How Reliable are Estimates of Poverty in Australia? Some Sensitivity Tests for the Period 1981-82 to 1985-86

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IN AUSTRALIA? SOME SENSITIVITY TESTS
FOR THE PERIOD 1981-82 TO 1985-86

Bruce Bradbury and Peter Saunders

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**HOW RELIABLE ARE ESTIMATES OF POVERTY IN AUSTRALIA?
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Bruce Bradbury and Peter Saunders

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ABSTRACT

The alleviation of poverty is one of the most important objectives of the Australian social security system. Estimates of poverty across different groups and over time are thus in principle a significant indicator of the effectiveness of social security programs. This paper investigates the reliability of Australian poverty estimates for 1981-82 and 1985-86 by assessing their sensitivity to changes in the assumptions used to construct a poverty line. The exercise utilises data from the **1981-82 Income and Housing Survey** and the **1986 Income Distribution Survey**. The results indicate that many broad conclusions about poverty incidence and trends are robust over the period studied. However, poverty estimates exhibit considerable sensitivity for those groups heavily reliant on the social security system for their income.

1. INTRODUCTION

The problem of poverty in advanced countries like Australia, after having been 're-discovered' in the sixties, was largely neglected in the seventies as governments struggled with broader macroeconomic problems. At the end of the eighties, after a decade of moderate economic performance, but with a continuation of high levels of unemployment, poverty has re-emerged onto the policy agenda. Interest in research on poverty in Australia has been re-kindled by the Prime Minister's 1987 pledge to end child poverty by 1990. Most research on poverty in this country has primarily been restricted to estimating trends in the incidence of poverty using income survey data produced by the Australian Bureau of Statistics (ABS) and the poverty standard established by the Poverty Commission in the mid-seventies, the Henderson poverty line. Ever since the Poverty Commission Report *Poverty in Australia* was released in 1975, researchers have debated the merits and limitations of the Henderson poverty line, but few have challenged its usefulness as a framework for quantitative poverty research and no-one has proposed an alternative (Saunders, 1981; Manning, 1982; Edwards and Whiteford, 1988; Saunders and Whiteford, 1989).

The Prime Minister's child poverty pledge added impetus to the poverty debate, not only because its achievement could only be assessed relative to some poverty standard, but also because it raised broader questions about the meaning of poverty itself. Estimates of poverty using the Henderson methodology in which poverty is equated with income inadequacy, indicated that poverty among families with children emerged in the eighties as the main problem requiring action (Bradbury, Rossiter and Vipond, 1986; Saunders and Whiteford, 1987). Other researchers have, more recently, attempted to broaden the debate by analysing poverty in a context in which factors other than income inadequacy play a role (Richardson and Travers, 1989; Whiteford, Bradbury and Saunders, 1989). Notwithstanding the importance of these contributions, this paper is restricted to estimates of poverty based upon the use of income as a measure of well-being and the Henderson poverty line as the poverty standard.

The main objective of the paper is to present a range of tests of the sensitivity of survey-based estimates of poverty to the assumptions implicit in the Henderson (or any other specific, income based) poverty line. Such analysis is of particular relevance where poverty estimates are used to justify changes to income support policies, for if the poverty estimates are themselves not robust they cannot form the basis for improvements in income support policies and in the adequacy of payment levels. Indications that income-based estimates of poverty may be sensitive to the assumptions implicit in the

poverty line have emerged in recent contributions to the Australian literature. One example is in the different estimates of the impact on child poverty of the Government's 1987 family package produced from similar data and methodologies by Saunders and Whiteford (1987) and Brownlee and King (1989). Another is the differences and sensitivities displayed by international comparisons of the incidence and structure of poverty, as evidenced in work based on the Luxembourg Income Study recently summarised from an Australian perspective by Gruen (1989). These results suggest that a more thorough investigation of the issues is in order.

The paper undertakes such an investigation using data released by ABS in unit record file form based on the **1981-82 Income and Housing Survey** and the **1986 Income Distribution Survey**. The framework and methodology adopted in the paper draws heavily on the work of Atkinson (1985; 1987). The basic aim of the paper can be summarised using the precise words chosen by Atkinson to describe his 1987 paper:

... the content is methodological rather than substantive. ... [The paper] does not seek to provide a definitive answer to the question as to whether poverty has increased; rather it explores some of the problems which arise in trying to provide such an answer. (Atkinson, 1987, p. 750)

In Section 2 of the paper, the sensitivity of poverty estimates for one particular family type to changes in the level at which the poverty line is set, and to the way in which the line is adjusted over time, is discussed. Section 3 analyses the sensitivity of poverty estimates at a point in time and of changes in poverty over time for each of a number of specific different family types, while Section 4 discusses the sensitivity of estimates of poverty for different family types using equivalence scales to express family well-being using a common measure. The main conclusions of the analysis are summarised in Section 5.

2. SETTING A POVERTY STANDARD

Since the elimination, or at least the amelioration, of poverty is one of the key goals of income transfer policies, it is not surprising that researchers and policy makers should look to established 'poverty lines' to evaluate the success or otherwise of such policies.¹

¹ In presenting the case for the Social Security Review, for example, Cass (1986) argued:

In choosing a set of first principles on which to base the objectives of the review, I look to poverty research and the perspective which explains powerfully the extent and composition of the population most affected by inadequate income and resources. (Cass, 1986, p. 12)

A poverty line for a given family type is typically defined as that level of income below which families are defined as being in poverty. In Australia the poverty line in widest use is that used by the Commission of Inquiry into Poverty (1975) chaired by Professor Ronald Henderson. Typically referred to as the Henderson poverty line, this measure has been influential in the debate about adequate levels of pensions and benefits and the areas where further assistance might be best targeted. And yet criticisms of this poverty line, and indeed of poverty lines in general, have been plentiful (see, for example, Saunders and Whiteford, 1989). The most important of these criticisms can be summarised in four categories:

- *The appropriateness of family money income as the measure of economic resources.* Poverty research typically ignores other factors such as wealth and in-kind transfers from the state and family. In Australia the use of an 'after housing' poverty line has been justified as a way of incorporating housing wealth, but in general a comprehensive analysis of poverty based on both cash and non-cash resource flows has not been undertaken. A limited justification for focusing upon money income can be derived from a policy focus upon income support policy, but even for the evaluation of such policy a wider scope might be more desirable. Similarly the structure of income support policy has led to Australian researchers typically using the 'income unit' as the unit within which income is assumed to be shared, and economic well-being equalised.² This implicitly assumes complete sharing of resources within the income unit but no sharing of resources within the wider family. A related question is the time period over which income is assumed to be spread. Saving and dis-saving constraints imply that lifetime or 'permanent' incomes are probably not appropriate for poverty research, and yet measuring poverty on the basis of income in a single week is probably too restrictive. The compromise followed by most Australian work (and that followed here) has been to use annual income as the basis for establishing poverty status.
- *The arbitrariness of the poverty line cut-off.* The vast majority of researchers agree that in modern societies it is impossible to distinguish a single poverty threshold. Rather, deprivation continues to increase with decreasing income (or resources). A poverty line can thus only be justified on the grounds of simplicity and ease of communication. Whilst this may be reasonable for some purposes,

2 Income units comprise either single adults, sole parents and their dependants, or couples (and dependants if present). Non-dependent adult children are typically treated as single person income units, but are often excluded from poverty estimates because sharing with other family members is likely to be widespread.

when incomes are grouped near the poverty line the particular poverty line definition chosen can markedly affect poverty estimates and thus policy implications. Additionally, estimates of the proportion of the population below a poverty line implicitly treat the situation of those just below the line and those significantly below the line identically. One method used to address this concern is based on estimation of the **poverty gap** – the total amount of income required to bring all persons up to the poverty line (Saunders and Whiteford, 1987; Brownlee and King, 1989).

- *How to adjust the poverty line over time.* The underlying conception of poverty will influence the way in which the poverty line should be adjusted. If poverty is conceived in **absolute** terms as some threshold level of consumption, then the poverty line should be adjusted by some measure of the price of goods in that consumption bundle. Alternatively, the more prevalent **relative** conception of poverty would suggest that the poverty line be set as some function of overall community living standards – as this will reflect the ability of the poor to participate in the general lifestyle of the community.³
- *The assumptions of relative income needs of different family types.* It is generally accepted that large families require higher income levels than do smaller families in order to maintain the same level of economic well-being (at least at low income levels). However, there is much less agreement over the precise income relativities required for different family types to attain uniform living standards. Different relativities can lead to quite different conclusions about the structure of poverty or the incidence of poverty among different family types – and hence of where to target further assistance.

In principle and given data of sufficient quality and coverage, all four of these criticisms could be dealt with via sensitivity testing of alternative assumptions. This paper illustrates how such analysis can be carried out with regard to the last three of these problem areas. Lack of data prevents a more thorough analysis of the income and income unit concepts. It is thus assumed that the ABS concepts of income unit and income unit income (after income tax) represent appropriate measures of economic resources – though as will be seen, the limitations of such measures cannot be ignored. The analysis is based upon the information on annual incomes derived from ABS

³ These conceptual issues also arise when attempting to set comparable poverty lines for different countries.

Income and Housing Survey 1981-82 and 1986 Income Distribution Survey and the particular questions addressed are:

- Which groups had the highest incidence of poverty in 1985-86?
- For which groups did poverty increase the most between 1981-82 and 1985-86?
- How sensitive are the answers to these questions to the different assumptions and methods used to measure poverty?

The object is to see how far one can go in relaxing the assumptions typically made in Australian poverty research and yet still be able to draw sensible and firm conclusions about poverty incidence and trends over time. For reasons of space, discussion is limited to a set of groups differentiated by family composition and the age of the head, though in principle the methods described here can be used more generally.

The issues to be discussed can be illustrated by noting the following definition of the poverty line:

$$PL_{it} = PL_{R0} \cdot x_t \cdot E_{Ri} \quad (1)$$

where PL_{it} = the poverty line for the i th family type at time t , PL_{R0} = the poverty line for the reference family type (R) in some base year ($t=0$), x_t = the index used to update the poverty line over time ($x_0=1$), and E_{Ri} = an equivalence factor which expresses the estimated needs of the i th family type relative to those of the reference family type. The discussion begins by focusing on the implications for poverty estimates of alternative updating indices and reference poverty lines for a given reference family and set of equivalence scales, and then proceeds to consider the sensitivity of poverty estimates to changes in the reference family and in the equivalence scales used. It is worth noting at the outset that these issues are not independent. As equation (1) indicates, an increase in the reference poverty line by some multiplicative factor produces the same poverty line as would occur if the updating factor had been changed by the same factor. Also, the equivalence factor, E_{Ri} , is a function both of the comparison family and of the particular reference family chosen. As will be seen below, this means that the actual monetary level of poverty lines produced from different equivalence scales will depend upon the particular reference family chosen.

The particular years chosen for the analysis immediately point to another key problem in the use of poverty measures as policy evaluation tools. The estimation of poverty rates typically requires large scale comprehensive survey data – and there are inevitable lags

in the collection, release and analysis of such data. In the meantime the policy environment is likely to change. Between 1985-86 and the present, for example, unemployment has fallen significantly as have real wages, income transfers to families with children have been increased significantly, whilst other transfers have had more stringent eligibility criteria imposed. It is very difficult to unravel the impact of each of these changes and thus to draw conclusions of contemporary policy relevance from the 1985-86 data. If poverty analysis is to have a significant impact upon policy decisions in a fast changing environment, either data will need to be made available faster and more frequently, or methods will need to be introduced to modify survey data to reflect changing economic and policy conditions.⁴ However, the issues addressed here are primarily methodological and so the restriction to currently available data sets is less important. This backward focus also provides an opportunity to comment on the sensitivity of previous research findings to alternative poverty line assumptions.

Although it can be argued that there is a fair degree of arbitrariness in the assumptions underlying poverty measurement, there is nonetheless some degree of consensus. There are basically two ways that can be used to incorporate such 'reasonable' variation into the calculations. The first is to calculate poverty rates using a variety of plausible assumptions, and to see if consistent conclusions are obtained. The second is to present the data so as to allow the reader to impose their own assumptions and draw their own conclusions (Atkinson, 1987). The following results contain illustrations of both approaches.

Within this shifting sea of assumptions it is useful to have some reference point against which to test divergences. The reference point chosen here is the Henderson poverty line for a standard family of married couple plus two dependent children. Though this line was initially formulated to describe poverty in 1966 it still represents the only serious attempt to fix an Australian poverty line. It was originally defined in the Melbourne study of Henderson, Harcourt and Harper (1970) as slightly above the basic wage plus child endowment payments. In June 1966 the poverty line for a couple (head working) with two children was thus set at \$33 a week, and since that time the Henderson line has been adjusted regularly over time, first by movements in average weekly earnings (AWE) and more recently by changes in household disposable income per capita (HDYC) (Manning, 1982). The poverty line (updated by AWE) was used to measure poverty in 1972-73 by the Commission of Inquiry into Poverty. Whilst the initial choice

4 The microanalytic updating methods necessary for this second option are currently being developed by several institutions in Australia (including the Social Policy Research Centre) but are far from straight-forward.

of this poverty line was somewhat arbitrary, it was essentially based on the assumption that;⁵

This is a definition of poverty so austere as, we believe, to make it unchallengeable. No one can seriously argue that those we define as being poor are not so. (Henderson, Harcourt and Harper 1970, p. 1)

That the Henderson poverty line, as it became known, was so widely used in the years afterwards can be interpreted as providing some support for such a statement.

A still more important justification for this choice of reference point in the present study flows from its widespread availability and usage. Updated versions of the Henderson poverty line are currently published quarterly, on the basis of movements in household disposable income per capita.⁶ In the simplified Henderson poverty methodology, there are actually two commonly used poverty lines for the standard family of head, spouse and two children, depending upon whether the head is working or not. Whilst the 'head working' poverty line is that derived from the earlier comparison with the minimum wage, the 'head not working' poverty line has been chosen here as the standard reference line because of its closer relevance to the living standards of those reliant upon income support.⁷

Table 1 shows this basic poverty line reference point together with some alternative measures. The simplified poverty line assumes that the head's employment adds 11 per cent to the cost of a minimum standard of living for the reference family type. As well as using these basic poverty lines, the Poverty Commission also used a measure of 120 per cent of these to distinguish the 'near poor' from the 'very poor'. Alternative poverty lines can also be derived by using different updating measures. Thus, if one were to accept the original Melbourne study's poverty line but used an 'absolute' poverty concept, a poverty line updated by movements in the Consumer Price Index (CPI) might

5 The author of the Chapter from which this quote was taken was actually R.I. Downing.

6 The updated poverty line is currently available from two sources; the **Social Policy Research Unit Newsletter** published by the National Institute of Economic and Industry Research and the Faculty of Humanities and Social Science at the Royal Melbourne Institute of Technology; and **Poverty Lines** published by the Institute of Applied Economic and Social Research at Melbourne University.

7 The Poverty Commission defined 'working' to mean either in full-time employment or unemployed - implying higher needs for the unemployed than for those not in the labour force. Here, equal income needs between these two groups is assumed and working is defined as being employed, either full-time or part-time.

**TABLE 1: ALTERNATIVE POVERTY LINES FOR THE HENDERSON
REFERENCE FAMILY OF MARRIED COUPLE (HEAD NOT WORKING)
WITH TWO CHILDREN: 1985-86 AVERAGES^a**

	Poverty Line \$/week	Relative to Head Not Working Poverty Line	Proportion of Two Adult, Two Child Families with Incomes Below Poverty Line ^b (Percentage)
With Head Not Working (reference definition)	\$216	1.00	5.9
(with Head Working)	(\$240)	(1.11)	(8.3)
120 per cent of Reference Definition ^c	\$259	1.20	9.8
Assuming Updating from Melbourne Study using CPI	\$140	0.65	1.8
Assuming Updating from Melbourne Study using HDYC	\$222	1.03	6.4
Assuming Updating from Poverty Commission Main Report Using CPI	\$195	0.90	3.9

Notes:

- a) All calculations are based on the June quarter 1989 **Australian National Accounts**.
- b) The method of poverty incidence calculation is explained in the main text.
- c) The Poverty Commission defined those with incomes less than 120 per cent of their poverty line as the 'near poor'.

Sources: Poverty lines: SPRU (1989) and dx Time Series data.
Poverty Incidence: ABS **Income Distribution Survey 1986**, unit record file.

be seen as most appropriate (although this would not be consistent with the basic wage element of the original methodology). As Table 1 shows, increases in real incomes over the period mean that this would give a poverty line in 1985-86 only 65 per cent of the reference line. Alternately, one could update consistently by movements in HDYC over the entire time since the original Melbourne study, giving a poverty line 3 per cent higher than that currently used. The last column of Table 1 indicates that, as one would expect, the measured incidence of poverty for the reference family type varies depending upon the poverty line which is ultimately chosen. And the extent of this variation in the incidence of poverty is also substantial: a variation of around 10 per cent either way from the reference line causes the estimate of poverty for this family type to vary between 3.9 per cent and 8.3 per cent.

As noted earlier, in terms of poverty in 1985-86, these alternative updating methods are empirically equivalent to selecting a different initial level for the poverty line. The alternatives presented in Table 1 range from 65 per cent to 120 per cent of the reference line – though even this range is essentially arbitrary. One way of summarising the consequences of varying the level of the reference poverty line, following Atkinson (1987), is with the use of a cumulative income distribution curve, which shows the proportion of the population with incomes below successively increasing levels of income. By expressing income levels relative to a fixed poverty standard (in this case the Henderson poverty line) the cumulative distribution curve can be used to show the percentage of families in poverty at different poverty line levels. Figure 1 shows the cumulative income distribution curves for the reference family type in 1981-82 and 1985-86. The numbers in the last column of Table 1 can be read off the solid curve of Figure 1, with point A, for example, representing the poverty incidence for the reference family using the Henderson poverty line definition. (The area under the curve up to point A is equal to the aggregate poverty gap averaged across all families of this type, expressed relative to the poverty line for such families.)

To minimise the complexity in the ensuing analysis, a single poverty line for each family type has been assumed, with no adjustments made for the workforce status of family members, or for the number of other persons in the household.⁸ The bottom axis of Figure 1 can thus be converted to 1985-86 dollars by multiplying by the relevant poverty line (\$11,262 a year) for couples with two children. Furthermore, in order to avoid some of the problems of appropriate resource measurement mentioned earlier, the data used to

8 This latter assumption has a considerable impact on estimates of poverty among those income units (primarily the aged) who share accommodation with others.

Figure 1 Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Couple with Two Dependents

construct Figure 1 and to derive all subsequent calculations exclude incomplete income units or income units with atypical income (the standard ABS exclusion for annual income; see ABS, 1987), income units with either the head or spouse self-employed, together with single person income units aged under 21 years who were not family heads.⁹ The income measure used is total combined annual income of both the head and spouse, less personal income tax. A tax imputation was made for cases where tax was not recorded in the 1985-86 survey, and for all cases in the 1981-82 survey. A factor of 52.14 was used to convert the weekly income poverty line into an annual amount.

Returning to the cumulative income distribution curve presented in Figure 1, it is clear that poverty rates for this family type vary significantly depending upon the choice of poverty line. In general, it is clear from Figure 1 that the shape of the cumulative income distribution curve will determine the sensitivity of poverty estimates to the setting of the poverty line. The steeper the curve is in the region of the poverty line, the greater will poverty estimates vary as the poverty line is moved; the flatter the curve the less the sensitivity. Whilst there may be some degree of consensus that the Henderson line is at least approximately appropriate as a definition of poverty, it is clearly not possible to fix such a line with any degree of precision. This conclusion is, of course, not new to researchers (though it may be to some users of poverty lines). However, such simple comparisons of incomes with poverty lines are **not** typical of the policy evaluation purposes for which poverty lines are used. More typical are the sorts of questions posed earlier – of the relative incidence and structure of poverty and the nature of changes over time. In principle it is possible to make comments on these issues without being committed to a particular poverty line. Figure 1, however, only looks at one family type. When other family types are introduced, sensitivity testing becomes much more complicated. But this issue is postponed for the moment, because even without any assumptions about the relative needs of different families it is possible to make some comments about changes over time in the incidence of poverty within family types.

3. CHANGES IN POVERTY BETWEEN 1981-82 AND 1985-86.

Figure 1 also presents the cumulative income distribution curve for this family type in 1981-82. In order to compare poverty in the two years, it is necessary to adjust incomes to some common metric. This can be done in two ways, corresponding to either an absolute or a relative concept of poverty. The former requires that incomes in the

9 To ensure consistency with the 1981-82 survey, self-employment in 1985-86 was determined on the basis of labour market status at the time of the survey only. In the 1981-82 survey, one fifth of single person income units aged 20-24 years were randomly assigned to the age of 20 years.

comparison year be adjusted in terms of price changes to correspond to incomes in the reference year whilst the latter implies adjustment in terms of community incomes. The consumer price index (CPI) and the national accounts measure of household disposable income per capita (HDYC) were used, respectively.¹⁰

Between 1981-82 and 1985-86, the CPI rose by 34.7 per cent, whilst HDYC rose by 40.5 per cent. In Figure 1, these two inflators have been used to derive two curves for income relative to the poverty line in 1981-82, the first based on a poverty line for 1985-86 adjusted over the previous four years in line with changes in prices, and the second based on a poverty line adjusted in line with the movement in incomes. These two curves can be thought of as the results of adjusting 1981-82 incomes to 1985-86 dollars using either an 'absolute' CPI inflator or a 'relative' HDYC inflator. This 'backwards' adjustment has been made (rather than the more common procedure of taking the **initial** year as fixed and adjusting forwards from there) in order that the results conform with the more detailed discussion of results for 1985-86 that comes later.

In Figure 1, the 'absolute' 1981-82 poverty line always lies above (or more precisely to the left of) the 'relative' line because of the rise in real incomes between 1981-82 and 1985-86. (Given the 'backwards' nature of the adjustment, it is probably clearer to think of this as a decline in real incomes from 1985-86 to 1981-82.) With such a real income 'decline', the relative line also falls whilst the absolute line remains constant in real terms – leading to a level of relative poverty in 1981-82 lower than that implied by the absolute (CPI) adjustment method.¹¹

To compare these alternative estimates of poverty in 1981-82 with the situation in 1985-86, all that is required is to see which curve is the higher at each possible poverty line. If one curve lies entirely above the other over the range of plausible poverty lines, then it can be unambiguously said that poverty increased over the period. Over the range of a half to one and a half times the Henderson poverty line shown in Figure 1, it is clear that poverty unambiguously **increased** between 1981-82 and 1985-86 for the reference family type. This conclusion applies whether the relative or absolute method is used to

10 In fact the computations actually changed the poverty lines rather than incomes by these deflators. In the calculation of incomes relative to poverty lines it is obviously irrelevant whether the adjustment is made to the numerator or the denominator.

11 This illustrates a more general point: Where real incomes are growing, an absolute poverty line **declines** in relation to a relative poverty line as one goes forward in time, but **increases** in relation to it as one goes backwards in time.

update the poverty line. This is what one might expect given the onset of the recession in 1982-83 and the subsequent slow recovery in employment up to 1985-86.

The procedure described above can be carried out for a range of family types within each of which needs are assumed to be reasonably homogeneous. The family types chosen for analysis here are listed in Table 2. In theory, this disaggregation could be carried even further by looking separately at families distinguished by other characteristics such as workforce status, age of children, housing tenure etc, each of which might be assumed to influence needs. Additionally, one could disaggregate by other characteristics of particular policy interest. Thus, aged income units have been separated here not because their needs are necessarily assumed different from the non-aged, but rather because the issue of poverty among the aged is of particular policy relevance.

The cumulative income distribution curves for a selection of these additional family types are shown in Figures 2(a) to 2(f). As before, incomes have been expressed relative to the simplified Henderson poverty line (head assumed not working) for each family type. These can be converted to 1985-86 dollars by multiplying by the relevant poverty line, which is shown below the horizontal axis on each of the Figures. It should be noted that these curves **cannot** be used to give estimates of poverty according to the Henderson definition, because even the simplified Henderson poverty line also takes into account such factors as the workforce status of the head and the number of other people in the household. However, they are useful for illustrating some of the sensitivity issues that were mentioned earlier.

For non-aged single person income units, the choice of poverty line and updating method are both important for determining the trend in poverty over the four year period. At the standard Henderson poverty line level, poverty is estimated to have increased significantly if the poverty line is adjusted by average community incomes, but by a negligible amount if the poverty line is held constant in real terms. At income levels below 95 per cent of the standard poverty line however, poverty rates actually **fell** over the period (using either updating method). This probably reflects the 18 per cent increase in the real rate of adult unemployment benefit (UB) over the period, together with the 81 per cent increase in rental assistance, and a 3 per cent increase in the youth UB rate (Moore and Whiteford, 1986).

For aged income units, the majority of whom are heavily reliant on income support, quite a different picture emerges. The clustering of incomes for this group (Figures 2(b) and 2(d)) means that the particular poverty line chosen will have a dramatic effect on the

TABLE 2: FAMILY TYPES USED IN POVERTY ESTIMATION

Income Unit Type	Proportion of Study Population:				Sample Size	
	Income Units		Persons		(Income Units)	
	1981-82	1985-86	1981-82	1985-86	1981-82	1985-86
	(Percentages)				(Number)	
Single Persons						
Aged < 65	34.1	34.5	16.2	16.6	5020	2631
Aged 65+	11.3	11.2	5.3	5.4	1649	871
Sole Parents						
1 dependent child	2.5	2.4	2.4	2.3	381	203
2 dependent children	1.4	1.5	2.0	2.1	214	116
3 dependent children	0.6	0.4	1.1	0.9	85	36
4+ dependent children	0.2	0.1	0.4	0.3	25	10
Couple with no dependants						
Head aged < 65	16.1	16.4	15.3	15.8	2358	1360
Head aged 65+	7.7	8.5	7.3	8.2	1192	691
Couple with dependants						
1 dependent child	8.2	8.2	11.7	11.8	1237	646
2 dependent children	11.5	11.0	21.9	21.2	1708	883
3 dependent children	4.9	4.4	11.6	10.6	744	352
4 dependent children	1.2	1.1	3.3	3.3	173	90
5+ dependent children	0.5	0.4	1.6	1.5	67	36

Sources: ABS, Income and Housing Survey, 1981-82 and Income Distribution Survey 1986, unit record files.

Figure 2(a) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Single Person Under 65

Figure 2(b) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Single Person 65 or Over

Figure 2(c) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Couple, Head Aged Under 65

Figure 2(d) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Couple, Head Aged 65 or Over

Figure 2(e) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Sole Parent with One Dependant

Figure 2(f) Cumulative Income Distribution Curve for 1981-82 and 1985-86:
Couple with Three Dependents

estimated level of poverty. Thus, at the standard poverty line, Figure 2(b) indicates relative poverty increasing from around 10 per cent to 42 per cent of the single aged population between 1981-82 and 1985-86. If the poverty line was set at 90 per cent of the Henderson line, however, the increase is much more modest, from around 5 per cent to 10 per cent, and it is even less if the absolute poverty definition is used. This sensitivity can also be illustrated in a different way. The clustering of incomes close to the poverty line for some groups (implying a steep cumulative income distribution curve in that region) makes poverty estimates very sensitive to changes in the poverty line. Figure 2(b), for example, implies that a 5 per cent revision either way in the estimate of HDYC (on which the Henderson poverty line is now based) will lead to the estimate of poverty among the single aged in 1985-86 varying from 21 per cent to around 55 per cent. And as Edwards and Whiteford (1988) have recently noted, revisions in the National Accounts estimates of HDYC of the order of 5 per cent are a practical reality.

This very high Henderson poverty rate among the aged in 1985-86 as compared with estimates derived from other research stems in part from the simplification of the Henderson equivalence scale – particularly, as noted earlier, the lack of account taken of the economies of scale from sharing accommodation. Those income units sharing their dwelling with others are assumed under the Henderson methodology to have lower needs, and hence a lower poverty line. If Figure 2(b) were drawn using this more detailed methodology, the curve would be both shifted to the right and flattened (because of the variation in housing circumstances). Whilst this would make the conclusions of the preceding paragraph less stark, it does not effect the general conclusion of extreme sensitivity of poverty estimates for the single aged to the position of the poverty line. If, for example, the more sophisticated Henderson methodology were used, the issue would recur as soon as one began to look at a group with homogeneous needs such as aged persons not working and living alone.

In fact, the change in poverty rates when accommodation sharing and workforce status are accounted for is relatively modest. Applying the full Henderson simplified poverty line methodology yields an estimate of poverty among the single aged in 1985-86 of 32 per cent as opposed to 42 per cent. Interestingly, this is still well above the 13.7 per cent poverty rate for the single aged estimated by the Social Policy Research Unit for 1985-86 (SPRU, *Newsletter No. 14*, November 1988). It appears that the difference stems mainly from their use of the **detailed** Henderson equivalence scale. This scale also differentiates by age and sex as well as family size and workforce status. Using the slightly different National Accounts data available for this earlier calculation, the detailed equivalence scale would imply poverty lines of \$5,479 and \$5,094 a year for single males and single females, respectively. The poverty line for males is slightly

above the single line used here (\$5,406) but that for females is significantly below this single line. Given that most of the single aged are female, this is the main explanation for the lower rate of poverty obtained in that earlier study.¹² More importantly, these differences illustrate once again the important effect that slight changes in methodology can have on poverty rates when incomes are tightly clustered.

Notwithstanding the considerable sensitivity of estimates of poverty among the single aged to the choice of poverty line, Figure 2(b) appears to indicate a general increase in poverty among the single aged between 1981-82 and 1985-86. A similar pattern appears for aged couples, though only for incomes above the Henderson poverty line (Figure 2(d)). These results are somewhat puzzling, as the real value of the age pension actually **increased** over the period by some 4 per cent (Moore and Whiteford, 1986). More detailed examination of the data on other income sources in the two surveys indicates that average real incomes from labour market activity and investments of single aged income units also increased over the period. However, the mean real income from government cash benefits decreased over the period by 7 per cent for the single aged, and by 2 per cent for aged couples. This can be reconciled with the real increase in the maximum rate of age pension by noting that the coverage of the age pension fell significantly over the period, from 75 per cent in 1981-82 to 66 per cent in 1985-86 (Saunders, 1987, Table A3.2). A major reason for this fall was the introduction of the assets test. The loss of pension by the asset rich but income poor could thus explain the observed change in the cumulative distribution curve, but whether this can be interpreted as increasing poverty is doubtful.

It is also interesting to note that significant proportions of the aged (and other groups) appear to have incomes well below the base level of pension. From the point of view of poverty research, there are two possible causes of this. First, the data may reflect recording errors where annual income is not fully recorded (although it would be surprising if this were the main cause of low incomes for the aged, as interviewers would be anticipating income from the age pension). A second possibility is that there are gaps in the income support 'safety net' (e.g. residence requirements or voluntary non-take-up) which lead to poverty (defined in terms of inadequate income) for some groups of the aged. The plausibility of this explanation needs to be assessed in the light of the (lack of) independent evidence of hardship for such groups. There is also the possibility that

12 The SPRU study used a different definition for self employment to that used here and also excluded persons living in non-private dwellings from the sample. When this methodology is replicated, a poverty incidence of 16 per cent for the single aged is calculated. The remaining difference between this estimate and the 13.7 per cent obtained by SPRU appears to stem from the different tax imputation methods used.

persons whose recorded incomes place them significantly below the poverty line are not in poverty in the broad sense of the term. These cases may, for example, include persons with substantial assets (such as superannuation lumpsums) held in low income yielding forms for a significant part of the year. Alternatively, they may reflect persons excluded from the age pension because of residence requirements but who are being supported by their family. For the non-aged categories, many of the extreme low income cases may be self-employed, for whom income may not represent an adequate measure of economic resources.¹³

If measurement errors are considered the cause of the recorded low incomes, it would seem inappropriate to be too concerned with the apparent 'poverty' of such people. To the extent that measurement errors are present in the data, the poverty estimates presented here may be an over-statement of 'true' economic poverty. These extremely low (or zero) incomes have their most serious implications for measures of the poverty gap. For example, a person who is not in poverty but is 'erroneously' classified as having zero income will contribute $1/N$ to the headcount incidence of poverty, but P to the aggregate poverty gap (where N is the total population and P is the poverty line). However, it is worth noting that to draw conclusions about changes in poverty rates over time (or between groups) it is necessary to assume that these 'measurement errors' are constant, over time and across different demographic groups.

Figures 3(a), 3(b) and 3(c) summarise the changes indicated in Figures 1 and 2(a) to 2(f). These summary figures plot the vertical difference between the 1981-82 and 1985-86 cumulative distribution curves using the relative updating procedure. (The corresponding difference with the absolute 1981-82 distribution will always be algebraically less than this). A positive change thus represents an increase in poverty over the four years. Figure 3(a) describes the situation for income units with the head aged over 65 years. The large peak in the single person income unit curve at the poverty line reflects the point made earlier, of the extreme sensitivity of poverty measurement to the poverty line for groups primarily dependent upon income support payments. The peak for aged couples is to the right of that for single persons simply because the Henderson equivalence scale assumes lower relative needs for couples than does the age pension structure. Given the earlier discussion about the conditions of those with incomes below the pension level, it probably makes most sense to concentrate discussion on changes in poverty rates to the right of the pension peaks. These indicate a general

13 Although the self-employed are excluded from the Tables and Figures, this is only done on the basis of the person's current employment status in their main job. Some self-employed may have been self-employed during the year but not at the time of survey.

increase in income poverty among the aged, with aged couples being less sensitive to the placement of the poverty cut-off than the single aged. This increase, as discussed earlier, flows both from the growth in real community incomes (leading to a higher real poverty line) and the decreased coverage of the age pension. Given that a major reason for the reduced pension coverage was the introduction of the assets test, and that real pension rates rose at a rate very close to real community income increases (both about 4 per cent over the four years) a strict interpretation of increased poverty may not be warranted.

The corresponding sensitivity test summaries for the non-aged groups are presented in Figures 3(b) and 3(c). As noted earlier, the proportion of single person income units with incomes less than poverty lines below the Henderson line decreased over the period, but at higher poverty line levels it increased (using the relative poverty definition). For couples without children, the pattern is somewhat more stable, with poverty increasing at all poverty line levels, particularly for those above 110 per cent of the Henderson line. For couples with children, the increase in poverty over the period is even more marked at all poverty line levels. The higher increases among families with three children may reflect the association between increasing unemployment among older workers and older workers tending to have larger families. The fact that the increase is greatest at higher income levels may reflect the fact that an increasing proportion of families were experiencing part-year unemployment in 1985-86 (rather than the increase in unemployment being all in the form of higher rates of full-year unemployment).

Finally for sole parent families, relative poverty has generally increased over the period, except at very low levels of income (Figure 3(b)).¹⁴ The fact that estimates of the magnitude of the change in poverty rates vary widely with the poverty line chosen reflects the fact that the incomes of sole parents, like the aged, are relatively clustered, because many sole parents rely almost entirely on income support payments. Thus, Figure 3(b) indicates that the extent of the increase in poverty among sole parent families with one child between 1981-82 and 1985-86 is very sensitive to the level of which the poverty line is set. An increase in the poverty line by around 15 per cent causes the estimated increase in poverty to fall from around 10 per cent to less than one per cent.

The two main economic changes over the 1981-82 to 1985-86 period were the growth in unemployment and a general rise in average real disposable incomes. It is not surprising therefore that the general conclusion of this analysis is one of increasing poverty,

14 The pattern for larger sole parent families (not shown) generally shows greater increases in poverty.

Figure 3(a) Change in Percentage of Population Group Below Different Poverty Lines,
1981-82 to 1985-86.
Income Units with Head Aged 65 and Over

Figure 3(b) Change in Percentage of Population Group Below Different Poverty Lines,
1981-82 to 1985-86.
Single Adult Income Units with Head Aged Under 65

Figure 3(c) Change in Percentage of Population Group Below Different Poverty Lines,
1981-82 to 1985-86.
Married Couple Income Units with Head Aged Under 65

especially when poverty is measured relative to average community incomes. The only significant exception to this upward trend in relative poverty is for non-aged single persons.¹⁵ For this group, large real increases in the level of unemployment benefit decreased the proportion in poverty at lower poverty line levels, whilst the rise in unemployment increased absolute poverty rates at higher levels. The increase in poverty appears to have been particularly notable among families with dependants, although the choice of the group with the largest increase is sensitive to the precise placement of the poverty line, as Figures 3(b) and 3(c) illustrate.

Even when poverty lines are held constant in real terms, the conclusion of generally increasing poverty is not changed much – though the magnitude of the change is significantly reduced. Absolute poverty fell for sole parents at levels just above the Henderson poverty line, and also for non-aged single persons (as in the case of relative poverty), but otherwise increased over the whole range of poverty lines considered here (even though the change was in some cases negligible). The increase in absolute poverty among non-aged families was generally greatest at higher poverty line levels, reflecting the fact that a large proportion of the higher unemployment in 1985-86 was part-year unemployment which moved families into near-poverty over the financial year rather than below the annual Henderson poverty line.

A key conclusion of this analysis is thus that it is possible to draw conclusions about broad trends in income poverty whilst not being restricted to particular poverty lines, at least for the period between 1981-82 and 1985-86. Even when different methods are used to update the poverty line, conclusions as to the directions of change are more often the same than they are different. A second conclusion, however, is that for groups predominantly reliant upon income support payments, estimates of poverty rates and magnitudes of changes in poverty are very sensitive to the poverty line chosen, particularly when it is close to the level of income support. Sensitivity testing must thus be a central part of the measurement of poverty among such groups.

The analysis also points to the need for an understanding of the limitations of income survey data in the measurement of poverty. This limitation is especially apparent when poverty analysis is used to assess the adequacy of income support payments. Income support policy is inevitably complex, partly because it has goals other than adequacy to fulfil, but also because administration of the assessment of resources (or means)

¹⁵ This ignores the negligible fall in relative poverty rates for aged couples in the 0.85 to 1.05 range and the fall in relative poverty below the 0.70 line for sole parents with one child, although this is based on only about 15 cases.

involves, quite properly, more than the measurement of income alone. Thus the increase in income poverty among the aged most probably reflects the reduction in income support available to the asset-rich but income poor. An understanding of the changes in such alternative measures of resources is essential to an appropriate assessment of the policy implications of poverty research based upon incomes.

Does this mean that poverty research should ignore those income units with recorded incomes below those of the income support safety net? This is too strong a conclusion to draw from the analysis. Firstly, it is of interest to know that there are now more aged people with incomes below the pension level, even if they do have significant assets. More importantly, the existence of incomes which are below the income support safety net may be a consequence of goals of the income support system other than adequacy. Factors designed to influence behaviour are of key importance in the design of income support systems, particularly for beneficiaries. Waiting periods and employment search criteria are examples of non-adequacy based criteria for unemployment beneficiaries that may lead to income levels below those of the 'safety net', at least in the short run. Whilst it is generally not possible with income survey data to identify whether the very low income groups are there because their resources have been more accurately assessed for income support purposes than is possible with income survey data alone, or whether their incomes are low because of other non-adequacy related aspects of the income support system, income distribution data are of use in assessing the potential impact of restricted benefit provision.

In any event, this question of the reasons for pension/benefit exclusion has less relevance for changes in the proportions of families with incomes only slightly above pension or benefit levels. One of the most interesting aspects of the changes between 1981-82 and 1985-86 has been the significant impact of increasing unemployment on the proportions of families in such 'near poverty'. This conclusion is unlikely to be affected by these concerns about the validity of income measures.

4. POVERTY RATES IN DIFFERENT FAMILY TYPES

The comparisons so far have only been made over time within family types. To form assessments of the relative poverty levels of different family types (or other groupings), it is necessary to make some assumptions regarding relative needs. Indeed, such assumptions are already implicit in the use of the Henderson poverty line as the reference point for each family type. So far, however, this assumption has only been used loosely, as trends have been examined over a broad range of poverty line levels. To

begin to make comparisons of the structure of poverty across in different family types, it is necessary to examine more closely the extent to which needs differ.

In poverty research, the relative needs of different family types are normally expressed in terms of equivalence scales describing the needs of a particular family type relative to some reference family. Clearly, the way in which such relative needs are defined will have a major impact upon the incidence and structure of poverty and thus upon conclusions about where additional income support assistance should be targeted. Unfortunately however, there is currently only a weak consensus over the equivalence scales that relate to family size and composition. Indeed, there is even disagreement as to what family characteristics should be taken into account in the equivalence scales. In order to keep the analysis manageable, attention is restricted to the relative needs of income units with different numbers of adults and children. Such family composition measures are typically the most important variables in equivalence scales, but it should be remembered that many equivalence scales, including the Henderson scales, incorporate other differentiating factors such as the workforce status of parents, the age of children, the numbers of other people in the household and even the gender of individuals.

The family compositions that are considered are similar to those in Table 2, though needs are assumed not to vary with age. A range of equivalence scales is shown in Table 3. These scales are presented in order to get some idea of the range of estimates produced by different researchers. They are ranked here in terms of their relative allowance for children compared to adults, with the OECD scale assuming the highest relative cost for children and the Australian 1985-86 pension relativities the lowest. For ease of interpretation, the scales are presented in two ways. The first, in plain type, describes family needs relative to couples with two children (the Henderson standard family). The second, in italic type, shows the same information, but expressed relative to single adult income units. These latter numbers can thus be interpreted as describing the number of 'equivalent adults' in each unit.

The range of needs implied by these different equivalence scales is quite broad – particularly when the sensitivity conclusions of the previous section are kept in mind. The relative needs of couples compared to single adults range from 1.70 (OECD) to 1.41 (Henderson) whilst the assumed relative needs of the first child (of couples) covers an even wider range from 0.50 (OECD) to 0.22 equivalent adults (1985-86 Pensions). Whilst the ideal solution would be to be able to say with more accuracy what the relative needs really are, there seems little likelihood of a consensus developing on this issue in

the near future. Hence, some method of undertaking sensitivity testing with regard to these alternative scales is required.¹⁶

One way to test the sensitivity of poverty estimates among different family types to different equivalence scale assumptions is to calculate the incidence and structure of poverty using each scale. To make such a calculation, however, it is necessary to specify the family type for which poverty lines are assumed constant across the scales. This specification will influence the overall rate of poverty and the structure of poverty estimated when the scales are applied. In Table 4, estimates of the incidence and structure of poverty are presented for different family types using the equivalence scales of Table 3. To illustrate the effect of the choice of reference family, two calculations have been made, one with the Henderson poverty line for couples with two dependants (2+2) as the reference family (in plain type) and the other with the Henderson poverty line for single adult households (1,0) as the reference (in italic). The numbers shown in bold are those which are by definition identical across the different equivalence scales.

For each equivalence scale, the first line of numbers shows the incidence of poverty, the proportion of families of each type with incomes below the poverty line – where the poverty lines of all 2+2 income units are held constant at the Henderson poverty line. The second line shows the corresponding structure of poverty, that is, the proportion of all those persons in families with incomes below the poverty line who are in each income unit type. The third and fourth lines of numbers (in italics) show the same results, but for the case where the poverty line for single adult (1+0) income units is held constant across equivalence scales. As a consequence of using the Henderson scale as the reference, the numbers in plain and italic type for the Henderson equivalence scale are identical.

It should be emphasised that in each of the different calculations underlying the estimates of poverty incidence and structure in this Table, it is only the equivalence scales (and reference families) and not incomes that are being altered. Thus, the fact that the Family Package equivalence scales produce **higher** estimates of poverty among families with children than do the 1985-86 Pension scales does not imply the failure of the family package as such. Quite the reverse. In deriving the results in Table 4, the incomes of pensioners and beneficiaries (for example) have not been altered from their 1985-86 values. The family package payment rates have simply been used as an index of the relative needs of families of different composition. The relative needs of families

¹⁶ See Buhmann et al. (1988) for an example of the importance of undertaking such sensitivity testing when comparing poverty rates across countries.

with children are assumed higher under the family package than was assumed in the pension system of 1985-86, and so, since the incomes of these families have not been altered, the family package relativities imply higher levels of poverty among families with children.

The last column of Table 4 shows the overall poverty rate using each equivalence scale and reference family type. The variation in overall poverty rates, both between equivalence scales as well as within each scale, points to the fact that the poverty line and hence the estimate of poverty depends **both** on the choice of equivalence scale **and** on the reference family selected. This is most clearly indicated for the OECD scale, which is most divergent from the Henderson scale (in terms of the relative needs of 2+2 versus 1+0 income units). Using the 2+2 family as the reference family, the OECD scale gives the **lowest** overall poverty rate, whilst using the 1+0 family as reference the OECD scale gives the **highest** overall poverty rate. This stems from the fact that the OECD scale assumes the highest needs for both spouses and for children. Hence, if the poverty line for families with two children is held constant across the family types, the OECD scale must have the lowest poverty lines (and hence the lowest poverty rates) for smaller families. On the other hand, using single adults as reference means that the OECD scale will assume the highest needs for larger family types and hence will have the highest poverty rates among these families.

The interaction between the choice of reference family group and the equivalence scale used is essentially identical to the choice of poverty line for a particular family type. Hence, one might expect the resulting variation in poverty estimates to be greatest among income unit types with incomes clustered near the poverty line. This is indeed the case. Poverty rates for the single aged, using the 1+0 income unit as reference, are fixed at the same level as was shown in Figure 2(b), i.e. at 42 per cent. The use of 2+2 families as the reference group still implies the same poverty incidence under the Henderson scale (by definition), but leads to much lower poverty estimates with other scales, 4 per cent for the OECD scale and 16 per cent for the Family Package equivalences.

In general, the choice of reference family might be expected to have less impact upon the structure of poverty than upon the incidence of poverty. This is because the choice of a different reference family corresponds to the choice of a different poverty line, leading to changes in the poverty estimates in the same direction for each family type thus leaving

TABLE 4: POVERTY INCIDENCE AND STRUCTURE ACROSS DIFFERENT FAMILY TYPES USING
ALTERNATIVE EQUIVALENCE SCALES, 1985-86

Equivalence Scale		Income unit type (adults + dependants)													
		1+0 <65	1+0 65+	1+1	1+2	1+3	1+4	2+0 h<65	2+0 h65+	2+1	2+2	2+3	2+4	2+5+	Total
OECD															
Reference = 2+2	Incidence	0.07	0.04	0.26	0.41	0.61	0.75	0.03	0.05	0.03	0.06	0.14	0.16	0.82	0.09
	Structure (%)	12	2	6	10	6	2	5	4	3	13	16	6	14	100
Reference = 1+0	Incidence	0.18	0.42	0.54	0.67	0.94	0.80	0.10	0.33	0.09	0.13	0.28	0.31	0.97	0.23
	Structure (%)	13	10	6	6	4	1	7	12	5	12	13	4	7	100
Henderson Simplified (head not working)															
Reference = 2+2	Incidence	0.18	0.42	0.41	0.52	0.69	0.75	0.04	0.38	0.03	0.06	0.14	0.16	0.75	0.17
	Structure (%)	18	14	6	7	4	1	4	19	2	8	9	3	7	100
Reference = 1+0	Incidence	0.18	0.42	0.41	0.52	0.69	0.75	0.04	0.38	0.03	0.06	0.14	0.16	0.75	0.17
	Structure (%)	18	14	6	7	4	1	4	19	2	8	9	3	7	100
Whiteford Mean															
Reference = 2+2	Incidence	0.16	0.33	0.40	0.45	0.61	0.61	0.04	0.07	0.05	0.06	0.12	0.08	0.71	0.13
	Structure (%)	21	14	7	8	4	1	5	4	4	10	10	2	9	100
Reference = 1+0	Incidence	0.18	0.42	0.43	0.47	0.69	0.61	0.05	0.08	0.05	0.06	0.13	0.08	0.71	0.14
	Structure (%)	21	16	7	7	4	1	5	4	4	10	10	2	8	100

**TABLE 4: POVERTY INCIDENCE AND STRUCTURE ACROSS DIFFERENT FAMILY TYPES USING
ALTERNATIVE EQUIVALENCE SCALES, 1985-86
(Cont'd)**

Equivalence Scale		Income unit type (adults + dependants)													
		1+0 <65	1+0 65+	1+1	1+2	1+3	1+4	2+0 h<65	2+0 h65+	2+1	2+2	2+3	2+4	2+5+	Total
Family Package															
Reference =2+2	Incidence	0.13	0.16	0.36	0.40	0.55	0.61	0.05	0.09	0.05	0.06	0.13	0.13	0.75	0.12
	Structure (%)	18	7	7	7	4	2	7	6	5	11	12	4	10	100
Reference =1+0	Incidence	0.18	0.42	0.44	0.50	0.60	0.75	0.10	0.29	0.06	0.08	0.15	0.16	0.75	0.18
	Structure (%)	17	13	6	6	3	1	9	13	4	9	9	3	7	100
1985-86 Pensions															
Reference =2+2	Incidence	0.16	0.33	0.36	0.40	0.55	0.61	0.08	0.23	0.05	0.06	0.13	0.11	0.75	0.15
	Structure (%)	18	12	6	6	3	1	9	13	4	9	9	2	8	100
Reference =1+0	Incidence	0.18	0.42	0.40	0.44	0.56	0.61	0.10	0.29	0.06	0.06	0.13	0.13	0.75	0.17
	Structure (%)	18	14	6	6	3	1	9	14	4	8	9	3	7	100
Note: See Table 2 for the equivalence scales used.															
Source: 1986 Income Distribution Survey, unit record file.															

the structure of poverty relatively unchanged. Even so, significant variation remains. For example, the proportion of people in income units with incomes below the poverty line who have dependants in their family varies between 77 per cent and 58 per cent using the OECD scale, and between 62 per cent and 48 per cent using the Family Package equivalences, though it is stable at around 55 per cent using the Whiteford Mean relativities. Some conclusions do seem reasonably robust, however. In none of the sole parent calculations does the poverty rate fall below 26 per cent. If the OECD scale is excluded this minimum poverty estimate for sole parent families rises to 36 per cent. By comparison, the poverty rate of non-aged couples without children is always below 11 per cent. Similarly, poverty in families with many children is always extremely high, although these estimates are derived from very small samples.

Over the last two decades of poverty research in Australia, there have been two main concerns; poverty among the aged, and poverty among families with children. In recent years the focus of policy attention has been on the latter – to some extent as a consequence of poverty research. It is interesting to see if the numbers in Table 4 confirm the conclusion of child poverty being the key problem. Though there are many ways of addressing this question, one way is to compare the proportion of the poor who are aged with those who are in families with dependants. This can be done from the poverty structure estimates of Table 4. Under all equivalence scales, and using either reference family type, the proportion of income units who are poor who are in families with children is always much larger than the proportion who are aged. The smallest difference is for the Henderson scale, where 45 per cent of the poor are in families with dependants and 33 per cent in aged families. This would seem to lend some support to the conclusion that child poverty was the key poverty issue in 1985-86.

However, even here there is a need for caution. The calculations in Table 4 are based upon the Henderson poverty line. As was shown earlier, poverty rates for some groups can vary considerably with small variations in that reference line. For example, all the calculations in Table 4 place the bulk of aged income units below the poverty line. The poverty line would not have to be raised too far to reverse this placement. With only a slightly higher poverty line, one might find the conclusion of the previous paragraph reversed.

To address this question, one could repeat the analysis of Table 4 for a range of different poverty lines. However, another, and more general way of addressing this question is illustrated in Figure 4, which shows the cumulative income distribution curves for selected different family types in 1985-86. For comparison with the earlier Figures (and

Figure 4 Cumulative Income Distributions for Different Family Types in 1985-86

with Table 4) the Henderson poverty lines (and hence poverty rates) have been marked on each curve with circles. In Figure 4, however, a logarithmic scale has been used for the horizontal axis. As a result, a given horizontal distance on the Figure corresponds to a given income ratio. This implies that cumulative **equivalent** income distribution curves can be represented by a horizontal shifts in the cumulative income distribution curve, the extent of the shift depending upon the equivalence scale used. The multiplicative ratios described by such a shift can be read off the key provided in Figure 4.

If the original curve for one family type lies everywhere above that for another, and if the needs of the former group are not less than the latter (whichever equivalence scale is used) then the incidence of poverty is unambiguously higher in the former group. This would be true **wherever** the actual poverty line is set and **whichever** equivalence scale is used. In Figure 4, for example, this result holds for aged couples compared to non aged couples. In other instances, the relative poverty rates of different family types may depend upon the income level at which the poverty line is set, as well as on the equivalence scale used. In such cases, it is necessary to compare the cumulative income distribution curve for one family type with the cumulative income distribution curve for another type by measuring the horizontal distance between the two curves in the Figure in terms of the key. The distance on the key then indicates the equivalence scale that would be required for the two family types to have identical equivalent income distributions, and hence identical poverty incidences at that point. This could be then repeated for a range of possible poverty levels.

This, of course, is by no means a trivial exercise with many family types and a variety of different poverty lines, and there is not space here to employ the method exhaustively. However, the great advantage of the approach is that it allows the sensitivity of poverty results to be simultaneously checked against changes in the level of the poverty line and in the equivalence scales used. It may be possible, for example, for the approach to indicate that, for a range of plausible poverty lines and equivalence scales one family type unambiguously has a higher poverty rate than another. Two examples of this approach will be given here, the first comparing the poverty status of aged singles and aged couples, and the second the poverty status of non-aged couples without children, compared with that of non-aged couples with three dependent children.

For the first comparison, one can start from the reference poverty line of \$5,406 a year for aged single person income units – which gives a poverty incidence of 42 per cent (as in Table 4). Measuring the horizontal distance between this point (indicated with a circle on the curve in Figure 4) and the curve for aged couples using the scale provided in the

key indicates that in order to have the same level of poverty as the single aged, aged couples would need to have needs approximately 1.77 times those of single aged people. The Henderson scale assumes that their needs are only 1.41 times as-large (Table 2) and so consequently estimates the level of poverty among aged couples as significantly less than among the single aged. Indeed, all the equivalence scales in Table 2 imply that the needs of aged couples are less than 1.77 times greater than those of the single aged (though the OECD scale comes close at 1.70). Hence, one can conclude that poverty is higher among the single aged than among aged couples irrespective of the equivalence scale chosen.¹⁷

Interestingly, the Australian pension system pays couples 1.67 times more than single people. The larger difference between the cumulative income distribution curves in Figure 4 probably reflects the fact that the single aged tend to be both older and female and for both these reasons have lower levels of non-pension income. Indeed, at lower points in the income-distribution (e.g. around the 20th percentile) the horizontal distance between the curves approaches the pension relativity. Thus, using a more stringent poverty line threshold, the acceptance of the pension relativity as an appropriate measure of needs would imply that the poverty rate among the two groups is identical.

To compare the two non-aged family types shown in Figure 4 two approaches can be used. The equivalence scales in Table 3 could be re-cast with couples without children as the reference group, or the incomes of both family types could be converted (using equivalence scales) into that for single adult equivalents. Inspection of Table 3 indicates that the scale which gives the lowest relative needs for couples with three children compared to childless couples is the 1985-86 Pension scale. This scale indicates relative needs of 1.43 ($= 2.38/1.67$) for couples with three dependants compared to those with none. This implies that to describe the equivalent income distribution of 2+3 families in terms of 2+0 equivalents, the 2+3 curve would need to be shifted to the left by the distance that can be read off from the point 1.43 on the key to Figure 4. By measuring the horizontal distance between the two curves on the Figure, it can be shown that this will lead to the 2+3 curve being everywhere above that for couples without dependants (except at the very bottom of the income distribution where they will be indistinguishable). Since the pension equivalence scale is that which is least generous to the needs of large families, it can be concluded that the poverty rate among couples with three dependants is thus unambiguously no lower than, and in almost all instances higher than, that among couples without dependants.

17 Assuming, of course, that the scales presented in Table 10 represent the full range of reasonable scales.

It is reassuring that both these examples confirm the picture described in Table 4 of higher poverty rates among aged single people than aged couples, and among larger families. Further analysis of other family types, (not shown in Figure 4) confirms the conclusion of uniformly higher rates of poverty among sole parent families. The concern for child poverty is thus reinforced. But it cannot be expected that the same conclusions will hold for every comparison. Indeed, the comparison of poverty among the single aged and aged couples indicates this by reinforcing the (obvious) fact that at the bottom end of the income distribution the relativities will be guided by the relativities inherent in the pension system. Hence the great divergence in poverty rates between aged single people and aged couples suggested by the Henderson methodology could be seen as misleading – or at least very dependent upon the particular equivalence scale chosen. The diagrammatic presentation in Figure 4, however, does allow more than this to be said, with the higher non-pension incomes of aged couples towards the middle of the income distribution resulting in lower poverty rates under all equivalence scales.

5. CONCLUSIONS

The aim of this paper has been to assess the sensitivity of poverty estimates to changes in the assumptions embodied in a poverty line against which poverty status is determined. It has not been primarily intended to produce definitive estimates of the incidence and structure of poverty using a particular methodology, and for this reason simplifications have been employed whenever they have helped to isolate the impact of the factors of main interest. Estimates of both the incidence and structure of poverty at a point in time (as well as changes over time) depend upon the level at which the poverty line is set (and adjusted over time), estimates of the relative needs of different families and the reference family chosen against which these relative needs are evaluated. Changes in each of these will influence estimates of poverty, but the crucial question is by how much. It can be shown that poverty estimates are relatively insensitive to changes in at least some of the assumptions embodied in the poverty line, then it follows that the choice between alternative assumptions will not greatly influence the policy and other conclusions to be drawn from quantitative poverty research. If, on the other hand, the estimates show extreme sensitivity to small variations in the poverty line assumptions, poverty estimates based on any specific set of assumptions are of questionable value.

The results presented in the paper are based on ABS income survey data for the years 1981-82 and 1985-86. They indicate that, for this period at least, many conclusions about the extent of, and changes in, poverty among different family types are fairly robust with respect to changes in the poverty line assumptions. Or to put the same point

differently, the use of quite different assumptions in constructing a poverty line will often lead to no marked change in the conclusions about poverty. There is, however, one important exception to this general rule. Estimates of the incidence of poverty among families primarily dependent on income support payments show extreme sensitivity to quite small changes in the poverty line either side of the Henderson (or any other) poverty line. These family types are identified in the paper as the aged (single and couples) and sole parent families, but a similar conclusion would also apply to other groupings heavily reliant on income support payments, such as invalids or the unemployed. The reason for this sensitivity is not difficult to understand. Since most of such families receive much of their income in the form of pensions or benefits, their incomes tend to be very similar and if pension and benefit levels are themselves close to the poverty line (as they often are) then only small changes in the poverty line can cause many families to switch from one side of the poverty line to the other. Such sensitivity can also occur in response to the use of a different set of equivalence scales, or even to the use of a different reference family type for a given equivalence scale.

To some extent, these sensitivities reflect the use of the headcount measure of poverty, but other measures of poverty (e.g. the poverty gap) require greater data accuracy if they are not to produce additional problems. But in any case, the finding that poverty estimates are particularly sensitive for those groups heavily reliant on income support creates a paradox of its own. For it is precisely these groups for whom past poverty research has been used to justify changes in the adequacy of income support payments. The analysis in this paper suggests that where the categories used to define family types correspond to those employed in the income support system, estimates of poverty can be very sensitive to how the poverty line is constructed. Such estimates should thus be treated with considerable caution when used **in isolation** to assess the impact of past income support policies or to assist with the design of future policies.

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