>-0.60</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Baseline</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>+10%</td>
<td>0.30</td>
<td>0.34</td>
<td>0.08</td>
<td>0.34</td>
</tr>
<tr>
<td>+20%</td>
<td>0.60</td>
<td>0.67</td>
<td>0.16</td>
<td>0.69</td>
</tr>
<tr>
<td>+30%</td>
<td>0.90</td>
<td>1.00</td>
<td>0.24</td>
<td>1.06</td>
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<tr>
<td>+50%</td>
<td>-</td>
<td>1.67</td>
<td>0.40</td>
<td>1.82</td>
</tr>
</tbody>
</table>

*Child poverty rate %*
| -20%                                                      | 9.5     | -      | -     | -  |
| Baseline                                                  | 8.5     | 19.2   | 22.0  | 34.8 |
| +10%                                                      | 8.2     | 18.0   | 22.0  | 32.6 |
| +20%                                                      | 7.5     | 16.6   | 22.0  | 29.9 |
| +30%                                                      | 6.7     | 15.5   | 21.9  | 28.3 |
| +50%                                                      | -       | 12.8   | 21.7  | 26.4 |

*All-person poverty rate %*
| -20%                                                      | 16.1    | -      | -     | -  |
| Baseline                                                  | 15.7    | 15.7   | 20.1  | 25.3 |
| +10%                                                      | 15.6    | 15.2   | 20.1  | 24.4 |
| +20%                                                      | 15.3    | 14.6   | 20.0  | 23.3 |
| +30%                                                      | 14.9    | 14.2   | 20.0  | 22.6 |
| +50%                                                      | -       | 13.1   | 19.9  | 21.8 |

*Proportional reduction in child poverty %*
| -20%                                                      | -11.6   | -      | -     | -  |
| Baseline                                                  | -       | -      | -     | -  |
| +10%                                                      | 4.0     | 6.2    | 0.04  | 6.2 |
| +20%                                                      | 11.8    | 13.6   | 0.2   | 14.0 |
| +30%                                                      | 21.9    | 19.5   | 0.5   | 18.5 |
| +50%                                                      | -       | 33.4   | 1.6   | 24.1 |

*Proportional reduction absolute poverty gap: households with children %*
| -20%                                                      | -11.7   | -      | -     | -  |
| Baseline                                                  | -       | -      | -     | -  |
| +10%                                                      | 5.3     | 8.1    | 0.7   | 10.7 |
| +20%                                                      | 10.7    | 15.8   | 1.2   | 20.3 |
| +30%                                                      | 15.1    | 23.1   | 1.6   | 29.0 |
| +50%                                                      | -       | 35.9   | 2.8   | 44.7 |

*Proportion of extra resources reaching poor households with children %*
| -20%                                                      | 10.4    | -      | -     | -  |
| Baseline                                                  | -       | -      | -     | -  |
| +10%                                                      | 9.5     | 24.0   | 23.4  | 49.6 |
| +20%                                                      | 9.6     | 23.3   | 20.6  | 46.5 |
| +30%                                                      | 9.0     | 22.8   | 19.7  | 43.5 |
| +50%                                                      | -       | 21.3   | 20.2  | 39.0 |

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. *These results are preliminary and should not be quoted without permission.*
Figure 1

Child poverty rates by additional spending on children

Source: EUROMOD

arrows indicate baseline position

Denmark
France
Spain
UK
Figure 2

How well is additional spending targeted on poor children?

Proportion of extra resources reaching poor households with children %

Source: EUROMOD

Poverty rates are fixed, pre-reform rates

Denmark
France
Spain
UK

Poverty rate: SPA
Poverty rate: UK
Poverty rate: FRA
Poverty rate: DK
Figure 3

Child poverty reduction by additional spending on children

Proportional reduction in child poverty rate %

Increase in household disposable income %

Denmark
France
Spain
UK

One third reduction

Source: EUROMOD
Figure 4

Child poverty and all-person poverty with different rates of spending on children

Source: EUROMOD

arrows indicate baseline position
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).\(^1^9\)

2. **Social contributions**

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

\(^1^9\) 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 rentrée scolaire (cost of school materials, annual lump sum age per child 6-18 under income threshold)
Amount increased proportionately
Income test not changed

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")
All values increased proportionately

2. Benefits

Child Benefits
Increased proportionately.

---

20 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 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.
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