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Measuring Poverty and Inequality from Highly Aggregated Small Area Data: The Changing Fortunes of Latrobe Valley Households

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ABSTRACT

The Latrobe Valley generates 85% of Victoria's electricity. The progressive privatisation of the electricity industry between 1989 and 1997, had a lasting effect on income distribution in the region. This paper investigates the change in income level, inequality and poverty for this region between 1986 and 2006. To circumvent data availability issues, we propose a general method of using aggregated data to obtain regional income distributions. We find that in 1986 Latrobe Valley incomes were well above other non-metropolitan areas while inequality measures were relatively low. Mean income subsequently dropped below comparable locations while inequality rose. Although income levels had partially recovered by 2006, inequality measures continued to rise.

Key words: Poverty, inequality, restructure, privatization, small-area income distribution

JEL classification numbers: D31, D63, R13, I32

“And I think for Australians, when they look at the cities in which they live and the regional towns in which they live, they can probably think of some pockets off their home towns and cities where, despite a long period of economic growth before the global financial crisis, there were parts of their community that got left behind for whom economic growth wasn’t making a difference.”

Gillard, Julia, excerpt from radio interview, Radio National Breakfast, 18 September 2009

I Introduction

The evaluation and assessment of poverty, wealth and income inequality in small townships and regional areas has always been of paramount concern to Australian analysts, researchers and policymakers alike. However, this has always proved difficult to do due to the absence of usable data. The specific issue with available data, such as the Census, is that the concerned statistical collection agency (the ABS, in this case) is bound by law to preserve the confidentiality of respondents and so only provide data in grouped form (see Harding, et al 2004 for a detailed description of the issues).

This problem with small area data has attracted our notice because we are interested in the welfare of households in Latrobe Valley, a small area in the state of Victoria that produces 85 per cent of state’s power, but one which was also strongly affected by the restructuring of the power generation industry in the early 1990s. We aim to measure, describe and analyse changes in welfare and the level of inequality in this small region over the last 20 years. Our interest is driven in part by the larger concern that some regional pockets of the economy did not share in the benefits of Australia’s 18 year run of solid economic growth. The current state of available data however prevents us from using standard methods to undertake a thorough analysis of this issue because no household level data exists for areas as small as the Latrobe Valley.

In the economic literature, Athanasopoulos & Vahid (2003) address this data gap by using a combination of unit records from the Census and Household Expenditure Survey (HES). Harding et al (2004), on the other hand, use another type of data augmentation technique, called microsimulation, which involves imputing characteristics of one distribution from another. This builds a ‘synthetic’ microunit dataset that lends more easily to standard analysis.

Both these approaches are deemed inadequate for the analysis of small areas. For the first case, unit record files are identified geographically only in terms of regions with populations of at

least 124,000, so that these data are not available for household level analysis in smaller statistical divisions (Latrobe Valley population is below 80,000). For the second case, the use of wider region average values and outcomes are deemed too broad to capture the detailed variations in welfare conditions within the small geographical areas that have unique characteristics.

In view of these considerations, the aims of this paper, formulated in sequence, are as follows:

- a. To measure, describe and analyse changes in household welfare in the Latrobe Valley region over the period 1986 to 2006. The period covers the industrial restructuring period in the state of Victoria and our results will provide new insights into the changing state of household welfare in the region over that 20 year period. In order to achieve this with the available data, an appropriate methodology must be developed. Therefore we have a second aim:
- b. To propose a simple but reliable alternative methodology for constructing combined income distributions from highly aggregated data for small areas. This method differs from data augmentation used in previous work in that it uses within-sample information to construct a more detailed income distribution that is useful for poverty and inequality measurement. This will lay the groundwork for the calculation and analysis of welfare indices at the small area level, in general. The techniques may also apply to other situations where income distributions involving different categories are combined.

This method we will introduce in (b) has wider application than just for Latrobe Valley analysis. The method, which involves combining different income distributions from grouped data to form a one unified one, can equally be applied to combining any collection of income distributions that are supplied in grouped form from disparate sources where the class intervals are different. For example, it could be applied to the problem of combining income distributions for a collection of countries.

The remainder of the paper is organized as follows. Section 2 provides a historical account of the Latrobe Valley economy. Section 3 investigates the data and some adjustments to the data, while Section 4 outlines the proposed methodology for constructing an overall frequency distribution from many disparate ones. In Section 5 we present our results including the evolution over twenty years of income distribution in the Latrobe Valley, and poverty and inequality measures deduced from the distribution. Section 6 concludes.

II Latrobe Valley: A Profile of the Economy

The Latrobe Valley region is a coal-rich industrial area in South East Victoria responsible for 85% of the Victoria's electricity production via the Yallourn, Hazelwood and Loy Yang power plants. Power plants have operated in the region since the early 1920s, and have been the major source of regional income as well the major provider of employment in the area. The power industry in the Latrobe Valley was restructured in a process starting in 1989, but the sale of power stations occurred between 1992 and 1997. A detailed timeline is shown in Table 1.

From an economic efficiency standpoint, Simhauser (2006) emphasizes the production efficiencies gained, not just for the region, but for the entire state. The overwhelming conclusion by industry researchers is that electricity reforms have delivered significant benefits to Australia as a whole, mostly reflected in the cost efficiencies in operations and which have led to reductions in usage charges. The restructuring of the electricity industry has however resulted in extensive labour-shedding in Victoria and elsewhere. The number of power industry jobs in the Latrobe Valley region peaked just above 10,000 in 1988 under the government-owned State Electricity Commission of Victoria (SECV Annual Report 1991-92). By 1995, this had been reduced to less than 4000, half of which were outsourced (Stone, 1996) and the remainder held directly with the private companies that now own the power stations¹.

Our interest in the welfare of Latrobe Valley households is both strategic and practical at many levels. The unique economic experience of the area provides an ideal platform to demonstrate our new method of combining frequency distributions. The long-term assessment of welfare in the Valley will also provide new insights into the issue of regions left behind in the era of growth. Lastly, looking ahead, the concern over household welfare in the Latrobe Valley has also taken on even greater significance more recently in light of the push for greener energy. The inevitability of the move away from coal-based power generation has placed this region, yet again, in a vulnerable social and economic state. It is imperative that the long term economic and social impacts of the region's industrial restructuring in the 1990s be well analysed. A clear understanding of these impacts will be critical for identifying areas and approaches for policy intervention; so that the negative effects of such changes on individual/household well-being and overall welfare levels in the region can be better managed.

III Data, Some Issues and Adjustments

As far as we are aware, there is no previous study of inequality and poverty for the Latrobe Valley region. The main reason for this, we believe, is the absence of usable income data for the purpose – that is, data available for such small 'statistical divisions' are not detailed enough to warrant reliability of the calculation of welfare measures. The particular difficulty lies in the fact that unit record data are not

¹Birrell (2001) provides more details of restructuring in Latrobe Valley.

available for small population regions (those with populations under 124,000) due to privacy considerations. The only income data specific to the Latrobe Valley that are available from the Australian Bureau of Statistics (ABS) are the gross annual incomes obtained from the census, and these are provided only in aggregated form.

In this paper we use aggregated income data from the five censuses 1986, 1991, 1996, 2001 and 2006 conducted by the ABS². For each census, individual incomes are collected in categorical form, that is, the range of possible incomes is divided into income classes, including an open-ended upper class. The household income data provided by the ABS, also in categorical form with an open-ended upper class, are derived from the data about each member of the household. The number of household income classes varies from census to census, ranging from 13 to 18. In particular, the available detail about high incomes varies.

The ABS definition of household is “one or more persons, at least one of whom is at least 15 years of age, usually resident in the same private dwelling”. Thus a household is a collection of people living together who may or may not be related. It includes (i) family households which can be couple family with no children, couple family with children, one parent family or other family, (ii) lone person household, (iii) group household, and (iv) other household. Family is defined by ABS as “two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who are usually resident in the same household”.

For our main analysis, we use comprehensive household data, which provides the number of households in each income class for each household type. The household types are specified by a combination of the number of adults (one to “five or more”) and number of children (zero to “five or more”). In our detailed discussion of child poverty, in Section V, we will restrict attention to certain family households.

(i) Adjustments to the data

To be able to examine inequality in Latrobe Valley using the data from different household sizes and across time the income data need to be adjusted for movements in prices over time and the different compositions of households. In what follows, we give detail regarding the consumer price index and the equivalence scales used in this study. Further, the data provided by the ABS are not perfect. There are several issues that we come across that require some adjustments. These issues are listed along with how we approach them.

1. Consumer Price Index

² Source: Australian Bureau of Statistics, Census of Population and Housing, 1986, 1991, 1996, 2001, 2006 [data available on request].

For all types of household and family data, we express the income class limits in 2006 dollars using the consumer price index (CPI) obtained from the ABS³. All dollar amounts throughout the paper are quoted in 2006 dollars. While the CPI refers to metropolitan households, there is no other suitable index available. As a consequence, we assume that the proportional price changes in the Latrobe Valley are the same as for the metropolitan area and use the CPI reported by the ABS.

2. Adult Equivalent Scales

The first aim of the paper is to combine the income distributions from different household types to come up with a single income distribution for the whole Latrobe Valley. To be able to combine these household types, we need to take into account the different compositions and economies of scale in household units. A popular option is to use the household per capita income. To obtain a better measure of household welfare, we choose instead to scale the household incomes into “adult equivalent income”. The scale we use is the one suggested by the OECD as “OECD-modified equivalence scale”. This scale, first proposed by Haagenars et al (1994), assigns a value of 1 to the household head, of 0.5 to each of additional adult member and of 0.3 to each child. Thus for a household with A adults and C children, and income x , the adult equivalent income is $w = x/s$ where $s = 1 + .5(A - 1) + .3C$. This is a measure of the number of dollars it would take for a single-person household to enjoy the same level of welfare as this household. Compared to reported household income, adult equivalent incomes are generally accepted as more accurate representations of household welfare.

3. The last income classes: open-ended intervals

For each type of household, the data we have are in the form of number of households in each income class. For each income class we know the lower and upper income limits except for the highest income class, which is an open-ended interval. In order to use the data to calculate inequality some assumptions about the open-ended interval are needed. The assumptions made will have a significant effect on the overall mean and the measure of inequality of the distribution. This problem is not unique to our study. What is commonly done in practice is to assume some maximum limit that is reasonable. An alternative approach is to assume that incomes at the tail follow some kind of distribution. For example, we tried fitting a Pareto distribution to the upper tail but the number of class intervals was insufficient to obtain a reasonable result. Given the available information, we make two adjustments to the data in the open-ended intervals. The first adjustment is to estimate the shape of the upper tail as follows. We start by noting that the lower income limit of the last interval varies from year to year. These limits are \$1911, \$4173, \$2570, \$2300 and \$4000 for 1986, 1991, 1996, 2001 and 2006, respectively, expressed in 2006 dollars. Since for 1991 and 2006 there are class intervals further into the upper tails relative to the other years, we apply the shape of the 1991 upper tail to that of the adjacent years 1986 and 1996, and we apply the shape of the 2006 upper tail to that of 2001. We then use this information to create more intervals in the upper tails of the 1981, 1986 and 2001. For 1986 for example, we create artificial class

³ Catalogue 6401.0 - Consumer Price Index, Australia, Selected Years. Catalogue from the Australian Bureau of Statistics.

limits in the tail beyond \$1911 equal to the class limits in the 1991 tail. We then distribute the number of households in the last class of 1986 to these extra intervals using the same proportions as those in 1991.

Secondly, we make an assumption about the upper limit of the highest intervals. We note that one of the wealthiest household types is two adults with no children. In non-metropolitan Victoria for this household type in 1991, less than 0.2 percent have household incomes above \$4173, and in 2006 there are less than 0.6 percent in non-metropolitan Victoria that have income above \$4000. For the remaining years (1986, 1996 and 2001) the behaviour of the upper tail of the distributions indicated by the available data (which is up to approximately \$2000 per week) lies between the values for 1991 and 2006. Consequently, we fix the upper limits for the highest interval for all years to be at \$4500.

4. Households with one adult

The income distribution data for single adult households are often inadequate, particularly at the upper tail. Table 2 is an example of this data – the 2006 data for all single adult households with and without children. None of these households has incomes within the intervals \$350-\$499 and \$1200-\$1399. The distribution also skips the interval \$2000-\$2499 and has a relatively very big frequency in the next interval \$2500-\$2999. Similar “broken” distributions occur for households with a single adult for other years. There are two issues with these data.

Consider first the zero observations in some income intervals. We investigated this problem and found that it occurs because of the ABS process of converting individual information from the census forms into household format. On the forms, income data for each individual member of the household is requested in the form of income intervals. When these data are processed each individual’s income is assumed to be equal to the midpoint of the interval in which it falls, and then the sum of household members’ incomes is assigned to be in a household income interval. In most census years, the class intervals for households are different from those for individuals. In some years this conversion process leads to a “bumpy” distribution where there are zero or very few households of a particular size in certain income classes. This is because for some household types there are household income classes that do not contain any sum of the midpoint incomes that pertain to a household of that size. For the case of one-adult households, where this problem is at its worst, there is enough information available to us to work our way back to the individual income data. From these data we then assume that the income in each class is distributed uniformly within that class. We then recalculate the household income distribution on this basis. However, for households with more than one adult, this is not possible because we cannot trace back to the individual income data and consequently distortions will be present in the final equivalised distribution that we develop.

The other issue with single adult households is inadequate data in the upper tail region. In our 2006 example, the highest individual income class on the census form starts at \$2000, and all members of this class have been arbitrarily assigned by the ABS to the \$2500-\$3000 reported household income class.

We could ignore this problem and use the data as given because the proportion of single adult household types in the Latrobe Valley with income in the upper tail is relatively very small. However, we choose to deal with this type of inadequacy by smoothing out the broken distribution. For example, the distribution in Table 2 is smoothed by spreading the 1773 households across all income classes above \$2000 by assuming that the shape follows the income distribution for all other household types combined.

IV An alternative Method for Combining Household Income Distributions

In this section we provide the details of an alternative methodology which we propose for constructing an overall equivalised income distribution from highly aggregated census data for small areas. We begin by considering the household income distributions for each household type adjusted for the tail distributions and the “bumpy” single adult frequencies, and reported as adult equivalent income in 2006 dollars, as detailed in Section 3. We aim to combine these income distributions using adult equivalent income to produce a meaningful household equivalised income distribution for the whole Latrobe Valley. The proposed method for combining income distributions is as follows.

For each household with income in an original ABS-provided class, its adult equivalent income now lies in the new scaled class interval corresponding to the original interval. At this point, we have a number of grouped frequency distributions for adult equivalent incomes, each having different class intervals and each corresponding to one type of household. We then combine these distributions in the next step to form a single distribution for all households in the region. To achieve this, there are two possibilities. One, which is common in practice, is to assume that each household received the midpoint equivalent income for the income class to which it belongs. Then the income distribution for the whole region is made up of all the households with their midpoint equivalent incomes. This was used for example by Milanovic (2002) in order to combine income distributions from different countries. Alternatively, a more realistic approach is to assume some distribution of incomes in each class interval of each household type (see, for example, Chotikapanich and Griffiths, 2000). In this paper, we choose to assume that the household equivalent incomes in a given class are distributed uniformly within each class interval. That is, the households in a given class are evenly spread over the interval instead of concentrating at the midpoint. This assumption is more realistic than the midpoint assumption, but is still simple enough to permit a straightforward method for combining distributions. Namely, under this assumption, for the distribution corresponding to each household type, the frequency density is constant within each class interval, and therefore at each point it is possible to calculate the sum of frequency densities contributed by each household type.

To illustrate the method, we develop a simple example. Consider the equivalised income distribution for households of type h , specified in terms of class intervals.

1. For any income x , falling into class interval i , the frequency density at that point is given by $p_{hi} = n_{hi} / w_{hi}$ where n_{hi} is the number of households in the i -th interval, and w_{hi} is the width of the i -th interval. Note that the width need not be the same for all i . We can graph p_{hi} against equivalised income to obtain a frequency density histogram. Such a histogram can be constructed for each household type. To facilitate exposition, we describe our methodology for hypothetical distributions for two household types $h = a$ and $h = b$. For example, household type a could contain one adult and no children, and household type b could contain two adults and no children. Or, in the context of global income distributions, a and b could refer to distributions of two different countries. Figure 1 illustrates histograms for two separate distributions, each with five class intervals, which we wish to combine.

2. If we draw the two frequency density histograms on the same axes as in Figure 2, the endpoints of the rectangles lie staggered along the income axis. As a result, the histogram for the combined data will have narrower class intervals. We will use the term subinterval for these narrower intervals. In our example, there are nine subintervals.

3. The combined distribution for a and b can be obtained by summing the frequency densities at each income point. Consider as an example income level x in Figure 2 which falls into subinterval 6 where the corresponding original class intervals are the third interval in a (a_3) and the fourth interval in b (b_4). The height of the combined histogram at x , which is the frequency density for the distribution of the combined household types, is obtained as the sum of the two frequency densities: $p = p_{a_3} + p_{b_4}$. The combined frequency density obtained in this way is the broken line in Figure 2. It is constant on each subinterval.

4. Finally the combined relative frequency density is obtained as $\frac{p}{N}$ where N is the total number of households of the two household types. From this, we can calculate various measures of welfare in the combined population.

This procedure can be applied to any number of household types. The higher the number of household types, the narrower the subintervals are in general. In our case, there are 30 types of households. Although there are irregularities caused by pre-processing of the data as discussed in Section 3, the process of combining equivalent income distributions for the whole region produces a smoother distribution than the different components corresponding to each household type. An example of the resulting distribution is shown in Figure 3. This is the distribution of adult equivalent income in the Latrobe Valley in 1991 where there are 540 subintervals. The generated data points that make up the combined distribution obtained by this method are sufficient to allow us to calculate poverty and

inequality measures. Lastly, it is noted that although the distribution appears to have non-zero density at zero income, the lowest income point on the graph is actually \$8.50. Similar numbers occur in the other census years.

In order to smooth the empirical distributions, we attempted to fit standard statistical densities to the data points generated, and we investigated fitting log-normal, beta-2, Dagum and Singh Maddala distributions. We find that none of these popular distributions fit well for any year or location. Because of the generally poor fit, we decided not to pursue this direction. We shall discuss a possible explanation for the non-standard shape of our empirical income distributions in Section 5.

All subsequent discussion and results are based on relative frequency distributions for adult equivalent income, measured in 2006 dollars, obtained by the method described above. Hereafter we refer to this adult equivalent income simply as income.

The following quantities required to analyse inequality and poverty conditions can now be derived: mean, median, quintile means, Gini coefficient and poverty indices. All are calculated from the combined income distribution described above. Typically, in our application, the number of subintervals is approximately 500 and the average width of a subinterval is less than \$10. Therefore using interpolation, or trapezoidal or midpoint approximations over these very small subintervals has little effect on the measures.

The mean

The mean of the distribution is calculated using the formula for grouped data, $\mu = \sum m_i p_i w_i / N$ where m_i , p_i , and w_i are the midpoint, frequency density and width respectively of the i^{th} subinterval.

Median

The median income is found by first choosing the subinterval containing the 50th percentile. The precise location of the median is then identified by linear interpolation between the lower and upper limits of the subinterval.

Quintile Means

The mean and median give single values describing the level of welfare. One way to look more closely at different sections of the distribution is to consider the mean of each quintile.

In the same way as for the median, the quintile limits are found by first choosing the subinterval containing the appropriate percentile and interpolating. The quintile means are then calculated in the same way as the overall mean.

Gini

The value of the Gini coefficient ranges from 0 to 1. It would take the value zero if every household had the same income (completely egalitarian), while a Gini of 1 would mean that all income accrued to one household (most inegalitarian.) The Gini coefficient can be calculated from

$$G = \sum_{i=1}^{I-1} \eta_{i+1} \pi_i - \sum_{i=1}^{I-1} \eta_i \pi_{i+1}$$

where I is the number of subintervals, π_i is the cumulative proportion of the population having income up to and including subinterval i , and η_i is the corresponding cumulative proportion of income.

Poverty indices

In the analysis that follows, we calculate the head count ratio, the poverty gap and the squared poverty gap. The generalised formula for these indices (Foster, Greer and Thorbecke 1984) is

$$P_\alpha = \frac{1}{N} \sum_{i=1}^q n_i \left[\frac{z - \tilde{x}_i}{z} \right]^\alpha$$

where \tilde{x}_i is the midpoint income of subinterval i , z is the poverty line, n_i is the number of households in the subinterval i , N is the total number of households and q is the number of subintervals for which $\tilde{x}_i \leq z$. The parameter α can be viewed as a measure of poverty aversion with a larger α giving greater emphasis to the poorest poor; P_0 is the head count ratio, that is, the proportion of households below the poverty line; P_1 is the poverty gap index which indicates the aggregate distance of poor household incomes from the poverty line; and P_2 , the squared poverty gap index, is a distribution sensitive weighted average of household poverty gaps. For all three measures, the higher the number, the greater the degree of poverty.

V Empirical Results

In this section, we present Latrobe Valley income distributions for the five census years from 1986 to 2006, obtained as described in Section 4.⁴ These distributions are then used to derive inequality and poverty indices. We analyse the extent to which these welfare measures changed in the Latrobe Valley over this 20-year period, where the first 10 years were characterised by the joint effects of a nationwide recession and the local restructuring of the electricity industry. For the Australian economy as a whole the next 10 years were characterised by recovery and strong growth, and we investigate to what extent the Latrobe Valley recovered from the restructuring sufficiently to share in this growth. For this purpose we compare income data in a similar region, namely Ballarat.

(i) Income Distributions

Graphs of income distributions for all households in the Latrobe Valley during the first 10 years are shown in Figure 4a. The three distributions pertain to the three census years 1986, 1991 and 1996. We see that in 1986 the distribution is bimodal with a good proportion of households having high levels of income. Over the next two census years, the income density grows more skewed to the right implying increasing inequality with more low-income households. This seems to reflect the prevailing conditions

⁴ Results were computed using the GAUSS programming language. The program is available on request.

at the time, including the Australia-wide recession of 1990 and 1991. For the case of Latrobe Valley, it could also reflect the adverse effects that the electricity industry restructuring may have had on the region at that time (see Table 1 in Section 2).

Fig 4b shows the distribution for the next 10 years. From 1996, some recovery is visible with the modal peak moving to the right by 2001. Between 2001 and 2006, we notice two key differences in the densities. The first is that the modal peak is lower in 2006 compared to 2001, and the second is that beyond the \$1200 income level, the density sits higher in 2006 than in 2001. These seem to suggest a shift to higher incomes which coincides with a time of strong growth in the Australian economy.

To what extent are these developments unique to the Latrobe Valley? In order to compare the fortunes of the Latrobe Valley over the twenty years from 1986 to 2006 with other regions, we also obtained corresponding data for Ballarat and for non-metropolitan Victoria. Ballarat was chosen as a comparison location because of its similar population size and distance from Melbourne. Also, the 2006 census shows that the profile of jobs across industry categories in Ballarat is very similar to that in the Latrobe Valley, except for approximately 1500 extra jobs in 'Electricity, Gas, Water and Waste Services' in the Latrobe Valley. The profile in these two locations differs from the rest of non-metropolitan Victoria mainly in having a lower percentage of jobs in 'Agriculture, Forestry and Fishing'.

For each census year, graphs of income distributions in the Latrobe Valley and in Ballarat are superimposed in Figure 5. We see that in 1986, incomes appear more evenly distributed in Latrobe Valley compared to Ballarat as indicated by the flatter Latrobe density curve. By 1991 the Latrobe Valley distribution has become much more skewed relative to 1986, whereas the Ballarat distribution has shown only a slight shift to the left relative to its 1986 position. The implication is that welfare in the Latrobe Valley deteriorated more sharply, even if the 1991 income distribution in the Latrobe Valley remained more favourable than in Ballarat. By 1996, the distributions for the two locations approximate each other very well; both have become even more peaked and this peak occurs at lower income. These shifts represent a continued worsening of the welfare distribution in the five years after the recession in both locations. But at last, the 10 years from 1996 to 2006 show improvement in income distributions for the two regions. By 2006 both curves have become less peaked and acquired stronger tails. More specifically, the income densities for Latrobe Valley and Ballarat were rather similar, though the Latrobe Valley had a larger proportion of households with low incomes (below about \$400), and fewer in the mid-range (\$400 to \$1000). Thus the Latrobe Valley has lost its income advantage and Ballarat now has the more favourable income distribution.

Note that in all these empirical distributions there is a prominent peak around the \$250 to \$300 income mark. The characteristic peaking around this low level of income may reflect government transfers and subsidies that are meant to bring poor families up to the poverty line. This would explain why the empirical distributions are not well approximated by standard parametric income density curves.

To quantify some of the changes observed above, we now consider mean and median incomes for the Latrobe Valley, Ballarat and non-metropolitan Victoria, which are reported in Table 3. In 1986, the Latrobe Valley had a mean equivalised income of \$599, 18 percent higher than in non-metropolitan Victoria as a whole, while its median income of \$532 was 26 percent higher. Ballarat lagged slightly behind the average for non-metropolitan Victoria, so that the Latrobe Valley's advantage over Ballarat was even greater.

Reflecting the recession, our data shows that mean and especially median incomes dropped significantly in non-metropolitan Victoria between 1986 and 1991. Median income fell by 4% in Ballarat (from \$412 to \$394) and by 14% in the Latrobe Valley, albeit from a higher base (from \$532 to \$458). This much bigger drop in the Latrobe Valley can be attributed to the job losses which resulted from the electricity industry restructuring that was happening at that time. From 1996 onwards, *median* incomes in the Latrobe Valley were below those in Ballarat and non-metropolitan Victoria, although by 2006 the *mean* income had recovered to \$636, which was identical to Ballarat. Based on the mean, one could argue that the premium that Latrobe Valley incomes once enjoyed in relation to other parts of the state has vanished, but a painful period of adjustment has passed and the Valley is now no worse off than another regional centre. However, note that the Latrobe Valley median in 2006 (\$502) remains well below that of Ballarat (\$530) and has dropped in real terms by \$30 over the 20 years, while the mean has had a net gain of \$37. The changing shape of the graphs, along with the relative values of the mean and median indicate a strong rise in inequality in the Latrobe Valley over the twenty year period. Calculation of Gini coefficients (Table 4) for the equivalised income distribution supports this conclusion.

The calculated Gini coefficients for 1986 show that the Latrobe Valley enjoyed more equality in the distribution of household incomes compared to Ballarat and non-metropolitan Victoria. However, by 1996 the Latrobe Valley Gini coefficient was substantially higher than in the other listed regions. This rise in the Gini coefficient thus coincided with the period of electricity industry restructuring. Over the twenty years, the Latrobe Valley Gini increased by 0.05, from 0.32 to 0.37, compared with a rise of just 0.013 for the other regions.

If we consider quintile means, a more detailed picture emerges. Table 5 presents quintile means for each census year, for the three locations. In 1986, quintile means for all Latrobe Valley quintiles were well above typical non-metropolitan values. All five quintile means fell in all regions between 1986 and 1991, with a much sharper decline in the Latrobe Valley. However, only the lowest quintile in the Latrobe Valley fell below the Ballarat value. As the Australian economy began to recover, the three middle Latrobe Valley quintile mean incomes continued to fall, so that by 1996 all Latrobe Valley quintile means were now close to or below the levels in Ballarat and non-metropolitan Victoria. After 1996, the two highest Latrobe Valley quintile means steadily recovered so that by the end of the period (2006) they were well above their 1986 values, and also somewhat above other non-metropolitan values. Meanwhile, the mean incomes in the lower three quintiles for 2006 were below their 1986 levels

and also lower than the other current non-metropolitan levels. Graphs of behaviour over time for each quintile mean are presented in Figure 6.

This shows that the increased inequality measured by the Gini coefficient resulted from a combination of reduced incomes in the lower quintiles and increased incomes in the upper quintiles. Miranti et al. (2009) identified correlates of high and low inequality in Australian regions, and may provide some explanation. Accordingly, increased incomes at the top end of the scale can be due to the concentration of managers and other professionals in the regions, following the more specialised jobs that have been retained or created during the restructuring period in Latrobe Valley. At the bottom end of the income scale, there is ample evidence to show that many jobs have been lost due to the electricity restructuring in the region (see, for example, Birrell (2001), and Fairbrother and Testi (2002)). Other researchers have also pointed out the increase in public housing in the region during the recovery years which, according to other related research (see for example, Birrell (2000) and Miranti et al. (2009)) is a strong indicator of the presence of large and growing numbers of low income households in the region.

(ii) Poverty Analysis

To investigate the level of hardship at the lower end of the distribution, we measure the depth and severity of poverty in the three regions, and analyse trends over time in this section. The calculation of poverty indices requires the specification of a poverty line. For Australia, the Henderson poverty line (HPL) is most commonly used, but it is based on metropolitan incomes. As this paper is about regional welfare, the HPL does not seem very suitable. We therefore adopt another recognised standard: half the median income. In particular for each census year, the poverty line we use is the half the current median income of the one adult equivalent income for non-metropolitan Victoria. Another approach to providing a poverty line for non-metropolitan areas was taken by Davidson, et al (2000) who argued for using 80% of the Henderson Poverty Line (HPL). Note that in the 20 years from 1986 to 2006, the HPL has risen by 35% while the half-median income poverty line which we use in this study has increased by only 22%. Therefore, our estimates of poverty are relatively conservative.

Table 6 lists these values. In real terms, the value of the median actually fell a little between 1986 and 1996; however from 1996 to 2006 it increased quite strongly during a time of general economic growth. Table 7 presents poverty indices for the Latrobe Valley and selected Victorian regions. In 1986, the head count ratio (HCR) for the Latrobe Valley was a low 0.097. It then steadily increased to reach 0.125 in 2001, and then shot up to be 0.166 in 2006. This trajectory differs from those of the other regions as seen in Figure 7. Ballarat and non-metropolitan Victoria had relatively high rates of poverty in 1986 (above 0.13), the HCR then decreased steadily to be below 0.1 in 2001 before rising sharply to levels in 2006 that are above those seen in 1986. That poverty rates in the Latrobe Valley rose while those of the other comparison regions fell and remained higher than other regions through to 2006, suggests that the effects of restructuring may have had a long-term influence on poverty levels. Results from the

calculation of the poverty gap P_1 and the squared poverty gap P_2 confirm a large deterioration of the poverty situation in Latrobe Valley in the last 20 years. By these measures, the extent and depth of poverty in the Latrobe Valley was significantly less in 1986 compared to other regional centres and by 2006, this order was reversed.

Having established that households in the Latrobe Valley fared relatively poorly compared to those in Ballarat and non-metropolitan Victoria generally in both the inequality and poverty stakes, we next ask ourselves how these eventualities have impacted on the welfare of children in the region.

(iii) Child Poverty

The welfare of children is of particular concern because unlike adults, children - especially young children - are seen to have little or no choice over their economic conditions. There is also abundant evidence showing that childhood family incomes do impact on development and later outcomes in life for children (see for example Belley and Lance (2007) and Plug and Vijverberg (2005)), even though the size of this impact is under debate. Such issues are particularly relevant to the evaluation of policy interventions that increase parental employment and income. So, in what follows, we discuss our findings on the extent and degree of child poverty in the Latrobe Valley region, and then provide more detailed look into the situation via an analysis of the welfare of particular family types. An attempt is made to explain observations by looking at relevant policy moves that may have influenced economic outcomes for children in the region at the time.

Table 8 presents child poverty rates for Latrobe Valley and the comparison regions of Ballarat and non-metropolitan Victoria. The head count ratios reported in this table represent the proportion of children in the respective locations that are below the poverty line. These figures indicate that in the Latrobe Valley, child poverty rates have ranged from 10.3 to 16.6 percent between 1986 and 2006. That is, between 10.3 and 16.6 percent of children in the Valley were below the poverty line, which is set here as half the median income of non-metropolitan Victoria. These rates are consistent with those estimated by previous studies. Davidson, et al (2000) estimate child poverty for 1990 at 12.8 percent for all of Australia, 14.3 percent for capital cities and 10.4 percent for non-capital city areas⁵. Harding and Szukalska (2000) meanwhile estimate child poverty rates for 1982 to be between 13.2 and 14.2 percent⁶, depending on the definition of children⁷; and for 1995/96, their estimates ranged from 8 to 11 percent. At the international level, our estimates here are also consistent. Australian child poverty rates were estimated at 10.9 percent for 93/94 (Forster 2000) and 12.6 percent for 96/97 (UNICEF 2000). As far as we are aware, there are no more recent estimates of child poverty. However, it is generally agreed

⁵ Davidson, et al (2000) reviews and summarizes/tabulates early estimates of child poverty rates in Australia for the years 1966 up to 1996, and they range from a low 6.2 for 1966 to as high as 24.6 for 1995/96.

⁶ Harding and Szukaska estimate rate based on different poverty lines; we quote their estimates here that use half median income as poverty line as we do in this paper.

⁷ Inclusion of older children appears to increase child poverty rates.

that metropolitan rates of poverty are higher than non-metropolitan, and therefore it should be expected that rates in our area of interest would be below those estimated for Australia generally.

From Table 8, we see that in 1986, the Latrobe Valley enjoyed relatively low poverty rates with just 10.3 percent of children in the region below the poverty line. The rates for Ballarat and non-metropolitan Victoria for this same year were 13.5 and 14.5 percent, respectively. From this point on, poverty rates grew consistently worse in Latrobe Valley while significant improvements in the rates were observed for the other two regions. More specifically, the proportion of Latrobe Valley children in poverty increased from 10.3 to 12.1 percent between 1986 and 1996, while the proportion in Ballarat decreased from 13.5 to 10.1 percent of all children in the Ballarat region. An even bigger decline in child poverty rates was observed in the non-metropolitan Victorian regions. We note here that these are the observations in the first 10 years of our study, a period which includes both the 1990-91 nationwide recession and most of the 1989-97 electricity restructuring period in Latrobe Valley.

Over the second 10-year period, child poverty rates were observed to have worsened in all regions, but the increase in the Latrobe Valley rates proved much larger compared to both Ballarat and the rest of non-metropolitan Victoria. We make particular mention of the rates in 2001 and 2006, a period of substantial recovery in Latrobe Valley as well as general prosperity for the national economy. During that time, child poverty rates in the Latrobe Valley climbed from 13.9 percent to 16.6 percent. Thus by 2006, Latrobe Valley child poverty rates were much higher than elsewhere in regional Victoria. This is the same trend as those observed for poverty rates calculated for all households earlier and strongly implies that children in Latrobe Valley were not shielded from the twin impact of the recession and the electricity restructuring. Not even government family payments – which increased substantially for families with children from 1987⁸ - could serve to insure these children from sliding into poverty. As seen in the later years, the extra disadvantage borne by families the Latrobe Valley persisted well after the recession and the restructure was complete; well-after the incomes of the top 40 percent had fully recovered.

To further understand the nature of child poverty in Latrobe Valley in general and to answer the income question posed above in particular, we focus our analysis on nuclear families. We use the term “nuclear family” to mean families consisting of one or two parents, along with one or more dependants, where “dependant” can refer to a child under 15 or an older dependent child aged 15 to 24. We focus on these kinds of families since this allows us to separately analyse the welfare of single-parent families and two-parent families, and it is also possible to distinguish between families where no parent works and families where at least one parent is employed. Over the twenty years considered in this study, the proportion of households in non-metropolitan Victoria that include children under 15 years of age fell

⁸ following the famous pledge of then Prime Minister Hawke that no Australian child would live in poverty by 1990.

from 37 percent to 27 percent. Among these households, the proportion of nuclear families rose from 85 percent to 89 percent.

We first look at Table 9 which shows child poverty rates for nuclear families that are grouped into couple-parent and single-parent types. Child poverty rates (HCRs) are tabulated for each census year along with the number of families of each type and their respective population shares. In all years and locations, couple-parent families far outnumber single-parent families, although the population share of single-parent types in all locations have significantly increased over time. Further, compared with Ballarat and the rest of Non-Metropolitan Victoria, the Latrobe Valley has experienced a larger increase in the proportion of single-parent families over time, rising from a low 13 percent of families with children in 1986 to a high of 28 percent of families with children in 2006.

In all locations, the calculated poverty rates show that children in single-parent families were most at risk of poverty, with child poverty rates in this single-parent subgroup being 5 to 6 times higher than those for couple-parent families. Further, the incidence of child poverty in single-parent families was also found to be relatively high in Latrobe Valley for all survey years. Notwithstanding, child poverty rates for single-parent families for all three locations exhibit a similar U-shaped movement over time, with sharp decreases observed in the first 10 years and an equally sharp increases registered in the next 10 years.

In contrast, for couple-parent families, the incidence of child poverty exhibited large declines over time in both Ballarat (by 28 percent) and the rest of regional Victoria (by 25 percent), but the opposite trend is observed for Latrobe Valley. In fact, Latrobe Valley child poverty rates for couple-parent families have increased by 62 percent over the 20 years, even though the rate decreased marginally during the pre-recession period of 1986-1991. During the period 1991 to 1996 these rates in the Latrobe Valley nearly doubled. The high poverty rate for children has persisted from this point through to 2006. This was a period when the local economy was struggling to recover from the recession at the same time it was dealing with the adverse effects of the industrial restructuring.

In Figure 8, we present the *number* of children in poverty by type of parents, in the Latrobe Valley and in Ballarat. It is apparent that even while poverty incidence for children is significantly higher for single-parent families compared to couple-parent families, the actual number of poor children coming from both groups is much closer than this might suggest. As we can see, in 1996 the number of poor children in couple-parent families was actually higher than the number in single-parent families. Whilst this was reversed in 2006, the number accounted for by couple-parent families remained substantial.

The above findings bring to the fore the attendant social problems that have accompanied the growth of single-parent families in the last two decades. The economic and social welfare literature has ample country-wide evidence that single-parent families, particularly single-mother families, are more prone

to poverty and they experience greater levels of economic insecurity⁹. In spite of government assistance programs catering to single-parent families, these risks remain high for them as well as for each child under their care.

In Table 10, the child poverty rates are tabulated for families grouped according to the employment status of the parents, that is, families with (i) no working parent and (ii) at least 1 parent working. Not surprisingly, the incidence of child poverty is vastly higher among jobless families, relative to families where at least one parent had a job. In all years, child poverty rates for jobless families are about the same for all the three regions. These child poverty rates declined between 1986 and 1991, but by 2006 had returned close to 1986 levels.

Compared with other regions, child poverty rates for families with working parents in the Latrobe Valley are relatively low before 1996. However, this rate has sharply increased so that by 2006, the Latrobe Valley rate was well above that of Ballarat and had moved very close to the consistently high rates found for non-metropolitan Victoria. For these comparison regions, child poverty rates in working families were lowest in 1996; but the period between 1996 and 2006 was one of rising child poverty overall.

In Figure 9, we present the *numbers* of children in poverty according to the employment status of their parents. In both Latrobe Valley and Ballarat, we clearly see improvement in the economic condition of children between 1986 and 1991. Since then however, the incidence of child poverty has risen again. Furthermore, we see that families with at least one parent working account for a non-trivial number of children in poverty in the region as well, despite child poverty rates being so low for this parent-type. Our results thus find strong evidence of the growing presence of a ‘working poor’ class in regional Australia generally, and in regional Victoria in particular. The emergence of such class is thought to arise over time from job losses following a regional industry decline, but also to a shift in worker composition favouring more women workers as well as to the increased availability of part-time and casual jobs in the regions. Further research will be needed to verify the exact nature of such attributions for all of regional Australia. Pending that, this particular result is consistent with earlier findings for the national economy that a substantial proportions of people in households with members in paid employment remain in poverty (Eardley 2000, Harding, et al 2001, Marks 2007 and Saunders, et al., 2008).

In summary, the foregoing analysis strongly indicates that lone parenthood and joblessness have, over time, become the major threats to the economic well-being of children in Latrobe Valley. While these family states/conditions have long been recognized as major risk factors

⁹ See Wong, et al (1993) for a cross-country study of the economic status of single mothers; see Bradbury (2003) and Harding, et al (2001) for an overview of lone parent families in Australia.

for children slipping into poverty in Australia in general (see Bradbury 2003 and Harding, et al 2001), our results provide the first solid evidence of the increased economic insecurity and vulnerability of children and their families in Latrobe Valley between 1986 and 2006, via the above-average increase in the population shares of these family types as the region adjusted itself through the recession and industrial restructuring years.

Latrobe Valley children would have been among those that have been drawn out of poverty by 1991 due to the substantial increases in income supplements provided by the government at that time, which targeted all low-income families with children, following the famous 1987 election campaign pledge of then Prime Minister Bob Hawke that said no Australian child would live in poverty by 1990¹⁰. The higher payment benefits to families with children have continued beyond 1996, through years that are marked by strong economic growth overall. Our findings however show that through these boom years, Latrobe Valley families experienced greater struggles to get back up on their feet compared to their counterparts in other regional areas as evidenced by the persistent high rates of unemployment (Fairbrother and Testi, 2002), continued stagnation in construction activities, zero growth in already low property prices and the associated “welfare-led” immigration as discussed in Birrell (2001). This suggests that the local economy has been left more weakened by the twin effects of the recession and industrial restructuring, where other regions only had to recover from the nationwide recession which was well over by 1996. Our results show that in 2006 there were more vulnerable families in Latrobe Valley despite the recent growth of the national economy, hence, more economic insecurity and vulnerability for children in the region.

V Conclusions

A major motivation for undertaking this research was to investigate how restructuring and privatisation affected income distribution and welfare. This is of particular interest in a region that is strongly dependent on one industry, and we therefore investigated as a case study how household income distribution in the Latrobe Valley was affected by the privatisation and restructuring of the electricity generation industry.

Estimates of income distribution for the Latrobe Valley had not previously been obtained because of the difficulty of extracting this information out of the available data. The population of this region is below the threshold at which Unit Record Files are made available, and therefore the only income data specific to the Latrobe Valley is census data, supplied in aggregated form. Census income data is categorical, and household data provided by the ABS is obtained by processing individual income categories as declared on the census form. In this paper we have proposed and implemented a method for obtaining

¹⁰ See Harding and Szukalska (2000) for more specific details in the increase in family assistance payments in Australian in general and Birrell et al (2000) for the increases in family allowances for regional Victoria.

adult equivalent income distributions from this type of data. We have established that it is possible to construct plausible distributions of adult equivalent incomes, and we have found that resulting estimates of poverty levels and inequality appear consistent with country-wide estimates available in the literature, thus providing some confirmation of our method.

The method by which the income distributions are obtained involves combining different adult equivalent income distributions corresponding to different household sizes. These are grouped distributions, each specified with a different set of class intervals, and can be combined into one distribution by summing frequency densities at every point. This method can equally be applied to combining any collection of income distributions that are supplied in grouped form from disparate sources so that the class intervals are different. For example, it could be applied to the problem of combining income distributions for a collection of countries.

With regard to the case of the Latrobe Valley, we find strong evidence that the region lost its economic advantage in the early 1990s due to the combined effects of the recession and industrial restructuring. Moreover, the region had great difficulty recovering from these shocks, and this experience is very different from those in other regional areas which only had to deal with the recession affecting the entire economy.

The most striking result of our study is the persistence of the high inequality and poverty that was apparently caused by the restructuring process. In 1986, the Latrobe Valley had low levels of poverty and inequality and high mean income compared with Ballarat and the rest of non-metropolitan Victoria. By 1996, when the restructuring was almost complete, these levels were higher in the Latrobe Valley than in the comparison regions. In 2006, nearly ten years after the restructuring process was complete, inequality and poverty levels in the Latrobe Valley had increased even further, and at a greater rate than in other regions. This is despite the fact that mean income had recovered to be well above the 1986 value and equal to the level in Ballarat.

On child poverty, our study reveals that in the Latrobe Valley, children were not shielded from the economic decline. From 1986 to 1996, at a time when child poverty was decreasing in the comparison regions, the proportion of children in poverty increased markedly in the Latrobe Valley. Furthermore, our Latrobe Valley figures show that living in single-parent households, and living in families where no parent works present the greatest risk of children falling into poverty – a result that is consistent with Australia-wide studies. This does not mean that we can be less concerned about children in couple-parent or employed households. In particular the numbers of children in poverty from families in the Valley with at least one working parent have also grown significantly over time. Clearly, efforts to assist all families with children should continue with particular focus on single-parent families and the working poor. For the case of households in the Latrobe Valley, some lessons can be learned from their ‘restructuring’ experience – and that is, gains in profitability and efficiencies in the economy had come at a price; there had been long term adverse effects on the welfare of the more vulnerable members of

the community. The Latrobe Valley experience should make us more cognizant of the increased support required for these groups when faced with another episode of economic restructuring.

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Table 1
SECV Restructuring and Privatisation Timeline

Year	Event
1989	Commencement of SECV restructure of Electricity Supply Industry
1992	Sale of 51% of Loy Yang B (1000 MW)
1993	Generation arm of SECV becomes Generation Victoria
1995	Generation Victoria reorganised into 5 “commercially viable” generating businesses
1996	Sale of: Yallourn Energy (1450 MW) Hazelwood Power (1600 MW)
1997	Sale of: Loy Yang Power (2000 MW) 49% Loy Yang B (1000 MW) Southern Hydro (469 MW)

Source: Fairbrother, Paddon and Teicher 2002

Table 2
*2006 Weekly Income Distribution for Households with Single Adult
 (With and Without Children), Non-metropolitan Victoria*

Lower limit (\$)	Upper limit (\$)	Number of households
1	149	4070
150	249	29463
250	349	39982
350	499	0
500	649	27038
650	799	15163
800	999	9607
1000	1199	8288
1200	1399	0
1400	1699	3321
1700	1999	1603
2000	2499	0
2500	2999	1773
3000	3499	0
3500	3999	0
4000		0

Table 3
Mean and Median Household Equivalised Incomes (2006 Dollars)

Year	Latrobe Valley		Ballarat		Non-metropolitan Victoria	
	Mean	Median	Mean	Median	Mean	Median
1986	599	532	498	412	508	422
1991	530	458	484	394	483	394
1996	514	402	513	410	506	404
2001	574	452	584	476	578	468
2006	636	502	636	530	627	514

Table 4
Gini Coefficients

	Latrobe Valley	Ballarat	Non- metropolitan Victoria
1986	0.320	0.334	0.339
1991	0.341	0.339	0.346
1996	0.359	0.344	0.346
2001	0.356	0.338	0.342
2006	0.370	0.347	0.352

Table 5
Quintile Means of Equivalised Incomes

Year	Quintile	Latrobe		Nonmetropolitan
		Valley	Ballarat	Victoria
1986	1	208	185	182
	2	368	289	292
	3	534	411	422
	4	723	587	597
	5	1133	1005	990
1991	1	175	176	166
	2	301	282	278
	3	455	394	394
	4	644	565	567
	5	996	969	974
1996	1	184	194	190
	2	271	285	281
	3	405	411	405
	4	611	597	585
	5	1099	1098	1060
2001	1	210	225	221
	2	305	324	323
	3	447	470	459
	4	677	678	673
	5	1210	1138	1205
2006	1	200	215	210
	2	333	362	350
	3	504	532	516
	4	764	755	742
	5	1355	1312	1299

Table 6
*Poverty line: Half the Current Median of
 Adult Equivalent Income in Non-metropolitan Victoria*

Year	Poverty line
1986	211
1991	197
1996	202
2001	234
2006	257

Table 7
*Poverty Indices for Households Based on
 Current Half Median Poverty Line*

Head Count Ratio P_0 =HCR			
	Latrobe	Ballarat	Nonmetropolitan Victoria
1986	0.097	0.133	0.134
1991	0.110	0.113	0.120
1996	0.121	0.097	0.103
2001	0.125	0.093	0.099
2006	0.166	0.135	0.142
Poverty Gap Index P_1			
1986	0.021	0.028	0.031
1991	0.028	0.027	0.033
1996	0.022	0.018	0.020
2001	0.024	0.018	0.020
2006	0.041	0.033	0.035
Squared Poverty Gap Index P_2			
1986	0.007	0.010	0.012
1991	0.013	0.011	0.016
1996	0.007	0.006	0.007
2001	0.008	0.006	0.007
2006	0.016	0.013	0.015

Table 8
Child Poverty (HCR) in Regional Victoria

Census Year	Region/Area		
	Latrobe Valley	Ballarat	Non-metropolitan Victoria
1986	0.103	0.135	0.145
1991	0.104	0.106	0.126
1996	0.121	0.101	0.105
2001	0.139	0.113	0.12
2006	0.166	0.13	0.139
Total % Increase	61.2	-3.7	-4.1
Per Annum %Increase	2.4	-0.2	-0.2

Table 9
Child Poverty Incidence in Nuclear Families by Family Type

Year	Couple Parents			Single Parents		
	No of families	Popn Share	Child poverty rate	No of families	Popn Share	Child poverty rate
Latrobe Valley						
1986	7238	(87%)	0.055	1126	(13%)	0.587
1991	7207	(82%)	0.045	1559	(18%)	0.327
1996	6832	(78%)	0.089	1889	(22%)	0.299
2001	6094	(74%)	0.090	2127	(26%)	0.334
2006	5518	(72%)	0.089	2129	(28%)	0.432
Ballarat						
1986	6268	(84%)	0.101	1182	(16%)	0.479
1991	6513	(80%)	0.063	1629	(20%)	0.242
1996	6708	(77%)	0.073	1985	(23%)	0.271
2001	6746	(75%)	0.069	2226	(25%)	0.283
2006	6763	(74%)	0.073	2426	(26%)	0.368
Non-Metropolitan Victoria						
1986	117818	(88%)	0.122	15450	(12%)	0.497
1991	122679	(85%)	0.087	20966	(15%)	0.288
1996	118507	(82%)	0.084	26707	(18%)	0.268
2001	113651	(79%)	0.085	30365	(21%)	0.295
2006	110361	(78%)	0.091	31771	(22%)	0.405

Table10
Child Poverty Incidence in Nuclear Families by Employment Status of Parents

Year	With NO Working Parent			With at least ONE Working Parent		
	No of families	Popn Share	Child poverty rate	No of families	Popn Share	Child poverty rate
Latrobe Valley						
1986	1330	(16%)	0.663	7034	(84%)	0.030
1991	1820	(21%)	0.360	6946	(79%)	0.031
1996	2318	(27%)	0.376	6403	(73%)	0.047
2001	2056	(25%)	0.425	6165	(75%)	0.055
2006	1678	(22%)	0.549	5969	(78%)	0.071
Ballarat						
1986	1309	(18%)	0.631	6141	(82%)	0.064
1991	1719	(21%)	0.338	6423	(79%)	0.039
1996	1976	(23%)	0.356	6717	(77%)	0.043
2001	1802	(20%)	0.390	7170	(80%)	0.047
2006	1589	(17%)	0.546	7600	(83%)	0.060
Non-Metropolitan Victoria						
1986	19906	(15%)	0.616	113362	(85%)	0.095
1991	25896	(18%)	0.357	117749	(82%)	0.070
1996	28689	(20%)	0.366	116075	(80%)	0.056
2001	25500	(18%)	0.420	118516	(82%)	0.063
2006	22155	(16%)	0.564	119977	(84%)	0.082

Figure 1

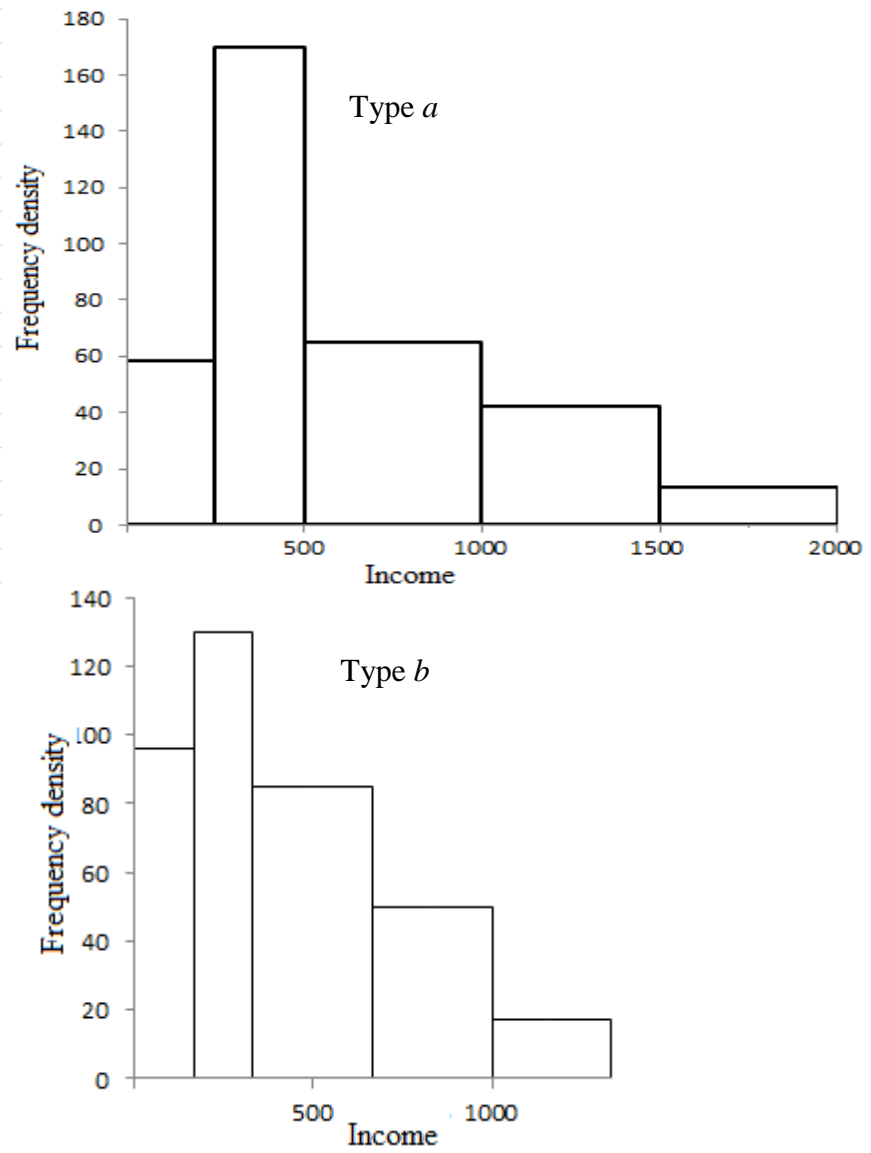


Figure 2

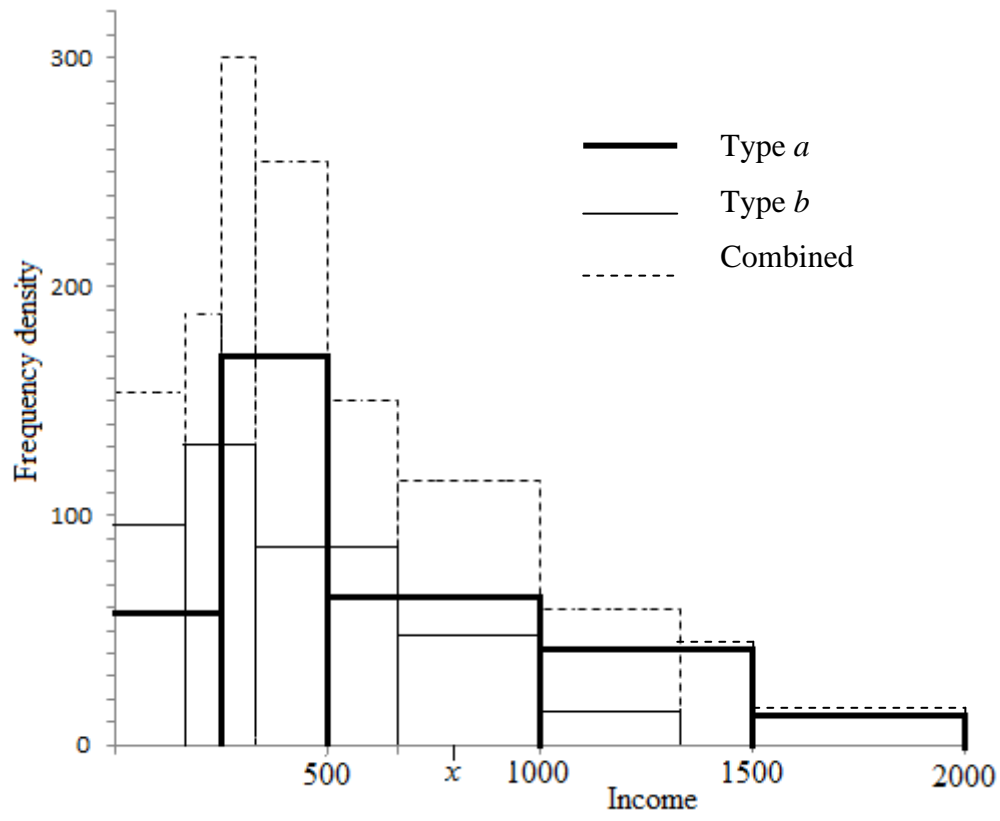


Figure 3
Latrobe Valley Income Distribution, 1991

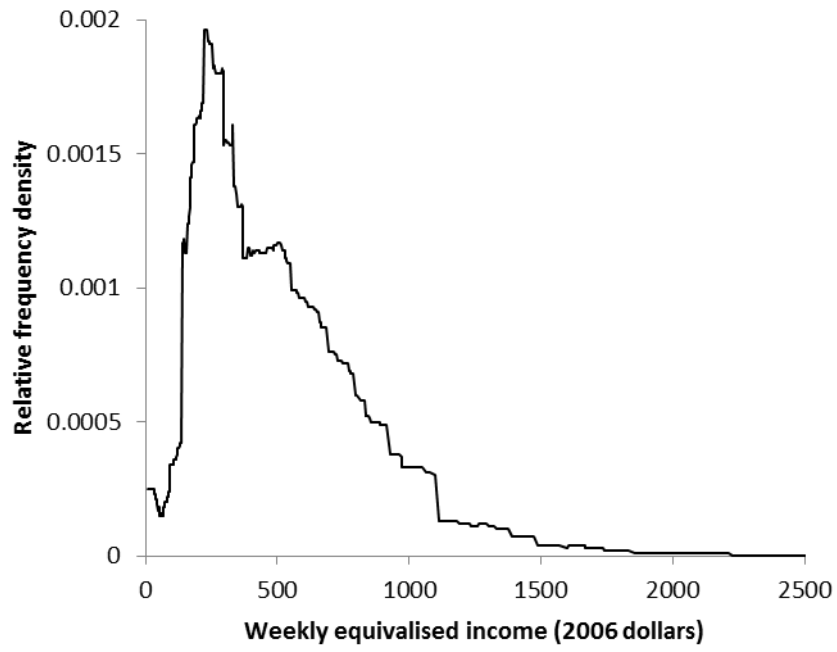


Figure 4a
Relative Frequency Densities, Latrobe Valley, 1986-1996

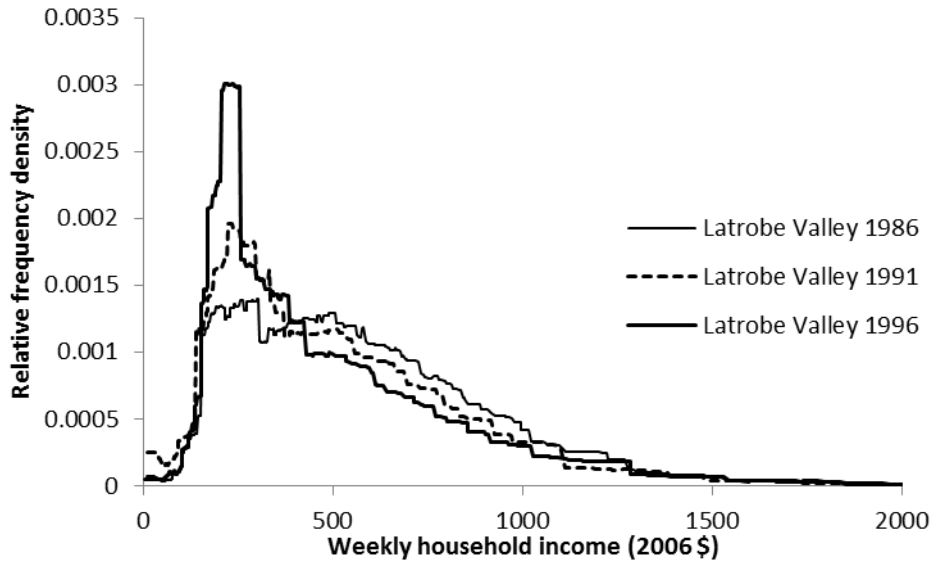


Figure 4b
Relative Frequency Densities, Latrobe Valley, 1996-2006

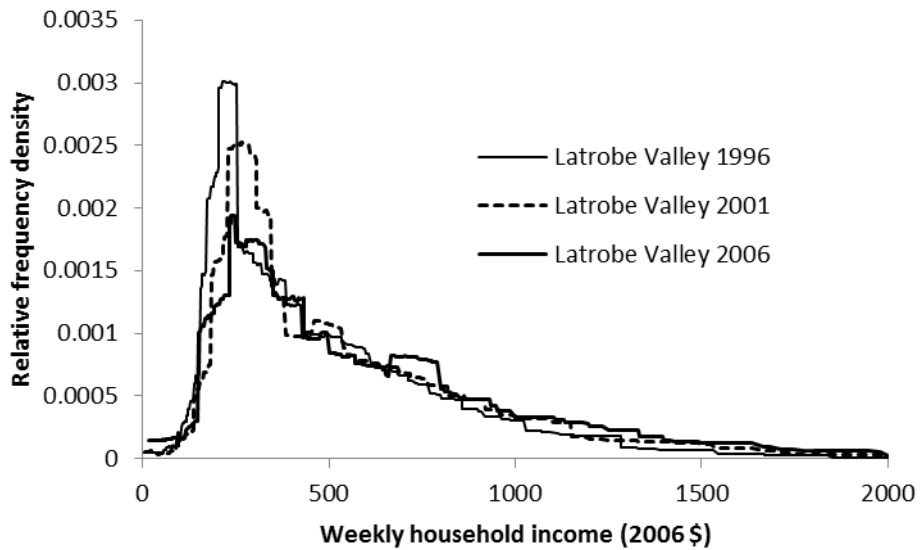


Figure 5
Frequency Distributions for Latrobe Valley and Ballarat. 1986 - 2006

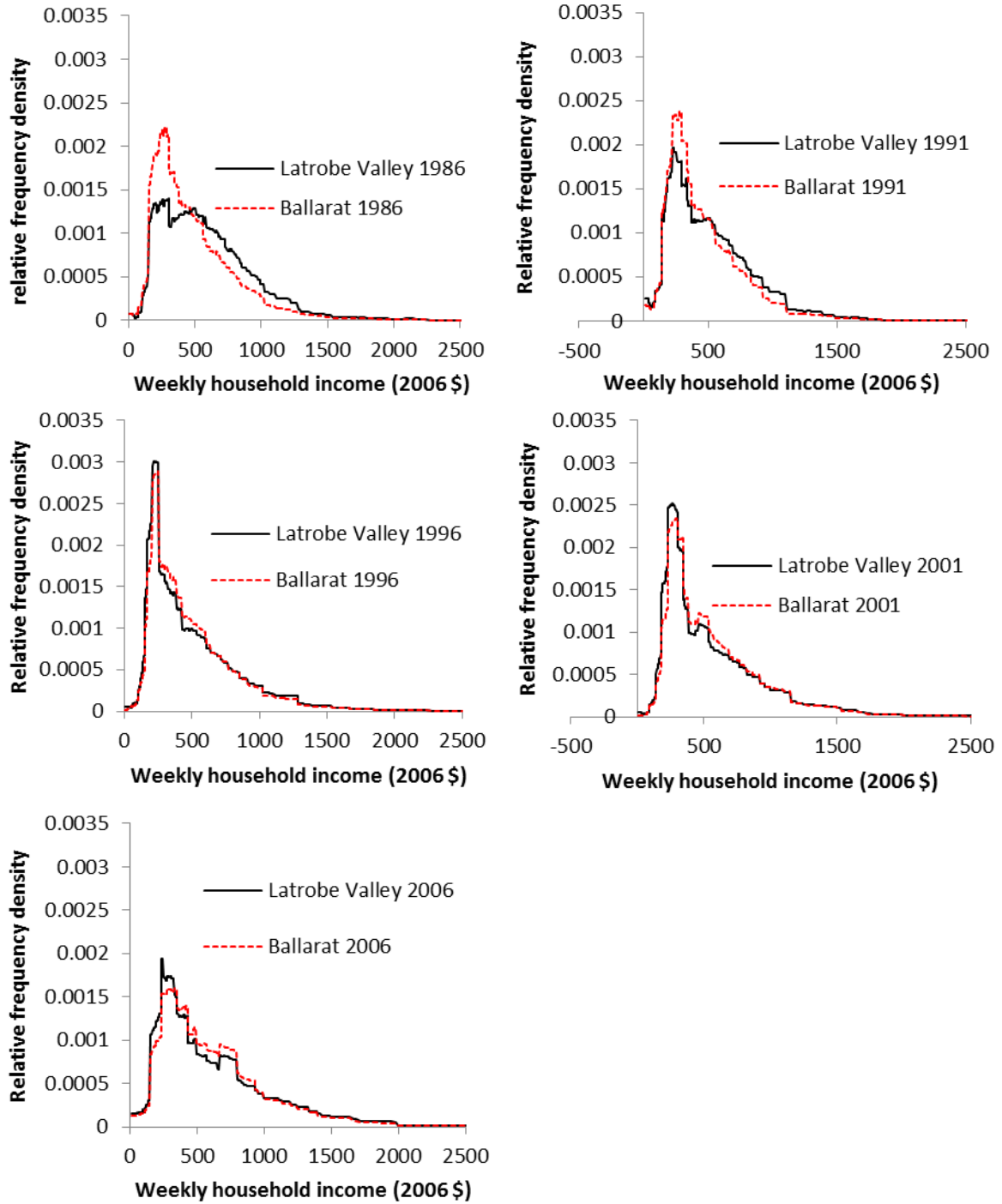


Figure 6
Quintile Means of Equivalised Incomes

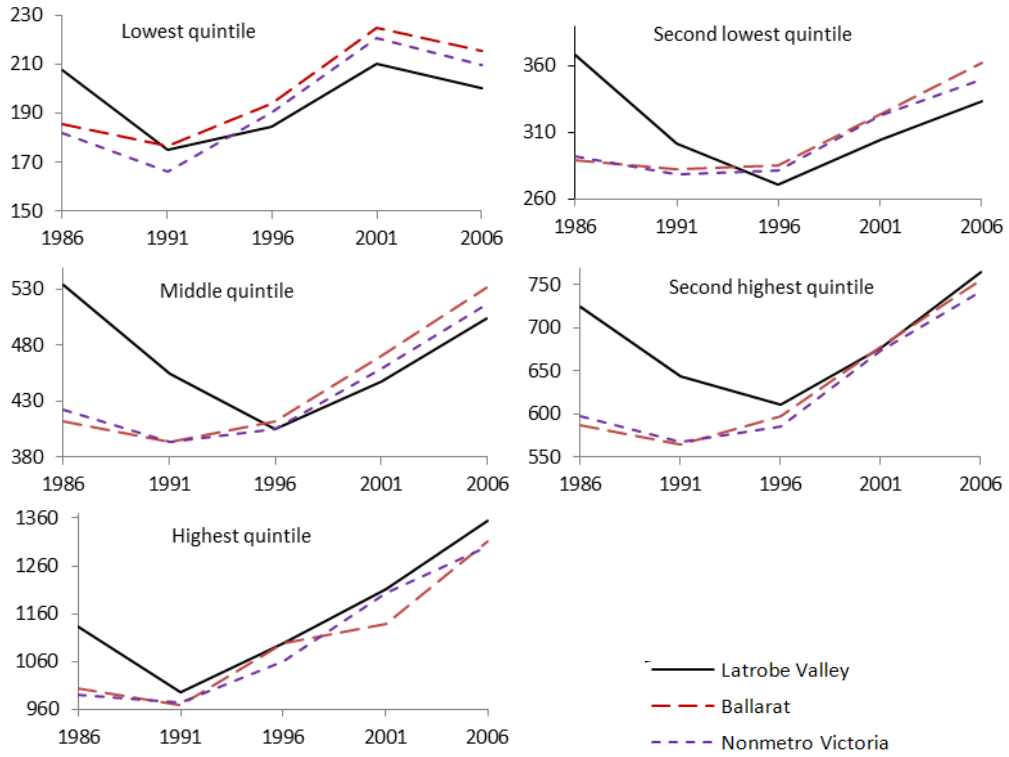


Figure 7
Household Poverty Rates for Regional Victoria, 1986 - 2006

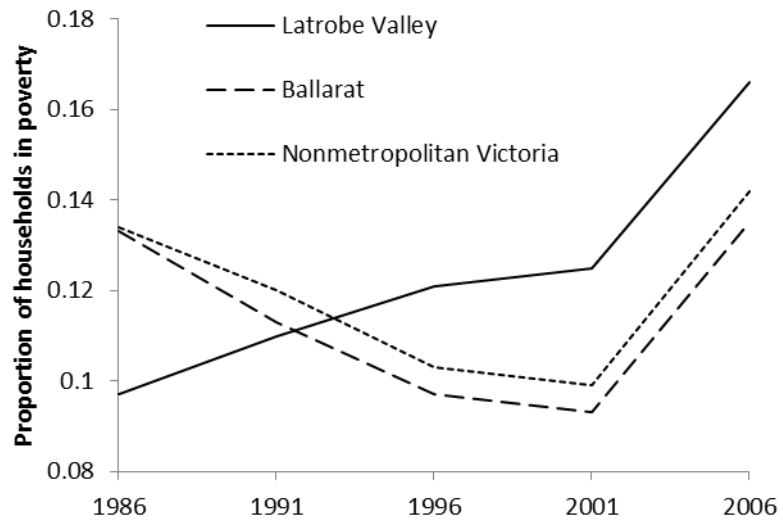


Figure 8
Number of Children in Poverty by Region and Family Type, 1986-2006



Figure 9
Number of Children in Poverty by Region and Parent Employment Status

