Decomposing Inequality Change in Australia 1984-1989: The Relative Contribution of Demographic and Economic Factors

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STUDY OF SOCIAL AND ECONOMIC INEQUALITIES

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Foreword

The idea that a Study of Social and Economic Inequalities (SSEI) should be undertaken in Australia was first proposed in 1988 by the then Minister for Social Security, Brian Howe. After development of a specific research proposal, core funding for the Study was provided by the Commonwealth Department of Social Security, which also agreed to provide matching funding on a dollar-for-dollar basis for any funding received from non-Commonwealth sources. On-going encouragement and additional financial support to allow final completion of the research was provided in 1993 by Peter Baldwin who had by then assumed responsibility for the social security portfolio.

The research was conducted over the period 1990-94 under the joint auspices of the Centre for Applied Economic Research and the Social Policy Research Centre, both located at the University of New South Wales. The main aim of the Study has been to shed new light on various dimensions of inequality in Australia - both economic and social - and to investigate the factors causing them. This involved the analysis of existing data rather than the collection of new data, a task which has been facilitated by the public availability of unit record and other data collected by the Australian Bureau of Statistics.

This report uses the technique of inequality decomposition in attempting to identify the role that factors such as changing age structure and family patterns played in explaining the increase in income inequality which was observed among Australian households in the 1980s. Such analysis is not intended to identify the underlying causes of the rise in inequality but rather to assist in a more detailed understanding of what has taken place, a process which will eventually help to identify the causes themselves.

This research would not have been possible without the very generous financial assistance (matched by the Commonwealth) which was provided by the Australian Mutual Provident (AMP) Society. We could not have asked for more supportive sponsors, and we would like to take this opportunity to record our gratitude to Ian Campbell and his colleagues at AMP for their support, interest and encouragement.

Peter Saunders and John Nevile
SSEI Project Directors

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1 Introduction

Research into inequality and the fundamental question of the overall distribution of income and wealth tends to be undertaken at a number of levels, akin to the peeling off of different layers of a fruit to get to the heart. In Australia, data in unit record form, have been available from a relatively consistent and regular set of ABS income, expenditure and wage surveys since the late 1960s. Since then, using that data, a number of studies have documented trend changes in income and wage inequality in Australia (Raskall, 1993; Saunders 1992a; King et al. 1991; Gregory 1992; Borland 1993). The consistent generalised conclusion is of a trend increase in wage and income inequality in Australia from the mid-1970s.

Research in other nations suggests that income inequality has similarly increased in the UK, USA, New Zealand and Sweden, although the timing of the point of increase differs from the early seventies in the US to the beginning of the eighties in Sweden (Atkinson, 1993). They all showed a sharp apparent trend rise over the 1980s. Whilst these nations experienced a rise in income inequality, as Atkinson (1993) points out, in others the movement was either ambiguous (Canada), little changed (France and Italy) or actually fell (Finland and Norway).

All of this suggests, to quote Atkinson that

> while common economic forces have undoubtedly been at work, we have also to look at national factors, and particularly national policies, in seeking an explanation of changes in inequality. (Atkinson, 1993: 23)

In Australia, variants on this descriptive level of aggregate analysis include the extension of the income concept considered to include aspects not covered by the 'cash-only' definition adopted by ABS for its surveys. These non-cash elements of income include work-related fringe benefits (Raskall, 1991) and elements of government expenditure on the 'social wage', such as health and education, which directly affect relative living standards (ABS, 1987 and 1992; Raskall and Urquhart, 1993). The intent of such work is to present a more comprehensive picture of the distribution of 'income' well-being. Other work goes beyond the income concept to look at wealth and its distribution (Raskall and Matheson, forthcoming), and aspects non-pecuniary well-being (Travers and Richardson, 1993).

At a second level, in seeking to examine this aggregate trend, aided by the availability of unit record data, research has extended to examine, again largely descriptively, more detailed patterns attached to inequality change. This research has sought to identify some of the determinants of increasing inequality or the impact of specific factors be they socio-economic or socio-demographic. As recent examples, Jordan (1992) and Saunders (1993a) have examined the impact of married women's earnings on family income inequality. Raskall and McHutchison (1992a and 1992b)

examined the contribution of socio-demographic factors through 'life-cycle' cohorts of households, to the level of aggregate inequality and changes in that inequality.

Given the perceived significance of the labour market to inequality, Saunders (1992b) has examined the impact of unemployment on inequality and utilised the regression results to project the impact on inequality of the current recession, beyond the latest available ABS survey data from 1989-90. Other work has examined the impact of government redistributive policy (Raskall, 1992; Raskall and Urquhart, 1993), its changing mix and significance of components over time, whilst other researchers have examined more specific dimensions of inequality such as that related to gender (Nevile and Tran-Nam, 1992; Kakwani, 1993; and Human Rights Commission, 1992).

Taking advantage of data comparability provided through the Luxembourg Income Study, researchers have drawn upon international comparative analysis to examine both the differences and commonalities in inequality (Bradbury, 1993; Saunders and Hobbes, 1988; Mitchell, 1991; and Saunders et al., 1992) and to elucidate national and broader factors.

All such studies, although valuable, provide only partial evidence of the significance of various factors to total economic inequality within Australia: they provide but one piece of the puzzle. Enough pieces and the general shape becomes apparent. However, many of the 'secrets' hidden in the unexplored areas remain clouded and more importantly, the links to a final more fundamental stage of research for policy purposes remain obscure.

Alternative 'holistic' approaches use the aggregate survey data as either a base or point of validation to develop microsimulations of the distribution of income at various conceptual levels (private, gross, disposable, or final). Such microsimulations (see Gallagher, 1990) enable researchers, given lags in the release of survey data, to up-date data to the present (King, 1987), or, given the period-interval between surveys, to fill in the annual 'gaps' of data (Raskall and Urquhart, 1993). The former enables particular prospective policy measures to be examined and the provision of annual estimates provides the data for comparison with other economic and social phenomena (Raskall, 1993) and for determination of the movements of inequality 'within-trend', such as relationship to the business cycle.

Most significantly, the construction of properly validated simulations enables researchers to analytically examine, via counterfactual analysis, the overall relative significance of various forces, on a comparative static basis. Notable among these studies is the work of Bradbury and Doyle (1992) which examines the impact of unemployment over the 1980s, the labour force participation rate of wives and movements in pensions and benefits, wages, investment income and income tax, through a series of 'what if' analyses. If constructed on a proper policy-oriented basis such microsimulations can provide policymakers with a valuable evaluation tool to assess the impact and cost of particular measures before they are put in place. Other microsimulations can incorporate a time dimension and behavioural response

to determine the distribution of life-time income and income over the life-course (Harding, 1992).

All of the above research stages are a necessary but not sufficient condition through which research must pass if we are to examine the fundamental structural factors giving rise to inequality and its consequences and, in turn, the impact of government redistributive policy, both *ex post* and *ex ante*.

Increasingly, with the availability of comparable data, attention is being directed not so much to the level of inequality at one point in time *per se*, as to **changes** in that level over time, and its related social consequences. The distinction is important because those factors (particularly income components) which, as a result of their dominant factor share (for example, wages) are significant in determining the overall level of inequality, may not be the same as those which particularly affect the marginal changes in inequality.

The research reported here forms part of the secondary descriptive research stage by extending the partial nature of previous work on the significance, and change, of the contribution of socio-demographic characteristics of households defined by 'life-cycle' cohorts (Raskall and McHutchison, 1992a and 1992b). That research utilised decomposition analysis, using a series of indices from the generalised entropy group (Cowell, 1977), to determine the within- and between-group components of overall inequality of household incomes as revealed by the 1984 and 1988-89 Household Expenditure Surveys, from groups constructed on the basis of household composition characteristics and age of head of household (and children, if applicable), such as to define stages in the life-cycle or life-course. Foster and King (1984), Bonnell et al. (1984) and Meagher and Dixon (1986) all report on an application of a decomposable index, the Shorrock's index, to individual income recipient data for a single year, 1978-79, from the ABS income distribution survey.

In this paper, earlier decomposition analysis by recipient household characteristics (Raskall and McHutchison, 1992a and 1992b) is extended to consider the contribution to economic inequality and its change of a broader variety of socio-demographic and socio-economic characteristics. The aim is to provide a more comprehensive set of partial analyses to indicate the relative (and changing) significance of these factors. Given the limitations of the commonly utilised Gini coefficient measure of inequality, a further 'outcome' of such a set of decompositions is the provision of within-group inequality indices for the variety of constructed subgroups which further aids interpretation of the nature of change in inequality at various points across the distributional spectrum.

In addition, a further set of decompositions of income by source is undertaken, to consider the contribution of each income type (for example, wages) to economic inequality in the 1984 to 1988-89 period. As with the previous decompositions by household characteristics, inequality indices can be constructed for each designated income source.

In a display of international research contiguity, at the same time as the current authors were conducting the earlier decomposition analysis by life-course cohort, Stephen Jenkins (in conjunction with Coulter and Cowell) was conducting similar though more comprehensive decomposition analyses for the UK. The result of this work was presented at the 1992 Study of Social and Economic Inequalities (SSEI) Conference on Income Distribution and Living Standards (Jenkins, 1992). Taking this study as a base, the earlier decompositions (Raskall and McHutchison, 1992a and 1992b) have been recalibrated to complement the Jenkins paper and thus to enable comparison of the structure of inequality in Australia and the United Kingdom, subject to the usual caveats regarding international data comparability.

In Section 2, the methodological approach and data sources used are outlined. The results of the empirical analysis of inequality based on decompositions by recipient household characteristics is set forth in Section 3. In Section 4 these recipient decompositions are analysed in relation to the revealed change in inequality over the 1984 to 1988-89 period. In Section 5, the results of analyses of both the structure of inequality and inequality change based on decompositions by income sources are detailed. By extending the analysis to consider other concepts of income (both pre-social security and pre-tax), the impact of direct government redistributive policy over the period is examined in Section 6. In Section 7 the analysis is recalibrated to provide direct comparison with the UK (Jenkins, 1992). Finally, from both sets of decompositions and the international comparison we summarise and draw the conclusions together.

2 Methodology and Data Sources

To ascertain the extent to which overall inequality is due to either socio-demographic differences of households or the individual component sources of income we require an appropriate inequality measure which is capable of decomposition.

2.1 Household Characteristics Decompositions

By decomposable measures we mean the class of inequality measures whereby, with the population sorted into a number of mutually exclusive socio-demographic or socio-economic groups (for example cohorts of life-cycle stages), the overall inequality revealed by these measures can be broken down into a between-group and within-group component. This means that should inequality increase in a single subgroup (without disturbing the mean income of this group), all other subgroup within-group values and between-group inequality remaining unchanged, overall inequality will rise. This property is not possessed by other widely used measures - notably the Gini coefficient.

This class of decomposable indices is from the Generalised Entropy (GE) family developed first by Theil (1967) and later by Shorrocks (Kakwani, 1986). The method of development is described in Appendix One.

The resultant sets of output from the procedures described in Appendix One can provide the evidence or clues to firstly, the extent to which particular characteristics of households contribute to total inequality (akin to horizontal inequality) and secondly, the extent to which that inequality occurs because of inequality within the component subgroups and, in particular, which subgroups (akin to vertical inequality) for various relative weightings of population and income shares. That is how the structure of socio-economic and socio-demographic characteristics determines the revealed level (and pattern) of income inequality.

Within the well-documented limitations of comparative static analysis, changes in inequality consequent upon changes in this structure can be similarly analysed and the (changing) sources of factors contributing to inequality change analysed. The emphasis is then upon this 'holistic' approach to analysing inequality and its changes, so that the 'true' significance of the gamut of relevant factors can be ascribed, and, in turn, the real causes start to be addressed, subject to the availability of linked data.

Whilst the above approach is operationally viable for analysing the particular characteristics of households - their composition, type, size, age, marital status, employment and earnings status and so forth - it is not satisfactory for complementary decompositions of income source changes in inequality.

2.2 Component Incomes Decompositions

Income can be obtained from a number of sources: wages in the labour market, earnings from self-employment, returns in the form of dividend, interest and rent from capital, or pensions and benefits from government. Even direct income taxes can be considered as negative income. Indeed if the data were available, a more comprehensive income definition would include non-cash occupational fringe benefits and benefits from the subsidised provision of social wage expenditure such as health, education and housing. Consequently total income can be subdivided into its component sources.

Following Jenkins (1992: 8-9), who in turn adapts methods proposed by Shorrocks (1982a; 1982b), we may regard total inequality as the sum of the factor contributions from incomes of each given source. The procedures adopted in this decompostion are described in Appendix Two. Through these analyses the contribution of each factor source of income to overall income inequality in both absolute and proportional terms can be ascertained as that being determined by the combination of the component forces. When combined with the 'characteristic of recipient' decompositions, the circumstantial evidence of the primary sources of inequality and changes in inequality can be accumulated or corroborated, to further build up a complete picture from which the 'puzzle of inequality' can be resolved.

Comparative international research, which seeks to elucidate purely national factors (that is, within a national government's sphere of influence) is greatly enhanced by such a comprehensive set of decompositions. This is preferable to relying on the ad hoc partial analyses of researchers in each country, even if they can be linked to a common, albeit dated, data set, as in the international Luxembourg Income Study.

2.3 Data Sources

Until the development of properly validated microsimulation models of inequality, or more current and consistent surveys, for data sources we are subject to the limitations and availability of existing large-scale surveys of income. Following previous research (Raskall and McHutchison, 1992a and 1992b), we take the ABS Household Expenditure Surveys (HES) of 1984 and of 1988-89.[1] The scope of the two surveys are described in detail in ABS (1987 and 1992 respectively). In both cases, whilst the consequence of the sampling and data release process, and under-response, is a degree of over- and under-represenation of certain subgroups, the overall sample is broadly representative of the Australian population. The surveys form the third and fourth in a series of such expenditure surveys conducted since 1974-75. However, the ealier surveys are not available in unit record form amenable to analysis.

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1   The choice was primarily determined by availability. The more recent 1989-90 Income Distribution Survey did not become available in final unit record form until March 1993.

The income data collected for both surveys relate to a 'usual and regular' income from all component sources and is based on a 'current' income concept. This poses a dilemma with the recorded tax figures. While the income for wage and salary earners is last-pay-period wages, the tax figures are based on average weekly tax paid in the last financial year. Aside from problems associated with tax averaging over time, there is a systematic bias in that the recorded tax figure in the HES are generally lower than the current tax paid for households who have moved up into a higher marginal tax rate bracket during the year, and, conversely, higher for those at the lower end who are either currently unemployed or retired but who were working in the previous year.

To overcome this, for the purposes of studying the incidence of government benefits and taxation on household income, the ABS (1987, 1992) has imputed tax liability of each household from the information contained in both surveys. For the latest survey, this imputed tax was released as an addendum to the revised HES unit record file which has been used here. For the 1984 survey whilst the imputation results by gross household decile were published (ABS, 1987), there was no issue of the fiscal incidence results (incorporating imputed tax) in unit record form.

To obtain a comparable set of direct tax figures attached to each household in the 1984 HES file, an imputation was undertaken using the Social Policy Research Centre TATLIB files, calculating taxable income rebates, deductions and applying the appropriate 1984 tax rates. To ensure compatibility with the ABS imputation assumptions, the resultant aggregate distributed tax allocation was constrained by the published 1984 results and the relevant individual records adjusted. The resultant imputation thus mirrors the results obtained by ABS for 1984, and thus provides consistency of comparability with the 1988-89 results.[2]

2.4 Appropriate Income Concept and Receiving Unit of Analysis

The analytical unit basis of the two Household Expenditure Survey data sources is, as its name suggests, the household, that is, all people residing at the one dwelling irrespective of familial relationship. Indeed, further disaggregation of the 1984 HES unit record file is, in general, impossible, data only being recorded at the household level. However, whilst the household must be the fundamental **data** unit of analysis, the question becomes for comparative welfare purposes, the definition of the appropriate receiving unit and, related to this, the appropriate income concept adopted.

Our primary concern is with income inequality, at least for income as defined by the ABS for the Household Expenditure Surveys. To translate this into welfare or 'living standard' terms for members of a household requires consideration of the

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2   The authors wish to acknowledge the contribution of George Matheson from the Social Policy Research Centre in this exercise.

concept of appropriate income (unadjusted or equivalent) and income receiving unit (household or individual). In decomposition analyses by life-cycle cohort (Raskall and McHutchison, 1992a and 1992b), five income concepts were used (Table 2.1).

Using household income itself and the household as the income receiving unit (Case A) makes no allowance for household size and composition. Thus a family comprising a head, non-working spouse and several children on $1000 a week would be regarded as achieving the same standard of living as a single person, living alone, receiving $1000 a week. Household income alone is thus limited in the information it can provide about the economic well-being of a household. Such is also the case with individual income since most individuals live in economic units that include others. To some degree, within household resources are pooled, therefore economic well-being cannot simply correspond to individual income. For example some individuals, in particular children, may receive no income. Provision for their economic needs is met by the income receiving unit.

Using per capita income (Cases B and D) would overstate the inequality experienced by households with larger than average number of dependants. This is because there are economies of scale available in multi-person households which mean that basic living costs do not vary proportionally with the number of household occupants. The most effective way to render the income of different households comparable is to use factors explicitly constructed to take differences in relative needs into account. This is achieved by use of equivalence scales (Cases C and E).

Equivalent incomes take into consideration the composition of the household in terms of number of persons and their age, although of course no equivalence scale can fully capture the differences in the needs of various households in different circumstances. In consequence, the concept of equivalent income is now widely used to rank different types of income units for comparability in studies of cross-sectional income distribution to ascertain differences and changes in 'true' inequality (Cowell, 1984; Kakwani, 1986; O'Higgins et al., 1988; Nevile et al., 1988; Jenkins, 1992; Raskall and Urquhart, 1993; Saunders, 1993).

The question then becomes which set of equivalence scales to use. In considering the significance of socio-demographic life-cycle factors, Raskall and McHutchison (1992a and 1992b), used the scales devised by O'Higgins et al. (1988), largely for comparative analytical purposes. Jenkins (1992) utilises the McClements scale. In Australia, reflecting the use of equivalence scales in ascertaining those in 'poverty', the Henderson scales, both 'simple' and 'complex', are generally used (e.g., ABS, 1984). Indeed, a review of such scales by Whiteford (1985) revealed a total of 57 scales then in existence. To provide some degree of international consistency, the OECD has devised its own set (OECD, 1982).

Where equivalence scales are used in this paper, for purposes of consistency we have used the O'Higgins et al. (1988) scales to link to previous analysis of changes in the contribution of the life-cycle factors (Raskall and McHutchison, 1992a and 1992b). However, for the section comparing Australian results with Jenkins' (1992)

Table 2.1: Concepts of Income and Income Unit

Income Concepts	Income Receiving Unit	
	Household	Person
Total Income	A	-
Total Income per capita	B	D
Equivalent Income	C	E

Case	Income Concept	Receiving Unit
A	Total Income	Household
B	Income per capita	Household
C	Equivalent Income	Household
D	Income per capita	Person
E	Equivalent Income	Person

estimates for the UK, we have recalibrated our results using the McClements scale. To test the sensitivity of the results to the use of particular scales we have produced some of the key results under different sets of equivalence scales, including the OECD scale in Appendix Three. Suffice to say that in the generality of the conclusions drawn in this paper the results do not change significantly. However, this remains an issue that the research community needs to resolve.

If, in general, in examining changes in inequality over time from cross-sectional studies, equivalent incomes are used as the preferred income concept what then is the appropriate income-receiving unit? Should we base the analysis on households or on individual persons? If we take individual persons as the fundamental unit of analysis, we must therefore allocate in some way household income to each person in the household, reflecting 'welfare'. Income could simply be divided equally on a per capita basis (Case D, Table 2.1). However, as already noted, this would take no account of the economics (opportunities for sharing costs for example) associated with living in large households.

The alternative method of utilising equivalent incomes is again commended: the equivalent income of each household in this approach, is imputed equally to each household member and the person-weights applied to the survey sample (Case E, Table 2.1). So far, by virtue of the source of data (the HES) households have been cast in this role.

Arguably, the primary concern should be the welfare of individuals, as distinct from households. The philosophical basis of assessing welfare on an individual basis - that rights in society are rights based in each person as an individual - are persuasive (Ringen, 1991). Cowell (1984) argues similarly, in the US context, that 'social welfare in the US depends on the well-being of individual persons, regardless of the units in which they happen to live, the alliances they form, or whether or not they

live at home' (Cowell, 1984: 359). Jenkins (1992) also argues in favour of individually-based welfare indices, and uses them, based on 'the predominant practice in the literature' (Jenkins, 1992: 11). Convention is not the strongest of arguments, although, through the requirements of comparability its practical strength is increased. On the more substantive rationale, an argument can be raised relating to the shifting nature of the welfare state, particularly in terms of public provision of redistributive welfare. Increasingly, following the argument of Cowell above, public welfare in Australia (through access and eligibility) is becoming tied to the well-being of the family rather than the individual, as evidenced by the income-test based on family income for family allowances, eligibility for unemployment benefits and parental income tests for young recipients. Increasingly, personal access to public welfare depends less on an individual's position and more on the living standards of all related members of the family. This would strengthen the case for considering Case C rather than Case E.

There is also the question of the purposes of such decompositions, and the methodological significance of difference between **levels** of inequality and **changes** in the level of inequality. If our intent is to examine the contribution of socio-demographic factors to levels of inequality at any one point in time, or in a comparative static sense, to compare these between two points in time, then it is inappropriate to use equivalent income (Case E) since this **incorporates** socio-demographic differences between different households. Thus, if equivalent income is used, then this will understate the relative contribution of socio-demographic factors compared to socio-economic factors, such as earning status of the household or principal sources of household income. Ideally, an equivalence scale would eliminate socio-demographic differences in 'base-need' between different household types (although this will not necessarily accord with recorded differences in outcome, that is, 'true' inequality in household income).

As an illustration, Raskall and McHutchison (1992b) through a decomposition analysis calculate the contribution of life-cycle socio-demographic factors to overall gross income inequality based on life-course cohorts, across the full range of concepts A to E (and across six inequality indices characterised by different α values). Taking $\alpha = 0$ (see Appendix One for an explanation of α) as an illustration for 1988-89 the contribution of such declines from 38.4 per cent under concept A (total income; household weighted) to 24.4 per cent under concept C (equivalent income; household-weighted) to 20.8 per cent under concept E (equivalent income; person-weighted). Thus, the use of equivalent income (based on socio-demographic factors such as household size and age of members) reduced the revealed contribution by about half.

On the other hand, if our intent is to examine **changes** in inequality and its contributory factors, then it is more appropriate to use the equivalent income concept because this would itself account for changes in family composition and size, so that, the emphasis is upon changes in 'true' inequality. Thus, the factors which contribute most to the explanation of the level of inequality in a given year are not necessarily those which account for the bulk of inequality changes.

A related methodological point on this issue concerns consistency. The above discussion relates principally to the first set of decompositions we undertake: those based on characteristics of the income recipients. The second set of decompositions, relating to component sources of income, by virtue of their very nature is more amenable to decomposition on the basis of household unadjusted distributions (concept A). Consequently, for the purposes of internal consistency it would seem appropriate that a common concept be adopted for both sets of decompositions. Jenkins (1992) overcame this by re-estimating his subgroup decompositions using unweighted unequivalenced household distributions. However, he does not report the results beyond the claim 'that the conclusions are robust to the choice of distribution type'.

In the light of the above methodological discussion, given the lack of a clear research tradition and mindful of the goals of consistency and comparability, the results are presented as follows. For the household characteristics subgroup set of decompositions, the structure of inequality (that is, the relative contribution of various characteristics) is estimated by reference firstly to unadjusted (unequivalenced) household distribution based on household weightings (Case A), that is, the actual revealed income inequality between households. The results are then replicated and presented for the person-weighted equivalent income distribution (Case E). For the purposes of ensuring the robustness of the results across the entire range of the distribution, in all these subgroup decompositions we present our results for four values of the α parameter: $\alpha = -0.5$, $\alpha = 0$, $\alpha = 1$ and $\alpha = 2$ (see Appendix One). In examining changes in inequality between the two surveys, greater preference is given to the equivalent income concept results, in addition the results are presented for two values of the α parameter: $\alpha = 0$ and $\alpha = 1$, for ease of computation. It will be recalled that if $\alpha = 0$, the weightings in the inequality expression reduce to the relative population share (equation 3, Appendix One), and if $\alpha = 1$, it reduces to the relative income share (equation 4, Appendix One).

On the other hand, the results of the income source decompositions are presented using the unadjusted household distributions (concept A) and with an α value of two ($\alpha = 2$). It will be recalled that if $\alpha = 2$ the inequality measure is a function (half the square) of the coefficient of variation which is a standard summary measure of inequality. Equally, though, it needs to be recalled that this inequality measure gives greater weight to the income shares and thus the upper end of the distribution.

Finally, it should be noted that all distributions relate to disposable money income. Thus, the impact of other forms of income such as non-cash fringe benefits received by employees and capital gains and losses received by the owners of capital are not included in private 'income'. In terms of 'public' income, similarly, the non-cash benefits received from social wage elements such as health, education and housing are not examined. Nor is the impact of changes to indirect tax included. However, the impact of other forms of government cash transfer activity (social security pensions and benefits and direct tax) is included.

3 Decompositions by Recipient Household Characteristics

3.1 Aggregate Inequality

Table 3.1 shows the levels of, and trends in, aggregate inequality which we seek to analyse, for both unadjusted household disposable income and equivalent disposable income. The first point to note is that inequality increased across all indices from 1984 to 1988-89. However, the extent of that increase varies with the sensitivity of the index to the upper and lower ends of the distribution. The change follows a U-shape with change being least for those measures sensitive to the middle ($\alpha = 0$ and 0.5) and greatest for those measures more sensitive to either end of the distribution ($\alpha = -1$ and $+2$).

The use of equivalent income, as expected, reduces the extent of the change across the indices. However, reflecting the greater relative weighting to population shares, the changes in those indices with negative α coefficients is less in the equivalent distribution than it is in the unadjusted distribution compared to those indices with positive α coefficients. Thus for I_2 ($\alpha = 2$), the percentage change in the index is virtually unchanged between the unadjusted and equivalent distributions. The very small change revealed in the Gini index for both distributions reflects both its inherent (some might say endemic) insensitivity and its greater responsiveness to changes in the middle of the distribution, where change was least.

In this section, we examine the extent to which this inequality and inequality increase was due to the within- and between-group components revealed by a series of decompositions based on characteristics of households. The characteristics selected reflect in part the limited availability of data within both the 1984 and 1988-89 surveys. Some characteristics which we may wish to have examined were not consistently available for both. This applies to, for instance, spatial decomposition for which the 1984 data was available for disaggregation by State but not the 1988-89 data where only a capital city - rest of Australia split was available.

The recipient characteristics selected for decomposition can be categorised under the broader headings of socio-demographic and socio-economic. With the socio-demographic we consider those demographic factors which reflect:

- the composition of the household: its size and family make-up;

- characteristics of the head of the household: age, marital status and gender; and

- those more comprehensive sets of subgroups which reflect a combination of the previous two: household type and life-cycle cohort.

Table 3.1: Changes in Aggregate Inequality: 1984 to 1988-89

Unadjusted Household Disposable Income:

Inequality Index		Indices (x 1000) 1984	1988-89	% change in index
Squared coefficient of variant (halved)	I_2	186	247	32.8
Thiel coefficient	I_1	176	201	14.2
	$I_{0.5}$	183	204	11.5
Mean Logarithmic Deviation	I_0	202	226	11.9
	$I_{-0.5}$	246	300	22.0
	I_{-1}	366	671	83.3
Coefficient of variation	C_{ov}	610	702	15.1
Gini coefficient	G	330	344	4.2

Equivalent Disposable Income:[a]

Inequality Index		Indices (x 1000) 1984	1988-89	% change in index
Squared coefficient of variant (halved)	I_2	139	184	32.3
Thiel coefficient	I_1	127	142	11.8
	$I_{0.5}$	129	140	8.5
Mean Logarithmic Deviation	I_0	140	150	7.1
	$I_{-0.5}$	169	195	15.4
	I_{-1}	258	413	60.0
Coefficient of variation	C_{ov}	528	606	14.8
Gini coefficient	G	278	283	1.8

Note: a)   O'Higgins et al. (1988) scale.

Similarly, in examining the relative significance of socio-economic factors we consider those factors which reflect the income-earning or economic capacity of households including those stemming from

*   the composition of the household: the number of employed persons and their earning status; and

*   characteristics of the head of household: occupation, employment status and principal source of income.

The final decomposition, the principal source of income of the head of household, acts as both a useful link to the income source set of decompositions and an indication of the relative aggregate significance of such income source factors in the context of other demographic characteristics of households. The detailed subgroups which make up these various factors are outlined in a set of tables.[3]

3.2 Structure of Inequality

Within and Between-group Contributions to Inequality

Unadjusted Household Distribution. We firstly examine the structure of inequality by the partitions in Table 3.2 which detail the within- and between-group components of inequality for α = -0.5, 0, 1 and 2 for each year using unadjusted household distributions. The first point to note is that whatever the α value, the year and, in general the characteristic, the within-group exceeds the between-group component. The exceptions to this are those factors relating to the socio-economic composition of the household for α = 0 and α = 1 in 1984. In 1988-89, only for α = 1, in respect of number of employed persons does between-group inequality exceed within-group. Related to this, it can be noted that a close contiguity of the results exists within each grouped set of characteristics such that a clear hierarchy of these sets occurs in respect of the contribution of between-group inequality. Taking α = 0 as an illustration:

- those subgroups reflecting socio-demographic characteristics of the head of household all contribute less than one-sixth to total inequality;

- those reflecting the socio-demographic composition of the household contribute around a quarter;

- those reflecting the economic characteristics of the head of household contribute a little under one-third;

- those reflecting the combined, more comprehensive socio-demographic characteristics of the household contribute about 40 per cent; and

- those reflecting the socio-economic composition of the household contribute about half of overall inequality.

Within the household head socio-demographic set of characteristics it appears that age is more significant than marital status or gender. It should be noted that gender applies to only the head of household and not all members of the household or all individuals in the distribution. It should also be noted that these between-group

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3   These tables are found in Appendix Four.

Table 3.2: Within-group and Between-group Inequality (Unadjusted): 1984 and 1988-89

| Recipient Characteristic | 1984 | | | | | | | | 1988-89 | | | | | | | |
| | $\alpha = -1/2$ | | $\alpha = 0$ | | $\alpha = 1$ | | $\alpha = 2$ | | $\alpha = -1/2$ | | $\alpha = 0$ | | $\alpha = 1$ | | $\alpha = 2$ | |
	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B
Socio-demographic																
1 Composition of household																
• Number of persons	196	49	157	45	136	40	150	36	239	61	170	57	151	50	201	45
• Family composition	195	51	156	46	136	40	150	36	239	61	170	56	153	48	204	43
2 Characteristic of head of household																
• Age	210	35	169	33	147	29	160	27	259	42	187	39	165	35	213	33
• Marital status	210	36	169	33	148	28	162	25	262	38	191	36	170	31	218	28
• Gender	223	23	181	21	157	19	169	17	281	19	208	18	184	17	231	15
3 Combination																
• Household type	163	83	127	76	109	67	123	64	207	94	142	85	127	74	177	70
• Life-cycle cohort	150	95	115	87	100	76	116	70	198	102	135	92	122	79	174	72
Socio-economic																
1 Composition of household																
• Number of employed persons	134	111	98	104	80	96	82	95	179	121	114	113	98	103	146	101
• Earnings status	131	115	97	105	83	93	100	87	176	125	114	113	103	98	156	91
2 Characteristic of head																
• Occupation	178	67	139	63	118	58	132	54	230	71	160	66	141	60	191	56
• Employment status	177	68	138	64	118	58	132	54	231	69	162	65	143	58	194	53
• Principal source of income	160	85	124	78	109	66	127	59	221	80	154	73	139	62	192	55
Total (overall)[a]	246		202		176		186		300		226		201		247	

Note: a) Components may not sum exactly due to rounding.

contributions are not additive. That is, we cannot add them to get the overall sum of between-group inequalities to total inequality, or even the overall impact of all socio-demographic factors. Each recipient characteristic is a separate decomposition. Thus, to the extent that inter-relation exists between the various factors analysed, for example, between, age and marital status or occupation and employment status, then addition of two would imply an element of double-counting. It is only by constructing more comprehensive factors for decomposition, such as the life-cycle cohorts or earnings status, that the significance of more embracing recipient characteristics can determined. Nevertheless, the relative hierarchy revealed by Table 3.2 can be utilised to sketch out the structure of inequality.

The revealed contiguity and hierarchy of factors is maintained for both years and for all values of α. This is highlighted by Table 3.3 which summarises the proportionate contribution of between-group to overall inequality for each grouping of recipient characteristics, for each α value both years. The mean between-group inequality has been taken for each set of characteristics.

Table 3.3 also indicates that for the middle sensitive indices (I_0 and I_1) the relative contributions are similar in each year and larger than the two extreme indices which are also similar. Thus these household recipient factors are more significant in the middle of the distribution than the extreme ends where the already dominant within-group inequalities greatly pre-dominate. Of interest for later analysis, is that this difference between the 0/1 (middle-sensitive measures) and $-1/2/2$ (extreme) contributions increases in all categories and both ends between 1984 and 1988-89.

Similarly it is worth storing in our bank of knowledge when we come to examine the changes in inequality that, whereas in 1984 the contribution of the economic composition type factors is slightly greater for $\alpha = 2$ compared to $\alpha = -1/2$, by 1988-89 the reverse position is the case. Indeed, for 1988-89, in all sets of categories the higher-income sensitive $\alpha = 2$ revealed a lower contribution of between-group inequality than the bottom-sensitive $\alpha = -1/2$. This was not the case for any set of characteristics in 1984. This would suggest that within-group inequality became even more significant towards the upper-end of the 1988-89 distribution.

Finally, we note, for further investigation, that in all sets of partitions, with the exception of demographic composition factors where $\alpha \leq 1$, the contribution of between-group inequality appeared to fall between 1984 and 1988-89.

In sum, even on an unadjusted basis, within-group inequality dominates the between-group inequality particularly with respect to those indices sensitive to the extremes of the distribution and that these results are exacerbated between 1984 and 1988-89. Moreover, in general, the significance of socio-economic characteristics, as inequality differentiating factors, exceeds socio-demographic partitions.

Equivalent Income Distribution. When we adjust the household distribution to reflect 'true' inequality by applying an equivalence scale reflecting household size

**Table 3.3: Contribution of Between-group to Total Unadjusted Income Inequality (%),
Groupings of Characteristics (Mean): 1984 and 1988-89**

Set of characteristics	$-^1/_2$	0	1	2
		α Value		
Year: 1984				
Demographic: head	13	15	15	13
Demographic: composition	20	22	23	20
Economic: head	30	34	35	30
Demographic: comprehensive	36	40	41	36
Economic: composition	46	52	53	49
Year: 1988-89				
Demographic: head	11	14	14	10
Demographic: composition	20	25	24	18
Economic: head	24	30	30	22
Demographic: comprehensive	32	39	38	29
Economic: composition	41	50	50	39

and ages of dependants, that is, equivalent individual income distribution, where equal sharing within households is assumed, then a dramatic change in the relative significance of the factors considered occurs. Table 3.4 replicates the set of decompositions by characteristic of the household for 1984 and 1988-89 for this equivalent income distribution. As may be expected from the nature of the equivalence scale, the relative between-group inequality of socio-demographic characteristics is much reduced. When the equivalent income concept is used, the within-group inequality component always dominates the between-group. Furthermore, this holds for every α value index used, that is, across the entire distribution. Moreover, except in the case of the comprehensive combined socio-demographic characteristics embodied in the life-cycle cohort and household type partitions, the contribution of between-group inequality by socio-economic factors swamps the contribution of socio-demographic characteristics. As we have seen, in part, this is the consequence of using an equivalence scale which reflects the socio-demographic differences between households.

However, if equivalent disposable individual income reflects a 'truer' measure of inequality, as Jenkins (1992), Cowell (1984), and others claim as 'the predominant practice in the literature' (Jenkins, 1992: 11), then two conclusions are unequivocable:

- firstly, that within-group inequality is much more significant than between-group inequality; and

- secondly, that socio-economic factors predominate in determining the contribution of between-group inequality.

Table 3.4: Within-group and Between-group Inequality (Equivalent): 1984 and 1988-89

	1984								1988-89							
	$\alpha = -\frac{1}{2}$		$\alpha = 0$		$\alpha = 1$		$\alpha = 2$		$\alpha = -\frac{1}{2}$		$\alpha = 0$		$\alpha = 1$		$\alpha = 2$	
Recipient Characteristic	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B
Socio-demographic																
1 Composition of household																
• Number of persons	159	10	130	10	118	9	131	9	186	8	142	8	135	7	177	7
• Family composition	162	8	132	7	120	7	132	7	188	6	144	6	136	6	178	5
2 Characteristic of head of household																
• Age	164	5	135	5	121	6	133	6	190	5	145	5	137	5	179	5
• Marital status	165	4	136	4	123	4	135	5	191	4	146	4	139	3	180	3
• Gender	167	2	138	2	125	2	138	1	194	1	149	1	141	1	183	1
3 Combination																
• Household type	144	25	115	25	102	25	114	26	174	22	129	21	122	21	164	20
• Life-cycle cohort	141	28	112	28	98	27	108	31	172	22	128	22	120	22	160	23
Socio-Economic																
1 Composition of household																
• Number of employed persons	137	32	110	30	100	28	114	26	161	34	119	31	114	28	158	26
• Earnings status	132	38	104	36	95	33	109	30	155	40	113	37	109	33	154	30
2 Characteristic of head																
• Occupation	141	28	112	27	101	26	114	26	165	30	121	29	115	27	157	26
• Employment status	140	29	112	28	102	25	116	23	167	28	124	26	118	24	161	22
• Principal source of income	126	43	100	39	94	34	110	30	160	35	118	32	114	28	159	25
Total (overall)[a]	169		140		127		139		195		150		142		184	

Note: a)   Within-group and between-group inequality may not sum to aggregate due to rounding.

Table 3.5 highlights this by outlining the proportionate contribution of between-group inequality by household recipient characteristic. The hierarchy of influence revealed by Table 3.5 is even more striking. The contribution of individual demographic factors attached to either head of the household or composition of the household are almost minimal. On the other hand, those economic factors similarly attached contribute around a fifth to a quarter of total inequality.

However, despite the minimal between-group inequality contribution of individual demographic factors, the comprehensive factors - the household type and the life-cycle cohorts (Raskall and McHutchison, 1992a) - are still, on a par with the socio-economic characteristics. In 1984, both these socio-demographic factors - comprising both composition and household head factors - contributed about a fifth to all inequality. Indeed, for the I_2 measure (α = 2), the comprehensive demographic factors were the largest partitioning force. The relative significance of the life-cycle/household type cohorts increased as the α value increased. With this exception, the pattern revealed in the unadjusted household distribution above, of a contiguity of relative significance in the two middle-sensitive indices, and a lower relative between-group inequality across the socio-economic characteristic factors at the extremes, is maintained.

In 1988-89, the relative between-group contribution across all characteristic sets is further reduced and conversely, within-group inequality increased. A notable shift in the pattern occurs in the I_2 measure (that is, high-income sensitive) where the between-group contribution falls off dramatically for all sets of both demographic and economic recipient characteristics. For the two socio-economic sets of groupings it is in fact substantially lower than even the bottom-sensitive α = $-1/2$ measure.

In summary, decomposition of the equivalent income distribution confirms that within-group inequality predominated in each year over between-group inequality. Moreover, comparing the contribution of between-group inequality to total inequality between the two years, confirms the results of the unadjusted distribution decompositions that within-group inequality became substantially more significant and conversely between-group inequality even less significant. This result holds firm for both socio-demographic and socio-economic factors.

Within-Group Inequalities

The impact of each particular subgroup for each decomposition, on total within-group and hence total inequality in the distribution depends upon: its relative share of the population (how many of each household with the defining characteristic there are); its relative income share (how high its average income is relative to others, and thus how much total income it receives); and within-group inequality (how equally that income is distributed amongst those characteristic households).

One of the benefits of decomposition analyses is the provision of a wide array of data on within-group subgroup inequalities which enable researchers to further

Table 3.5: Contribution of Between-group to Equivalent Income Inequality (%), Groupings of Characteristics (Mean): 1984 and 1988-89

Set of characteristics	$\alpha = \frac{1}{2}$	0	1	2
Year: 1984				
Demographic: head	2	3	3	3
Demographic: composition	5	6	6	6
Economic: head	16	19	20	21
Demographic: comprehensive	20	22	22	19
Economic: composition	21	24	24	20
Year: 1988-89				
Demographic: head	2	2	2	2
Demographic: composition	4	5	5	3
Economic: head	11	15	15	12
Demographic: comprehensive	16	19	19	13
Economic: composition	19	23	22	15

(header spanning columns: α Value)

investigate particular aspects of inequality. To assist other researchers, a separate set of tables (see Appendix Four) outlines for each household characteristic, decompositions of the internal inequality, population and income shares we report upon, both for the unadjusted household and equivalent disposable income distributions. Summarising the general trends, for $\alpha = 0$, by each subgroup the results are shown here.

Socio-demographic Characteristics

Number of Persons. Within-subgroup inequality tends to decrease as the number of persons in the household increases. Thus one-person households exhibit greatest internal inequality.

Family Composition of Household: Households comprised of multi-families or unrelated single people have lowest inequality; those composed of married couple families or single persons only exhibit greatest inequality.

Age of Head of Household. In general, income inequality by age decreases to about age 40, then increases to retirement age of 65, and then drops slightly to a post-retirement level about equal to the 45-54 age group.

Marital status. Inequality tends to increase the further household heads are from a married status. Internal inequality is least amongst currently married heads, greater for those separated or divorced, higher again for those widowed, and greatest for those who have never married.

Life-cycle. Reflecting all of the above, the more comprehensive 'life-cycle' cohorts (developed and outlined in Raskall and McHutchison, 1992a and 1992b), internal inequality is greatest for:

- single young people and older working age adults;

- older couples of working age with no children;

- couples where the oldest child is aged under 15; and

- older sharing households.

Conversely, inequality is lowest within:

- retired single adults and young couples;

- couples with multi-aged (including older) children;

- single parent households; and

- sharing households with children

In part, this reflects the equalising impact of government pensions, benefits and family allowances.

Household Type. This pattern is also reflected in the comprehensive household type partitioning, such that single person working-age households exhibit greatest inequality. For working aged households the addition of other adults and children acts as equalising forces on internal inequality. Thus, sole parents and multi-adult households with children exhibit least inequality. On the other hand for retired households, the existence of an additional adult increases inequality from a minimum level for retired singles.

Socio-economic Characteristics

Number of Employed Persons. From maximum internal inequality exhibited by households with nil workers, the addition of additional employed persons dramatically reduces inequality within each subgroup.

Earning Status. Households where the head is over 65 exhibit greatest inequality particularly where one or more earners is present. On the other hand, lack of an earner for working-age households produces inconsistent results. In 1984 inequality for these households approximated those for earner-present households. However, in 1988-89, these non-earner households exhibited substantially higher inequality.

Occupation of Head. Inequality amongst professional and clerical heads is similar and low. At the other extreme, internal inequality is greatest and similar for managerial and sales and service occupation heads. On the other hand, inequality among blue-collar tradespeople and labourers fell in between these two extremes in

1984, although in 1988-89 internal inequality fell dramatically towards the lower range of subgroup inequality.

Employment Status. As can be expected, inequality amongst full-time employee households is substantially the lowest. At the other extreme, inequality is greatest among households headed by self-employed people.

Principal Source of Income of Household Head. Households where the head's principal source of income is from capital investment exhibit greatest internal inequality. These households are followed by those where the head's predominant income is from their own business. At the other extreme, are households where the head is reliant upon government pension and benefit income.

However, as indicated above, the within-subgroup contribution to aggregate inequality depends not merely on those internal inequalities but also upon the relative population and income shares of the subgroups. As far as the structure of inequality, at any one point in time, is concerned it becomes clear that aside from dramatic variations in subgroup inequality (which generally only occurs in distributions with extreme α 'aversion' values, either positive or negative) the major contributing factor determining the contribution of any subgroup to overall inequality is its population share. Levels of inequality within couple households will have a larger impact on total inequality than the level of inequality within sole parent households because there are far more couples than sole parents.

This is borne out by Table 3.6 which shows the proportional within-group contributions to aggregate inequality for each of the socio-demographic and socio-economic subgroups we have considered above in the within- and between-group analysis. In Table 3.6 the unadjusted household distribution is used for α values of both 0 and 1, for both 1984 and 1988-89. The data relate to the percentage contribution of within-subgroup inequality to overall inequality. In addition, the between-group inequality percentage contribution is also presented for each decomposition partition. Hence the total of each group partitioning adds to 100. In this table we can see the contribution of each particular aspect to overall inequality. It will be recalled that $\alpha = 0$ reflects internal subgroup inequality by its population share and $\alpha = 1$, subgroup inequality by income share.

It should be noted that for presentation purposes some of the smaller subgroups with minimal overall contribution have been aggregated. This is not technically exact in that such aggregation would alter the internal inequality of the combined set and thus also alter the between-group inequality. Thus the observant reader would note that from Table 3.6, summing the contribution of single person households (by five categories) from the Life-cycle Cohort decomposition would suggest a total contribution of 12 per cent to overall inequality (for 1984; $\alpha = 0$), whereas the Family Composition decomposition (with only one single person category) would suggest 18 per cent and the Household Type decomposition (with two singles categories), 14 per cent. The more one decomposes a category the more likely that within-group inequality contributions fall (because internal inequalities fall) and

Table 3.6: Within-subgroup Contributions to Aggregate Inequality (%; Unadjusted): 1984 and 1988-89

	1984		1988-89	
	$\alpha = 0$	$\alpha = 1$	$\alpha = 0$	$\alpha = 1$
A Socio-demographic				
1 Composition of household				
• Number of persons				
1	18	10	18	9
2	25	25	26	24
3	13	15	12	17
4	13	15	13	15
5	7	8	5	8
6	2	3	2	2
7+	1	1	0	1
Within-group (total)	78	77	75	75
Between-group	22	23	25	25
• Family Composition				
Married couple	52	59	49	59
Sole parent	3	2	2	2
Single person	18	11	18	9
Unrelated singles	2	3	2	2
Other family type	2	2	3	3
Within-group (total)	77	77	75	76
Between-group	23	23	25	24
2 Characteristic of head				
• Age				
<25	5	5	5	4
25-34	18	17	14	13
35-44	13	15	15	17
45-54	15	19	13	20
55-64	16	15	18	16
65-74	11	8	12	8
75+	6	4	6	4
Within-group (total)	84	83	83	83
Between-group	16	17	17	17
• Marital status				
Married or de facto	53	60	51	61
Separated	3	3	4	2
Divorced	6	5	5	4
Widowed	10	6	11	7
Never married	12	10	14	11
Within-group (total)	84	84	85	85
Between-groups	16	16	15	15
• Gender of head				
Male	69	73	65	69
Female	21	16	27	22
Within-group (total)	90	89	92	91
Between-group	10	11	8	9

Table 3.6: Within-subgroup Contributions to Aggregate Inequality (%; Unadjusted): 1984 and 1988-89 (Continued)

	1984		1988-89	
	$\alpha = 0$	$\alpha = 1$	$\alpha = 0$	$\alpha = 1$
3 Combination				
• Household type				
1 adult/aged 65+	4	2	3	1
2 adults/aged 65+	7	7	9	7
1 adult	10	7	11	6
2 adults	14	15	14	14
3+ adults	3	5	5	8
1 adult/1 child	2	1	2	1
2 adults/1 child	6	6	6	8
2 adults/2 children	8	8	8	9
2 adults/2+ children	6	6	3	4
3+ adults/child	3	4	2	5
Within-group (total)	63	62	63	63
Between-group	37	38	37	37
• Lifecycle cohort				
Single person				
(Age of head)				
<34	2	2	4	2
35-54	3	3	2	2
55-64	3	2	3	1
65+	4	2	3	1
Couple only (no child)				
(Age of head)				
<34	4	3	2	2
35-54	3	3	3	3
55-64	3	3	6	5
65+	3	3	5	4
Couple with children				
(Age of children)				
<5 only	5	5	5	4
5-14 only	7	6	8	11
15-24 only	4	6	4	7
<5 and 5-14	4	4	3	3
5-14 and 15-24	3	5	3	4
Single parent				
(Age of children)				
<14 only	1	1	1	1
< 14 and/or 15-24	1	1	1	1
Share households (no child)				
(Age of head)				
<34	2	2	2	2
35-64	3	3	3	3
65+	1	2	1	2

Table 3.6: Within-subgroup Contributions to Aggregate Inequality (%; Unadjusted): 1984 and 1988-89 (Continued)

	1984		1988-89	
	$\alpha = 0$	$\alpha = 1$	$\alpha = 0$	$\alpha = 1$
Share household (children)				
(Age of children)				
<14 or 15-24	1	2	1	1
15-24	2	3	2	3
Within-groups (total)	57	57	59	61
Between-groups	43	43	41	39
B Socio-economic				
1 Composition of household				
• Number of employed persons				
0	16	8	18	8
1	16	14	16	15
2	14	18	14	21
3	2	4	2	4
4+	1	2	1	1
Within-group (total)	49	46	51	49
Between-group	51	54	49	51
• Earnings status				
1 adult/no earners	3	1	4	1
1 adult/1 earner	4	4	4	3
2+ adults/no earners	3	1	4	2
2+ adults/1 earner	8	8	9	9
2+ adults/2 earners	18	25	19	28
No earners, aged 65+	9	5	9	5
1+ earners, aged 65+	3	3	2	3
Within-group (total)	48	47	51	51
Between-group	52	53	49	49
2 Characteristic of head				
• Occupation				
Professional	5	9	7	11
Admin/Managerial	5	7	10	15
Clerical	3	4	3	4
Sales/Service	7	7	5	5
Trades/Labourer	19	21	14	15
Not in labour force	30	20	32	20
Within-group (total)	69	67	71	70
Between-group	31	33	29	30
• Employment Status				
Employee - full-time	20	30	23	34
Employee - part-time	3	3	5	7
Self-employed	16	15	12	11
Unemployed	3	1	3	2
Not in labour force	26	18	30	18
Within-group (total)	68	67	71	71
Between-group	32	33	29	29

Table 3.6: Within-subgroup Contributions to Aggregate Inequality (%; Unadjusted): 1984 and 1988-89 (Continued)

| | 1984 | | 1988-89 | |
	$\alpha = 0$	$\alpha = 1$	$\alpha = 0$	$\alpha = 1$
• Principal source of income				
Wages and salaries	22	32	23	33
Own business	7	10	8	10
Superannuation	1	1	2	2
Investment	9	6	14	12
Maintenance/compensation	1	1	1	1
Pension	10	6	9	5
Benefit	7	4	7	4
No income	4	1	4	1
Within-group (total)	61	62	68	69
Between-group	39	38	32	31

between-group inequality rises. This relationship between the number of subgroup inequalities needs to be borne in mind when comparing different sets of decompositions in the same year. However, for these very small subgroups where population or even income share dominates overall contribution, it is not that minimal aggregation and the consequent aggregate 'error' is sufficient to outweigh the improvement in presentation (and understanding) afforded.

Table 3.6 also provides a facilitative basis for interpretation of these within- and between-group inequalities. Each of these inequalities would fall if a particular inequality was eliminated. Thus, if inequality amongst each particular subgroup category was eliminated, then overall inequality would fall by that particular within-group inequality percentage. On the other hand, if we were able to eliminate inequality between the various subgroups for each partitioning, then overall inequality would fall by that particular between-group inequality.

To illustrate this, we may take the simplest decomposition: that of gender of the head of household. For 1988-89 using the I_0 value, from Table 3.6, within-subgroup inequality for households with a male head comprises 65 per cent of the overall inequality, within-subgroup inequality for female-headed households 27 per cent and between-group inequality 8 per cent. If inequality amongst households with a female head were eliminated, then overall I_0 inequality would fall by 27 per cent. If income inequality were eliminated between households headed by a male and those by a female, then total inequality would be reduced by 8 per cent.

Thus, to generalise this, again from Table 3.6, if inequality amongst two-people households were eliminated, total inequality would fall by 26 per cent in 1988-89, whereas if inequality were eliminated between households of different sizes then the I_0 value overall inequality would fall 2.5 per cent, the between-group contribution.

Static Comparison 1984 to 1988-89

Changes in the relative contribution of specific within-subgroup and between-group inequalities between 1984 and 1988-89 provide some indication of the change in the structure of inequality over the period and, in consequence, the contributory factors to inequality change.

From Table 3.6(A) (the **socio-demographic** decompositions) we can see that in decomposing inequality by number of persons in each household, the dominant contribution to overall inequality comes from inequality amongst two-person households (25 per cent in 1984), marginally ahead of the between-group contribution (22 per cent in 1984). Reflecting the mean incomes of one and two person households, the contribution of single person households is virtually halved when we consider inequality based on income shares ($\alpha = 1$).

Two things stand out from the table. First, the dominant socio-demographic household grouping of a couple with a male head dominates as the major factor with respect to total inequality. That is, it is inequality within this grouping that impacts the most upon total inequality in the community. On the other hand, levels of within-group inequality amongst sole parents contribute very little to total inequality.

Static comparison of the major changes between 1984 and 1988-89 aside from the between-group decreases already discussed, suggests the significant within-group changes (for $\alpha = 0$) to be as shown below.

Increased Inequality Contribution:

* amongst couple-only households aged over 65;

* households made up of 3 or more adults under 65;

* households where the head is aged 45-64;

* households with a single head;

* female-headed households;

* single person only households aged under 34; and

* sharing households comprising a number of adults.

Decreased contribution:

* younger (<34) couple-only households;

* larger households with two adults and three or more children; and

* male-headed households.

Many of these categories are, of course, inter-related. In sum, the evidence would point to increased significance of inequality amongst younger single people and older-headed households, and, conversely, the reduced significance of younger couples and larger related households at least for this calibrated distribution (unadjusted; household; $\alpha = 0$). We should note, though, that these results are altered when we take the analysis where $\alpha = 1$ and relative income shares dominate. Not only do larger families in consequence have a greater absolute significance, but often the changes observed based on population share ($\alpha = 0$) are reversed. In other cases, they are exacerbated. For example, within subgroup inequality of 3 person households, including those with a child aged 5-14, increases its contribution to overall inequality dramatically. This sensitivity of the contributions of different household types and factors to changes in the α values so that they are more or less significant at different ends of the distribution is important when we consider the income decompositions later.

In part B of Table 3.6, the **socio-economic** decomposition results are detailed for each of the two years. Analogous to and in part reflective of the socio-demographic decompositions, significant within-group changes are apparent.

Increased Inequality Contribution:

• households with two or more adults, particularly if the head were a full- or part-time employee and the others were earned income recipients;

• households where the head was in a managerial or professional occupation;

• households where the principal source of income of the head was investment; and

• households not in the labour force with no employed people.

Decreased Contribution:

• households where the head was a tradesperson, labourer or in a sales or service occupation; and

• households were the head was self-employed.

Unlike the socio-demographic characteristic decompositions, there are fewer changes as emphasis is given to different segments of the distribution. At $\alpha = 0$, as may be expected, the emphasis of change is more on households not in the labour force, whereas at $\alpha = 1$, the emphasis shifts to households of more than one adult where the head is in a managerial occupation or in receipt of investment income.

Whilst this static comparative analysis provides some clues to the structure of inequality and its change over the period, of greater relevance is the use that can be made of the decomposition techniques to explictly examine the contribution of different factors to the **change** in inequality from 1984 to 1988-89.

4 Decomposition of Aggregate Inequality Change

In the same way as we are able to decompose the contribution of various within- and between-group **inequalities** to **total inequality** in each year, so too are we able to decompose the contributions by a variety of sub-sets of **changes** in the various within- and between-group **inequalities** to **change in total inequality over a period** of time.

We do this by examining how much the change in each of the between-group and within-group absolute inequalities from one point in time to another accounts for the total absolute change in aggregate inequality, remembering that the basis of an additively decomposable index is that, for an analysis covering the entire population, the separate components sum to the total inequality. From this we are able to take the proportional contribution of each component to the change in total inequality.

4.1 Within-Group and Between-Group Contributions

We begin by examining for each of the set of 'household characteristic' decompositions the relative contributions of change in between-group inequality and the weighted sum of within-group inequality to total inequality change. As argued above in Section 2, since we are interested in the contribution of each component to 'true' inequality and not merely inequality consequent upon a change in the demographic composition of the population, it is appropriate to take equivalent income as the basis for these decompositions. In this way we are discounting the significance of changes in the population without discounting the significance of changes in the within- and between-group impact of socio-demographic and socio-economic factors.

The relative contribution of changes in such within- and between-group inequality by household recipient characteristics, for various values of α, is given in Table 4.1. The notable point to emerge from Table 4.1 is that for, say $\alpha = 0$, not only do changes in within-group inequality account for the major contribution of changes in aggregate inequality, compared to between-group inequality, but that, with the exception of socio-economic variables attached to household composition or occupation of the head, changes in within-group inequality account for the whole of the change in total inequality.

In relation to all of the **socio-demographic** household composition and comprehensive subgroups, within-group inequality increase exceeds aggregate inequality increase. Thus the reduction in between-group inequality actually constrains the increase in total inequality. For those subgroups relating to the socio-demographic characteristic of the head, between-group inequality change makes no contribution, with total inequality change due entirely to within-group change.

Table 4.1: Decomposition of Changes in Aggregate Equivalent Income Inequality: 1984 to 1988-89

	Aggregate[a] Inequality $\%\Delta I$	Account for by changes in Within	Between	Aggregate[a] Inequality $\%\Delta I$	Account for by changes in Within	Between
	$\alpha = 0.05 = I_{-1/2}$			$\alpha = 0 = I_0$		
Socio-demographic						
1 Household composition						
• Persons	15	16	-1	7	8	-1
• Dependants	15	16	-1	7	9	-2
• Family Composition	15	16	-1	7	9	-2
2 Characteristic of head						
• Age	15	14	1	7	7	0
• Marital status	15	15	0	7	7	0
• Gender	15	16	-1	7	8	-1
3 Comprehensive						
• Lifecycle cohort	15	19	-4	7	11	-4
• Household type	15	18	-2	7	10	-3
Socio-economic						
1 Household composition						
• Employed persons	15	14	1	7	6	1
• Earnings status	15	14	1	7	6	1
2 Characteristic of head						
• Occupation	15	14	1	7	6	1
• Employment status	15	16	-1	7	8	-1
• Principal source of income	15	20	-5	7	12	-5
	$\alpha = 1 = I_1$			$\alpha = 2 = I_2$		
Socio-demographic						
1 Household composition						
• Persons	12	14	-2	32	33	-1
• Dependants	12	14	-2	32	34	-2
• Family Composition	12	13	-1	32	33	-1
2 Characteristic of head						
• Age	12	13	-1	32	32	0
• Marital status	12	13	-1	32	33	-1
• Gender	12	12	0	32	32	0
3 Comprehensive						
• Lifecycle cohort	12	16	-4	32	38	-6
• Household type	12	15	-3	32	36	-4
Socio-economic						
1 Household composition						
• Employed persons	12	12	0	32	32	0
• Earnings status	12	12	0	32	32	0
2 Characteristic of head						
• Occupation	12	11	1	32	32	0
• Employment status	12	13	-1	32	33	-1
• Principal source of income	12	17	-5	32	36	-4

Note: a)   'Within' and 'Between' may not sum to 'Aggregate' because of rounding.

For the socio-economic decompositions based on household composition, the contribution of between-group inequality change is minimal and only exists for those measures more sensitive to the lower-end of the distribution. It is only in respect of the **socio-economic** subgroupings attached to a characteristic of the head of household that some internal variation from these grouped traits appear. For decomposition by occupation there is a minimal contribution of between group-change to total change. For earnings status, increases in within-group inequality exceed the increase in total inequality. Finally, for the principal source of income of the head, the within-group increase in inequality is five percentage points greater than total inequality increase, with the latter being restrained by the substantial decrease in the contribution of change in between-group inequality.

A glance at the relative contributions to total change for other values of α reveals that these conclusions appear to hold right across the distribution for whichever sensitivity measure utilised. The results are quite stable.

If the reader is still feeling uncomfortable about our use of equivalenced person-weighted distributions we reproduce our results using unadjusted household income distributions in Table 4.2. As may be expected, there is some contribution from between-group inequalities, particularly for those variables reflecting household composition and size. However, this merely reflects changes in the living arrangements of Australian households and the consequent impact on income relativities of changes in population share. The broad conclusions of the earlier results still hold. In every situation the majority of the increase in aggregate inequality stems from changes in within-group rather than between-group inequalities. Again, the result holds for whichever 'sensitivity' or α value we select. In fact, the contribution of between-group inequality change remains remarkably robust such that variations in the change in total inequality across the α value measures responds almost purely to changes in within-group inequalities.

Clearly for greater understanding of the contributing forces to overall inequality change between 1984 and 1988-89 we need to examine the component changes of within subgroup inequalities.

4.2 Within-Group Contributions to Change in Aggregate Inequality

Table 4.3 provides the details of the component contribution of changes in subgroup inequality to total inequality change from 1984 to 1988-89 for each set of the partitioning we have considered, using the equivalenced person-weighted distribution (in the two columns on the left) and the unadjusted household-weighted distribution (in the right hand two colums). Analogously to Table 3.6 above we have

Table 4.2: Decomposition of Changes in Aggregate Unadjusted Income Inequality: 1984 to 1988-89

	Aggregate[a] Inequality %ΔI	Account for by changes in Within	Account for by changes in Between	Aggregate[a] Inequality %ΔI	Account for by changes in Within	Account for by changes in Between
	$\alpha = 0.05 = I_{-1/2}$			$\alpha = 0 = I_0$		
Socio-demographic						
1 Household composition						
• Persons	22	17	5	12	6	6
• Family Composition	22	18	4	12	7	5
2 Characteristic of head						
• Age	22	20	2	12	11	1
• Marital status	22	21	1	12	11	1
• Gender	22	24	-2	12	13	-1
3 Comprehensive						
• Lifecycle cohort	22	19	3	12	10	2
• Household type	22	17	5	12	8	4
Socio-economic						
1 Household composition						
• Employed persons	22	18	4	12	8	4
• Earnings status	22	18	4	12	8	4
2 Characteristic of head						
• Occupation	22	20	2	12	11	1
• Employment status	22	22	0	12	12	0
• Principal source of income	22	24	-2	12	14	-2
	$\alpha = 1 = I_1$			$\alpha = 2 = I_2$		
Socio-demographic						
1 Household composition						
• Persons	14	8	6	33	28	5
• Family Composition	14	9	5	33	29	4
2 Characteristic of head						
• Age	14	12	2	33	31	2
• Marital status	14	12	2	33	31	2
• Gender	14	15	-1	33	34	-1
3 Comprehensive						
• Lifecycle cohort	14	12	2	33	32	1
• Household type	14	10	4	33	30	3
Socio-economic						
1 Household composition						
• Employed persons	14	10	4	33	30	3
• Earnings status	14	11	3	33	31	2
2 Characteristic of head						
• Occupation	14	13	1	33	32	1
• Employment status	14	14	0	33	34	-1
• Principal source of income	14	16	-2	33	35	-2

Note: a) 'Within' and 'Between' may not sum to 'Aggregate' because of rounding.

Table 4.3: Within-subgroup and Between-group Contributions to Change in Total[a] Income Inequality: 1984 to 1988-89

	Equivalent Income I_0	I_1	Unadjusted Income I_0	I_1
A Socio-Demographic				
1 Composition of household				
• Number of persons				
1	1	1	2	0
2	4	2	4	2
3	3	7	0	4
4	3	4	2	2
5	-2	0	-1	1
6	1	0	0	-1
7+	-1	0	-1	0
Within-group	8	14	6	9
Between-group	-1	-2	6	5
Total	**7**	**12**	**12**	**14**
• Number of dependants				
0	3	1	7	5
1	4	8	4	7
2	3	4	1	2
3	-2	0	-1	-1
4+	1	1	1	1
Within-group	9	14	11	13
Between-group	-2	-2	1	1
Total	**7**	**12**	**12**	**14**
• Family composition				
Couples	3	10	3	8
Sole parent	1	0	-1	0
Single person	1	0	2	-1
2+ unrelated singles	1	0	0	-1
Other family type	3	2	2	2
Within-group	9	13	7	8
Between-group	-2	-1	5	4
Total	**7**	**12**	**12**	**14**
2 Characteristic of head				
• Age of head				
<25	-1	-1	1	0
25-34	-5	-6	-2	-2
35-44	7	7	4	4
45-54	1	9	0	4
55-64	4	4	4	3
65-74	1	0	2	1
75+	0	0	0	1
Within-group	7	13	9	12
Between-group	0	-1	3	2
Total	**7**	**12**	**12**	**14**

Table 4.3: Within-subgroup and Between-group Contributions to Change in Total[a] Income Inequality: 1984-89 (Continued)

	Equivalent Income		Unadjusted Income	
	I_0	I_1	I_0	I_1
• Marital status				
Married or de facto	5	12	4	10
Separated	0	0	1	-1
Divorced	-1	-1	0	0
Widowed	0	0	2	2
Never married	3	1	4	2
Within-group	7	13	11	13
Between-group	0	-1	1	1
Total	**7**	**12**	**12**	**14**
• Gender of head				
Male	1	3	4	6
Female	7	9	9	9
Within-group	8	12	13	15
Between-group	-1	0	-1	-1
Total	**7**	**12**	**12**	**14**
3. Combination				
• Household type				
1 adult/65+	-1	0	-1	-1
2 adults/65+	2	2	3	0
1 adult	1	0	2	0
2 adults	2	1	2	1
3+ adults	3	5	3	4
1 adult/1 child	0	0	0	0
2 adults/1 child	2	5	1	3
2 adults/2 children	3	4	1	2
2 adults/2+ children	-4	-2	-3	-1
3+ adults/child	2	2	-1	2
Within-group	10	16	8	10
Between-group	-3	-4	4	4
Total	**7**	**12**	**12**	**14**
• Lifecycle cohort				
Single person				
<34	1	1	3	0
35-54	0	-1	-1	-1
55-64	0	-0	0	-1
65+	-0	-1	-1	-1
Couple only (no child)				
<34	-2	-1	-2	-1
35-44	-1	-1	0	0
55-64	4	3	4	3
65+	2	3	3	2

Table 4.3: Within-subgroup and Between-group Contributions to Change in Total[a] Income Inequality: 1984-89 (Continued)

	Equivalent Income I_0	I_1	Unadjusted Income I_0	I_1
Couple (with children)				
<5 only	1	-1	1	0
5-14 only	4	11	2	7
<5, 5-14	-3	-1	0	2
5-14, 15-24	0	0	-1	1
15-24	2	3	0	0
Single parent				
<14	1	0	0	0
<14, 15-24	-1	-1	0	0
Share house (no child)	1	1	0	1
Share house (children)	1	0	0	1
Within-group	11	16	9	13
Between-group	-4	-4	3	1
Total	**7**	**12**	**12**	**14**

B   **Socio-Economic**
1   **Composition of household**

	Equivalent Income I_0	I_1	Unadjusted Income I_0	I_1
• Number of employed persons				
0	1	-1	4	1
1	1	0	2	3
2	3	9	2	6
3	1	2	0	1
4+	0	0	0	-1
Within-group	6	12	8	10
Between-group	1	0	4	4
Total	**7**	**12**	**12**	**14**
• Earning status				
1 adult/no earner	1	0	2	0
1 adult/1 earner	-1	-1	0	-1
2+ adults/no earner	2	0	2	1
2+ adults/1 earner	2	3	2	2
2+ adults/2+ earners	2	8	3	7
no earner, aged 65+	0	0	1	1
1+ earner, aged 65+	0	1	-1	0
Within-group	6	12	9	11
Between-group	1	0	3	3
Total	**7**	**12**	**12**	**14**

2   **• Occupation**

	Equivalent Income I_0	I_1	Unadjusted Income I_0	I_1
Professional	1	3	3	4
Managerial/Admin	9	14	6	10
Clerical	1	2	0	1
Sales/Service	-2	-2	-1	-1
Trades/Labour	-8	-8	-3	-4
Not in Labour Force	5	2	6	3
Within-group	6	11	11	13
Between-group	1	1	1	1
Total	**7**	**12**	**12**	**14**

Table 4.3: Within-subgroup and Between-group Contributions to Change in Total[a] Income Inequality: 1984-89 (Continued)

	Equivalent Income		Unadjusted Income	
	I_0	I_1	I_0	I_1
• **Employment status**				
Employed full-time	6	8	5	8
Employed part-time	4	8	2	5
Self-employed	-8	-5	-2	-2
Unemployed	0	0	0	1
Not in labour force	5	2	7	2
Within-group	8	13	12	14
Between-group	-1	-1	0	0
Total	7	12	12	14
• **Principal source of income**				
Wages and salaries	4	4	4	6
Own business	1	3	2	1
Superannuation	0	0	1	1
Investment	6	8	7	8
Other	1	1	0	0
Pension/Benefit	2	1	1	0
No income	-1	0	0	0
Within-group	12	17	15	17
Between-group	-5	-5	-3	-3
Total	7	12	12	14

Note: a)   Due to rounding, numbers may not appear to add up exactly.

selected I_0 and I_1 as the inequality measures we seek to decompose.[4] In addition, we have included the appropriately weighted sum of the contribution of changes in within-group inequality as well as the contribution of change in between-group inequality to provide the comprehensive set for each partitioning of relative contributions to aggregate inequality increase from 1984 to 1988-89.

The aim of this section is to identify the characteristics of those households within which inequality change has contributed most to overall aggregate inequality change, that is, the 'recipient' characteristics of those households amongst which are the source of the observed inequality increase.

As argued above, the preferred distribution for the analysis of such change, following Jenkins (1992) and others, is the equivalenced person-weighted distribution. It is to this that we turn first.

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4   Again, for the purposes of presentation we have aggregated the minor contributions of some subgroups where to do so does not alter the validity of the presented results.

Equivalent Income Distribution

If we look firstly at the population-weighted distribution ($\alpha = 0$) then the principal contributions to the change in inequality by virtue of changes in within-group inequality for each partitioning are listed below.

Disequalising subgroups (large positive contributions) include households with:

- two, three and four person households, predominantly adults;

- nil or one dependant aged 5-14;

- couple only (no children) in household with head aged 55+;

- two employed persons;

- head either in full-time work in a managerial or administrative occupation or not in the labour force;

- principal source of income of head either investment income or wage and salary; and

- head aged 35-44 or 55-64.

Aggregating these various characteristics, they fall into two distinct categories:

1   couple only households with the head aged 55-64, not in the labour force and reliant upon investment income; or

2   couple households with the head aged 35-44, with one child aged 5-14, both adults employed full-time with the head in a managerial or administrative occupation.

Equalising subgroups (negative contribution) include households with:

- five or more persons, possibly some unrelated;

- three dependants (aged under 5 and 5-14);

- divorced head of household;

- self-employed head;

- head in sales or services or trades occupation;

- head aged under 34; and

- couple-only household aged under 34.

Aggregating these various characteristics, though more diverse than the disequalising subgroups, they can be grouped into two categories:

- larger share households with head aged under 34 years with a number of dependants or other adults with a range of ages; head possibly divorced; and employed in sales or blue-collar occupation, possibly self-employed; or

- couple-only households with head aged under 34, employed in a sales, service or blue-collar occupation.

Thus, we tend to see a polarisation of extremes. Those characteristics attached to households whose within-group inequality increase has made a significant contribution to the increase in total inequality are generally couple households, with a reasonably high relative mean income, with the head aged over 35 but under 65 and in an upper white collar occupation with investment income. At the other extreme, aside from the equalising impact of changes in between-group inequality, changes in inequality within households which are either young and childless or shared larger households with a head aged less than 34 years in lower-white or blue-collar occupation tend to have reduced the change in overall inequality.

When we move to the income share-weighted distribution ($\alpha = 1$), then those subgroups whose changes in within-group inequality have contributed significantly to the increase in overall inequality tend to be more focused on one of the two outlined above: the couple with one dependant (aged 5-14) where both adults are employed with the head, aged between 35 and 64, employed in a managerial occupation.

On the other hand, at $\alpha = 1$, where increases in within-group inequality contribute even more to total inequality increases, the groups whose within-group inequality change acted to mitigate the increase, become more diverse but generally were younger couples or singles over 35 who were self-employed engaged in a trade or sales/service occupation or were younger childless couples.

Again the almost generational polarisation is clear-cut. Households where the head was under 35 in a lower paid occupation, tended to have a change in within-group inequality which restrained the change in overall inequality. The opposite households, particularly couples where the head was aged over 35, with a child and in a higher-paid upper white-collar occupation, had an increase in within-group inequality which largely contributed to increased observed overall inequality.

Unadjusted Household Income Distribution

Even when we turn to the unadjusted (non-equivalenced) household income distribution in the two right-hand columns of Table 4.3, the resultant factors associated with positive within-group increases to overall inequality change are similar: couples, over 35, nil or one dependant, employed full-time in a managerial or administrative occupation or not in the labour force with investment income (for $\alpha = 0$), and as the emphasis shifts up the distribution (for $\alpha = 1$) these couple households are more likely to exhibit a second-earner and extra dependant. Thus,

the use of unadjusted or equivalent income distributions makes little difference to the conclusions derived from these decompositions of inequality change.

In summary, the 'stand-out' factors which gave rise to the identification of households amongst which increases in inequality contributed most to both overall within-group inequality change and total inequality change in the 1984 to 1988-89 period were: marital status (couples); age (over 35 and under 64); occupation (managerial); employment status (employed either full- or part-time) and income source (investment). Conversely, falls in inequality amongst younger (under 35) households and those where the head was engaged in a trades or labouring occupation contributed to restraining the growth of overall inequality increase.

Thus, from our household recipient characteristics decomposition we note firstly the declining significance of between-group inequalities as a contributing factor to the increase in inequality. The predominant contributing force leading to the increase in inequality stemmed from the dramatic increases in within-group inequality of older working aged households (35-64) where both head and spouse worked. The question then becomes what was the basis for the increase in within-group inequality for this group? For that we turn to the source of income decomposition.

5 Decomposition by Income Source

The second generic set of decompositions undertaken is in respect of income source. As outlined in Section 2, and Appendix Two, the contribution of each source of income to total inequality and changes in that inequality can be ascertained by reference to equation (9), that is, from the income sources share of total income, its correlation with the distribution of total income and its internal inequality.

Table 5.1 provides these critical variables for each of the designated sources of income for both 1984 and 1988-89. In consequence, the proportionate and absolute contribution of each income source to total inequality in disposable income are determined and presented in the table. For the purposes of these decompositions the unadjusted household distributions are utilised, with the measure of inequality being I_2 (that is, $\alpha = 2$).

Structure of Inequality

From Table 5.1 we observe the structure of inequality via proportionate contribution of each income source to aggregate inequality, for each year of analysis. Thus, for 1984, earnings from self-employment contributed about 20 per cent of the total inequality in household disposable income. The outstanding feature is the overwhelming predominance of wages income, which in both years contributed over 80 per cent of gross income inequality, and over 100 per cent of disposable income inequality when the restraining effect of government benefits and taxes are taken into account. Self-employment and total investment income each contribute about one-fifth of this influence of wages. In terms of the countervailing effect of taxes and benefits, at this measure of inequality, taxes predominate by a factor over four times that of benefits. It should be recalled again that the measure itself is more responsive to higher incomes in the distribution. In total these government redistributive measures restrain the increase in inequality that would have been occasioned by private or market income component source contributions by around one-third.

The pre-dominance of wage and salary earnings is only to be expected given its dominance as a factor share: approximately 90 per cent of all disposable income, 75 per cent of gross income and 80 per cent of private (non-government) or market income. Added to this, as reflected in the relative correlations with total income, its receipt is spread most evenly over the entire income distribution, compared to the other income sources. Whilst these two factors explain its predominance, its low level of internal inequality (reflected by the factor inequality column) relative to the other income sources, in fact constrains its impact. If it were less evenly distributed, the overall impact of wages and salaries as a component of aggregate inequality would be considerably greater. Hence, if our concern is with the level of inequality, clearly changes in the labour market, labour market participation and comparative

Table 5.1: Decomposition by Income Source: 1984 and 1988-1989 (Unadjusted)

Income Source	1984						1988-89					
	Factor Share %χ	Correlations %	Factor Inequality If (x1000)	Proportionate Contribution %sf	Absolute Contribution Sf	Inequality Impact Ratio	Factor Share	Correlations	Factor Inequality	Proportionate Contribution	Absolute Contribution	Inequality Impact Ratio
Disposable Income	100	1.000	186	100.0	186	1.00	100	1.000	247	100.0	247	1.00
Wages	89.2	.831	523	124.1	230.8	1.39	91.2	.775	512	101.9	251.7	1.12
Self-earnings	10.3	.317	7366	20.5	38.1	1.99	12.0	.347	7002	22.1	54.6	1.84
Investment	8.2	.297	5359	13.0	24.2	1.59	7.7	.501	10546	25.2	62.3	3.27
• dividend	2.9	.201	19515	6.0	11.2		2.7	.490	50679	19.3	47.5	
• rent	1.4	.205	27857	3.4	6.3		1.0	.182	61907	3.0	7.4	
• interest	3.9	.170	5493	3.6	6.7		4.0	.165	5434	3.0	7.4	
Superannuation	1.9	-.008	16747	-0.1	-0.2	-0.05	1.6	-.009	17848	-0.1	-0.3	-0.06
Other market	1.5	.057	14889	0.8	1.5	0.53	1.3	.073	21468	0..9	2.2	0.69
Government:	14.2	-.383	843	-11.5	-21.5	-0.81	12.6	-.328	1017	-8.4	-20.7	-0.67
Pension	6.9			-9.0	-16.9	-1.30	6.3			-6.6	-16.4	-1.05
• Age	4.7	-.320	2773	-5.7	-10.7		4.1	-.280	3202	-4.1	-10.2	
• Invalid	0.9	-.067	16486	-0.5	-0.9		1.1	-.073	13215	-0.5	-1.3	
• Veterans	0.2	-.120	9248	-1.7	-3.2		0.2	-.110	9489	-1.4	-3.4	
• Widow	0.8	-.106	17651	-0.8	-1.5		0.6	-.093	21459	-0.5	-1.3	
• Wifes	0.3	-.064	33149	-0.3	-0.6		0.3	-.037	31786	-0.1	-0.2	
Benefits	3.5			-2.7	-5.1	-0.77	2.5			-1.7	-4.1	-0.68
• Unemployment	2.2	-.102	8231	-1.5	-2.8		1.3	-.085	13828	-0.9	-2.1	
• Sickness	0.3	-.045	54898	-0.2	-0.4		0.3	-.026	64056	-0.1	-0.2	
• Supp. Parent	1.0	-.108	17462	-1.0	-1.9		0.9	-.096	18575	-0.7	-1.8	
Allowances	1.9			0.3	0.5	0.15	1.9			0.0	-0.2	0.00
• Family	1.6	.117	1174	0.4	0.7		1.0	.016	2524	0.0	0.0	
• Student	0.3	-.046	40772	-0.2	-0.4		0.4	-.012	24914	0.0	0.0	
Other	0.4	.015	42254	0.1	0.2	0.25	0.5	-.014	30852	-0.1	-0.2	-0.20
Direct Taxes	-25.3	-.919	757	-46.8	-87.0	-1.85	-26.4	-.880	793	-41.6	-102.7	-1.58

wages (for example by occupation, gender and age) are particularly important. It is therefore little wonder that descriptive trend analysis of wage inequality matches that observed for total income inequality.

Some indication of the relative significance of each income source in impacting on inequality can be gleaned by looking at the ratio of the proportionate contribution to factor share. In the case of employee earnings in 1984, wages and salaries comprised 89 per cent of total disposable income but 124 per cent of the contribution to total income inequality, implying an 'inequality impact' ratio of 1.39. Thus, each one per cent of disposable income in the form of wages, distributed as it is both within itself and across the entire income distribution, contributed 1.39 per cent to inequality in 1984. This 'inequality impact' ratio is shown in the last column for each year of analysis. Thus, it can be observed that for 1984, of all the major income source components, self-employed earnings has the largest relative contributing inequality impact. The 10 per cent of income received as self-employed earnings contributes about double (20.5 per cent) to toal inequality. This is largely the high level of internal factor inequality compared to other income sources.

The other major positive contribution to inequality comes from investment income with an aggregated impact ratio of 1.59. Thus, the eight per cent of investment income contributed 13 per cent of inequality in 1984. However, significant differences reflecting capital portfolio arrangements occur within this category. Interest income from investments, being far more equally distributed particularly to lower-income retired people, contributes a smaller than factor share contribution to inequality. Rental income and dividend income from shares both contribute about double their factor share to overall inequality because of their highly concentrated distribution.

On the other hand, superannuation income, because of its low incidence of receipt in 1984 and its negative correlation with total income distribution, contributes insignificantly to total inequality. The other negative contributions (that is, restraining influences) are, as expected, direct government cash payments in the form of pensions and benefits, and direct incomes taxes. For the weighting and distributional sensitivity reflected in the I_2 measure, direct taxes reduce overall disposable income inequality by 1.85 per cent for every percentage point raised. The inequality impact of government welfare payments is somewhat less, reflecting the emphasis of the I_2 measure on higher incomes and depending on whether such payment is a pension, a benefit, or some other allowance. Proportionate to factor share, pensions have the greatest redistributive effect. In 1984, the allowances in the form of family allowances, with their lack of a means test, added to inequality. This differential impact reflects the different objectives and hence means-testing of schemes. Clearly also the net impact on inequality of each of these measures will vary over time with changes in demographic characteristics (for example, the 'ageing' of the population) and in the level of economic activity (for example, the level of unemployment) as reflected in changes in the relative factor share of income. In addition, changes in administrative arrangements affecting targeting through eligibility and means-testing will affect its inequality impact.

Whilst, for illustrative purposes, most of our comments to date have been in reference to the 1984 data year, they hold in general terms for the 1988-89 data year as well. Overall wages are again dominant; self-employment earnings and investment income have a greater inequality impact relative to their factor share; and direct taxes and to a lesser extent welfare benefits restrain the otherwise observed level of inequality. However, it seems appropriate at this point to highlight in comparative static terms some of the changes in inequality structure observable **between** the two years. Whilst wages contributed a greater factor share in 1988-89, its apparent reduced internal inequality, relative to changes in other component source incomes, meant that its overall proportional contribution to inequality was slightly reduced. On the other hand, the inequality impact of both government cash benefits and direct taxes was reduced (although still redistributive) in 1988-89. This was despite the fact that the absolute contribution of social security and taxes remained the same in the case of the former and actually increased in the latter case. The previously positive contribution of family allowances was eliminated through greater means-testing.

The principal reason that proportional contributions of income sources fell, despite in most cases an increased absolute impact, was the dramatic increase in the relative inequality impact ratio associated with investment income. Here, despite its factor share falling to 7.7 per cent, its proportionate contribution to inequality rose from 13 per cent to 25 per cent, with a consequent increase in the impact ratio from about 1.5 to well over three. The cause of this was a dramatic increase in within-factor inequality and an equally dramatic increase in its correlation with total income.

Disaggregation of this investment income by its component parts - interest, rent and dividends - indicates that the source of this increased contribution was in dividend income. Its internal inequality virtually tripled in the period, and its receipt by higher-income earners more readily approximated the relativities in the distribution of **total** income. This can be interpreted as a number of high total income earners getting a rapidly expanded dividend income and conversely a number of low total income recipients getting much less from dividends. This could have occurred by virtue of a dramatic change in dividend receipt pattern from the shares owned by higher-income recipients or a sharp transfer of shares from low-income earners to high-income earners. The net impact was that by 1988-89, dividend income, despite comprising less than three per cent of total disposable income, contributed nearly 20 per cent to the total level of inequality of that income. To further analyse the nature of this change in the contributory structure of inequality we turn to our decomposition of the **change** in inequality over the period.

5.2 Decomposition of Inequality Change by Income Source

In Table 5.2, the results of the decomposition of the change are presented. These are obtained by comparing the differences in absolute contribution of each income source in 1988-89 to those in 1984 (column 3 = column 2 less column 1). Thus, of

Table 5.2: Decomposition of Inequality Change by Income Source: 1984 to 1988-89

Income Source	(1) Absolute contribution 1984	(2) Absolute contribution 1988-89	(3) Change in absolute contribution = (2)-(1)	(4) % Change in absolute contribution =(3)÷(1)	(5) Contribution to 84-89 change =(3)÷ total (186)	(6) % Contribution to 84-89 change
Disposable Income	186	247	61	32.8	32.8	100
Wages and salary	231	252	21	9	11	34
Self-earnings	38	55	17	45	9	27
Investment	24	62	38	158	21	64
• Dividend	11	48	37	336	20	61
• Rent	6	7	1	17	1	3
• Interest	7	7	0	0	0	0
Superannuation	0	0	0	0	0	0
Other Market	2	2	0	0	0	0
Government:	-22	-21	1	-4	1	3
Pensions	-17	-16	1	-6	1	3
• Age	-11	-10	1	-9	1	3
• Invalid	-1	-1	0	0	0	0
• Vetrans	-3	-3	0	0	0	0
• Widow	-1	-1	0	0	0	0
• Wifes	0	0	0	0	0	0
Benefits	-5	-4	1	-20	1	3
• Unemployment	-3	-2	1	-33	1	3
• Sickness	0	0	0	0	0	0
• Supporting Parent	-2	-2	0	0	0	0
Allowances	1	0	-1	100	-1	-3
• Family	1	0	-1	100	-1	-3
• Student	0	0	0	0	0	0
Other	0	0	0	0	0	0
Direct Taxes	-87	-103	-16	18	-9	-27
Disposable Income	186	247	61	32.8	32.8	100

the increase in total disposable household income inequality (1000 x I_2) of 61 points, wages and salaries contributed 21 of the increase or 34 per cent of the total change, although the percentage increase in absolute contribution of wages was only 9 per cent.

Confirming our earlier analysis, the outstanding feature of Table 5.2 is the 158 per cent increase in the absolute contribution of investment income, or more particularly, the 336 per cent increase stemming from dividend income. Specifically, dividend income contributed 37 points of the total 61 point increase in total inequality. Thus of the total 32.8 per cent increase in inequality, 20 percentage points were attributable to dividend income alone. Without the restraining factor of a progressive tax system this equates to a contribution of about half the increase in

inequality in overall private and gross income. This was despite the fact that, as a share of total income, dividends actually declined from 2.9 per cent to 2.7 per cent. Clearly something dramatic occurred here in respect of its internal inequality which had a major impact on the trend in total inequality in Australia over the period 1984 to 1989.

Of the other significant private income sources, earnings from self-employment show a similar major contribution to observed total inequality change. Seventeen points of the 61 point change was attributable to this source, which translated into a total of 9 percentage points of the total change of 32.8 per cent. Combined together, non-wage private income sources contributed 30 of the 32.8 per cent increase in disposable income inequality, and three-quarters of the contribution from private and gross income sourced inequality, although such non-wage income only comprises about 20 per cent of all income.

As may be expected through the operation of a progressive income tax system, if the increase in non-wage private income was concentrated in the higher income levels, then the restraining force of taxation would increase as well. In fact, the contribution of direct taxes increased such that it limited the growth of inequality in disposable income of 32.8 per cent by nine points from what it would otherwise have been. This, however, was substantially less than the positive inequality impact of this non-wage income. In fact it roughly equated to the contribution of self-employment earnings or wages and salaries individually, or about half their combination. From Table 4.2 we noted that the direct tax system restrained total disposable income inequality by about 47 per cent. Given the top marginal tax rate in operation over the period this is about the rate that might be expected. Bearing in mind the sensitivity of the particular I_2 measure to higher incomes, this reflects the higher marginal and average tax rates, compared to the factor income share rate of 25 per cent.

The reason for the apparent fall in the inequality impact ratio of the tax system and its failure to restrain the change in inequality over the period by its expected 40 per cent rather than the actual 27 per cent, probably lies in the introduction of dividend imputation during the period. This meant that in 1988-89, dividend income received in the hands of the individual recipient effectively become tax-free, having been paid at the company level. Thus the 20 percentage points of the 32.8 per cent increase in total disposable income inequality was not subject to the restraining influence of 'claw-back' through the tax system. Hence, income inequality increased more dramatically than would otherwise have been the case - possibly by nine to ten percentage points. Thus, if dividend income had been subject to the same tax arrangements in 1988-89 as in 1984 then the increase in total inequality may have been reduced from 32.8 per cent to about 23 per cent, or nearly one-third.

Clearly, given its impact this dramatic contribution of dividend income to the increase in total inequality merits further examination. For this we turn to further decompositions.

5.3 Decomposition of Inequality Change by Household Member

Just as income inequality can be decomposed into its component contributions by source, so also we can decompose this change by the household member who received it - the head, spouse or other member of the household. Both the 1984 and 1988-89 HES record the total income received by the household, and the head and the spouse of the household head. The difference between the head and spouse combined income and total household income can be designated to the collective 'other member of household'. Unfortunately the 1984 HES, unlike the 1988-89 HES, does not enable disaggregation of the type of income received by the head and the spouse, only their individual total income.

Table 5.3 presents the decomposition analysis of the different 'sources' of household income, where 'source' is the receiving person in the household, analogous to the decomposition by source of income above, where 'source' is the form of income received by the household. The 'household member' decompositions in Table 5.3 are presented firstly for 1984 and then 1988-89. Direct taxes, by limitation of the data, particularly the 1984 HES, are separated and presented at the household level.

Thus, for 1984, the gross income of the household head comprised 81.4 per cent of the total disposable income of the household, or 65 per cent of household gross income. Spouse income comprised 25.9 per cent of disposable household income or 20 per cent of gross. The remaining 15 per cent of household gross income, or 17.9 per cent of disposable income, was contributed by the collective 'other' household members.

By 1988-89, the head's share had decreased in response to increases in both the share of the 'spouse' and 'other'. In most households, cultural determinism and financial status mean that the 'head' is normally self-designated the husband and the 'spouse' the wife. Thus the increases in relative income share of 'spouse' could reflect both increased labour force participation rates of married women and the consequent increase in non-wage income, if additional earned income has been used to purchase income-producing assets such as shares. Similarly, the increase in the relative income share of 'other' household members may reflect the tendency described by Raskall and McHutchinson (1992b) for more older-age children to remain within the parental home, partly related to increased tertiary education participation rate.

With these changes in factor income shares, the internal income inequalities by household member and the relationship of such designated income to total household income distribution, the proportionate and absolute contributions of each household member source of income can be determined from Table 5.3. Thus the proportionate contribution of the head to total inequality increased marginally from 72.7 per cent to 72.9 per cent between 1984 and 1988-89; that of the spouse increased from 39.3 per cent to 41.6 per cent; but that of other members decreased from 34.7 per cent to

Table 5.3: Decomposition by Household Member: 1984 to 1988-89

	Head	Spouse	Other	Household Taxes	Total
1984					
Factor share (%)	81.4	25.9	17.9	-25.3	100.0
Correlations	.737	.605	.505	-.919	1.000
Factor inequality (x1000)	274	1171	2735	757	186
Prop. factor contribution sf (%)	72.7	39.3	34.7	-46.7	100.0
Absolute factor contribution	135.2	73.1	64.5	-86.9	186
Inequality impact ratio	0.89	1.52	1.94	1.85	1
1988-89					
Factor share (%)	80.1	27.9	18.3	-26.4	100.0
Correlations	.753	.631	.454	-.880	1.000
Factor inequality (x1000)	360	1373	2623	793	247
Prop. factor contribution sf(%)	72.9	41.6	27.1	-41.6	100.0
Absolute factor contribution	180.1	102.8	66.9	-102.8	247
Inequality impact ratio	0.91	1.49	1.48	1.58	1
% Change 84-89 Absolute contribution %ΔSf	33.2	40.6	3.7	+18.3	32.8
Contribution to 84-89 change (sf %ΔSf)	24.0	15.9	1.3	-8.4	32.8
% Contribution to 84-89 change	73.2	48.5	4.0	25.6	100.0

27.1 per cent. Reflecting the consistency of the decomposition process, the results for household direct taxes replicates the results from the earlier decomposition. Without sequestering member's income, it is interesting to note that the positive contribution of spouse income in 1988-89 exactly equals the restraining contribution of direct taxes.

The fact that the inequality impact ratio is little changed for both head and spouse, although it declines for 'other', suggests that some common factor resulting in increases in inequality of both head and spouse incomes contributed reasonably equally to increased inequality overall. This is reflected in the fact that the changes

in absolute contribution of head (33.2 per cent) and spouse (40.6 per cent) incomes were relatively similar both to each other and overall inequality (32.8 per cent). However, the relative contribution of spouse incomes to overall inequality was slightly greater. Thus, of the 32.8 per cent overall inequality increase, 15.9 percentage points (48 per cent of the increase) was attributable to the increase in spouse income inequality, a proportion somewhat higher than the factor share contribution. On the other hand, the 73.2 percentage point contribution of income received by the head to the total 32.8 per cent overall increase, was similar to head's income share. Aside from the changes contributed by the income tax system discussed above, the other outstanding result is the relatively minor contribution of changed income inequality from other household members to the 1984-89 aggregate change.

5.4 Subgroup Decompositions

To further examine the nature of this change, we decompose several subsets of the total population with respect to the change in household member contribution to inequality change between 1984 and 1988-89. The subsets we examine are six in number: subdivided firstly by the presence or otherwise of earned income and secondly by the age of the head. Again, it should be recalled that the emphasis is on the decomposition of the change in inequality.

The summary results of these decompositions are presented in Table 5.4 in a fashion analogous to the penultimate row of Table 5.3. Thus, for households where the head is aged under 30 and either head or spouse earn income from wages or self-employment, total inequality increased by 8 per cent between 1984 and 1988-89, as measured by I_2. For presentation reasons, spouse and other household members have been combined.

The most obvious point to emerge from Table 5.4 is the diversity of inequality change by household subgroup category. For younger households with no earned income, inequality fell by one per cent, whereas for older working age (30-59) households, in receipt of earned income, total inequality rose by 77 per cent. These results mirror those obtained from our earlier decompositions by demographic and economic characteristics of households (see Section 4). This diversity in aggregate inequality change is also reflected, in the pattern of contribution to change by household member. In part this reflects the different nature of the households in each subgroup category, and their position in the overall distribution.

Looking at the contribution to total subgroup inequality change by the head of household (the first column) we observe that far and away the dominant contribution occurred within earning households where the head was over 30 but under 60. For these households, the contribution of the head was almost double that of other members of the household, contributing over 80 per cent of total change in that subgroup. For all other household subgroups the income inequality of head was not the most significant contribution. Indeed, for two subgroups, younger age (under

Table 5.4: Household Member Contributions to Change in Inequality, Subgroup Decompositions: 1984 to 1988-89

	Head	Other	Taxes	Change in Aggregate Inequality %	Inequality (I_2) 1984	1988-89
With Earnings						
0-29	-8	15	1	8	88	95
30-59	62	33	-17	78	106	188
60+	9	21	-8	22	141	172
Without Earnings						
0-29	2	-15	12	-1	107	106
30-59	2	19	2	23	111	137
60+	-17	8	19	10	166	183
All Households	24	17	-8	33	186	247

30) earning households and older age non-earning (that is, retired) households, it was a negative factor on inequality change. For the others it was relatively insignificant, with the possible exception of older earning households (over 60).

Such diversity in household member contribution between subgroups is also observable in the relative contribution of 'other' members. Again the contribution of the 'other' household members is greatest in absolute terms in earning households aged 30-59 (and more detailed dissection indicates it was concentrated amongst spouses), although this is largely because the greatest change occurred in this age category. However, the contribution of 'others' was also significant in other subgroups. Indeed, on a proportionate basis to the observed total inequality change, this 'other' (and again this is largely spouse) contribution was the dominant contributor for three other subgroups including both younger and older earning households and mid-aged (30-59) households without earnings. On the other hand, for younger households without any earned income it was a negative factor. For the remaining subgroup, retired households, the 'other' contribution was still significant, accounting in total for 80 per cent of the change in overall inequality. However, this was countered by the dramatic decline in the contribution of income received by the head and the equally dramatic apparent positive contribution of the tax system.

Despite having a restraining influence on the inequality increase for all households (although as we have seen this was a decreased influence compared to its impact on total inequality in 1984), it is apparent that the impact of the direct tax system on inequality amongst the various subgroups varied dramatically.

In interpreting these results, it should be remembered that a supposedly positive contribution to inequality change, does not necessarily imply that the tax system

became less progressive. The result merely shows the change in the restraining influence of the tax system on total inequality at the end of the period of analysis (1988-89) compared to the beginning (1984). This may occur because it is less progressive but it may also occur because it is less significant to the members of the particular subgroup as a consequence of their relative mean income falling and changes in the minimum threshold and rate. In other words, the members of that particular subgroup may not be paying as much income tax as previously because of their incomes and inequality in that group, relative to the changes in threshold and rates. Less higher-income and higher-tax-paying households in each group will reduce the relative significance of the tax system in restraining overall inequality in that group and hence lead to an apparent positive contribution to total disposable income inequality **change.** This is one of the important methodological distinctions between analysis of inequality structure and inequality change.

However, the pattern revealed by Table 5.4 in relation to the tax system is dramatic. It is only for earning households over 30 years of age that taxes show the negative restraining influence on inequality change observable in the impact for all households. For other households, notably those without earnings in either the younger or older age groups, the net result of those factors impinging on the change in inequality is such that direct taxes appear to have enhanced inequality change in that subgroup. Thus if we limited our examination to gross income only, and ignored the operation of the tax system on disposable income inequality, total gross income inequality would have **fallen** amongst younger and older households without earnings - possibly because more were reliant upon the social security system. This is generally relatively equalising compared to inequality amongst private income.

To examine this further, and to examine the dramatic shift in the inequality change impact of head of household income of retired households compared to those aged 30-59 with earned labour income, we decompose the total inequality change of these subgroups by income source. We pay particular attention to investment income given its significance to the change in income inequality for all households (Table 5.2) discussed earlier. The results of these decompositions of household subgroups, analogous to the earlier results presented in this section, are outlined in Table 5.5.

The sources of the diversity revealed by the household member subgroup decompositions become apparent when we examine Table 5.5. As would be expected, the relative contribution to total subgroup inequality varies dramatically because of the ways in which we have defined the groups and the relative differences in sources of total income in each group. Thus, wage and self-employment earnings only contribute, by definition, to those groups 'with earnings'. Similarly, if we examine relative income shares, government benefits (social security) dominates amongst those groups 'without earnings'. We will not dwell on the obvious.

However, we do note that in relation to government benefits, the contribution of this source to total inequality change is the same at around 11-13 percentage points for

Table 5.5: Contribution to Inequality by Income Source, Subgroup Decompositions: 1984 to 1988-89

	Wages	Self-employed	Investment	Government Super.	Other	Direct benefits	Total Taxes	%
With Earnings								
0-29	12	-4	-2	0	0	1	1	8
30-59	26	24	45	0	0	-1	-17	77
60+	5	23	-2	-1	3	0	-7	22
Without Earnings								
0-29	na[a]	na	0	0	-24	11	12	-1
30-59	na	na	3	6	1	11	2	23
60+	na	na	-15	-11	4	13	19	10
All Households	11	9	21	0	1	0	9	33

Note: a) na - not applicable.

each of those groups without earnings. This is doubly notable in that it is a positive contributive to change. That is, whilst inequality in the distribution of government benefits is one of two principal sources for inequality amongst these households (the other being inequality in income from capital), over the period of analysis the changes in its contribution to total inequality were such as to be a positive contributory factor to the overall increase. This occurred because of an increase in the correlation of its distribution with the distribution of total disposable income (for the young and the older households) or an increase in its internal inequality (for middle-aged households). This could have been the result of changed eligibility (for example, unemployment benefits or assets test) or increased differentiation between different household types within the same age group. The fact that from this differing set of causal policies, the net outcome on total inequality change was nearly identical in relative terms on each category of non-earning households may be either coincidence and or an implicit policy objective. Irrespective, when added to the impact of tax changes discussed above, then changes within the government income transfer system dominated inequality change for these non-earning groups.

Within the sources of private income, the dramatic apparent contribution of 'other' income for non-earning households aged under 30, largely the result of a dramatic decline in factor share from 16.5 per cent in 1984 to 8.6 per cent in 1988-89, may be the result of sampling variation, in view of the smaller number of households in this sub-category. However, the restraining contribution of superannuation income in the older age groups probably reflects the longer-run impact of increased accessibility to such schemes.

Again, following the all-households analysis earlier, it is the dramatic variation in the contribution of investment income between the subgroups which is the outstanding feature of Table 5.5. In view of the significance of investment income to the change in overall inequality, the fact that a very specific pattern between groups emerges takes on added importance.

Almost all of the activity regarding the contribution of investment income occurred in two of the six subgroups: earning households aged 30-59 and retired households over 60. In the former case, the contribution was a strongly positive 45 percentage points out of the overall 78 per cent increase in inequality (nearly 60 per cent of the change in inequality). In the latter case of retired households, however, the contribution of investment income on an inequality increase of 10 per cent was a negative (that is, restraining influence) of 15 percentage points.

From the income source decomposition equations of Section 2 and Appendices One and Two we know that these dramatic contribution changes can stem from: a change in inequality within the distribution of investment income; a change in the share of investment income to total received disposable income; and a change in the correlation with that total income. In other words, the inequality impact depends on the change in the size of the investment portfolio, the change in the portfolio mix and the relative yields, and the differential return (yield) received by different income groups or household types. To investigate these further, and in particular to determine a link between the subgroup results we further decompose investment income to its component forms: interest, rent and dividends. The results are presented in Tables 5.6 and 5.7. In Table 5.6, we outline the impact of each investment form on the change in inequality for each subgroup. Table 5.7 details the components of the decompositions of the structure and contribution to inequality of investment income types in 1984 and 1988-89 respectively. This capacity to examine a specific form of income is one of the advantages of an additive decomposition approach.

From Table 5.6, as for the change in all households, we can isolate the movements in specific subgroups of the contribution of change in dividend income. For retired households (non-earning and over 60), changes associated with dividend income contributed negatively 20.2 percentage points to the change in total income inequality. On the other hand, for the 30-59 (with earnings) subgroup, dividend income contributed positively 42.2 percentage points to the 45.1 percentage point impact to the total inequality increase. Thus, we look closely at the dividend income components of this change for these two critical subgroups in Table 5.7.

Taking those households receiving no earned income with the head over 60 years of aged (the 'retired') we see that internal dividend income inequality declined slightly from an I_2 of 10.931 in 1984 to 10.550 in 1988-89 and similarly, there was a slight decline in the correlation of this income with all income received from .625 to .592. This would suggest that there was a slight decline by those previously receiving higher amounts relative to others in this category in the receipt of dividend income.

Table 5.6: Contribution of Investment Income Types to Change in Inequality: 1984 and 1988-89

Subgroup Age	Income source	Absolute Contribution to inequality 1984	Absolute Contribution to inequality 1988-89	Change in contribution	Contribution to total change
With Earnings					
0-29:	Interest	1.9	1.0	-0.9	-1.0
	Rent	0.5	0.0	-0.5	-0.5
	Dividends	1.9	1.2	-0.7	-0.8
	Total	4.3	2.2	-2.1	-2.4
30-59:	Interest	3.8	4.1	0.3	0.3
	Rent	4.0	6.8	2.8	2.6
	Dividends	7.6	52.3	44.7	42.2
	Total	15.4	63.2	47.8	45.1
60+:	Interest	29.3	32.9	3.6	2.6
	Rent	21.7	11.2	-10.5	-7.4
	Dividends	17.1	21.0	3.9	2.3
	Total	68.1	65.1	-3.0	-2.5
Without Earnings					
0-29:	Interest	-0.6	-0.5	0.1	0.1
	Rent	1.3	0.0	-1.3	-1.2
	Dividends	-1.0	-0.2	0.8	0.7
	Total	-0.3	-0.7	-0.4	-0.4
30-59:	Interest	9.9	11.8	1.9	2.1
	Rent	5.9	4.5	-1.4	-1.6
	Dividends	5.9	8.1	2.2	2.4
	Total	21.7	24.4	2.7	2.9
60+	Interest	53.3	58.7	5.4	3.3
	Rent	13.8	17.4	3.6	2.2
	Dividends	99.3	65.7	-33.6	-20.2
	Total	166.4	141.8	-24.6	-14.7
All Households					
	Interest	6.7	7.4	0.7	0.4
	Rent	6.3	7.4	1.1	0.6
	Dividends	11.2	47.4	36.2	19.5
	Total	24.2	62.2	38.0	20.5

Table 5.7: Contribution of Investment Income Types to Overall Income Inequality: 1984 and 1988-89

Subgroup		1984				1988-89			
Age	Income source	Share of Income %	Internal In-equality I_2	Corre-lation χ	Relative Inequality Contri-bution (sf)	Share of Income %	Internal in-equality I_2	Corre-lation χ	Relative inequality contri-bution (sf)
With Earnings									
0-29:	Interest	1.3	7.695	.173	2.2	0.9	3.034	.188	1.0
	Rent	0.2	39.520	.122	0.6	0.1	159.604	-.004	0.0
	Dividends	0.6	57.818	.148	2.2	0.3	84.540	.150	1.3
	Total	2.1	9.252	.225	5.0	1.3	6.704	.210	2.3
30-59:	Interest	2.1	4.438	.261	3.6	2.3	3.951	.216	2.2
	Rent	1.2	22.059	.225	3.8	0.8	68.625	.254	3.6
	Dividends	2.0	21.506	.251	7.2	2.5	63.419	.619	27.8
	Total	5.4	5.443	.383	14.7	5.7	17.535	.616	33.7
60+:	Interest	9.3	3.472	.450	20.8	4.7	3.046	.442	19.1
	Rent	4.1	12.561	.399	15.4	6.0	22.644	.194	6.5
	Dividends	4.8	11.629	.279	12.1	6.4	13.903	.349	12.2
	Total	18.2	2.887	.587	48.2	17.1	2.755	.554	37.8
Without Earnings									
0-29:	Interest	0.6	10.695	-.107	-0.6	0.3	8.930	-.185	-0.5
	Rent	0.4	49.038	.137	1.2	0.0	-	-	0.0
	Dividends	0.4	23.226	-.162	-0.9	0.1	33.647	-.133	-0.2
	Total	1.3	9.322	-.014	-0.2	0.4	7.165	-.211	-0.6
30-59:	Interest	6.8	4.711	.194	8.9	7.8	4.981	.178	8.6
	Rent	1.0	48.883	.246	5.3	1.7	42.917	.103	3.3
	Dividends	2.7	13.135	.173	5.3	1.8	29.257	.220	5.5
	Total	10.6	4.092	.298	19.5	11.3	4.689	.264	17.8
60+	Interest	14.5	3.252	.495	32.1	14.5	3.551	.503	32.1
	Rent	2.6	26.383	.257	8.3	2.5	45.049	.240	9.5
	Dividends	11.8	10.931	.625	59.8	8.0	10.550	.592	35.9
	Total	29.0	3.339	.770	100.2	25.0	3.212	.740	77.5
All Households									
	Interest	3.9	5.493	.169	3.6	4.0	5.434	.165	3.0
	Rent	1.4	27.857	.205	3.4	1.0	61.907	.182	3.0
	Dividends	2.9	19.515	.201	6.0	2.7	50.679	.490	19.2
	Total	8.2	5.359	.297	13.0	7.7	10.546	.501	25.2

However, these changes are relatively minor. On the other hand, the share of total income received in the form of dividend income by this group fell from 11.8 per cent in 1984 to a mere 8.0 per cent in 1988-89. That is, as a proportion of all disposable income it fell almost one-third. It is no wonder then that the contribution of this source of income to total inequality in 1988-89, and hence the change in inequality over the period, fell so considerably for this group.

Compare this with those households over 60 still participating in the labour force and receiving an earned income. Here the contribution of dividend income increased from 4.8 per cent to 6.4 per cent, an increase of about one-third. The over one-fifth increase in inequality of both dividend income distribution per se and its correlated relationship to overall income distribution suggests this dividend income increase went largely to higher income earners.

In the absence of any comprehensive wealth distribution statistics in Australia, we are unable to say with certainty whether the decline in dividend income of the 'retired' households was due to the nature of shares owned and the relative dividend yield obtained on those shares or a decline in the number of shares owned. However, the comparative change of those earning households over 60 suggests the strong possibility of the latter as the causal factor. Thus, the working hypothesis at this stage is that for some reason .retired households disposed of a substantial proportion of their share portfolio in the period 1984 to 1988-89. Who then may have purchased these?

We have just noted above that one group that increased their dividend income share was the elderly 'earner' households. These were largely self-employed households. All other groups, including the young and middle-age non-earner households and the younger earner households, had decreased dividend income as a share of total income. The sole exception is middle-aged (30-59) earning households, the subject of the other side of our current examination.

For these households, the share of dividend income increased from a seemingly minor 2.0 per cent to 2.5 per cent, or by around one-quarter. However, because of the relatively high level of internal dividend income inequality this increase was concentrated in the higher income levels. This is confirmed by the dramatic increase in internal inequality from I_2 of 21.506 in 1984 to 63.419 in 1988-89, a three-fold increase. Similarly, the correlation of dividend distribution with total income distribution increased dramatically from .251 to .619. In consequence, the contribution of dividend income to the total level of inequality in 1988-89 and the change over the 1984-89 period increased dramatically, as reflected in the final column of Table 5.5 and in Table 5.4. Remember also that whilst the change of half of one per cent in total income received from dividends may appear small, this subgroup of middle-aged earner households is not only the most populous but also the highest relative income earners. Thus, they receive the 'lion's share' of total income such that even a small change in one component is large in absolute terms.

Thus, our working hypothesis is that for some reason older households sold a substantial portion of their share portfolio between 1984 and 1988-89 and that this

was purchased by the higher income recipients in working households aged 30-59 and largely self-employed people working after 60 years of age.

It will be noted that the contribution of household member being the head also contributed most for this subgroup category (Table 5.4) relative to others as was the contribution of spouse; and that self-employment earnings and wage and salary income was also a significant contributor to the dramatic increase in income inequality (Table 5.1). An examination of the components of this inequality increase by source of income (see Appendix Four) suggests that for wages and salaries, the prime force was an increase in internal inequality of over 5 per cent for 30-59 year old households. For self-employed earnings the prime force was a dramatic increase in internal inequality of over 11 per cent for the 30-59 year-old earning households and over 50 per cent for the over 60 year old earning households. In summary, the available evidence is strongly suggestive of the hypothesis that the additional wages and more particularly self-employed earnings of these households, concentrated towards already high-income earners were used to purchase the share portfolio that the retired households were selling.

At this point, however, we should remember that we are dealing with trend inequality over two points in time almost five years apart. To confirm that this trend is corroborated by other available evidence and to isolate, if possible, the hypothesised share transfer with its significant implications for overall inequality, to a more narrow band of time, we have examined the distribution of dividend income by age and gross income for households as revealed by the 1981-82, 1985-86 and 1989-90 Income Distribution Surveys (IDS).

This examination confirms that such a dramatic shift in the receipt of dividend income by age of head of household occurred over the 1980s, particularly amongst higher income earners. The trend began in earnest between 1981-82 and 1985-86 and then continued to 1989-90. Thus we can begin to narrow the time period at which this first occurred: sometime between 1981-82 and 1985-86 (from IDS data) and between 1984 and 1988-89 (from HES data). The intersection leaves a narrow time span between 1984 and 1985-86.

Having begun to acquire these shares at around this point, these higher-income mid-to-older working households were then able to benefit from the disposable income and tax implications of the introduction of dividend imputation in 1987-88, discussed above. Hence their already high disposable income was dramatically increased (see Raskall and Urquhart, 1993, Table 2 for evidence from the *Taxation Statistics* of the actual value of this benefit). In consequence, inequality amongst these particular subgroups increased by the dramatic rates indicated above and total inequality amongst all groups increased also.

If we were to speculate on the reasons for this share transfer, with retired households transferring their shares (and subsequent dividend income) to higher income mature-aged earning households, then this apparent time span of around 1985 becomes critical. On the one hand, retired people could have found that with their disposable income living standards declining in the early part of the 1980s, there was a

necessity to realise this wealth. Albeit time-limited evidence from Raskall and Urquhart (1993) would support the decline in living standards, as would evidence of the recent Fitzgerald Report into Savings (Fitzgerald, 1993) which suggests a sharp decline in the flow of household savings (disposable income less consumption) in the late 1970s and early 1980s, following on from a further sharp decline in the early 1970s. The evidence of the 1984 HES of apparent negative current savings (defined in relation to income and consumption) of a large number of retired households, forcing them to draw on aggregate savings, would add weight to this.

Also of possible significance was speculation regarding possible tax changes proposed in the 'Tax Debate' of 1985. This could have created uncertainty and confusion such that retired households decided to sell off those assets. It is of interest that, having sold their share assets there is no indication of other investment type income (Table 5.7) of these households having altered their investment portfolio and placed the proceeds in other forms of capital (either property or interest-bearing assets). Indeed, from the decline in the contribution of the tax system as a proportionate share of disposable income it would appear that they did not translate the proceeds into other wealth forms providing taxable income. This suggests possibilities in the owner-occupied residential and renovation sectors.

It should also be noted that the rebate available on up to $1000 of dividend income for individual taxpayers which was introduced in the 1982-83 Budget was abolished as from 1 July 1983. The observable subsequent share transfers may also have been the result of this decision. The apparent change in share-ownership may not even have occurred through sale in the market. The abolition of gift duty and the speculation of possible re-introduction of both gift and inheritance tax could have seen a direct transfer to their children. Certainly the generational shift in the apparent pattern of ownership suggests such a possibility.

Finally, given the specific nature of the apparent 'selling' households - retired people heavily reliant upon social security pension benefits - suggests concern about changes in the pension system. In fact, the assets test, imputing an income for eligibility and receipt purposes of certain assets of pensioners was introduced in March 1985. It is possible that the fear of, or reaction to, this triggered the behavioural response observed above. Certainly all the factors discussed warrant further consideration.

Irrespective of the motivation for such changes, the fact remains that these decomposition analyses suggest that events concerning the ownership of shares, the receipt of dividend income, the distribution of that income and its taxation treatment all played a substantial part in underpinning the increase in inequality observed over the latter part of the 1980s.

5.5 Corroboration of Apparent Trends

Finally, to confirm that the two points in time and intermediate period selected, by virtue of data availability, were not abnormal and that the trends revealed and noted

above are not the mere consequence of this data period selection, we have examined the unit record files of the two Income Surveys conducted around the HES collection periods in the 1980s - specifically for 1985-86 and 1989-90. To enable comparison with the trends revealed in the HES data used, we have aggregated results to the household level and utilised the 'current' income concept adopted by the HES rather than the more usual 'annual' income concept adopted for analysis of the IDS. There are problems both of methodology and consistency which mitigate against undertaking a detailed comparison. For instance, we are forced to use the ABS tax imputation in the unit records for consistency, which is on an 'annual' basis. Similarly, comparison with times of more rapid and complex adjustments in the labour market conditioned by the rise of part-time and casual work as occurred in 1989-90 can lead to odd results. Our interest is then in the generality of results: are investment income and self-employment earnings the dominant contributions to change in inequality? With these caveats the comparative results for 1985-86 to 1989-90 are presented in Table 5.8. The emphasis is on comparability of change rather than the absolute results.

The first point to note is the major discrepancy in that, on the data presented, inequality as measured by I_2 using the ABS imputations and current gross incomes appeared to fall between IDS 1985-86 and 1989-90, although on a period or annual basis it actually increased. The reason lies in the fact that the 'current' income (largely wages) for 1989-90 relates to the survey period of September 1990 when the labour market was turning and weakening into recession. The tax data relates to the annual income over the year July 1989 to June 1990, a time of 'relatively' full employment (at least in terms of currently defined levels). In any event our interest is more in the contributory structure of inequality change.

Looking at the relative contribution to inequality change of different income sources in the bottom panel of Table 5.8, we can see that, with the exception of the reversal in the contributory sign of wages (referred to above), the pattern of HES change is confirmed by the IDS. The overwhelmingly dominant positive contribution to inequality is investment income, followed by self-employment earnings. The contribution of the other sources is broadly similar. This pattern is reinforced in the middle panel which shows the change in relative contribution to inequality structure. contribution of the other sources is broadly similar. This pattern is reinforced in the middle panel which shows the change in relative contribution to inequality structure. Again, the magnitude of the increased contribution and investment income and self-employment is approximately similar from both sets of data.

Thus, the trend of increasing significance in investment income and self-employed earnings and their dominant effect on change in inequality is confirmed.

5.6 Conclusion and Comparison with 'Recipient Characteristic' Decompositions

Aside from the actual results, the predominant lesson to be drawn from this section lies in the usefulness of the decomposition analyses, in this case by income source

Table 5.8: Comparison of IDS and HES Results: 1985-86 to 1989-90

	IDS 1985-86 to 1989-90	HES 1984 to 1988-89
Change in share of total income (%):		
Wages	-2.1	+2.0
Self-earnings	0.7	1.7
Investment	1.9	-0.5
Superannuation	-0.1	-0.3
Other	-0.1	-0.2
Government Benefits	-0.1	-1.8
Tax	-0.3	-1.1
Change in relative contribution to inequality structure:		
Wages	-3.3	-22.2
Self-earnings	4.4	1.6
Investment	11.8	12.2
Superannuation	-0.7	0.0
Other	-1.5	0.1
Government benefits	-0.4	+3.1
Tax	-10.6	+5.2
Contribution to inequality change		
Wages	-9	11
Self-earnings	3	9
Investment	10	21
Superannuation	-1	0
Other	-1	0
Government benefits	0	1
Tax	-8	-9
Total inequality change	-6	32

and household member, as a technique of 'forensic science', to build up a picture of the complex and changing nature of economic inequality. By conducting a series of decompositions at an aggregate household level we were able to utilise the inferences of the results to conduct sets of decompositions by various subgroups which provided the 'clue' for further and more focused interpretation of the aggregate results.

As far as the results themselves are concerned, the critical finding lies in the predominant significance of changes in investment income and, in particular, those associated with dividend income as the major contributor to increased total inequality in the latter part of the 1980s in Australia. Other significant factors were self-employment earnings and wages and salaries (by virtue of their increased significance in total income share, at least up to 1988-89). More particularly it was found that these movements in dividend income and their significance could be

traced to specific transfers from retired households to higher income 30-59 aged earning households.

The results of the 'income source' decompositions confirm the results obtained from the decompositions of household recipient characteristics. Those decompositions (outlined in Sections 3 and 4 above) indicated that between-group inequalities became less significant over the period of analysis and within-group inequalities in certain subgroups were the dominant contributors to inequality change. Those subgroups (for $\alpha = 1$ reflecting income shares, the nearest equivalent to the I_2 measures used in this section) were couple households of three persons including one dependent child aged 5-14 years where there were two employed persons in either full-time or self-employment, with the head being in either a managerial or professional occupation and aged between 35 and 64. Most pertinently when decomposed by principal source of income of the head of household the significant within-group contributors to total inequality change were first and foremost investment income, followed by self-employment earnings and wages and salaries.

This latter result is precisely the result the more specific and comprehensive decompositions by household income source in this section also yielded. Further, the household characteristics of that group whose within-group inequality contributed so much to inequality change is precisely the subgroup identified with major changes in dividend and self-employment income that the income source decomposition also isolate: middle-aged and older earning households, aged over 30, with a contributing spouse.

On the other hand, the subgroups that the 'household recipients' decompositions revealed as contributing negatively (that is, restrained growth) to inequality change were those not in the labour force, at the extremes of age (older and younger) and were more likely to be single. If in employment, the head was more likely to be in lower-paid, white-collar or blue-collar occupations.

The one apparently contradictory result that emerges by comparing the various sets of decompositions raises some interesting hypotheses. On a total household income basis in this section we observed the positive and relatively significant impact of self-employment earnings to total income inequality change. However, in the 'recipient characteristics' decompositions when we decomposed inequality by the employment status of the **head** of household, within-group inequality of households with self-employed heads contributed negatively to inequality change, at least for I_0 and I_1 (and the negative contribution reduced in moving from I_0 to I_1). One possible reconciliation of these apparently contradictory results may be that it is the spouses of the household heads in full-time waged employment and higher-income white-collar occupations who are the recipients of, and thus the contributing force to, self-employed income at the **household** level. That is, the significance of self-employment income to total inequality change comes not so much from the household head being self-employed as from the spouse of that head. Unfortunately, the limitations of the 1984 HES data preclude more specific analysis of the source of income of the spouse for that year.

6 Impact of Government on Within- and Between-Group Inequality

To date we have concentrated solely on the distribution of disposable income as that concept best reflecting the relative standard of living (in cash-money terms) of households. However, such an income concept reflects post-redistributive action by the government in the form of the provision of direct cash pensions and benefits to certain classes of people and the impact of the direct income tax system. By such activity the government can affect both within- and between-group inequality and in consequence overall inequality. Indeed, the concepts of within and between-group inequality could be considered as analogous to the welfare concepts of vertical and horizontal equity.

Musgrave (1959: 160) defines horizontal equity as the principle that people in equal positions should be treated equally, that is, equal treatment of equals. This is contrasted to the principle of vertical equity which is concerned with how people in different positions should be treated. This latter concept is thus more explicitly concerned with redistribution of income to reflect community goals of desired levels of equality, whereas the former is concerned to avoid discrimination between people who are equal in welfare terms.

The concepts are more generally applied in taxation theory, following Pigou (1951), to distinguish between the requirement that an equal sacrifice should be imposed on people in equal positions (which is the essence of horizontal equity) and Mill's principle that an equal sacrifice should be imposed on all people (which is one interpretation of vertical equity). Whilst in reality both principles may be considered as linked, as opposite sides of the same coin, it could be argued that the principal goal of the social security system is horizontal equity, that is, ensuring that people are not disadvantaged in welfare (income) terms by virtue of their particular circumstances - be that their family situation, the number of dependent children they have, whether they are disabled or not, their age in relation to labour force norms, or indeed, whether they have a job or not. On the other hand, whilst mindful of the principle of horizontal equity such that all income irrespective of source is treated equally, the taxation system could be argued to be more concerned with vertical equality.

In fact, it can also be argued that the use of equivalence scales, to reflect the different needs of households with respect to size and composition, represents an attempt to 'extract' horizontal inequality components so that the remaining levels of inequality in the distribution of such equivalenced income represents vertical or 'true' inequality.

As argued above, between-group inequality represents that portion of total inequality which is attributable to the differences between the subgroups defined in a particular decomposition of households. Within-group inequality represents that component

due to observed income differences within each of these subgroups. Thus, arguably between-group inequality, could be said to reflect horizontal inequality and within-group inequality, vertical inequality.

Without labouring this point, or putting over-much emphasis upon it, it is pertinent to examine how government activity through social security and taxation reduces not just overall inequality but its between- and within-group components.

Most analyses of redistribution tend to rely on summary measures, such as the Gini coefficient, and comparisons of the level of these at the market or private income level, the gross income level (adding social security payments), and finally, the disposable income level (subtracting income payments). Other studies such as the fiscal incidence studies of the Australian Bureau of Statistics (ABS, 1987 and 1992), Saunders et al. (1992) and Raskall and Urquhart (1993) extend this to cover aspects of indirect non-cash or social wage expenditure or indirect tax impacts. However, because of the previously discussed limitations of such measures as the Gini coefficient in relation to decomposability, these studies do not distinguish between between- and within-group inequality components and the relative impact of government taxes and transfers.

In Table 6.1 we present the set of summary inequality measures for different components of unadjusted household income distribution: market, gross and disposable for each of the two points in time and the trend between 1984 and 1988-89. From this table we can see that as we move to indices which are more sensitive to changes in the lower-end of the distribution $(I_{-1/2}, I_{-1})$ the revealed level of inequality, particularly in private or market income, increases dramatically. This reflects the increasing number of households who receive no such income either because they are retired from the labour force, unable to obtain a job or have no income from capital. For those measures which are more upper-income sensitive such market inequality falls.

With the addition of the social security transfers, overall inequality falls across all measures for gross income, as expected, as it does when we consider the tax system and after-tax or disposable income. Those measures more sensitive to the extremes remain highest and exhibit the greatest change. Again, the relative insensitivity of the Gini coefficient is highlighted.

From the percentage change over the period we can observe that, as far as market income is concerned inequality appeared to actually fall for one measure $(I_{1/2})$, although for all other measures there was an increase in aggregate inequality between 1984 and 1988-89. However, if we compare the change at each concept of income, we observe that in all situations the percentage increase in inequality in fact grows larger with the imposition of government activity, both the social security and taxation systems. This suggests that the cash-transfer system of government was less progressively redistributive in 1988-89 than in 1984, and this observation holds for both the social security and taxation system.

Table 6.1: Summary of Inequality Measures by Different Concepts of Income, Unadjusted Distribution: 1984 and 1988-89

Inequality Measure (x 1000)	1984			1988-89			Change 84-89 (%)		
	$M^{(a)}$	$G^{(b)}$	$D^{(c)}$	$M^{(a)}$	$G^{(b)}$	$D^{(c)}$	$M^{(a)}$	$G^{(b)}$	$D^{(c)}$
Gini	475	375	330	479	388	344	0.8	3.5	4.2
Covariance	892	721	610	953	797	702	6.8	10.5	30.7
Entropy Measures									
I_2	401	261	186	454	317	246	13.2	21.5	32.3
I_1	420	232	176	428	255	201	1.9	9.9	14.2
$I_{1/2}$	554	240	183	553	260	204	-0.2	8.3	11.5
I_0	1057	266	202	1071	292	227	1.3	9.8	12.4
$I_{-1/2}$	3787	328	246	4252	392	300	12.3	19.5	59.3
I_{-1}	25880	502	366	34610	893	671	33.7	77.9	83.3

Notes: a)   M   Market or Private Income (excludes social security payments)
          b)   G   Gross Income (includes social security payments)
          c)   D   Disposable Income (subtracts direct income tax).

This is not to suggest that the entire redistributive activity of government became less progressive. As Raskall and Urquhart (1993) point out, there was a shift in the mix of activity over the 1980s towards social wage expenditure (particularly in the area of education and health) which had a progressive redistributive impact. Thus, whilst the cash-transfer system, per se, may have had a lessened impact, the increased expenditure on social wage expenditures, particularly at the Commonwealth level, had a countervailing greater redistributive impact. It is also possible that with lag effects related to administrative arrangements of the social security (particularly eligibility) and taxation systems that the impact of government redistributive activity will vary over the business cycle, and at different stages of the cycle. In particular, it might react more slowly with consequent lesser apparent impact in an up-swing rather than a down-swing.

The other point to be recalled is that Table 6.1 is based on unadjusted household distribution such that variations might occur as a consequence of demographic changes in household composition and size. In Table 6.2 we reproduce these changes in inequality measures by income concept for person-weighted equivalenced income distribution.

From Table 6.2 we observe that, using an equivalenced distribution, the change in overall inequality in market income is reduced particularly for those more 'bottom-sensitive' measures. Inequality as measured by I_0 at the market level now falls in addition to $I_{1/2}$. The largest increase still occurs, though, for I_{-1}.

Table 6.2: Change in Equivalent Income Distribution by Income Concept: 1984 to 1988-89 (%)

Inequality Measure (x 1000)	Market	Gross	Disposable
Gini	2.1	3.4	4.7
Covariance	2.5	3.3	4.4
Entropy Measures			
I_2	13.2	23.5	35.3
I_1	0.6	9.1	11.8
$I_{1/2}$	-1.9	6.8	8.5
I_0	-1.6	6.8	7.1
$I_{-1/2}$	6.7	13.9	14.8
I_{-1}	24.8	56.9	60.1

However, the use of an equivalenced distribution does not change the conclusion above that, as far as the cash-transfer system is concerned, government activity in both the social security system and the taxation system had a lesser redistributive impact in 1988-89 compared to 1984, and that inequality change was greatest for all indices at the disposable income level.

As expected the lessened impact of the social security system appeared to impact more at the bottom-end of the distribution (I_{-1}), comparing the change at the gross income level with that at the market level. This possibly reflected tightened eligibility arrangements. Conversely, the lessened apparent impact of the taxation system, comparing the change at the disposable level with that at the gross level, appeared to affect more the upper-end of the distribution (I_2).

The question then becomes: did this reduced apparent impact of government activity affect between- or within-group inequality? That is, was it primarily a reduction in horizontal or vertical equality? Our first step is to decide upon which particular type of decomposition to examine the impact of government activity.

To link in with previous papers utilising the same framework (Raskall and McHutchison, 1992a and 1992b) we initially utilise the 'Life-cycle Cohort' partitionings. This is a comprehensive concept which defines subgroups of households by a combination of socio-demographic characteristics reflecting household composition, age, marital status, presence of dependent children, and their age, household size and family composition of the household (see Table 3.6 for the subgroupings). For the reasons outlined above, we use the equivalenced income distributions.

6.1 Between-Group Inequality

Table 6.3 shows for both 1984 and 1988-89 the percentage reduction in between-group inequality revealed by each measure as a consequence of: the social security system (the reduction in inequality at the gross level compared to the market level); the taxation system (the change in inequality from the gross to the disposable level compared to the market level); and in combination (the reduction in inequality at the disposable income level compared to the market level).

From Table 6.4 it is apparent that both the social security system and the taxation system operated in both years to reduce the extent of between-group inequality occurring as a result of the distribution of market or private inequality. As may be expected the primary contributor to this was the social security system which, depending on the inequality measure examined, reduced inequality by between one-half and two-thirds. The greatest impact occurred amongst those measures which are 'bottom-sensitive'.

From this point, the tax system operated to further reduce between-group inequality from the gross level by a further one-fifth to one-quarter in 1984 and a further one-third in 1988-89. In total, the tax system reduced market inequality by an average 10 per cent in 1984 and 13 per cent in 1988-89. Again the impact is stronger at the lower end of the distribution.

In combination, the two components of the governments cash-transfer system acted to reduce the market income level of between-group inequality by between 58 per cent and 76 per cent in 1984 and 64 per cent and 81 per cent in 1988-89. Comparing the two years, it is apparent that the operation of both the social security and the taxation systems in 1988-89 was such as to have a greater impact in reducing between-group inequalities than in 1984.

To confirm this, Table 6.4 outlines the change in between-group inequality at the various concepts of income between 1984 and 1988-89. From Table 6.4 it is apparent that, at the market or private income level, changes occurred in the period which reduced between-group inequality at all measures. However, the operation of the market (including both the capital and labour markets) was such as to particularly reduce between-group inequality at the upper-end of the distribution, as indicated by I_2 for which between group inequality fell by 13.5 per cent.

However, of particular pertinence for this section, the impact of social security transfers was to substantially increase this reduction in between-group inequality for all measures. This was particularly so for those measures that are sensitive to changes in the bottom part of the distribution (I_{-1}). Thus, whilst at the market income level, between-group inequality fell by 0.9 per cent for I_{-1}, at the gross income level, reflecting the impact of the social security system changes, between-group inequality fell by 8.2 per cent. For the middle-sensitive I_0 measure the reduction of 6.7 per cent in between-group inequality at the market income level was transformed with social security payments into a reduction of 11.1 per cent. Thus,

Table 6.3: Proportionate (%) Reduction in Between-group Inequality (Lifecycle Cohort) by Social Security and Tax System: 1984 and 1988-89

| | 1984 | | | 1988-89 | | |
Impact of:	Social Security	Tax	Both	Social Security	Tax	Both
Inequality Measure						
I_2	47	11	58	50	14	64
I_1	53	10	63	56	13	69
$I_{1/2}$	55	10	65	58	13	71
I_0	60	9	69	62	12	74
$I_{-1/2}$	63	9	72	68	11	77
I_{-1}	68	8	76	71	10	81

Table 6.4: Change in Between-group Inequality (Lifecycle Cohort) by Income Concept: 1984 to 1988-89

| | Absolute Change (x1000) | | | Percentage Change (%) | | |
Inequality Measure	Market	Gross	Disposable	Market	Gross	Disposable
I_2	-10	-7	-8	-13.5	-18.1	-25.8
I_1	-8	-6	-7	-10.3	-16.2	-24.1
$I_{1/2}$	-6	-5	-7	-7.3	-13.5	-24.1
I_0	-6	-4	-6	-6.7	-11.1	-21.4
$I_{-1/2}$	-4	-4	-6	-4.0	-10.8	-21.4
I_{-1}	-1	-3	-6	-0.9	-8.2	-21.4

for the period 1984 to 1988-89, changes in the social security system acted to reduce inequality between subgroups and so can be said to have enhanced horizontal equity.

A similar pattern emerges when we examine the impact of the income taxation system. By every inequality measure we use, between-group inequality fell by between 21 and 25 per cent at the disposable income level. Again, for each measure, this was in excess of the decline at the gross income level. The impact of the tax system in further reducing between-group inequality was proportionately greater at those more bottom-sensitive measures.

The clear conclusion is that the changes made to both the social security and taxation systems over the period from 1984 to 1988-89 had the impact of reducing inequality **between** the subgroups defined by the comprehensive life-cycle cohort socio-demographic characteristics.

To confirm this result for other forms of subgroup partitionings we replicated the analysis for two other decompositions: age and earnings status, the former because it is purely demographic and the latter because it is based on socio-economic characteristics. Table 6.5 outlines the reduction in between-group inequality arising from the combined interaction of the social security and taxation system for each year - that is, the difference between between-group inequality at the market and disposable level, as a proportion of the market level.

Table 6.5 not only confirms the results indicated above in respect of life-cycle cohorts in terms of the significance of the cash-transfer system in reducing between-group inequalities but also confirms that its success in doing so increased between 1984 and 1988-89. Indeed, for the socio-economic characteristic, earnings status, the increase in the reduction in between-group inequality consequent upon the cash-transfer system in 1988-89 was particularly strong (especially at the higher-end of the distribution.

The significance of this result has added impetus, in the light of the contribution of changes in between-group inequality, to overall inequality by specific household recipient characteristics examined earlier. It will be recalled that for virtually every decomposition examined, between-group inequality not only declined in significance as a contribution to total disposable income inequality but in most cases the changes in it were such as to restrain the growth of overall inequality. It becomes clear from this analysis that to a large extent this was due to changes in the operation of both the social security and taxation system over the period. Thus when we come to examine the contribution of government benefits and taxation to overall inequality these 'hidden' achievements in horizontal equity need to be borne in mind.

6.2 Within-Group Inequality

When we turn to the other component of overall inequality, within-group, a substantially different pattern emerges over the period. Table 6.6 shows the proportionate change in within-group inequality (for the life-cycle cohorts) as a consequence of the operation of the social security and tax system in both 1984 and 1988-89. As for Table 6.3 above, this shows the change in market, gross and disposable within-group inequality contingent upon the specific aspect of the government cash-transfer system.

Examining Table 6.6, a similar pattern to that shown in respect of between-group inequality emerges, the combined interaction of the social security and tax transfer system operates to dramatically reduce within-group inequality by every measure

Table 6.5: Proportionate Reduction in Between-group Inequality (Age and Earnings Status) by Combined Impact of Social Security and Tax System: 1984 and 1988-89 (%)

Inequality Measure	1984		1988-89	
	Age	Earning Status	Age	Earning Status
I_2	59	53	63	59
I_1	64	59	67	64
$I_{1/2}$	66	64	69	68
I_0	69	70	73	73
$I_{-1/2}$	72	77	75	79
I_{-1}	76	83	79	85

Table 6.6: Proportionate Change in Within-group Inequality (Lifecycle Cohorts) by Social Security and Tax System: 1984 and 1988-89 (%)

Impact of: Inequality Measure	1984			1988-89		
	Social Security	Tax	Both	Social Security	Tax	Both
I_2	34	23	57	28	20	48
I_1	46	16	62	40	15	55
$I_{1/2}$	60	11	71	55	11	66
I_0	78	6	84	75	7	82
$I_{-1/2}$	93	2	95	92	2	94
I_{-1}	98	1	99	97	1	98

examined. It is particularly important at reducing market inequality levels for measures that are bottom-sensitive. However, even for top-sensitive measures, within-group inequality is reduced by about a half.

At the bottom-sensitive end of the distribution, social security is overwhelmingly dominant, accounting for 98 of the 99 per cent fall in within-group inequality for I_{-1} in 1984. For more top-sensitive measures, the taxation system becomes more significant. However, even here the social security system is still dominant, accounting for 34 of the 57 per cent fall in market within-group inequality, with the taxation system accounting for the difference of 23 per cent. None of this should be surprising. Indeed, as indicated earlier one of the principal objectives of both the social security and the tax systems is to reduce inequality, particularly vertical inequality.

Compared to the proportionate reduction in between-group inequality, considered above (Table 6.3), in general, the reductions in within-group inequality due to the

combined effect of government cash-transfers are substantially greater, particularly at the lower end of the distributions. For those measures which are more sensitive to movements in the upper end, the total impact of both on between-group market income inequality tends to be greater.

When we examine the impact of the social security and taxation systems separately, from a solid base for I_2 the success of the social security system in reducing within-group inequality increases dramatically at each measure as they become more bottom-sensitive. On the other hand, from a peak of reducing market within-group inequality by about one-quarter at I_2, the tax system declines rapidly as a relative contributor to vertical equity as we move to more bottom sensitive measures, as it gets 'swamped' by social security measures.

Unlike the earlier analysis of government contribution to between-group inequality, a very different picture emerges when we examine the **change** in the contribution to reducing within-group market inequality between 1984 and 1988-89. For all measures of inequality, the combined contribution in reducing within-group market inequality was less in 1988-89 than in 1984. This is particularly noticeable for those measures reflecting upper-end sensitivity. From Table 6.6, for I_2, as an example, in 1984 the combined impact of social security and tax was such as to reduce within-group market inequality by 57 per cent. By 1988-89 this equalising contribution had been reduced to 48 per cent.

Across all inequality measures, the social security system was less successful in reducing inequality in 1988-89 compared to 1984, although the extent of this decline in impact was greater the more 'top-sensitive' the measure. Thus for I_2 in 1984, social security reduced market inequality by 34 per cent whereas in 1988-89 that reduction was limited to 28 per cent. On the other hand, the lessened impact of the tax system in reducing within-group inequality was revealed only in those measures I_1 and I_2 which are top-end sensitive. For the remainder the vertical inequality reducing capacity of the tax system was maintained from 1984 to 1988-89. In fact for the I_0 measure, its contribution was actually enhanced, albeit marginally.

To verify the decreased redistributive impact of government cash-transfer system, particularly the social security system, Table 6.7 outlines change in equivalent within-group inequality at the various concepts of income between 1984 and 1988-89, analogous to Table 6.4 for between-group inequality.

From an examination of Table 6.7, we can see that the majority of changes at the market income level occurred around the extremes of the distribution. For the middle-sensitive indices $I_{1/2}$ and I_0, inequality in market income distribution actually fell. Thus, the change at the market level as measured by the set of inequality measures follows an almost perfect U-shape with similar percentage increases at the extremes and a slight change in the middle.

However, when the changes in social security transfers outcome is superimposed on the market income distribution, then inequality at the gross income level increased

Table 6.7: Change in Within-group Inequality (Lifecycle Cohort) by Income Concept: 1984 to 1988-89 (%)

Inequality Measure	Absolute Change (x1000)			Percentage Change (%)		
	Market	Gross	Disposable	Market	Gross	Disposable
I_2	+55	+55	+52	+21.9	+33.3	+48.1
I_1	+10	+22	+22	+3.9	+15.8	+22.4
$I_{1/2}$	-2	+17	+16	-0.6	+12.1	+15.8
I_0	-7	+117	+16	-1.0	+11.0	+14.3
$I_{-1/2}$	+194	+35	+29	+7.2	+18.0	+22.0
I_{-1}	+4920	+206	+161	+24.9	+66.9	+70.0

for all measures. Given the likely incidence of its contribution to income, the change in social security impact in increasing inequality was greatest at the lower end of the distribution (I_{-1}). For all other measures the impact appears to add between 10 and 12 per cent to inequality change.

With the addition of the changes in the tax system, inequality increases for all measures at the disposable income level were greater again. The magnitude of these additional inequality increases was substantially less than occurred as a consequence of the social security transfers, with the exception of the I_2 measure reflecting changes in taxation affecting highest incomes.

In summary then, and contrary to the pattern revealed by changes in between-group inequality, the changes in the social security system and in the taxation system both served to increase within-group inequality over the 1984 to 1988-89 period. In the case of social security system this is particularly noticeable for the I_{-1} measure reflecting the lower extreme of the distribution, whereas for taxation a larger impact occurs with respect to the I_2 measure reflecting the upper extreme of the distribution.

One interpretation of this would be that the change in eligibility conditions for social security, ostensibly on the basis of targeting to need, may in fact have excluded many with apparently low incomes, or alternatively, the system may not have been designed to adequately accommodate those whose incomes fell dramatically to place them in the lower end of the distribution. On the other hand, the reduced impact of the tax system in reducing inequality at the upper ends of the distribution may be the consequence of reduced marginal tax rates or the introduction of schemes which advantaged particular high-income group sources of income such as dividend imputation.

To confirm the generality of this result with respect to within-group inequalities we examine again the consistency through other decompositions, by age group and earnings status group, in Table 6.8.

Table 6.8: Proportionate Reduction in Within-group Inequality (Age and Earnings Status) by Combined Impact of Social Security and Tax System: 1984 and 1988-89

Inequality Measure	1984 Age	1984 Earning Status	1988-89 Age	1988-89 Earning Status
I_2	52	52	43	35
I_1	56	64	53	46
$I_{1/2}$	67	69	65	64
I_0	82	86	81	85
$I_{-1/2}$	94	96	94	96
I_{-1}	99	99	98	98

This table not only confirms the decreased impact of the government cash-transfer system in reducing within-group inequality between 1984 and 1988-89 noted above for life-cycle cohorts, but also highlights the dramatic decline in its contribution to the reduction in within-group inequality by earnings status, particularly for the I_1 and the I_2 measures. This latter decline in apparent progressivity is particularly sharp and concentrated, being about double the change observed for the I_1 and I_2 measures for within life-cycle cohort inequality (Table 6.6) and that for within-age group inequality in Table 6.8.

6.3 Horizontal and Vertical Equity

The changes that occurred over the 1984 to 1989 period in the tax and social security systems reflect a realignment of the emphasis of horizontal and vertical equity. This is best illustrated by Table 6.9 which shows the relative contribution of each form of government redistributive activity towards reducing within- and between-group inequality, and the ratio of the two.

With respect to social security, the table shows the percentage reduction in total between-group (life-cycle cohort) inequality as a consequence of social security, measured by the difference between market and gross income measures as a proportion of the market income (from Table 6.3). Similarly, the same measurement concept is adopted for total within life-cycle cohort inequality. These two, reflecting the strength of the social security system in reducing between- and within-group inequality are then related in ratio form by dividing the between-group influence by within-group results. For assessment of the relative significance of the tax system to each form of inequality reduction a similar analysis is conducted. This time, though, the relevant measure is the difference between the relevant disposable and gross inequalities divided by the gross income inequality.

For the social security system the ratio declines as the α value decreases, whereas for the tax system it increases. That is, at I_{-1} social security acts more strongly to

Table 6.9: Relative Contribution to Within-group and Between-group Inequality of Tax and Social Security: 1984 and 1988-89

Year	Social Security Contribution to			Tax Contribution to		
	Between (%)	Within (%)	Ratio (B/W)	Between (%)	Within (%)	Ratio (B/W)
1984:						
Inequality Measure						
I_2	47	34	1.38	21	35	0.60
I_1	53	46	1.15	22	29	0.76
$I_{1/2}$	55	60	0.92	22	28	0.79
I_0	60	78	0.77	22	27	0.81
$I_{-1/2}$	63	93	0.67	22	27	0.81
I_{-1}	68	98	0.69	24	28	0.86
1988-89:						
I_2	50	28	1.79	28	27	1.04
I_1	56	40	1.40	29	25	1.16
$I_{1/2}$	58	55	1.05	31	25	1.24
I_0	62	75	0.83	31	25	1.24
$I_{-1/2}$	68	92	0.74	33	25	1.32
I_{-1}	71	98	0.72	35	25	1.40

reduce within-group inequality compared to the position at I_2 where between-group inequality reduction is more significant. For the tax system the conclusion is reversed.

Table 6.9 demonstrates clearly that between the two years, for every inequality measure, emphasising different segments of the distribution, the contribution of social security to the reduction in between-group inequality increased relative to its contribution to within-group inequality. This was particularly so at the I_2 measure where the ratio increased from 1.38 to 1.79. Even at the bottom-sensitive I_{-1} measure, the ratio of between- to within-group inequality reduction increased from 0.69 to 0.72

More dramatic still is the shift in emphasis of the taxation system between the two years. Consistently, across all inequality measures the relative contribution to between-group inequality reduction increased compared to its contribution to within-group reduction. The absolute magnitude of the two directions of redistribution is reversed.

That is, unlike in 1984, the income tax system in 1988-89 acted more, in absolute terms, to reduce between-group inequality rather than within-group inequality. For the I_{-1} measure, the relative contribution of between- to within-group inequality

reduction of the tax system increased from 0.86 in 1984 (that is, its impact on within-group inequality was more significant than on beween-group inequality) to 1.40 in 1988-89 (that is, a substantially greater relative impact on between-group inequality than on within-group). Even at the top-sensitive I_2 measure, the ratio increased from 0.60 to 1.04.

Thus, whether by policy design or an inability to respond to inequality change, over the 1984 to 1988-89 period the emphasis of government redistribution shifted away from the reduction of within-group inequality (vertical equity) towards reduction of between-group inequality (horizontal equity). One possible interpretation of this is that in the conflict with other government objectives such as efficiency or expenditure minimisation, the government was prepared to accept an outcome of greater vertical inequality than previously in attempting to redress horizontal inequality. Alternatively, the outcome may be the consequence of a structural change within the cash-transfer system, such that it was the nature and source of inequality change over the period that produced this outcome.

In particular, in Section 5, we noted the significance during the period of non-wage dividend and self-employment earnings to inequality change and, confirmed in Section 4, that this occured largely through the increase in within-group inequality of older working-age couples, who were already on a high income. In blunt colloquial terms, the inequality increase came from the 'rich' getting 'richer'. For a social security system based on a myriad of schemes targeted to those specifically in 'poverty' or in 'need', defined by specfic household characteristics, the challenge of reducing such an increase in vertical inequality may have been beyond it. For the income tax system, concern might be interpreted as having been about the impact of perceived high marginal tax rates on labour supply incentives (and thus operating through wage income) and to broaden the revenue base beyond the money-income concept by incorporating fringe benefits and capital gains with possible trade-offs for political acceptance. This, coupled with the paucity of current accurate data on share ownership, dividend receipt and self-employment earnings meant that the source of rising private or market inequality change eluded policy makers. Whatever its merits in achieving other objectives, the introduction of dividend imputation in 1987 certainly exacerbated the inequality increase already occuring. Indeed, if vertical equity was a goal in such policy-making, it could be argued that the concern with the level of inequality (dominated in perception by wages) overrode concern, or knowledge of, the causes of **changes** in inequality.

The use of decomposition analysis by household recipient characteristics to examine the contribution of government policy suggests that over the period of 1984 to 1988-89, both the tax and social security systems acted to reduce between-group inequality but exacerbated the increase in within-group inequality. In consequence, it was less than successful in reducing vertical inequality.

7 Comparison with United Kingdom

As indicated in the introduction, Jenkins (1992) has recently published the results of a similar set of decompositions for the United Kingdom over the period 1971 and 1986. This provides the opportunity for a comparison with the United Kingdom, both of the structure of inequality and the contributory factors underlying changes in inequality.

To facilitate such comparisons the results and variables have been recalibrated to provide as close a comparison as is available, subject of course, to comparability of the basic data. In that regard, Jenkins indicates that he has revised the public use UK FES (Family Expenditure Survey) data files to accord with actual, current income excluding the imputed value of income from owner-occupation (Jenkins, 1992, Appendix 25). This accords with the Australian HES data definition we have used. In addition, the sources of household disposable income correspond to those we have used, as does the 'household' unit of analysis. As in Jenkins' study households with negative or zero disposable income have been excluded. Thus, the data are broadly comparable.

Jenkins' decompositions by subgroup are based on distributions in which household incomes are adjusted using the McClements (1978) equivalence scale. All such distributions are person distributions (assuming incomes are shared equally within each household). His decompositions by income source, 'following the predominant practice in the literature', use unequivalenced household distributions.

Throughout this paper to date, where an equivalent income distribution has been utilised the scales used in O'Higgins et al. (1988) have been used to maintain comparability with previous research reported upon (Raskall and McHutchison 1992a and 1992b). However, for the purposes of this international comparison with the results of Jenkins' subgroup decompositions previous results have been revised by using the McClements' equivalence scale. In practice, as the comparison in Appendix Three indicates, the choice of these two equivalence scales makes little difference to the results.

The variables for the subgroup decompositions have been re-defined to accord as closely as the HES variable definitions enable us. Jenkins selected four partitions: age of household head; household type; earnings status; and standard region. Unfortunately, the provision of HES data by spatial division is not as comprehensive as it would appear to be in the UK FES files, nor is it consistent between the two survey periods that are examined. In 1984, the HES data was capable of disaggregation only by state of residence, but in 1988-89, the state variable was replaced by a spatial variable reflecting the capital city, other urban and rural areas. Consequently, this spatial decompositon is not available for comparison. The remaining subgroups are defined in the notes to Table 7.2 below. Attention is concentrated on Jenkin's results for 1981 and 1986, as the nearest temporal comparison, although the differences in the two analysis periods should be noted.

7.1 Aggregate Inequality

Table 7.1 outlines a set of aggregate inequality measures for both countries. Both countries display an increase in inequality by all measures with the passage of time. On an unadjusted household distribution basis, apparent inequality, as measured by the I_2 ($\alpha = 2$) measure, is less in Australia in 1984 than in the UK in either 1981 or 1986. However, when adjustment is made based on the McClements equivalence scale to reflect 'true' inequality, then for every one of the five measures used, inequality in Australia in 1984 was greater than or equal to the UK in 1981 except for the I_2 measure, which, as indicated previously, is sensitive to higher incomes. However, as we move to more mid-distribution sensitivity measures, Australian inequality is far greater, even for the Gini coefficient. Thus, the greatest difference occurs for the population-share-only weighted index, I_0.

By 1986, however, inequality in the UK had exceeded the level of inequality in Australia in 1984 by all indices with one exception. That exception occurs in the I_0 index again. The increase in the I_0 indices (population weights) in the UK between 1981 and 1986 was not sufficient to eliminate the initially high difference between the Australian and UK measures.

By 1988-89 in Australia, the increase in inequality in the period resulted in the Australian value for the I_0, I_1 and the Gini coefficient again exceeding its UK counterpart for 1986. However, for those measures (I_2 and C_{ov}) which are most susceptible to changes in the upper end of the distribution, the increase in Australia, although dramatic (32.6 per cent) was less than that in the UK such that for these measures Australia was less unequal than the UK. Again, for the unadjusted household distribution, the I_2 measure of inequality was greater in the UK than in Australia.

If we look at the patterns of change in inequality, then we observe similarity in that inequality increases in both countries were less in middle-sensitive measures than in those measures which were more top-sensitive. In all measures, the increase in the UK 1981 to 1986, exceeded that in Australia for 1984 to 1988-89. If we accept the evidence, based on microsimulation modelling, reported by Raskall and Urquhart (1993) that inequality in the 1980s decade reached its peak in 1988-89 and if the UK trend in the early part of the decade was continued into the later part, then it is likely that at the end of the 1980s, inequality in the UK exceeded that in Australia. Atkinson (1993) concludes a survey of more recent trends in income inequality in the UK, including the 1988 Family Expenditure Survey, with the comment that 'there are grounds to believe that the rise between 1985 and later years in the 1980s was even more marked' (Atkinson, 1993: 19). With the onset of recession in both countries in the early part of the 1990s, certainly dramatically increasing inequality in Australia (see Saunders, 1992b), the relative current comparative inequality is now more uncertain.

Table 7.1: Aggregate Inequality: Australia (1984 to 1988-89) and UK (1981 to 1986)[a]

Inequality Index		Australia 1984	Australia 1988-89	%Δ	UK 1981	UK 1986	%Δ
Squared $C_{ov} \div 2$	I_2	138	183	32.6	138	192	39.1
Thiel	I_1	127	142	12.6	117	141	20.5
Mean Log. deviation	I_0	141	152	7.8	117	135	15.4
Coefficient of variation	C_{ov}	524	604	15.3	525	620	18.1
Gini	G	278	284	2.2	263	282	7.2
(Unadjusted)	I_2	186	247	32.8	202	260	28.7

Note: a)   Based on McClements Equivalence Scale.

Source: Jenkins (1992), Table 1 and Table 6; and Table 2 above.

In examining differences in the pattern of inequality change in each country to elucidate national characteristics it becomes apparent that the increase in inequality in Australia relative to the UK is closer the more upper-sensitive the measure; comparing, for example, the change in I_2 and I_0 in the two nations, Australia comes closer to the UK rate. This would seem to confirm our conclusion in the earlier section that changes in the dividend and other capital income inequalities in Australia were the significant cause of the increase in the later part of the 1980s, given their concentration in the upper deciles. More particularly, in 1984, moving from I_0 to I_2, actually shows reduced inequality in Australia. Whereas in the UK, in both 1981 and 1986, such a comparison of inequality indices was accompanied by increased apparent inequality. However by 1988-89, the Australian pattern had changed so that moving from I_0 and I_2 resulted in a substantial increase in the inequality index, though not quite matching that of the UK.

In summary then, in comparing the above sets of figures for the eighties, it would appear that inequality as measured by more conventional middle-sensitive measures was substantially higher in Australia than the UK. However, the UK was closing this gap up to 1986 such that, speculatively, it may have surpassed Australian inequality prior to the current recession. On the other hand, for the more upper-end sensitive I_2 measure, inequality in Australia was uniquely less than for I_0 in 1984, but on a par with the UK 1981 figure. However, again the increase in the UK over the period 1981-86 exceeded the increase between 1984 and 1988-89 in Australia. Over this time, though, the inequality in the upper end in Australia (I_2) showed a

much greater increase than the middle-sensitive I_0 such that in terms of inequality over the entire distribution, Australia's pattern was becoming more like that observed for the UK. Taking these figures as the latest comparably available, then at $\alpha = 0$, inequality is greater in Australia and at $\alpha = 2$, it is greater in the UK (giving greater weight to the upper end of the distribution). Such complexities in the pattern of overall inequality suggest the necessity to utilse a range of inequality measures, as indeed Atkinson (1993) does.

7.2 Household Characteristic Decompositions

Between- and Within-Group Inequality

Tables 7.2 and 7.3 present the results of the comparable decompositions by various subgroup partitioning for Australia, compared with Jenkins' reported results for the UK. The results are presented for $\alpha = 0$ and $\alpha = 2$ in both years.

As far as the structure of inequality, as revealed by the between-group components are concerned (Table 7.2) it becomes apparent that significant differences occur between Australia and the United Kingdom.

Age. In both countries, age is a relatively small contributor to overall inequality. Whilst the significance of between age-group inequality declines for the upper end sensitive measures in both countries, between-group inequality by age is **less significant** in Australia than the UK in both absolute and proportional (to total inequality) terms. However, between the two points in time, it is of increasing absolute significance in Australia but decreasing in the UK. In terms of its proportional contribution to overall inequality it continues to be very small in both countries.

Household Type. In contrast to inequality between age groups, inequality between household types is **more significant** in Australia than the UK, both in absolute and proportional terms. Whereas in Australia this significance decreased significantly between the two periods, it remained relatively stable (perhaps marginally declining for I_2) in the UK. In addition, moving from I_0 to the measure more sensitive to the upper end of the distribution marginally reduces the significance of household type in Australia, it increased its significance in the UK in 1981 (although by 1986, a marginal decrease occurred).

Earning Status. Between-group inequality by earnings status (reflecting the number of wage or self-employed earners in a household) shows the largest difference between Australia and the UK. Earnings status is substantially **more significant** in both absolute and relative terms in Australia. Inequality between groups based on earnings status explains over 27 per cent of total inequality in Australia but only 20 per cent in the UK (for $\alpha = 0$). For the I_2 measure, this international difference is even more substantial, averaging for the two survey years over 20 per cent of total inequality in Australia and less than 14 per cent in the UK.

Table 7.2: Between-group[a] Inequality: Australia (1984 to 1988-89) and UK (1981 to 1986)

| | Australia | | | | UK | | | |
| | 1984 | | 1988-89 | | 1981 | | 1986 | |
α =	0	2	0	2	0	2	0	2
Age	5	5	6	5	7	6	6	5
Household type	27	26	23	22	19	20	19	18
Earnings status	39	33	40	32	24	21	27	24
Overall	141	137	152	183	117	138	135	192

Note: a)   Subgroups defined as follows:

Age of Household head:	<25; 25-34; 34-44; 45-54; 55-64; 65-74; 75+
Household type:	1 Adult/head aged 65+; 2+ Adults aged 65+; 1 Adult; 2 Adults; 3+ Adults; 1 Adult and Children; 2 Adults and 1 child; 2 Adults and 2 children; 2 adults and 3+ children; 3+ adults and children.
Earnings status:	1 Adult, no Earner; 1 Adult Earner; 2+ Adults, no Earners; 2+ Adult, 2 Earners; Head aged 65+, no Earner; Head 65+, 1 Earner.

Source: HES Unit Record File, 1984 and 1988-89.
           Jenkins (1992), Table 3.

Table 7.3: Within-group Inequality: Australia (1984 to 1988-89) and UK (1981 to 1986)

| | Australia | | | | UK | | | |
| | 1984 | | 1988-89 | | 1981 | | 1986 | |
α =	0	2	0	2	0	2	0	2
Age	136	133	146	178	110	132	129	187
Household type	114	112	129	161	98	118	116	174
Earnings status	102	105	112	151	93	118	107	168
Overall	141	138	152	183	117	138	135	192

Note: As for Table 7.2

Source: HES Unit Record File, 1984 and 1988-89.
           Jenkins (1992), Table 3.

For the I_0 measure, the contribution of between group inequality in Australia to total inequality decreased substantially between 1984 and 1988-89 with all of the increase in inequality occurring within subgroup inequality. In contrast, in the UK, the significance of earnings status for this measure actually increased in absolute terms although the larger increase in total inequality implies a slight reduction in proportionate contribution.

If we turn to Table 7.3, showing total within-group inequality, the converse of the above picture emerges. Within-group age inequality is greater in Australia for both periods for the I_0 index but less than in the UK for the I_2 measure. However, the UK was rapidly closing the gap for I_0.

With respect to inequality within household types, for I_0, Australian inequality exceeds that of the UK for both years although the relative disparity was decreasing. For I_2, however, inequality within household type subgroups in the UK exceeded that in Australia.

For earnings status, a similar pattern to that for household type emerges. At I_0 (mid-distribution sensitive) inequality within these groups in Australia exceeds that in the UK in both years, but at I_2 (upper-end sensitive) inequality in the UK is greater. However, in both cases the relative disparity is lessening.

In summary:

* inequality between household types and earnings status groups, both reflecting household composition, is greater in Australia than the UK; and

* within-group inequality amongst household types and earning status groups is greater in Australia for I_0, but greater in UK for I_2.

Most significantly, in all of the above, the relative disparity between the nations was decreasing, although the reader is again cautioned to note the discrepancies in time between the sets of surveys.

Changes in Aggregate Inequality

Turning from analysis of the **structure** of inequality in the two nations during the 1980s, decomposition of the **changes** in aggregate inequality, the similarities and differences we inferred above become more clear-cut.

Table 7.4, analogous to Jenkins (1992: Table 3) sets out the contribution of the various within- and between-group inequalities to the change in aggregate inequality observed for both values of α sensitivity.

Looking firstly at Australia for the 1984 to 1989 period, with α set at zero, Table 7.4 shows that the overwhelming majority of the aggregate inequality change (7.8 per

Table 7.4: Decomposition of Changes in Aggregate Income Inequality:[a] Australia (1984 to 1988-89) and UK (1981 to 1986)

Inequality Measure	I_0			I_2		
	Aggregate inequality	Accounted for by changes in		Aggregate inequality	Accounted for by changes in	
	%Δ	Within	Between	%Δ	Within	Between
Australia: 84-89						
Age	7.8	7.1	0.7	32.6	32.6	0.0
Household type		10.6	-2.8		35.5	-2.9
Earnings status		7.1	0.7		33.3	-0.7
UK: 81-86						
Age	15.4	16.2	-0.9	39.1	39.8	-0.7
Household type		15.4	0.0		40.6	-1.4
Earnings status		12.8	2.6		36.9	2.2

Note: a)   Based on McClements Equivalence Scale.

Source: HES Unit Record Files, 1984 and 1988-89
          Jenkins (1992) Table 3.

cent) was accounted for by the increase in within subgroup inequality irrespective of the decomposition partitioning adopted. Indeed, between-group inequality **reduced** its contribution substantially for household type decompositon.

If we compare this pattern to the similar analysis for the UK for 1981 to 1986, then the similarity of the overwhelming predominant factor of increased within-group inequality is immediately apparent. However, closer examination suggests some subtle differences. In respect of age, in Australia there was some contribution, albeit small (about 10 per cent of the change in total inequality), from between-group inequality, whereas in the UK between-group age inequality actually fell. In the household type decomposition the between-group inequality fell substantially (about 40 per cent as a contributing factor) in Australia, but not in the UK. Finally, between-group earnings status inequality contributed substantially (about 20 per cent of the percentage change in aggregate inequality in the UK) whereas it was virtually insignificant in Australia.

For the other inequality measure analysed, I_2, a similar international comparison in respect of between-group age inequality is apparent. However, in the UK, between-group household type inequality actually fell but nowhere near the extent of the

reduction in Australia. On the other hand, all of the 32.6 per cent change in aggregate inequality in Australia was accounted for by changes in within-group earnings status inequality, with between-group inequality actually contributing a negative factor (-0.7). Conversely, in the UK, again between-group inequality changes in earnings status positively contributed at least some of the aggregate inequality change.

Within Subgroup Contribution to Aggregate Inequality

Aside from these subtle distinctions, the clear common factor is the dominance of within-group inequality change as the contributing factor to aggregate inequality change. However, the decomposition technique enables us to examine the differences in such a common picture, by examining the relative within subgroup contribution to total inequality in both nations as outlined in Table 7.5. Analogous to Table 3.6 in Section 3, this table outlines, for $\alpha = 0$, the contribution of each subgroup to aggregate inequality, based on internal inequality and population shares. For completeness, the between-group inequality is also shown so that for each partition the relative contribution to aggregate inequality can be examined. Thus, for each partition, subject to rounding errors the percentage contributions total 100.

Looking at this decomposed structure of inequality, the commonalities and differences between Australia and the UK as they transpose into inequality terms are highlighted. In terms of the commonalities, aside from the already observed relative significance (or not) of between-group inequality we can observe the main results.

Age:

- the dominance in the two countries of within-group inequality of those aged 25-34 and 35-44;

- the significance in movement over time of the 'bulge' of the 'baby-boomer' generation, from 25-34 in the earlier period to 35-44 in the latter; and

- the greater congruence of structure between the two countries in the later surveys compared with the earlier.

Household Type:

- the more diverse contributions of within-group inequality from the various household types compared to the other partitionings;

- the decreased significance over time of large families with three or more children;

- the most significant contribution in both countries in the earlier period came from between-group inequality, singly, and two-adult families in combination; and

Table 7.5: Within Subgroup Contribution to Aggregate Inequality:[a] Australia (1984 to 1988-89) and UK (1981 to 1986) ($\alpha = 0$)

| | Australia | | UK | |
	1984	1988-89	1981	1986
Age of Head:				
<25	4	4	6	5
25-34	29	22	23	24
35-44	26	30	24	27
45-54	18	17	17	16
55-64	10	13	14	13
65-74	6	7	7	7
75+	3	3	3	4
Between-group	4	4	6	4
Household Type:				
1 adult aged 65+	2	2	2	3
2 adults aged 65+	7	8	8	8
1 adult	5	6	5	8
2 adults	14	16	15	18
3+ adults	5	8	6	7
1 adult and child/ren	2	2	2	2
2 adults and 1 child	8	9	9	9
2 adults and 2 children	16	17	15	14
2 adults and 3+ children	16	10	12	8
3+ adults and child/ren	6	7	9	9
Between-group	19	15	17	14
Earning Status				
No earner aged 65+	5	5	7	9
1+ earner aged 65+	2	2	2	2
1 adult, no earner	2	3	2	4
1 adult, 1 earner	4	4	4	5
2+ adults, no earners	5	6	9	11
2+ adults, 1 earner	17	17	27	24
2+ adults, 2 earners	38	37	28	25
Between-group	28	26	22	20

Note: a)   Based on McClements Equivalence Scale.

- at the latter survey time, with the decline in this between-household-group inequality, within-subgroup inequalities became the most significant: notably two adult only households and two adult and two children households, that is couples with or without two children.

Earning Status:

- the dominance of within-subgroup inequality amongst two-earner households in both countries.

Despite these similarities, some notable structural differences become apparent. These can be, analogously to the above, summarised as follows.

Age:

- the greater significance at least in the earlier time period of the dominant 25-44 age subgroups in Australia. Their combined total of 55 per cent exceeds that of the equivalent group in the UK by a full eight per cent, far more than between-group inequality in both countries. However, by the later data time this had equalised to around 51-52 per cent in both countries;

- the increased significance of inequality within the younger (<25) age group in the UK; and

- the greater significance in inequality in 1981 in the UK amongst the 45-54 age group.

Household Type:

- the increased significance of single-person households in 1986 in the UK;

- the greater significance of the two-person only adult household type in the UK in the later period, and conversely the greater significance of households with two or more children in Australia; and

- the greater significance of larger households containing at least three or more adults with children in the UK.

Earning Status:

- the increasing and greater significance of households with no earner in the UK, particularly in 1986, whether the head was aged over 65 or a single adult and most notably with two or more adults; and

- the significantly greater contribution of two or more adult households with two earners in Australia.

The significant distinction between the two countries by number of earners is the most notable overall conclusion to be drawn from this comparison between the two nation's within subgroup inequality structure. The contribution of within-group inequality for households with no earners was 24 per cent for the UK in 1986, compared to only 14 per cent in Australia. For households with only one earner the relative comparison was 29 per cent for the UK and only 21 per cent for Australia. On the other hand, for households with two earners, the contribution to overall

inequality was 37 per cent in Australia compared to only 25 per cent in the UK. Such significance occurs despite a relatively comparable structural contribution by each household type. This suggests that, at least comparing the UK of 1986 with Australia in either 1984 or 1988-89, lack of participation in the employment market either through lower labour force participation of spouses or unemployment was a more significant factor affecting inequality in the UK.

Relative Within-subgroup Contributions to Aggregate Inequality Change

More pertinent than merely decomposing the structure of inequality in each country in indicating the comparative features of the changing nature of inequality, is the decomposition of both within-subgroup and between-group contributions to the trend aggregate inequality change between the latest two points in time (1984 to 1989 for Australia and 1981 to 1986 for the UK).

Table 7.6 is derived from the data provided in Table 7.5 and from Jenkins (1992, Tables 3 and 5). It shows the absolute contribution to the change in total inequality (eight per cent in Australia and 15 per cent in the UK) of changes in between-group inequality and the various within subgroup inequalities for each partitioning by household characteristic. Thus for Australia, for the age decomposition the increase in the within-subgroup inequality of households headed by 35-44 year olds contributed six per cent of the total eight per cent increase in total inequality in the 1984 to 1989 period. The increase in inequality of the same subgroup contributed seven per cent of the total 16 per cent increase observed in UK inequality in the 1981 to 1986 period.

The final column is the difference between the two relevant inequality changes of the two countries and is expressed in absolute percentage terms. Thus, the smaller this value is, the closer is the absolute contribution to change over the period of investigation of each within subgroup inequality change and between-group change, between the UK and Australia. It can be seen that the most significant difference between the decomposed inequality trends relates to the within-group inequality change of households where the head is aged 25-34. This fell substantially in Australia between 1984 and 1988-89 but rose substantially in the UK between 1981 and 1986.

Such changes can have two causes: a change in population share or a change in within-group inequality. We know that in Australia the fall occurred in response to a fall in both factors: within subgroup inequality which fell by eight per cent on a McClements adjusted equivalent income basis, and the person-weighted population share by three per cent between 1984 and 1988-89. Unfortunately, such a detailed breakdown is not available from Jenkins (1992).

Other notable differences in inequality impact occurred with respect to childless couples and single adults, and households with nil or only one earner where the contribution of within-group to aggregate change was much greater in the UK.

Table 7.6: Within Subgroup and Between-group Contribution to Inequality Change: Australia (1984 to 1988-89) and UK (1981 to 1986) ($\alpha = 0$)

Subgroup	Australia	United Kingdom	Difference
Age of Head:			
<25	0	0	0
25-34	-5	5	10
35-44	6	7	1
45-54	0	2	2
55-64	4	1	3
65-74	2	1	1
75+	0	1	1
Between-group	0	-1	1
Household Type:			
1 adult aged 65+	0	2	2
2 adults aged 65+	2	1	1
1 adult	1	4	3
2 adults	3	6	3
3+ adults	4	2	2
1 adult and child/ren	0	0	0
2 adults and 1 child	2	2	0
2 adults and 2 children	2	1	1
2 adults 3+ children	-5	-3	2
3+ adults and child/ren	2	2	0
Between-group	-3	-1	2
Earning Status			
No earners aged 65+	0	3	3
1+ earner aged 65+	0	0	0
1 adult, no earners	1	3	2
1 adult, 1 earner	0	2	2
2+ adults, no earners	2	4	2
2+ adults, 1 earner	1	1	0
2+ adults, 2 earners	3	1	2
Between-group	0	2	2
Total change in inequality	8	15	7

Note: Sub-totals may not sum exactly to total due to rounding.

Conversely, such within-group contributions to change were greater in Australia for older-aged households, larger shared households and two-earner households.

7.3 Decompositions by Income Source

With respect to the second set of decompositions undertaken - contributions to inequality by source of income - several data limitations hinder our capacity for international comparisons.

Jenkins presents his similar decompositions by separating the earned income from either wages or self-employment for both the head and the spouse in the household. Unfortunately, as indicated above, the 1984 Australian HES unit record tape only provides income source data at the household level. Head and spouse data is only available at the all sources level. On the other hand, whilst head and spouse earned income is delineated, Jenkins (1992) combines the earned income of other members of the household together with other income (such as alimony and maintenance) of all household members. Consequently, we are limited in our capacity to undertake comparative decompositions of inequality change.

Structure of Inequality

However, for the latest data period (1988-89 in Australia and 1986 in the UK) it is possible to compare the component contribution to the structure of inequality of each income source. This is outlined in Table 7.7. Following Jenkins, for these purposes the unadjusted household income distribution with the α value set at 2, that is the I_2 measure has been utilised . Thus the aggregate results will differ slightly from those presented above for recipient characteristic. Indeed, on the unadjusted distribution, inequality is greater in Australia in 1988-89 than the UK in 1986 which reverses the result above for equivalent income.

Looking firstly at relative factor shares, it is apparent that head earnings were greater in Australia, comprising 73 per cent of disposable income compared to only 62 per cent in the UK. Similarly, spouse earnings in Australia were larger at 22 per cent compared to 16 per cent in the UK. Since the converse was true with respect to government benefits, with UK households receiving 20 per cent from government benefits compared to only 13 per cent in Australia, this would suggest that the impact of unemployment was greater at the relevant time in the UK. It also suggests the need for caution in such time-dependent international comparisons and reinforces the conclusions of Raskall and Urquhart (1993) regarding the need to consider cyclical fluctuations in assessing inequality at any particular point in time and trends over time. International comparison compounds this point.

In looking at the factor share from capital, it is somewhat surprising in terms of cultural stereotypes to note that income from investments at eight per cent in Australia is substantially higher than the five per cent in UK. This may again reflect differential interest rates in the two countries contingent upon the business cycle and monetary policy.

Reflecting the greater tradition concerning occupational pensions (superannuation) in the UK, its share of total income is larger than the two per cent in Australia as at 1988-89. However, certainly within Australia, the introduction of a Statutory Superannuation Guarantee levy on employers in 1992 will, in time, substantially increase this rate.

Table 7.7: Decompositions by Income Source: Australia (1984 to 1988-89) and UK (1981 to 1986)

	Australia					United Kingdom				
	Factor shares	Correlations	Factor inequalities	Proportionate contribution	Absolute contribution	Factor shares	Correlation	Factor inequality	Proportionate contribution	Absolute contribution
Head										
- wages	64	.648	516	60	147	54	.596	879	59	154
- self-earnings	9	.326	7949	16	39	8	.445	14242	27	70
Spouse										
- wages	18	.486	1862	24	59	15	.464	2210	20	51
- self-earnings	4	.241	12318	6	15	1	.171	58156	2	5
Household										
- investment	8	.501	10546	25	62	5	.283	8264	9	23
- superannuation	2	-.009	17848	0	0	5	.087	5701	2	6
- other	11	.450	3864	20	49	14	.408	3362	20	53
- others wages	10	.443	4433	19	47					
- other income	1	.073	21468	1	2					
Govt. benefits	13	-.328	1017	-8	-21	20	-.310	464	-8	-22
Income tax	-26	-.880	793	-42	-103	-17	-.699	1202	-25	-65
National Insurance						-6	-.654	605	-6	-15
Disposable income	100	1.000	247	100	247	100	1.000	260	100	260

Source: HES Unit Record File, 1988-89.
Jenkins (1992), Table 6.

Finally, it is noted that the (negative) contribution of income tax in Australia to total income exceeded the combined shares of income tax and national insurance (or social security) contribution in the UK. As indicated above this may be the result of each nation being at a different stage in the business cycle with different levels of unemployment. Alternatively, it may reveal differences in the structure of the entire tax system as other, notably capital and indirect, taxes (such as VAT) are not included in the analysis. Of course, it may also reflect different progressivity of the income tax system. Related to this, it should be recalled that the examination is of the I_2 (that is, $\alpha = 2$) measure which is more sensitive to the higher-income end of the distribution. Thus, for instance, the lower factor share of government benefits in Australia may reflect greater targeting of benefits in that country.

Turning to the contributions to total inequality of each income source, which is also dependent upon the correlations with total disposable income and the internal source factor inequalities, then a different pattern emerges. Although wages and salaries of the head of household are 10 per cent greater as a factor share in Australia, because they are more equally distributed (as indicated by comparative factor inequalities), the proportionate contribution of head's wages in both countries is on a parity, around 60 per cent. Similarly, because self-employment earnings by the head of household is substantially more equally distributed in Australia, the proportionate contribution of such earnings is greatly (almost doubly) significant in the UK. This significance of self-employment earnings is a point that Jenkins examines in detail in his paper (1992: 20-22). However, it does not appear to have the same influence in Australia, at least in 1988-89.

As far as spouse earnings are concerned, the greater inequality among recipients in the UK for both wages and earnings from self-employment is countered by the more even spread across the distribution of all incomes (reflected in the correlation) such that the proportional contribution to total inequality reflects relative factor shares, which is greater in Australia. Thus, in Australia specific spouse earnings income contributed 30 per cent to total inequality, compared to 22 per cent in the UK.

The greatest difference between the two countries is also perhaps the most surprising. In respect of investment income, in the form of dividends, interest and rents, the contribution to aggregate inequality in Australia, at 25 per cent, is dramatically higher than in the UK, at a mere nine per cent. This is despite the fact that it comprises eight per cent of factor share in Australia, compared to five per cent in the UK. This stems from the dramatically higher correlation of investment income with total disposable income in Australia compared with the UK, and the higher inequality within its factor distribution. It was more evenly distributed across households in the income distribution in the UK, and thus its contribution to overall inequality was much less.

Finally, in looking at the structure of inequality comparatively we can also examine the contribution of the direct government redistributive system through income tax and social security contributions and receipts. The differences in the relative factor

shares has already been noted as well as the possible implications of the inequality measure (upper-end sensitive).

As far as direct government benefits are concerned, despite its smaller factor share in Australia, and slightly greater targeting (comparing the correlations with total income), its contribution to reducing overall inequality is the same (about eight per cent) in both nations. This stems from the substantially greater internal inequality in its distribution in Australia (1017 compared to 464 in the UK). One interpretation of this may be greater universality of provision of actual receipt, that is, a greater number getting a more widely varying amount (with means-testing) compared to the UK where fewer get much the same amount. In other words, targeting is based less on eligibility conditions and more on income tests.

On the other hand, the income tax system in Australia compared to the combined impact of the tax and national insurance contributions is much greater in reducing inequality (42 per cent) compared to the UK (31 per cent). A comparison of both the factor inequality and the correlation with total income distribution suggests that it is more heavily borne by higher-income earners.

In total, therefore, for this I_2 measure of inequality, the combined impact of the direct tax-transfer system in Australia appears to reduce private income inequality by a much greater extent than in the UK. The total negative proportionate contribution related to disposable income inequality is 50 per cent in comparison to 39 per cent in the UK. Again the caveats in respect of the particular date of the survey data, in relation to the levels of unemployment and the business cycle, and the use of the I_2 measure should be noted in interpreting this result.

Contributions of Income Source to Inequality Trends

As indicated earlier, data limitations attached to the 1984 HES survey restrict the ability to compare the source component contributions to changes in inequality. However, if the assumption is made that the overwhelming contribution of 'other household income' is the earnings income (particularly wages) of members of the household other than the head and spouse then at least an estimate of such trend or change contribution in the latest years can be undertaken for each country. In Australia this assumption is valid, in that, as indicated in Table 7.7 above, 'other wages' comprised 90 and 95 per cent respectively of 'other household income' at the two points of time. To overcome the lack of details for head and spouse earnings in 1984, all earnings (head, spouse and assumed other) were aggregated to determine total factor share and proportionate contributions. The resultant comparison for change in inequality by income source decompositions for the UK 1981 to 1986 and Australia 1984 to 1988-89 is outlined in Table 7.8.

By the I_2 measure for the unadjusted household distribution, inequality increased by 33 per cent in Australia between 1984 and 1988-89 and by 29 per cent in the UK between 1981 and 1986. However, reference to the final column for each country in

Table 7.8 indicates that the pattern of this similar proportionate increase was very different.

In the UK, as Jenkins points out (1992: 22), the primary factor, contributing 18 percentage points of the increase, was self-employment earnings. Investment receipts and wages and salaries both contributed six to seven percentage points. On the other hand, the restraining influence (negative contribution) of government benefits and taxes increased by seven percentage points.

In contrast, in Australia, confirming the earlier conclusion in Section 5, the overwhelmingly dominant contributor was investment income which alone accounts for 20 percentage points of the 33 per cent increase. Self-employment earnings, dominant in the UK, hand a much smaller impact of about one-half as a contributor to the change in total inequality. On the other hand, despite the presence of a centralised wage fixation system through the Accord process, increased inequality amongst wage and salary earners contributed significantly more to total inequality (11 percentage points or about one-third of the 33 per cent increase) than in the UK. This could reflect the increased prevalence of part-time work. Conversely, it should be noted that the Australian survey did not include fringe benefits or occupational non-cash income. As far as redistributive government action is concerned, whilst the restraining impact on the inequality increase (eight percentage points) approximately matched that of the UK Government, it was entirely concentrated in changes in the contribution of tax, with that of government benefits remaining unchanged.

7.4 Conclusion

Without reiterating the specific points of difference, the comparison of both structure of inequality and decompositions of change in inequality between Australia and the UK, indicate the significance of national factors. Whilst it may be tempting to assign a commonality of increase in inequality amongst the two countries to a commonality of international factors or even the stage of the capitalist economic system, an examination of the specific patterns and contributory sources to that increase reveals significant national differences.

Certainly there are many common features, notably the small and declining significance of between-group inequality attached to socio-demographic and socio-economic characteristics and the conversely increasing significance of within-group inequalities. But even here, in the small number of such decompositions undertaken, differences between the two nations are noticeable.

When the contributions of specific subgroup inequalities are examined, reflecting different population shares, relative incomes and within-subgroup inequalities, the dominance of specifically national socio-demographic characteristics is again apparent.

Table 7.8: Decompositions of Inequality Change by Income Source: Australia (1984 to 1988-89) and UK (1981 to 1986) ($\alpha = 2$)

	Australia				United Kingdom			
	Absolute contribution 1984	Absolute contribution 1988-89	Change in absolute contribution	Contribution to change in total Inequality (4) = (%)	Absolute contribution 1984	Absolute contribution 1988-89	Change in absolute contribtuion	Contribution to change in total Inequality (4) = (%)
Household income source[b]	(1)	(2)	(3) = (2)-(1)	(3) ÷ total	(1)	(2)	(3) = (2)-(1)	(3) ÷ total
Wages	233	254	21	11	242	257	15	7
Self-employment	38	55	17	9	38	75	37	18
Investment	24	62	38	20	10	23	13	6
Superannuation	0	0	0	0	2	5	3	2
Government benefits	-21	-21	0	0	-18	-21	-3	-2
Income tax[a]	-87	-103	-16	-8	-71	-81	-10	-5
Total disposable income	186	247	61	33	202	260	58	29

Notes: a) Income tax includes National Insurance Contributions for the UK.
        b) Individual source contributions may not add to aggregate sum due to rounding.

Source: UK - Jenkins (1992), Table 6.17.
         Australia - HES Unit Record Files and Table 34 above.

It is, however, through the income source decompositions that these national differences become evident. For the periods examined in each nation, the predominant source of the increased inequality was quite different: self-employment earnings in the UK and investment income in Australia.[5] If there is a common feature it is this dominance of non-wage income, despite wages share of total income, that seems to principally influence the level of, and more particularly change in, inequality in both countries.

However, as Jenkins (1992) points out, the relative significance of particular factors has changed over time in the UK from 1971. There can be little doubt that, with the onset of the recession in Australia, with substantially increased unemployment and its consequent impact on inequality (see Saunders, 1992b) the relative contribution of specific factors would be currently different again. The probable definitive conclusion is that just as the structure of inequality and inequality change is time - dependent to a particular period, so also is it peculiar to each particular country, at the same time.

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5   It is notable that Jenkins (1992: 16) notes that for the UK despite 'surprisingly small' investment inequality in 1986, investment 'still had a relatively large increase in contribution'.

8 Summary and Conclusions

Examination of the contribution of particular component factors to inequality has in general, been conducted by partial techniques through use and analysis of a relatively insensitive Gini coefficient of concentration. Such examination does not show the **relative** significance of that factor contributing to either inequality or changes in inequality, compared to other possible factors.

This paper has examined the absolute and relative contribution of a variety of socio-demographic characteristics, socio-economic characteristics both of the household and household head, as well as component income sources both by type of income and household member recipient, through a series of decomposition analyses, using inequality measures from the Generalised Entropy group. The result is a fully-integrated analysis of the range of factors giving rise both to inequality in the late 1980s in Australia and changes to that inequality. Moreover, by utilising a range of indices (by varying the α value in the generalised formulation) which reflects sensitivity at various portions (from top to bottom) of the distribution of household income we are able to examine the changing and different segments of the distribution.

Conclusions about what accounts for inequality in a given year and changes between years, using indices which are more reflective of changes in the middle or high-income segments of the distribution, are not necessarily appropriate for providing an anatomy of poverty changes or changes for those on the brink of some defined income-based poverty line. Whilst inequality and poverty are undoubtedly integrally linked such that, in general, increased inequality will give rise to increased numbers in poverty, the specific causal factors (and more particularly their comparative significance) may well reflect subtle but distinct differences requiring appropriately subtle differences in policy direction and emphasis.

In particular, the techniques utilised have enabled us to examine inequality **change** between two points in time, as distinct from the level of inequality at one particular point in time. The methodological importance of this should not be underestimated. Given the significance of the contribution of labour in our society and the consequent dominance of income from labour in the form of wages, it is not surprising that at any point in time, *a priori*, inequality in wages and access to the labour market should predominate in determining the structure of total income inequality. However, such static analysis can ignore the contribution of changes in other sources of income which, although less significant in absolute or relative income share terms, can be more significant in determining total inequality change. This can lead to a misplaced over-emphasis by researchers and policy-makers on one form of income (wages) in addressing primary inequality or alternatively a consequent over-emphasis on secondary forms of redistribution such as the social security system and the direct and indirect taxation system. Yet it is **change** in inequality, and directional change in particular, which is possibly of greater significance in determining the social and economic consequences of inequality

(some of which in relation to suicides, homicides and crime are examined in Raskall 1993b).

These sets of decomposition analyses, both by household recipient characteristics and income source, demonstrate that as far as the levels or structure of household income inequality are concerned, using unadjusted income:

- within-group inequality is more significant than between-group inequality;

- socio-economic factors predominate in determining the contribution of between-group inequality;

- within each of the major categories of factors, socio-demographic and socio-economic, composition of the household tends to be more significant relative to contributions based on a similar characteristic of the head of household;

- those subgroups reflecting socio-demographic characteristics of the head of household (age, gender, marital status) each contribute less than one-sixth to total inequality;

- those reflecting the socio-demographic composition of the household (number of persons) contribute around a quarter;

- those reflecting the economic characteristics of the head of household (occupation, employment status, principal source of income) contribute a little under a third;

- those reflecting combined, more comprehensive socio-demographic characteristics of the household (life-cycle stage, household type) contribute about 40 per cent;

- those reflecting the socio-economic composition of the household (number of employed persons and their earning status) contribute about half of overall inequality;

- wages income (given its factor income share) is the dominant contributor to the level of inequality, contributing about two-thirds of private (excluding social security income and taxes) income inequality;

- earnings from self-employment and total investment income each contribute about one-fifth of the influence of wages';

- for the measure of inequality utilised, the social security and taxation systems restrained inequality by about one-third of what it might otherwise have been; and

- when factor share is taken into account through the 'inequality impact' ratio (that is, the contribution to disposable income inequality divided by share of

total disposable income), self-employed earnings and investment income have a greater contribution to inequality impact than wages.

Compared to analogous work in the UK by Jenkins (1992):

- **age** is less significant in Australia than the UK although for both countries it is a relatively small contributor to overall inequality;

- **household type** is more significant in Australia;

- **earnings status** (reflecting the number of wage or self-employed earners in a household) is substantially more significant in Australia, contributing between 20 and 27 per cent to total inequality (depending on the inequality measure used) compared to between 14 and 20 per cent in the UK;

- inequality between household types and earnings status groups, both reflecting household composition, is greater in Australia than the UK; and

- within-group inequality amongst household types and earning status groups is greater in Australia for I_0, but greater in UK for I_2.

Turning to comparisons between the UK and Australia based on 'income source' contributions to total inequality:

- **wages** of the head of household contribute less to inequality (when compared to factor share) in Australia than in the UK;

- **self-employment** earnings are substantially more significant in the UK than in Australia;

- earned income of **spouses** contributes more in absolute terms (30 per cent) to total inequality in Australia than in the UK (22 per cent) although this reflects differences in relative factor share;

- **investment income** (dividends, rent and interest) contributed substantially more (25 per cent) to aggregate inequality in Australia compared to the UK (nine per cent);

- despite its smaller factor share, the direct **government benefits** system in Australia contributes the same reduction in inequality as it does in the UK, with the implication that the Australian system is more targeted; and

- the **income tax** system in Australia contributes more to a reduction in inequality than does the combined impact of tax and national insurance contributions in the UK.

These conclusions are clearly of great import. However, when we examine the contributions to change in inequality between 1984 and 1988-89, several other important conclusions emerge.

- Changes in within-group inequality account for the major contribution of changes in aggregate inequality compared to between-group inequality for 'household characteristics'.

- In fact, for equivalent incomes, with the exception of socio-economic variables attached to household composition or occupation of the head, changes within groups account for the whole of the change in inequality or more.

- On an unadjusted incomes basis, as may be expected, there is some contribution from between-group inequalities, particularly for those variables reflecting household composition and size. However, this merely reflects changes in the living arrangements of Australian households and the consequent impact on income relativities of changes in population share. The broad conclusions still hold and in every situation the majority of the increase in aggregate inequality stems from changes within groups rather than between groups.

- This result holds for whichever 'sensitivity' or α value is selected such that variations in the change in total inequality across the α values (different ranges of the distribution) responds almost purely to changes in within-group inequalities.

- This result was in part occasioned or reinforced by changes in the social security and taxation systems which shifted emphasis in the period from reducing within-group inequality ('vertical' equity) to reducing between-group inequality ('horizontal' equity). That is, more emphasis was placed, at least in outcome, on reducing inequality contingent upon family circumstance or arrangement rather than inequality within each household type stemming from low relative income.

- When these within-group inequality changes were examined, it became apparent that certain subgroups were the dominant contributors to inequality change in the period. Those subgroups were couple households of three persons, including one dependent child (aged 5-14 years), where there were two employed persons in either full-time or self-employment, with the head being either in a managerial or professional occupation and aged between 35 and 64.

- When decomposed by principal source of income of the head of household the significant within-group contributors to total inequality change were first and foremost investment income, followed by self-employment earnings and wages and salaries.

- The 'income source' decompositions of inequality change revealed that the major contributor to increased total inequality in the latter part of the 1980s in Australia was dividend income. Despite the fact that as a share of total income, dividends actually declined from 2.9 per cent to 2.7 per cent, dramatically increased internal inequality in its distribution (and who received them in terms

of other overall income) meant that dividend income alone contributed 20 per cent of the total 32.8 per cent increase in inequality (or over 60 per cent) for the I_2 inequality measure used.

- More particularly, it was found that these movements in dividend income and its significance could be traced to specific transfers from retired households to higher-income earning households aged 30-59.

- Events concerning the ownership of shares, the receipt of dividend income, the distribution of that income and its taxation treatment all played a substantial part in underpinning the increase in inequality observed over the latter part of the 1980s.

- It was calculated that the introduction of dividend imputation arrangements for tax purposes contributed to increased overall inequality by nine to ten percentage points. Thus, if dividend income had been subject to the same tax arrangements in 1988-89 as in 1984 then the increase in total inequality may have been reduced from 32.8 per cent to about 20 per cent, nearly one-third.

- The other significant factor contributing to inequality changes was self-employment earnings although this was far less in both absolute and relative (compared to factor income share) terms than dividend income.

Compared to the United Kingdom,

- **investment** income was a far greater contributor (about three times) to increased inequality in Australia;

- on the other hand, **self-employment** earnings in Australia had a much smaller impact, of about half that in the UK;

- despite centralised wage fixation in Australia, increased inequality in **wages and salaries** (probably reflecting the increased prevalence of part-time work) contributed more to total inequality change in Australia compared to the UK.

In respect of 'household recipient characteristics' despite several similarities in respect of the common decline in between-group inequality, notable differences in Australia compared to the UK were apparent:

- though a small contributor, the significance of **age** increased in Australia but decreased in the UK;

- for **household** type, between-group inequality fell substantially in Australia but not in the UK;

- between-group **earnings status** inequality change contributed in the UK whereas it was insignificant in Australia;

- in general the relative disparity in structure between the nations decreased; and

•   similar subtle differences were notable in examining changes in the contribution of within-group inequality of particular subgroups, especially households where the head is aged 25-34.

In examining inequality change in various periods, Jenkins (1992) in the fashion of a 'whodunit' puts up a hypothetical list of suspects with a prima facie case to answer as to cause of change. This is reproduced below:

Jenkins' Inequality 'Culprits' (Jenkins, 1992: 2-4)

1.   Age distribution changes
2.   Household composition
3.   Changing employment structure
4.   Changing industrial structure
5.   Unemployment change
6.   The business cycle
7.   Income tax and benefit changes
8.   Earnings inequality
9.   Changes in income from capital

The appropriateness of the analogy with a criminal investigation has already been noted with the decomposable analytical techniques providing the opportunity to investigate these prima facie 'culprits' via forensic evidence. After such an 'investigation', akin to the 'autopsy' performed in this paper, Jenkins concludes, for the UK, by acquitting (at least for the period of investigation) potential influences 1, 2, 4, 5, 6 - that is, the proportions in, and relative mean incomes across, different age groups, household types, regions and earnings status groups as well as inequality contributions of cash social security benefits and income tax payments. On the other hand, he puts the 'blame' on a mixture of 3, 8 and 9 with the caveat that from the early 1980s, the emphasis changes to 'employment structure' and 'income from capital' explanations and away from the 'wages inequality' explanation previously most important (Jenkins, 1992: 22).

Whilst allowance must be made for the slightly different time period of analysis, a similar 'Inequality Trial' in Australia, on the evidence presented above, would lead to a similar conclusion: that for the period of investigation, 1984 to 1989 the principal 'guilty parties' as causal factors of increased inequality were dividend income from shares, income from self-employment, and by implication changes in employment structure reflecting itself in occupational rewards and the increase in part-time work.

Such a generalised conclusion, however, would miss many of the subtleties only in part reflected in the summaries above, and in particular, the changing within-group contributions to inequality change partitioned by household recipient characteristics and the changing nature of the government tax and cash social security system outcomes in terms of within- and between-group inequality.

Moreover, whilst at a broadly general level, apparently similar, if not common, forces may be operating internationally, one clear conclusion from the main body of the text and the summary above is that important national differences and consequent national forces are also operating. In the case of Australia in this period, of particular relevance is the overwhelming significance of dividend income changes particularly within two income households where the head is between 30 and 59 and in a managerial or professional occupation. Clearly any analysis based purely on wage changes would be inadequate and miss these aspects. Yet our data on share ownership and wealth distribution remains woefully inadequate.

What also becomes evident is that the significance of each factor changes, both in space (at least internationally) and in time. Thus, changes in the level of unemployment, which altered little in the period under review, may at least *a priori* be expected to have become far more significant in the early 1990s as the recession 'bit' in employment terms. The partial analysis of Saunders (1992b) would suggest that this has in fact been the case. On the other hand, dividend income may have been reduced in relative significance in the period since 1989. Conversely, recent surges in the stock exchanges and changes in the relative returns from equities (in the form of dividends) and other investment sources (in the form of interest rates) may be foreshadowing further increased significance in the inequality contribution of dividend income, as indeed may further more recent changes in the ownership of the shares.

Over-riding the conclusions outlined in the paper, which **are** important, are the techniques utilised to derive those conclusions. In particular, the use of a range of indices or measures of inequality which reflect sensitivity to various segments of the entire distribution enhances our knowledge of that entirety rather than being limited to a segment which may be inappropriate to the particular analysis being undertaken. The use of decomposable indices in such a comprehensive fashion clearly adds another, more fruitful, layer to inequality research directed towards isolating causal factors. Not only do they enable us to holisticly identify the relative contribution of various factors (and in turn more accurately define those factors) to total inequality but we can examine inequality **change** more directly, rather than relying on partial insensitive one-off analyses.

As even the summaries of the results presented above indicate, factors which contribute most of the explanation of the **level** of inequality in a given year are not necessarily those which account for the bulk of inequality **changes**. Thus changes in wage inequality may be increasingly less reliable as the foundation of explanations of income inequality change. As the nature of work changes in our society, other sources of income (such as from self-employment or investment) or changes amongst non-earners may be increasingly important. This poses a challenge to statisticians, economists and others who recognise the significance of economic inequality as a cause, and not merely a consequence, of other social and economic phenomena.

For those who design our base income survey data, clearly attention needs to be directed towards provision of comprehensive income concepts with comprehensive data. If such a relatively small component in factor share terms as dividend income can generate such significant changes in income inequality as outlined here, then other, presently subordinately treated income sources, such as the value of fringe benefits, asset ownership and imputed returns, and, in relation to the impact of government, the provision of indirect benefits through expenditure on the social wage, need to be explicitly and adequately incorporated. The quality of our data on self-employed income, with its opportunities for evasion and avoidance, needs to be enhanced if it remains as significant a contributor to inequality change as it appears both in this paper and in the UK (Jenkins, 1992).

Researchers who examine this data are increasingly reliant upon microsimulation models both to fill in the gaps between four and five yearly surveys to identify annual changes in inequality contingent upon the business cycle, and to examine the distributional impact of particular current and prospective proposals. The challenge for them is to design those models so that they are more than just models of wages but are capable of diverse analysis of inequality **change** by isolating all relevant recipient characteristics and income sources.

For policy-makers, who bear the responsibility for the consequences of inequality generated, the challenge to co-ordinate the researchers and statisticians is greatest. For it is only by insisting that all the consequences of decisions be outlined and all the contributing factors be understood that they can begin to ask the right questions. Then, and only then, do we have any hope of arriving at the 'correct' or most appropriate answers.

It would be an ironic paradox indeed if just as the tools for proper analysis of the phenomena of inequality and its change were being developed, as in its own modest way this paper attempts, we were to lose the capacity or even the will to enable such tools to be properly utilised. The irony would be doubly cruel to those trapped at the bottom of the inequality distribution consigned to poverty and all the socially deleterious manifestations of that position.

As John Kennedy noted:

> Change is the law of life. And those who look only at the past
> or the present are certain to miss the future.

The decomposition techniques outlined in this paper, provide a way in which we can analyse inequality **change** and at least ensure that the past and present can contribute positively to the future.

Appendix One: Methodology for Decomposition by Household Characteristics

In general, decomposable indices from the Generalised Entropy (GE) family assume the form:

$$I_\alpha = \frac{1}{\alpha^2 - \alpha} \left[\frac{1}{n} \sum_{i=1}^{n} \left[\frac{y_i}{\mu} \right]^\alpha - 1 \right] \qquad (1)$$

where .... y_i = income received by the ith of n households

μ = population mean income

This equation is applied to each of the G specified subgroups, and also to the overall survey sample with all within-group income set at the relevant subgroup means. The G individual within-group inequality scores are aggregated, using a combined population and income weighting, into an 'average' within-group figure. This, when added to the between-group inequality (I_B), reflecting relative mean incomes of the subgroups and their population size, gives overall, or total inequality (I_α).

That is:

$$I_\alpha = \sum_{g=1}^{G} V_g^\alpha \ W_g^{1-\alpha} \ I_g^\alpha + I_B^\alpha \qquad (2)$$

where .... $W_g = n_g/n$ (population share)

$V_g = n_g \mu_g / n\mu$ (income share)

The alpha (α) coefficients can be considered as 'inequality aversion' parameters of members of the Atkinson inequality index family. The more positive α is, the more sensitive the index is to income differences at the top of the income distribution and the more negative, the more sensitive to differences at the bottom end of the distribution. Consequently, to avoid bias the analysis, in the previous analyses of life-cycle cohorts (Raskall and McHutchison 1992a and 1992b) utilised a range of six measures with α values ranging from -1 to +2. In this respect, these indices are superior to the more familiar Gini coefficient which is considered particularly sensitive to 'middle' incomes only - leading to possibly ambiguous results.

Jenkins (1992) for his purposes utilises two values for his recipient analyses: $\alpha = 0$ and 2. The former is the mean logarithmic deviation and the latter a function of the coefficient of variation (half the squared value of such). In the interests of

comparability and manageability, we intend using $\alpha = -\frac{1}{2}$, 0 and 2 to reflect this range of sensitivity to various areas of the distribution.

The first part of the expression (on the right hand side of equation 2) provides the within-group inequality, that is, the portion of overall total inequality that can be explained by the weighted sum of the within-group inequalities of each of the subgroups considered. It is these weightings of population and income share that reflect the α sensitivity. Thus, if $\alpha = 0$, then the expression reduces to the relative population weights and if $\alpha = 1$, it reduces to the relative income weights.

That is, from equation (2):

$$I_0 = \sum_{g=1}^{G} W_g \, I_g^0 + I_B^0 \tag{3}$$

and

$$I_1 = \sum_{g=1}^{G} V_g \, I_g^1 + I_B^1 \tag{4}$$

Hence, the greater the positive value given the α, the more the weightings reflect the relative incomes of the subgroups - a procedure that makes the inequality measure more sensitive to changes in higher incomes. Conversely, the negative value of α, emphasises the population weightings compared to income share and makes the measure more sensitive to changes in lower incomes.

The second part of the right-hand of equation (2) reflects the 'between-group' inequality, that is, the portion of overall inequality that can be explained by the differences between the subgroups. Thus, the more significant is this component then the more significant is that particular set of characteristics as an inequality delineating factor. Given the differing socio-demographic and socio-economic characteristics of high- and low-income households then the significance of between-group inequality can vary with different α values, as well.

Finally, by examining the proportional contribution, given population and income share weightings, of inequality of each subgroup G, to total within-group inequality, the relative contribution of inequality (and changes in inequality) within each subgroup to overall inequality can be determined.

Appendix Two: Methodology for Decomposition by Component Incomes

Following Jenkins (1992: 8-9) who adapted methods proposed by Shorrocks (1992a; 1992b), we may regard total inequality as the sum of the factor contributions from incomes of each given source.

Thus,

$$I = \Sigma_f S_f \tag{5}$$

where S_f depends on incomes from income source f. If S_f is negative there is an absolute equalising contribution and if it is positive, a disequalising one. If we define the proportional contribution of each factor income to overall inequality as

$$s_f = \frac{S_f}{I} \tag{6}$$

then

$$\Sigma_f s_f = 1 \tag{7}$$

The question then becomes the appropriate decomposition rule to specify these various s_f.

Here Shorrocks (1982a; 1982b) argues the case for the point estimate of the slope coefficient from a regression of total income on component. That is, where

$$S_f = \frac{C_f}{\sigma^2} = \frac{\rho_f \sigma_f}{\sigma} \tag{8}$$

where .... C_f is the covariance between component f and total income
ρ_f is the correlation between component f and total income
σ_f is the coefficient of variation of component f income
σ is the coefficient of variation of total income.

Given the necessity to adopt an index which can accommodate the incidence of zero incomes for many of the component incomes, both Shorrocks (1992a) and Jenkins (1992), settle on I_α where $\alpha = 2$, that is, I_2. In this case,

$$S_f = S_f I_2 = \rho_f \chi_f \sqrt{I_2 \times I_{2f}} \tag{9}$$

where χ_f is the share of total income provided by component f income.

Thus the absolute contribution of the various factor income components in the decomposition analysis depends on correlation with total income, factor share, and factor inequality.

In operational terms, the correlation reflects the extent to which income from each source is distributed amongst households, that is, how extensively it is distributed and by whom (high or low income recipients) it is received most. The factor share reflects the relative size of the income sources such that distributional charges in each source will have more or less effect. Finally, the factor inequality reflects how equally that particular income source is distributed.

Appendix Three: Sensitivity Analysis of Equivalence Scales

Much of the analysis undertaken in the text has involved the use of equivalence scales to determine equivalent income, that is, income adjusted on some basis to reflect the differing needs or requirements of individuals within each household. Thus the income of households of different size and composition can be compared to determine 'pure' inequality, where such inequality reflects the differences between the incomes of all such diverse households. For most of the analysis in Section 3 on decomposition by household recipient characteristics, to ensure contiguity with earlier work (see Raskall and McHutchison, 1992a and 1992b) the scale utilised by O'Higgins et al. (1988) was used. Jenkins in his analysis of the UK (1992) utilises the McClements scale outlined in McClements (1978) which Jenkins describes as 'the semi-official UK one'. In Section 7 where the Australian results are compared with those of Jenkins, the McClements scale was utilised to ensure comparability.

However, it is important that the sensitivity of the results, and their consequent robustness, to the particular equivalence scale used be tested. Given that Whiteford (1985) has identified some 57 such scales, including the commonly utilised Henderson scales in Australia and the more generic OECD scales recommended for international comparison in OECD (1982), it is important to establish that the generality of the results obtained are maintained so that the conclusions drawn are valid and not specifically the consequence of the set of equivalence scales selected.

In this appendix the sensitivity of the results to the use of both the McClements and the O'Higgins et al. scales is examined to enable direct linkage of the earlier results with the comparative analysis of Section 7. Both these results are further tested against those obtained by use of the OECD scale to establish the broader generality of conclusions that could be drawn.

In Table A3.1 the three equivalence scales (O'Higgins, McClements and OECD) are outlined using a couple as the base unit equal to 1.00. Where applicable, the before housing rather than after housing costs scale is utilised. Perusal of this table indicates that with the exception of the weightings for the fourth and further adults and older children, very little difference exists between the McClements and the O'Higgins et al. scales. On the other hand, the OECD scale gives a much greater weight to families with children, particularly younger children. Conversely, it gives less weight to older children than either of the other two.

Table A3.1: Equivalence Scales for Sensitivity Analysis

	O'Higgins et al.	McClements	OECD
Couples	1.00	1.00	1.00
First adult	0.60	0.61	0.59
Second adult (de facto)	0.40	0.39	0.41
Third adult	0.45	0.42	0.41
Fourth + adult	0.45	0.36	0.41
Child aged			
0-1		0.09	
2-4	0.15	0.18	
5-7		0.21	
8-10	0.21	0.23	0.29
11-12		0.25	
13-15	0.27	0.27	
16-18	0.45	0.36	
Examples:			
Couple + child aged 4	1.15	1.18	1.29
Couple + children aged 4, 8, 14	1.63	1.68	1.87

Sources: O'Higgins, et al. (1988: Table 5.10: 251).
            McClements (1978: Table 5.8: 114)
            OECD (1982).

A3.1 Aggregate Inequality and Inequality Change Measures

As both the first test, and to establish the base levels of overall inequality, in Table A3.2, the set of General Entropy (GE), measures plus the coefficient of variation and the Gini coefficient is outlined for each data set (year) for equivalent disposable income (person-weighted) by each of the three equivalence scales, as well as the resultant percentage change. All measures are multiplied by 1000 for presentation purposes.

Table A3.2: Measures of Inequality: Alternative Equivalence Scales

Measure	O'Higgins			McClements			OECD		
	1984	1988-89	%Δ	1984	1988-89	%Δ	1984	1988-89	%Δ
I_2	139	184	32.4	138	183	32.6	152	193	27.0
I_1	127	142	11.8	127	143	12.6	138	151	9.4
$I_{0.5}$	129	140	8.5	130	140	7.7	139	149	7.2
I_0	140	150	7.1	141	152	7.8	151	161	6.6
$I_{-0.5}$	169	195	15.4	171	197	15.2	183	209	14.2
I_{-1}	259	414	59.8	264	422	59.8	281	445	58.9
Cov	528	606	14.8	524	604	15.3	551	621	12.7
Gini	278	283	1.8	278	284	2.2	291	295	1.4

As may be expected from examination of the actual parameters of the scales, very little difference, both in absolute value of any inequality measure or the change of the period, occurs between the O'Higgins and the McClements scales, although the McClements results are marginally more responsive. On the other hand, the OECD scale results in marginally higher absolute levels of inequality in both years but lower change in inequality between the years, compared to the other two. In general, the results are consistent across each equivalence scale for each measure emphasising different segments of the distribution.

A3.2 Contribution of Between-Group Inequality

It would clearly be superfluous to replicate every one of the socio-demographic and socio-economic household recipient characteristics to test the sensitivity of the results on between-group contribution. We therefore concentrate on four of these - age, household type, earnings status and life-stage grouping - for comparative purposes.[6]

In Table A3.3, the calculated absolute between-group inequality attributable to each of these characteristics, for each inequality measures (α value), for each analysis year and for each equivalence scale is presented. In Table A3.4, the respective relative contribution of this between-group inequality as a percentage of overall inequality is outlined.

An examination of the absolute between-group inequality in Table A3.3, indicates that the results are generally robust irrespective of the equivalence scale used. In general, the results obtained using the McClements scale lie mid-way between those

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6   The components of these groups are shown in more detail in a set of tables available from the information officer of the SPRC.

Table A3.3: Absolute Between-group Inequality: Alternative Equivalence Scales

| Year/Characteristic | Inequality Measure (α Value) | | | | | |
	-1	$-\frac{1}{2}$	0	$\frac{1}{2}$	1	2
1984						
Age						
O'Higgins	5	5	5	5	4	4
McClements	5	5	5	5	5	5
OECD	5	5	5	5	5	5
Household type						
O'Higgins	25	25	25	25	25	25
McClements	27	27	27	26	26	26
OECD	33	33	33	33	33	34
Earnings status						
O'Higgins	40	38	36	34	33	30
McClements	44	42	39	37	36	33
OCED	45	43	41	39	37	35
Life-cycle						
O'Higgins	28	28	28	29	29	31
McClements	30	30	30	31	31	32
OECD	38	38	38	39	40	42
1988-89						
Age						
O'Higgins	5	5	5	5	5	5
McClements	6	6	6	6	5	5
OECD	6	6	6	6	6	6
Household type						
O'Higgins	22	22	21	21	21	20
McClements	24	23	23	22	22	22
OECD	33	32	31	31	30	30
Earnings status						
O'Higgins	43	40	37	35	33	30
McClements	46	43	40	37	35	32
OECD	48	44	42	39	37	34
Life cycle						
O'Higgins	22	22	22	22	22	23
McClements	24	24	24	24	24	24
OECD	33	33	32	33	33	34

Table A3.4: Relative Between-group Inequality: Alternative Equivalence Scales
(Percentage of overall inequality)

Year/Characteristic	Inequality Measure (α Value)					
	-1	$-^1/_2$	0	$^1/_2$	1	2
1984						
Age						
O'Higgins	2	3	4	4	3	3
McClements	2	3	4	4	4	4
OECD	2	3	3	4	4	3
Household type						
O'Higgins	10	15	18	19	20	19
McClements	10	16	19	20	20	19
OECD	12	18	22	24	24	22
Earnings status						
O'Higgins	15	23	26	26	26	22
McClements	17	25	28	28	28	24
OCED	16	23	27	28	27	23
Life-cycle						
O'Higgins	11	17	20	22	23	22
McClements	11	18	21	24	24	23
OECD	13	21	25	28	29	28
1988-89						
Age						
O'Higgins	1	3	3	4	4	3
McClements	1	3	4	4	4	3
OECD	1	3	4	4	4	3
Household type						
O'Higgins	5	11	14	15	15	11
McClements	6	12	15	16	15	12
OECD	7	15	19	21	20	15
Earnings status						
O'Higgins	10	21	25	25	23	16
McClements	11	22	26	26	24	17
OECD	11	21	26	26	24	18
Life cycle						
O'Higgins	5	11	15	16	16	13
McClements	6	12	14	17	17	13
OECD	7	16	20	22	22	18

of the O'Higgins et al. scale which shows least between-group inequality and those obtained by use of the OECD scale which shows greatest absolute between-group inequality. The OECD scale results are differentiated to the largest extent compared to the other two in respect of household type and life-cycle partitioning.

When related to the overall inequality measures outlined in Table A3.2, the generality of the results with respect to the relative contribution of between-group inequality is confirmed with the results as set out in Table A3.4 showing strong congruity irrespective of the equivalence scale used - particularly for the age and earning status decompositions. For the closely related household type and life-cycle group partitionings, the OECD scale produces greater relative between-group inequality in both years compared to the other two. The question here is whether this slight difference produces any substantial difference to the results when the contributions to inequality change are examined.

Table A3.5 outlines the change in absolute and relative contributions of between-group inequality to inequality change over the period for each decomposition and each set of equivalence scales.

The results outlined in Table A3.5 are very satisfying. The change in absolute between-group inequality is virtually the same irrespective of which equivalence scale is used, with the arguable exception of the OECD scale for household type decomposition at negative values of the α (where greatest emphasis is on the lowest income segment of the distribution). For the remainder not only are the raw figures virtually the same but the trends over the various segments of the distribution as the α value changes are broadly similar.

Even the apparent discrepancy noted in the previous paragraph disappears when the change in relative contribution of between-group inequality to total inequality is examined in the lower part of Table A3.5. The conclusions that can be drawn hold true whether one examines the values for each α measure within each characteristic partitioning (that is, down the columns) or one examines the values across α measures for each equivalence scale within each characteristic decomposition (that is, across the rows).

The results obtained from each equivalence scale show that over the period, between-group inequality fell substantially for the socio-demographic household type and life-cycle variables almost uniformly across the distribution; that it fell particularly at the extremes of the distribution for the socio-economic earnings status variable; and that it was virtually unchanged across the distribution (except possibly at the lowest end) for the demographic age of head variable.

Thus, the results obtained and reported upon in the text, even where, for comparability purposes, alternate equivalence scales have been used, are robust and are applicable irrespective of the scale utilised. Indeed, as the text itself indicates, whilst using unequalised (unadjusted) household distributions rather than equivalenced individual ones provides different estimates of the absolute inequality levels, the trends are similar.

Table A3.5: Change in Absolute and Relative Between-group Inequality: 1984 to 1988-89

Year/Characteristic	\-1	$-^1/_2$	0	$^1/_2$	1	2
			Inequality Measure (α Value)			
Absolute						
Age						
O'Higgins	0	0	0	0	1	1
McClements	1	1	1	1	0	0
OECD	1	1	1	1	1	1
Household type						
O'Higgins	-3	-3	-4	-4	-4	-5
McClements	-3	-4	-4	-4	-4	-4
OECD	0	-1	-2	-2	-3	-4
Earnings status						
O'Higgins	3	2	1	1	0	0
McClements	2	1	1	0	-1	-1
OCED	3	1	1	0	0	-1
Life-cycle						
O'Higgins	-6	-6	-6	-7	-7	-8
McClements	-6	-6	-6	-7	-7	-8
OECD	-5	-5	-6	-6	-7	-8
Relative						
Age						
O'Higgins	-1	0	-1	0	1	0
McClements	-1	0	0	0	0	1
OECD	-1	0	1	0	0	0
Household type						
O'Higgins	-5	-4	-4	-4	-5	-8
McClements	-4	-4	-4	-4	-5	-7
OECD	-5	-3	-3	-3	-4	-7
Earnings status						
O'Higgins	-5	-2	-1	-1	-3	-6
McClements	-6	-3	-2	-2	-4	-7
OECD	-5	-2	-1	-2	-3	-5
Life-cycle						
O'Higgins	-6	-6	-5	-6	-7	-9
McClements	-5	-6	-7	-7	-7	-10
OECD	-6	-5	-5	-6	-7	-10

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Appendix Four: Data Sets of Household Recipient Characteristics

This appendix provides the details for each year of analysis by each subgroup category of each 'household recipient' characteristic decomposition of: population share, mean income, income share, and internal inequality (all measurement indices with α value from -1 to 2) for both the household distribution and the person-weighted equivalent income distribution using the O'Higgins et al. (1988) scale.

It is organised as follows: In Section A, the unequivalenced or unadjusted household distribution results are presented, sorted by each variable examined. These are arranged by broad category, namely:

- socio-demographic household composition,

- socio-demographic head of household characteristic,

- socio-demographic comprehensive,

- socio-economic household composition, and

- socio-economic head of household characteristic.

For each variable and detailed subgroup, the results are presented firstly for 1984 and immediately adjacent the 1988-89 results. These results detail the internal inequalities within each subgroup, between-group and aggregate inequality by each α value measure; and, for each subgroup, the population share, mean income and total income share. All inequality measures are multiplied by 1000 for presentation purposes.

In Section B, the results outlined in Section A are reproduced in the same format and detail for the person-weighted equivalent income distribution using the O'Higgins et al. (1988) scale.

Section A: Unadjusted (Non-equivalenced) Income

Characteristic: Number of Persons

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
1 person	221	193	189	194	212	262
2 people	159	150	153	164	195	323
3 people	140	131	134	146	173	248
4 people	116	110	114	129	169	290
5 people	129	124	130	148	189	291
6 people	121	112	113	118	131	161
7 or more people	131	129	135	150	178	233
Within	150	136	141	157	196	312
Between	36	40	42	45	49	54
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
1 person	18.5	189	9.5
2 people	31.2	344	29.3
3 people	17.5	427	20.4
4 people	20.1	433	23.8
5 people	9.0	484	11.9
6 people	3.0	507	4.2
7 or more people	0.7	477	0.9

Characteristic: Number of Persons

1988-89	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
1 person	206	180	181	196	212	262
2 people	181	164	167	184	195	323
3 people	279	177	164	167	173	248
4 people	142	127	131	152	169	290
5 people	161	123	119	124	189	291
6 people	105	104	109	123	131	161
7 or more people	121	114	113	115	178	233
Within	202	151	151	170	239	604
Between	45	50	53	57	61	67
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
1 person	20.3	251	10.1
2 people	31.7	462	29.0
3 people	16.4	601	19.5
4 people	18.6	656	24.2
5 people	9.2	683	12.4
6 people	3.1	657	4.0
7 or more people	0.7	679	0.9

Characteristic: Family Composition

1984	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Couple	142	134	139	153	193	328
Sole parent (male)	168	158	158	161	168	179
Sole parent (female)	153	133	129	127	128	131
Other one family type	99	98	100	105	112	124
Multi-family with sole parent	95	87	85	84	84	85
Multi-family with no sole parent	79	86	92	100	111	126
Single person	221	193	189	194	212	262
Two unrelated adults	100	96	98	103	112	126
3+ unrelated singles	77	81	85	91	99	109
Within	150	136	140	156	194	310
Between	36	40	43	46	51	56
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
Couple	67.8	416	76.9
Sole parent (male)	0.5	297	0.4
Sole parent (female)	5.0	237	3.2
Other family type	3.5	358	3.4
Multi-family household	0.7	547	1.0
Single person	18.5	189	9.5
Two unrelated singles	3.2	458	4.0
3+ unrelated singles	0.9	619	1.5

Characteristic: Family Composition

1988-89	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
Couple	203	159	159	174	233	537
Sole parent (male)	134	137	145	161	188	236
Sole parent (female)	130	114	112	114	112	133
Other one family type	134	124	124	129	138	153
Multi-family with sole parent	95	90	90	94	99	109
Multi-family with no sole parent	94	88	87	88	91	95
Single person	206	180	181	196	256	562
Two unrelated adults	99	105	116	148	313	1890
3+ unrelated singles	62	65	68	72	79	87
Within	204	153	152	171	239	603
Between	43	48	52	56	61	68
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Couple	64.1	588	74.5
Sole parent (male)	0.7	428	0.6
Sole parent (female)	4.9	316	3.0
Other family type	3.7	465	3.4
Multi-family household	2.1	753	3.1
Single person	20.3	251	10.1
Two unrelated singles	3.4	576	3.9
3+ unrelated singles	0.8	897	1.3

Characteristic: Age of Head

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
<25	126	125	131	148	205	498
25-34	120	121	130	151	206	395
35-44	111	108	112	122	143	192
45-54	169	167	179	206	265	400
55-64	217	194	196	210	241	313
65-74	272	203	191	190	204	258
75+	315	222	201	191	189	193
Within	157	144	150	166	207	325
Between	29	32	33	36	38	41
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
<25	6.7	364	6.6
25-34	23.5	389	25.0
35-44	21.7	423	25.1
45-54	14.8	478	19.3
55-64	15.3	329	13.7
65-74	11.6	219	7.0
75+	6.4	191	3.3

Characteristic: Age of Head

1988-89	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
<25	170	167	179	215	352	1211
25-34	119	116	124	147	235	803
35-44	144	126	130	147	203	455
45-54	279	191	183	190	213	264
55-64	306	255	257	285	390	978
65-74	331	231	215	216	247	390
75+	399	263	234	220	215	220
Within	214	166	167	188	258	626
Between	33	35	37	39	42	45
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
<25	5.6	472	5.2
25-34	21.6	518	22.3
35-44	23.6	590	21.0
45-54	16.0	659	27.7
55-64	14.6	452	13.1
65-74	12.3	297	7.3
75+	6.3	271	3.4

Characteristic: Marital Status

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
Married	144	136	141	156	199	350
Separated	207	179	174	176	184	198
Divorced	185	175	178	187	202	226
Widowed	274	217	204	198	199	207
Never married	198	184	191	209	248	341
Within	161	148	153	169	209	327
Between	25	28	30	33	36	39
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
Married	68.4	417	77.7
Separated	3.8	255	2.7
Divorced	6.1	280	4.6
Widowed	10.5	180	5.2
Never married	11.2	322	9.8

Characteristic: Marital Status

1988-89	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Married	203	160	160	176	236	536
Separated	187	175	184	210	280	523
Divorced	198	176	176	185	204	244
Widowed	321	243	226	219	224	251
Never married	211	193	202	236	382	1387
Within	219	170	171	191	262	629
Between	28	31	33	36	38	42
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Married	65.5	588	76.2
Separated	4.0	350	2.7
Divorced	6.3	345	4.3
Widowed	10.8	260	5.5
Never married	13.4	425	11.3

Characteristic: Gender

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Male	158	151	160	186	283	891
Female	244	210	206	211	229	306
Within	169	157	163	181	223	342
Between	17	19	20	21	23	24
Total	186	176	183	202	246	255

	Population Share	Mean Income	Income Share
Male	79.1	402	86.5
Female	20.9	239	13.5

Characteristic: Gender

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Male	195	166	171	192	268	688
Female	473	280	258	260	299	498
Within	232	184	187	208	281	651
Between	15	17	17	18	19	20
Total	247	201	204	226	300	671

	Population Share	Mean Income	Income Share
Male	76.7	555	84.1
Female	23.3	346	15.9

Characteristic: Lifecycle Cohort

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
Single person						
<34	103	105	112	125	146	185
35-44	88	93	99	109	125	149
45-54	198	190	198	216	250	311
55-64	190	163	160	166	187	243
65+	175	124	111	105	109	137
Couple only - Age of head						
<34	63	70	81	112	237	1033
35-44	118	122	129	142	161	191
45-54	149	150	163	192	251	377
55-64	123	111	109	110	113	119
65+	137	105	96	92	90	94
Couple with children						
Age of children						
<5	105	100	106	122	169	317
5-14	90	94	105	128	186	342
<5, 5-14	109	104	111	130	174	289
5-14, 15-24	113	103	103	108	118	144
15-24	97	94	96	102	112	128
<15, 115-24	77	75	75	76	78	81
Single parent						
Age of children						
<14	84	70	66	63	61	60
<14, 15-24	74	74	75	78	81	86
15-24	128	126	129	134	143	155
Single households						
(no children)						
Age of head						
15-24	70	70	73	77	83	92
25-34	63	68	72	80	92	112
35-54	79	83	87	93	102	115
55-64	130	117	115	116	121	129
65+	158	130	124	122	123	128
Single household						
(with children)						
Age of child						
<14	62	64	67	71	76	84
15-24	104	98	99	103	110	123
<14, 15-24	76	77	80	84	91	100
Within	116	100	103	115	151	258
Between	70	76	80	87	95	108
Total	186	176	183	202	246	366

1984	Population Share	Mean Income	Income Share
Single person			
<34	3.8	262	2.8
35-44	1.7	303	1.4
45-54	1.9	246	1.3
55-64	3.8	159	1.6
65+	7.2	125	2.5
Couple only			
(Age of head)			
<34	6.3	486	8.3
35-44	1.1	473	1.4
45-54	2.5	388	2.8
55-64	6.1	305	5.1
65+	7.6	224	4.7
Couple with children			
(Age of child)			
<5	8.3	373	8.6
5-14	10.5	408	11.9
<5, 5-14	6.8	379	7.0
5-14, 15-24	6.4	528	9.2
15-24	7.0	587	11.4
<5, 15-24	0.4	372	0.4
Single parent			
(Age of child)			
<14	3.1	181	1.6
<14, 15-24	1.1	301	0.9
15-24	0.5	311	0.4
Sharing household			
(Age of head)			
15-24	1.5	418	1.7
25-34	1.2	535	1.7
35-54	1.0	462	1.3
55-64	1.3	436	1.6
65+	2.2	339	2.0
Sharing household with child			
(Age of child)			
<14	1.2	465	1.5
15-24	3.5	543	5.3
<14, 15-24	2.1	312	1.8

Characteristic: Lifecycle Cohort

1988-89	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Single person						
<34	105	113	130	181	386	1674
35-44	113	103	105	112	127	157
45-54	161	154	159	171	191	225
55-64	206	166	161	170	220	482
65+	144	103	94	92	97	118
Couple only - Age of head						
<34	56	60	65	74	96	162
35-44	60	65	70	76	85	98
45-54	105	108	113	123	140	167
55-64	268	212	212	244	390	1306
65+	274	176	155	148	171	338
Couple with children						
Age of children						
<5	111	106	115	146	269	919
5-14	318	191	176	185	239	430
<5, 5-14	120	99	99	108	139	243
5-14, 15-24	135	100	97	100	115	161
15-24	151	115	111	113	122	142
<15, 115-24	62	60	60	61	64	68
Single parent						
Age of children						
<14	93	88	88	92	99	113
<14, 15-24	71	68	67	68	69	71
15-24	114	108	109	112	118	128
Single households						
(no children)						
Age of head						
15-24	108	114	123	136	158	193
25-34	103	98	99	103	111	123
35-54	105	109	116	130	155	200
55-64	117	115	117	123	132	147
65+	204	153	143	140	142	149
Single household						
(with children)						
Age of child						
<14	83	80	81	86	95	109
15-24	125	119	126	157	351	2523
<14, 15-24	69	72	76	83	93	108
Within	175	122	120	135	198	554
Between	72	79	84	92	102	117
Total	247	201	204	227	300	671

1988-89	Population Share	Mean Income	Income Share
Single person			
<34	4.9	338	3.2
35-44	2.1	388	1.6
45-54	1.9	321	1.2
55-64	3.8	210	1.6
65+	7.7	164	2.5
Couple only			
(Age of head)			
<34	5.1	650	6.5
35-44	1.5	632	1.8
45-54	2.8	551	3.0
55-64	5.9	430	5.0
65+	8.0	321	5.0
Couple with children			
(Age of child)			
<5	7.1	502	7.0
5-14	9.3	608	11.2
<5, 5-14	6.2	552	6.8
5-14, 15-24	6.1	737	9.0
15-24	7.9	803	12.5
<5, 15-24	0.6	650	0.8
Single parent			
(Age of child)			
<14	3.3	259	1.7
<14, 15-24	0.9	415	0.8
15-24	1.8	445	1.6
Sharing household			
(Age of head)			
15-24	1.3	600	1.6
25-34	1.1	709	1.6
35-54	1.4	684	1.9
55-64	1.7	593	2.0
65+	2.2	492	2.1
Sharing household with child			
(Age of child)			
<14	1.3	616	1.6
15-24	3.4	773	5.2
<14, 15-24	0.9	760	1.3

Characteristic: Household Type

1984	2	1	$^1/_2$	0	$-^1/_2$	-1
			α Value			
Internal Inequalities						
1 adult aged 65+	175	124	111	105	109	137
2 adults aged 65+	211	157	145	138	137	143
1 adult	170	165	171	186	216	280
2 adults	114	115	122	139	188	413
3+ adults	93	92	94	100	109	125
1 adult/1 child	104	91	87	84	83	83
2 adults/1 child	112	106	110	124	160	275
2 adults/2 children	89	88	94	113	161	302
2 adults/3+ children	117	112	118	134	171	258
2+ adults/child(ren)	78	76	78	82	88	98
Within	122	109	112	126	162	273
Between	64	67	71	76	83	93
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
1 adult aged 65+	7.4	126	2.5
2 adults aged 65+	10.3	263	7.4
1 adult	11.1	231	7.0
2 adults	20.5	409	22.8
3+ adults	6.6	591	10.6
1 adult/1 child	4.7	206	2.6
2 adults/1 child	9.7	407	10.7
2 adults/2 children	15.0	398	16.3
2 adults/3+ children	8.5	417	9.7
2+ adults/child(ren)	6.3	598	10.3

Characteristic: Household Type

1988-89	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
1 adult aged 65+	144	103	94	92	97	118
2 adults aged 65+	275	193	176	171	193	344
1 adult	159	153	162	191	294	873
2 adults	127	125	134	157	246	856
3+ adults	143	114	112	115	126	147
1 adult/1 child	88	83	84	87	94	107
2 adults/1 child	362	191	168	168	213	447
2 adults/2 children	141	120	126	152	246	693
2 adults/3+ children	110	94	95	104	128	195
2+ adults/child(ren)	113	88	84	85	88	95
Within	177	127	125	142	206	564
Between	70	74	79	85	94	107
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
1 adult aged 65+	7.7	164	2.5
2 adults aged 65+	10.6	371	7.8
1 adult	12.6	304	7.6
2 adults	20.6	542	22.1
3+ adults	9.2	834	15.1
1 adult/1 child	4.1	270	2.2
2 adults/1 child	7.8	542	8.3
2 adults/2 children	12.4	586	14.4
2 adults/3+ children	7.5	561	8.3
2+ adults/child(ren)	7.5	793	11.7

Characteristic: Number of Employed Persons

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
No workers	139	114	111	115	108	202
1 worker	85	81	84	92	112	164
2 workers	74	75	81	97	136	257
3 workers	63	63	66	71	79	94
4+ workers	58	61	65	70	79	93
Within	91	80	84	98	134	245
Between	95	96	99	104	111	121
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
No workers	28.1	170	13.0
1 worker	34.3	335	31.4
2 workers	29.9	505	41.2
3 workers	5.8	646	10.1
4+ workers	2.0	780	4.3

Characteristic: Number of Employed Persons

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
No workers	168	135	134	147	202	469
1 worker	150	113	109	117	164	480
2 workers	137	97	93	101	134	312
3 workers	84	64	60	59	60	63
4+ workers	43	42	43	43	45	47
Within	146	98	98	114	179	537
Between	101	103	106	113	121	134
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
No workers	27.8	223	12.3
1 worker	30.1	448	26.6
2 workers	32.2	671	42.8
3 workers	7.3	879	12.6
4+ workers	2.6	1107	5.8

Characteristic: Earnings Status

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
1 adult/0 earners	91	76	74	76	84	107
1 adult/1 earner	87	85	89	96	110	137
2+ adults/0 earners	63	64	71	89	147	401
• 2+ adults/1 earner	69	65	67	75	97	163
2+ adults/2 earners	81	80	86	99	136	247
0 earners aged 65+	171	132	124	122	129	157
1+ earner(s) aged 65+	179	159	160	171	191	225
Within	100	83	85	97	131	239
Between	87	93	98	105	115	128
Total	186	176	183	202	246	367

	Population Share	Mean Income	Income Share
1 adult/0 earners	6.6	132	2.4
1 adult/1 earner	9.3	288	7.3
2+ adults/0 earners	6.5	206	3.6
2+ adults/1 earner	22.5	354	21.7
2+ adults/2 earners	37.0	541	54.6
0 earners aged 65+	14.9	172	7.0
1+ earner(s) aged 65+	3.2	387	3.3

Characteristic: Earnings Status

1988-89	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
1 adult/0 earners	129	113	118	141	227	626
1 adult/1 earner	76	71	72	79	112	368
2+ adults/0 earners	111	108	120	156	280	890
2+ adults/1 earner	148	109	105	115	174	551
2+ adults/2 earners	128	97	94	101	130	286
0 earners aged 65+	186	137	128	128	144	219
1+ earner(s) aged 65+	196	166	167	180	219	322
Within	156	103	100	114	175	531
Between	91	98	104	113	125	140
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
1 adult/0 earners	6.6	176	2.3
1 adult/1 earner	10.5	370	7.7
2+ adults/0 earners	5.7	267	3.0
2+ adults/1 earner	17.2	476	16.3
2+ adults/2 earners	41.3	731	60.0
0 earners aged 65+	15.5	226	7.0
1+ earner(s) aged 65+	3.1	596	3.7

Characteristic: Occupation of Head

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Professional	99	92	92	96	104	118
Manager/Administration	116	113	121	145	213	451
Clerical	92	87	87	89	93	99
Sales/Service	137	132	138	153	187	266
Trades/Labourer	107	104	109	124	159	259
Not in Labour force	216	176	171	178	197	274
Within	132	118	123	139	178	295
Between	54	58	60	63	67	71
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
Professional	11.5	527	16.7
Manager/Administration	7.4	522	10.7
Clerical	6.4	433	7.6
Sales/Service	8.8	407	9.8
Trades/Labourer	31.4	410	35.4
Not in Labour force	34.5	209	19.8

Characteristic: Occupation of Head

1988-89	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
Professional	147	111	106	109	124	179
Manager/Administration	291	203	198	222	335	1156
Clerical	158	122	116	114	115	120
Sales/Service	169	148	152	179	337	1657
Trades/Labourer	99	96	99	108	133	222
Not in Labour force	262	208	202	213	272	567
Within	191	141	141	161	229	595
Between	56	60	63	66	71	76
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Professional	14.2	697	19.6
Manager/Administration	10.4	717	14.7
Clerical	6.6	568	7.4
Sales/Service	5.8	589	6.8
Trades/Labourer	29.0	568	32.5
Not in Labour force	34.0	283	19.0

Characteristic: Employment Status of Head

1984	2	1	$1/2$	0	$-1/2$	-1
			α Value			
Internal Inequalities						
Full-time wage	84	77	76	77	79	84
Part-time wage	168	150	148	150	157	170
Self-employed	255	236	254	307	446	849
Unemployed	129	126	134	153	199	307
Not in labour force	221	178	171	172	189	264
Within	132	118	122	138	177	293
Between	54	58	61	64	68	73
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
Full-time wage	51.9	470	66.5
Part-time wage	3.7	304	3.1
Self-employed	10.6	388	11.3
Unemployed	3.6	191	1.9
Not in labour force	30.2	210	17.3

Characteristic: Employment Status of Head

1988-89	α Value					
	2	1	$^1/_2$	0	$^-1/_2$	-1
Internal Inequalities						
Full-time wage	132	104	100	100	104	115
Part-time wage	592	299	256	245	268	358
Self-employed	225	198	211	264	487	1967
Unemployed	239	190	189	204	251	382
Not in labour force	265	209	203	214	274	584
Within	194	143	143	162	231	596
Between	53	58	61	65	69	75
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Full-time wage	51.2	646	65.4
Part-time wage	4.5	533	4.8
Self-employed	10.2	536	10.8
Unemployed	2.9	277	1.6
Not in labour force	31.1	283	17.4

Characteristic: Principal Source of Income of Head

1984	α Value					
	2	1	$1/2$	0	$-1/2$	-1
Internal Inequalities						
Wages	88	82	81	83	87	93
Own business	191	172	174	183	202	235
Superannuation	92	89	90	93	98	105
Investment	345	300	322	407	673	1695
Maintenance/						
Compensation	96	97	102	111	127	152
Pension	198	153	142	135	133	133
Sole Parent Benefit	152	126	119	115	113	114
Unemployment Benefit	115	102	101	103	108	116
Sickness Benefit	120	105	102	102	104	109
Veterans Pension	118	100	95	93	92	94
Allowance	103	108	113	121	132	147
No income	343	361	420	554	859	1701
Within	127	110	112	124	160	271
Between	59	66	71	78	85	95
Total	186	176	183	202	245	366

	Population Share	Mean Income	Income Share
Wages	54.3	462	68.4
Own business	8.2	442	9.9
Superannuation	2.8	331	2.6
Investment	4.3	316	3.7
Maintenance/Compensation	1.2	298	1.0
Pension	14.5	166	6.6
Sole Parent Benefit	4.7	187	2.4
Unemployment Benefit	3.4	189	1.8
Sickness Benefit	0.6	213	0.3
Veterans Pension	4.3	213	2.5
Allowance	0.4	261	0.3
No income	1.3	174	0.6

Characteristic: Principal Source of Income of Head

1988-89	α Value 2	1	½	0	-½	-1
Internal Inequalities						
Wages	116	99	97	98	109	175
Own business	228	183	179	187	210	263
Superannuation	188	161	157	157	162	173
Investment	1108	542	512	637	1322	6053
Maintenance/						
Compensation	289	224	217	226	258	328
Pension	204	159	149	143	141	144
Sole Parent Benefit	166	137	129	125	124	126
Unemployment Benefit	141	123	120	122	127	137
Sickness Benefit	221	200	201	211	232	266
Veterans Pension	135	115	111	109	110	114
Allowance	340	301	311	347	433	625
No income	313	348	427	613	1089	2498
Within	192	139	137	154	220	582
Between	55	62	67	73	80	89
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Wages	53.7	630	66.8
Own business	9.1	625	11.2
Superannuation	2.5	410	2.0
Investment	4.9	449	4.4
Maintenance/Compensation	1.2	458	1.1
Pension	14.6	234	6.7
Sole Parent Benefit	4.2	255	2.1
Unemployment Benefit	2.6	266	1.4
Sickness Benefit	0.6	388	0.4
Veterans Pension	4.5	285	2.5
Allowance	0.8	369	0.6
No income	1.3	265	0.7

Characteristic: Inequality by State (Unadjusted)

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
NSW	199	190	201	234	361	1.173
Vic	180	170	177	197	252	.514
Qld	186	175	185	216	317	.827
SA	186	178	186	203	235	.297
WA	176	163	167	180	205	.256
Tas	162	149	152	163	196	.352
ACT and NT	130	134	149	191	398	2.122
Within	187	177	186	211	295	763
Between	1	1	1	1	1	2
Total	188	178	187	212	296	765

	Population Share	Mean Income	Income Share
NSW	35.2	371	35.9
Vic	26.4	372	27.0
Qld	15.9	351	15.3
SA	9.2	335	8.5
WA	9.0	359	8.9
Tas	2.9	317	2.5
ACT and NT	1.5	474	1.9

Characteristic: Location (Urban/Rural)

1988-89	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
Capital City	256	204	206	229	305	709
Other Urban	207	189	191	214	285	627
Rural	195	178	184	205	267	475
Within	243	197	200	223	296	667
Between	4	4	4	4	4	4
Total	247	201	204	227	300	671

	Population Share	Mean Income	Income Share
Capital City	64.1	538	68.2
Other Urban	27.5	447	24.3
Rural	8.4	453	7.5

Section B: Equivalent Income

Characteristic: Number of Persons

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
1 person	221	193	189	194	212	262
2 people	154	145	147	158	188	313
3 people	121	113	116	125	147	209
4 people	93	90	96	110	147	254
5 people	108	105	112	128	163	247
6 people	79	76	77	82	91	112
7 or more people	98	101	108	120	142	180
Within	130	118	120	130	159	248
Between	9	9	9	10	10	10
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
1 person	6.9	187	7.3
2 people	22.8	204	26.3
3 people	18.1	194	19.9
4 people	27.9	165	26.1
5 people	15.7	156	13.9
6 people	6.7	137	5.2
7 or more people	2.0	107	1.2

Characteristic: Number of Persons

			α Value			
1988-89	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
1 person	206	180	181	196	256	562
2 people	177	160	163	178	242	648
3 people	271	164	149	149	174	290
4 people	122	108	112	130	195	484
5 people	133	102	99	103	118	161
6 people	78	80	86	100	132	220
7 or more people	97	91	91	92	94	99
Within	177	135	133	142	187	405
Between	7	7	7	8	8	8
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
1 person	7.3	251	7.4
2 people	22.9	276	25.4
3 people	17.8	272	19.5
4 people	26.9	250	27.1
5 people	16.6	220	14.7
6 people	6.7	182	4.9
7 or more people	1.7	157	1.1

Characteristic: Family Composition

1984	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Couple	129	120	123	136	171	277
Sole parent (male)	99	100	103	107	113	122
Sole parent (female)	74	68	66	65	65	66
• Other one family type	80	80	83	87	93	102
Multi-family Household	91	87	87	88	90	93
Single person	221	193	189	194	212	262
Two unrelated adults	100	96	98	103	112	126
3+ unrelated singles	77	81	85	91	99	110
Within	132	120	122	133	161	250
Between	7	7	7	7	8	8
Total	139	127	129	140	168	258

	Population Share	Mean Income	Income Share
Couple	79.5	177	79.8
Sole parent (male)	0.5	141	0.4
Sole parent (female)	6.0	117	4.0
Other family type	3.5	173	3.5
Multi-family household	0.5	176	0.5
Single person	6.9	188	7.3
Two unrelated singles	2.3	262	3.5
3+ unrelated singles	0.8	232	1.1

Characteristic: Family Composition

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Couple	189	141	138	148	194	410
Sole parent (male)	97	96	100	108	119	138
Sole parent (female)	76	74	76	81	91	111
Other one family type	112	106	108	114	125	144
Multi-family household	85	80	81	83	88	89
Single person	206	180	181	196	256	562
Two unrelated adults	99	105	116	148	313	1890
3+ unrelated singles	63	66	69	73	79	87
Within	179	136	134	144	189	406
Between	5	6	6	6	6	7
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Couple	77.1	252	78.1
Sole parent (male)	0.7	212	0.6
Sole parent (female)	5.2	161	3.4
Other family type	4.7	238	4.5
Multi-family household	1.6	237	1.5
Single person	7.3	251	7.4
Two unrelated singles	2.5	329	3.3
3+ unrelated singles	0.9	343	1.2

Characteristic: Age of Head

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
<25	102	102	106	119	163	399
25-34	143	135	141	161	215	394
35-44	132	118	119	127	147	199
45-54	130	126	133	151	193	299
55-64	121	111	111	115	124	146
65-74	155	121	113	109	113	131
75+	184	135	122	113	108	106
Within	133	121	123	134	163	252
Between	6	6	6	6	6	6
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
<25	5.2	198	5.8
25-34	24.9	187	26.4
35-44	29.0	167	27.4
45-54	16.5	192	18.0
55-64	12.6	179	12.8
65-74	7.9	144	6.5
75+	3.9	137	3.0

Characteristic: Age of Head

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
<25	109	116	126	149	213	486
25-34	134	126	131	149	212	525
35-44	153	126	127	141	194	431
45-54	248	154	140	138	146	170
55-64	205	164	162	176	242	631
65-74	197	138	127	126	149	282
75+	248	165	145	132	125	122
Within	178	136	134	144	188	406
Between	6	6	6	6	7	7
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
<25	4.2	274	4.6
25-34	22.7	259	23.7
35-44	32.0	239	30.7
45-54	18.0	276	20.3
55-64	11.3	256	11.6
65-74	8.0	194	6.3
75+	3.6	199	2.9

Characteristic: Marital Status

1984	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Married	130	120	124	136	171	279
Separated	210	165	154	147	145	146
Divorced	182	155	150	150	154	162
Widowed	142	115	108	104	102	104
Never married	132	129	134	145	169	207
Within	135	123	125	136	165	254
Between	5	4	4	4	4	4
Total	140	127	129	140	169	258

	Population Share	Mean Income	Income Share
Married	80.3	177	80.6
Separated	3.4	140	2.7
Divorced	4.5	167	4.3
Widowed	5.6	143	4.6
Never married	6.1	228	7.9

Characteristic: Marital Status

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Married	188	140	137	148	193	404
Separated	186	162	161	169	194	265
Divorced	171	143	137	137	141	152
Widowed	138	112	107	106	111	127
Never married	130	129	138	164	268	1035
Within	181	139	136	146	191	409
Between	3	3	4	4	4	4
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Married	79.1	251	79.8
Separated	3.1	212	2.6
Divorced	4.4	217	3.8
Widowed	5.8	197	4.6
Never married	7.6	298	9.2

Characteristic: Gender

1984	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
Male	137	126	129	141	175	281
Female	147	127	123	121	123	127
Within	138	126	128	138	167	256
Between	1	1	2	2	2	2
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
Male	85.7	180	87.6
Female	14.3	153	12.4

Characteristic: Gender

1988-89	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
Male	161	133	133	145	194	433
Female	324	190	172	170	194	310
Within	183	141	139	149	194	412
Between	1	1	1	1	1	1
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Male	76.7	253	84.1
Female	23.3	225	15.9

Characteristic: Lifecycle Cohort

1984	α Value					
	2	1	$^{1}/_{2}$	0	$^{-1}/_{2}$	-1
Internal Inequalities						
Single person						
<34	103	105	112	125	146	185
35-44	88	93	99	109	125	149
45-54	198	190	198	216	250	311
55-64	190	163	160	166	187	243
65+	175	124	111	105	109	137
Couple only - Age of head						
<34	63	70	81	112	237	1033
35-44	118	122	129	142	161	191
45-54	149	150	163	192	251	377
55-64	123	111	109	110	113	119
65+	137	105	96	91	90	94
Couple with children						
Age of children						
<5	112	105	109	125	171	315
5-14	93	99	110	135	195	356
<5, 5-14	122	115	122	142	190	310
5-14, 15-24	100	91	92	95	104	124
15-24	96	90	92	96	105	118
<15, 115-24	87	81	80	80	82	84
Single parent						
Age of children						
<14	74	64	61	59	58	57
<14, 15-24	70	67	67	68	69	72
15-24	75	71	70	69	70	71
Single households						
(no children)						
Age of head						
15-24	52	52	54	57	60	66
25-34	63	67	72	79	91	109
35-54	97	95	96	99	104	112
55-64	108	99	98	99	102	107
65+	143	119	113	111	111	115
Single household						
(with children)						
Age of child						
<14	81	80	81	84	89	96
15-24	94	87	87	89	94	102
<14, 15-24	47	47	48	50	52	56
Within	108	98	100	112	141	230
Between	31	29	29	28	28	28
Total	139	127	129	140	169	258

1984	Population Share	Mean Income	Income Share
Single person			
<34	1.3	258	1.9
35-44	0.6	308	1.0
45-54	0.8	253	1.1
55-64	1.4	160	1.3
65+	2.9	126	2.0
Couple only			
(Age of head)			
<34	4.4	294	7.4
35-44	0.8	294	1.3
45-54	2.0	220	2.5
55-64	4.5	182	4.6
65+	5.7	133	4.3
Couple with children			
(Age of child)			
<5	9.8	184	10.2
5-14	14.4	160	13.1
<5, 5-14	11.0	146	9.1
5-14, 15-24	11.1	160	10.1
15-24	8.8	207	10.3
<5, 15-24	1.0	106	0.6
Single parent			
(Age of child)			
<14	3.4	110	2.1
<14, 15-24	1.5	114	1.0
15-24	0.5	124	0.3
Sharing household			
(Age of head)			
15-24	1.0	206	1.2
25-34	1.0	290	1.6
35-54	0.8	231	1.0
55-64	1.3	198	1.5
65+	2.1	167	2.0
Sharing household with child			
(Age of child)			
<14	2.1	155	1.8
15-24	3.7	216	4.6
<14, 15-24	2.4	156	2.1

Characteristic: Lifecycle Cohort

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Single person						
<34	105	113	130	181	386	1674
35-44	113	103	105	112	127	157
45-54	161	154	159	171	191	225
55-64	206	166	161	170	220	482
65+	144	103	94	92	97	118
Couple only - Age of head						
<34	56	60	65	74	96	162
35-44	60	65	70	76	85	98
45-54	105	108	113	123	140	167
55-64	268	212	212	244	390	1306
65+	274	176	155	148	171	338
Couple with children						
Age of children						
<5	114	108	117	149	276	973
5-14	346	196	179	188	245	441
<5, 5-14	127	106	105	113	140	230
5-14, 15-24	128	100	99	105	125	191
15-24	161	111	104	103	107	119
<15, 115-24	65	64	66	68	71	77
Single parent						
Age of children						
<14	92	87	89	95	109	138
<14, 15-24	78	71	70	69	70	72
15-24	92	87	88	91	95	102
Single households						
(no children)						
Age of head						
15-24	81	86	91	100	113	134
25-34	80	80	83	88	96	108
35-54	80	87	95	110	138	191
55-64	88	86	87	90	96	103
65+	162	121	111	106	104	106
Single household						
(with children)						
Age of child						
<14	65	66	69	74	81	92
15-24	95	93	99	117	215	1117
<14, 15-24	68	70	75	82	93	110
Within	161	120	118	128	173	391
Between	23	22	22	22	22	22
Total	184	142	140	150	195	413

1988-89	Population Share	Mean Income	Income Share
Single person			
<34	1.8	338	2.4
35-44	0.7	388	1.2
45-54	0.7	321	0.9
55-64	1.4	210	1.2
65+	2.8	164	1.8
Couple only			
(Age of head)			
<34	3.7	390	5.8
35-44	1.1	379	1.6
45-54	2.0	330	2.6
55-64	4.2	258	4.4
65+	5.8	193	4.5
Couple with children			
(Age of child)			
<5	8.9	245	8.8
5-14	13.5	246	13.4
<5, 5-14	10.7	215	9.3
5-14, 15-24	10.4	229	9.6
15-24	10.3	279	11.6
<5, 15-24	1.3	196	1.0
Single parent			
(Age of child)			
<14	3.3	158	2.1
<14, 15-24	1.3	160	0.8
15-24	1.6	216	1.3
Sharing household			
(Age of head)			
15-24	1.1	297	1.3
25-34	0.9	378	1.4
35-54	1.2	332	1.6
55-64	1.7	266	1.8
65+	1.9	240	1.9
Sharing household with child			
(Age of child)			
<14	2.1	208	1.8
15-24	3.9	296	4.6
<14, 15-24	1.8	199	1.4

Characteristic: Household Type

1984	α Value					
	2	1	$^1/_2$	0	$^{-1}/_2$	-1
Internal Inequalities						
1 adult aged 65+	175	124	111	105	109	137
2 adults aged 65+	158	123	114	109	108	112
1 adult	170	165	171	186	216	280
2 adults	114	115	122	139	187	410
3+ adults	82	82	85	91	99	113
1 adult/1 child	75	67	65	63	62	62
2 adults/1 child	110	104	108	122	157	265
2 adults/2 children	86	85	91	109	157	293
2 adults/3+ children	119	113	119	135	171	252
2+ adults/child(ren)	73	72	73	77	82	90
Within	113	102	104	115	144	233
Between	26	25	25	25	25	25
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
1 adult aged 65+	2.9	126	2.1
2 adults aged 65+	8.4	148	7.0
1 adult	4.0	230	5.3
2 adults	14.9	241	20.3
3+ adults	7.7	223	9.7
1 adult/1 child	4.8	113	3.1
2 adults/1 child	9.5	197	10.6
2 adults/2 children	20.6	161	18.8
2 adults/3+ children	16.1	137	12.5
2+ adults/child(ren)	11.1	170	10.7

Characteristic: Household Type

1988-89	α Value					
	2	1	$1/2$	0	$-1/2$	-1
Internal Inequalities						
1 adult aged 65+	144	103	94	92	97	118
2 adults aged 65+	230	159	144	140	158	286
1 adult	159	153	162	191	294	873
2 adults	128	126	135	158	247	864
3+ adults	139	104	100	102	109	126
1 adult/1 child	88	82	83	88	98	121
2 adults/1 child	360	192	169	169	212	432
2 adults/2 children	137	116	122	147	238	654
2 adults/3+ children	119	101	101	110	136	212
2+ adults/child(ren)	110	86	84	85	90	98
Within	164	121	119	129	173	391
Between	20	21	21	21	22	22
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
1 adult aged 65+	2.8	164	1.8
2 adults aged 65+	8.3	207	6.9
1 adult	4.6	305	5.6
2 adults	14.9	321	19.2
3+ adults	11.3	306	13.8
1 adult/1 child	4.2	155	2.6
2 adults/1 child	8.5	267	9.1
2 adults/2 children	18.0	243	17.6
2 adults/3+ children	14.4	194	11.2
2+ adults/child(ren)	13.1	230	12.1

Characteristic: Number of Employed Persons

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
No workers	118	90	85	87	104	176
1 worker	117	102	101	107	126	181
2 workers	112	109	116	135	184	327
3 workers	82	78	80	83	91	104
4+ workers	68	67	69	73	78	87
Within	113	99	100	110	137	224
Between	26	28	29	30	32	34
Total	139	127	129	140	168	258

	Population Share	Mean Income	Income Share
No workers	19.7	107	12.0
1 worker	34.2	167	32.4
2 workers	34.2	215	41.7
3 workers	8.3	210	9.8
4+ workers	3.6	205	4.2

Characteristic: Number of Employed Persons

1988-89	α Value					
	2	1	$1/2$	0	$-1/2$	-1
Internal Inequalities						
No workers	136	105	103	116	167	395
1 worker	176	136	132	141	186	416
2 workers	169	122	118	125	161	358
3 workers	91	75	72	72	74	78
4+ workers	54	51	51	52	53	53
Within	158	114	110	119	161	377
Between	26	28	30	31	34	36
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
No workers	16.0	142	9.2
1 worker	27.4	215	23.9
2 workers	40.0	288	46.9
3 workers	11.5	295	13.8
4+ workers	5.1	302	6.2

Characteristic: Earnings Status

1984	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
1 adult/0 earners	77	58	54	52	53	60
1 adult/1 earner	146	137	139	146	160	185
2+ adults/0 earners	83	77	81	95	139	300
2+ adults/1 earner	83	77	79	87	109	169
2+ adults/2 earners	102	100	106	121	160	272
0 earners aged 65	128	93	84	79	79	90
1+ earner(s) aged 65+	133	114	111	111	115	123
Within	110	94	95	104	131	218
Between	30	33	34	36	38	40
Total	140	127	129	140	169	258

	Population Share	Mean Income	Income Share
1 adult/0 earners	4.1	98	2.3
1 adult/1 earner	4.7	228	6.0
2+ adults/0 earners	6.8	92	3.5
2+ adults/1 earner	27.6	154	24.1
2+ adults/2 earners	44.9	214	54.5
0 earners aged 65+	8.9	123	6.2
1+ earner(s) aged 65+	3.0	197	3.3

Characteristic: Earnings Status

1988-89	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
1 adult/0 earners	103	83	85	98	144	329
1 adult/1 earner	120	110	111	119	147	317
2+ adults/0 earners	121	108	116	145	236	605
2+ adults/1 earners	162	120	116	126	175	418
2+ adults/2 earners	143	106	103	108	136	281
0 earners aged 65+	133	95	86	84	100	196
1+ earner(s) aged 65+	199	149	139	137	148	184
Within	154	109	105	113	155	370
Between	30	33	35	37	40	43
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
1 adult/0 earners	4.1	134	2.2
1 adult/1 earner	5.0	312	6.3
2+ adults/0 earners	6.1	124	3.1
2+ adults/1 earner	21.3	210	18.0
2+ adults/2 earners	51.9	294	61.4
0 earners aged 65+	8.7	165	5.8
1+ earner(s) aged 65+	2.9	285	3.4

Characteristic: Occupation of Head

1984	α Value					
	2	1	$\frac{1}{2}$	0	$-\frac{1}{2}$	-1
Internal Inequalities						
Professional	109	104	106	113	128	159
Manager/Administration	117	110	115	134	191	386
Clerical	60	59	60	61	64	67
Sales/Service	111	107	112	128	167	273
Trades/Labourer	110	104	108	121	154	245
Not in Labour force	124	101	97	99	114	176
Within	113	101	102	113	141	229
Between	26	26	27	27	28	29
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
Professional	12.5	240	17.0
Manager/Administration	9.2	215	11.2
Clerical	6.0	219	7.4
Sales/Service	9.2	189	9.9
Trades/Labourer	36.4	176	36.3
Not in Labour force	26.7	120	18.2

Characteristic: Occupation of Head

1988-89	2	1	$^1/_2$	α Value 0	$^-{}^1/_2$	-1
Internal Inequalities						
Professional	134	106	102	104	118	170
Manager/Administration	308	197	184	196	267	697
Clerical	115	90	86	84	85	89
• Sales/Service	132	124	130	157	292	1252
Trades/Labourer	86	83	86	96	122	212
Not in Labour force	149	121	119	130	175	379
Within	158	115	112	121	165	382
Between	26	27	28	29	30	31
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Professional	15.3	326	20.0
Manager/Administration	12.4	304	15.2
Clerical	6.0	293	7.1
Sales/Service	5.9	284	6.8
Trades/Labourer	34.3	243	33.5
Not in Labour force	26.0	166	17.4

Characteristic: Employment Status of Head

1984	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Full-time wage	90	82	80	80	83	89
Part-time wage	121	105	102	101	102	106
Self-employed	243	223	239	288	417	775
Unemployed	91	79	80	90	114	173
Not in labour force	118	96	92	92	104	163
Within	116	102	103	112	140	227
Between	23	25	26	28	29	31
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
Full-time wage	56.4	207	66.3
Part-time wage	3.4	163	3.1
Self-employed	13.5	162	12.4
Unemployed	4.0	89	2.0
Not in labour force	22.7	126	16.2

Characteristic: Employment Status of Head

1988-89	α Value					
	2	1	$1/2$	0	$-1/2$	-1
Internal Inequalities						
Full-time wage	120	97	93	94	100	122
Part-time wage	553	269	226	217	250	393
Self-employed	224	183	189	227	382	1234
Unemployed	134	112	113	126	164	265
Not in labour force	146	118	116	127	173	392
Within	162	118	115	124	167	384
Between	22	24	25	26	28	29
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Full-time wage	57.5	288	66.6
Part-time wage	4.4	271	4.7
Self-employed	12.1	231	11.2
Unemployed	3.1	131	1.7
Not in labour force	22.9	171	15.8

Characteristic: Principal Source of Income of Head

1984	α Value					
	2	1	$1/2$	0	$-1/2$	-1
Internal Inequalities						
Wages	90	82	81	81	83	88
Own business	182	160	159	163	175	198
Superannuation	60	56	55	54	55	56
Investment	287	264	290	369	595	1364
Maintenance/						
Compensation	97	93	94	97	104	114
Pension	54	47	44	42	41	41
Sole Parent Benefit	61	52	50	48	46	45
Unemployment Benefit	54	46	43	40	38	37
Sickness Benefit	51	45	43	41	40	39
Veterans Pension	37	34	32	32	31	31
Allowance	45	42	41	40	40	40
No income	363	376	435	562	830	1440
Within	109	93	93	101	126	210
Between	30	34	36	39	43	48
Total	139	127	129	140	169	258

	Population Share	Mean Income	Income Share
Wages	58.8	205	68.4
Own business	10.3	186	10.8
Superannuation	1.9	195	2.1
Investment	3.9	166	3.6
Maintenance/Compensation	1.2	155	1.1
Pension	9.4	111	6.0
Sole Parent Benefit	4.6	102	2.6
Unemployment Benefit	3.9	88	2.0
Sickness Benefit	0.7	90	0.4
Veterans Pension	3.1	124	2.2
Allowance	0.3	125	0.2
No income	1.8	65	0.7

Characteristic: Principal Source of Income of Head

1988-89	α Value					
	2	1	$^1/_2$	0	$-^1/_2$	-1
Internal Inequalities						
Wages	104	89	87	89	102	184
Own business	237	178	169	170	181	210
Superannuation	82	79	80	83	89	100
Investment	912	500	479	585	1108	4344
Maintenance/						
Compensation	321	209	186	178	182	202
Pension	55	48	46	45	45	45
Sole Parent Benefit	51	45	44	43	42	43
Unemployment Benefit	66	57	55	54	56	59
Sickness Benefit	95	82	79	77	77	79
Veterans Pension	54	51	51	51	53	57
Allowance	245	213	226	273	400	754
No income	289	320	395	568	997	2187
Within	159	114	110	118	160	375
Between	25	28	30	32	35	38
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Wages	59.9	283	68.1
Own business	10.9	264	11.6
Superannuation	1.8	247	1.8
Investment	3.8	266	4.0
Maintenance/Compensation	1.2	217	1.0
Pension	9.5	154	5.9
Sole Parent Benefit	4.0	142	2.3
Unemployment Benefit	2.8	127	1.4
Sickness Benefit	0.8	146	0.4
Veterans Pension	3.0	178	2.2
Allowance	0.8	184	0.6
No income	1.5	110	0.7

Characteristic: Inequality by State (Equivalent) O'Higgins

1984	α Value					
	2	1	$1/2$	0	$-1/2$	-1
NSW	145	134	136	148	176	251
Vic	123	113	114	120	142	220
Qld	154	139	144	163	218	380
SA	150	131	130	136	154	198
WA	127	114	114	119	132	167
Tas	134	125	127	137	160	213
ACT and NT	102	100	104	118	180	615
Within	138	126	128	139	168	256
Between	1	1	1	1	1	2
Total	139	127	129	1240	169	258

	Population Share	Mean Income	Income Share
NSW	35.1	181	35.9
Vic	26.4	182	27.3
Qld	16.1	166	15.1
SA	8.7	169	8.3
WA	9.2	171	9.0
Tas	2.9	153	2.5
ACT and NT	1.6	219	2.0

Characteristic: Location

1988-89	2	1	$^1/_2$	0	$^{-1}/_2$	-1
			α Value			
Internal Inequalities						
Capital City	195	146	142	151	195	436
Other Urban	136	121	122	135	177	349
Rural	164	137	138	152	205	405
Within	181	139	137	147	192	410
Between	3	3	3	3	3	3
Total	184	142	140	150	195	413

	Population Share	Mean Income	Income Share
Capital City	64.3	262	67.8
Other Urban	26.5	229	24.4
Rural	9.1	121	7.8

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