CMPO Working Paper Series No. 02/50

Employment Polarisation in Australia

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July 2002

Abstract

Whilst employment levels in Australia are healthy when compared to those twenty years ago, the available work has become increasingly polarised into either all-work or no-work households. This paper measures the extent of polarisation that has taken place in Australia since 1982 with a measure that accounts for changes in individual based employment and family structure. We find that employment growth over the period should have largely offset the effects of shifts in household composition towards more single-adult households. However, polarisation of employment across households means that there are around 3.3 percent more households with no earned income. We also find that couples with children have faced the bulk of this rising joblessness as a result of this polarisation. Exploration of wider shifts in employment away from less-educated men and toward prime-age better educated women explain about 40% of the adverse shift against couples with children. The increase in all-work households is confined to multi-adult households, again focused on families with children. Hence, there is a large shift in patterns of employment in households with children, away from a dominant single male earner model toward more dual-earner and no-earner households with children. This dramatic polarisation of work and incomes for families with children is likely to have consequences for welfare costs and child opportunities in the next generation.

JEL Classification: J6
Keywords: Polarisation, Joblessness.

Acknowledgements

We would like to thank Jonathan Wadsworth for his recommendations and comments and participants at a seminar at MIAESR and the Towards Opportunity and Prosperity conference. In particular we would like to thank the Department of Family and Community Services for funding this research. The views expressed in this paper are those of the authors and do not represent the views of the Minister for Family and Community Services, the Department of Family and Community Services or the Commonwealth Government.

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CMPO is funded by the Leverhulme Trust.

Summary

Whilst employment levels in Australia are healthy when compared to those twenty years ago, the available work has become increasingly polarised into either all-work or no-work households. This paper measures that extent of polarisation that has taken place in Australia between 1982 and 1997/98 with a measure of polarisation that accounts for changes in individual based employment. Initially we measure the extent of polarisation against a benchmark of randomly distributed work and then extend this to account for varying employment rates across subgroups of the population. We find that employment growth over the period should have largely offset the effects of shifts in household composition towards more single-adult households. However, polarisation of employment across households means that there are around 3.3 percentage points more households with no earned income. The vast majority of the increase in polarisation is found to be within-household types and does not reflect shifts to household types where employment levels are traditionally low. We also find that couple households with children are the dominant household type to see rising joblessness as a result of this polarisation. Exploration of whether wider shifts in employment away from less-educated men and toward prime-age better educated women lie behind these developments suggest that about 40% of the adverse shift against couples with children and against this benchmark lone parents do much worse. Lone parents have gained employment over this period at a faster rate than the average worker but are failing to keep up with prime age women who contribute to the growing number of couples where both adults work. Households renting privately are also particularly prone to the growing polarisation of work even after conditioning on varying employment prospects. The increase in all-work households is confined to multi-adult households, again focused on families with children. Hence, there is a large shift in patterns of employment in households with children, away from a dominant single male earner model toward more dual-earner and no-earner (couple and single) households with children. This dramatic polarisation of work and incomes for families with children is likely to have consequences for welfare costs and child opportunities in the next generation.

1. Introduction

Although aggregate employment rates across OECD countries have recovered from the recession lows of the 1980s, there has also been an upward trend in the number of jobless households in the majority of these nations (OECD, 1998). Thus, the aggregate unemployment rate, or employment rate based on individual data, may not fully capture the evolving economic and social impact of joblessness on families. Both Australian and overseas studies have shown that the burden of unemployment, or more generally joblessness, is concentrated in certain households (for eg. Dawkins, Gregg and Scutella, 2002; Dawkins, 1996; Miller, 1997; Gregg and Wadsworth, 1996a, 1996b and 2000; OECD, 1998; Gregory, 1999). Furthermore this concentration has become more pronounced, so that there has been a switch away from those not in work being supported by other family members toward whole households being jobless and being largely supported by the State (Dawkins, Gregg and Scutella, 2002 or Whiteford, 2000). Alongside this studies have found that there has been an increase in all-work households (for eg. Dawkins, 1996 and Gregory, 1999).[1] Thus, employment is becoming increasingly polarised into all-work households and no-work households.

Increasing employment concentration within households has a direct impact on inequality and poverty with seventy per cent of jobless households with incomes in the lowest quintile (see OECD, 1998 and Dawkins, Gregg and Scutella, 2002). Even more worrying is that over seventy four per cent of jobless households with children are in the poorest quintile. The aim of this paper is to examine the changing distribution of employment and determine what has contributed to this uneven dispersion of employment towards households in society who already receive earnings, leaving others jobless and essentially dependent on government support. We wish to establish the relative contribution of aggregate changes in employment, household composition and the changing distribution of work for given household types in driving this phenomenon. Then to assess how wider shifts in patterns of employment by gender, age, education, region and immigrant arrival status relate to jobless households.

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[1] As overseas studies concentrate on the household as opposed to the family or the income unit we similarly focus on the household for comparative purposes. In most analyses of poverty the household is used as the unit of measurement to allow for possible intra-household transfers.

The relationship between individual unemployment (non-employment) and household circumstances has changed sharply over the last 15 years or so, which has ramifications for welfare support costs and poverty. The recent McClure Report on Welfare Reform (Reference Group on Welfare Reform, 2000a and 2000b) emphasised that the growth in jobless households and families over the last two decades was a major motivation for their recommendations, and that substantially reducing the number of jobless households and families should be one of three targets for reform. A second target was to reduce substantially the number of people who rely heavily on income support. A substantial reduction in jobless families would also impact on the second target.

The McClure Report emphasised that reducing jobless families would not only be a major improvement for society at the time, it could be expected to have positive inter-generational effects. McClelland, MacDonald and MacDonald (1998) state that there is evidence to suggest that the likelihood of a young person completing secondary school and finding secure employment is affected by their parent's socio-economic background. Longitudinal social security data show that, between the ages of 16 and 18, young people from income support recipient families are much more likely than other young people to become parents at an early age, leave school early, receive income support and be highly income support reliant themselves (Pech and McCoull, 1999). For all of these outcomes but the first, the risk is highest for young people whose parents have received income support continuously for at least two years.

In earlier work we examined the relationship between household and individual joblessness and patterns across certain demographic groups in some detail (see Dawkins et al. 2002). Here, we focus more formally on analysing this observed divergence between individual and household measures of joblessness in Australia. We use a measure of the polarisation of employment derived from the observed deviation from a benchmark world where the available work is randomly distributed across all working age adults. This measure was proposed by Gregg and Wadsworth (2001) and following them we extend this approach to allow for variations in employment rates across various subgroups of the population.

This paper finds that joblessness has become concentrated in particular households, especially households with children. This has been so strong that jobless households have become more

prominent while employment levels increased. Part of the explanation, for the growth in jobless households, lies in the changing structure of households. In particular there has been a household compositional shift towards single-adult households, both with and without children. Of at least equal importance however, has been the polarisation of employment within-household types. Indeed, a large majority of the polarisation of employment within-household types is found within two-adult (couple) households, particularly those with children. Nearly two thirds of the increase in polarisation for households of a given size comes from couples with children.

Relaxing the random distribution of employment assumption and allowing for varying employment rates across the key subgroups of the population by which employment is known to vary, shows that the shifts in employment across these groups goes part of the way in explaining the concentration of joblessness within certain households, especially for couples. However, even after conditioning for characteristics there remains an unexplained component. This is most pronounced for couple households with children and for households renting privately. In conjunction with this, we also find an increase in the all-work household rate also almost entirely emanating from couples and again focused on couples with children. Hence, the employment circumstances of families with children have born the brunt of employment polarisation.

The structure of the paper is as follows. A description of the data used in the analysis is provided in Section 2. Section 3 presents a summary of the patterns and trends in the incidence of jobless families between 1982 and 1997/98 while Section 4 presents the method and results of measuring the polarisation of employment in Australia looking at jobless households. Households facing particular disincentives to offer labour supply at the lower end of the income distribution, households with children and households in private rental property, are the focus of our attention in Section 5. Attention is diverted to the other end of the distribution of work to that of all-work households in Section 6. Concluding comments and policy implications are offered in Section 7.

2. Data: Survey of Income and Housing Costs and Income Distribution Surveys

The Australian Survey of Income and Housing Costs (SIHC) has been conducted since 1994/95 as part of the Monthly Population Survey and contains detailed unit record data on the composition of income and housing costs both at the income unit level and at the person level. Around 650 households are surveyed monthly. Prior to 1994 similar information was collected as part of the Income Distribution Survey (IDS) which was conducted at four yearly intervals over 3 months in the second half of the year.

Demographic characteristics of each person of workforce age in each income unit are recorded, including: age, sex, marital status, country of birth, number of dependent children and age of youngest child. Other characteristics recorded include: dwelling type and structure, tenure type, current weekly rent paid and current weekly loan repayments of each income unit, employment status, labour force status, highest educational qualification, weekly hours of work, occupation and industry in main job, duration of unemployment, current weekly earned and unearned income from various sources and annual income from each source in previous financial year. Income sources are detailed and include income from wages and salary, property and interest, social security allowances and pensions, superannuation and other regular sources. The ease of access to the unit record data and the detail of both personal and household characteristics in the surveys are the definite strengths of using the SIHC and IDS. While the Labour Force Survey undertaken by the ABS gives a longer time series, the unit record data is not publicly available therefore published tables need to be relied on which makes it less flexible to use. It also lacks details of individual and household income. Alternatively Census data is available, which was used by Miller (1997), however this data is far less frequent and thus inadequate when examining trends over short to medium term time frames. It also only provides income information at the household level, which is then only available in income ranges. Thus, for any distributional or poverty analysis Census data has its limits. Since 1994 the SIHC has been conducted on an annual basis. Prior to this the IDS were conducted at four yearly intervals. At present there are unit record data for the following years: 1982, 1986, 1990, 1994/95, 1995/96, 1996/97 and 1997/98. The resulting sample of households were 6819, 7112, 7402 and 7171 over the 1994/95, 1995/96, 1996/97 and 1997/98 financial years respectively whilst in 1982, 1986 and 1990 the sample of households were 14925, 8514 and 14669 respectively.

This analysis refers to adults as individuals of working age not in full-time study where working age is defined as 15-64 years for males and 15-59 years for females. We refer to the reference person (or head of household in the 1982 and 1986 IDS data) as the nominated head of household. Note that the ABS definition of a reference person/head of household is the male partner in a couple household, the parent in a lone parent household and the person in a single person household. Full-time students are excluded as their economic inactivity is a productive investment in their future and thus does not reflect the same degree of social distress or exclusion. Likewise, and for similar reasons, households with heads of retirement age are also excluded. Note that the early retired are included in the analysis. Dependent children are defined as all children less than 15 years plus full-time students under the age of 18 years. We choose to depart from the current ABS definition of dependents, as we prefer to focus on households with children rather than including dependents that are adults not in full-time education (as noted above, students are excluded). Note that as we only include the working-age non-student population there may be differences in the information presented in this analysis and other published statistics.

3. Summary of the Incidence and Trends in Jobless Households

Previous studies have shown an increase in the incidence of both unemployed households (Miller, 1997) and jobless households (Dawkins et al 2002; Dawkins, 1996; and Gregory, 1999) over the last two decades in Australia. The following section provides an overview of the extent of the divergence between individual based measures of joblessness and household based measures in Australia. A jobless household is defined as a household where no working-age adult is employed[2]. Thus, household members in a jobless household can be either unemployed or not in the labour force.

3.1. Aggregate Incidence

Table 1 shows the aggregate employment rate (the individual non-employment or jobless rate is then calculated as one hundred minus the employment rate) and the overall incidence of jobless households from 1982 to 1997/98.

Table 1: Comparison of employment rates and jobless household rates, 1982 to 1997/98

	Employment rate	Recipient rate of major income support payments[a]	Jobless households	Working age adults in jobless households	Dependent children in jobless households
	%	%	%	%	%
1982	70.4	15.4	12.7	9.5	10.2
1986	71.9	14.9	14.9	10.8	11.5
1990	74.2	15.8	14.2	10.5	11.4
1994/95	73.1	20.4	15.5	11.8	14.2
1995/96	74.3	20.9	15.1	11.2	12.9
1996/97	72.8	22.9	16.8	12.3	15.6
1997/98	73.7	21.3	16.3	12.1	15.0

a) Benefits included as major Income Support Payments are unemployment benefits (Unemployment Benefit, Job Search Allowance, Newstart Allowance, Mature Age Allowance and Youth Training Allowance), sole parent benefits (Supporting Parents Benefit, Sole Parents Benefit and Sole Parent Pension) and disability payments (War Disability Pension, Invalid Pension, DVA Disability Pension and Disability Support Pension).

Aggregate employment recovered between 1982 and 1990 after the early 80s recession. Since then it has remained broadly unchanged. By contrast, there has been a near continuous growth in the overall incidence of jobless households, from 12.7 per cent in 1982 to 16.3 per cent in 1997/98. This rise in jobless households mirrors the increasing number of households where a member is claiming one of the three major income support payments (unemployment, disability and lone parenthood). Here there may be an earner present and so the rates are higher than the associated jobless household rates. The Reference Group on Welfare Reform noted that between 1986 and 1996 the proportion of workforce-age income units with at least 90% of their income from government cash payments rose from 11.9 to 14.1% (Reference Group on Welfare Reform, 2000c, p.28). Again this was a period over which employment rose. So the rise in jobless households is mirrored in terms of rising welfare dependency. Table 1 also shows the proportions of working-age adults and the proportion of dependent children in jobless households. Both of these have also risen over the period, with the proportion of dependent children in jobless households rising at a notably faster rate. The

[2] Labour force status classifications used in ABS statistics correspond to those set out by the International Labour Organisation (ILO) and the United Nations Statistical Office.

proportion of children in jobless households rose by 5 percentage points to 15 percent (or nearly 50% above its 1982 level). Labour force data published by the Australian Bureau of Statistics (1999) suggests that the upward trend in the number of children living in jobless families may have continued over recent years with about 860,000 (17.4 per cent) dependent children living in jobless households in June 1999[3].

Figures 1 and 2 place Australia in the international context. These draw on the data published by the OECD (OECD, 1998). The OECD estimates of jobless households for Australia (using Labour Force Survey data) in 1996 match ours closely, at over 16%. Australia in this data has a lower share of households that were jobless than is common in most developed nations but perhaps the most striking feature is just how little variation there is given the wide variations in employment patterns. This commonality disappears however, when households with children are considered. Here Australia, along with other English speaking countries other than the US, has an unusually high incidence of children growing up in households with no adult working. Only the UK and Ireland have larger proportions of children in jobless households and this is also true if single parent or couple households are considered separately. The OECD study also explored changes between 1985 and 1996, many OECD countries, including Australia, experienced rising shares of jobless households whilst employment also rose. This implies that the available work is going to other households and indeed in Australia the share of households where all adults work has risen from 49% in 1982 to 59% in 1997. Dawkins, Gregg and Scutella (2002) highlight how the vast majority, 70%, of jobless household have incomes in the lowest quintile and this is even higher for families with children. Furthermore, they highlight how most of these households do not contain an unemployed adult, which suggests a widespread and growing absence of any labour supply in Australian working-age households.

[3] In the labour force data dependent children are defined as children under 15 plus dependent students aged 15-24.

Figure 1: Jobless household rate by country (OECD – 1996)

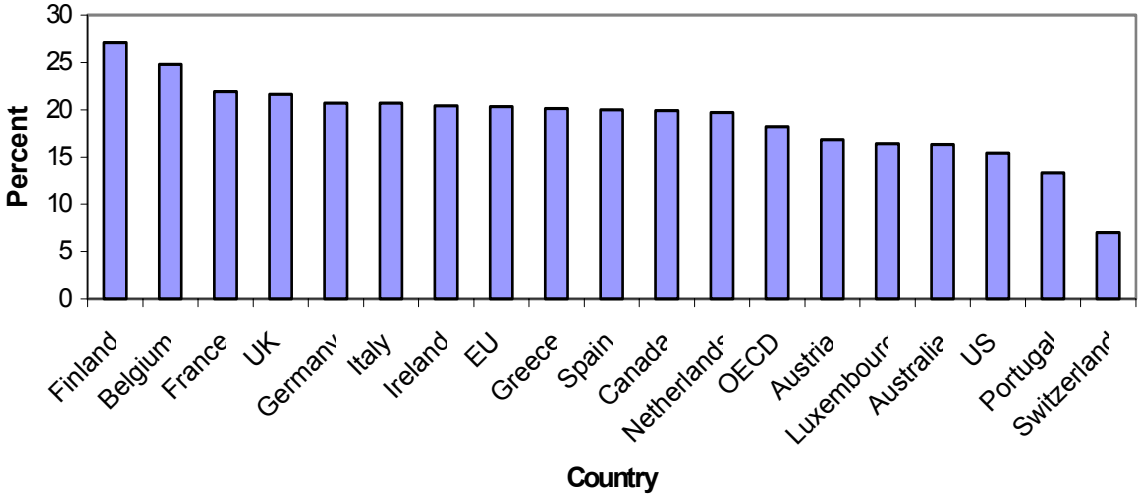


Figure 2: Jobless household rate by country for households with children (OECD – 1996)

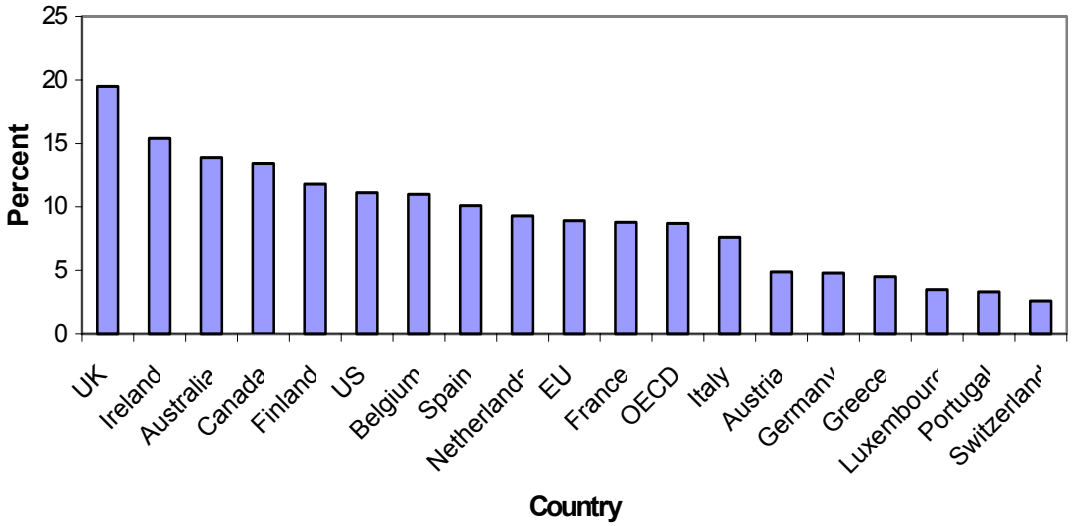


Table 2 outlines the shifting circumstances of the jobless household population. Jobless households in the table are captured in the first category they fall under. Therefore, the first column reports the proportion of jobless working-age households where there is an unemployed person resident, with the second column reporting the proportion of lone-parent jobless households who are not represented in the unemployed category, the third the proportion with a permanently unable to work member who are not represented in columns one or two, and so on. Households with an unemployed person are offering labour supply but are perhaps constrained (even if only temporarily) by a lack of opportunities in the labour market. Here we see that the full impact of the early eighties recession had not yet fed through

to unemployment rates in 1982 and as such the proportion of jobless households with an unemployed resident only fell slightly by 1986, with an overall increase between 1982 and 1990. This then fell after the early nineties recession, tapering off to remain fairly steady over the mid to late nineties. This is coupled with quite a significant and consistent increase in the proportion of the unemployed resident in jobless households. Thus although the proportion of jobless households with an unemployed member does not change significantly over the general period, the unemployed have become increasingly concentrated in jobless households (see Dawkins, Gregg and Scutella, 2002).

Table 2: Hierarchy of jobless households by primary source of joblessness, 1982 to 1997/98[a]

	Unemployed person resident	Lone parent households not in the labour force	Permanently unable to work person resident	Person resident 50 years plus	Other jobless households	Total jobless households
1982	31.3	15.3	0.7	40.3	12.4	518,324
1986	29.2	17.2	0.3	41.5	11.8	641,127
1990	36.9	16.1	1.0	36.3	9.7	649,466
1994/95	35.8	16.5	2.5	35.1	10.2	751,886
1995/96	32.9	18.6	2.2	31.8	14.5	754,398
1996/97	32.5	20.2	2.6	32.7	12.1	821,939
1997/98	32.5	17.7	3.7	32.6	13.5	819,442

a) Note that the table reads with jobless households represented in the first category they fall under. That is the first column reports the proportion of jobless working-age households where there is an unemployed person resident, the second column the proportion of lone-parent jobless households who are not represented in the unemployed category, the third the proportion with a permanently unable to work member who are not represented in columns one or two, and so on.

With unemployment being increasingly concentrated in certain households, the majority of jobless households are not offering labour supply. Columns 2 to 5 of Table 2 show the changing characteristics of households not offering any labour supply. Lone parents not in the labour force increase slightly over the period, while the proportion of jobless households with a person resident who is permanently unable to work has consistently risen over the period[4].

[4] The question in the surveys enabling identification of those permanently unable to work changed between the Income Distribution Surveys and the Income and Housing Costs Surveys therefore we expect that part of the rise between the proportions in this category between 1990 and 1994/95 was due to this. However, we still expect the increasing prominence of households in this category to be apparent.

Early retirement does not seem to be a significant factor in explaining the increase in the jobless household rate as the proportion of jobless households with a member over 50 years and not in any of the other jobless categories actually declines over the period. Labour Force data also shows us that the trend towards early retirement for males actually stabilised in the early 1980s, which is when our data begins, therefore we would not expect that this early retirement trend would explain much of the increase in the jobless household rate over this period.

Thus, the key point from this table is the stability in the primary source of joblessness within these households. While the permanently unable to work group has clearly increased, they remain a very small portion of the jobless population.

If increasing household joblessness has its origins in changes in household structure toward units where labour supply has always been low then policy makers may need to look at trends in family break-up and household formation as explanations of the rise in jobless households rather than on labour market opportunities and constraints on members of these households. Table 3 looks at the changes in household composition over the period. Presented in the table are the relative shares of each household type within all households with working-age adults over the period of interest with the final row showing the change in the composition between the start and end period.

There have been clear shifts in the pattern of household composition with a 10 percentage point increase in the share of households containing only one adult, with corresponding declines in the share of both two and three plus adult households. If we disaggregate household types further to differentiate by the presence of children we find that single-adult households without children account for the majority of the rise in one-adult households rather than lone parents. General changes in the size of households have translated through to the composition of households that are jobless as is seen in Table 4. As a result of move towards smaller households, one-adult households now make up approximately 60% of all jobless households. Of course, larger households make up a much larger share of the population living in jobless households. One-adult households contain only around 40 per cent of working-age adults living in jobless households and contain around half of children in such households.

Table 3: Change in household size, 1982-1997/98 (shares of all households containing working-age adults)

	1 adult	2 adults	3+adults	Total
1982	19.2	62.2	18.7	100
1986	23.6	59.6	16.8	100
1990	23.2	61.4	15.4	100
1994/95	26.3	58.6	15.2	100
1995/96	28.7	56.5	14.7	100
1996/97	28.4	56.4	15.2	100
1997/98	29.1	56.1	14.8	100
Δ1982-97/98	9.9	-6.1	-3.9	

Table 4: Share of jobless households in household type, 1982-1997/98

	1 adult	2 adults	3+adults	Total
1982	53.0	41.5	5.5	100
1986	60.2	35.8	4.0	100
1990	59.0	37.2	3.8	100
1994/95	56.8	38.9	4.3	100
1995/96	62.8	33.8	3.5	100
1996/97	63.0	32.8	4.2	100
1997/98	61.7	35.1	3.2	100
Δ1982-97/98	8.7	-6.4	-2.3	

4. Measuring the Polarisation of Employment

The previous sections show that since 1982, while employment rates have risen, there has been a substantial shift toward smaller households and a rise in the number of jobless households. We want to be able to address how the growing amount of work is distributed across the increasing number of households and to look for evidence of polarisation of work across households. There is a natural analogy with inequality measures for the distribution of income. However, a person's employment position is a discrete measure and standard inequality measures such as Gini coefficients are designed for continuous data. To explore the

distribution of work across households we want a measure that is intuitive and can be decomposed in a way that allows identification of the origins of any developments. Gregg and Wadsworth (2001) suggest exploring the deviation from a benchmark of random distribution of available work across individuals. So that for an employment rate of 75%, 1 in 4 individuals would be jobless if work were randomly distributed. For single-adult households then the individual and household jobless rate is the same and 1 in 4 will have no work for this benchmark. Likewise, assuming independence, a couple will have a 1 in 16 chance of being workless. So if *n* is the aggregate jobless rate for the population the probability of a household with *i* adults being jobless at time *t* is given by,

$$p_{it} = n_t^{\,i} \tag{1}$$

Now taking a weighted average of these rates across household types, with the weights given by the shares of household type *i* in the population, gives the aggregate predicted jobless household rate,

$$\hat{w}_t = \sum_i s_{it} p_{it} = \sum_i s_{it} n_t^{\,i} \tag{2}$$

So for a given employment level and family structure we get a prediction of the share of households with no or all adults in work if being in employment is a random state. Over time, this gives a decomposition of whether changes are down to changes in the predicted rate, which contains changing family structure and employment levels, or shifts in the extent that work is polarised across households. Polarisation is the deviation in the number of jobless or all working households from that predicted by the random distribution of work,

$$\begin{aligned} Polarisation_t &= Actual_t - Predicted_t \\ &= w_t - \hat{w}_t \\ &= \sum_i s_{it} w_{it} - \sum_i s_{it} n_t^{\,i} \\ &= \sum_i s_{it} (w_{it} - n_t^{\,i}) \end{aligned} \tag{3}$$

There is said to be negative polarisation where there are fewer than predicted jobless households. This would occur in the traditional family if one adult works in paid employment

whilst another, normally the woman, produces within the home. Positive polarisation is where there are more jobless or all working households that would occur from a random distribution of work. These calculations can be replicated for each household size in order to see which types have experienced the greatest proportion of the polarisation. An alternative representation is to describe polarisation as the actual jobless household rate relative to the predicted rate such as in equation (4).

$$\begin{aligned} Polarisation_t &= Actual_t / Predicted_t \\ &= w_t / \hat{w}_t \\ &= \sum_i s_{it} w_{it} / \sum_i s_{it} n_t^i \end{aligned} \qquad (4)$$

Table 5 provides the measures of polarisation using these methods.

Table 5: Employment polarisation, 1982 to 1997/98

	Actual jobless household rates	Predicted jobless household rates	Employment Polarisation	Ratio of actual to predicted
1982	12.67	11.46	1.20	1.11
1986	14.88	11.62	3.26	1.28
1990	14.2	10.26	3.94	1.38
1994/95	15.48	11.55	3.93	1.34
1995/96	15.11	11.31	3.80	1.34
1996/97	16.77	12.14	4.63	1.38
1997/98	16.28	11.75	4.53	1.39
Δ1982-97/98	3.61	0.29	3.33	0.28

Presented in the first column are the jobless household rates actually observed in Australia between 1982 and 1997/98. Taking the available stock of employment and randomly assigning it across individuals gives the predicted jobless household rates presented in the second column. The penultimate column presents our measure of polarisation, which is the difference between the two, and shows the deviation of the actual jobless household rate from a world where employment is randomly distributed across the working-age population. The relative measure of polarisation is presented in the final column of the table.

The predicted jobless household rate is driven by employment levels and the evolving family structure of households whilst the polarisation term measures the evolving deviation of the actual number of jobless households from that consistent with a random distribution of work across all working-age adults (which is also driven in part by relative shares of each household type). In 1982, the observed number of jobless households was only marginally higher than that predicted by a benchmark of randomly distributed work. There was thus little observed polarisation on this measure. Since then the predicted jobless household rate has broadly remained flat and the majority of the observed rise in workless households is attributable to the polarisation of work across households.

So since 1982 the predicted jobless household rate, given employment levels and household structure, has increased only fractionally by 0.3 percentage points. But the observed rate has increased by far more leading to a 3.3 point increase in measured polarisation. Using the relative measure, this equates to there being 40% more jobless households than predicted by the random distribution benchmark in 1997-98, up from 10% in 1982. Since 1982, polarisation has risen reasonably continuously, but the bulk of the deviation occurred prior to 1990.

4.1. Exploring Changes Over Time

The predicted jobless household rate is driven by changes in individual employment rates and general changes in household composition. For instance if there is a general move towards smaller households, this will be picked up by our predicted jobless household rate. Likewise, polarisation need not be equal for all household sizes and so changes in household shares will also affect our measure of polarisation if there are moves toward household types that are traditionally more likely to be jobless (for instance lone parent households). Basic shift-share analysis can be used to decompose the predicted jobless household rate and our measure of polarisation to separate out these effects.

We now proceed to decompose changes over time in both the predicted and polarisation measures in order to explore the source of any disturbance. To examine the change in the predicted workless household rate over time, we follow Gregg and Wadsworth (2001) and use a shift-share breakdown adapting the decomposition slightly to take account of developments

presented in Shorrocks (1999), which eliminate the need for a residual, or interaction, term. The change in the predicted jobless household rate between any two-time periods can thus be decomposed into:

$$\Delta\hat{w}_t = \sum_i \Delta s_{it} n_t^{\,i} = \sum_i \Delta s_{it} (n_0^{\,i} + n_t^{\,i})/2 + \sum_i ((s_{i0} + s_{it})/2)\Delta n_t^{\,i} \qquad (5)$$

where the two terms capture the impact of changes in family structure taking the average employment rate over the base period and end period, and changes in aggregate employment taking the average household share over the base and end period, respectively. Hence, between any two dates, the predicted component can be attributed to changes in family structure and changes in labour market performance as measured by the aggregate employment rate.

Polarisation need not be equal for all household sizes and so changes in household shares will also affect our measure of polarisation if there are moves toward household types with a high propensity to be jobless (e.g. single-adult households) this is likely to increase measured polarisation. We can therefore again use shift-share analysis to decompose the change in polarisation as:

$$\begin{aligned} \Delta(w_t - \hat{w}_t) &= \sum_i \Delta s_{it} (w_{it} - n_t^{\,i}) \\ &= \sum_i \Delta s_{it} ((w_{i0} - n_0^{\,i}) + (w_{it} - n_t^{\,i}))/2 + \sum_i ((s_{i0} + s_{it})/2)\Delta(w_{it} - n_t^{\,i}) \end{aligned} \qquad (6)$$

where the first term is the between-household type component and the second term measures the within-household type component of the observed polarisation. This tells us whether the change in polarisation is due to shifts in household structure towards family types who tend to have lower employment probabilities than their predicted benchmark, (term 1 on the right hand side of (5)), or due to employment opportunities worsening amongst all family types, (term 2). Term 2 can also be split into whether the within-household component is strongest amongst single-adult or multi-adult households. These results of these decompositions are presented in Table 6.

Table 6: Decomposition of Changes in Predicted Jobless Household Rates and Polarisation, 1982 to 1997/98

	Change in predicted workless household rate	Impact due to changes in household composition	Impact due to changes in employment rate	Change in polarisation	Between-household type decomposition	Within-household type decomposition
1982-1997	0.3	2.3	-2.0	3.3	0.5	2.8
1982-1990	-1.2	1.0	-2.2	2.7	0.3	2.5
1990-1997	1.5	1.2	0.3	0.6	0.4	0.2

The first column of the table presents the change in the predicted jobless household rate over the entire period, and then over each decade separately. The second and third columns present the results of the decomposition of the predicted rate with the contribution that changes in household composition and employment have on predicted joblessness across households if employment were randomly assigned. The apparent stability in the predicted jobless household rate is actually the result of two offsetting developments, rising employment between 1982 and 1997/98 would, every thing else held equal, reduce the number of jobless households by 2 percentage points. While an underlying trend in household structure toward more single-adult households has an opposite effect of broadly the same magnitude. The timing of these developments is such that the number of jobless households should have fallen in the 1980s through the strong employment recovery but have risen in the 1990s from changing household structure.

Changes in employment polarisation are presented in column 4 of Table 6 with the between-household type and within-household type decompositions in columns 5 and 6 respectively. Columns 4 to 6 make clear that movements toward more single-adult households exert a very modest upward pressure on the measure of polarisation, with 85% of the rise in polarisation coming from an increased propensity for joblessness within-household types. Also shown in the table is that, while it seems that the majority of the employment polarisation across households occurred primarily in the 1980s, changes in household structure were more pronounced in the 1990s. Table 7 makes clear why this is the case by looking at the measured polarisation for each household size.

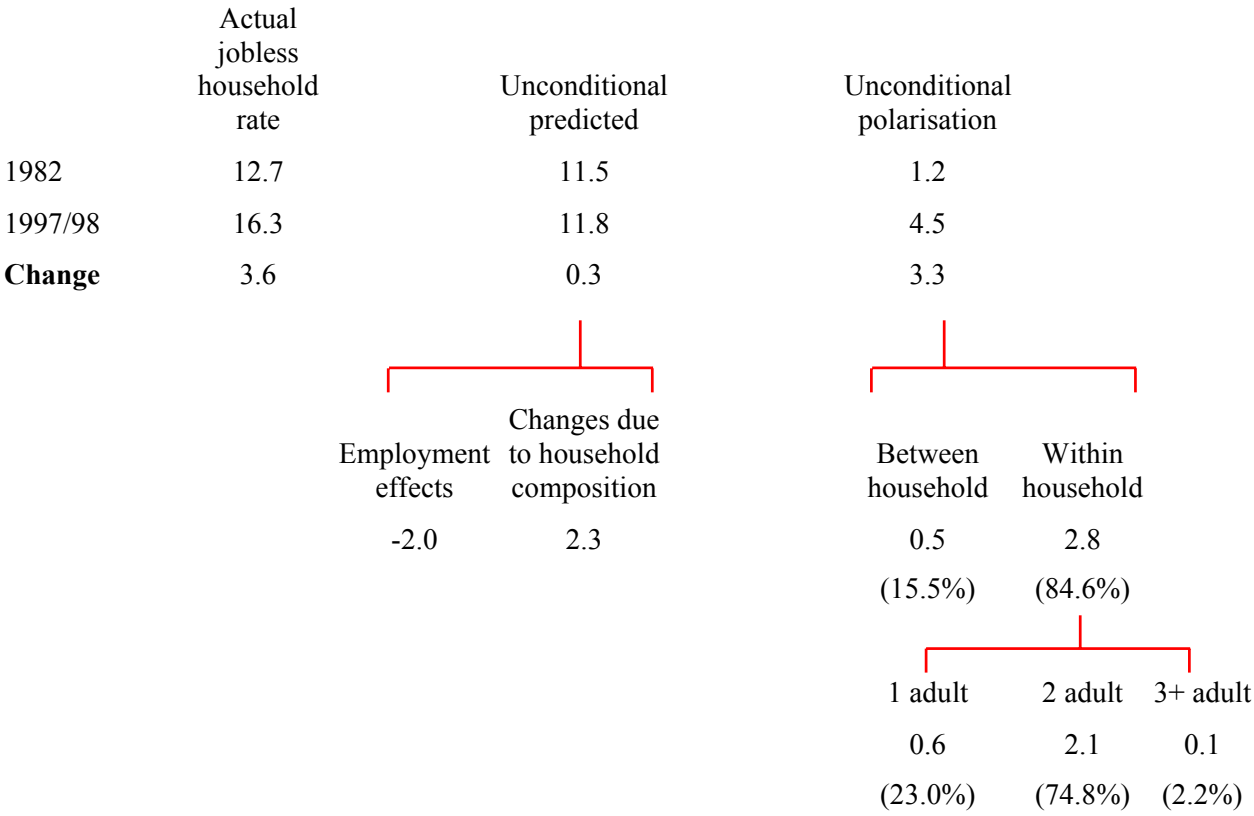
Table 7: Actual and Predicted Jobless Household Rates by Household Size, 1982 to 1997/98

	1 adult			2 adult			3 adult plus		
	Actual jobless household rates (w)	Predicted jobless household rates ($\hat{w}$)	($w - \hat{w}$)	Actual jobless household rates (w)	Predicted jobless household rates ($\hat{w}$)	($w - \hat{w}$)	Actual jobless household rates (w)	Predicted jobless household rates ($\hat{w}$)	($w - \hat{w}$
				Per cent					
1982	35.1	29.6	5.5	8.5	8.7	-0.2	3.7	2.0	1.7
1986	38.0	28.1	9.9	8.9	7.9	1.0	3.5	1.7	1.8
1990	36.1	25.8	10.3	8.6	6.7	1.9	3.5	1.3	2.2
1994/95	33.5	26.9	6.6	10.3	7.3	3	4.3	1.5	2.8
1995/96	33.0	25.7	7.3	9.0	6.6	2.4	3.6	1.3	2.3
1996/97	37.1	27.2	9.9	9.8	7.4	2.4	4.7	1.5	3.2
1997/98	34.5	26.3	8.2	10.2	6.9	3.3	3.6	1.4	2.2
Δ1982-97/98	-0.6	-3.3	2.7	1.7	-1.8	3.5	-0.1	-0.6	0.5

In 1982 there were slightly fewer workless couples than would occur from a random distribution of work among adults, whilst single-adult households were somewhat more susceptible to being without work. But between 1982 and 1997 the share of single-adult households without work diminished slightly whilst joblessness rose for couples. Taking into account the general improvement in the employment situation both single-adult households and couples saw sharp increases between the actual shares that were without a worker against the benchmark of that predicted by a random distribution of the available work amongst working age adults. This polarisation is actually slightly more acute for couples with a little under a 4 percentage point increase than singles with a 3 point rise. As couples are the most common household type in the population it is clear that the increased polarisation of work comes mainly amongst two-adult households (couples). This is examined further below.

Figure 3 summarises the information presented in Table 6 and looks at the relative contribution of each household type in driving the polarisation within-household types.

Figure 3: Summary of decompositions of predicted jobless household rates and polarisation assuming random distribution of work



At the top of the diagram the actual and predicted jobless household rates in 1982 and 1997/98 and the polarisation estimated are presented. The change between the start and end period are also presented. The next level of the diagram shows the results of the decompositions of the predicted jobless household rate and of the measured polarisation respectively, with the numbers in brackets referring to the contributions of each component in percentage terms. We then go one step further and show the contribution that each household type has on the polarisation found within-household types, again with the number in brackets referring to the contribution in percentage terms.

Decomposing the predicted jobless household rate tells us that the increase in single-adult households assuming employment is distributed randomly would, given employment levels in 1982, have lead to a 2.3 point increase in the jobless household rate. As single-adult households, particularly those with children, traditionally have employment rates lower than those predicted by a random distribution of employment, a shift towards smaller households would also lead to a 0.5 point increase in employment polarisation (this is the between-

household component of the decomposition). So moves toward smaller households with traditionally weak employment chances are of a roughly equal magnitude to the within-household type polarisation effect, with both adding about 2.8 percentage points to the jobless household rate. Examining the relative contribution of each household type to the polarisation found within-household types we find that three quarters of the polarisation comes from two-adult households (couples). Further decomposing this by differentiating household types by the presence of children suggests that 65% of the within-group polarisation affects couples with children. We examine this more fully later.

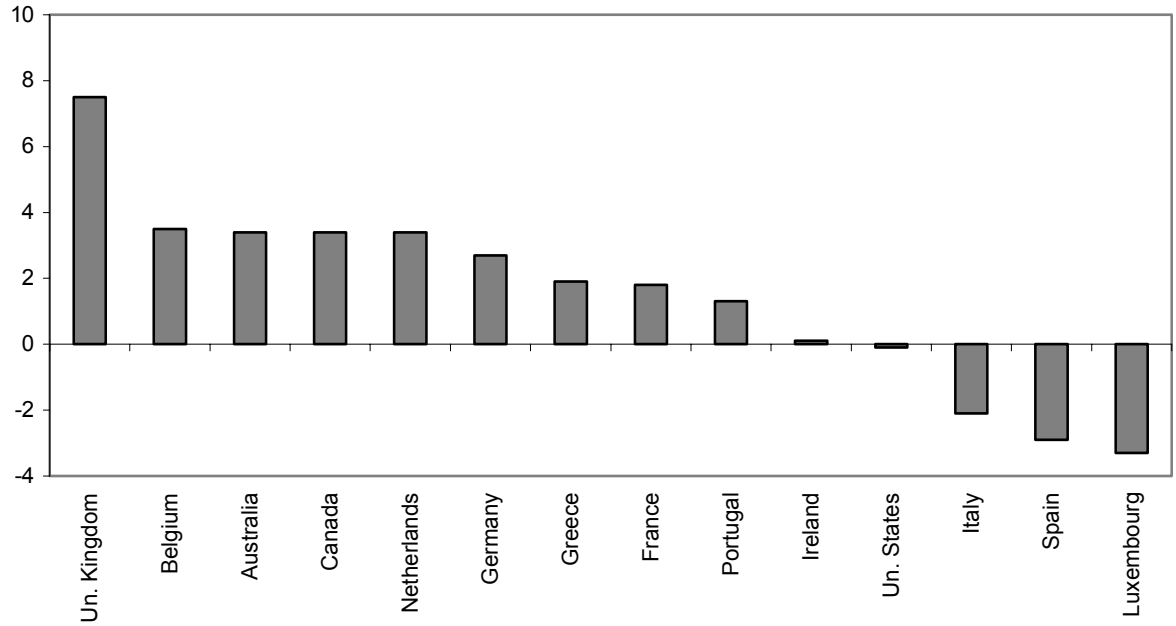
Table 8 and Figure 4 use the data published by the OECD, (OECD, 1998) to apply this methodology internationally and to look at Australia's standing in the world.

Table 8: Polarisation by country, 1996

	Workless household rate w	Predicted $\hat{w}$	Absolute Polarisation $(w - \hat{w})$	Relative Polarisation, $(w / \hat{w})$	Change in absolute polarisation 85-96	Change in relative polarisation 85-96
Australia	16.3	12.9	3.4	1.26	1.4	0.11
Belgium	24.8	21.3	3.5	1.16	3.7	0.17
Canada	19.9	16.5	3.4	1.21	2.6	0.16
France	21.9	20.1	1.8	1.09	1.0	0.05
Germany	20.7	18.0	2.7	1.15	0.6	0.04
Greece	20.1	19.2	1.9	1.05	1.2	0.06
Ireland	20.4	20.3	0.1	1.00	3.8	0.16
Italy	20.7	22.8	-2.1	0.91	1.4	0.08
Luxembourg	16.4	19.7	-3.3	0.83	-0.3	0.00
Netherlands	19.7	16.3	3.4	1.21	2.5	0.16
Portugal	13.3	12.0	1.3	1.11	-0.2	-0.03
Spain	20.0	22.9	-2.9	0.87	0.1	0.01
United Kingdom	21.6	14.1	7.5	1.53	1.3	0.08
United States	15.4	15.5	-0.1	0.99	0.5	0.03

Source: adapted from Table 9 in Gregg and Wadsworth (2000)

Figure 4: Polarisation by country, 1996



Australia has measured polarisation that places it as one of three countries in the second rank behind the UK, along with Canada and Belgium. In the UK, Canada and Australia the relatively high employment rates do not as effectively reduce jobless households as compared to other countries. This makes using a relative benchmark even more marked and on this measure Australian polarisation is second only to the UK. Over the period 1985-96, which was used by the OECD, polarisation increased in most OECD countries (Portugal and Luxembourg the only exceptions). Australia was in the middle grouping of countries with moderate increases in polarisation, along with France, Italy and the UK.

Individual Characteristics

The observed polarisation within-household types may be just a representation of a polarisation in another dimension. If household members have similar characteristics then inequalities in labour market opportunities along the lines of these characteristics will bring a coincident polarisation by household. The most obvious is by region, for all household members reside at the same address then if that is an area of low employment, all household members are likely to have a lower propensity to be in work. In the context of couples the process by which members share common characteristics is called assortative mating. This kind of 'assortative mating' would tend to make joblessness concentrated on particular households if joblessness is more apparent in certain sections of the population. With female participation rates rising and male participation rates falling, it is quite likely that some of the

observed polarisation may be due to assortative mating becoming more apparent. This effect will be strengthened if employment opportunities have worsened for certain groups in the population while improving for others, and the disadvantaged groups live in the same household. For instance demand for less skilled employment may have fallen with an increase in demand for high skilled employment. With less skilled males more likely to be married to less skilled females, and high skilled males more likely to be married to high skilled females, this will have a significant effect on employment polarisation.

To explore whether there is any indication of a change in assortative mating by education over the period the correlation between the age of head of household and spouse and between the education of head of household and spouse are presented in Table 9.

Table 9: Correlation between age and education of head of household and spouse, 1982 to 1997/98

	Correlation coefficients	
	Age	Education
1982	0.9277	0.2964
1986	0.9176	0.3324
1990	0.9109	0.3571
1994/95	0.9073	0.3693
1995/96	0.9074	0.3728
1996/97	0.9010	0.3787
1997/98	0.9079	0.3684

While assortative mating by age has remained relatively unchanged over the years, couples were more likely to marry those with an equivalent educational qualification in 1997/98 than they were in 1982. Due to changes in educational classifications across certain years, individuals were categorised in one of three education groups: university qualification, other qualification or no qualification. As those with no qualifications are more likely to be out of work, a rise in assortative mating by education is consistent with an increase in the jobless household rate. However, the increase in the correlation between educational qualification of nominated head of household and spouse may be an artefact of the changing marginal distribution of educational qualifications. Examining the changing distribution of educational qualifications of heads of households and their spouses over the period we find evidence to suggest that the increased correlation is due almost entirely to a growing propensity for the

increasing number of graduates to be paired together. Thus, the large increase in those with university educations, especially among women, is a significant factor in explaining the increasing correlation over time.

We also explored the correlation coefficient for age. This is quite high as members of couples are generally in the same age bracket but the correlation is roughly stable with a slight fall over the 1982-1997/98 period, suggesting that couples are no more likely to marry individuals of their age bracket in 1997/98 than they were in 1982.

To explore the importance of common characteristics on employment polarisation, we relax the assumption of work being randomly distributed across all working-age adults by allowing the predicted individual non-employment rates to vary by gender, age, qualifications and region. This allows us to see whether the major shifts in the pattern of employment across regions, skill and age groups over the last twenty years lie behind the observed polarisation of work. Since the predicted rate, $n_k^{\,i}$, is now based on the average non-employment rate in group k, the predicted and actual rates for group k will converge the more disaggregated the population on which $n_k^{\,i}$ is based. The degree of disaggregation used is, of course, arbitrary but does allow us to look at the major factors over which employment is known to vary. This conditional polarisation measure at any point in time, *t*, now becomes

$$\begin{aligned} Polarisation_t &= w_t - \hat{w}_t \\ &= \sum_{ik} s_{ikt} w_{ikt} - \sum_i s_{ikt} n_{kt}^{\,i} \\ &= \sum_{ik} s_{ikt} (w_{ikt} - n_{kt}^{\,i}) \end{aligned} \qquad (7)$$

The extent that this count differs from the measure introduced in (5) is attributable to changing variation in employment across groups and any residual polarisation from (7) can be said to be conditional polarisation. Note that if employment dispersion across any observable population type lies behind the divergence between actual and predicted measures then disaggregating by this variable should reduce polarisation relative to the unconditional case. Since the average actual rate at any point in time, $\sum_{ik} s_{ikt} w_{ikt}$, is unchanged by disaggregation, the better the prediction, $\sum_{ik} s_{ikt} n_{kt}^{\,i}$, the lower the polarisation measure.

This helps clarify the extent to which polarisation rises if either (a) multi-adult household members have common characteristics across which employment varies substantially or (b) single-adult households have characteristics which are associated with low employment probabilities. Having accounted for a set of observable characteristics, any residual polarisation, which we call conditional polarisation, would suggest that jobless households form because all members of certain households suffer reduced access to work relative to others with similar characteristics.

We focus on characteristics over which employment varies widely in the population and are weakly exogenous to the individual. Characteristics such as housing tenure or neighbourhood of residence may well be influenced by current or past joblessness and are therefore not included. It is of course possible, indeed probable, that current or past joblessness influences household structure. Joblessness may well put families under greater stress and lead to a greater incidence of break up. In this way household size may be influenced by observed or unobserved personal characteristics. Given the static nature of our data we do not explore this as we treat household structure as weakly exogenous to events we describe.

The characteristics we use to differentiate between varying employment rates are region (4 groups: NSW, ACT and NT; Victoria and Tasmania; Queensland; WA and South Australia)[5], capital city, gender, age (4 groups; 15-24 years, 25-34 years, 35 to 49 years and 50 years plus), education (3 groups; university education, other post secondary and no post secondary) and we also differentiate for recent arrivals. Recent arrivals are defined to be all arrivals during and after 1970 in the 1982 and 1986 surveys, all arrivals during and after 1975 for the 1990 survey and all arrivals during and after 1981 for the 1994/95 to 1997/98 surveys. To predict the jobless household rate we then use one characteristic at a time and then combine, see Table 10.

[5] Ideally we would like to be able to differentiate employment rates by individual States but as sample sizes become very small when we do this across the combined set of variables, particularly for the smaller States, we are constrained to aggregate across certain States. At this stage we have aggregated across States in a fairly arbitrary fashion which we understand is not desirably as there are quite substantial difference in employment rates across the States and the Territories, however in future work we will look into using propensity score matching to get around the cell size problem.

Table 10: Comparison of actual vs. predicted jobless household rates, 1982 to 1997/98

	Actual jobless household rate	Predicted jobless household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Gender	Age	Education	Region	Capital city	Recent arrival	Combined
1982	12.7	11.5	10.1	12.0	11.2	11.5	11.5	11.5	10.2
1986	14.9	11.6	10.6	12.3	11.4	11.6	n.a.	11.6	11.0
1990	14.2	10.2	9.7	10.8	10.1	10.2	10.3	10.2	10.1
1994/95	15.5	11.6	10.9	12.0	11.4	11.6	11.6	11.6	11.1
1995/96	15.1	11.3	10.8	11.5	11.1	11.3	11.3	11.3	10.9
1996/97	16.8	12.1	11.6	12.4	12.1	12.1	12.2	12.1	11.8
1997/98	16.3	11.8	11.2	12.0	11.7	11.8	11.8	11.7	11.5
Δ97/98-82	3.6	0.3	1.1	0.0	0.5	0.3	0.3	0.2	1.3

Actual jobless household rates over the period between 1982 and 1997/98 are presented in Table 10 alongside the predicted jobless household rate, initially assuming employment is distributed randomly in the second column and then allowing employment to vary across gender, age, education, region, capital city and whether a recently arrived migrant in columns 3 to 8 respectively. Allowing employment rates to vary across all of these combined characteristics generates the predicted jobless household rates presented in the final column. Our initial, or unconditional, measure of polarisation is estimated by taking the absolute difference between the actual and predicted jobless household rates presented in the first two columns. Any unexplained, or conditional, polarisation is estimated by taking the difference between the actual jobless household rate and the predicted jobless household rate allowing employment to vary across our combined set of characteristics presented in the final column of the table.

The table shows that allowing employment to vary by gender and education increases the predicted change in the jobless household rate. The other factors add relatively little when taken individually. Allowing for gender variations actually lowers the predicted jobless household rates but does so more for 1982. Back then fewer women worked and male employment rates were higher. As most couples contain a man and a woman then allowing for gender differences predicts fewer jobless households. Since then employment has risen for women and fallen for men and this effect has become less pronounced. Taken with the

educational changes this suggests that less educated men are losing employment while better-educated women are gaining and these groups tend to live in different households. Appendix 1 presents the individual based employment rates for each characteristic we control for. In combination these employment changes raise the predicted increase by around 1 percentage point, so even after conditioning two thirds of the polarisation remains. As was noted earlier, male employment and labour force participation rates for those aged over 50 years tended to stabilise in the early 1980s and thus we do not expect this group to be a significant driver of the polarisation over the entire period. However, as is shown in Table A3 of Appendix 1, the employment rate for males over 50 years did fall between the 1982 and 1986 surveys prior to stabilising and thus will be a contributing factor in the combined predicted rate however when looking at age as an individual component, this is outweighed by increases in female employment rates.

No doubt if we had more detail on certain variables, particularly with regards to education, a larger portion of the observed polarisation could be explained. For instance if we could differentiate between those not completing secondary school with those who do, the poor employment rates for the former group is likely to explain part of the polarisation. However, the available information on education is limited and we cannot observe those not completing secondary school. Also, the association of micro-locational factors with the incidence of joblessness was highlighted in Hunter (1995) and Gregory and Hunter (1995). Here the authors found that there had been an increase in the economic polarisation within our cities with low socio-economic status areas characterised by job loss and income falls and high socio-economic status areas characterised by job growth and income rises. Gregory and Hunter (1995) showed that within major cities, two-job families were congregating together in areas of high socio-economic status, especially in areas where manufacturing workers used to live. On a geographical basis families were found to be polarising into neighbourhoods of double-income earner or no-income earner families. Geographic polarisation that is within-city such as that described by Gregory and Hunter, is best seen as a mixture of cause and effect of employment polarisation across households. Jobless households will be naturally sorted into more deprived neighbourhoods but also declining local employment opportunities will also reinforce this process. Unfortunately however, finer disaggregation of this data to capture micro-locational factors is not possible.

As before we can repeat this conditioning for each household size. Tables 11-13 undertake this operation.

Table 11: Comparison of actual vs. predicted jobless household rates for 1 adult households, 1982 to 1997/98

	Actual jobless household rate	Predicted jobless household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Sex	Age	Education	Region	Capital city	Recent arrival	Combined
1982	35.1	29.6	28.0	32.1	28.6	29.6	29.5	29.6	30.1
1986	37.9	28.1	26.7	30.7	27.5	28.1	Na	28.0	28.9
1990	36.2	25.8	25.4	28.2	25.5	25.8	25.8	25.7	27.7
1994	33.5	26.9	26.2	28.3	26.6	27.0	26.9	26.9	27.1
1995	33.0	25.7	25.1	26.5	25.0	25.8	25.7	25.6	25.3
1996	37.1	27.2	26.8	28.3	26.8	27.2	27.3	27.1	27.8
1997	34.5	26.3	25.6	27.2	26.2	26.3	26.3	26.1	26.3
Δ97/98-82	-0.6	-3.3	-2.4	-4.9	-2.4	-3.3	-3.2	-3.5	-3.8

Table 12: Comparison of actual vs. predicted jobless household rates for 2 adult households, 1982 to 1997/98

	Actual jobless household rate	Predicted jobless household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Sex	Age	Education	Region	Capital city	Recent arrival	Combined
1982	8.4	8.7	7.1	8.8	8.5	8.8	8.8	8.8	6.6
1986	8.9	7.9	6.8	8.0	7.7	7.9	n.a.	7.9	6.4
1990	8.6	6.7	5.9	6.5	6.5	6.7	6.7	6.7	5.6
1994	10.3	7.3	6.5	7.3	7.1	7.3	7.3	7.3	6.3
1995	9.0	6.6	6.1	6.6	6.5	6.6	6.7	6.7	6.0
1996	9.8	7.4	6.8	7.3	7.4	7.4	7.5	7.5	6.6
1997	10.2	6.9	6.4	6.8	6.9	6.9	7.0	7.0	6.4
Δ97/98-82	1.8	-1.8	-0.7	-2.0	-1.6	-1.9	-1.8	-1.8	-0.2

Table 13: Comparison of actual vs. predicted jobless household rates for 3+ adult households, 1982 to 1997/98

	Actual jobless household rate	Predicted jobless household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Sex	Age	Education	Region	Capital city	Recent arrival	Combined
1982	3.8	2.0	1.5	2.0	2.3	2.0	2.0	2.0	1.7
1986	3.5	1.7	1.4	1.9	2.2	1.7	na	1.7	1.8
1990	3.5	1.3	1.1	1.6	1.6	1.3	1.3	1.3	1.5
1994	4.3	1.5	1.2	1.7	1.9	1.5	1.5	1.5	1.7
1995	3.6	1.3	1.1	1.5	1.7	1.3	1.3	1.3	1.4
1996	4.7	1.5	1.3	1.7	1.9	1.5	1.5	1.5	1.6
1997	3.6	1.4	1.2	1.6	1.7	1.4	1.4	1.4	1.6
Δ97/98-82	-0.2	-0.6	-0.3	-0.4	-0.6	-0.6	-0.6	-0.6	-0.1

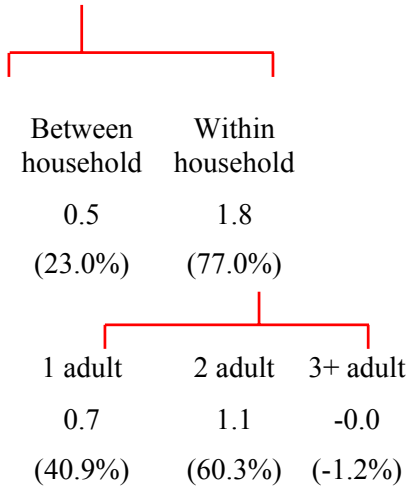
For single-adult households conditioning on characteristics makes little difference and, if anything, suggests that characteristics of singles have moved over time to make them more employable. Age is the dominant change here with singles now being somewhat more likely to be of prime age. So the conditional polarisation for one-adult households is higher than the unconditional at around 3.2 percentage points rather than 2.7 points.

In contrast, conditioning on characteristics for couples makes a significant difference back in 1982. It suggests that there should have been fewer jobless couples in 1982 if the gender mix of employment is taken into consideration. Especially when gender mix is considered along with other characteristics. Over time the unwinding of the stark gender differences means that the conditional predicted jobless household rate is very similar in 1997 as 1982, whereas the unconditional has a marked decline due to rising employment levels. Hence characteristics of couples have moved to make them more likely to be jobless. So the conditional polarisation for couple households is around 2 percentage points. After conditioning the small three-plus-adult household type shows no polarisation. So the process of conditioning suggests that singles are doing worse than in the raw polarisation measure and conditional polarisation is less acute for couples.

We can repeat the within and between-household decomposition, such as in Table 6, on our measure of conditional polarisation. Figure 5 provides a summary of the decompositions of conditional polarisation.

Figure 5: Decompositions of predicted jobless household rates and polarisation allowing employment to vary across subgroups of population

	Actual jobless household rate	Unconditional predicted	Conditional predicted	Conditional polarisation
1982	12.7	11.5	10.2	2.5
1997/98	16.3	11.8	11.5	4.8
Change	3.6	0.3	1.3	2.3



The top of the diagram presents a summary of the actual and predicted jobless household rates between the start and end period of our analysis, and also presents our measure of conditional polarisation, which is the difference between the actual jobless household rate and the conditional predicted jobless household rate. Immediately below the measure of conditional polarisation are the results of the decomposition into the portion of polarisation attributed to the between-household type component and the within-household type component. The numbers in brackets refer to the contribution of each component in percentage terms. As in Figure 3, the relative contribution each household type has on the polarisation found within-household types, is presented at the bottom of the figure. Here we see that even after conditioning, the vast majority of the residual polarisation (77%) remains within-household types. And, yet again, the bulk of this within-household type rise affects couples (60%), so taken together around half of the 2.3 point total rise in conditional polarisation derives from among couples.

In summary, shifts in the patterns of employment toward the better educated, the prime-aged and women can explain about one third of the observed unconditional polarisation. Thus, two thirds of the initial polarisation based on randomly distributed employment, cannot be explained by the observed characteristics of household members and this is most marked among couples. So far we have explored the major characteristics by which employment varies across society. We now go further and explore whether this observed conditional polarisation varies by family circumstances that may be more clearly affecting labour supply. In particular we might anticipate the increase in conditional polarisation for one-adult households stems from the increasing number of lone parents who have traditionally low employment rates.

5. Households with children and renters

In this section we explore employment polarisation for households with children and households renting further. Financial incentives to enter into paid employment facing households with children and those renting privately differ widely from other household types. Lone parents are obviously exposed to additional constraints in offering labour supply, as they are often the sole carers of their children. However, it is also the case that for couple households, when interactions between the tax system and the social security system are taken into consideration, couples with children can face substantial disincentives from one member entering into low paid, insecure work, and often it only pays if both adults enter the labour force. This is even more pronounced if one takes into consideration the costs associated with employment, such as travel costs, and the loss of non-cash benefits such as concessions to utilities and transport etc. Residing in rental accommodation may act as a proxy for individuals with low lifetime earnings potential. Also, families renting privately may be entitled to Rent Assistance and thus face differing financial incentives to enter employment than other families. Either way they have poorer incentives (lower potential wages and slightly higher benefits).

Households with children

As households with children face different incentives to enter the labour market, and Australia has one of the highest jobless household rates in the OECD, this part of the analysis focuses

on households with children. Table 14 reports the actual jobless household rate, our unconditional measure of polarisation and our conditional measure of polarisation by household size and the presence of children in 1982, 1990 and 1997/98 with the final rows presenting the change over the period.

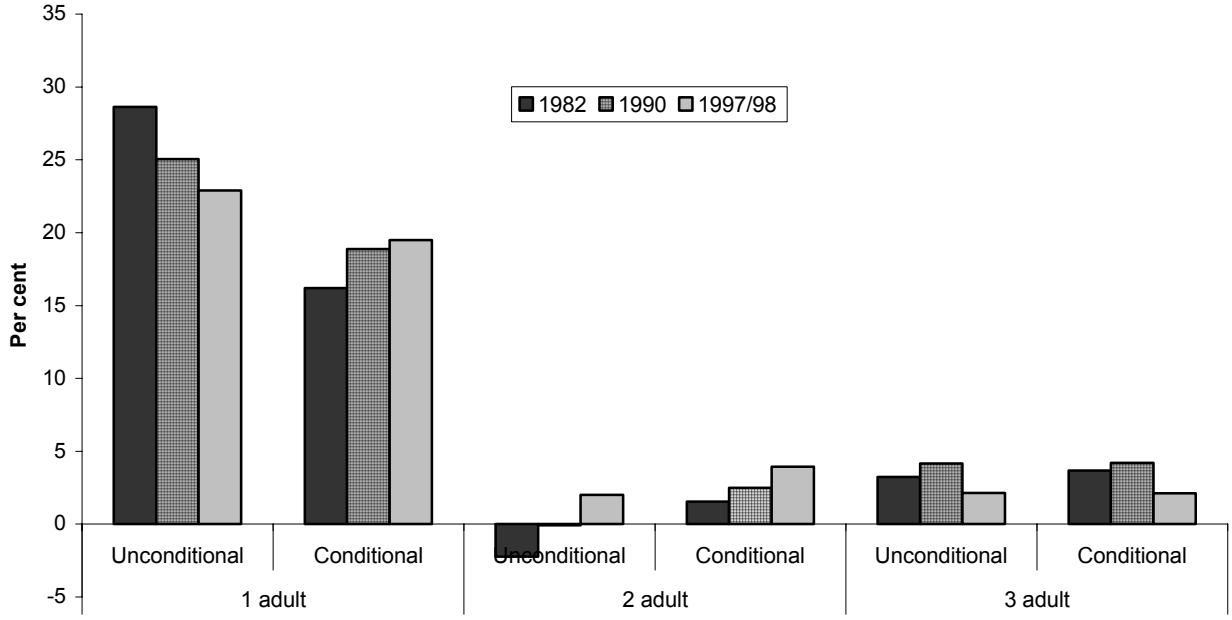
Table 14: Unconditional and conditional polarisation within households by presence of children

		1 adult		2 adult		3 adult	
		Kids	No kids	Kids	No kids	Kids	No kids
1982	Actual	58.2	29.9	6.5	11.8	5.1	2.5
	Unconditional polarisation	28.6	0.3	-2.2	3.0	3.2	0.5
	Conditional polarisation	16.2	2.5	1.6	2.5	3.7	0.7
1990	Actual	50.8	31.2	6.6	12.0	5.5	2.1
	Unconditional polarisation	25.0	5.4	-0.1	5.4	4.2	0.9
	Conditional polarisation	18.9	5.0	2.5	3.9	4.2	0.6
1997/98	Actual	49.2	29.6	8.9	12.0	3.6	3.5
	Unconditional polarisation	22.9	3.3	2.0	5.1	2.1	2.2
	Conditional polarisation	19.5	4.4	3.9	3.5	2.1	1.8
Δ1997/98-82	Actual	-9.0	-0.3	2.4	0.2	-1.5	1.0
	Unconditional polarisation	-5.8	2.9	4.2	2.1	-1.1	1.7
	Conditional polarisation	3.3	1.9	2.4	1.1	-1.6	1.2

So for instance, the actual jobless household rate for a one-adult household with dependent children in 1980 was 58.2, polarisation based on a benchmark world of randomly distributed employment was 28.6, and any residual polarisation not explained by varying individual characteristics was 16.2. By 1997/98 the actual jobless household rate for single-adult households with children had fallen by 9 percentage points to 49.2, unconditional polarisation had fallen by 5.8 points to 22.9 and conditional polarisation had risen by 3.3 points to 19.5.

The key feature of this table is the large increase in conditional, or unexplained, polarisation in one and two-adult households with children. These are emphasised in Figure 6.

Figure 6: Polarisation for households with dependent children



Figures A3 and A4 in Appendix 5 present the decompositions of unconditional and conditional polarisation respectively, furthering the disaggregation of household type to included both household size and presence of children. From these decompositions we see that unconditional polarisation, based on the benchmark of randomly distributed employment, is heavily focused on couples with children (65% of the total change in unconditional polarisation within-households is driven by couples with children whereas for lone parents unconditional polarisation fell sharply). Conditioning on changes in employment across key characteristics shifts the emphasis toward lone parents. In 1982 lone parents deviated quite substantially from the average employment rate, but by much less if other similar women are used as a comparison benchmark. Since then lone parents have gained ground in terms of employment against the average working age person, but lost ground relative to other women with the same observable characteristics. In absolute terms, the change in conditional polarisation is the greatest for lone parents. However, as couples with children represent a much larger group in the population, the 2.4 point increase in conditional polarisation for two-adult households with children accounts for 53% of the total change in conditional

polarisation within-household types, whereas lone parents account for just 13%. Conditional polarisation has also risen for single adults and couples without children to a smaller degree. The increasingly adverse situation of couples with children occurs right throughout the period, although our sample period stops before the recent welfare reform process has had any chance of a noticeable impact. For lone parents and single/couples without children the conditional polarisation stabilises in 1990.

Therefore, allowing for the presence of children suggests that more of the 3.3 point increase in unconditional polarisation comes about through movements between-household types, especially toward more lone parents. However, employment rates of lone parents have risen by around 9 percentage points over this period. The striking thing about allowing for the presence of children is the poor employment performance of couples with children.

This is in line with the findings of Gregory (1999) that couple families with children have become much more prone to joblessness over the last two decades. With falling male employment rates matched by a growth in female employment, Gregory shows that over ninety per cent of the increase in female employment in couple families with children between 1979 and 1998 went to families where the male was already in employment. Our results also reinforce Miller's (1997) finding that couple families with young dependents are particularly prone to unemployment. Gregory and Hunter (1996) show that there is a geographical dimension to this with two-job families within major cities congregating together into areas of high socio-economic status and no-job families grouping together into areas of low socio-economic status, especially in areas formerly reliant on manufacturing.

Households renting

Another dimension by which work incentives are affected over this period is renting. Renters, except those in public housing, can receive Rent Assistance in addition to their basic income support payment, which is withdrawn as incomes rise after other income support payments have ended. The reforms implemented in July 2000, with more generous family payments and their slower withdrawal, mean that renters lose this support far further up the income distribution than before. Also, renting may act as a proxy for low lifetime earnings. Therefore, households in rental accommodation face different work incentives to other households in the

working-age population. Table 15 presents the equivalent to Table 14 for households renting rather than households with children.

In Table 15 public housing units are excluded, as we do not have information on public housing for all of the years, so the numbers do not add up to the totals used before. Where we do observe public housing information, only around 5% of households are in public housing. In 1997/98 nearly 60% were jobless, which is not surprising, as households need to be in extreme financial hardship to qualify for public housing. Highlighted in the table is that renting couples have always been more prone to joblessness, even after conditioning for other observable characteristics. However, since then conditional polarisation between renters and non-renters has diverged ever more sharply. With both couples and singles in rented accommodation seeing sharp increases in joblessness for given characteristics. Figure 7 presents the estimates of polarisation for households in private rental accommodation in 1982, 1990 and 1997/98 and emphasises the jumps in polarisation for single and couple households. Over the period there has been little change in the share of households renting privately and other major characteristics have been conditioned on already. While it is probable renters have other unobserved characteristics against which there have been adverse shifts over this period, the results tend to imply that lower wages, poorer work records and worse financial incentives to work have had adverse consequences on households in the private rental sector.

Figure 7: Polarisation for households renting privately

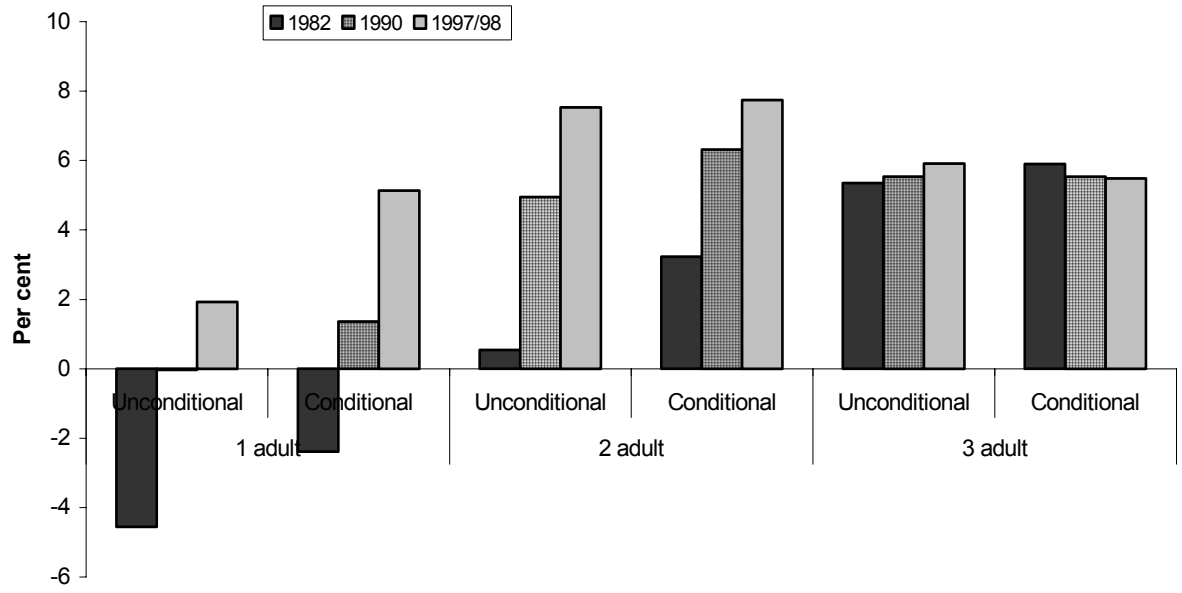


Table 15: Unconditional and conditional polarisation within households by rent paid[6]

		1 adult		2 adult		3 adult	
		Renting privately	Not renting	Renting privately	Not renting	Renting privately	Not renting
1982	Actual	25.0	36.7	9.3	7.1	7.4	2.3
	Unconditional polarisation	-4.6	7.2	0.5	-1.7	5.3	0.4
	Conditional polarisation	-2.4	6.5	3.2	0.5	5.9	0.6
1990	Actual	25.8	34.2	11.6	6.6	6.8	2.5
	Unconditional polarisation	-0.0	8.4	4.9	-0.0	5.5	1.1
	Conditional polarisation	1.4	6.5	6.3	1.1	5.5	1.0
1997/98	Actual	28.2	29.2	14.5	7.5	7.3	2.6
	Unconditional polarisation	1.9	2.9	7.5	0.6	5.9	1.2
	Conditional polarisation	5.1	2.4	7.7	1.2	5.5	1.0
Δ1997/98-82	Actual	3.2	-7.5	5.2	0.4	-0.1	0.3
	Unconditional polarisation	6.5	-4.3	7.0	2.2	0.6	0.8
	Conditional polarisation	7.5	-4.1	4.5	0.7	-0.4	0.4

6. All-work and mix-work households

Up until this point we have concentrated on measuring employment polarisation by looking at households with no employed adults. In this section we now turn to the full distribution of employment to examine households where all-adults are working (all-work households) and also households where at least one adult is working (mix-work households). In the same way that predicted jobless household rates were constructed, either assuming a random distribution of employment or allowing for employment changes within certain subgroups of the population, the full distribution of work can be predicted, thus allowing us to examine

[6] Households in public housing have been excluded as they are such a small group in the population.

patterns of employment in mix-work and all-work households. Following our definition of the predicted jobless household rate in equation 2, the predicted allocation of work across households is,

$$\begin{aligned} \hat{Dist}_t &= \hat{NoWork}_t + \hat{MixWork}_t + \hat{AllWork}_t \\ &= \sum_i s_{it} n_t^i + \sum_i s_{it} (1 - n_t^{\,i} - (1 - n_t)^i) + \sum_i s_{it} (1 - n_t)^i \end{aligned} \tag{8}$$

Using equation 8 we can alter our focus on the distribution of employment from no-work households, to all-work households at the opposite end of the household employment distribution. As employment and polarisation towards jobless households have both increased there must be a rise in the number of households with all-adults in work. As the polarisation measure is not linear (see Equation 3), polarisation that brings about more jobless households is not necessarily symmetrical with the share of households with all adults in work.

All-work household rates and the associated measures of polarisation are presented in Table 16.

Table 16: Actual and predicted all-work household rates

	Actual	Predicted[1]	Polarisation
1982	49.5	50.1	-0.6
1986	53.6	53.4	0.2
1990	58.3	56.8	1.5
1994	58.2	55.8	2.4
1995	60.3	58.1	2.3
1996	57.4	55.8	1.6
1997	59.4	57.3	2.1
Δ1997-82	9.9	7.2	2.7

1) Predicted rate calculated assuming randomly distributed employment.

The first column shows the actual rate of working-age households where all adults are working, while the second column shows the predicted all-work household rate based on a random distribution of employment. Polarisation, presented in the final column, as in the jobless case, is the difference between the actual and predicted rates. In 1982 the predicted share of households with all adults in work and the actual share were almost identical. The growth in employment and move toward more single-adult households leads to a sharp

increase in the predicted share of households with all-adults in work. However, the actual figure out stripped even this as the share of households with all adults in work rose by 10 percentage points. Thus, our measure of polarisation implies that there are 2.7 percent more households with all adults in work in 1997 than in 1982, given employment rates and household composition.

The relative importance of employment and changes in the structure of households to the increase in the predicted all-work households are our focus in Table 17.

Table 17: Decomposition of all-work household rates

	Change in predicted all-work household rate	Impact due to changes in household composition	Impact due to changes in employment rate	Change in polarisation	Between-household type	Within-household type
1982-1997/8	7.2	2.8	4.4	2.8	-1.1	3.9
1982-1990	6.7	1.5	5.2	2.1	-0.6	2.7
1990-1997/8	0.5	1.2	-0.7	0.6	-0.9	1.5

The table suggests that changes in household composition have an effect with a similar order of magnitude to the total impact of polarisation. Also explored in the table are the relative contributions of between and within-household type effects on the increase in polarisation. Here, the between component is actually negative because there are moves toward more singles who had less employment than would have occurred if employment were distributed randomly. For single-adult households the polarisation measure for all-adult households is the exact opposite of that for jobless households. The first three columns of Table 18 show that singles suffered more from joblessness than would have been the case if employment were randomly distributed. Here the results for singles are the opposite of those in the previous section (columns 1-3 in Table 7). Thus, all of the rise in polarisation toward more households where all adults work occurs within multi-adult households.

In 1982 there were just under 1% less couples were both adults worked than would be predicted from a random distribution of employment. By 1997 this had increased to 5% more such couples than would occur randomly. The small number of households with three or more adults has seen equally dramatic shifts towards all members working.

Table 18: Actual and predicted all-work household rates by household size, 1982 to 1997/98

	1 adult			2 adults			3 adults plus		
	Actual	Predicted[1]	Polarisation	Actual	Predicted[1]	Polarisation	Actual	Predicted[1]	Polarisation
1982	64.9	70.4	-5.5	48.7	49.6	-0.9	36.2	30.9	5.3
1986	62.0	71.9	-9.9	53.9	51.7	2.2	40.6	33.6	7.0
1990	63.9	74.2	-10.3	59.2	55.1	4.1	46.5	37.4	9.2
1994	66.5	73.1	-6.6	58.5	53.4	5.1	42.7	35.4	7.3
1995	67.0	74.3	-7.3	61.6	55.2	6.4	42.5	37.3	5.2
1996	62.9	72.8	-9.9	57.4	53.0	4.4	46.8	34.5	12.4
1997	65.5	73.7	-8.2	59.2	54.3	4.9	48.3	36.3	12.1
Δ1997-82	0.6	3.3	-2.7	10.5	4.7	5.8	12.1	5.4	6.8

2) Predicted rate calculated assuming randomly distributed employment.

Now we investigate whether this polarisation can be explained by observable characteristics. Following equation 7, we relax the random distribution of employment assumption and allow employment rates to vary across the same observable characteristics as were used in the jobless case, that is; gender, age, education, State, capital city, and recent arrivals. Tables 19 and 20 explore the impact of conditioning on these characteristics on our measures of polarisation for two-adult and three-plus-adult households respectively.

Table 19: Comparison of actual vs. predicted all-work household rates for 2 adult households, 1982 to 1997/98

	Actual all-work household rate	Predicted all-work household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Sex	Age	Education	Region	Capital city	Recent arrival	Combined
1982	48.7	49.6	46.4	50.0	50.7	49.6	49.6	49.6	47.1
1986	53.9	51.7	49.1	52.9	53.0	51.7		51.7	50.9
1990	59.2	55.1	53.4	56.7	56.3	55.1	55.1	55.0	55.4
1994/95	58.5	53.4	52.0	54.3	54.6	53.4	53.4	53.3	53.7
1995/96	61.6	55.2	54.1	56.2	56.4	55.2	55.1	55.1	55.7
1996/97	57.4	53.0	51.8	54.0	54.0	53.0	52.9	52.9	53.1
1997/98	59.2	54.3	53.2	55.5	55.4	54.3	54.2	54.2	54.8
Δ97/98-82	10.5	4.7	6.8	5.5	4.7	4.7	4.6	4.6	7.7

Table 20: Comparison of actual vs. predicted all-work household rates for 3+ adult households, 1982 to 1997/98

	Actual all-work household rate	Predicted all-work household rate							
		Randomly distributed employment	Allowing for employment variations by:						
			Sex	Age	Education	Region	Capital city	Recent arrival	Combined
1982	36.2	30.9	30.2	31.5	29.0	30.9	31.0	30.9	28.8
1986	40.6	33.6	33.0	33.1	31.0	33.6		33.6	30.5
1990	46.5	37.4	37.1	36.1	34.8	37.4	37.4	37.5	34.6
1994/95	42.7	35.4	35.3	35.1	32.9	35.4	35.5	35.4	33.0
1995/96	42.5	37.3	37.3	36.2	34.5	37.4	37.6	37.5	34.5
1996/97	46.8	34.5	34.5	33.5	32.7	34.4	34.9	34.6	33.1
1997/98	48.3	36.3	36.2	34.9	34.3	36.2	36.7	36.4	34.9
Δ97/98-82	12.1	5.4	6.0	3.4	5.3	5.3	5.7	5.5	6.1

The situation of singles is analogous but opposite to that in Table 11 in the previous section and thus is not presented separately. The share of couples where both adults work has risen by more than 10 percentage points. Higher rates of employment in the general economy can predict around 5 of those 10 points. So the rate of couples with both adults working over this period increases by nearly 6 percentage points more than is consistent with the aggregate increase in employment. The change in gender patterns of employment can explain a fair chunk of this, and taken together with age and other factors, the gap in actual and predicted rates is halved to 3 points. Conditioning on observable characteristics is however, far less important in explaining the large increase in employment among larger (three-plus-adult) households.

In summary, there has been a sharp increase in the share of couples and larger family units where all adults work. Even after conditioning on observable characteristics there is still a large unexplained increase in dual-earner couples. Turning to households with dependent children as presented in Table 21, this trend is the mirror image of the polarisation associated with jobless households. Along with the increase in couple households with children where no adult is working there has been a simultaneous increase in those where both adults work, even after taking account of observable characteristics. Decomposing the measure of conditional polarisation as we did in the jobless case, we find that couples with children account for 66% of the within-household type polarisation over this period whereas for couples without children it is just 10% (see Appendix 5, Table A8).

Table 21: Unconditional and conditional polarisation within households by presence of children

		2 adult		3 adult	
		Kids	No kids	Kids	No kids
1982	Actual	42.9	58.6	34.5	37.7
	Unconditional polarisation	-6.8	9.0	4.0	6.5
	Conditional polarisation	-5.4	13.4	5.8	8.8
1990	Actual	57.5	61.9	43.9	48.4
	Unconditional polarisation	2.4	6.9	6.0	11.3
	Conditional polarisation	-0.8	11.3	6.6	15.5
1997/98	Actual	54.8	65.5	45.1	50.5
	Unconditional polarisation	0.5	11.2	7.9	14.8
	Conditional polarisation	-2.4	14.1	8.9	16.4
Δ1997/98-82	Actual	11.9	6.9	10.6	12.8
	Unconditional polarisation	7.3	2.2	4.0	8.3
	Conditional polarisation	3.0	0.7	3.2	7.6

7. Concluding comments

Over the last fifteen years or so Australia has seen rising employment, shifts toward smaller households and more households having no earned income. Using a benchmark model of how many households would be jobless if employment was randomly distributed across the working-age population we examine whether Australia has seen a move to a world where the available work has become polarised into households with either all adults in paid work or no adults in paid work. This paper has used the Income Distribution Surveys and the Surveys of Income and Housing Costs from 1982 to 1997/98 published by the ABS to measure the extent of the polarisation of employment and examine which groups in Australia are the most

disadvantaged. Trends in both ends of the spectrum have been examined (all-work and no-work households) but with an emphasis on jobless households as they are of greater importance to policy makers.

The shift in the composition of households towards more one-adult households, whose probability of being jobless is higher than for multi-adult households, has contributed substantially to this increase in jobless households. However, we have shown that employment growth over the years should have largely offset the effects of this household compositional shift. The diminishing numbers of jobless individuals have become concentrated in particular households. This increase in jobless households has been matched by more multi-adult households with two or more earners. Hence it is fair to say that there has been a marked polarisation of employment opportunities in Australia over this period. This polarisation against the benchmark of a random distribution of work has resulted in around 3.3 percentage points more jobless households or around 170,000 extra largely poor and welfare dependent families. A large majority of the polarisation is within-household types and most of the increase in polarisation mainly falls on 2 adult (couple) households, especially with children.

Relaxing the random distribution of employment assumption and allowing for varying employment rates across certain subgroups of the population shows that changing variation in employment across groups explains about a third of the increasing incidence of jobless households. We have found that employment differences across gender and education groups add the most explanatory power to our conditional polarisation measure. Our analysis suggests that less educated men are losing employment whilst better-educated women are gaining with these groups tending to live in different households. However, even after conditioning for characteristics there remains a large unexplained element. Exploring this further we have found that once the variation in employment across groups has been taken into account, polarisation is most adversely affecting families with children (couples and lone parent) and households renting privately.

Alongside this has been a growth in all-work households. Employment growth over the period and a move toward more single-adult households leads to a predicted rise in all-work households, however the actual extent of the rise in the all-work household rate was quite a

significant amount higher than that predicted by these shifts. Polarisation has created a marked increase in dual-earner couples and again couples with children have seen largest increases. Hence taken together there has been a marked increase in the proportion of children living households with no earner and in those with two or more earners.

It is important to note that the rise in jobless households happened in two rather different periods. The polarisation of employment primarily occurred in the 1980s whereas the changes in household composition predominantly occurred after 1990. Hence the employment gains made after the early 1980s recession made no dent in the number of welfare dependent families, in fact jobless families continued to rise. This was due to a failure for this employment to reach these jobless families. Whereas after 1990 the continued rise was due to shifts in household structure toward single-adult households where employment rates are low. This still begs the question as to why single-adult households (with or without children) have such low labour supply.

Why might employment have become unevenly distributed into all-work or no-work households? A number of major changes have occurred over this period in the world of work. One of the most pertinent is the sharp rise in inequality of earnings. This saw real earnings fall for low waged men in the 1980s (See Borland, Gregory and Sheehan, 2001, for a discussion of this). This fall in real earnings was most pronounced at around the 25th percentile of the distribution (see Appendix 2, Figure A1 for the patterns for weekly wages for male full-time earners from our data), so there was a substantial crushing of the wage distribution just above the minimum wage. By contrast there were sharp increases in earnings for the more educated, especially more educated women over this period. Men with low earnings potential and women with high earnings potential tend to live in different households. Our calculations after conditioning on gender and education show how changing employment patterns across these groups lies behind about one third of the observed polarisation (Appendix 1, Tables A3 and A4 highlight the differing employment trends between men and women over this period).

This decline in less educated males earnings power coincided with increases in the replacement rates between incomes available when not working and those for taking a job at the minimum wage (see Reference Group on Welfare Reform, 2000c). This figure is reproduced in Appendix 3, Figure A2. Indeed the conditional polarisation we observe falls

disproportionately on families with children and renters. These groups face additional disincentives and constraints in taking low wage employment. Renting also proxies low earnings potential and aspects of geographic location, as highlighted by Gregory and Hunter (1995). However, the difference in relative incentives between the first earner taking a low wage job and those facing second earners remain marked particularly if one also takes into consideration various non-cash benefits which give social security recipients various concessions on pharmaceuticals, utilities and public transport. Australia (and the UK, the other country with very high jobless households with children) is unusual in having no earnings related element in welfare payments combined with an individualised tax system. This means that work incentives vary among the jobless according to family structure (whereas earnings related payments make these broadly flat) and individualised tax systems give strong incentives for second earners relative to first earners.

The ongoing welfare reform process starting from around 1994 has addressed many of these issues. The separate treatment of partners with a partial individualisation of welfare payments; the Jobs, Education, Training (JET) programme designed to assist lone parents into re-entering the labour force; and greater emphasis and monitoring of job search by the unemployed are the longest standing elements of reform. More recently, financial incentives for families with children, especially with child-care costs and a wider focus on motivating and helping all welfare recipients to find work are likely to reduce this problem after our period of study. In addition, we believe that improving basic education levels and reducing employer taxes on low-wage workers (France is having some success with this latter strategy recently) may provide useful support to these reforms. Over the next few years we should hopefully be able to assess whether this reform strategy has worked.

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Appendix 1: Employment rates across subgroups of population

Table A1: Aggregate employment rates, total and by gender, 1982 to 1997/98

	Total	Male	Female
1982	70.4	85.0	54.2
1986	71.9	84.0	58.5
1990	74.2	84.1	63.5
1994/95	73.1	82.6	62.9
1995/96	74.3	82.7	65.4
1996/97	72.8	81.7	63.3
1997/98	73.7	81.9	65.0

Table A2: Aggregate employment rates by age and educational qualification, 1982 to 1997/98

	15-24 years	25 to 34 years	35 to 49 years	50 years plus	University	Other post secondary	No post secondary
1982	75.7	71.1	73.8	59.0	88.3	77.9	64.0
1986	75.6	75.3	76.5	55.4	88.5	81.1	64.5
1990	75.2	75.8	80.5	59.3	89.9	80.7	66.7
1994/95	75.9	74.7	78.1	59.5	88.3	81.0	65.0
1995/96	75.6	77.0	78.6	62.6	89.1	81.7	66.3
1996/97	74.6	72.9	77.9	62.4	88.4	80.2	64.5
1997/98	75.2	75.9	78.5	62.1	88.0	79.9	65.9

Table A3: Male employment rates by age and educational qualification

	15-24 years	25-34 years	35-49 years	50 years plus	University	Other post secondary	No post secondary
1982	82.3	90.3	91.8	72.8	92.9	87.8	81.6
1986	82.0	92.8	90.8	65.7	94.4	89.3	78.2
1990	81.1	91.1	90.9	68.0	94.9	87.4	78.6
1994/95	80.7	89.0	89.5	66.8	92.8	87.2	76.2
1995/96	80.6	89.5	88.4	68.9	93.3	87.3	76.1
1996/97	78.6	88.3	88.1	68.5	92.8	86.5	74.7
1997/98	80.2	87.4	88.8	68.1	93.2	84.9	76.0

Table A4: Female employment rates by age and educational qualification, 1982 to 1997/98

	15-24 years	25-34 years	35-49 years	50 years plus	University	Other post secondary	No post secondary
1982	68.9	52.2	54.7	37.4	79.2	62.1	49.2
1986	68.9	58.6	61.6	39.0	78.8	68.4	52.4
1990	69.0	61.5	69.9	45.5	82.0	71.8	56.3
1994/95	70.9	61.3	67.1	48.6	82.7	71.4	55.7
1995/96	70.6	65.3	69.0	53.3	84.1	73.2	58.1
1996/97	70.3	58.9	68.3	53.0	83.7	70.2	56.0
1997/98	70.0	65.4	68.5	53.4	82.6	72.4	57.0

Table A5: Aggregate employment rates by region and capital city, 1982 to 1997/98

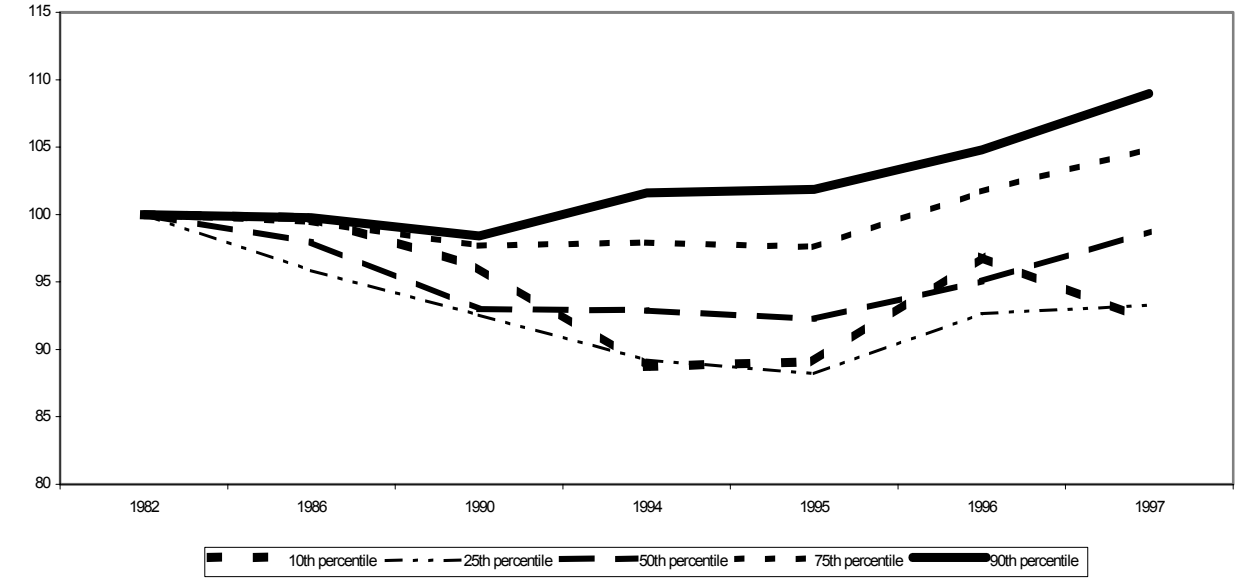
	NSW, ACT&NT	Vic and Tas	Queensland	WA and SA	Capital city	Non capital city
1982	70.0	71.1	69.5	71.0	71.7	68.2
1986	71.6	73.2	69.9	72.3	na	na
1990	74.3	74.3	73.8	74.2	74.8	73.1
1994/95	73.5	72.3	73.0	73.5	73.9	71.7
1995/96	75.7	73.8	73.6	73.2	75.2	72.8
1996/97	73.1	71.9	73.1	73.2	74.2	70.6
1997/98	73.4	74.1	72.9	74.5	74.9	71.6

Table A6: Aggregate employment rates by immigrant arrival status, 1982 to 1997/98

	Recent arrival	Non recent arrival
1982	70.0	70.5
1986	69.9	72.2
1990	74.5	71.3
1994/95	70.3	73.3
1995/96	68.3	75.0
1996/97	69.3	73.2
1997/98	67.8	74.4

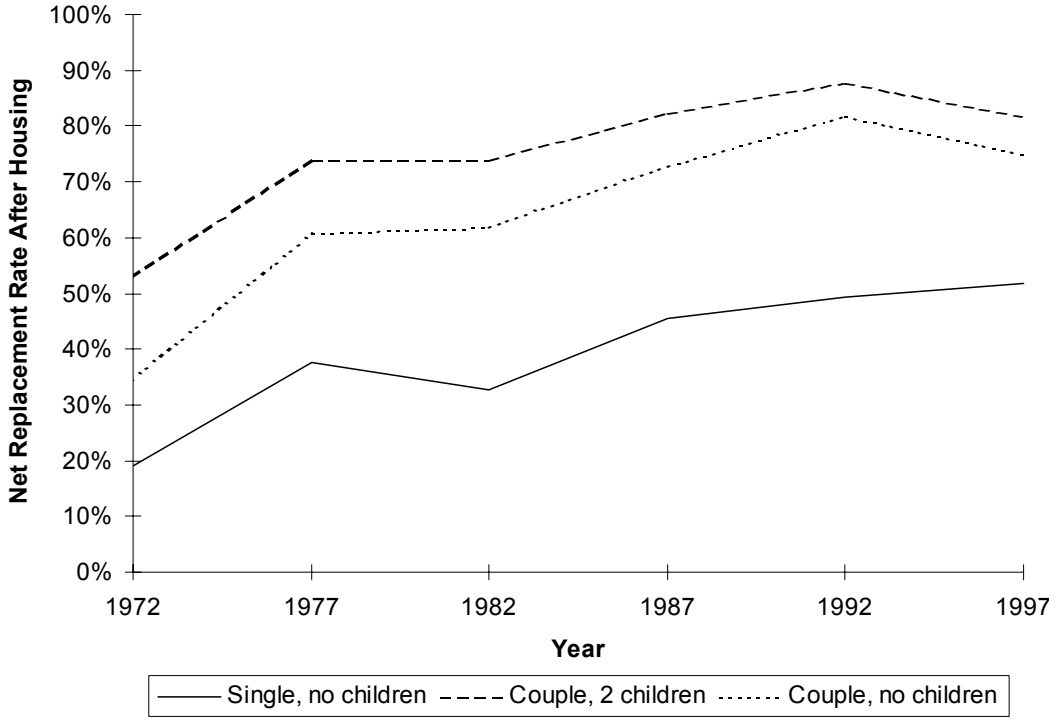
Appendix 2: Real wages

Figure A1: Real male weekly full-time wage and salary earnings, 1982 to 1997/98



Appendix 3: Replacement rates

Figure A2: Net Replacement Rates of income support versus minimum wage, various non-renter income unit types



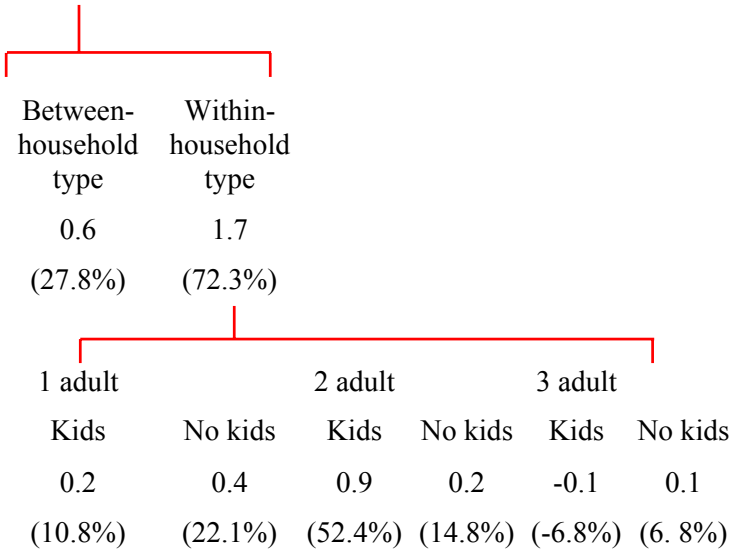
Source: Reference Group on Welfare Reform (2000c), Appendix 4, p.50

Appendix 4: Decompositions of predicted jobless household rates and polarisation by household size and presence of children

Figure A3: Decompositions of predicted jobless household rates and polarisation assuming random distribution of work

Figure A4: Decompositions of predicted jobless household rates and polarisation allowing employment to vary across subgroups of population

	Actual jobless household rate	Unconditional predicted	Conditional predicted	Conditional polarisation
1982	12.7	11.5	10.2	2.5
1997/98	16.3	11.8	11.5	4.8
Change	3.6	0.3	1.3	2.3



Appendix 5: Decompositions of predicted all-work household rates and polarisation

Figure A5: Decompositions of predicted all-work household rates and polarisation assuming random distribution of work

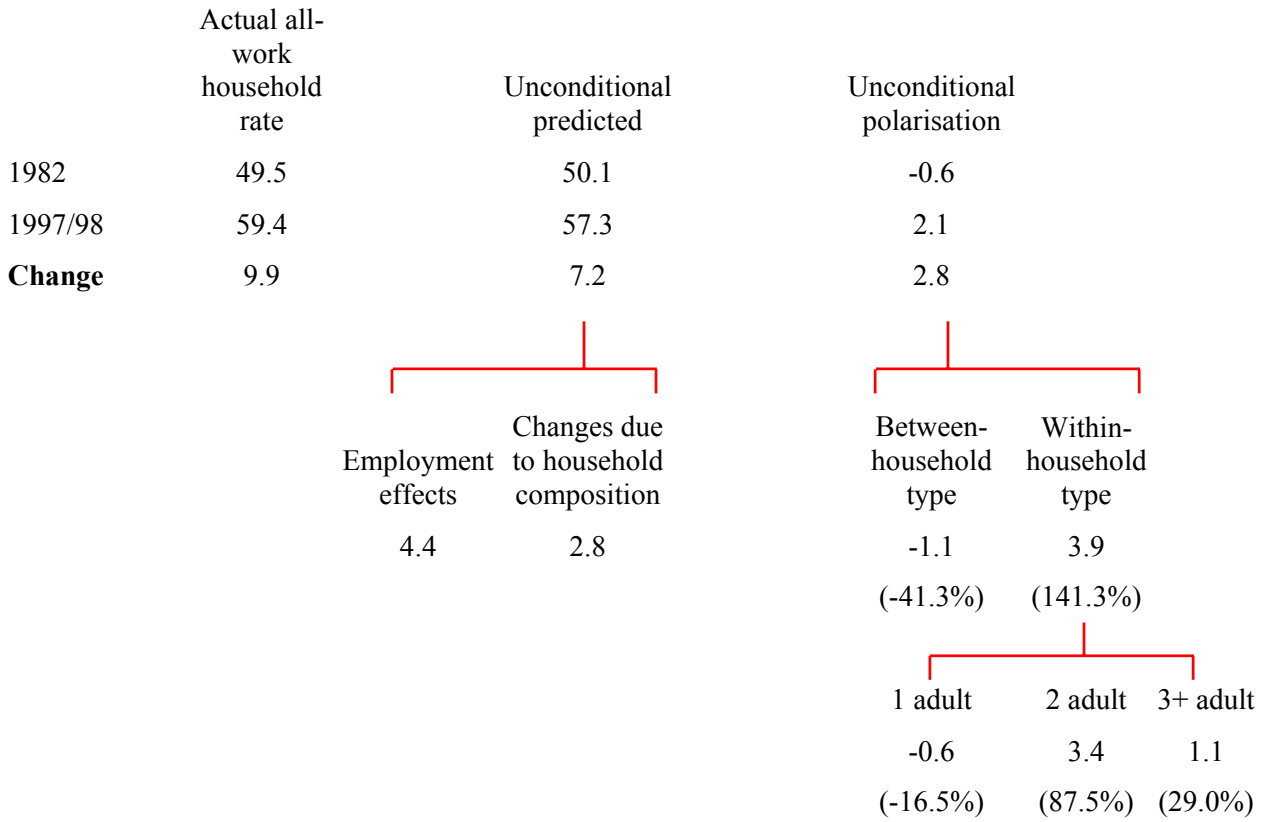


Figure A6: Decompositions of predicted all-work household rates and polarisation allowing employment to vary across subgroups of population

	Actual all-work household rate	Unconditional predicted	Conditional predicted	Conditional polarisation
1982	49.5	50.1	48.1	1.4
1997/98	59.4	57.3	57.4	2.1
Change	9.9	7.2	9.3	0.6

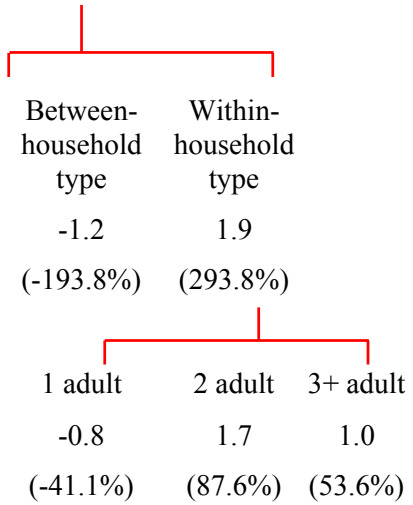


Figure A7: Decompositions of predicted all-work household rates and polarisation assuming random distribution of work

	Actual all-work household rate	Unconditional predicted	Unconditional polarisation
1982	49.5	50.1	-0.6
1997/98	59.4	57.3	2.1
Change	9.9	7.2	2.8

Changes due to household composition	Employment effects	Between-household type	Within-household type
4.4	2.8	-1.2	4.0
		(-43.1%)	(143.1%)

1 adult		2 adult		3 adult	
Kids	No kids	Kids	No kids	Kids	No kids
0.3	-0.6	2.6	0.5	0.3	0.8
(7.9%)	(-13.9%)	(66.3%)	(12.6%)	(7.3%)	(19.9%)

Figure A8: Decompositions of predicted all-work household rates and polarisation allowing employment to vary across subgroups of population

	Actual all-work household rate	Unconditional predicted	Conditional predicted	Conditional polarisation
1982	49.5	50.1	48.1	1.4
1997/98	59.4	57.3	57.4	2.1
Change	9.9	7.2	9.3	0.6