THE WELFARE INTERPRETATION OF FAMILY SIZE EQUIVALENCE SCALES

by Bruce Bradbury

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Tony Eardley
Editor
Abstract

Do family size equivalence scales have a welfare interpretation? Whilst many economists routinely use equivalence scales as a component of between-household welfare comparisons, others insist that choice over demographic composition means that such an interpretation is inappropriate. This paper discusses the conditions under which equivalence scales may be appropriately used for welfare comparisons, and concludes that they will often, but not always, be satisfied. In particular, the analysis suggests that distributional analysis should assume that equivalent income is different for the adults and children in each family.
1 Introduction

Family size equivalence scales are indices that show the relative income levels required by people in different family types to attain the same level of economic well-being. As such, the theory of equivalence scales might be described as an ‘economic theory of (relative) need’. The applications of equivalence scales are, in consequence, many. Research on the level and distribution of economic well-being has long recognised the importance of taking account of the different needs of people in different family types. These concerns are also reflected in government policies. Whilst need is not always the central rationale for income support and taxation policies, it is nonetheless an important criterion and one whose importance is likely to grow along with the increased targeting of social assistance.\[^1\]

Despite these many applications of equivalence scales, many economists remain extremely sceptical. They agree with the oft-quoted views of Pollak and Wales that, ‘if a family chooses to have three children and $12,000 when it could have had two children and $12,000, then a revealed preference argument implies that the family prefers the alternative it chose’ (1979: 219). Whilst children may be costly, that parents (often) choose them must imply that they bring offsetting benefits. Pollak and Wales describe equivalence scales that do not take account of the benefits of particular family compositions as ‘conditional equivalence scales’, because they can be derived from consumer demand behaviour under the assumption that demographic structure is fixed. Conditional equivalence scales thus describe the costs of children but not their benefits.

Pollak and Wales argue that, whilst these scales may be useful for explaining patterns of consumer demand, for welfare comparisons we need to consider ‘unconditional equivalence scales’ which take full

\[^1\] Similarly, the close relationship between the concepts of equity and need means that equivalence scales often appear in legal applications, such as the question of the compensation to be paid to families with deceased members (Luntz, 1990).
account of choices over demographic composition. These latter scales cannot be inferred from consumer demand behaviour alone. Such considerations have led Blundell and Lewbel (1991: 66) to conclude that to use equivalence scales derived from demand data for welfare comparisons is ‘inherently dishonest or at least uninformative’.

Despite these criticisms however, commodity based equivalence scales continue to be estimated, and, what is more important, continue to be used in research and policy applications. Many users would echo the views of Deaton and Muellbauer:

That parents choose to have children means that the benefits of having them are greater than the costs, but it does not mean that the costs are zero. What is required is a narrower and more purely economic definition of parental welfare, and one that excludes the benefits of the children themselves, whether real or psychological. (Deaton and Muellbauer, 1986: 725)

Rather than setting the question to one side in this way, however, the goal of this present paper is to specify more clearly how these widely divergent points of view might be reconciled. Specifically, the question addressed here is: under what circumstances will the narrow concept of cost implicit in conditional equivalence scales be consistent with a broader view of welfare maximisation?

Whilst the basic thrust of the ‘demographic choice’ argument cannot be denied, there are three separate grounds on which a case can be made for the use of conditional equivalence scales for welfare comparisons. These three arguments are based on different constraints on the demographic choices open to families and individuals. The first, and most straightforward argument, is that often we may be concerned with the welfare of those who do not make the demographic choices – the children of the household. Second, many adults do not have total control over their fertility. In some circumstances this may imply that the conditional equivalence scale will be close to the unconditional scale. Similarly, single people are not always able to marry or cohabit with the person of their choice.
Finally a more general argument for compensation for child costs rests on imperfections in capital markets. If, for example, incomes are relatively stable over the lifecycle, but the childrearing years involve additional expenses, utility maximising individuals will tend to save when they do not have children and borrow when they do. If capital markets do not permit this behaviour (or if childrearing cannot be foreseen) then state intervention to redistribute from those without children to those with, can be welfare enhancing.

The object of this paper is to address these arguments more carefully, and to see what happens when we take both choice and constraint seriously. Whilst the variety of choices and constraints facing households is enormous, and difficult to subject to empirical investigation, there are assumptions that can be made which are plausible and also permit us to make some headway in resolving these issues. To keep the discussion simple, I focus on only three family types, single people, couples and couples with children. Since quite different issues are involved in household formation vs fertility behaviour, these two comparisons are treated separately. It is assumed that commodity based equivalence scales can be estimated for these three family types - with the scale for couples without children set at unity. To simplify discussion, these equivalence scales are assumed to be the same across all income levels.

Following Pollak and Wales, most discussion of these issues has focused on the choices facing (potential) parents. This perspective is followed in the next two sections, where issues relating to unanticipated low incomes and savings constraints are considered in turn. Section 4 then considers the implications of these choices for children, whilst Section 5 considers the issue of marriage. The conclusions are summarised in Section 6.

2 Parents: Unanticipated Low Incomes

We begin by assuming that the preferences of the (potential) parents in a given household can be represented by a single utility function, and consider the relationship between the costs of children, fertility decisions and welfare. Issues such as the distribution of resources within the
household between men and women are not addressed. Labour supply is assumed to be exogenous. Following Deaton and Muellbauer (1980), the parental welfare function to be maximised is represented as

\[ w = W(U(q,a), a) \]  \hspace{1cm} (1)

where \( U(q,a) \) is the parents’ welfare function over commodities, which depends upon both quantities \( q \) and demographic composition \( a \), and \( W(U,a) \) is the parents’ overall welfare function that also takes into account the direct contribution of children to the parents’ well-being. The separable form of this equation means that the parents’ decision problem can be considered in two stages.

First, for a given demographic composition, \( a \), and budget constraint \( y = pq \), the parents choose \( q \) to maximise \( u = U(q,a) \). The behavioural outcomes of this maximisation can be used to identify a conditional equivalence scale, \( m(a) \) such that,

\[ m(a_1) = \frac{c(u_0, p_0, a_1)}{c(u_0, p_0, a_0)} \]  \hspace{1cm} (2)

where \( c(u,p,a) \) is the cost of reaching (sub) welfare level \( u \) at prices \( p \) and with demographic composition \( a \), and the subscripts 0 and 1 represent the reference and comparison families respectively. For simplicity of presentation, it is assumed that \( m(a) \) is independent of \( u_0 \), and prices are assumed constant and identical across family types. Hence the maximum value of \( u \) that can be reached given \( y \), \( p \) and \( a \) can be represented by the indirect utility function, \( V(y/m(a), p) \). That is, commodity based welfare will be a function of equivalent income \( (y/m(a)) \) and prices; with demographic effects relevant only through equivalent income. One way of interpreting this conditional equivalence scale is to describe \( 1/m \) as the

\[ 2 \text{ Or alternately, income can be considered as full income.} \]

\[ 3 \text{ The assumptions required to do this are, nonetheless, far from trivial. See Deaton and Muellbauer (1980) for an overview.} \]
fraction of household income that is adults’ rather than children’s consumption.\textsuperscript{4}

Given this information about the relationship between demographic composition and commodity based welfare, the second stage of the household’s maximisation problem is then to choose $a$ and $u$ to maximise $W$ whilst satisfying the constraint that $u=V(y/m(a),p)$.

The trade-off that this implies between commodity and ‘demographic’ consumption is shown in Figure 1. The horizontal axis of this figure shows the number of children, assumed for heuristic purposes to be a continuous variable. Since $V$ is an increasing function of $y/m(a)$, and utility is an ordinal concept, we can use equivalent income as our indicator of commodity based utility, and this is shown on the vertical axis. The solid lines in the figure illustrate the possible trade-offs available to the parents between equivalent income and number of children, for each level of income. For a simple ratio equivalence scale these ‘demographic constraint’ lines will be convex to the origin, with the convexity increasing the greater are economies of scale. Since $m(a) = 1$ when there are no children (this is defined to be the reference family type), the intersection of these lines with the vertical axis shows the level of money income for each line.

The dotted lines in the figure illustrate a set of hypothetical parental indifference curves describing the trade-off between children and equivalence income. For parents with preferences as denoted in Figure 1, children are a normal good, with more preferred as income increases. Below an income level of $y^0$, however these parents would prefer to have no children. Note that this figure represents the preferences of one household only. Clearly the fact that at any given income (or lifetime income) some adults choose to have children whilst others do not, suggests that there will be significant variations in the preferences for children vs commodity consumption.

\textsuperscript{4} Though the concept of an equivalence scale does not rule out the existence of family goods, nor of children’s consumption entering directly into the parents’ utility function. See Deaton and Muellbauer (1986).
This variability of preferences poses problems for interpersonal welfare comparisons. Typically, applied welfare economics deals with the problem of interpersonal comparability by comparing money metric welfare levels for some arbitrary set of preferences and prices (e.g. as implied in equations 1 and 2). If preferences vary widely such comparisons are not possible. However, insofar as demographic preferences vary only with income and the effective ‘price’ of children as represented by m(a), economic analysis can be used to illustrate the welfare effects of constraints on demographic choice.
The first point to make in this regard is that many parents do not have control over their family composition because of imperfect contraception. In general, any constraint upon behaviour will lead to a fall in welfare (or at best no change). However whilst some adults may end up with children they did not plan, others may be unable to have children when they wish to. Hence this sort of constraint in itself does not provide a general justification for compensation for families with children. However some forms of constraint are more policy (and research) relevant than others. One key constraint is that of unanticipated reductions in income.

The preferences shown in Figure 1 imply that parents will choose to have fewer children when their incomes are lower (ceteris paribus). Figure 2, however, illustrates the situation of a family with similar preferences who chose a family size of $a^*$ when they expected to have income $y^*$, but now find themselves with an income of $y^2$ (e.g. because of unemployment). If this income level had been anticipated, they would have chosen to have no children, attaining a welfare level of $w^2$, and this
is the welfare level which a family with identical preferences, but no children, would attain. However now that the parents have $a^*$ children, they can only attain a welfare level of $w^1$.

To reach the same level of equivalent income as a family with no children and income $y^2$, the family would require an income $y^3$ such that $y^3 = m(a^*)y^2$. However, with preferences as indicated, this would permit the compensated family to attain a higher welfare level ($w^3$) than the uncompensated family ($w^2$). Compensation that sought to equalise welfare would only require an income increase for the larger family to $y^e$, less than the adjustment implied by a conditional equivalence scale.

The conclusions from this stylised example can be summarised quite simply. If a reduction in income leads to parents having more children than they would have chosen if they had anticipated the income fall, some form of compensation will be required in order for them to reach the same welfare level as a comparable family without children. However the required compensation will be less than the conditional equivalence scale (unless there is no substitution). This is because, even though the parents may not have chosen to have children at this income level, they still derive some welfare from their presence.

However there are some qualifications that need to be considered. One question is whether the smoothly convex indifference curves shown in Figures 1 and 2 are appropriate. Deaton and Muellbauer (1980) apparently argue, for example, that at low income levels parents may see children as a ‘non-good’, even after allowing for their effect on commodity consumption. This could perhaps occur if parents feel particularly bad about having to look after children when their income is low (over and above a concern that children will stretch the family budget further). If this is the case then the lower level indifference curves will slope upwards, and the commodity equivalence scale will imply an undercompensation of families with children. However I do not find this argument particularly convincing, except in the case of extremely low incomes. For example, in wealthy nations I would still
think it to be more normal for parents reliant upon income support, to consider, on balance, their children as a blessing rather than a curse.\(^5\)

A more plausible criticism of this model, however, is that the preference substitution between equivalent consumption and children implied by these figures is too strong. The smooth preferences shown in Figures 3.1 and 3.2 imply that additional (equivalent) commodity consumption can compensate people for having fewer children (and vice versa). Is this the case? Examples of women delaying childrearing to get ahead in their career seem to be consistent with such a substitution, as might be the argument that family size has fallen in wealthy nations along with the increase in the commodity (and time) cost of children. However the extent of substitution is probably very small.

Inspection of Figure 2 indicates that the more convex the indifference curves (less substitution), the closer will the unconditional equivalence scale be to the conditional scale, and in the limit of zero substitution they will be identical. Note that zero substitution does not imply that preferred family size cannot vary with income, only that people do not trade-off commodity consumption and family size against each other.

However the fundamental assumption of this stylised model is that income fluctuations will lead to deviations from the preferred demographic structure. This will only be relevant if indeed demographic preferences are a function of (expected) incomes. For income levels found in wealthy societies at least, there seems to be little association between levels of permanent income and preferred family size,\(^6\) and so this model provides little justification for additional compensation to parents who experience an unexpected fall in their permanent income level. This demand relationship is, however, more plausible with respect to transitory income fluctuations. That is, one might expect some parents experiencing an unexpected, but not long term, spell of unemployment to

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5 And in poor countries (and perhaps also in rural areas of wealthy nations) children may be seen as investment. It is assumed here, however, that children do not bring income into the household.

6 If anything the ‘demand’ for children decreases with income increases due to the increased time costs of children in high wage families.
have preferred to delay their childrearing until a period when they had a higher income level. In this case, the welfare level of the parents will be lower than that of a couple with identical preferences but who (because of foresight or luck) did not have children. In this circumstance, and if we can also assume no substitution, then the conditional equivalence scale will be appropriate. On the other hand, if some substitution is assumed, then some level of compensation lower than the conditional equivalence scale will be appropriate for welfare equalisation.

3 Parents: Lifecycle Issues

Indeed, the question of lifecycle fertility planning is much more general than just for families experiencing unexpected low incomes. Whilst we may observe a great deal of household demographic variation, much of this stems from lifecycle stage, rather than from variations in preferences for parenthood (or from income effects). Thus parents whose children have left home are still parents, and people who have not yet had children may be anticipating having children in the future. From the point of view of a lifetime welfare function, the prospect of being a parent may be as welfare enhancing as actually being a parent. To the extent to which this is the case, the revealed preference argument against equivalence scales loses its force. This is because a range of demographic structures observed in a single cross-section can be considered as stemming from the same pattern of lifetime preferences.

The implications of a lifecycle perspective can be elaborated by extending the model of the previous section to incorporate an inter-temporal variation in equivalent consumption. Using the same reasoning as before, we can use equivalent consumption in each period to represent a current consumption welfare sub-index. Expanding equation (1) in this indirect utility form, and now drawing a distinction between income and consumption, this is

\[ w = W( U(x_n, x_k / m), a) \]  

(3)
where $x_n$ is total current consumption where the parents have no children, $x_k$ is family current consumption when they have children to support and $m$ is the conditional equivalence scale. As before, it is convenient to interpret $1/m$ as the share of family consumption going to the adults, so that $x_k/m$ is adult consumption in period $k$. The demographic composition variable, $a$, is now taken to represent a given lifetime family composition. The consumption allocation decision for people who choose to have children in neither period (non-parents), as well as for people who are parents in period $k$ (parents),\footnote{In this section the term ‘parents’ is used to denote those who have dependent children, as well as those who intend to be parents or those who have had dependent children in the past.} is illustrated in Figure 3.

For both family types lifetime incomes are assumed to be $y$, and for simplicity we assume that this is equally divided ($y/2$ in each period). The line $y—y$ thus indicates the lifetime adult consumption feasibility set of people who do not have children, whilst the line $y—y/m$ is the corresponding constraint for people who do have children. The latter has a steeper slope because for each unit of family consumption in period $k$ only $1/m$ units are adult consumption. The equivalence scale, $m$, can thus be interpreted as the price of consuming in period $k$ rather than period $n$.

Preferences over adult consumption between the two periods are assumed to be symmetric and quasi-concave, so that non-parents will prefer to divide their consumption equally between the two periods. Unless there is no between-period substitution, the ‘price effect’ of raising children implicit in this model means that this conclusion will not follow for parents. Since consumption is a relatively inefficient input into welfare in period $k$, they will tend to substitute towards consumption in the period when they do not have children. Indeed if between-period substitution is large enough, Figure 3 shows that they may prefer to spend more in the period when they do not have children than in the period when they do.
This result is precisely analogous to the substitution relationships of the Barten (1964) equivalence scale model, and follows from the fact that the welfare function $U(x_n, x_{k/m})$ can be described as a two good version of the Barten model (with children only consuming the second good). However the Barten model is based upon a particularly individualistic notion of welfare. Equation (3) implies that the parents will be seeking to maximise their welfare as a function of adult consumption in the two time periods. No account is taken of parents’ concerns for their

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8 See Muellbauer (1977).
children’s consumption. At the most general level, this problem could be dealt with by relaxing the symmetry restriction on preferences, to give greater weight to consumption in periods with children. With this restriction removed, however, the model can tell us little about how consumption is likely to be allocated between the two periods.

A more interesting approach is to assume that parents allocate their consumption so that child consumption is a function of the parents lifetime income, rather than the family’s consumption level when they have children. We might justify this by noting that it is reasonable to assume that equivalent consumption in period k may well serve as an indicator of the welfare of the children in the household, as much as it does of the adults (see Section 4). But whilst it may be feasible for adults to trade-off consumption in period k for consumption in period n, this option is not open to the children (or to the parents in deciding for the children). If the goal of the parents is to equalise welfare between family members, then since adult welfare is a function of lifetime income, child consumption can only be set with reference to lifetime income. In this case, child costs will not vary with the allocation of adult consumption between the two time periods, and equation (3) will take the form

\[ w = W( U(x_n, x_k-C), a) \]  \hspace{1cm} (4)

where C is some measure of the additional costs associated with having children. For example, C may be defined as \( p_k(\gamma - \gamma/m) \) where \( p_k \) is the proportion of time in period k, and m is the period k conditional equivalence scale. In this model, adult consumption in period k is \( x_k-C \), and for a given C, parents will still seek to maximise the (parental) welfare function \( U(\cdot) \). Since in this model child costs have only an

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9 Whilst we cannot assume that this is the case, in the absence of additional information it is the most reasonable starting point for analysis.

10 Whilst equation (3) is analogous to the Barten model, equation (4) is analogous to the translation model of Pollak and Wales (1981) (extended to have C depend on income). With this extension, I have shown elsewhere (Bradbury, 1992a) that the translation model can be used to represent the equivalence scale models of Prais and Houthakker (1955) and Rothbarth (1943).
income effect on adult consumption, symmetric welfare functions imply that, like the childless family, parents prefer to equalise adult consumption between the two periods. With perfect capital markets and foresight we would thus expect parents to locate at point B in Figure 4, whilst non-parents would locate at point A.

Note that both Figures 3 and 4 only portray the preferences inherent in the welfare sub-index \( U(.) \) rather than the overall welfare function \( W \). Hence, because the division between families who plan to have children and those who do not is a matter of different preferences for children, we cannot say that the level of welfare on indifference curve \( u^A \) is greater than that on \( u^B \).

Note also that the choice of point B by parents implies that they split the cost of children across both periods. However some child-rearing families will not be able to make this intra-lifecycle transfer, and will be forced to bear the full cost of children in period \( k \) (and have correspondingly higher consumption in period \( n \)). This could occur either because of capital market imperfections, or a lack of foresight. These families will locate at point Z, and reach a welfare level, \( u^Z \) that must be lower than \( u^B \).

If we are prepared to accept that most demographic variation is lifecycle variation, rather than variations in preferences for children, then a number of implications follow from the models in equations (3) and (4). The first is that in each period the conditional equivalence scale will represent the relative costs of reaching equal period-specific commodity sub-welfare levels, and hence it may be appropriate to use equivalent consumption for welfare comparisons. This follows from the assumption that lifecycle preferences for children have been assumed constant.

Moreover, if we accept the fixed child cost model of equation (4), Figure 4 shows that equal within-period equivalent consumption levels will be lifetime welfare maximising. (This however, will not be the case under the welfare model of equation (3) due to the between-period price effect). The policy implications of this depend upon the extent of saving (and information) constraints.
If there are no such constraints, equivalent consumption in the two periods is chosen by parents to maximise welfare (in the fixed cost model it is equalised), and there is no scope for welfare enhancing transfer policies. Moreover if the fixed cost model is correct, the saving behaviour implied by this model means that conditional equivalence scales estimated by comparing adult consumption levels with incomes may be too low, as the costs of children will be spread across the lifecycle. That is, adult consumption will be equalised across periods,
and if incomes are also equal no costs of children will be apparent. To accurately estimate conditional equivalence scales in this situation it is necessary to base the comparison on consumption (including services from durables) rather than income levels.

It seems more realistic, however, to assume that for most families significant savings and information constraints apply. Whilst this assumption is unlikely to be completely true (witness young couples saving to purchase a house before the birth of their first child) the difficulties of borrowing against uncertain future family arrangements are clear. These saving constraints are likely to be most apparent for families at the lower end of lifecycle income distribution. Whilst strong evidence of the extent to which families are able to shift their consumption across their lifecycle is hard to obtain, casual empiricism does seem to suggest that variations in material standards of living (associated with both variations in costs and in incomes) over the lifecycle are usually considered the norm.

Given that parents are constrained to locate at point Z, it is clear from Figure 4 that a state transfer of $C/2$ from period $n$ to period $k$ will be required to maximise welfare. That is, the consumption level of families with children will be higher than that of families without by the amount of the conditional estimate of child costs, $C$. Thus the conditional cost of children may be interpreted as the cost of compensating for the capital market imperfections associated with the lifecycle fluctuations in the costs of children. If incomes vary over the lifecycle (e.g. because of

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11 The overall population will also include adults who plan never to have children, but even a comparison of the adult consumption in these families with that of parents in period $k$ will be an underestimate of the cost of children because saving has permitted an increase in the consumption level of parents with children. (In the simple two period fixed cost model, this comparison will yield an estimate of only half the actual child costs. That is $y/2 - (y-C)/2 = C/2$.) See Pashardes (1991) for more discussion of the differences between income and consumption based equivalence scales.

12 These conclusions do not follow if the proportional child costs model is correct. In Figure 3, for example, in the presence of saving constraints, welfare would be maximised (moving from point Z to B) by a transfer away from period k.
the effect of the time costs of children on parental labour force participation) the required compensation must be adjusted accordingly.

Whilst saving constraint is a key assumption for this conclusion, equally important is the assumption of symmetry of preferences between the two periods. Symmetry of preferences over time is an assumption often made in models of saving behaviour, but its implications are perhaps not so innocent here. Studies of subjective welfare evaluations often conclude that parents with children say they need little more than families without children to attain the same level of subjective living standards (Buhman et al., 1988). Elsewhere (Bradbury, 1989, 1992b) I have argued that one reason for this is that people judge their level of subjective well-being against that of other people in similar demographic circumstances. If families with children have on average lower equivalent incomes, then parents may be happy with their own living standard. More generally, parents may be quite prepared to accept the social norm of a lower material standard of living during the period when they have children. Although this seems a plausible explanation of how people evaluate their own well-being, I am not convinced that it is an appropriate direction for welfare (and policy) evaluations to take. I think there is a virtue in maintaining a clear separation between constraint and choice – which is blurred when we use the subjective approach. From this perspective, I think the assumption of symmetry of preferences is quite defensible.

The most fundamental assumption of this simple model, however, has already been introduced in the previous section and in the discussion of Figures 3 and 4. It is simply that the argument for compensation for child costs is only an argument for intra-lifecycle transfers, and becomes much less relevant when the diversity of expected demographic lifecycles is considered. Whilst a lifecycle model is useful in reminding us that much variation in demographic situation is intra-lifecycle variation, it is still the case that a good deal of variation is between people. This will be particularly the case if we wish to compare families of many different sizes (or any other detailed characteristics). Whilst it may be reasonable to take an insurance approach and discount the purely random component of this between person variation, much demographic variation is still clearly due to preference differences.
3.1 Summary of Parents’ Perspective

The fundamental issue raised in this section is thus essentially the same as that raised in Section 2. If variations in family size are the result of preferences for children then the use of conditional equivalence scales for welfare comparisons is not appropriate. If however, variations in family size are due to income effects in association with demographic constraints (Section 2), or if they are due to intra-lifecycle variations in family structure, then conditional equivalence scales may be appropriate for welfare comparisons. In Section 2 it was argued that stringent conditions were required to use the full conditional equivalence scale to compensate for the welfare loss associated with unexpected falls in income. In many respects the lifecycle issues raised in this section seem to hold a stronger case.

To make these issues clearer, it is useful to consider a simple example. Assume we observe two couples, one with, and one without a child. Both families have the same consumption level. Using a conditional equivalence scale, the latter family is judged to be worse off. Is this justified? If we are prepared to assume that these two families really have the same preferences for children, but just happen to be at different stages of their lives, then the analysis above suggests that it is indeed sensible to make this assumption. This follows from the period-specific welfare index being equivalent consumption. The observation that the family with children has a lower equivalent consumption could reflect saving constraints, or could arise because this latter family has a lower lifetime income. Note that the appropriate comparison here is of consumption rather than income levels. If some saving/dissaving is possible then equivalent consumption will tend to be more equal than equivalent income (under the fixed cost model).

What, however, if we are unable to make this assumption of common demographic preferences? In this case welfare comparisons will vary, depending upon whose preferences we take as reference. Taking the preferences of the parents as reference, and assuming that (on average) they would prefer to be parents, the couple without children must be worse off (or at best indifferent) since despite being otherwise identical,
they have not been able to attain the preferred family structure. Given this irreconcilability it seems there is no other option but to retreat to the more basic welfare measure of total consumption. Using unequivalised consumption as the welfare index provides a simple way of balancing the two alternative preference orderings.

What guidance does this provide for applied research? It certainly points to the problematic nature of using equivalence scales, as demographic variation is due to both preference and lifecycle variation. A simple approach might be to recognise this, and so assume that a true ‘average’ equivalence scale for parents might lie somewhere between the conditional equivalence scale and unity.

Other issues are also important for policy analysis. Even though conditional equivalence scales may be appropriate for the measurement of intra-lifecycle consumption patterns, it does not automatically follow that tax and transfer policies should be structured to equalise equivalent income. This will only be welfare maximising if there are no opportunities for between-period resource transfers (or if income variations do not match variations in needs). Moreover, using transfer policies to compensate for savings constraints assumes that such transfers can be made on an intra-lifecycle basis. As in the case of general welfare considerations, to the extent to which there are variations in lifetime preferences for numbers of children, such transfers may not be appropriate.

Given that savings constraints are usually on the borrowing side, perhaps the strongest policy conclusion to come from this analysis is that quite large universal\textsuperscript{13} transfers to families with children can be justified if they are financed by higher taxes on parents whose children are now adults. Incorporating this idea with one of general lifecycle saving constraints would suggest a tax surcharge on such parents in the years when their incomes are highest. Any such policy, however, is justified by the

\textsuperscript{13} An assumption of higher saving constraints for low income families might be used to justify a higher transfer proportion (e.g. via a flat rate family transfer) to low income families.
existence of saving (or information) constraints. The nature of these is an empirical question.

4 Children’s Perspective

Whilst there thus appears to be only a limited welfare justification for compensating adults for the cost of their children, the perspective from the point of view of the children is more clear-cut. It is clear that the welfare functions described in equations (3) and (4) cannot be relevant to the children in the household, as they do not have a choice over their own existence. However the sub-component of welfare based upon commodity consumption will be relevant. If we then define the (commodity based) welfare level of children in a family with a given level of equivalent income as equal to that of an adult with the same equivalent income then we can simply use equivalent income as our welfare indicator for children.

Whilst this assumption is arbitrary, it mirrors the assumptions made in social policy about income sharing within the household. Policies directed towards alleviating child poverty, for example, usually involve transfers to parents. Whilst it is difficult to gather direct information on within-household consumption patterns, it is commonly assumed that resources are shared so that all individuals within the household have the same welfare level. Even if we are not sure that this is the case, this remains the most logical starting point for any distributional analysis.

What conclusions can we draw if we combine this assumption with the discussion of the previous two sections? There it was shown that, for a given family income (or expenditure), parents with children will have a lower level of equivalent consumption than couples. For some adults, the benefits of parenthood outweigh this loss of consuming power. But children do not have choices over their family structure. If we assume that consumption based welfare is equalised within the household, then children must have a lower level of equivalent consumption than childless adults (family income held constant). If we then combine this with the conclusion that the true unconditional equivalence scale for
parents is less than the conditional scale, this must then imply that children have a lower welfare level than their parents.

The policy and research implications of this conclusion vary depending upon the application. Since the major rationale for additional income support payments to families with children is the alleviation of child poverty, it is the child’s welfare level which is appropriate. This will depend upon the level of equivalent consumption, and so if the state seeks to equalise the extent of poverty between children and childless adults, compensation according to the conditional equivalence scale will be required. In this situation the fact that the parents may gain some welfare from the presence of children is irrelevant.

On the other hand, if we are concerned with describing the distribution of well-being, or the extent of poverty, then this conclusion is relevant. It implies for example, that in a given family the children may be below a poverty line, but the parents may be above it. This stems from the fact that (on average) the parents have chosen to reduce their consumption level by raising children.

### 5 Singles vs Couples

It is common wisdom that ‘two can live more cheaply than twice one’, and these economies of scale of sharing are reflected in estimates of conditional equivalence scales for single people relative to couples. But we might equally consider revealed preference in this situation. Why should it be assumed that welfare is lower if people prefer to give up the economies of scale associated with sharing?

As for parents and children, the main reason why we might not accept the revealed preference argument is because of restrictions on choices, and it is clear that choices regarding marital status are very much constrained. The reason these constraints might make conditional equivalence scales appropriate for welfare comparisons between singles and couples is examined in this section.
As before, equivalence scales are defined with couples as the reference category. The combined income (or expenditure) of the couple is denoted $y$, and this is assumed to be equally shared when they are separated. To focus more clearly on the equivalence scale issue, the two (potential) members of the couple are treated identically, and assumed to share the same preference function over consumption and ‘marriage’ (used here to include cohabiting). To emphasise that marriage is the most ‘efficient’ family formation, the conditional equivalence scale for singles is defined as $m' = 2m$, where $m$ is the equivalence scale of a single person vs a couple. Since $0.5 < m < 1$, $m'$ will be greater than one, and so represents the relative income required by two single people to attain the same consumption-based welfare as a couple.

From here we can proceed in the same way as in Section 2 to describe the nature of the trade-off between consumption and demographic preferences. Since the choice here is binary, an algebraic representation is most convenient. Let the combined welfare function for the two people be,

$$w = W(y/m', s)$$

where $s$ takes the value 1 if single and 0 if married. As before, it is assumed that $\frac{\partial y}{\partial (y/m')}$ is positive. However the sign of the contribution of marital status to the welfare function cannot be determined a priori (unlike Section 2, where it was assumed that children were a good). People for whom $\frac{\partial w}{\partial s} < 0$ (being married is a good) will always prefer to be married, whereas people for whom $\frac{\partial w}{\partial s} > 0$ (being single is a good) might prefer either marital status, depending upon the extent of their relative preferences for being single and commodity consumption.

The key point to be made, however, is that there are fundamental constraints on household formation decisions, and these constraints are asymmetric. In western societies married people almost always have the option of separation (even if sometimes on unfavourable terms).14

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14 And it has been a clear trend of family law in most western societies for these terms to become more equal.
However single people only rarely have the choice of cohabitation. An important and policy relevant example is the case of the single elderly. In the majority of cases, these people are single because of the death of a spouse, and the social norm is for these people to continue to be single. Even more generally, however, single people are usually in the situation of not being able to cohabit with a person of their choice.

Given this asymmetry of constraint, we can conclude that if people are married this is their preferred situation, but that if people are single this may or may not be their preference. If individuals’ preferences are such that they prefer to be single, and there is some degree of substitution between consumption and demographic choice, then the cost of attaining some welfare level must be lower when single than when married. The conditional equivalence scale assumes the opposite, and so compensation according to this scale will over compensate single people.

Alternately, these single people may prefer to be married. That is, $W(y/m',1) < W(y,0)$. This could occur either because $\partial w/\partial s < 0$ (married is good) or because $\partial y/\partial (y/m')$ is sufficiently large (a strong preference for consumption). If the former is the case, then it must be true that an increase in the incomes of the single people in line with the conditional equivalence scale will be an under compensation because the conditional equivalence scale compensates them for the costs of being single, but not for the fact that they would prefer to be married. That is, $\partial w/\partial s < 0$ implies that $W(m'(y/m'), 1) = W(y, 1) < W(y, 0)$.

Finally, if individuals would prefer to be married for purely ‘economic’ reasons even though they consider being single a positive factor, but they are actually constrained to be single, compensation according to the conditional equivalence scale will be too generous ($\partial w/\partial s > 0 \Rightarrow W(m'(y/m'), 1) > W(y, 0)$).

Thus compensation according to conditional equivalence scales may be either too generous, or not generous enough to single people. If there are no constraints, then there is no reason for any adjustment and the most appropriate unconditional equivalence scale to use would be the per-capita scale. But marriage is a situation where constraints are pervasive.
Of the three scenarios outlined above, the last is probably the least important, implying as it does a strong degree of substitution between marital and consumption preferences. Setting this aside, the remaining two scenarios suggest that the conditional equivalence scale will be too large or small depending upon whether the individuals prefer to be married or not. Given our ignorance of these matters, this suggests a good case for using the simple conditional equivalence scale for welfare comparisons between couples and singles.

The pervasiveness of constraint seems to me to be such that we can quite satisfactorily restrict ourselves to this simple methodology. Nonetheless, there are refinements that could be introduced. For example, whilst constraint is clearly important for older people, there is some evidence that the behaviour of younger people is more flexible. Thus one might speculate that the increasing age of first marriage may be interpreted in terms of increased living standards leading to a greater prevalence of single (or group)\(^{15}\) living (the separation of living arrangements from sexual behaviour is also important here). If one accepts that choice is greater among younger people, then one might choose to lower the relative needs of young singles compared to young couples. Similarly, a case could be made that choice will be greater for those with higher incomes. In general though, both these cases seem to me to be rather tenuous, not really justifying a move away from the simple conclusions of the previous paragraph.

6 Conclusions

Despite the efforts of many, it is probably fair to say that the complexities of family life have prevented a fully successful economic theory of fertility or family formation behaviour. The fact that people may be prepared to make choices between demographic structure and economic well-being has prompted many economists to describe as impossible any attempt at estimating the relative needs of families of

\(^{15}\) Whilst the economics of group households have not been discussed here, it can be noted that such households do not encompass some of the economies of scale (e.g. of bedrooms) that sexual cohabitation does.
different compositions. Whether we like it or not however, judgements of relative needs are made all the time. The goal of this paper has been to try to bridge this gap between the caution of positive theory and the world of normative decisions. Given our sparse knowledge of demographic decisions, this analysis has, of necessity, been highly stylised. Yet it is my view that the discussion here does provide a useful framework on which to build some simple conclusions.

For the most part, the results of this paper support the traditional use of conditional equivalence scales for welfare comparisons. With respect to equivalence scales for single people vs couples, the constraints on family formation would seem to be so pervasive that conditional equivalence scales would seem to be most appropriate. Similarly, it seems quite reasonable to describe children’s economic well-being as a function of their families’ (conditional) equivalent income, and to base income support policies for families with children on this relationship.

In considering the welfare levels of parents, however, there is less justification for taking into account the additional cost of their children. This is primarily because much of the variation in fertility behaviour is probably due to variations in preferences rather than either income effects or lifecycle variations. This means that relative welfare orderings will vary depending upon which preferences are taken as reference. In the face of this incomparability a retreat to a more fundamental notion of well-being (such as unequivalised income) is the only alternative. If we are forced to derive an average ‘true’ equivalence scale for parents with children (as we are for many applications), then given the mixture of situations discussed in Section 2 and 3, it must be defined as lying somewhere between the conditional scale and unity.\textsuperscript{16} This implies, for example, that distributional studies would of necessity assign different welfare levels to the adults and children of the same household. Aside

\textsuperscript{16} The situation for other family types such as sole parents is much more complicated, depending, inter alia, on how the family is formed. If a sole parent family is created by a wife choosing to leave her husband one might argue that since she chose to leave she is better off, and so does not require compensation. However perhaps we should be comparing her welfare level with that of a woman with identical preferences but with a better husband?
from a more appropriate summary of relative needs, this may have the supplementary benefit of engendering a clearer focus on the well-being of demographic groups such as children.
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