



The welfare interpretation of consumer equivalence scales

Bruce Bradbury

Social Policy Research Centre, University of New South Wales, Sydney, Australia

Keywords *Consumers, Income, Inequality, Children, Costs, Welfare*

Abstract *Conventional consumer equivalence scales measure the cost of children (and other household living arrangements) but not their benefits. Since many people choose to have children, these costs must be outweighed by other benefits. This paper considers these issues of demographic choice and explores the relevance of consumer equivalence scales to the broader welfare questions associated with tax/transfer policies and poverty and inequality measurement. The paper concludes that in contrast to conventional methods of measuring poverty and inequality, there is a case for the use of different equivalence scales for adults and children in the same household. Though the adults may have chosen their lower living standard in exchange for the “joys of parenthood”, the children have made no such choice.*

1. Introduction

Despite the widespread use by researchers and policy makers of consumer equivalence scales, many economists remain sceptical of their validity. Even if they concede that it is possible to use economic theory to make interpersonal comparisons, they are likely to agree with the views of Pollak and Wales (1979, p. 219) 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”. While children may be costly, that parents (often) choose them must imply that they bring offsetting benefits.

Corresponding arguments can be raised with respect to other family types. Thus people who live alone face additional costs because they cannot benefit from the joint consumption possible in large households. However, many people choose to live alone because of offsetting benefits – such as personal space and autonomy. Similarly, many sole parent families are formed as a result of the custodial parent’s decision to leave their partner.

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 in some circumstances from consumer demand behaviour under the assumption that demographic structure is fixed. Conditional equivalence scales encompass the costs of children but not their benefits.

Pollak and Wales argue that, while these scales may be useful for understanding patterns of consumer demand, for welfare comparisons it is necessary to know the “unconditional equivalence scales” which take full



account of choice of household composition. These latter scales cannot be inferred from consumer demand behaviour alone. Such considerations lead Blundell and Lewbel (1991, p. 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, conditional equivalence scales continue to be used in research and policy applications. In the applied public finance literature, for example, many writers take for granted that child costs are an important consideration in assessing “capacity to pay” (e.g. Musgrave and Musgrave, 1984; Pechman and Engelhardt, 1990). Many such users would support the views of Deaton and Muellbauer (1986, p. 725):

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.

As Nelson (1993) argues, this view is more in keeping with the historical tradition of equivalence scale estimation. The original work of Engel (1857, 1895), Sydenstricker and King (1921) and others was concerned with welfare evaluated in a much narrower sense than is relevant to the modern “revealed preference” approach. Indeed, for the most part their focus was on physiological requirements rather than revealed preferences. In addition, they considered the consumption of the whole household – including the children as well as the household decision makers. Unconditional equivalence scales, on the other hand, must be derived from the revealed preferences of the household decision makers.

The traditional approach to the equivalence scale question, Nelson (1993, p. 485) argues, is more appropriate for the policy and applied research uses of equivalence scales:

As questions of the distribution of pure subjective happiness are rarely raised in practical application, equivalence scales in the older, more materialistic, and more objective sense remain of great practical concern.

Following Sen (1987) she uses the term “standard of living” to describe this narrower welfare concept. It is the standard of living, argues Sen (1987), that should be the main concern of poverty and other distributional research and policy. The standard of living is determined by individuals’ capability to undertake personally and socially important activities. Subjective happiness, even if revealed by behaviour, varies too much across individuals to be of use to policies concerned with living standards.

However, such a general rejection of the revealed preference approach is not entirely convincing. Certainly it makes sense to assume that household living standards are more relevant to the welfare of children than are the revealed fertility preferences of their parents. For adults, however, the ability to become

a parent is one of their most important capabilities. Why should those people that exercise this capability be considered disadvantaged compared with those who do not?

The goal of this paper is to explore in more detail how these alternative points of view might be reconciled. Specifically, the question addressed is: "Under what circumstances will the narrow concept of cost implicit in conditional equivalence scales be consistent with a broader view of welfare maximisation?"

One issue that is explicitly not considered in this paper is the question of optimal fertility rates and the role of policy variables, such as transfers to families with children, in influencing fertility. Central to this issue are the positive and negative externalities associated with child rearing. On the one hand, adults who do not have children may benefit from the presence of other people's children who grow up to finance their old age pensions (directly or indirectly)[1]. On the other hand, over-population is associated with a host of negative environmental and congestion externalities. Overall, there is no consensus over the relative magnitudes of the positive and negative externalities of population growth in wealthy societies and so, in this paper, family size is assumed neutral for overall social welfare.

Because equivalence scales are typically used to compare the welfare of different people, we must begin by acknowledging that we cannot assume that preferences are constant across the population. If two people facing identical constraints choose to have different numbers of children (or other demographic arrangements) this must, by definition, be because they have different preferences. Inter-personal comparisons in these circumstances require the use of additional normative principles – such as the principle of "horizontal equity".

Unfortunately, in the public finance literature the concept of horizontal equity has been defined in many different ways – two of which are, for our purposes here, potentially contradictory. Many authors treat family size as exogenous and define horizontal equity to mean that incomes should be adjusted in line with the conditional equivalence scale (e.g. Balcer and Sadka, 1986). This definition begs the question of interest here.

Instead we draw on the definition of Atkinson and Stiglitz (1976, p. 72). Achieving horizontal equity means that "differences in tastes are not 'relevant' characteristics on which [policy] discrimination ought to be based"[2]. Atkinson and Stiglitz argue that this has two implications. The first is that personal welfare functions should be normalised so that, in some reference policy environment (e.g. no taxes) people are defined to have the same welfare level if all characteristics other than tastes are identical. Second, taxes or transfers should be set so as to maintain this equality of welfare. This concept of horizontal equity can also be related to the "ability to pay" criteria of earlier taxation theory[3].

That is, in the formulation of policy, taste differences should not be considered to be relevant differences, and taxes should be based only on the opportunity sets facing different individuals rather than their behaviour. If two people have identical opportunities (including full incomes), but choose to have different sized families, this concept of horizontal equity thus implies that they should face identical tax/transfer policies. That is, there should be no compensation to parents for the costs of their children.

However, this conclusion is not inevitable once we recognise that opportunity sets do differ across households. Hence a consideration of the constraints acting on fertility and other demographic choices is the key focus of this paper. In the following section we consider the implications of fertility and income uncertainty for the costs of children while Section 3 and 4 examine life-cycle considerations from the perspective of the parents and children respectively. Section 5 then considers the “cost of adults”, or the extent to which analysis and policy should take account of the economies of sharing when adults live together.

Section 6 summarises the main conclusions of the paper. It is argued there is a strong case for using different equivalence scales for the parents and the children in the same household. This implies that distributional research should often consider children to have a lower welfare level than their parents.

2. Income and fertility uncertainty and the cost of children

Does the irreversibility of children and the uncertainty of the economic environment provide equity or efficiency grounds for providing financial assistance to parents? To address questions such as this, it is useful to formalise the trade-off between fertility and living standards facing parents with a simple stylised model of parental welfare. Following Deaton and Muellbauer (1980), parents are assumed to maximise a welfare function:

$$W(U(q; a), a). \quad (1)$$

The function $U(q; a)$ is the “standard of living function” of the parents. When the household consumes commodity vector q and has demographic composition a , the parents have a standard of living $u = U(q; a)$. For simplicity, it is assumed here that the welfare of the two parents can be represented by a single function. For a given household consumption vector q , the parental standard of living will decrease with the number of children since a component of household consumption will be allocated to children’s consumption. The parental living standard is in turn one component of parental welfare, $W(u, a)$ which also depends directly on the presence of children.

Given this separable structure, the parents’ decision problem can be considered in two stages. First, for a given demographic composition, a , budget constraint $y \geq pq$, and rules for commodity allocation to children, the parents

choose q to maximise $U(q; a)$. With the aid of some additional assumptions (which are not without controversy)[4], observation of the behavioural outcomes of this maximisation can be used to identify a conditional equivalence scale, m such that:

$$m(a, a_0, u, p) = c(u, p, a) / c(u, p, a_0), \quad (2)$$

where $c(u, p, a)$ is the cost of reaching a parental standard of living u at prices p and demographic composition a and a_0 represents the reference family composition (no children in this case). In general, m will depend on the two family types being compared, as well as on prices and the reference standard of living. To make the argument here clearer, it is assumed that prices are constant and identical for all families[5] and that m is the same at all welfare levels[6].

Typically, estimates of equivalence scales in the literature define the vector q to represent household commodity purchases, and the cost of children represents the increase in expenditure required to reach some specific living standard. One of the main costs of raising children, however, is in the form of time, and so a more comprehensive analysis of child costs would include parental leisure as a consumption commodity, take account of home production, and define income as full income (the sum over household members of the product of their wage rate and potential working hours). This broader approach leads to a "full income conditional equivalence scale" (Apps and Rees, 1995). Since young children are particularly time intensive, the full income scale is likely to be higher than the conventional scale, though for older children it is difficult to establish an a priori ordering.

For either definition of q , equation (2) states that the income (monetary or full as appropriate) required to reach a given parental living standard will be m times the cost of reaching this level for the reference family. We can thus interpret $1/m$ as the fraction of "real" household income devoted to the parents' consumption and we can use equivalent income y/m as the indicator of parental living standards, $U(q; a)$ [7].

Given this relationship between demographic composition and living standards, the second stage of the parents' maximisation problem is then to choose between a higher equivalent income (or living standard), and a larger family. We can use this model of the trade-off between living standards and parenthood in considering the implications of uncertainty on parental welfare.

One special feature of parenthood is that it is irreversible. However, while contraception may be imperfect, fertility constraints work both ways, with many people unable to have children when they wish to. For example, Bracher and Santow (1991) show that in the post-war period in Australia, average achieved fertility has been lower than that intended at marriage. While this may in part reflect revisions to fertility plans in the light of later events, it certainly provides no support for the hypothesis that people generally have

more children than they would prefer. We cannot therefore use an argument based on a tendency of constrained over-consumption of parenthood to justify compensation for families with children. Similar considerations apply to the information limitations facing parents. While people might have children without fully appreciating their costs, they may equally fail to take full account of the benefits of parenthood.

Nonetheless, some people may have more children, and others fewer children than they desire. If welfare is concave in the standard of living, then lump sum transfers from small to large families in line with the conditional equivalence scale might appear, at first glance, to provide some insurance against fertility unpredictability. However, while these transfers might effectively insure against the uncertainty of living standards this ignores the direct impact of family size on welfare. Parents who have greater or fewer numbers of children than desired will have a lower welfare level than if they had attained their preferred number. To take money from those who have smaller families could exacerbate the variance of welfare outcomes.

A sounder approach is to consider conditional equivalence scale-based transfers as insurance against unanticipated reductions in income. This may be particularly relevant to income support policies for groups such as the unemployed and sick, as well as for poverty research. Deaton and Muellbauer (1980) use the framework outlined above to consider this.

If children are a normal good, then adults who have an unanticipated income reduction will find themselves supporting more children than they would have chosen at this lower income level. If the income reduction is such that they would have chosen to have no children, and if there is no substitution in the welfare function $W(\cdot)$ between living standards and children, then they will require their income to be increased in line with the conditional equivalence scale if they are to reach the same welfare level as someone with identical preferences, but who has not had children[8]. Comparing these two families, therefore, the unconditional equivalence scale will equal the conditional scale[9]. Further, if the drop in income is due to a labour market constraint such as unemployment, we may wish to assume a zero shadow wage and use the conventional money income equivalence scale rather than the full income scale.

All of this, however, assumes that incomes do significantly alter preferred family size, but in wealthy societies the evidence for a positive income elasticity for children is relatively weak (e.g. Becker, 1981). Possibly the short-term income response is greater than the long-term response, since many people might postpone child rearing in the light of a transitory income fall[10]. Even if we take this short-term perspective, however, it is unlikely that the income fluctuations associated with events like unemployment will be both unexpected and so large as to dramatically change the desired family size. This income uncertainty argument thus provides, at best, only a very partial justification for

the use of the conditional equivalence scale in welfare comparisons and income support policies.

3. Failures in the capital and insurance markets for parenting expenses

In both social and economic terms, it makes most sense to think of fertility decisions as an aspect of life-cycle planning. People who are not yet parents may envisage having children later, while older people may have children no longer living with them. For example, among those women born in Australia last century, between 80 and 92 per cent (depending on year of birth) will become mothers at some stage in their life. In 1991, however, only 62 per cent of married couples had children living with them (McDonald, 1993).

While parenthood is thus an activity of relevance to the whole life-cycle, child rearing costs are concentrated in one period. Unless (full) incomes over the life course follow the same pattern as costs, welfare maximising individuals will wish to transfer income from low to high need periods of their lives. If the relevant insurance and capital markets do not exist, income support and taxation policies to enable this transfer may thus increase social welfare. In some, albeit special, cases the transfers required will be directly related to the conditional equivalence scale.

The implication of capital market imperfections can be considered from two viewpoints: that of the parents as consumers of “parenthood”; and that of children who are unable to finance their own consumption. This section begins with a consideration of the parental perspective, whilst the second perspective is considered in Section 4.

To elucidate the difference between life-cycle and current period measures of child costs, the model of the previous section is generalised to cover two periods, with and without children. Now focussing on consumption rather than income, the parental welfare function to be maximised is

$$W(U(x_n, x_k/m), a), \quad (3)$$

where x_n is household consumption in period n (when the parents have no children in their household), x_k is consumption in period k (when they have children), m is the conditional equivalence scale, and total consumption equals lifetime income ($y = x_n + x_k$). All consumption terms are discounted at the consumer’s discount rate, which is equal to the interest rate. As before, we interpret $1/m$ as the share of real 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 trajectory of family composition over the parents’ lifetime[11].

While this might appear to be the simplest plausible generalisation of the one-period model shown in equation (1), it can easily be shown that this model can imply paradoxical behaviour. The structure of this model is, in fact, the

same as the well-known equivalence scale model of Barten (1964). In this model, consumption behaviour is determined by a welfare function based on the adults' consumption. In equation (3), the parents consume only a share $1/m$ of total household consumption in the period when there are children in the household. This effectively increases the price of consumption during this period. If there is sufficient substitution in inter-temporal consumption this could then imply that the household will consume less in total when there are children in the household[12].

The problem with this model is that no account is taken of parents' concerns for their children's consumption. One modelling approach to this would be draw on the argument advanced in the next section that x_k/m can also be considered as an indicator of child living standards. This would then imply that the welfare function $U(.,.)$ should place a much greater weight on its second argument – which would more than outweigh the substitution effect described above.

A simpler approach, which does not require assumptions about the role of child living standards in the parental welfare function is to assume that some fixed amount is allocated to child consumption during period k , with the remainder allocated to parental consumption across the two periods. In this case, child costs will not vary with the allocation of adult consumption between the two time periods, and expression (3) is replaced with:

$$W(U(x_n, x_k - C), a), \quad (4)$$

where C is some measure of the additional costs associated with having children, $x_k - C$ is adult consumption in period k and again the budget constraint is $y = x_n + x_k$. In general, C may depend on market prices, lifetime income and the conditional equivalence scale, but is not a function of x_k . This formulation is analogous to the single period translation model of Pollak and Wales (1981) if C is constant, or the Rothbarth (1943) equivalence scale model when C varies with lifetime income (see Bradbury, 1994).

In this representation, child costs have only an income effect on adult consumption, so that, if preferences for adult consumption are symmetric between the two periods and there are no capital market imperfections, parents will choose to have the same adult consumption in each period – implying a higher household consumption during the child rearing years. This assumes that parents are able to save and dis-save so as to equalise consumption in this way.

As an aside, we may note that, to the extent to which this is the case, conditional equivalence scales estimated by comparing adult consumption levels with household incomes may be too low, as the parents will be also financing their consumption by drawing down savings. To estimate accurately conditional equivalence scales in this situation it is necessary to base the

comparison on household consumption (including services from durables) rather than income levels[13].

In general, however, there may well be significant financial market and information constraints that restrict the ability to smooth out demographic costs across the life-cycle. These include credit rationing and the tax treatment of interest, together with the moral hazard and selectivity bias problems associated with insurance. Whilst constraints are not complete (e.g. young couples often save to purchase a house before the birth of their first child) they are nonetheless very significant – particularly for those families at the lower end of the lifetime income distribution.

If, however, income is evenly spread between the two periods and there are no opportunities for private saving/dis-saving then a state-regulated transfer between the two periods equal to the cost of children can mimic the optimal saving pattern. Thus the conditional cost of children (C) may be interpreted as the cost of compensating for the capital market imperfections associated with the lifetime fluctuations in the costs of children. In principle, the appropriate concept of child cost to use in this context is the full cost, including the time costs of children.

The above discussion does assume, however, that the preference function is symmetric with respect to parental living standards in each period. In the absence of evidence to the contrary this might seem a plausible starting point. However, studies of subjective welfare evaluations often conclude that parents with children say they need only a little more than families without children to attain the same subjective living standard (Buhman *et al.*, 1988). Should we take account of this apparent preference for reduced parental consumption?

One possible explanation for this response is that people evaluate their living standard against certain “consumption norms” and these norms may change with family status. In particular, if it is commonplace for parents to change their lifestyle when they have children so as to reduce their consumption, then any individual parent may compare their situation with that of other parents and hence not evaluate this drop in consumption as implying a drop in living standard (Bradbury, 1989). 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.

Whether we accept this subjective internalisation of financial constraint, or whether we prefer to take a more “objective” approach to the evaluation of social welfare is ultimately a subjective and perhaps a political question. This author would argue that there is a virtue in maintaining a clear separation between constraint and choice, which is blurred when we use the subjective approach. With respect to the issues considered here, however, either approach can be incorporated, via the choice of the appropriate conditional equivalence scale, based on either subjective evaluations or examination of expenditure requirements.

The most fundamental assumption of this life-cycle model, however, is that it only provides an argument for intra-lifetime transfers. In any given population there are several sources of the observed variation in family size. As well as life-cycle variation, there is also variation due to different fertility preferences, differences in incomes and prices faced by different families and differences arising from the unpredictability of fertility outcomes. Apart from the limited arguments with respect to income uncertainty advanced in the previous section, these other sources of variation do not provide a justification for the use of the conditional equivalence scale when considering parental welfare.

The existence of savings constraints is thus only a partial justification for the use of the conditional equivalence scale when comparing the living standards of a given cross-section of families. To the extent that people have the same preferences for children, but are simply at different stages of their life-cycle, it provides a useful index of period-specific welfare levels. On the other hand, when comparing people with the same incomes but with different lifetime preferences for parenthood, horizontal equity principles suggest that we treat them identically – i.e. not using any equivalence scale when calculating summary measures of welfare distribution.

4. Children's perspective

From the perspective of parents, the existence of savings constraints and income uncertainty thus provide only a weak justification for the use of the conditional equivalence scale as a welfare indicator. The story from the perspective of children, however, is different. Apps and Rees (1995) argue that the existence of capital market constraints on children's ability to finance their own consumption provides the prime reason for the state to provide assistance to families with children.

In a world of complete information and perfect markets it would be possible for a child (or its parent as agent) to borrow against its future income to cover all the costs of its childhood, including those of being born! . . . The fact that, as far as we are aware, such debt contracts are not available must be attributed to imperfect information about the future income stream of a newly-born child, as well as to an agency problem – what would there be to stop a parent mortgaging the future income of the child to increase his or her own consumption? (Apps and Rees, 1995, pp. 5-6).

Certainly, agency issues are one reason why much state support to children is provided in the form of services. Even ignoring such questions of intra-household allocation, however, it is difficult to know just how a state-provided substitute for an absent market solution should be structured. If for example, children had the same fertility preferences as their parents, it would be difficult to justify transfers from those “family lines” with small families to those with large. The conditional equivalence scale would thus be not relevant, though there may still be some role for a lower level of

within-life-cycle transfers. If, on the other hand, we think of an insurance policy being written which treats each child as if they have the same preferences, then a transfer of income from small to large families along the lines of the conditional equivalence scale might provide an appropriate replacement.

Irrespective of whether we use this life-cycle or a single-period perspective, a key question is how to compare the welfare of children to that of adults. Even if we knew the way in which economic resources were distributed within the household, adults and children have different tastes and (socially defined) needs. We cannot assume that adults and children have the same level of well-being if they have same consumption.

To turn children into “adult equivalents” a socially defined normalisation is required. The most natural normalisation, and the one that most distributional researchers implicitly follow, is the “democratic” one; to take the average pattern of intra-household allocation as reflecting the social welfare function of that society. That is, we assume that the average pattern of resource distribution between parents and children in a given society represents that society’s valuation of their relative needs (and/or deserts). In other words, to accept this normalisation is to accept that, on average, children have the same living standard as their parents – where living standards are defined in terms of incomes relative to the conditional equivalence scale.

Similarly, it is only in the space of living standards that we can sensibly compare children with non-parents (or make within-life-cycle comparisons for children). In this comparison, therefore, it is the conditional equivalence scale that is most sensibly used to compare living standards. While the parents may trade-off living standards against the number of children they have, the children themselves are not involved in this decision.

Whilst this is supportive of the common practice in distributional research (for children at least) it leaves open the question of the appropriate measure of consumption to use. In particular, the standard approach of using equivalence scales based on money income would appear to be quite limiting in this respect as it does not directly take account of home production (particularly of child-care services) nor state-provided services. If one adopted the “democratic” normalisation described above, it is possible that a broader approach based on full income might not change the broad picture of distributional calculations all that much, since different levels of full income might be offset by a different equivalence scale[14]. Nonetheless, further research is needed which integrates a more direct examination of child consumption with conventional distributional analysis.

5. The cost of adults

It is common wisdom that “two can live more cheaply than twice one”, and these economies of sharing are reflected in estimates of conditional equivalence scales for single people relative to couples. However, we might equally consider

revealed preference in this situation. If people prefer to be single and thus give up the efficiencies of joint consumption associated with sharing, why should we consider them to have a lower welfare level than those people who share with other adults?

The conditional equivalence scale for the household income of a couple (compared to a single person) is generally accepted to lie between 1 and 2. That is, there are economies of joint consumption which imply that a couple requires a higher income than a single person, but less than twice as much, in order to maintain the same level of consumption for each person. In order to focus solely on the impact of household size, it is assumed here that each member of the couple faces the same economic constraints and shares equally in the economic gains from marriage. To the extent to which one member of a couple may receive a greater share of the couple's resources, the analysis here should be considered as comparing the average single person with the average married person.

The relevance of the conditional equivalence scale for welfare comparisons between couples and singles can be addressed by asking the question "If a single person and a married person both have the same equivalent income, who is better off when we take into account a broader notion of welfare which incorporates the direct benefits of family composition?"

The answer to this question depends on the reasons why one of our two hypothetical people is single and the other married. While a comprehensive answer (even for the "average person") depends on a much greater understanding of marriage behaviour than we have available to us, it is useful to consider some stylised examples. The simplest possible model of marriage is to assume that the marriage (or divorce) decision is influenced by three factors: income, the quality of available partners and preferences for marriage.

Consider first, two people with identical preferences, the same equivalent income, but one married and one not. Since they have the same equivalent income then the personal income of the married person (half their household income) is lower than that of the single person. If everything else about these two people is identical – including their potential marriage partners, then we should judge the lower income person, i.e. the married person, as worse off.

In other words, under this particular hypothetical scenario, the conditional equivalence scale is an inappropriate adjustment to income as it under-estimates the relative well-being of single people.

However, even among people with identical "tastes for marriage", there are many difficult to observe factors (such as the quality of potential marriage partners that each person happens to meet) that vary between people. Arguably, these are a more important explanation than income effects as to why some people are married and others are not. If this is the case, then it is possible that information on the full extent of resources available to people

would lead to a conclusion that, at equal equivalent income, the married person is better off. That is, even though they have a lower (per-capita) income, they have been able to find a more favourable relationship. We might therefore conclude from this perspective that using the conditional equivalence scale leads to an over-estimate of the relative well-being of single people.

The above discussion assumes that married and single people have identical tastes, but different opportunities (either income and/or potential partners). People also differ in their tastes for marriage and household sharing – in which case it is necessary to focus on opportunity sets rather than the motivation behind behaviour. However, this does not really lead to different conclusions, as the arguments advanced above were essentially about opportunity sets – in the form of either income or potential partners – and so the same conclusions supporting a possible bias in either direction also apply.

Hence we have two countervailing arguments. On the one hand, there is the analogue of the revealed preference argument with respect to the cost of children. If a person chooses to forgo the economic advantages of marriage, because of preference or because they can afford to, this is no reason to consider them worse off. To use a conditional equivalence scale to compare the well-being of singles and couples would thus tend to under-estimate the living standards of single people. On the other hand, a case can be made that the relative well-being of single people is over-estimated. While the conditional equivalence scale compensates them for the loss of joint production, it does not compensate for the lack of a suitable partner.

There are some population groups where this second argument may have particular resonance. In particular, one important policy use of conditional equivalence scales arises in the setting of retirement pensions, where it is often desired that an equitable relativity be found between pensions for couples and singles (or survivors). In this case, most singles arrive at their status via widowhood rather than choice, and so one might consider the conditional scale to lead to, if anything, an underestimate of their relative well-being.

These same issues are also relevant to groups such as separated parents. Some sole parents might choose their status – and hence be better off irrespective of the loss of income and joint consumption efficiencies which occur on separation. On the other hand, the fact that some people separate and others do not, may be more dependent on the quality of the partner they have or are able to have. These sole parents are thus doubly disadvantaged. Again, while the conditional equivalence scale cannot reflect all these complexities, biases are possible in both directions. Thus the conditional scale and income based measures of welfare are still an appropriate starting point for welfare comparisons.

6. Summary and implications

The fact that people may be prepared to make choices between demographic outcomes and economic well-being has prompted many economists to describe as impossible any attempt to estimate the relative needs of families of different composition. Whether we like it or not, however, judgements of relative needs are made all the time. Research into inequality and poverty almost always draws on assumptions about relative needs, as do many income transfer and social insurance programs. The goal of this paper has been to try to bridge this gap between the caution of positive theory and the world of value-laden policy. Given our sparse knowledge of demographic decisions, this analysis has of necessity been highly stylised.

In many respects, the discussion here supports the traditional use of conditional equivalence scales for welfare comparisons. When comparing single people with couples, even though equivalent income is an incomplete indicator of welfare, it remains a valuable reference point since more comprehensive measures could alter welfare comparisons in either direction. Similar considerations are relevant to comparisons between married and separated parents.

The story with respect to the cost of children is somewhat more involved, because of the different reasons for the existence of different sized families. One source of variation in family size is fertility preferences. In this case, horizontal equity principles suggest no role for the conditional equivalence scale, nor for policies to assist parents. (Although note that this paper has explicitly not considered externality-based arguments of the appropriate population growth rate.)

Household income levels are another source of potential variation in family size, as is the inherent uncertainty of fertility. However, the case for the use of the conditional equivalence scale to compensate for this uncertainty only seems relevant under quite restrictive conditions.

The strongest case for parental (and child) support comes from a consideration of the life-cycle variations in family size, and the failure of capital markets to permit a matching of consumption need and income across the life-cycle. If parents cannot spread the cost of raising children across their whole lifetime, they will require a higher income when raising their children so as to be as well off as when they have no children. The conditional equivalence scale may thus serve as an indicator of the transfers required in order to maximise life-time parental welfare.

However, even in the presence of capital market restrictions, this argument only provides a justification for transfers within the life-cycle, but not between people. It provides no grounds for transfers between those people that, have had, have, or will have, fewer children to those people who with larger families. In the context of distributional studies nonetheless, it may be reasonable to assume that on average, parents with larger families need more income, but not

as much as the conditional scale implies. Such a compromise scale would represent an acceptance that the revealed preference argument introduced at the beginning of this paper is of relevance to some of the observed variation in family size, but not all.

A similar approach might be carried over to tax and transfer policies. However, the above discussion also suggests a number of alternative policy approaches to the equity issues associated with child costs. One way of assisting parents to spread child costs over the life-cycle, while not penalising those who are not parents, would be to have large child-related transfers which would be financed by additional taxes on those parents who were still in the workforce but whose children had left home. Another option would be for the state to provide loan finance for the raising of children – possibly accompanied by an insurance-based arrangement for repayment. Again, it should be stressed that this paper has not considered the externality-based issues of optimal population size – from which efficiency arguments could be advanced for either subsidies or taxes on parenthood. (Nor do we consider the efficiency costs of different taxation arrangements.)

From the perspective of children, however, the revealed preference issues considered above are not relevant. A child's living standard is related to that of its parents but children do not experience the "joys of parenthood". Since the living standards of children can only be compared with that of their parents in the context of the household, the conditional equivalence scale is thus the relevant scale to use when comparing the welfare of children with that of adults. Thus income support policies which have a primary focus on child welfare should be based upon the conditional equivalence scale. There would seem to be scope, however, for a broadening of the traditional concept of cost to include a wider range of services relevant to child well-being.

This suggests that in distributional studies it would be defensible to assume that, on average, children have a lower welfare level than their parents. In larger households, all members have lower living standards, but (at least some) parents choose these lower living standards in exchange for the benefits of parenthood. The children can enter into no such exchange.

Ultimately, however, the choice of arguments for the social welfare function which motivates distributional analysis or policy recommendations is a value decision. If concern for poverty is motivated simply by distaste for observing people with low levels of material consumption, then the fact that people might choose to have a lower material living standard in exchange for the benefits of parenthood is irrelevant. However, if we wish to give weight to the exercise of the capability of parenthood then perhaps we do need to take revealed preference arguments seriously when making welfare comparisons.

Notes

1. See, for example, Mirrless (1972) and Felderer and Ritzberger (1995).

2. Horizontal equity has also be defined in terms of the re-ranking of the income distribution under taxation (Feldstein, 1976) or in terms of the process of tax collection (Atkinson and Stiglitz, 1980).
3. There are some minor differences. In the ability to pay framework, the goal is to equalise taxes for people with the same opportunities, while in the Atkinson and Stiglitz formulation of horizontal equity it is welfare burdens that are equalised. If price elasticities vary, differential taxation for people with the same constraints but with different tastes might be required to satisfy the horizontal equity goal (this idea goes back as far as Pigou, 1947). For example, it might be the case that parents have more elastic labour supplies than non-parents (since they have alternative uses for their time). Horizontal equity might then imply a higher tax rate for parents since they can better compensate for the reduction in returns in the labour market by turning to domestic production. (Note that this may be in conflict with efficiency considerations.) However, the difference between horizontal equity and ability to pay is a second order phenomenon compared with the more fundamental issue of whether there should be lump-sum transfers between parents and non-parents. This latter issue is the focus here.
4. A wide range of identifying assumptions has been used in the equivalence scale literature. For a survey see Whiteford (1985).
5. The simplifying assumption of constant prices means, in particular, that we do not consider issues associated with variations in wage rates that might be relevant to full income equivalence scales.
6. That is, the equivalence scale is assumed independent of base (Lewbel, 1989). This assumption does not fundamentally affect the arguments here. As long as m does not vary in an extreme fashion with the reference income level then the qualitative trade-offs described in this paper will still apply.
7. See Bradbury (1997) for a more detailed exposition. If there are no jointly consumed goods in the household, $1/m$ is simply the fraction of actual income devoted to the parents' consumption rather than the children's.
8. This is because zero substitution implies that the children provide zero marginal utility when living standards are reduced below the optimum, and so welfare depends only on living standards. See Deaton and Muellbauer (1980, pp. 210-11), for a diagrammatic representation.
9. Deaton and Muellbauer go on to argue that at very low income levels, parents may even see the fact that they have brought children into the world as a "non-good" and hence the conditional equivalence scale will under-compensate them. However, in wealthy societies at least it is likely that even poor parents on balance see their children more as a blessing than a curse.
10. This may lead to research based on cross-sectional data finding a low income elasticity, and time-series analysis a stronger elasticity. The divergent results in Turchi (1975) (US cross-section, negative income elasticity) and Ermisch (1983) (UK time-series, high income elasticity) are consistent with this hypothesis.
11. Pashardes (1991) uses a similar two period model to illustrate the difference between within period and lifetime child costs (although closer to the model of equation (4)).
12. Bradbury (1997). See Brown (1964), Muellbauer (1977), and Nelson (1993) for discussion of the limitations of the Barten equivalence scale model.
13. See Pashardes (1991) for more discussion of the differences between income and consumption based equivalence scales. See also Banks *et al.* (1991) who provide simulations of the impact of assumed within-period equivalence scales on life-time spending patterns and life-time consistent equivalence scales.

14. See Bradbury and Jäntti (1999) for a discussion of this equivalence scale issue in the context of state-provided services.

References

- Apps, P.F. and Rees, R. (1995), *Household Production, the Costs of Children and Equivalence Scales*, Faculty of Economics and Commerce and Economics Research Program, Research School of Social Sciences, Australian National University, Canberra.
- Atkinson, A.B. and Stiglitz, J.E. (1976), "The design of tax structure: direct versus indirect taxation", *Journal of Public Economics*, Vol. 6, pp. 55-75.
- Atkinson, A.B. and Stiglitz, J.E. (1980), *Lectures on Public Economics*, international edition, McGraw-Hill, London.
- Balcer, Y. and Sadka, E. (1986), "Equivalence scales, horizontal equity and optimal taxation under utilitarianism", *Journal of Public Economics*, Vol. 29, pp. 79-97.
- Banks, J., Blundell, R. and Preston, I. (1991), "Adult equivalence scales: a life-cycle perspective", *Fiscal Studies*, Vol. 12 No. 3, pp. 16-29.
- Barten, A.P. (1964), "Family composition, prices and expenditure patterns", in Hart, P.E., Mills, G. and Whitaker, J.K. (Eds), *Econometric Analysis for National Economic Planning*, Butterworth, London.
- Becker, G. (1981), *A Treatise on the Family*, Harvard University Press, Cambridge, MA.
- Blundell, R. and Lewbel, A. (1991), "The information content of equivalence scale", *Journal of Econometrics*, Vol. 50, pp. 49-68.
- Bracher, M. and Santow, G. (1991), "Fertility desires and fertility outcomes", *Journal of the Australian Population Association*, Vol. 8 No. 1, pp. 33-49.
- Bradbury, B. (1989), "Family size equivalence scales and survey evaluations of income and well-being", *Journal of Social Policy*, Vol. 18 No. 3, pp. 383-408.
- Bradbury, B. (1994), "Measuring the cost of children", *Australian Economic Papers*, June, pp. 120-38.
- Bradbury, B. (1997), "Family size and relative need", PhD thesis, Economics, University of New South Wales, Sydney.
- Bradbury, B. and Jäntti, M. (1999), *Child Poverty across Industrialised Nations*, Innocenti Occasional Papers, Economic and Social Policy Studies, No. 71, UNICEF International Child Development Centre, Florence.
- Brown, J.A.C. (1964), "Discussion of the paper by A.P. Barten", in Hart, P.E., Mills, G. and Whitaker, J.K. (Eds), *Econometric Analysis for National Economic Planning*, Butterworth, London, pp. 294-5.
- Buhmann, B., Rainwater, L., Schmaus, G. and Smeeding, T. (1988), "Equivalence scales, well-being, inequality and poverty: sensitivity estimates across ten countries using the Luxembourg Income Study (LIS) Database", *Review of Income and Wealth*, Vol. 34 No. 2, pp. 115-42.
- Deaton, A.S. and Muellbauer, J. (1980), *Economics and Consumer Behaviour*, Cambridge University Press, Cambridge.
- Deaton, A.S. and Muellbauer, J. (1986), "On measuring child costs: with applications to poor countries", *Journal of Political Economy*, Vol. 94 No. 4, pp. 720-44.
- Engel, E. (1857), "Die Productions und Consumtionsverhältnisse des Königsreichs Sachsen", *Zeitschrift des Statistischen Bureaus des Königlich Sachsischen Ministeriums des Innern*, Vol. 3.

-
- Engel, E. (1895), "Die Lebenskosten Belgischer Arbeiterfamilien früher und jetzt", *Bulletin de l'Institut International de Statistique*, Vol. 9, pp. 1-124.
- Ermisch, J. (1983), *The Political Economy of Demographic Change*, Heinemann, London.
- Felderer, B. and Ritzberger, K. (1995), "Family allowances as welfare improvements", *Journal of Economics*, Vol. 61 No. 1, pp. 11-33, (Zeitschrift für Nationalökonomie).
- Feldstein, M.S. (1976), "On the theory of tax reform", *Journal of Public Economics*, Vol. 6, pp. 77-104.
- Lewbel, A. (1989), "Household equivalence scales and welfare comparisons", *Journal of Public Economics*, Vol. 39, pp. 377-91.
- McDonald, P. (1993), *Family Trends and Family Structure in Australia*, Australian Family Briefings No. 3, Australian Institute of Family Studies, Melbourne.
- Mirrless, J.A. (1972), "Population policy and the taxation of family size", *Journal of Public Economics*, Vol. 1, pp. 169-98.
- Muellbauer, J. (1977), "Testing the Barten model of household composition effects and the cost of children", *The Economic Journal*, Vol. 87, pp. 460-87.
- Musgrave, R.A. and Musgrave, P.B. (1984), *Public Finance in Theory and Practice*, 4th ed., McGraw-Hill, New York, NY.
- Nelson, J. (1993), "Household equivalence scales: theory versus policy?", *Journal of Labour Economics*, Vol. 11 No. 3.
- Pashardes, P. (1991), "Contemporaneous and intertemporal child costs", *Journal of Public Economics*, Vol. 45, pp. 191-213.
- Pechman, J.A. and Engelhardt, G.V. (1990), "The income tax treatment of the family: an international perspective", *National Tax Journal*, Vol. 43 No. 1, pp. 1-22.
- Pigou, A.C. (1947), *A Study in Public Finance*, 3rd ed., Macmillan, London.
- Pollak, R.A. and Wales, T.J. (1979), "Welfare comparisons and equivalence scales", *The American Economic Review*, Vol. 69 No. 2, pp. 216-21.
- Pollak, R.A. and Wales, T.J. (1981), "Demographic variables in demand analysis", *Econometrica*, Vol. 49 No. 6, pp. 1533-51.
- Rothbarth, E. (1943), "Note on a method of determining equivalent income for families of different composition", in Madge, C. (Ed.), *War-time Pattern of Saving and Expenditure*, Appendix IV, University Press, Cambridge.
- Sen, A. (1987), *The Standard of Living Cambridge*, Cambridge University Press, Cambridge.
- Sydenstricker, E. and King, W.I. (1921), "The measurement of the relative economic status of families", *Quarterly Publications of the American Statistical Association*, Vol. 17, pp. 842-57.
- Turchi, B.A. (1975), *The Demand for Children: The Economics of Fertility in the United States*, Ballinger, Cambridge, MA.
- Whiteford, P. (1985), *A Family's Needs: Equivalence Scales, Poverty and Social Security*, Research Paper No. 27, Development Division, Department of Social Security, April.