

## **Changes in Poverty Rates During the Howard Era**

by

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## **Changes in Poverty Rates During the Howard Era**

### **Abstract**

This paper considers changes in poverty rates under the Howard government. We also make three methodological contributions. We consider the statistical significance of estimated changes in poverty. We propose a decomposition technique which reconciles trends in absolute and relative poverty. We also use ‘poverty profiles’, which illustrate sensitivity to alternative poverty lines. We find decreases in absolute poverty and increases in relative poverty, both of which are statistically significant over a range of poverty lines. At a poverty line equal to half of median income the increase in relative poverty is statistically significant for all people, and borders on significance for children.

## 1. Introduction

In March 1996, the Howard government took office, beginning almost twelve years of Liberal-National Party coalition rule. Howard, himself, has described the policies enacted by his government as ‘a blend of economic liberalism ..... and social conservatism’ and he has expressed the belief that ‘in Western societies .... two of the greatest contributors to poverty are joblessness and family breakdown’ (Howard, 2008).

An evaluation of the effect of Howard government policies, individually or as a whole, on the material well being of the Australian population, or of specific groups, is a task well beyond the scope of this paper. It is clear, however, that the four terms of coalition government coincided with a period of economic prosperity. Australia experienced consistently high rates of economic growth, low unemployment and low inflation. It is less clear how the most vulnerable members of society fared during that time period. Economic prosperity at the aggregate level does not guarantee increased well being for those at the bottom end of the income distribution. Economic liberalism in the form of flexible labour markets<sup>1</sup> may reduce joblessness but at the same time create job insecurity among people in precarious employment, leading to stress and increased family breakdown. Socially conservative policies that promote the traditional family may reduce incentives for married women with children to work and thereby reduce family income.<sup>2</sup> The effect on poverty is ambiguous.

The aim of this study is to chart the progress made by the disadvantaged from the financial year immediately prior to any policy enacted by the Coalition

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<sup>1</sup> Flexible labour markets were promoted particularly under the Workplace Relations Acts of 1996 and 2005, with a major intent to reduce the power of unions to influence wages and workplace conditions.

<sup>2</sup> The Howard government made a number of changes to Australia’s income support programs, which tended to favour families with children. Welfare spending rose in real terms from approximately 53 billion dollars in 1995-96 to 72 billion dollars in 2006-07, with large annual increases of 6, 14, and 11 per cent in 1998-99, 2000-01 and in 2003-04, respectively (ABS, 1998 – 2008).

government taking effect, 1995-96, to the financial year 2004-05. The latter is the most recent year for which sufficiently comparable data are available. The period covered thus spans all but the last 2½ years of the Howard Government's 11¾ year rule. We discuss the issue of data comparability in more depth later in this paper. Our results will enable a better evaluation of claims made by both sides of politics about how Australia's disadvantaged fared during this period. We also make three methodological contributions: we test the statistical significance of observed poverty-rate changes; we use a decomposition technique to reconcile changes in relative and absolute poverty rates; and we use 'poverty profiles' to determine the sensitivity of poverty rates to where the poverty line is set.

We are not the first to measure inter-temporal changes in poverty in Australia. Several others have also compared poverty rates at different points in time (for example, Saunders and Bradbury, 2006; Harding, Lloyd and Greenwell, 2001; Harding and Szukalska, 2000; Mitchell and Harding, 1993; Saunders and Matheson, 1993; Harding and Mitchell, 1992). All of these studies have been based upon sample data, the Surveys of Income and Housing (SIH) conducted by the Australian Bureau of Statistics (ABS) being the most frequently used data source. However, none of these studies was able to test the statistical significance of the poverty-rate changes it observed.<sup>3</sup> This can now be done using the replicate weights provided by the ABS on re-releases of its SIHs. With these weights standard errors of poverty rates can be calculated using a jackknife procedure. In view of the controversy generated by some of the poverty studies (Hughes, 2001; Tsumori, Saunders and Hughes, 2002; Saunders (CIS), 2002; Saunders (SPRC), 2002; Saunders (SPRC), 2005) it would seem prudent,

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<sup>3</sup> A recent exception is Wilkins (2007), who estimated standard errors using a bootstrap technique. The resulting standard errors may be biased as the bootstrap procedure does not take account of the complex designs of the ABS income surveys. However, our preliminary analysis suggests that the extent of such bias is likely to be small, at least over the period covered in our study.

before debating other issues, to ascertain whether any observed change in the poverty rate can be explained by sampling variation. A major contribution of this study is to compute standard errors of poverty rates and to test whether the observed poverty-rate change is significantly different from zero, statistically speaking.

Part of the controversy concerning changes in poverty in Australia relates to the type of poverty line chosen. The majority of researchers favour a poverty line set equal to a given percentage of median, or mean, income in the current year, in which case the poverty line can vary in real terms and poverty is a relative concept (for example, Harding, Lloyd and Greenwell, 2001; Headey, Marks and Wooden, 2005). Others (for example, Tsumori, Saunders and Hughes, 2002) argue that an absolute poverty line is better able to identify those most in need. Like Adam Smith we take the view that both concepts are informative:

‘By necessities I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for credible people, even of the lowest order, to be without.’ Adam Smith (1776, p. 691).

Our study reconciles the relative poverty approach with an absolute poverty approach.<sup>4</sup> Changes in relative poverty are decomposed into two components: the effect of a change in the bottom end of the income distribution with the poverty line constant (a change in absolute poverty) and the effect of a change in the real poverty line with the bottom end of the income distribution constant. The decomposition

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<sup>4</sup> In social research an ‘absolute poverty line’ has two interpretations (Heady and Warren, 2008, p.49). To some it means an amount of money that is just sufficient to support a minimal material standard of living in terms of food, clothing and shelter. Others use the term to refer to a poverty line that retains a constant real value over time and consequently is independent of changes in general living standards (Citro & Michael, 1996, p. 31; Saunders & Bradbury, 2006, p.349). In this paper, we use the term in this latter sense.

clarifies the source of an observed change in relative poverty and consequently will assist the interpretation of poverty-rate changes.

Also contributing to the controversy is the question of where the poverty line, absolute or relative, should be set. This concern can be largely resolved by presenting results in the form of poverty-rate profiles, which display the sensitivity of poverty rates, and changes in poverty rates, to the poverty line. Indeed, the profiles enable the simple, but crude, head-count ratio to convey information about the depth of poverty at a given poverty line, as well as its incidence. We use poverty-rate profiles to analyse relative and absolute poverty rates, and their changes over time, both of the population as a whole and of dependent children aged under 15 years.

The rest of the paper is organised as follows. The data and methodology used in the analysis are described in Section 2. The results of our analysis of poverty-rate changes among the population as a whole are reported in Section 3. Changes in child poverty rates are examined in Section 4. Some concluding comments are offered in Section 5.

## **2. Data and Methodology**

### *2.1 Data*

The Surveys of Income and Housing (SIH) conducted by the ABS are the main source of income distribution data in Australia. A limitation of these data is that inter-temporal comparability is affected by methodological changes that have been implemented over time. The methods used in the SIHs held between 1994-95 and 2002-03 are quite different to those of earlier income surveys (Siminski *et al.*, 2003a and 2003b). More importantly for this study, several methodological changes implemented in the 2003-04 and 2005-06 surveys affect comparability over the period of interest here (ABS 2007a).

The main comparability issues are discussed by the ABS (2007a) and are summarised below. First, the 2003-04 and 2005-06 SIHs were stand alone surveys whereas between 1994-95 and 2002-03, the SIH was a supplement to the Monthly Population Survey. Respondents to the SIHs between 1994-95 and 2002-03 had already been interviewed for eight consecutive months on labour force topics. This may have resulted in differences in the nature of non-response in these earlier surveys compared with the stand alone surveys. Unfortunately, the ABS does not publish response rates which are comparable over the entire period. A second consequence of this change is that data collected in the Monthly Population Survey were available for use in imputation procedures for earlier years, but not in the stand alone surveys. This resulted in some changes to the imputation methodology. A third comparability issue relates to the collection of asset and liability data in the 2003-04 and 2005-06 SIHs. The ABS notes that this may have improved the quality of reporting of associated income streams (ABS, 2007a).

The SIH collects income data for the previous financial year ('annual income') as well as weekly income at the time of the interview ('current income'). Some further comparability issues affect only one or the other of these income concepts but these issues appear to be more substantial for current income than for annual income. The 2005-06 SIH includes salary sacrificed benefits in the current income measure. From 2003-04 onwards, the procedures for collecting data on current income from investments and own-business income are also significantly improved. The public (confidentialised) SIH 2005-06 data files include some current income variables which are intended to be comparable with those in pre 2003-04 SIH data. However, the file does not include such a variable for current disposable income from all sources, nor for the amount of (imputed) income taxation. Thus without access to the

ABS income tax imputation model, analyses of trends over the period 1995-96 through 2005-06 using current disposable income are difficult to pursue with confidence.

Annual income comparability is affected by two methodological changes relating to the ABS 'financial exclusion flag'. Analysis of annual income may not be appropriate for people whose household composition has changed, or who have recently arrived in the country, because the recorded household size and composition does not apply to the period over which annual income is measured. In an attempt to account for this issue, the ABS includes a 'financial exclusion flag' that identifies the affected households and suggests they be excluded from annual income analysis. However, Saunders and Bradbury (2006) note that changes in the definition of the flag (affecting annual income from 1998-99 onwards) appear to have an important effect on poverty rates. They suggest that a more comparable analysis of annual income would ignore the exclusion flag, a suggestion that we follow here.

The second methodological change to annual income is that from 2003-04 onwards, the ABS began collecting income for people who had arrived in Australia sometime during the 'current financial year'. In earlier surveys, their annual income was set to zero. These new arrivals are flagged for exclusion from annual income analysis in both 2003-04 and 2005-06 but they are not distinguishable from other people flagged for exclusion on the publicly available files. However, their numbers are small (62 people in the 2005-06 SIH), and the direction of resulting bias in poverty trends is predictable. If we treat the SIH 2005-06 methodology as a benchmark, annual income poverty rates for 1995-96 are likely to be slightly overestimated because there are some people with zero recorded income for 1995-96, who actually had positive incomes. Therefore the increases in relative poverty that we

find are likely to be slight underestimates of actual changes in poverty rates. Conversely, the decreases in absolute poverty rates that we find are likely to be slight overestimates. Note that exclusion of households with zero income would not fully account for this issue, since some newly arrived migrants may share a household with other people.<sup>5</sup>

Whilst we do have some reservations over the comparability issues involving annual income data that are discussed above, there are few differences in our substantive results if the endpoint of the analysis is limited to SIH 2002-03, especially for trends in poverty for the overall population [self-reference to working paper suppressed for peer review].

The Household Expenditure Survey (HES), also conducted by the ABS, is another commonly used source of household income data, and it was also considered for this study. The HES has been held approximately every five years up to 2003-04 and it has also been affected by some of the methodological changes implemented in 2003-04 (ABS, 2006). The collection of wealth data in 2003-04 may have improved the reporting of associated income streams. The income tax model was completely different in 2003-04 compared with previous years. The integration of the HES and the SIH may have resulted in a greater emphasis on the auditing of income items, leading to improvements in quality. In any case, the timing of the HES surveys is not ideal for our study. The Howard government was elected approximately halfway between the 1993-94 and 1998-99 surveys and thus neither is ideal for the purpose. Similarly, 2003-04 is not an ideal endpoint for our analysis.

The Household, Income and Labour Dynamics in Australia (HILDA) survey was also considered. Six waves of HILDA income data are available beginning 2000-

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<sup>5</sup> Others have been concerned over annual income (in the previous financial year) recorded in the SIH 1994-95 and the SIH 1995-96 (Saunders and Bradbury, 2006, p.353; ABS 2003, p.14). These years are outside the period of our investigation.

01 and, in principle, could be used to measure poverty-rate trends during the latter years of the Howard government. However, there are questions as to whether HILDA is a suitable data source for an investigation of trends in cross-sectional statistics. HILDA is a panel survey and as such it does not take a random sample of Australian households in any year other than the initial year. The cross-sectional weights provided correct for differences in some observed characteristics between the sample and that of the population in each year. However, differences in unobserved characteristics (and those observed characteristics that do not contribute to the weights) are not taken into account. Unlike repeated, cross-sectional, random samples, any resulting bias is likely to intensify over the length of the panel survey. Saunders and Bradbury (2006, p. 259) also draw attention to concerns over the need to use imputed incomes in a large number of cases where income data are missing.

In view of the above data issues, we have decided to conduct our analysis using the 18,873 people living in households that were selected for the 1996-97 SIH and the 24,295 people in households selected for the 2005-06 SIH.<sup>6</sup> When appropriate weighting procedures are used these people constitute a random sample of individuals living in private dwellings in all but the most remote areas of Australia. The two per cent of Australians who are outside the scope of the surveys (ABS 2005, p.2) include the homeless and people living in institutions such as boarding schools, prisons and military barracks. Our analysis is based on annual income in the previous financial year, the primary reason being that we are more confident of the inter-temporal comparability of annual income data than of the current income data as discussed above. However, some results based on current income are presented in the Appendix. Results for the whole population are much the same regardless of the income

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<sup>6</sup> The 1996-97 Basic SIH-CURF contains 7,245 households, in which live 14,595 people aged 15 years or older and 4,278 people younger than 15 years. The 2005-06 Basic SIH-CURF contains 9,961 households, with 19,190 people aged 15 years or older and 5,105 people younger than 15 years.

measure, but results for children vary somewhat with the income measure used. We use disposable income, which is gross cash income from all sources minus income taxes (which are imputed by ABS). Incomes in each year were inflated to 2004-05 prices by the CPI.<sup>7</sup> We do not exclude households with zero or negative incomes. This is consistent with Saunders and Bradbury (2006).<sup>8</sup>

## 2.2 Methodology

It is well recognised that the analyst's choice of methodology is likely to influence the value of the poverty rate. The methodology employed in this study is similar to that used by Saunders and Bradbury (2006) in that the person is the unit of analysis, poor people are defined as those who live in households with insufficient equivalised, disposable income, and the modified OECD equivalence scale is used to convert household income to an adult-equivalent basis.<sup>9</sup> The poverty rate is estimated by the (weighted) number of poor people in the sample divided by the (weighted) total number of people in the sample. The underlying assumption of this methodology is that resources are shared among household members, so that each member has the same standard of living.

Studies of inter-temporal poverty must decide the type of poverty line to be used and how to update it over time. The purely relative approach is to set the poverty line in a given year equal to a particular point in *that year's* income distribution, in

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<sup>7</sup> The consumer price index used is: CPI, All Groups, Weighted Average of the Eight Capital Cities (ABS 2007b). It averages 118.72 in 1995-96 and 146.94 in 2004-05.

<sup>8</sup> Changes in overall poverty rates are not sensitive to the exclusion of non-positive incomes. Changes in child poverty rates are slightly lower (between 0.1 and 0.6 percentage points lower) with such an exclusion. The levels of poverty in both years are also slightly lower (between 0 and 1 percentage point lower) at most poverty lines with the exclusion (full results are available from authors).

<sup>9</sup> The modified OECD scale assigns the first adult in the household a weight of one point. Each additional person aged 15 years or older receives 0.5 points, and each child under 15 years of age receives 0.3 points. Thus, a couple with two children is considered to have needs that are  $(1 + 0.5 + 0.6 =) 2.1$  times as large as those of a single adult household. In other words, the household contains 2.1 adult equivalents. Disposable income divided by the number of adult equivalents gives the equivalised disposable income of the household, which can be compared with the poverty threshold for a single adult to determine whether or not the household is poor. The OECD scale has become the conventional choice of equivalence scale in the Australian literature, and in most international studies.

which case the real value of the poverty line can change over time. An absolute poverty line of the type used in this paper is set equal to a particular point in *the initial year's* income distribution and updated for changes in the cost of living, thereby keeping the material standard of living represented by the poverty line constant through time. Our approach to absolute poverty, sometimes called an anchored poverty line, was employed by Saunders and Bradbury (2006, p.350-352). It is also used to produce one of the indicators of social exclusion collected by EU countries, where the poverty line is 'anchored' at 60 per cent of median income three years earlier and updated for inflation to the current year (Blank, 2008, p. 247).<sup>10</sup>

Although most studies of poverty in Australia use a purely relative approach, we believe that keeping the poverty line constant in real terms is also informative. In an expanding economy, a relative poverty approach could report an increase in poverty, even though many people experience an increase in their material standard of living. Similarly, in a period of economic downturn, a relative poverty approach could report a decline in the poverty rate, despite many people experiencing a deteriorating material standard of living. Therefore we propose a decomposition technique that reconciles the two approaches. We decompose changes in relative poverty rates into the effect of changes in the real value of the poverty line and the effect of changes in the real incomes of people in the lower part of the income distribution.

The data in the SIHs constitute a complex random sample of people living in private households throughout urban and most rural areas of Australia. Standard errors of the poverty rates reported in this paper were computed using the jackknife

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<sup>10</sup> The other type of absolute poverty line is set at a budgeted level sufficient to fulfil basic needs in the initial year and is updated over time for changes in the cost of living. The U.S. Census Bureau publishes official poverty statistics based on such an absolute poverty line. The Henderson poverty line, which has been used in many Australian studies, is a hybrid approach. It originally was set at a budgeted level that was independent of the distribution of income, but when it is updated using changes in per capita household disposable income it takes on aspects of a relative poverty line. Foster (1998) discusses various ways in which absolute and relative concepts enter into poverty measurement.

methodology described by the ABS (2005, pp.10-11) and ABS (2007c, pp.27-29). The process entails computing each poverty rate multiple times using the multiple sets of replicate weights provided on the confidentialised unit-record files (CURF) from the SIHs and measuring the variability of these multiple estimates around the poverty rate calculated using the ‘main’ weight. Thus:

$$SE(\hat{p}) = \sqrt{\frac{M-1}{M} \sum_{j=1}^M (\hat{p}_j - \hat{p})^2} \quad (1)$$

where  $\hat{p}$  is the poverty rate computed from the full sample using the ‘main’ weight and  $\hat{p}_j$  is the poverty rate computed from the sub-sample that is obtained when the  $j^{\text{th}}$  set of replicate weights are used.  $M$  is the number of sets of replicate weights, 30 in the 1995-96 SIH-CURF and 60 in the 2005-06 SIH-CURF. The poverty line used in computing the poverty rate for each of the random sub-samples identified by the replicate weights can be absolute or relative. An absolute poverty line is fixed across all  $M$  random sub-samples but a relative poverty line must be recalculated for each of the  $M$  random sub-samples. Consequently, the standard error of a poverty rate that is calculated using an absolute poverty line,  $z$ , will be smaller than the standard error of a poverty rate calculated using a relative poverty line that is equal in value to  $z$ .

The SIHs are independent samples so the standard error of the change in the poverty rate between the two survey dates is given by:

$$SE(\hat{p}_{04-05} - \hat{p}_{95-96}) = \sqrt{SE(\hat{p})_{04-05}^2 + SE(\hat{p})_{95-96}^2} \quad (2)$$

and the statistical significance of the poverty-rate change is based upon the standard normal statistic:

$$Z = \frac{\hat{p}_{04-05} - \hat{p}_{95-96}}{SE(\hat{p}_{04-05} - \hat{p}_{95-96})} \quad (3)$$

### 3. Poverty Rates and Poverty-Rate Changes

#### 3.1 Relative Poverty

Relative poverty-rate profiles for 1995-96 and 2004-05 are presented in Figure 1a. Each profile is a graph of the poverty rate against the poverty line, which was increased in one percentage-point increments from zero to 100 per cent of median income, thereby producing a smooth profile. The real value of any poverty line in Figure 1a differs between years. For example, 50 per cent of median income equates to \$11,193 per annum in 1995-96 and \$13,619 in 2004-05. Consequently, any change in the poverty rate over that time period will be partially due to the increase in median income between the two years and partially due to changes in the lower end of the income distribution. Figure 1b graphs the change in the relative poverty rate between 1995-96 and 2004-05, together with its 95 per cent confidence interval, as functions of the poverty line.

Table 1 displays five points on the poverty-rate profiles that appear in the figures. The top and middle sections of the table correspond to Figure 1a and list poverty rates and their jackknifed standard errors at various poverty lines in 1995-96 and 2004-05, respectively. The bottom section of the table corresponds to Figure 1b and gives the change in the poverty rate, the standard error of that change, the Z-statistic and its P-value at the five poverty lines.

Several features of Figure 1 and Table 1 are of interest. First, at low thresholds, the poverty rate is small and changes little as the threshold increases. But as the threshold becomes larger the poverty rate becomes sensitive to the choice of relative poverty line. At a poverty line equal to 40 per cent of median income, the poverty rate is 5.08 and 6.79 per cent in 1995-96 and 2004-05, respectively. It doubles to 10.33 per cent (1995-96) or 13.34 per cent (2004-05) at a poverty line equal to 50

per cent of median income, and increases substantially again to 19.35 or 21.36 per cent at a poverty line equal to 60 per cent of median income. Second, at all poverty lines less than or equal to 91 per cent of median income, the 2004-05 poverty-rate profile lies above that of 1995-96, indicating an increase in relative poverty. Furthermore, the increase is statistically significant over poverty lines ranging from 23 through 68 per cent of median income. Third, those increases in the relative poverty rate that are statistically significant are large enough to be noteworthy. For example, the 3.02 percentage point increase that occurs at 50 per cent of median income constitutes a  $(3.02/10.33 =)$  29 per cent increase in poverty over the nine-year period. Finally, the fact that the largest inter-temporal changes in relative poverty are observed at poverty thresholds close to half median income is not surprising. The poverty rate will approach 50 per cent and the inter-temporal change in the poverty rate will approach zero as the poverty line approaches 100 per cent of median income.<sup>11</sup> Similarly, when the poverty line equals zero the poverty rate will equal the percentage of negative incomes in the sample and, assuming the latter is small in any given year, the inter-temporal change in the poverty rate will be close to zero.

### *3.2 Absolute Poverty*

Absolute poverty-rate profiles for 1995-96 and 2004-05 are presented in Figure 2a, which differs from Figure 1a only in that the poverty line on the horizontal axis is expressed as a monetary amount. In constructing these profiles, the poverty line was increased from zero to 22,000 dollars per annum in 100-dollar increments, which are small enough to produce a smooth profile. The poverty lines on the horizontal axis of Figure 2a range from 4,000 dollars per annum, below which poverty rates showed little variation, to 20,000 dollars, which is a ‘generous’

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<sup>11</sup> A poverty rate defined as the proportion of observations *below* median income does not necessarily equal 0.5 exactly. For example, two out of five observations in the set {3, 5, 10, 12, 15} are below the median, as are two out of six of the observations in the set {3, 5, 10, 10, 12, 15}.

threshold in the sense that it corresponds to more than 70 per cent of median equivalised disposable income in both years. Unlike Figure 1a, any poverty line in Figure 2a has the same (real) value in both years. Therefore, any change in the poverty rate will be entirely due to changes in the lower end of the income distribution. Similar to Figure 1b, Figure 2b graphs the change in the absolute poverty rate between 1995-96 and 2004-05, and its 95 per cent confidence interval, as functions of the real, equivalised poverty line. Five points on the poverty-rate profiles are displayed in Table 2, together with their standard errors, Z-statistics and P-values. The range of poverty thresholds in Tables 1 and 2 are comparable in magnitude: 30 per cent of median income equals \$6,716 in 1995-96 and \$8,171 in 2004-05; 70 per cent of median income equals \$15,670 in 1995-96 and \$19,067 in 2004-05.

There are three salient features of Figure 2 and Table 2. First, as was the case with relative poverty, the choice of absolute poverty line has a considerable influence on the poverty rate. This is no coincidence. Every relative poverty line has a corresponding absolute value. The rate of increase in the absolute poverty rate quickens after \$9,000 in 1995-96 and after \$11,000 in 2004-05, which are equal to approximately 40 per cent of median income in the two years. Second, in contrast to the relative poverty profiles, the 2004-05 absolute poverty-rate profile lies below that of 1995-96 at poverty lines greater than or equal to \$7,800 per annum, indicating a decrease in poverty. Furthermore, the poverty-rate reductions are statistically significant at all poverty lines in excess of \$9,000 per annum. Third, the reduction in the absolute poverty rate between 1995-96 and 2004-05 is large and becomes larger as the poverty line increases. For example, at a poverty line of \$12,000 the reduction in the poverty rate is 5.17 percentage points; at \$15,000 it is 7.84 percentage points; and at \$18,000 the reduction in the poverty rate is 10.01 percentage points.

The pictures of poverty painted by Figures 1 and 2 are somewhat different: relative poverty has risen significantly at poverty lines ranging from 23 through 68 per cent of median income; absolute poverty has decreased significantly at poverty lines ranging from \$9,100 to \$20,000 per annum. The relative-poverty approach implicitly assumes that the norms of an acceptable standard of living are proportional to median income and therefore will likely change over time. The absolute-poverty approach implicitly assumes that what constitutes an acceptable standard of living is independent of the distribution of income and therefore will remain constant in real terms over time. Consequently, the type of poverty line – relative or absolute – and where it is set can have a considerable effect on changes in the proportion of people who are considered to be poor.

### *3.3 Decomposition*

It is possible to determine how much of a given change in the relative poverty rate can be attributed to (i) a change in the bottom end of the income distribution with the poverty line constant (that is, a change in the absolute poverty rate), and how much can be attributed to (ii) a change in the median level of annual, real, equivalised, disposable income with the bottom end of the distribution of income constant. Figure 3 displays one such decomposition while Table 3 decomposes several relative poverty-rate changes into these two components.

The decomposition of the change in the relative poverty rate can be performed in two ways, which will now be explained using a poverty line equal to 50 per cent of median income as an example (see Rows C1-C3 of Table 3). The decomposition is presented graphically in Figure 3, which duplicates part of Figure 2a but adds vertical lines equal in monetary value to 50 per cent of median income in 1995-96 and 2004-05. Poverty rates at these poverty lines are labelled a, b, c and d.

Decomposition 1 In 1995-96 a poverty line set at 50 per cent of median income was equivalent to \$11,193 and the poverty rate was 10.33 per cent (see Point a in Figure 3). At that same threshold, the poverty rate in 2004-05 was 7.37 per cent (Point b), a fall of 2.96 percentage points. By 2004-05, 50 per cent of median income was equivalent to \$13,619 at which threshold the poverty rate was 13.34 per cent (Point d), which is 5.98 percentage points higher than 7.37 per cent. In other words, the  $(13.34 - 10.33 =) 3.02$  percentage point increase in the relative poverty rate (from Point a to Point d) can be decomposed into a 2.96 percentage point fall in absolute poverty (from Point a to Point b) and a 5.98 percentage point increase in relative poverty resulting from the increase in median income (from Point b to Point d).

Decomposition 2 In 1995-96 a poverty line equal to 50 per cent of the median income was equal to \$11,193 and the poverty rate was 10.33 per cent (see Point a). Had the poverty line in 1995-96 been set at \$13,619, which is 50 per cent of 2004-05's median income, the poverty rate would have been 20.08 per cent (Point c), which is 9.76 percentage points higher than 10.33 per cent. At a threshold of \$13,619, the poverty rate in 2004-05 was 13.34 per cent (Point d), which is 6.74 percentage points lower than 20.08 per cent. In other words, the  $(13.34 - 10.33 =) 3.02$  percentage point increase in the relative poverty rate (from Point a to Point d) can be decomposed into a 9.76 percentage point increase in relative poverty resulting from the increase in median income between 1995-96 and 2004-05 (from Point a to Point c) and a 6.74 percentage point fall in absolute poverty (from Point c to Point d).

Both decompositions demonstrate that the increase in relative poverty from 1995-96 to 2004-05, with the poverty line set at 50 per cent of median income, can be attributed to an increase in median income that more than offset a reduction in the density of the lower tail of the income distribution. The same conclusion is reached

with poverty lines equal to 40, 60 and 70 per cent of median income. However, at a poverty line equal to 30 per cent of median income, a small increase in the proportion of people in households with incomes below \$6,716, and an increase in median income, both contributed to the small increase in relative poverty of 0.98 percentage points.

#### **4. Poverty Rates and Poverty-Rate Changes of Children**

The vulnerability of the young makes child poverty a special issue. Whereas it can be argued that some adults are poor because they have made unwise decisions, these arguments do not apply to children. There is also a concern that growing up in poverty could limit one's earning potential as an adult, thereby perpetuating a cycle of poverty. Children are seen as an investment in society's future so it is not surprising that reducing child poverty has been a policy objective of previous governments, Bob Hawke's 1987 election promise that by 1990 no Australian child would live in poverty being a well-known example. The socially conservative policies of the Howard Government promoted the traditional family<sup>12</sup> but their effect on children from disadvantaged families is complex. For example, the direct effect of the Family Tax Benefit Part B, which was introduced in July 2000, was to increase the incomes of families with young children and one main income earner. However, it may have had the indirect effect of encouraging married women with children to leave the workforce and encouraging single women with children to enter the workforce, with implications for their families' incomes.

In this section we focus on changes in poverty among children from 1995-96 to 2004-05. Under the equivalence assumption employed throughout this paper, the

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<sup>12</sup> Spending on Family Assistance rose in real terms from approximately 8 billion dollars in 1995-96 to 15 billion dollars in 2006-07, with large annual increases of 33 and 40 per cent in 2000-01 and in 2003-04, respectively (ABS, 1998 – 2008).

poverty status of children is the same as that of their parents. In line with the ABS (2004, p.53) we define children as persons younger than 15 years. Some of our results for child poverty are similar to those relating to poverty in the population as a whole: at poverty lines up to 68 per cent of median income of the entire population, relative poverty rates of children increased over the time period considered (see Figure 4 and Table 4); at poverty lines from \$9,100 to \$20,000 per annum, absolute poverty rates of children decreased (see Figure 5 and Table 5).

There are, however, some additional points of interest. The first involves comparisons of top two sections of Table 4 with those of Table 1, and of Table 5 with Table 2. The poverty rate of children exceeds that of the entire population at all poverty lines reported in Tables 4 and 5.<sup>13</sup> However, the differential is smaller in 2004-05 than in 1995-96 at poverty lines equal to 50, 60 and 70 per cent of median income. For example, at a relative poverty line equal to 50 per cent of median income in 2004-05 the poverty rate of children is  $(15.41 - 13.34 = )$  2.07 percentage points higher than that of the whole population; in 1995-96, the corresponding differential is  $(13.11 - 10.33 = )$  2.78 percentage points. Thus, over the time period considered we see a tendency for the relative poverty rate of children to become more like that of the entire population at the most commonly used poverty lines.

Second, although at most relative poverty lines the poverty rates of children increase from 1995-96 to 2004-05, the increase is statistically significant over a narrower range of poverty lines – 25 to 49 per cent of median income – than the corresponding range for the whole population (compare Figure 4b with Figure 1b). In contrast, poverty rates of children decrease from 1995-96 to 2004-05 at most absolute poverty lines, and the reduction is statistically significant at poverty lines in excess of

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<sup>13</sup> In 2004-05 this is true at all relative and absolute poverty lines that we considered. In 1995-96 it is true at relative poverty lines in excess of 9 per cent of median income, and at absolute poverty lines in excess of \$2,200.

\$10,200 per annum, which is similar to the corresponding range for the whole population (compare Figure 5b with Figure 2b).

How much of the change in the relative poverty rate of children can be attributed to a change in the real value of the poverty line, and how much to a change in the concentration of children at the bottom end of the income distribution? Table 6 follows the same decomposition procedure for children's poverty rates as Table 3 does for the entire population. The decomposition at a poverty line equal to 50 per cent of median income (see Rows C1-C3 of Table 6) is illustrated graphically in Figure 6.

#### Decomposition 1

The 2.29 percentage point increase in the relative poverty rate (from 13.11 per cent at Point a to 15.41 per cent at Point d) can be decomposed into a 3.14 percentage point fall in absolute poverty (from 13.11 per cent at Point a to 9.97 per cent at Point b) and a 5.43 percentage point increase in relative poverty resulting from the increase in median income (from Point b to Point d).

#### Decomposition 2

The 2.29 percentage point increase in the relative poverty rate (from 13.11 per cent at Point a to 15.41 per cent at Point d) can be decomposed into a 10.17 percentage point increase in relative poverty resulting from the increase in median income (from 13.11 per cent at Point a to 23.28 per cent at Point c) and a 7.87 percentage point fall in absolute poverty (from Point c to Point d).

Both decompositions demonstrate that the increase in relative poverty of children from 1995-96 to 2004-05, with the poverty line set at 50 per cent of median income of the entire population, can be ascribed to an increase in median income that more than offset a reduced concentration of children in the lower tail of the income

distribution. The same conclusion is reached with poverty lines equal to 40, 60 and 70 per cent of median income. However, at a poverty line equal to 30 per cent of median income, the increase in median income, and small increases in the proportions of children in households with incomes below \$6,716 and below \$8,171, both contributed to the increase in relative poverty of children of 2.04 percentage points.

## **5. Summary and Conclusions**

The years 1995-96 to 2004-05, the first three terms of the Howard government and part of the fourth, present a somewhat mixed report card as regards poverty. Results depend on the type of poverty line used. At a relative poverty line equal to 50 per cent of median income we observed an increase of 3.02 percentage points in the poverty rate of the population in general, which is statistically significant, and a 2.29 percentage point increase in the poverty rate of children, which borders on statistical significance (the P-value is 0.06). At an absolute poverty line equal to 50 per cent of median income in 1995-96 there was a decrease of 2.96 percentage points in the poverty rate of the entire population and a 3.14 percentage point decrease in the poverty rate of children, both of which are statistically significant. The decomposition of relative poverty-rate changes presented in this paper reconciles these diverse results: the increase in poverty resulting from an increase in median income more than offset the reduction in absolute poverty that occurred over this time period. The methodological transparency of the decomposition assists the interpretation of relative poverty-rate changes.

Another lesson to be learned from this study is that inter-temporal changes in poverty rates that are calculated with sample data need to be tested for statistical significance before any firm conclusion is drawn about whether poverty has increased

or decreased. We find that observed increases in relative poverty for the entire population were statistically significant at the five per cent level at poverty lines between 23 and 68 per cent per cent of median income. In the case of children, the range was narrower: 25 to 49 per cent of median income. Observed decreases in absolute poverty were statistically significant at the five per cent level at all poverty lines greater than approximately \$9,100 per annum for the entire population and \$10,200 per annum for children.

Finally, the poverty-rate profiles presented in this paper show the sensitivity of poverty rates to where the poverty line – relative or absolute – is set. Our results show that at poverty lines below 40 per cent of median income the poverty rate is low and unresponsive to increases in the poverty line. The poverty rate doubles when the poverty line increases from 40 per cent to 50 per cent of median income, and increases substantially again with an increase in the poverty line from 50 per cent to 60 per cent of median income. Empirical studies are typically based on one or other of these the poverty lines; our results show the importance of reporting all three.

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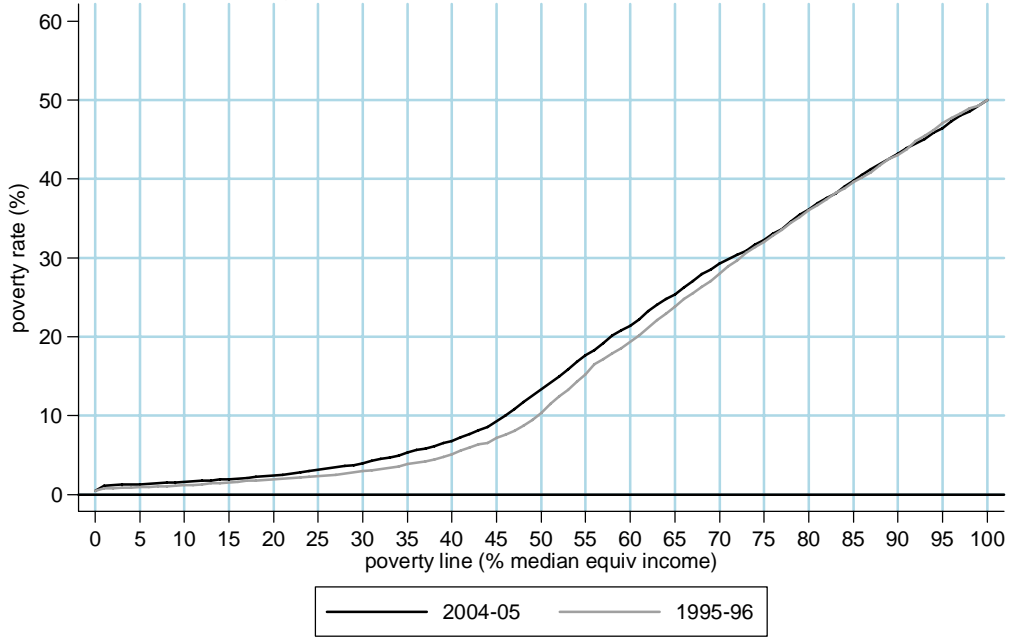
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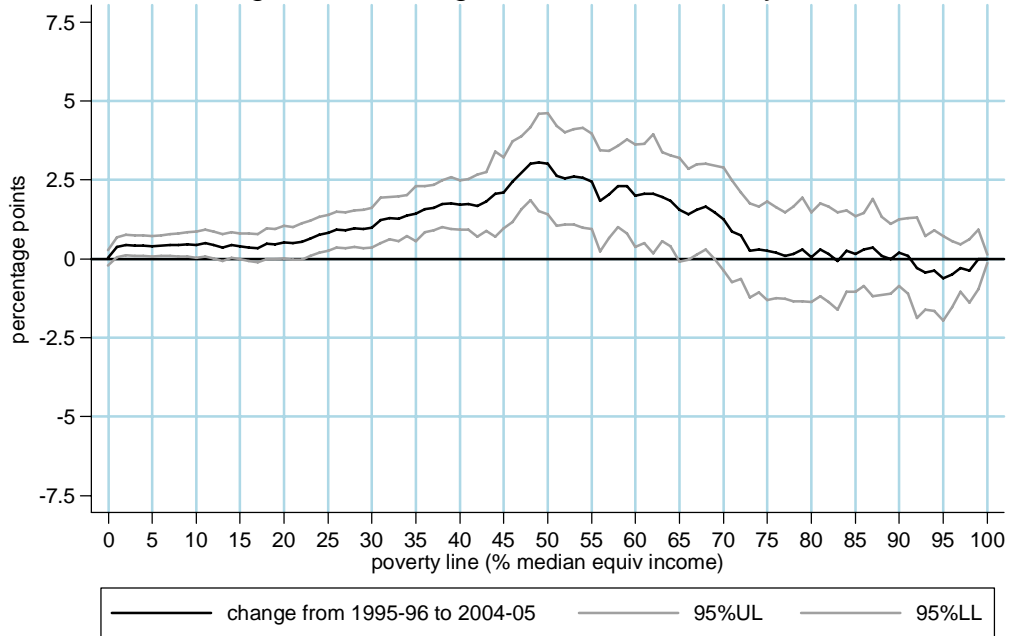
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Figure 1a: Relative Poverty-Rate Profiles



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Figure 1b: Changes in Relative Poverty Rates



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 1: Relative Poverty-Rate Profiles and their Changes, 1995-96 to 2004-05

<u>1995-96</u> median equivalent income = \$22,386    standard error = \$219		
<u>Poverty line</u> (% median income)	<u>Poverty rate</u> (%)	<u>Jackknifed SE</u> (%)
30%	2.93	0.20
40%	5.08	0.22
50%	10.33	0.60
60%	19.35	0.65
70%	27.97	0.68

<u>2004-05</u> median equivalent income = \$27,238    standard error = \$190		
<u>Poverty line</u> (% median income)	<u>Poverty rate</u> (%)	<u>Jackknifed SE</u> (%)
30%	3.91	0.25
40%	6.79	0.33
50%	13.34	0.55
60%	21.36	0.50
70%	29.23	0.48

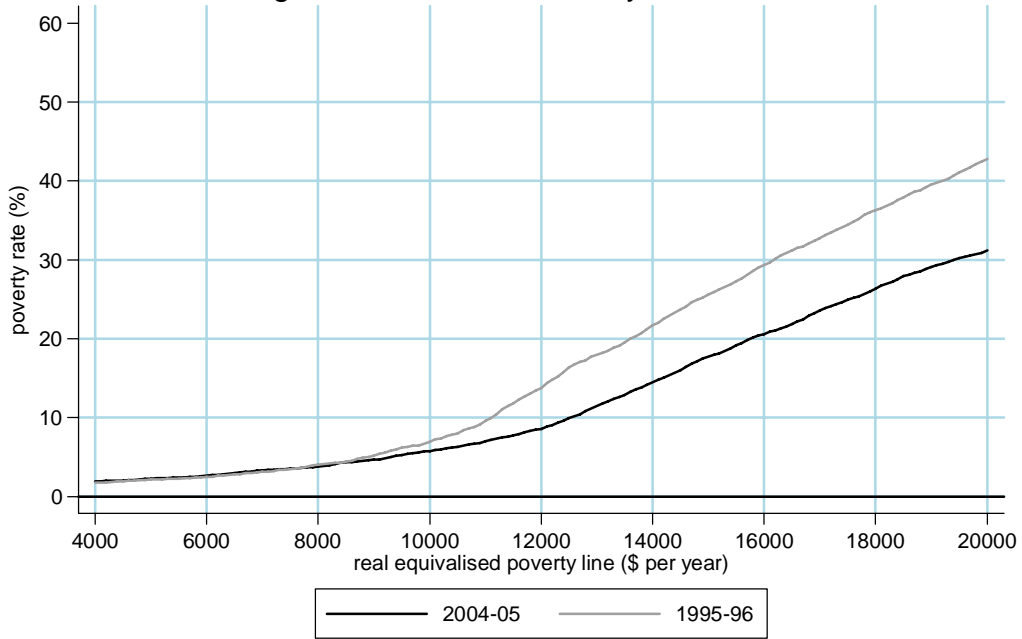
<u>1995-96 to 2004-05</u> $\Delta$ in median = \$4,852    SE ( $\Delta$ in median) = \$290				
<u>Poverty line</u> (% median income)	<u><math>\Delta</math> in poverty</u> rate	<u>SE of <math>\Delta</math> in</u> poverty rate	<u>Z-stat</u>	<u>P-value</u> (two-tailed)
30%	0.98	0.32	3.0465	0.0023
40%	1.71	0.40	4.3037	0.0001
50%	3.02	0.82	3.6972	0.0002
60%	2.00	0.82	2.4292	0.0151
70%	1.26	0.83	1.5056	0.1322

*Note 1:* All monetary values are in 2004-05 dollars.

*Note 2:* Relative Poverty Lines are calculated as a percentage of median equivalised disposable (financial-year) income.

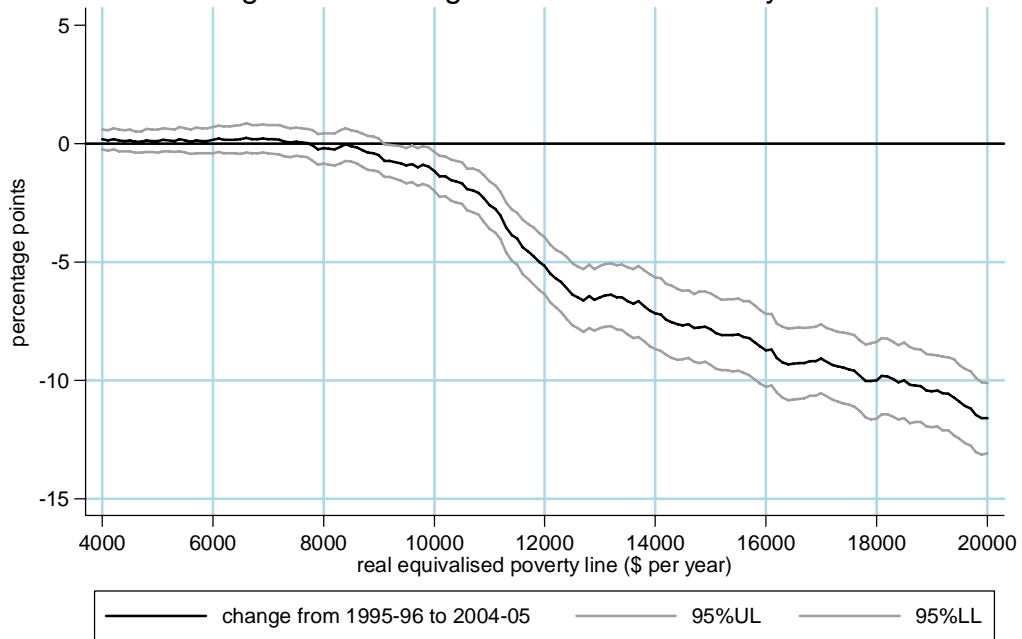
*Source:* Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

Figure 2a: Absolute Poverty-Rate Profiles



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Figure 2b: Changes in Absolute Poverty Rates



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 2: Absolute Poverty-Rate Profiles and their Changes, 1995-96 to 2004-05

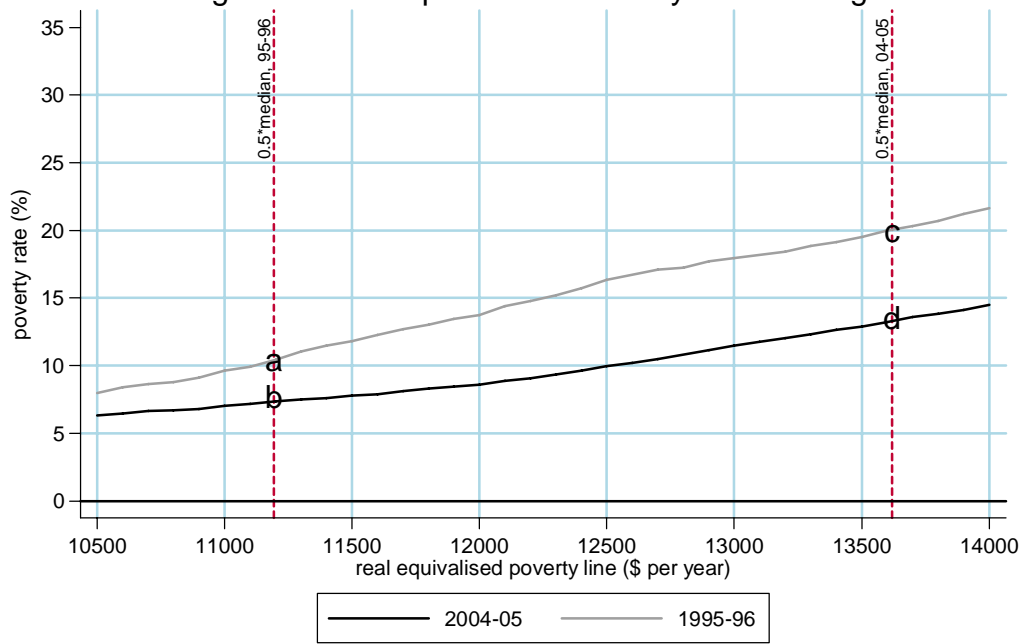
<u>1995-96</u>				
<u>Poverty line</u> <u>(per year)</u>	<u>Poverty rate</u> <u>(%)</u>	<u>Jackknifed SE</u> <u>(%)</u>		
\$6,000	2.50	0.17		
\$9,000	5.17	0.24		
\$12,000	13.75	0.50		
\$15,000	25.56	0.60		
\$18,000	36.29	0.62		
<u>2004-05</u>				
<u>Poverty line</u> <u>(per year)</u>	<u>Poverty rate</u> <u>(%)</u>	<u>Jackknifed SE</u> <u>(%)</u>		
\$6,000	2.64	0.23		
\$9,000	4.68	0.27		
\$12,000	8.58	0.36		
\$15,000	17.72	0.49		
\$18,000	26.28	0.55		
<u>1995-96 to 2004-05</u>				
<u>Poverty line</u> <u>(per year)</u>	<u><math>\Delta</math> in poverty</u> <u>rate</u>	<u>SE of <math>\Delta</math> in</u> <u>poverty rate</u>	<u>Z-stat</u>	<u>P-value</u> <u>(two-tailed)</u>
\$6,000	0.15	0.29	0.5163	0.6056
\$9,000	-0.49	0.36	-1.3700	0.1707
\$12,000	-5.17	0.62	-8.3817	0.0001
\$15,000	-7.84	0.78	-10.1203	0.0001
\$18,000	-10.01	0.82	-12.1739	0.0001

*Note 1:* All monetary values are in 2004-05 dollars.

*Note 2:* Absolute poverty lines are expressed in (financial-year) equivalised disposable income.

*Source:* Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

Figure 3: Decomposition of Poverty-Rate Changes



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 3: Decomposition of the Change in Relative Poverty Rates

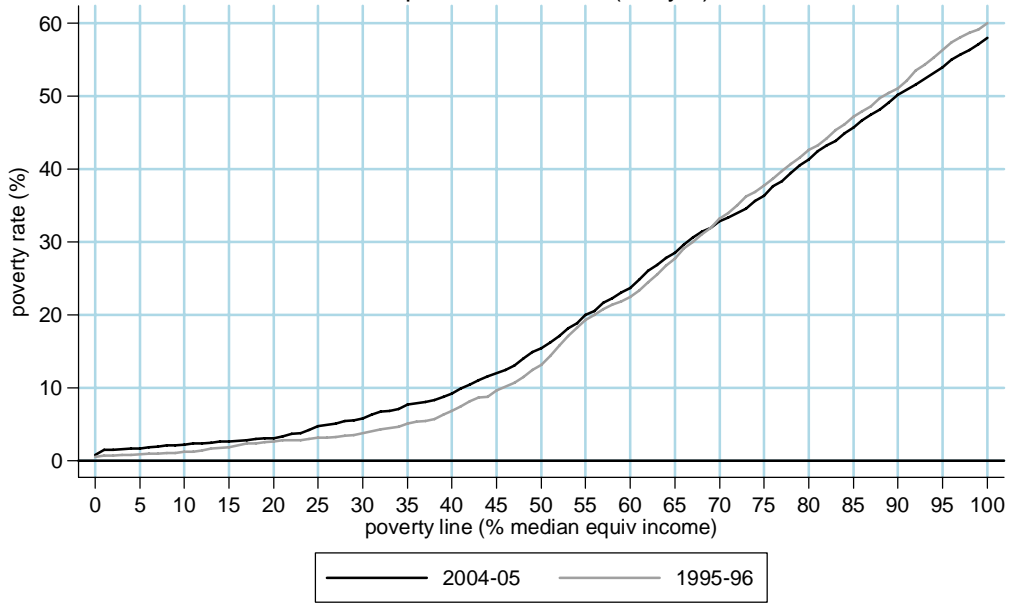
Type of poverty line (1)	Value of poverty line (2)	Poverty rate (%)		Change in absolute poverty rate 1995-96 to 2004-05 (5)	Change in relative poverty rate 1995-96 to 2004-05 (6)
		1995-96 (3)	2004-05 (4)		
A1. 30% of median income, 1995-96	\$6,716	<b>2.93</b>	3.11	0.18	
A2. 30% of median income, 2004-05	\$8,171	4.16	<b>3.91</b>	-0.24	
A3. Change due to a change of median	\$1,456	1.23	0.80		<b>0.98</b>
B1. 40% of median income, 1995-96	\$8,954	<b>5.08</b>	4.61	-0.48	
B2. 40% of median income, 2004-05	\$10,895	9.10	<b>6.79</b>	-2.31	
B3. Change due to a change of median	\$1,941	4.02	2.19		<b>1.71</b>
C1. 50% of median income, 1995-96	\$11,193	<b>10.33</b>	7.37	-2.96	
C2. 50% of median income, 2004-05	\$13,619	20.08	<b>13.34</b>	-6.74	
C3. Change due to a change of median	\$2,426	9.76	5.98		<b>3.02</b>
D1. 60% of median income, 1995-96	\$13,432	<b>19.35</b>	12.75	-6.60	
D2. 60% of median income, 2004-05	\$16,343	30.58	<b>21.36</b>	-9.22	
D3. Change due to a change of median	\$2,911	11.23	8.61		<b>2.00</b>
E1. 70% of median income, 1995-96	\$15,670	<b>27.97</b>	19.75	-8.22	
E2. 70% of median income, 2004-05	\$19,067	39.67	<b>29.23</b>	-10.44	
E3. Change due to a change of median	\$3,397	11.70	9.48		<b>1.26</b>

Note 1: All monetary values are in 2004-05 dollars.

Note 2: Relative poverty lines are calculated as a percentage of median equivalised disposable (financial-year) income.

Source: Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

**Figure 4a: Relative Poverty-Rate Profiles**  
 Dependent children (<15yrs)



Data: ABS, SIH-CURF, 1996-97 and 2005-06

**Figure 4b: Changes in Relative Poverty Rates**  
 Dependent children (<15yrs)



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 4: Relative Poverty-Rate Profiles and their Changes, 1995-96 to 2004-05  
Dependent Children (<15yrs)

<u>1995-96</u> median equivalent income = \$22,386    standard error = \$219		
<u>Poverty line</u> (% median income)	<u>Poverty rate</u> (%)	<u>Jackknifed SE</u> (%)
30%	3.74	0.49
40%	6.77	0.51
50%	13.11	0.79
60%	22.38	0.94
70%	33.09	1.07

<u>2004-05</u> median equivalent income = \$27,238    standard error = \$190		
<u>Poverty line</u> (% median income)	<u>Poverty rate</u> (%)	<u>Jackknifed SE</u> (%)
30%	5.78	0.53
40%	9.14	0.64
50%	15.41	0.95
60%	23.66	1.16
70%	32.79	1.15

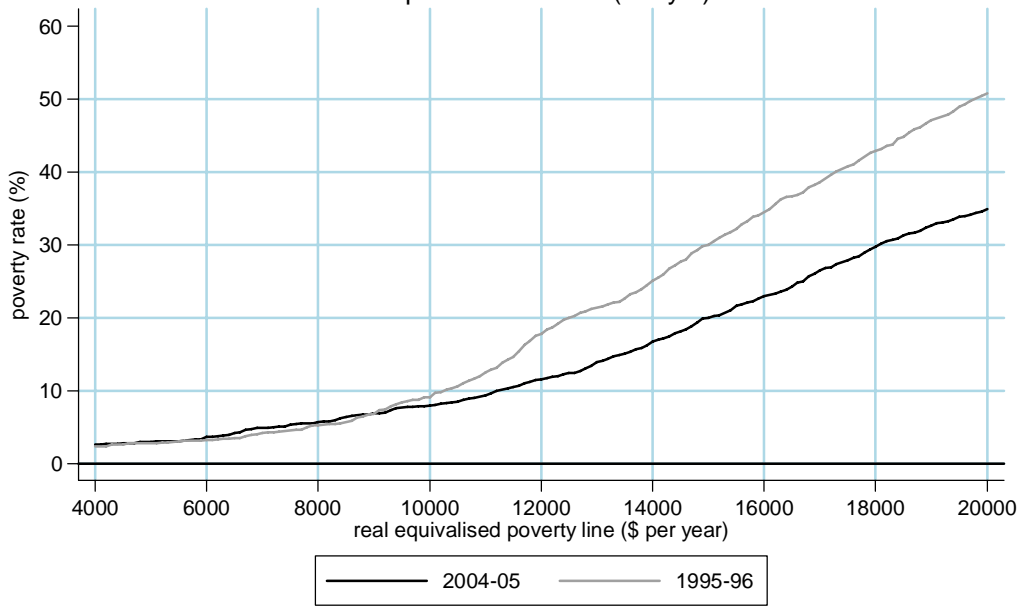
<u>1995-96 to 2004-05</u> $\Delta$ in median = \$4,852    SE ( $\Delta$ in median) = \$190				
<u>Poverty line</u> (% median income)	<u><math>\Delta</math> in poverty rate</u>	<u>SE of <math>\Delta</math> in poverty rate</u>	<u>Z-stat</u>	<u>P-value</u> (two-tailed)
30%	2.04	0.72	2.8427	0.0045
40%	2.37	0.82	2.9026	0.0037
50%	2.29	1.23	1.8577	0.0632
60%	1.28	1.50	0.8534	0.3934
70%	-0.30	1.57	-0.1937	0.8464

*Note 1:* All monetary values are in 2004-05 dollars.

*Note 2:* Relative Poverty Lines are calculated as a percentage of median equivalised disposable (financial-year) income.

*Source:* Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

**Figure 5a: Absolute Poverty-Rate Profiles**  
 Dependent children (<15yrs)



Data: ABS, SIH-CURF, 1996-97 and 2005-06

**Figure 5b: Changes in Absolute Poverty Rates**  
 Dependent children (<15yrs)



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 5: Absolute Poverty-Rate Profiles and their Changes, 1995-96 to 2004-05  
Dependent Children (<15yrs)

<u>1995-96</u>				
<u>Poverty line</u> <u>(per year)</u>	<u>Poverty rate</u> <u>(%)</u>	<u>Jackknifed SE</u> <u>(%)</u>		
\$6,000	3.22	0.44		
\$9,000	6.79	0.52		
\$12,000	17.81	1.02		
\$15,000	30.00	1.16		
\$18,000	42.84	1.11		

<u>2004-05</u>				
<u>Poverty line</u> <u>(\$ per year)</u>	<u>Poverty rate</u> <u>(%)</u>	<u>Jackknifed SE</u> <u>(%)</u>		
\$6,000	3.61	0.45		
\$9,000	6.86	0.57		
\$12,000	11.58	0.79		
\$15,000	19.98	1.01		
\$18,000	29.75	1.15		

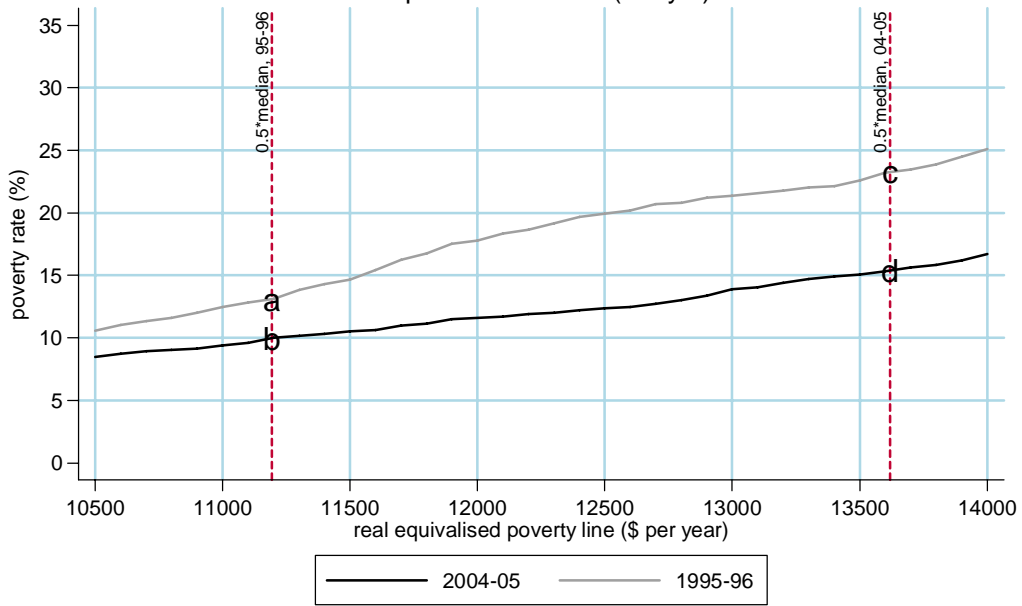
<u>1995-96 to 2004-05</u>				
<u>Poverty line</u> <u>(per year)</u>	<u><math>\Delta</math> in poverty</u> <u>rate</u>	<u>SE of <math>\Delta</math> in</u> <u>poverty rate</u>	<u>Z-stat</u>	<u>P-value</u> <u>(two-tailed)</u>
\$6,000	0.39	0.63	0.6114	0.5409
\$9,000	0.06	0.78	0.0814	0.9351
\$12,000	-6.23	1.29	-4.8206	0.0001
\$15,000	-10.02	1.54	-6.4893	0.0001
\$18,000	-13.09	1.60	-8.1802	0.0001

*Note 1:* All monetary values are in 2004-05 dollars.

*Note 2:* Absolute poverty lines are expressed in (financial-year) equivalised disposable income.

*Source:* Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

Figure 6: Decomposition of Poverty-Rate Changes  
Dependent children (<15yrs)



Data: ABS, SIH-CURF, 1996-97 and 2005-06

Table 6: Decomposition of the Change in Relative Poverty Rates  
Dependent Children (<15yrs)

Type of poverty line (1)	Value of poverty line (2)	Poverty rate (%)		Change in absolute poverty rate 1995-96 to 2004-05 (5)	Change in relative poverty rate 1995-96 to 2004-05 (6)
		1995-96 (3)	2004-05 (4)		
A1. 30% of median income, 1995-96	\$6,716	<b>3.74</b>	4.57	0.83	
A2. 30% of median income, 2004-05	\$8,171	5.36	<b>5.78</b>	0.42	
A3. Change due to a change of median	\$1,456	1.62	1.21		<b>2.04</b>
B1. 40% of median income, 1995-96	\$8,954	<b>6.77</b>	6.74	-0.02	
B2. 40% of median income, 2004-05	\$10,895	12.02	<b>9.14</b>	-2.88	
B3. Change due to a change of median	\$1,941	5.25	2.40		<b>2.37</b>
C1. 50% of median income, 1995-96	\$11,193	<b>13.11</b>	9.97	-3.14	
C2. 50% of median income, 2004-05	\$13,619	23.28	<b>15.41</b>	-7.87	
C3. Change due to a change of median	\$2,426	10.17	5.43		<b>2.29</b>
D1. 60% of median income, 1995-96	\$13,432	<b>22.38</b>	15.03	-7.35	
D2. 60% of median income, 2004-05	\$16,343	36.21	<b>23.66</b>	-12.55	
D3. Change due to a change of median	\$2,911	13.83	8.63		<b>1.28</b>
E1. 70% of median income, 1995-96	\$15,670	<b>33.09</b>	22.02	-11.07	
E2. 70% of median income, 2004-05	\$19,067	47.24	<b>32.79</b>	-14.45	
E3. Change due to a change of median	\$3,397	14.15	10.77		<b>-0.30</b>

Note 1: All monetary values are in 2004-05 dollars.

Note 2: Relative poverty lines are calculated as a percentage of median equivalised disposable (financial-year) income.

Source: Author's computations using the ABS' *Surveys of Income and Housing*, 1996-97 and 2005-06, confidentialised unit record files.

## **Appendix – Changes in Poverty Rates Based on Current Weekly, Equivalised, Household Disposable Income**

The results presented in the body of the text are based on income in the previous financial year because we conclude that inter-temporal comparability issues appear to be less severe for annual income than for current income over the period of interest. This appendix presents changes in relative-poverty rates, overall and for children, computed using current income thereby revealing the sensitivity of our results to the income measure used.<sup>14</sup>

A comparison of Figure 1b in the text with Figure A.1b in this appendix reveals that changes in the overall poverty rate are not greatly sensitive to the choice of annual rather than current income. The range of poverty lines over which the poverty-rate change is positive and statistically significant is wider under annual income but at the most commonly used poverty line – 50 per cent of median income – the poverty rate increases by approximately 2.5 percentage points and is statistically significant under both income measures.

On the other hand, the profile of change in the relative-poverty rate of children is quite sensitive to the use of annual versus current income (compare Figure 4b in the text with Figure A.4b in this appendix). At a poverty line equal to 50 per cent of median income, the relative-poverty rate of children increases by 2.3 percentage points and is marginally significant when annual income is used but under current income the increase is tiny and not significantly different from zero. An earlier version of our paper [reference to working paper suppressed] used the 2002-03 SIH as the endpoint in the analysis, thereby avoiding the comparability problems that we have discussed here. In that paper, changes in the relative-poverty rate of children

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<sup>14</sup> Changes in absolute poverty rates based on current income, like those based on annual income, are negative and statistically significant at almost all poverty lines. Consequently, they are not shown here.

were far less sensitive to the choice of income measure. This provides further support for our assertion that results based on current income should be treated with caution in the context of the research questions we have addressed here.

