Comparative Analysis of Basic Income Proposals: prospects for the use of national tax-benefit models in five European countries

T. Callan and H. Sutherland

September 1996

Department of Applied Economics
University of Cambridge
Sidgwick Avenue
Cambridge CB3 9DE
Comparative Analysis of Basic Income Proposals: prospects for the use of national tax-benefit models in five European countries

Tim Callan and Holly Sutherland

September 1996

1. Introduction

The differential impact of comparable Basic Income (BI) schemes is examined for two countries by Callan et al (1996). This study uses national tax-benefit microsimulation models for Ireland (SWITCH) and the UK (POLIMOD). It finds that the relative effect of a scheme depends on the way in which it is integrated into the existing tax-benefit systems in the two countries as well as the level and structure of existing taxes and benefits, and the economic and demographic characteristics of the population. Furthermore, the types of scheme that it is possible to model for both countries is constrained by the capabilities of the two models and by the availability of suitable data in the model databases.

An extension of the comparative study to more than two countries is of interest for a number of reasons.

• BI schemes have received considerable attention in a number of European countries. These include Ireland and the UK, the subjects of the two-country study, but this interest has recently extended to Italy (Rizzi and Rossi, 1996) and has been suggested as the basis for a European wide safety net (Atkinson, 1995, chapter 15).

• The identification of the important parameters affecting the impact of BI is an aid to the design of effective schemes. Thus it is of interest to study the relative effect of BI in the context of as wide a range of existing systems and sets of underlying characteristics as possible.

• The universal and unconditional nature of BI make it a convenient benchmark policy to use as a common standard against which existing systems may be compared. This

---

1 Tim Callan is from the Economic and Social Research Institute, Dublin and Holly Sutherland is from the Microsimulation Unit, Cambridge. An earlier version of this paper was presented at the 4th meeting of the European Commission-funded Human Capital and Mobility network on Comparative Social Policy and Taxation Modelling, Cambridge 24th-25th May 1996. Thanks are due to the participants for comments and particularly to Christophe Joyeux, Nicola Rossi and Amedeo Spadaro who provided information on national models for Belgium, Italy and France respectively. The authors alone are responsible for any misunderstandings or errors that may have occurred in their use of this information.
comparative study of BI tells us as much about the differences between existing systems as about the BI schemes themselves. It is an approach to the comparison of tax and benefit systems which can encompass many aspects of the operation of these systems. Basic Income, as it is often conceived, affects both tax and benefit systems and may be integrated with either in a number of ways. Furthermore, a comparative analysis that uses microsimulation allows us to take account of many issues such as those concerning coverage and take-up, as well as differences in rates and rules.

- The comprehensiveness of any microsimulation comparison requires us to establish comparability in many dimensions. Thus a case study of BI proposals using many national models is a stringent test of the comparability of these models and of the feasibility of this approach as a general framework for a broad range of other policy comparisons. It can illuminate the difficulties and highlight the requirements of such an approach, as well as illustrate its potential.

The two-country study found that data and model constraints limited the schemes that could be modelled consistently and also limited the ways in which the results could be presented. It is to be expected that in general the more countries there are involved, the greater the accumulated constraints. This paper examines what possibilities remain after the main constraints that we can anticipate have been considered. No actual modelling has been attempted and from the experience of the two-country comparison it is to be expected that significant further problems would arise in practice. We discuss the extent to which the problems we do identify could be solved by an alternative approach: the construction of an integrated Europe-wide model.

The national models and national systems we address are those for Belgium, France, Ireland, Italy and the UK. The models are, respectively, The DULBEA model, SYSIFF, SWITCH, TBM91 and POLIMOD. The information for the UK and Ireland came from the two-country study. The information for the other three countries came from responses to a series of questions addressed to model builders in those countries. A summary of these questions is provided in the Appendix.

2. Basic Income schemes

As explained in Callan et al (1996), BI schemes can take many forms and there are also many respects in which comparability must be considered. First, the nature of the BI payment or entitlement itself must be established. Its level and unit of assessment need to be specified. The relative size of payments to adults and children of different ages and of first and subsequent adults in the unit needs to be considered (the latter in the case of a family- or household-based BI). Each of these could be determined in relation to existing national policies or could be harmonised according to some unified cross-country criterion.

Secondly, the mode of integration into the existing national tax-benefit systems needs to be established. A BI can be designed to replace either social assistance or social insurance (and other non-means-tested benefits) or both. Alternatively, it can be integrated with one or both by reducing entitlement to these existing benefits by the value (or part of the value) of the BI. On
the income tax side, BI can replace or partially replace personal allowances. Its introduction is often envisaged as being accompanied by a widening of the tax base in other respects. This might involve the inclusion of non-means-tested benefits in the tax base, perhaps with adjustments in level to prevent recipients losing. It might involve the abolition or reduction of other exemptions and reliefs.

Whether or not the level and mode of integration of the BI implies an increase in taxes (to maintain an existing revenue target) the structure of income tax can also be changed or left the same as under the existing system. It is usually the case that additional financing is required. There is no unique or neutral way of raising taxes that does not itself have an impact on the national income distribution. Indeed, whatever method is chosen, it will have a differential distributional impact in each country. Callan et al (1996) consider various income tax structures, but the financing of the reform could alternatively involve the increase in other taxes, such as VAT.

Other parts of the tax-benefit system may be affected, either as a matter of deliberate policy in the design of a particular scheme with particular goals, or as a result of the interactions in the existing system. If social insurance benefits are reduced should contributions also be reduced or abolished? Should assistance with the costs of housing be reduced or replaced? In the case of locally determined additions to income tax (or benefits), how will local finances be reconciled?

How questions such as these are resolved depends on the reasoning behind the interest in BI as the basis of a tax-benefit system. If adequacy of living standards is the main concern, perhaps in the context of an ineffective or inadequate safety net benefit, then the BI may well be considered as an additional payment. On the other hand, if the main aim of the BI is to reduce the poverty trap and improve work incentives, then account will be taken of it in the means tests and BI will replace some or all of the means-tested benefit system. Some advocates of BI see it as a way of removing the need for contributory benefits (and hence contributions). In these schemes, contributory benefits are reduced by the amount of the BI (Parker, 1989). In other schemes BI is seen as additional to existing contributory benefits and complementary to them in reducing the need for meanstesting. (Atkinson, 1995, chapter 15).

As far as tax is concerned, BI can be seen as part of a move towards a flat tax system: the same tax-free income is delivered to all regardless of income or status, accompanied by a flat tax on all remaining income. However some forms of BI could also complement increased progressivity in the income tax structure so that non-meanstested taxable transfers are worth more to people with lower taxable incomes. In general, BI is seen as one route towards the integration of tax with the benefit system, automation of which would deliver a more efficient and effective system of income maintenance. It can also be seen as a route towards the individualisation of the income maintenance system, if individual BIs are independent of family or marital status.

In a comparative perspective, however, some of these choices of principle are ruled out. The limits placed on the range of schemes that can be modelled by existing models are described in the next section. It should be borne in mind that some of these limitations reflect difficulties that
would be encountered when implementing actual BI schemes in practice. In other cases they simply reflect different emphasis in national models or differing availability of suitable data.

3. National tax-benefit models

In this section we consider the attributes of national models that are necessary to simulate the variations in BI schemes described in the previous section. As mentioned above, they are not necessarily the sufficient conditions for the models to be used in a comparative exercise. Many details of national systems and the current capabilities of national models have not been explored and it is our experience that there are many hidden problems of detail.

The characteristics of the model that are relevant for this exercise include:

1. The data in the database immediately accessed by the model and which may be referenced in the modelling or output sequences. Henceforth referred to as data.

2. Unit(s) of analysis: the unit (typically individual, family unit or household) for which results apply.

3. Scope of simulation: the elements of income that may be simulated (as distinct from read from the data).

4. Output income concept: the definition of income that is used to define gain or loss by households and fall or rise in revenue to government. Typically this is made up of elements from data and from simulation and is accumulated over a particular unit.

Four further aspects would need to be considered in any practical application:

5. Date to which the output applies. This may be later than when the underlying data were collected, since these may have been subjected to an updating or ageing procedure.

6. Model adaptability: although this exercise assumes that the models remain largely in their current state, it is also assumed that some adaption, including some additional re-programming would have to take place. We assume that the data are all available for the development of new categorical variables in the output routine and that the BI calculation itself is unproblematic.

7. Database comparability: it is assumed that the national survey data sources on which the models depend are comparable with regard to their national representativeness. Aspects such as population coverage, response rates, differential response, item non-response as well as the approaches taken to deal with such problems that are identified may vary across countries. An assessment of the comparability of the outcomes would be necessary.
8. Modelling assumption comparability: it is assumed that models treat similarly, where they arise, such problems as non-takeup, individual behaviour and within-household income sharing.

Sutherland (1995) considers some of these issues in the case of models in the same five countries.

The most fundamental requirement of the models, if they are to be used comparatively, is that the output income concept is the same in each. Typically this is made up of elements of income that are partly retrieved from data and partly from those which are simulated. Callan et al (1996) use the following definition of net income:

\[
gross \text{ original income} \\
\quad \text{plus} \\
\quad \text{non-meanstested benefits (incl. social insurance benefits)} \\
\quad \text{less} \\
\quad \text{income tax} \\
\quad \text{less} \\
\quad \text{(employee) social insurance contributions} \\
\quad \text{plus} \\
\quad \text{social assistance benefits (incl. meanstested family benefits)} \\
\quad \text{plus} \\
\quad \text{Basic Income}
\]

This definition does not allow for changes in housing assistance or local taxation, which were held constant for the UK and not modelled or not relevant for Ireland. Any one of these elements (or components of them) could be omitted from the output income measure, so long as it plays no part in the introduction of the BI scheme, either directly or indirectly. Even then, interpretation of indicators such as the percentage change in income would need to take account of the fact that they were calculated with an income base that excluded some elements and that these exclusions may be of varying importance to household incomes in each country.

The second way in which a model attribute may fundamentally reduce its ability to participate in a comparative exercise is if elements of income that would change as a result of a particular BI scheme cannot be simulated. An exception to this general rule occurs if the scheme would abolish the element entirely or reduce it by a set amount or proportion, and if the element is available in data. Typically, social insurance benefits are not fully simulated by tax-benefit models because entitlement crucially depends on unobserved variables, such as contribution records. Attempts have been made to conduct limited simulations using recorded data (Wilson, 1995), but most models are only able to increase or reduce recorded amounts of these elements of income by cash amounts, or set them to zero. In the Irish case, additions to social insurance benefits for dependents are simulated, once basic entitlement is established with reference to

2 These would simply be rudimentary simulations, requiring minimal programming.
data. In situations where receipt of more than one non-meanstested benefit is legitimate, the modelling of overlapping benefit rules is necessary for schemes that integrate BI by reducing these benefits. Any compensating reduction in benefit must take place only once per BI beneficiary if losses are to be avoided. In cases where child BIs are to be introduced with compensating reductions in child additions to social insurance or other non-meanstested benefits, these child elements must be able to be modelled.

Not being able to fully simulate social insurance benefit entitlements does not limit the modelling of most BI schemes to any great extent. However, the same is not the case for income tax or social assistance benefits, both of which must be re-calculated following a change in their income base since, by their nature, they depend on income.

If a model cannot re-calculate entitlement to meanstested benefits then it is limited to the modelling of BI schemes that either abolish meanstesting altogether (and aim to replace it) or do not include the BI in the income base for the benefit (ie the BI is added to income after the benefit). Models without these benefits in data can only model BI schemes which are additional to existing social assistance. Models which do not simulate meanstested benefits cannot model the effects of BI schemes which aim to integrate in any way with the existing benefit system.

A tax-benefit model which cannot simulate income tax is severely limited in the BI schemes it can model. None of the models considered here are in this category, but it is worth noting that the integration of a BI with the benefit system, assuming no part of that were in the tax base, would be possible to address in these circumstances.

Two further possible limitations are considered: differences in the unit of analysis employed by the model; differences in the definition of a child between models.

Comparability of model outputs depends, among other things, on being able to use a common unit of analysis. Clearly the distribution of changes in income needs to be compared across the same income units. Complete harmonisation is unlikely to be possible, since the definition of the household in the underlying household survey data is unlikely to be identical in all countries. However, these differences will be small compared with differences in household, individual and family unit distributions.

The definition of a child may not be of great importance when modelling a BI that aims to retain existing national definitions within each country's BI scheme or which involves no change in the tax-benefit system as regards children. However, the design of the child BI itself may be an issue in countries where more than one child definition is used in the tax-benefit system. If the aim is to integrate different elements of the system, then a common definition must be found. Furthermore, in a comparative study one may want to use a common equivalence scale across countries when analysing the impact of the policy change on incomes. This implies the use of a common definition of a child which in turn suggests that the definition will diverge from that used in construction of the BI scheme to a greater extent in some countries than in others. On the other hand, if there is evidence that the relative cost of children and economies of scale in general vary across countries, then it may be appropriate to use non-uniform equivalence scales.
4. Prospects for comparable modelling

Table 1 shows for each model some of the attributes listed above. It shows the status of the main categories of direct tax and benefits: whether they are simulated by the models, can only be read from data (and hence amended in limited ways), or are not accessible to the model at all. Income tax and social insurance contributions are considered, as are two categories of benefit. These are defined according to their possible interaction with BI schemes. The first category includes benefits that depend in any way on income. In most BI schemes these would include BI in their income test and hence require re-calculation following its introduction. Within this group are benefits referred to as means-tested benefits, social assistance benefits, income-related benefits or residual benefits and includes family benefits that depend on family income. For our purposes we have also included housing assistance in this category since cash housing assistance is often income-related. It is a difficult area because assistance is sometimes given as a cash benefit and in other cases as a rent subsidy. Typically, the first, but not the second, is captured in an output income measure (Gardiner et al, 1995). Exclusion of housing benefits does present problems for consistency across countries since it is sometimes integrated into social assistance or family benefits.

The second benefit category includes those benefits that do not depend on current income: many social insurance benefits, some child benefits and some other non-means-tested non-contributory benefits for the disabled and other groups.

Table 1 also shows the units of analysis that may be used by each model and the definition of a child built into each model.

**Output income concept**

Comparing the available income components for all five countries with the income definition used as the output measure in the UK-Ireland study shows that there would be two clear problems with reproducing this definition using the French, Italian and Belgian models. First, the Belgian model does not have access to information either simulated or in the database, on social insurance contributions. A unified income measure would therefore have to exclude these, and modelling BI schemes which involved any interaction or integration with contributions would be ruled out. Secondly the Italian database does not include information on all non-means-tested benefits or all means-tested benefits. The extent to which this matters in a comparative exercise would depend on the relative importance of these benefits to Italian incomes. They cannot be ruled out of the common income measure, since they are central to the exercise at hand.

**Non-means-tested benefits (including social insurance benefits)**

With the exception of Italy, data or simulations of these are available for each country. (The exclusion of medical insurance payments for Belgium is not important since these are unlikely to be included in a comparative study anyway.) If it is assumed that it is possible to identify child additions and to replicate overlapping benefit regulations, a range of BI schemes may be modelled for the remaining four countries, excluding Italy. If we can assume that the missing information on unemployment benefit for Italy is unimportant, then Italy may also be included.
It should be noted that our available information does not make it entirely clear whether state pensions are fully covered and identified in all the models and to what extent any simulation can take place.

**Meanstested benefits**

As explained above, any integration of BI with the existing system requires the simulation of meanstested benefits. In all five models the coverage is incomplete. The Irish and UK model both ignore minor benefits affecting few people. In each of Italy, France and Belgium some part of the meanstested system is also not simulated. In Belgium and France those that are not simulated are available in data, which means that the extent of the problem can be established. In general the non-comprehensive coverage of simulated meanstested benefits limits possible modelling of BI schemes to the following:

- schemes which do not integrate with meanstested benefits: BI payments are additional; or
- integrated BI schemes on the basis that the excluded benefits are unimportant.

Housing assistance is not addressed in the Irish model and is simulated in the French and UK models. Its exclusion from the output income measure and from any integration with BI places limits on possible modelling exercises. It may also pose problems for models (and national systems) where housing assistance is already an integral part of the social security system and difficult to abstract from.

**Taxation and contributions**

As explained above, the possibility of integrating a BI with social insurance contributions is ruled out. Income tax, on the other hand, appears not to present problems as all the models simulate income tax liabilities. However, it is possible that potential difficulties remain obscured and could only be brought to light with further investigation. The treatment of tax reliefs in particular may be difficult to harmonise, as was the case in the UK-Ireland exercise. In general, the fewer changes made to the income tax structure as part of the BI scheme, the fewer problems are likely to be encountered. Re-structuring income tax in a comparable way across five countries would itself be a demanding exercise.

**Unit of analysis**

The household is a commonly used unit of analysis in all models except the Irish model, which, in its current version, primarily operates at the family unit level. Family unit analysis is only possible in the Irish model and the UK models (where the definition of the family depends on the definition of a child, which is different in the two cases). It is possible to focus on individual incomes in the Belgian and UK models, but not the remainder. We cannot assume that the differences between the family unit and the household are small in this context. They will be significant if multi-family households are common, and to the extent that between-family within-household income sharing assumptions in the models differ at the household level. There are nearly twice as many family units as households in the Irish dataset. (On average there are two families per household.) For the UK the ratio is 1.24, suggesting that not only would
the choice of unit make a difference, but that the extent of this difference will vary across countries.

Although some models cannot use the family unit as the unit of analysis (the unit over which income sharing is assumed), it is an open question whether it is possible for these models (Belgium, France and Italy) to model family-based BIs. In this situation married or cohabiting couples would be identified and their joint BI entitlement would be some proportion less than that for two single adults. Similarly, we take for granted (but have not established as fact) that under existing benefit systems if the unit of entitlement is the couple or the family unit (rather than the whole household), this unit can be identified for the simulation of these benefits.

Definition of a child
None of the five definitions are the same. If national definitions are retained in each case this will not cause comparative modelling problems, but account of this will need to be taken in the national implementation of the BI and if a uniform equivalence scale is to be used.

5. Four schemes

We focus on four BI schemes and examine the possibilities for modelling them for all five countries. In each case we assume (unless otherwise stated):

- the unit of analysis is the household, except in the case of Ireland, where it is the family unit;
- simple universal structures of BI, based on existing national definitions of children and couples, without introducing the complications of differential payments for people in special circumstances (for example, higher BIs for pensioners would require harmonisation of the definition of this group; data identifying the disabled would be needed for a disability addition to the BI);
- no changes to social insurance contributions, housing assistance or net local tax;
- financing by simple changes to income tax;
- partial integration of income tax by abolition of personal allowances (or reduction in them if their value is greater than the BI);
- specific national income tax reliefs to remain unchanged as far as possible;
- the BI is not itself taxed;
- the BI is included as income in any residual means test.

(i) Full replacement BI
1. All existing social security benefits are set to zero (except housing assistance), either in the database or by simulation.

2. The BIs are set at levels sufficient to protect current benefit recipients. This could be interpreted in a number of ways. It could be the maximum level of benefit, fully protecting all benefit recipients. To reduce costs, it could be the minimum benefit level, implying some low income loser. Or an intermediate level could be identified whereby the majority of benefit recipients were protected.

3. Personal income tax allowances are set to zero and tax rates are increased enough to finance the scheme (options could include an increase in the `main' rate, proportional increases in all rates; percentage point increases in all rates).

Problems with this scheme arise with Italy, where not all the benefit system is available to the modeller for abolition, and the UK where keeping housing assistance intact at the same time as abolishing the rest of social assistance is not straightforward.

This is a radical scheme which would be expected to have a major impact on tax rates in each country but which would also have a large differential effect depending on the relative generosity of the current systems. The more universal the BI became (ie the less discrimination there was on the basis of the relative need of different groups) the more expensive the scheme, since the key parameter would be the largest benefit income received under the current system, rather than anything related to the coverage of the current system. The cheaper the scheme (in terms of the smaller the tax increase necessary to finance it), the greater the losses experienced by current benefit recipients, particularly those currently judged most in need or most deserving (and hence receiving the most generous benefit).

(ii) Full BI replacing social insurance and other non-meanstested benefits

1. Existing non-meanstested benefits set to zero.

2. BIs set at levels at least sufficient to approximately replace social insurance benefits.

3. Meanstested benefits remain as a safety net in cases where the BI is not sufficient to meet need.

4. Personal income tax allowances are set to zero and tax rates are increased enough to finance the scheme (as above).

Problems with this scheme again arise with Italy, where unemployment benefit cannot be identified or abolished. Retaining a residual meanstested system causes problems to the extent that it is incompletely simulated in each model. This appears to be particularly severe in the Belgian and Italian models. In cases where income-related benefits are not fully simulated, we have few options:

- assume the benefits that are not simulated are insignificant;
or

• assume that the rules governing the benefits that cannot be changed do not allow for the reforms taking place: entitlements to these benefits remain the same.

For those benefits that are available in data, we could assume they are abolished at the same time as social assistance benefits. The remaining (simulated) benefits are assumed to fill the gap. This solution is not appropriate in the case of the Belgian and Italian models (and to some extent, the French model) where the main simulated benefits are those applying to families with children. These cannot be assumed to `fill the gap' for other families, who do not qualify for them.

The relative generosity of the social assistance and social insurance systems in each country, as well as the comprehensiveness of the coverage or take-up of each would be expected to be the key parameters in affecting the national costs of such schemes. We would expect BI schemes which guaranteed a level of income in relation to a national relative scale, such as a proportion of median income to encounter similar problems as those schemes which replace social insurance. Such a scheme could be designed to ensure an adequate income level (in relative national terms), with the existing means-tested system acting as a safety net. However, models that did not capture all means-tested benefits might underestimate savings on these benefits and at the same time risk missing some people falling below the safety net provided by them.

(iii) A Partial BI

1. Leave existing non-means-tested benefits unchanged.
2. BIs set at modest `affordable' levels.
3. Means-tested benefits remain as a safety net.
4. Personal income tax allowances are set to zero (or reduced if they are worth more than the BI) and tax rates are increased enough to finance the scheme (as above).

In this scheme the aim is to supplement social insurance benefits and hence these, and other non-means-tested benefits are left unchanged, avoiding any problems with exclusions from the models. The BI is set at a level that requires a relatively modest tax increase to finance it. For example, if it is set equal to the mean cash value of personal tax allowances then there will be no net cost among taxpayers. The cost of delivering the small BI to people in receipt of social assistance will be clawed back by reductions in entitlements to these, leaving only the cost of BIs for people who are in neither group to be met by increases in tax. (People in both groups may face a loss.) However, this structure depends on means-tested benefits remaining as an important part of the system. Although the BI reduces entitlements, these benefits will typically still act as a safety net for families without other sources of income such as earnings. Thus it is of great importance to the assessment of such schemes that the means-tested system is simulated accurately. Judgements about the relative importance of the benefits not simulated by each
model will therefore have to be made, and it seems unlikely that the Belgian or Italian systems are captured sufficiently in this respect.

Of the meanstested benefits that are simulated by the models, there is a concentration of modelling effort on family benefits. A BI scheme which focuses only on children may therefore offer the greatest scope for comparable simulation by the models.

(iv) A Child BI

1. A child BI which could be a flat rate amount, or could vary by age or number of children, based on national child definitions.

2. Non-meanstested benefits remain unchanged, except with respect to any child additions, which would be reduced.

3. Meanstested benefits remain unchanged in structure but take account of the child BI in their income test.

4. Child and family tax allowances are abolished. Tax rates are increased enough to finance the scheme (as above).

This scheme is similar in structure to the previous one except the BIs are only paid on behalf of children, replacing any concessions in the income tax system. Here, however, we assume that child additions to non-meanstested benefits are reduced by up to the amount of the child BI. This is only possible in models where these elements are identifiable or where their receipt can be inferred from other information and a rudimentary calculation carried out for the reduction which offsets the BI.

If we can assume that the main adjustments in the meanstested system take place within the child and family benefits that are simulated by the models, then this scheme can be modelled by all of them. However, it should be remembered that any follow-on effects on benefits not simulated (such as housing assistance or a general safety net benefit) will not be captured. It would not be easy to establish a comparable list of benefits in each country that would take account of the new child BI, and a list of benefits that would not on this basis. In the UK, for example, the distinction between a family benefit and one which applies to a wider group is difficult to determine.

An alternative option would be not to abolish or reduce the child additions to social insurance benefits, avoiding any problem with modelling these reductions. This would increase the net cost of the BI. In countries where there is substantial non-meanstested child support, it would increase the relative generosity of support to families not on meanstested support relative to those who were.

Either version of the scheme would represent a transfer of resources from families without children to those with children. In a comparative exercise we would expect the relative impact of this shift to depend on the national distribution of children in families or households, the
definition of a child itself and the existing level of child support through the tax and benefit systems. The scheme suggested here does not explicitly base the level of the child BI in terms of any existing parameters of the system. There are many ways of doing this - using the child elements inherent in some chosen part of the system or by taking some external estimate of the cost of a child - and the results would be highly sensitive to the choice, since they would depend on the existing modes and levels of support in each country.

6. An integrated approach

It is clear that severe constraints are placed on any comparative modelling of BI schemes for all five countries considered here using existing national models. Many of the more politically attractive schemes are all but ruled out. If we were to include more countries and more models, the choice of BI scheme would become even more limited. In order to be able to model a wide range of new schemes, as well as compare national systems in a framework that offers all the advantages of microsimulation, a different approach is required. An integrated model with a core of common definitions would allow us to model comparable policies in a way that did not itself limit the policy questions of interest and which did not confuse genuine national differences with variations in technique or assumption.

National models are built with national priorities and traditions in mind. They are often initiated for a single purpose and then develop incrementally as new applications are considered and new funding opportunities arise (Sutherland, 1995). Even highly developed and mature models continue to show signs of their origins. Thus the Irish model operates primarily at the family unit level and the UK model cannot easily produce an output income measure that is net of housing assistance. All the models reflect the child definition inherent in their national systems. One approach to avoiding the limitations caused by these kinds of in-built rigidities would be to amend national models in order to harmonise their assumptions and options. Where a few countries and limited policy areas are involved, this could be a fruitful approach that would at the same time improve the methods and scope of the national models as each learned from each other. However, if a larger number of countries were to be involved, and particularly if the modelling of a wide range of policy options across the European Union were the objective then, as described above, this harmonisation process would have to take many more limitations and rigidities into account and the work involved would be substantial. An alternative approach is to build an integrated Europe-wide model, designed specifically to maximise comparability (Sutherland, 1996).

Other aspects of the constraints imposed by national models may appear to be more problematic, particularly where exclusions of key policy elements from the models reflect absences in the underlying data. However, in some situations the missing information has been imputed in the models, reflecting the importance of the particular policy element in national debates. This is the case for both social insurance contributions and local tax in the UK model. Thus although the lack of adequate data appears to inhibit the range of policy areas simulated by a model, it does not entirely explain their omission. Nor does it rule out the development of a model which attempts to fill crucial holes in the data. While imputations are clearly inferior to real data, the development of a transparent and principled framework in which to carry them out would allow us to construct a comprehensive model.
Finally, there are differences between the systems in countries that mean that it is not possible to approach each case in a common way. An example is the relative importance of goods in kind in relation to cash transfers, particularly where no data are available on the value of the in kind income. A unified model has the advantage that it is forced to confront these issues directly as it is being built. The users of such a model would be made aware of differences between countries that do not lend themselves to a common approach: a feature that would itself be instructive.

The hypothetical comparative exercise reported in this paper has suggested several elements of an integrated European tax-benefit model that would be important to make part of a common core. These include:

- units of analysis and units of assessment;
- definitions of a child, and equivalence scales;
- output income measures;
- range of policy elements that can be simulated;
- range of policy elements that can be amended.

Others, that have not been the subjects of this paper but would require treatment within a common framework include:

- date of simulation;
- database representativeness;
- modelling assumptions concerning such problems as non-takeup, individual behaviour and within-household income sharing;
- reference period for income data;
- model language, model structure, and hardware and software requirements.

For each individual single country it is likely that the unified treatment of their data and national tax-benefit system may diverge in a number of respects from what happens in the national model. However, the existence of national models allows these differences to be monitored, and their effects quantified. Experience with the UK-Ireland comparison showed us that national models have much to learn from each other in terms of the techniques and assumptions used and the available options that can be offered. We would expect the exercise of building a European model to contribute substantially to the body of knowledge and expertise among model builders and users worldwide, as well as providing a unique tool for comparable policy analysis across Europe.
References

## Table 1: The Scope and Characteristics of Five National Models

<table>
<thead>
<tr>
<th></th>
<th>Income Tax</th>
<th>Social insurance contributions</th>
<th>Social insurance and other non-meanstested benefits</th>
<th>Social assistance and other meanstested benefits</th>
<th>Units of analysis</th>
<th>Definition of a child</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Belgium</strong></td>
<td>Simulated</td>
<td>No</td>
<td>Most in data; child allowances are simulated⁶</td>
<td>Meanstested child allowances are simulated; remainder in data</td>
<td>Household; individual</td>
<td>0-18; 19-25 if in education; child must have income less than a specified amount</td>
</tr>
<tr>
<td>DULBEA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>France</strong></td>
<td>Simulated</td>
<td>Simulated</td>
<td>Family allowance simulated; remainder in data</td>
<td>Some simulated;⁴ some in data.⁵ Some housing assistance simulated.⁶</td>
<td>Household</td>
<td>0-16; 17-20 if in education; 16-18 if parents unemployed</td>
</tr>
<tr>
<td>SYSIFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td>Simulated</td>
<td>Simulated</td>
<td>Data on receipt indicates entitlement; some aspects simulated</td>
<td>Main benefits simulated; minor benefits ignored. Housing assistance not modelled.</td>
<td>Family unit; (household¹)</td>
<td>0-14 or in full-time education (no upper age limit)</td>
</tr>
<tr>
<td>SWITCH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td>Simulated</td>
<td>Simulated</td>
<td>No⁵</td>
<td>Meanstested family benefits are simulated; Some in data. Others not available.⁹</td>
<td>Household</td>
<td>0-17; 18-25 if university student</td>
</tr>
<tr>
<td>TBM91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UK</strong></td>
<td>Simulated</td>
<td>Simulated</td>
<td>Child benefit and one-parent benefit simulated; for the others, data on receipt indicates entitlement; some aspects simulated</td>
<td>Main benefits simulated⁰; minor benefits ignored;¹¹ housing assistance simulated.</td>
<td>Household, family unit or individual</td>
<td>0-15; 16-18 in full-time non-advanced education</td>
</tr>
<tr>
<td>POLIMOD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Benefits are distinguished on the basis of whether or not they depend on income, regardless of which other factors they also depend on. Thus family benefits are divided between meanstested and non-meanstested benefits according to this criterion.

1. Except medical insurance.
2. Contributory allowances and those for the children of disabled and student parents.
3. Pension de Reversion, Retraite (pension), Indemnité viagère de départ d'anciens agriculteurs (for older farmers), Pension alimentaire (divorcede's pension), Pension de guerre ou d'invalidité (war or disability pension), Indemnité de chômage (unemployment), Préretraites (early retirement).
4. Allocation aux vieux travailleurs salariés (older workers allowance), Complement familial, Allocation pour jeune enfant (young child allowance), Allocation parent isolé (lone parent allowance), Allocation de rentrée scolaire (re-entry school allowance).
5. Minimum vieillesse (old age pension), Aide de l'employeur ou de la Mairie (employer or council aid), Bourse d'étude (scholarships), Aide sociale de la Direction Affaires Sociales et Sanitaire, Allocation parentale d'éducation (education allowance), Allocation de garde à domicile (babysitting allowance).
6. Allocation pour le logement.
7. The Irish model currently operates primarily at the family unit level, although household analysis is possible.
8. Mainly unemployment benefit.
9. Sub-minimum compensation payments, not included, are to be abolished in 1996.
10. Family credit, income support, council tax (local tax) benefit.
11. Disability working allowance.
Appendix: Questions put to national model-builders

Basic Income in European Countries

Basic Income (BI) schemes come in many forms. Even the simplest (eg universal, uniform and individual-based) may be integrated into the existing tax-benefit system in a large number of alternative ways. It may entirely replace elements of the system, may partially replace them or may supplement them. The BI may itself affect the calculation of the elements that remain (it may be taxable or be included in the income assessment for means-tested benefits). The feasibility of a multi-country study of BI proposals depends crucially on the characteristics of the national models and well as the current tax-benefit systems. An initial attempt at assessing what is and what is not possible depends on the answers to the following questions. *If the terminology used is unclear or inappropriate then please say so.*

1. Means-tested benefits and state pensions

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>None</th>
<th>Some*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in the survey database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included in the model database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated within the tax-benefit program</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Social insurance benefits and state pensions and other non-means-tested benefits

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>None</th>
<th>Some*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in the survey database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included in the model database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated within the tax-benefit program **</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Child benefits and family allowances

Please indicate the nature of child benefits/family allowances in your country:

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in the survey database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included in the model database</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated within the tax-benefit program</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Please specify those included and excluded and give an indication of the relative importance of those excluded (on a separate sheet if necessary).
** Please indicate whether the benefits are fully modelled (ie contribution conditions etc) or simply the amounts of payment (with receipt of benefit being taken as an indicator of eligibility), or if some other strategy is used.
4. Employee social insurance contributions

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in the survey database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included in the model database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated within the tax-benefit program</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Income tax

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included in the survey database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Included in the model database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulated within the tax-benefit program</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Definition of a dependent child

Does your model have a fixed definition of a dependent child? If so, please describe and indicate and what this definition is based on.

Is it possible to change this definition with reference to the survey database? *

7. Unit of analysis / Unit of tabulation

Which units of analysis are possible for your model (family unit is used as meaning adults plus dependent children, with adult children counting as a separate unit)?

- Household
- Family unit of head of household
- All family units
- Individuals

At which levels can your model produce tabulations?

- Household
- Family unit of head of household
- All family units
- Individuals

8. Finally.....

Which recent policy years can your model simulate (eg 1994, April 1995 - March 1996, ...)

* Please estimate how many days work.