

Economic Inequality in Australia Volume 2: Some Factors Causing Inequality

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Centre for Applied Economic Research • Social Policy Research Centre

**STUDY OF
SOCIAL AND
ECONOMIC
INEQUALITIES**

**Economic Inequality in Australia
Volume 2: Some Factors Causing Inequality
Edited by Phil Raskall and Peter Saunders**

SSEI Monograph No. 2



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The views expressed in this publication do not represent any official position on the part of the Centre for Applied Economic Research or the Social Policy Research Centre. This monograph was produced to make available the research findings of the individual authors, and to promote the development of ideas and discussions about major areas of concern in the field of social and economic inequality.

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. The main focus of the Study is to shed new light on various dimensions of inequality in Australia - both economic and social - and to investigate the factors causing them. The research involves 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. By adopting an empirical approach, the study will inform the development of government policies directed at alleviating those forms of inequality requiring policy action. Some of the work is being conducted in an international comparative context, thus providing a framework in which we in Australia can learn from experience in other countries where appropriate.

The Study is being conducted 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 five main themes of the Study are:

Money Income Inequality, Poverty and Living Standards in Australia;

Non-Monetary Benefits and Income Inequality;

Factors Contributing to Inequalities in Monetary Income;

Economic Inequality over the Family Life Cycle; and

International Dimensions of Inequality and Redistribution.

During its initial phase, funding for the Study has been provided primarily by the Commonwealth Government through the Department of Social Security. Supplementary funding has been provided by the Sidney Myer Foundation and the Australian Mutual Provident (AMP) Society.

As Directors of the Study, we intend to publish and disseminate the results emerging from the research to as wide an audience as possible. One of our first tasks was to bring together researchers associated with the Study and with other organisations in Australia in order to review what is currently known about inequality in Australia. To this end, a two day Conference was held at the University of New South Wales in July 1991. This report, the second in a series of SSEI Monographs, is one of two which contain some of the papers presented at that Conference, organised under two main themes: **Government and Redistribution** and **Some Factors Causing Inequality**. These two reports represent an overview of the current state of knowledge and point to areas where further research is required. Some of that research will be conducted as part of the Study and will be reported on in due course.

John Nevile and Peter Saunders

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Inequality in Australia - What We Know and What We Don't

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1 Context

The very notion of an overview - hovering above the forest to provide guidance to those down amongst the trees - to give a different perspective, presupposes a mechanism to get there. Moreover, just as others can get lost in the trees, so the overview can lose sight of the complexity and delicate ecosystem of the individual glades. Such would not do justice to the valuable contributions of the practitioners in the field.¹

To overcome this, this paper takes as its point of departure, a metaphysical mechanism to ascend from a conceptual basis of what the terrain might look like towards a view of 'reality'. The paper does not intend to review in detail our current pieces of knowledge on the subject, our initial fossils, but more our state of knowledge, or lack thereof. Each of the session speakers will provide far more insight into these aspects of detail. Instead, this paper aims to provide a framework from which the components of inequality can be interlocked and we can begin to see the nature of these inter-relationships which form the basis of a truer understanding of social and economic inequality.

If there is one over-riding feature missing from our knowledge of inequality in Australia it is this interaction. Research into aspects of inequality too often tends to be isolated by the bounds of discipline or the confines of access. Disparate research in the health field links illness to 'socio-economic condition' but little 'socio-economic research' draws upon these disparate studies, to link well-being to being-well.

The problem is often one of perception. Research in various disciplines sees inequality either as a cause or as an outcome rather than as both in a multi-disciplinary sense.

1 For excellent annotated bibliographies of the inequality and poverty field, the reader is referred to Encel (1988, 1990) and Sitsky (1989).

Similarly reflecting the state of our knowledge, too often 'inequality analysis' has been merely descriptive and specific to one time and one place, rather than being process-oriented or causally-related - that is, analytic. This has stemmed in part from the lack of a coherent data base on the dimensions of inequality. In a nation where inequality is often ignored, research that points to its existence is important but, we would argue, not sufficient if we are to seriously address its causes and consequences.

A large part of the analysis presented at this Conference, and indeed the Conference itself, forms part of the Study of Social and Economic Inequalities being jointly conducted by the Social Policy Research Centre and the Centre for Applied Economic Research at this University. It is a long-term project which basically has three (somewhat daunting) objectives:

- the extent of inequality in economic and social dimensions: comparative across countries and across time;
- the factors giving rise to that inequality; and
- the extent to which governments can and have affected that distribution.

We all recognise the significance of government in redistributing resources and providing opportunities for enhanced social equality, but with that involvement comes a public perception of total responsibility for the manifestation of all inequality. It is therefore a brave government which seeks to demystify inequality, to be prepared to step out from the cosy myths, often carefully nurtured, which are often invoked to enable the 'just' to justify their injustice, to govern not on illusion but on a willingness to face reality. For that reason, particular credit goes to the Deputy Prime Minister, Brian Howe as the driving force behind securing base funding for the project.

It is not only a brave government, it is a wise government, since every decision has distributional consequences. These not only include the socially deleterious effects on health, crime, drug abuse, and the adequacy of housing reflecting personal danger, alienation and desperation, but also important economic impacts, with efficiency effects. For instance, differential expenditure ratios as a proportion of income, differential expenditure patterns, import-content, labour-intensity, and savings rates between high and low income recipients all imply different impacts on the economy stemming from changes in the distribution of economic resources. Similarly, as we have seen in the last decade, asset and asset-price effects impact significantly upon the economy.

Despite this, we know very little about such economic interconnections with the distribution of income and wealth which reflects itself in the paucity of our knowledge of the impact of taxation and social security measures on economic phenomena.

The often tragic reality of our economic and social history is that the dominant form of discourse on social justice in Australia has been language dressed up as rhetoric. This has stemmed from two, not unrelated, sources: the reliance of policy-makers on a limited form of economics (self-described as 'rational') which denies the relevance of distributional issues and hence conveniently ignores them, aided and abetted by a lack of co-ordinated information on the extent and consequences of economic and social inequality. Resort is then made to intuition or implicit value judgements.

We are not foolishly deluding ourselves that this study will resolve all of what may well be irresolvable. The area is full of philosophical mines as the economics and sociology disciplinary paradigms jostle like plates on the earth's crust, occasionally producing epistemological earthquakes.

Indeed, if we can merely assemble the array of work now being produced under the banner of 'inequality' analysis under a coherent framework I believe we will have achieved a considerable advance. Too often such research takes place within a cell of isolation with its interconnectedness not readily either identified or appreciated. In simple terms, we can easily get caught up examining the trees and not see the forest.

From this perspective, we can begin to construct the conceptual foundations of an analytical framework from which the state of our knowledge can be evaluated, and hopefully enhanced.

2 Philosophical Research Foundations

The analytic starting point to such a framework must be a clear understanding of the terms we are using - linguistic validation. What is inequality? Whose inequality we are interested in? Inequality of what? Few emotions evoke as much deep-seated passion as the associated concepts of justice and injustice, equity, fairness and social ethics.

Without digressing into a discourse on the philosophy of equality from the Greeks through to Rawls and his critics, it seems to me that, in the aggregate, we are interested in the distribution of **power**: power to create and influence social structures, to maintain and reproduce them, and, in turn, to receive rewards measured through command over economic resources in the market, based upon property rights and social rewards of status and prestige.

At the individual level, this can be translated into personal well-being or happiness, as illustrated by welfare economics with its aim to examine the conditions and specify the process which maximise each individual's well-being and its additive assumption that society's well-being is maximised when each individual's well-being is maximised. The famous Pareto optimality criterion - the altar before which efficiency-only economics bows - purports to do this. This states that society can be made better-off if the welfare of one individual can be improved without making any

other worse off. The variant becomes the proposition that efficiency is enhanced if those made better-off are still better-off after compensating those made worse-off.

Aside from its static limitations, this seems to ignore the Gestalten philosophy whereby the whole is greater than the sum of its parts. Individuals, implicitly or explicitly, can act together for their own joint benefit if it is in their interest and they have, or can create, the power to do so. They can enhance their own position at the expense of others. If they can get away with it without compensating those 'others' (that is, appropriate the surplus benefits of power) then so much better. Thus, the behavioural emphasis is on the creation of a system which legitimates certain manifestations of power and a system that maintains that legitimation by a process of reward, penalties for non-compliance and, if need be, a process of mystification of reality.

It is here that so-called 'rational' economics falters badly since the very foundations on which it is based assume that there is no differential individual power. All individuals possess equal knowledge and participate equally in the market system. This explains why limited rational economics says so little about distributional matters. The 'invisible hand' would work if everybody were equal. That they are not complicates 'economics' so 'economists' assume they are.

It should be remembered that the market system allocates societal economic resources according to the preference of each unit of the money system. But a dollar coin does not have a preference, the owner of it does - hence each owner's impact on the market and thus on the allocation of resources (each owner's power) is at least proportional to the number of dollars each owner has, in other words, the distribution of wealth.

This power is based on social acceptance of property rights. Each person, backed by the power of a body like the state, accepts that those units of economic power (whatever their manifestation) reside in perpetuity in their owner's hands. They cannot be unilaterally confiscated. However this power extends beyond mere command over economic resources but is manifested into a vast array of social structures which produce different measurements of the reflection of this power - the elements of social inequality.

Through this sort of conceptual analysis we can see that it is possible to integrate the economics of inequality with the sociology of inequality; we are looking at the same creature from a different angle. Unfortunately, too often we bear witness to paradigmatic debates over the linguistics, over the rightness or wrongness of the angle of observation.

However, the core concept, that of the distribution of something called 'power', is elusive for definition at an operational analytical level. For that reason we seek out indicators of that power relation and consequent inequality: the distribution of economic well-being, be it wealth and/or income, and of social rewards, prestige and status.

In view of the paucity of data for testing analytical propositions and units of analysis capable of measurement to examine the distribution of social rewards, we intend in our project to concentrate upon inequality as measured by the distribution of income, but income defined in a more comprehensive fashion than previously considered. Moreover, for policy purposes government, short of revolutionary change, can only affect accretions to wealth, that is, income, and even then possibly only at the margins.

Inequality is the focus of the study. That requires analysis of the wealthy (in its classical sense of high-income) as well as the poor. To quote Tawney: 'What thoughtful rich people call the problem of poverty, equally thoughtful poor people with equal justification call the problem of riches' (1913: 13).

From this perspective, 'poverty' studies form a subset of the study of inequality. If inequality is defined across a power dimension, then poverty is defined as a lack of power, and consequently a relative and almost immeasurable term. The poor are the powerless to differing relative degrees. But relative to what? Clearly the powerful. Thus, if poverty is the lower tail of the animal of inequality, we need also to examine the head that wags the tail. Moreover, as Saunders and Matheson (1991) show, the absolute numbers of poor in poverty change dramatically depending on where we take the benchmark.

A final conceptual trap needs to be noted. Inequality should not, at face value, be equated with inequity. It is possible to have a 'just' system of allocation of resources which appears as an unequal distribution of allocated resources. There are innumerable examples of this, the most common being capacity of participation in a reward system which is based on manual labour contribution. A child, the frail elderly and the sick may not receive an equal primary level allocation but are reliant, through dependency, on a secondary level of distribution. That primary allocation is unequal but not inequitable whilst the basis of a reward system is socially accepted. The equity of the secondary allocation depends on relative needs.

In more formal terms equity is the ethical construct of equality. Whilst economists and sociologists have no more, and no less, expertise than any other member of the community to comment on the ethical, that is, the equity, they do have the expertise, and the obligation, to examine through a cause-and-effect analytic framework the equality of a society, the relativity of needs as measured and the efficacy of the primary and secondary distribution mechanisms.

This ethical concept of equity raises a fundamental methodological issue. In methodological terms, following Samuel's analysis (Samuel, 1989), there is a dual $x:X$ problem in general, and in distributional analysis in particular, one epistemological and the other linguistic.

Let X represent the object of inquiry, in this case inequality, and x represent our knowledge of X . The key epistemological problem is whether x (our knowledge) is representative of X (inequality). All work in deduction and especially induction (for

example, econometrics or statistics) must somehow come to grips with this problem. Simply put, it is the problem of representativeness of our knowledge sample.

In terms of our study, the danger of heading off from established knowledge, without subjecting it to scrutiny, would compound this possible unrepresentativeness, particularly given the dominance of rhetoric on 'social justice'. Consequently, there has been a conscious attempt to adopt a multi-disciplinary approach that accepts very little as given and stresses the whole rather than the mere parts.

The key linguistic problem is whether the language with which we specify X (inequality) and x (our knowledge of inequality), respectively, has any meaning with regard to X . In some ways this is demonstrated by the debate between the economics and sociology discipline paradigms. It raises the broader philosophical question of whether language is a derivative of the object of study, or is it something which we superimpose on it. Simply put, in this context, is our language (and our analyses stemming from it) equitable, that is, does it ethically treat all things equally? Or to what extent is it itself subject to that ideology invoked by all societies to reassure themselves of the 'justice' of their 'injustices'. We talk about the economics of efficiency but not the economics of equality. If the epistemological goal of the first is efficiency what is the goal of the more commonly used term, the economics of inequality?

How we resolve these dual problems is the, often inherent, first decision we make in undertaking research. The decision can engender an insurmountable directive or constraint on the whole framework for subsequent analysis. Conversely, cognisance needs to be taken of operational constraints: what is both capable of measurement and available from previous research analysis.

Our resolution has been to take as the core touchstone of our analysis, the concept of 'income' broadly defined. Some might claim that this puts over-emphasis on the economic aspect of inequality. However, we ask sceptics at this stage to hold criticism. Firstly, reality demands that we recognise the dominance of money as a unit of exchange in our social system in determining access to property and enjoyment of consumption. Secondly, we must recognise the consequent multi-collinearity between economic resources and other measures of quality of life and standards of living. Thirdly, we must accept for incorporation into our framework, previous research and data bases which have income as the common linkage. Finally, 'income' need not be merely constrained to accountancy-based definitions.

3 Conceptual Framework

In the light of the above, what could be an equitable concept of income amenable to an operational definition? The least constraining definition of 'income' is one that recognises income as the embodiment (or indicator thereof) of power of command over economic resources backed by property rights. It enables us to acquire and retain things that give us, at an individual level, utility or happiness and, within a social framework, prestige and status and the capacity to generate further power.

From this perspective economic income in a socio-economic language can be comprehensively defined as Haig (1921) did as 'the increase or accretion in one's power to satisfy his wants in a given period in so far as that power consists of (a) money itself, or (b) anything susceptible of valuation in terms of money' (Haig, 1921: 43). This is where money is seen as the common commodity for assessing relative values. This can be translated for operational purposes, as Simons (1938) does, as the sum of:

- the market value of rights exercised in consumption; and
- the change in the value of the store of property rights between the beginning and end of the period.

In other words, income is seen as the sum of consumption and change in net worth. The feature of this conceptual definition is that it is comprehensive.

Furthermore, reinforcing the earlier discourse on epistemology, the Minority Report of the UK Royal Commission on the Taxation of Profits and Income (1955) concludes:

No concept of income can be really **equitable** that stops short of the comprehensive definition which embraces all receipts which increase an individual's command over the use of society's scarce resources - in other words his net accretion of economic power between two points in time. (quoted in Atkinson, 1975: 33, emphasis added)

So the stress is on the accretion in the person's command over economic resources, where the 'economic' is merely power measured in money terms.

Following this, we can come up with an operational definition, whereby any receipt, in cash or in kind (through consumption) is an accretion to economic power and so should be included in the 'income' base. This definition of income, representing economic well-being in its true sense, would include aspects outlined in Table 1.

It should be noted that this definition, whilst apparently cast in the language of market value does not mean that 'consumption' must arise through a market transaction. The key is the ability to exercise command over resources. Thus, goods and services (and conceptually, at least, prestige, power and status) received outside the market mechanism become part of this broad income definition. Indeed, it extends to the accessibility of non-market services, such as community services. Proceeding along these lines puts into closer perspective the relation between economic and social inequality.

This definition also highlights two other methodological issues in measuring economic inequality:

- the time period adopted for analysis: current, annual, life-cycle or life-time; and
-

Table 1: Broad Income Concept

Wages and Salaries
Self-employed Income
Interest, Rent and Dividends
Government Pensions and Benefits
Superannuation
Capital Gains
Transfers:
Social Wage
Fringe Benefits
Bequests/Gifts
Imputed Income:
Owner-occupied Dwellings
Household Activity

- the social unit of analysis: individual, family, household, social group or indeed, class.

The former allows for adjustments highlighting the dynamic nature of inequality; people move in and out of situations defined as 'poverty' as they move through events in the life cycle. It also allows for periodicity in the receipt of income.

With the construction of micro-analytical simulation models, this line of innovative research is reflected in the paper presented by Dr Ann Harding at this conference (Harding, 1992). This research highlights a major gap in our state of current knowledge stemming from the lack of longitudinal data sets. We have snapshots of inequality over time but these are just frames within a moving film, where the actors as individuals are constantly changing. The sooner we begin work almost constructing these longitudinal sets, the sooner we will obtain meaningful results about the process by which inequality is generated and maintained. By its very nature, there is a long lead-time.

This extended time period analysis is important because it directly integrates the narrowly-defined economic with the narrowly-defined sociological. We can observe how people's circumstances alter along the dimension of inequality as they encounter the education system; schooling and post-schooling; marital and family institutions; housing circumstances; children and retirement; as well as the longer-term implications of gender, race and ethnicity on inequality.

Again, this line of investigation can be extended into intergenerational transmission of inequality, both economic and social, which represents a further major gap in our knowledge. We have some evidence from social mobility studies but virtually none on economic intergenerational aspects such as the pattern of inheritance. Yet it could be argued that inheritance represents one of the more significant factors causing inequality.

In the context of our earlier discussion, we have a series of piecemeal but not integrated studies which have linked various aspects of social dimensions of inequality. The gap here is the elucidation of the integration. For instance, there is an array of literature outlining the linkage between the quality and appropriateness of housing to health, principally linked via tenure form. Similarly we can draw on inductive reasoning to hypothesize a relation between housing and education. Its hard to achieve educational status when you have to study in overcrowded conditions, either sharing a study area with others or on the dining room table surrounded by other forms of entertainment for members of the family. Through occupational health and safety, there are clear links between employment, whether paid or otherwise, and health; this is sometimes called the impact of 'life situation'.

These are relationships particularly important as we extend the period of analysis if we accept the premise that aspects of social inequality are long-lasting and hence more immutable, whereas economic inequality (or rather particular people's position with regard to it) is a more dynamic, changing and short-term phenomena. Perhaps social inequality forms more of the stock and economic inequality more of the flow.

Consequently, the shorter our time frame of analysis the more emphasis by nature is given to purely economic factors in inequality. This emphasis may well distort the true nature of the process of inequality.

Similarly, the units of analysis chosen for examination, from individual, income recipient, family, income unit and household through to construction of class, can dramatically alter our vision of inequality. Differences in this vision highlight the significance of social interaction on the formation and maintenance of inequality. It raises the question of homogamy, that is, the extent to which people of similar income socially associate and cohabitate or marry. This in turn raises issues of social, as distinct from occupational, mobility, and group access to resources.

In general, other things being equal, the larger the unit of analysis, the less the revealed inequality, because of the implied assumption of equality between all members within a unit. However, the reality of this assumption has been questioned by several researchers. The appropriate unit selected depends upon the purposes of the analysis, and the extent to which that requires consideration of shared resources. For instance, for analysis of consumption, and thus consumption taxes, the household is the appropriate unit.

4 Surveying the Knowledge

4.1 Data Sources

At the end of the nineteenth century, Australia could arguably be said to have lead the world in collection of data on the distribution of economic well-being. From the late 1880s, the Statistician, T. A. Coghlan, regularly published reports on the distribution of income and wealth, as recorded at the time, from either tax or probate data. Indeed, the analysis by Coghlan of the wealth data using mortality multipliers pre-dated supposedly 'original' analysis in the UK by about 15 years.

Unfortunately, in the absence of other international data, Coghlan (possibly out of a desire to enhance the image of Australia) wrote up the results with resort to rhetoric:

Wealth is widely distributed, and the contrast between rich and poor, which seems so peculiar a phase of modern civilization, finds no parallel in these southern lands. That there is poverty in these colonies is undeniable and inevitable; but no one in Australia is born to poverty, and that hereditary pauper class which forms so grave a menace to the freedom of many States has therefore no existence here. (Coghlan, 1887: 491)

It was in such a way that the myth of Australia as an egalitarian nation was maintained and perpetuated. However, this concern with distributional issues in a statistical form paralleled Australia's advances in social policy, as instanced by the introduction of age the pension in 1908.

This research reached its apex in 1915 when Australia conducted a unique full Census of Income and Wealth of all persons aged 18 or upwards possessed of property or holding property in trust, or in receipt of income (Soltow, 1972). Jones (1975) estimated the overall response rate at over 90 per cent. For comparative purposes, it should be remembered that income was defined so as to include quarters and board allowed by an employer and an imputed income of 5 per cent on the capital value of land and improvements in addition to wages, self-employed income, rent, interest, dividends and post-retirement payments. However, it excluded Commonwealth social benefits of age and invalid pension. Most importantly deduction was made for a range of items including interest paid on borrowed money and rates and taxes paid.

In addition, for the first and only time in our history, data on wealth was collected. The then Government Statistician Knibbs (1920) analysed the relationship between income and wealth - what he termed the 'plutoprosodic' relation.²

² According to Knibbs this was after the Greek, 'pluto', meaning wealth, and 'prosodic', meaning pertaining to income. A few romantics prefer to link 'pluto' to plutocracy as in rule by wealth and 'prosodion' to the ancient Greek processional hymn chanted by a chorus in moving toward the temple or altar of a god, for the purpose of supplication.

It was not until the 1933 Census, at the height of the Depression, that a further question on income was included. This related to persons of all ages and referred to gross (that is pre-tax) income but excluded imputed income from home-ownership. From that point on, no Census question on income was included until 1976, and no survey undertaken to determine the distribution of income, until 1968-69.

That is not to say that no work on the distribution of economic well-being was conducted within the government. Indeed, H. P. Brown (1957) reports on such activities principally to calculate the relative taxable capacity of the six states of the Federation and the yield of possible increased rates of Commonwealth income tax. However, aside from a few ad hoc surveys of labour earnings conducted by the Bureau of Statistics in the late 50s and 60s, data on the distribution of income remained unpublished. Australians could reify the myth of egalitarianism without reference to discomfiting factual analysis. Indeed, NSW Premier, Sir Robin Askin, was able to say in 1967: 'We have no poor people in New South Wales. Nor any very rich people. Ours is a classless society' (Askin, 1967). The work of Ronald Henderson culminating in the Poverty Inquiry resulted in a revitalisation of the demand for adequate information from which to base policy.

The last twenty years have seen the incorporation of questions about income in each of the last three Censuses; four Household Expenditure Surveys; two Family Surveys; two Housing Surveys; and six explicit Income Surveys (that latest just completed). In addition, since 1975 we have had annual surveys of employee earnings (from both an employer and employee perspective) and in the 1980s, an annual survey of employee benefits. To these could also be added more detailed taxation statistics published by the Commissioner of Taxation over the last few years. To top this off, with the release by the Australian Bureau of Statistics of unit record tapes in recent years, we have seen the development of microsimulation models.

The raw data available to the researcher into income distribution is now a bewildering array, at times overwhelming in its extent. Indeed, it could be claimed that the task of the researcher is merely to keep pace with the release of data. Again, the consequence is an emphasis on descriptive rather than analytic work.

The report on the collection of data about wealth distribution, however, is not so gratifying. With the exception of the 1915 Census no further work, aside from a survey in 1968 by Macquarie University and more recent research on divorce by the Institute of Family Studies, has been undertaken. A few researchers, this author included, undertook some studies utilising estate statistics in the 1970s.³ However, with the demise of estate and probate duty and the consequent need to collect data on the value of estates, this source of data is no longer available. For the historic record, this data showed that the wealthiest one per cent of Australian adults owned about a quarter of the wealth, the top five per cent about 45 per cent and the top ten per cent about 60 per cent.

3 For review of this work see Piggott (1984) and Nevile and Warren (1984).

Despite a commitment to a wealth inquiry, the present government has yet to realise that promise and indeed ironically last considered the issue in the week of the Stock Market collapse in 1987. Researchers such as Dilnot (1990) have been forced to revert to utilising the income distribution survey and the antiquated (in overseas terms) 'investment-multiplier' approach. On the other hand, the Reserve Bank has begun compiling important data on the total value of wealth (Callen, 1991).

The paper by Judy Yates at this conference (Yates, 1992) on the impact of the imputed income of home ownership in income distribution therefore represents an important advance in this area and on further consideration of the plutoprosodic relation between income and wealth, on the stock and flow of economic resources.

It must be said that the lack of basic data on the distribution of assets, debt and net wealth represents a fundamental gap in our knowledge and a hindrance to both effective analysis of inequality and consideration of the economic and social consequences. Indeed it hinders our evaluation of the efficacy of all government policy.

In the absence of wealth data, the income data, at least, enables us to examine trends in economic inequality in Australia over time, comparisons of Australian inequality with other like nations and the significance of government in redistributing income.

4.2 Trends in Inequality

Economists use the Gini coefficient as a summary measure of inequality. It ranges from 0 for perfect equality, where everybody gets exactly the same, to 1 where all income is received by one person. Technically, the Gini coefficient measures the area between the Lorenz curve, which relates cumulative shares of people/income units/households to the cumulative share of income, and the line of perfect equality, whereby 10 per cent of people get 10 per cent of income, 60 per cent get 60 per cent, and so on. This coefficient, with its limitations, can therefore be taken as an indicator of inequality and changes in inequality. If it declines it means income is more equally distributed, and if it increases it means income is less equally distributed.

Table 2 presents the Gini coefficient for gross income for different units of analysis as revealed by the various surveys since 1968-69. Gross income refers to all private income plus government pensions and benefits before tax. IS indicates an income survey and HES is a household expenditure survey. The data is taken from various ABS publications, over the period.

The table shows the calculated Gini coefficient for differing units of analysis. These range from: all males, females and individuals in receipt of income; families, defined as combinations of individuals based on marital linkage or dependency; income units, defined as families and single people residing alone; to households, defined as combinations of people sharing the same cooking facilities.

Table 2: Distribution of Gross Income: Gini Coefficients

Survey Date	Unit of Analysis					Families
	Males	Individuals Females	Persons	Income units	Household	
1968-69IS	0.35	0.54	0.48			0.33
1973-74IS	0.35	0.53	0.47	0.39		0.31
1974-75HES					0.34	
1975-76HES					0.35	
1978-79IS	0.35	0.48	0.44	0.39		0.32
1981-82IS	0.36	0.47	0.44	0.40		0.34
1983-84HES					0.37	
1985-86IS	0.37	0.48	0.45	0.41		0.36
1988-89HES			0.45		0.39	

Source: Australian Bureau of Statistics, various.

For those who find shares of income a more readily understood concept, Table 3 shows the gross income shares of lowest and highest quintiles (twenty percentile groups) for individuals, income units and households.

From the tables, we can see that:

- inequality amongst males has increased slightly;
- inequality as measured by received income amongst females has reduced over the past two decades, largely because of increased labour force participation;
- in combination, inequality amongst individuals decreased over the seventies, but the eighties have seen an increase;
- inequality amongst families has increased consistently since 1973-74;
- inequality amongst all income units has also increased over the period of surveys, although to a lesser degree; and
- inequality amongst all households increased dramatically and consistently to a greater extent than for income units.

The trend is clear, increased economic inequality since the mid-seventies.

Table 3: Gross Income: Quintile (20%) Shares

Survey date	Quintile					
	Individual		Income units		Households	
	L	H	L	H	L	H
1968-69IS	1.6	49.1				
1973-74IS	1.6	47.9	3.9	43.1		
1974-75HES					5.5	39.2
1975-76HES					5.2	40.0
1978-79IS	2.7	45.7	4.6	43.2		
1981-82IS	2.9	45.9	4.6	44.2		
1983-84HES					5.1	42.2
1985-86IS	2.8	46.8	4.7	45.3		
1988-89HES					4.4	42.3

Note: L = Lowest H = Highest

Source: Australian Bureau of Statistics, various.

The second trend apparent is that greater increase in inequality occurs the larger the size of the unit of analysis adopted. This highlights the influence of changes in the composition of family or household types: more aged person households, more sole parents, less married couples.

One means to elucidate this influence is to follow the approach of Bradbury and Doyle (1992) in their paper delivered at this Conference and calculate changes in the income of each type of family or household. Another is to create 'equivalent' households by taking into account the differing 'needs' of household as reflected by size and composition.

Similarly, whilst we can present the results above in aggregate, true comparability would require us to ensure that the data sets are absolutely comparable. Such is not exactly the case.

Firstly, each data source has its unique advantages and disadvantages:

- The census data is a full count (although the response rate differs), but the data is self-reported and unverified; it relates to current income at a point in time each 5 years and is collected within ranges rather than as an absolute figure.
- The taxation statistics are annual but relate only to those who submit a taxation return, exclude a large number of low-income earners and hence are unrepresentative of the population. Moreover, they are based upon a legislative

definition of taxable income which changes both with legislation and with minimum threshold levels.

- The survey data is a sample and is therefore subject to sampling error particularly when disaggregated. However, it is verified and consistent within each survey.

Secondly, even the best available, broadly comparable data source, the survey data, is subject to differences in scope, sample size, objective, reference period of income and concept of income utilised between surveys.

In respect of scope, for instance, the 1974-75 HES was limited to urban areas; others are both urban and rural; the 1981-82 IS included all persons 14 years of age and over, the others 15 years and over; the IS include people in non-private dwellings (such as hotels and boarding houses) whereas the HES exclude them; and, the inclusion of newly-arrived migrants, full-time students and females who change marital status within a reference year varies between surveys.

There is a general trend of decline in sample size over time with variations from 1/2 of one per cent of the Australian population to 1/6 of one per cent which particularly affects the validity of disaggregated results.

In regard to the reference period of income, earlier income surveys utilised the latest financial year data (which is necessary to calculate and verify non-wage income). However data on wage income has shifted from this past financial year basis to a current basis as at time of interview. In consequence, problems of comparability arise between years and for each year when past non-wage and current wage incomes are combined and erroneously designated as 'current' by the ABS. This is particularly important in periods of high inflation.

Finally, the concept of 'income', albeit narrowly defined, varies between surveys. In particular, there have been various and varying attempts to incorporate some employment fringe benefits (payments in kind). For example, contributions to board and rent were included in income surveys of the 1970s but excluded in the 1980s and were treated differently again in Household Expenditure Surveys.

Over-riding these inter-survey differences, though, is the fact that all these data sources have their base in a definition of income stemming essentially from the Income Tax Act, a 'cash-only counts' approach.

In part, this is the consequence of surveys being conducted for primary purposes of which income is ancillary. For the HES this is expenditure and for the census, population and dwellings.

Examination of the original survey forms reveals that the explicit Income Surveys utilise tax assessment documents as the verification reference points. Too often, researchers in the field are too ready to ridicule studies based solely on taxation statistics, preferring those based upon income surveys. They would do well to

remember that the difference between them is only the universality of the population (through the exclusion of certain persons whose income is below the minimum tax threshold) and the fact that tax statistics are ranked and published after tax deductions are taken into account, that is, on the basis of taxable income. There is very little difference in terms of the operational concept of income on which both sets of data are based, and hence limited.

The reality is that under the 'cash-only counts' approach of the surveys, the tax accountancy bean-counters have in fact captured the data and language by which we measure economic inequality. From our earlier argument, it makes examining inequality analogous to examining the health of a company by examining only its cash-flow statement and ignoring a full income statement or balance sheet. This is not only incorrect but can readily lead to erroneous conclusions. Moreover, it is inequitable, with inevitable consequences.

The poor have been defined, isolated, examined, prodded and poked, but the rich have been left to get on with expanding their economic power. Through the pensioner assets test we know how many millionaires are receiving the pension but we do not know how many millionaires in total there are in Australia. We investigate, with great rigour, pensioner fringe benefits but we do not know the value of employment fringe benefits to executive managers.

The result is a failure to appreciate the duality of inequality - that poverty and wealth are opposite sides of the same coin. The consequence of this failure is a limited approach to the development of policy to alleviate inequality, an approach which by its limited scope often serves to merely transfer the nature of the inequality, or to fail to address the appropriate point of intervention. We continue to address the symptoms and not the causes. The emphasis of our analysis is directed away from the process to the consequences. It is in this way, that our knowledge or lack of it can have policy implications which serve to exacerbate the problem.

4.3 International Comparison

If direct comparison over time within Australia is fraught with difficulties then international comparisons become a minefield. Yet for various reasons, whether out of a sense of overt nationalism as displayed in rhetoric, or a need to test alternative hypotheses on the causes of inequality and the impact of redistribution policies, Australia's comparable international income inequality is significant.

The Luxembourg Income Study was established to enable such comparisons to be made by explicitly ensuring that data from each participating nation was uniformly based. Based on data for the early 1980s from other advanced capitalist nations (the 1981-82 Income and Housing Survey was the Australian basis), Saunders and Hobbes (1988) conclude that:

On all indicators, Sweden has the most equality. Followed by Norway and then the UK. Most indicators place Canada next,

followed by Australia, with Germany and the US the most unequal. (Saunders and Hobbes, 1988: 19)

Saunders (1990) summarises the position thus:

The data ... cast very serious doubt on the widely held view that Australia is a relatively egalitarian country, at least in income terms. On the basis of these kind of figures - which represent the best comparative income distribution data currently available - Australia is among the most unequal of the countries included in such comparisons, along with the United States. (Saunders, 1990: 32)

Further results from the Luxembourg Income Study relating to noncash government benefits are presented by Saunders at this Conference (Saunders, 1992).

One of the key findings of the Saunders and Hobbes (1988) analysis is that the redistributive impact of direct taxes (and government cash benefits) is greatest in those countries which already exhibit most income equality. As they state, 'this suggests that the two major methods of income redistribution - use of the tax-transfer system and attempts to improve the structure of income equality generated by the market - may in fact be complementary rather than alternative policy directions' (Saunders and Hobbes, 1988: 19). This raises the question of the significance of government in redistribution through government pensions and benefits, the taxation system and social wage expenditure.

4.4 Impact of Government

Utilising the 1984 Household Expenditure Survey, the Australian Bureau of Statistics published a study which examined the impact of government benefits and taxation on the distribution of household income (ABS, 1987).

Table 4 outlines the relative impact of differing forms of government redistributive activity, by detailing the share of each quintile of each form of income, when re-ranked with the addition of aspects of direct government redistribution. The table starts with private or market income, being the receipts of earned and capital income. The Gini coefficient here for households is 0.47. To this is added social security payments to form gross income, the concept used in Table 3 above, with a Gini coefficient on distribution of 0.37. Thus, the Gini index declines from 0.47 to 0.37 as a consequence of the social security system. The impact of the income tax system in further equalising spending power is indicated by the reduction in the Gini to 0.33 when disposable (after-tax) income is distributed. When the distribution of the benefits of the social wage (here defined as education, health and housing expenditure) is added the Gini falls further to 0.29. However, when indirect taxation is added to reflect final income then the Gini coefficient increases to 0.30 reflecting the regressive nature of such consumption-based taxes in Australia.

Table 4: Impact of Government on Household Inequality: 1984 HES

	Lowest	2	Quintile Shares		Highest	Gini
			3	4		
Private (Market)	0.3	7.7	17.9	27.3	48.8	0.47
Gross (incl. Social Security)	5.1	10.5	17.2	25.0	42.2	0.37
Disposable (after Tax)	6.3	12.1	17.9	24.7	39.0	0.33
Disposable and Social Wage	7.6	12.9	18.3	24.3	36.9	0.29
Final (Indirect Tax)	7.5	12.7	18.2	24.3	37.3	0.30

Source: ABS, 1987.

Several summary points can be made:

- government activity, through the tax-transfer system, significantly reduces inequality;
- government pensions and benefits contribute more to reducing inequality than direct taxation;
- the social wage (education, health and housing expenditure by government) reduces inequality by about the same extent as direct taxation; and
- indirect taxation increases inequality, despite its relatively small base in 1983-84. In that regard we can see the likely regressive impact of proposals for an expanded consumption tax, particularly if used to reduce personal direct tax.

Neil Warren looks further at the redistributive impact of the tax-transfer system at this Conference, by reference to the 1975-76, 1984 and 1988-89 Household Expenditure Surveys (Warren, 1992). Similarly, Judy McHutchison and Robert Urquhart will be reporting on progress in our social wage project which aims to examine the distributional impact of the social wage for each year during the 1980s (McHutchison and Urquhart, 1992).

The evidence above suggests that less government involvement in redistribution pushes the distribution of inequality back towards that revealed by the distribution of private or market income.

4.4 Source of Income

Whilst secondary distribution by government remains important, it is equally significant to examine trends in primary distribution of market income. This details the structure of inequality generated by the market and can be examined by reference

to the sources of income. Table 5 outlines the results of research using the 1985-86 Income Survey showing the distribution of private income from each source amongst recipients of that income, by quintile.

In summary, we can see that:

- the income from self-employment - business or trust income - is more unequally distributed than wage income;
- the distribution of interest, rent and dividends, reflecting the distribution of 'cash' income-producing assets is extremely unequal, with a Gini-coefficient even amongst recipients of 0.82. As a point of comparison, the latest calculated distribution of wealth (also including residential dwellings), referred to above, indicated a Gini coefficient of 0.70; and
- as of 1986, only a quarter of a million people received income from superannuation. However, with the ageing of the Australian population and the push for award-based superannuation, this is expected to grow rapidly. In passing, it should be noted that there are as yet unresolved conceptual problems in the treatment of superannuation. Is it a deferred wage or an asset? This ambiguity is reflected in the differential tax treatment accorded it.

The relevance of such market-source income data is not merely to link the personal distribution of income to factor income shares, but also to enable consideration of the impact of macro-economic policy on the distribution (Nevile, 1990).

With very little research available on such macroeconomic impact, or indeed on the impact of the distribution on economic phenomena, it is little wonder that economic policy-making has ignored distributional analysis other than where redistribution is an explicit goal, such as changes to the direct tax system.

Inflation and unemployment are accepted as outcomes of economic policy but have importantly different complex distributional impacts. We need to outline these in more detail and test distributional hypotheses. Indeed, the entire incomes policy approach embodied in the Prices and Incomes Accord is predicated on such distributional relationships. Yet there is virtually no work available on the distributional outcome of the Accord since its introduction. It is here that simulation models constructed by using survey data as a base set are invaluable in allowing researchers to test alternative hypotheses and distributional impacts of economic policy proposals as well as the more narrowly defined social policy proposals.

4.5 Wages and the Labour Market

The most significant source of income, that of wages from the labour market is the most overt way in which inequality manifests itself. The data sources here are more numerous since ABS has conducted an annual survey of employee earnings each August since 1975.

Table 5: Distribution of Types of Income: 1985-86

Source	Quintile ^(a)					Gini	% all private income recipients receiving income source
	Bottom	2	3	4	Highest		
Wages and Salary	4.1	12.7	19.1	25.1	39.0	0.35	67.5
Self-employment	2.4	8.6	14.9	23.1	51.0	0.48	12.0
Interest, Rent, Dividends	0.2	1.0	3.2	9.3	86.3	0.82	66.8
Superannuation	2.2	9.0	18.1	26.9	43.8	0.43	2.7
Other	1.2	3.3	7.3	18.6	69.6	0.66	7.5

Note: a) Refers to quintiles of those receiving income from that source.

Table 6: Weekly Earnings of Employees: Gini Coefficients 1975-1990

	1975	1980	1985	1990
Total:				
Male	0.22	0.24	0.25	0.27
Female	0.25	0.29	0.29	0.32
Persons	0.25	0.27	0.28	0.31
Full-Time:				
Male	0.21	0.22	0.23	0.24
Female	0.18	0.21	0.20	0.21
Persons	0.21	0.23	0.23	0.24

Source: Calculated from ABS, *Weekly Earnings of Employees (Distribution)*, 6310.0, various issues.

The calculated Gini coefficients for the distribution of money wages amongst all male and female persons in both full and part-time employment and working full-time only are shown at five year intervals in Table 6.

The pattern which emerges is again one of increasing inequality. The trends in the table reflect the move toward equal pay between men and women, increased labour force participation rates and the increasing significance of part-time work.

In looking at these outcomes, we should note the changing structural parameters of the labour market. In 1975 the image of a worker might have been that of a full-time male - five out of every eight workers were. Now only four out of every eight are males working full-time. The full-time work-force, whilst still predominantly male (twice as many full-time males as females) is becoming less so and the growing part-time work-force whilst still overwhelmingly female (around four times as many females as males) is becoming more masculinised. This raises the question of gender differences in earnings which Nevile and Tran-Nam address at this Conference (Nevile and Tran-Nam, 1992). How much of social discrimination by gender is reproduced in economic inequality in the labour market? The question is not merely one of pay segregation in award rates but in over-award rates, access to overtime, job segregation, promotional opportunities and indirect forms of discrimination against women.

Over-riding the distribution of earnings within the labour market is, of course, access to the labour market and employment security within it. Anecdotal evidence would suggest that lower-paid workers are more susceptible to retrenchment. If this is true then it is a statistical axiom that the commonly-utilised mean average weekly earnings of the employed labour force will increase as a **consequence** of an increase in unemployment. Without knowledge of the income distribution of unemployment, it is not difficult to see how fallacious apparent relations can give rise to inappropriate policy responses.

Together with the high incidence of youth unemployment, this raises the question of the creation and existence of a marginalised labour force, or what sociologists have come to refer to as an 'underclass'. Such a question goes to the core of understanding of the poverty outcome of inequality.

4.6 Income from Self-Employment

One of the perennial problems facing researchers in the field of income inequality is the question of understatement of self-employed income. This has the capability to significantly affect the overall level of revealed income inequality.

Aside from legitimate avoidance, such understatement can stem from the operation of the hidden economy, often also referred to as the 'black' economy. As has been indicated above, the verification for much of the data in income surveys is tax assessments. To the extent that activities are concealed from the law (that is, the tax law) then income can be understated. Even if such income is revealed, self-employed income recipients may overstate expenses. Very little is known about the extent of evasion and avoidance in Australia. The Tax Office in 1985 estimated that 'income tax evasion may involve a revenue loss of at least \$3 billion per annum' (Commonwealth of Australia, 1985: 36).

Estimates from the UK place the 'black market' (undeclared income) at 5 per cent of GDP. Most of this occurs within the self-employed sector. Indeed, the UK National Accounts are actually adjusted upwards by something like 15 per cent of reported

self-employment income to account for tax evasion. Whilst it is understood that a similar adjustment is made to the National Accounts in Australia, the percentage adjustment is not publicly disclosed.

Pissarides and Weber (1989) have recently utilised Family Expenditure Survey data for the UK to analyse expenditure on food as a basis for estimation of understated income. The assumption made is that food expenditure should be similar across the same income irrespective of source (when adjustment is made for other factors such as age, number of children, family composition). They conclude: 'that on average self-employment incomes have to be multiplied by a factor of 1.55 to give true incomes' (Pissarides and Weber, 1989: 29). That is, declared self-employed income is understated by about 35 per cent from actual self-employed income. For the UK this implied that the size of the hidden economy was about 5.5 per cent of GDP.

Such a study needs to be replicated in Australia using the latest HES data and could substantially alter the revealed pattern of inequality. At present, no such understatement is recognised. Incorporating it would probably increase revealed inequality, but we do not know by how much.

4.7 Noncash Income

As indicated above, one of the major deficiencies of the income surveys is the extremely limited concept of income encompassed - the cash-only income approach. Economic well-being can be enhanced by the receipt of noncash income in the form of consumption or accretions to wealth. Data on such noncash sources, and hence knowledge of inequality in their distribution, is virtually non-existent in Australia.

Capital Gains

The most fundamental omission is in respect to capital gains - increases in the value of assets held in ownership. Capital gains and losses clearly form part of broader income. Taxable capital gains have been included in surveys, certainly in the 1986 Income Survey. However, reflecting the 'tax' nature of the income included, only the purchase and sale within twelve months was considered and as expected was relatively insignificant. The Draft White Paper on *Reform of the Taxation System* (Commonwealth of Australia, 1985) estimated a distribution based on Canadian Statistics following the introduction of its capital gains tax such that 2.2 per cent of individuals accounted for 61.2 per cent of capital gains.

Capital gains tax now applies on real gains (that is, above the inflation rate) on assets (excluding the family home) acquired and sold since 1985. There is no deemed realisation on death. In consequence, the *Taxation Statistics* (Commissioner of Taxation, 1991) now publish data on the incidence of such taxable capital gains by grade of taxable income. Subject to the limitations of coverage of the tax and limitations of taxation statistics noted above, Table 7 outlines this distribution.

Applying the appropriate tax rates to the capital gains tax receipts suggests total taxable capital gains for the 1989-90 income year, based on Treasury Budget forecasts, of about \$1500 million. Noting that this tax is only in its fourth year of operation and only applies to newly acquired and realised gains above the inflation rate, we can get some indication of the extent of income, defined as measuring economic well-being, currently excluded from our economic inequality measures.

The introduction of the capital gains tax provides an excellent illustration of the way in which the gaps in our knowledge of the extent of inequality can affect policy-making. In the 1985 Taxation Statement by the then Treasurer, P. J. Keating, Treasury (Keating, 1985) estimated revenue from the tax at \$25m after five years of operation (basically in annual accretions of \$5m as more assets were brought into its ambit). In fact, in its first real year of operation (1986-87) the capital gains tax raised nearly \$115 million, which increased to \$281m in 1987-88 and \$543m in the 1988-89 income year. By its fifth year of operation it is likely to raise about \$700m. The Treasury estimate based on a lack of data on wealth and its distribution, is therefore likely to be out by a factor of 28 times. Put another way, Treasury forecast a revenue of \$75 million in its first five years of operation - the actual revenue is likely to be \$2239 million, a difference of \$2.164 billion.

Fringe Benefits

The other significant form of noncash income is the receipt of income in the form of benefits-in-kind. These are also known as perquisites, hence the common term 'perks'. As pointed out by remuneration experts, while Australia's executive salaries are relatively low by worldwide standards its executive benefits are fairly high, and grew rapidly over the eighties as a component of total remuneration.

Despite its obvious relevance to inequality in the labour market and income inequality overall, there has been very little examination of fringe benefits in Australia. With one notable exception, the work at the beginning of the 1980s by Jamrozik, Hoey and Leeds (1981), there has been virtually no serious academic investigation of the extent of such benefits or their distribution. On the other hand, the range, cost and value of pensioner fringe benefits has been closely examined (Babbage, 1984). In many ways, at least within the labour market, the receipt of employment fringe benefits is the economic manifestation of prestige and status, both between and within occupations.

What then do we know about their extent and their distribution? The ABS conducted its first survey of employment benefits in February-May 1979. Since then, it has conducted such a survey annually in August since 1983. The Bureau defines 'employment benefits' as 'concessions, allowances or other privileges received by or provided to employees in their main job in addition to wages or salary' (ABS, 1990b: 22). This definition includes benefits ranging from discounts on goods, concessional loans and transport through to educational benefits, shares and club subscriptions. It also includes leave entitlements such as annual and sick

Table 7: Distribution of Real Capital Gains: Individuals

Taxable Income	1986-87	1987-88	1988-89
Non-taxable	3.7	6.3	5.6
Below 7 500	1.6	0.6	0.3
7 500 - 12 600	4.4	3.9	2.9
12 600 - 19 500	7.2	7.7	7.4
19 500 - 28 000	9.8	11.0	11.1
28 000 - 35 000	8.3	8.3	7.8
35 000 - 50 000	12.5	13.0	15.8
Above 50 000	52.5	49.2	47.7
Total	100.0	100.0	100.0

Source: Commissioner of Taxation, *Taxation Statistics*, various years.

leave, long-service leave and employer contributions to superannuation. Unfortunately, the ABS survey only covers the receipt of a benefit not its value. Thus, it is only of limited use in determining the distribution in relation to wage income. Nonetheless, it reveals the inequality in access to these benefits.

In general, not only does an increasing percentage of employees receive a particular benefit when they are ranked by revealed money wages and salaries, but more receive a greater number of benefits. Some benefits (goods and services, and electricity) are received more by lower-income earners. Most though, are highly concentrated in the upper income ranges; and, irrespective of income, men receive more than women.

However, it is not just the receipt of a benefit that is important, it is the value of that benefit. To incorporate this, an initial estimate can be derived by assuming that the value of a benefit received varies between income groups at a rate dependent upon the relative income of those groups. In practice, this is a conservative assumption implying that the proportion of benefits, if received, to total remuneration is constant across all income groups. Partial evidence from management remuneration surveys suggests that in fact they increase. That is, the greater the income the greater the absolute and relative proportion of total remuneration for any particular benefit (Raskall, 1991). The application of these two factors, the incidence of fringe benefit coefficient as revealed by ABS surveys and the valuation assumption enables an estimate to be made of the distribution of each benefit.

This resultant distribution for each type of fringe-benefit received by full-time employees is summarised in Table 8, which shows the Gini as well as the share of value received by the highest and lowest quintile of workers. The data relate to full-time earners only. This is about the most equal of all income distributions. If it

Table 8: Inequality in the Distribution of Fringe Benefits Received by Full-Time Employees: 1990

	Gini Coefficient	Share of Value	
		Bottom 20%	Top 20%
Entertainment Allowance	0.66	1.6	71.9
Club Fees	0.63	3.2	71.1
Union Dues	0.56	3.7	65.8
Shares	0.52	3.6	59.0
Telephone	0.50	5.1	57.0
Education Expenses	0.49	3.9	56.0
Medical Expenses	0.48	4.0	57.4
Vehicle	0.47	4.9	54.2
Low-Interest Loan	0.44	4.7	51.9
Holiday Expenses	0.43	4.4	50.2
Housing	0.37	9.4	47.2
Electricity	0.26	13.3	41.6
Goods and Services	0.18	12.5	31.3
Superannuation	0.31	7.2	38.8
Study Leave	0.38	5.1	42.2
Long-Service Leave	0.27	8.0	35.9
Sick Leave	0.24	9.5	34.3
Annual Leave	0.24	9.6	34.6
Wages	0.23	10.2	34.3

Source: Raskall (1991).

were extended to include part-time employees (who receive substantially less benefits, both in receipt and value of each) and individuals not in the paid labour force (who receive no benefits) then the revealed inequality increases dramatically. As a touchstone, the distribution of money wages amongst full-time employees revealed by the 1990 August survey is also included.

The benefits fall into four distinct groups:

- the 'super-benefits' - those concentrated in the highest levels of executive management;
- the 'usual perks' - senior management;
- the 'work-related benefits'; and
- superannuation contributions.

Fringe benefits, then, are very unequally distributed. The key is how important are they, compared to the weight of wages. Jamrozik, Hoey and Leeds (1981) calculated that they amounted to about 15 per cent of total money-wages for full-time wage-earners.

McLean and Richardson (1986) utilising data from client surveys by a management consultant to provide an estimate of the value of fringe benefits in 1981 and their relation to cash earnings. They concluded:

The effect of inequality in the distribution of male earnings by an amount which largely offsets the equalizing effects of the personal income tax. When both effects are included the Gini coefficient for the male labour force falls from 0.309 to 0.296, and that for all male income falls from 0.390 to 0.385. (McLean and Richardson, 1986: 77)

McLean and Richardson place fringe benefits on a scale close to the personal income tax system in affecting wage inequality. Moreover, trends to award-based superannuation and the 'legitimisation' of fringe benefits in total remuneration packages with introduction of Fringe Benefit Tax in 1986 has seen an increase in the significance of fringe benefits over the 1980s.

Clearly, any analysis of economic inequality which ignored fringe benefits would be seriously deficient. Yet we do not even collect unambiguous records of their value - a clear gap in our knowledge.

Imputed Income of Home-Ownership

Our knowledge of income from this source has been considerably enhanced by the paper presented at this Conference by Judy Yates (1992) - enhanced in the sense that it represents the **only** substantial work on the impact of imputed income on the distribution of income. It is worthwhile recording that this income was collected in the 1915 Census of Income and Wealth.

Value of Household Work

By their very nature, the emphasis of income distribution surveys is on paid activity, that is, activity that occurs through the market mechanism. As indicated above, this can be a very limiting condition to examination of aspects of inequality. In particular, the whole question of work performed unpaid within the household and its impact on distribution, is another major gap in our knowledge. It is often suggested that the exclusion of unpaid work from our GDP figures results in the adoption of policies which are inequitable in their treatment of gender.

Inheritance

Despite the obvious relevance of inheritance as a factor in sustaining social and economic inequality between generations, our knowledge of the extent of this factor is scant and with abolition of estate and probate information, our data is non-existent.

Accessibility

Directly related to the concept of the social wage is the question of access to community services such as schools, hospitals and so on. Such access affects the well-being of a household and the private transport cost of utilising such services. It thus directly connects the spatial distribution of activity to the distribution of expenditure and income. This inter-connection between location and equality transcends into the private sphere through the journey to work required to earn income.

Whilst a body of literature exists in urban sociology on the impact of the distribution of power and income on the allocation of space, very little empirical work has been undertaken on the impact of locational pattern on the distribution of income and well-being. A priori, we have an understanding of the 'disadvantage' faced by people living in under-served outer suburbs of our cities, but as yet little quantification (for comparative purposes) of the extent of that disadvantage. Survey work currently being undertaken through the Institute of Family Studies (Brownlee, 1991) may significantly improve this situation.

The spatial dimension and its analysis may well prove crucial to a fuller understanding of the complex process of inequality generation and maintenance as well as highlighting the inter-connection between efficiency and equity issues, as Deputy Prime Minister Brian Howe outlines in his paper (Howe, 1992).

At the theoretical level, consideration of space and the costs of traversing it, highlights the need for, and challenge of, a perspective and methodology in inequality research which extends beyond the narrow confines of 'rational economics' which exists within a framework devoid of a spatial dimension. The dynamic here is the imperative: inequality determines spatial allocation and relative location impacts back on primary and secondary inequality.

The concept of accessibility can be extended beyond mere spatial characteristics to examine access to rights of citizenship as accepted in the civil and legal structures. The manifestation of inequality of access to rights and services is commonly the basis of 'social problems' that we observe in areas of our cities. It is usually the spatial differentiation that becomes the touchstone of analysis, be it in the area of health, accidents, congestion or pollution.

Conclusion

Despite the apparent abundance of data in recent times, this meander through the state of knowledge on economic well-being highlights the magnitude of the task before us.

One might have thought that with a concept as apparently amenable to measurement as income, our knowledge at least of descriptive trends might be reasonably substantial. Unfortunately, the combination of problems of comparability and a narrow conceptual and operational definition mitigates against even the most basic objective of answering the question: What is the degree of economic inequality in Australia today?

Moreover, as indicated in our earlier discussion, economic inequality represents merely one aspect or dimension of the phenomena of inequality. This 'creature' is capable of being dissected and viewed from a number of angles. All of the above components of inequality can be examined by gender, by race and ethnicity and, by socio-demographic constructs related to age and family composition. The paper by Podder (1991) provides such an analysis.

5 Concluding Comments

The Federal Government's explicit Social Justice Strategy recognises the breadth of dimensions encompassed in the term.

For this Government, social justice means building a society with:

- equity in the distribution of economic resources;
- equal access to essential services such as housing, health care and education
- equal rights in civil, legal and industrial affairs; and
- the opportunity for participation by all in personal development, community life and decision making'.

(Commonwealth of Australia, 1988, Introduction)

In these terms, social justice or injustice, underlying inequality is seen as far broader than mere economic resource distribution, and encompasses social inequality impacting, through health, education and housing, on personal and community well-being. No one factor operates in isolation but through the interaction of their impact on the complex continuum we designate as 'inequality'. Indeed, as Brian Howe (1992) points out, the spatial manifestation of this inequality in terms of inefficient and inequitable cities feeds back on itself by restricting and distributing access to essential services, further reducing opportunities for low income households.

This paper has examined the most basic, and measurable, proxy of economic resources - income - as the touchstone to evaluate what we know and what we do not. The depressing conclusion, as the reader will have discovered, is that even within this limited framework our knowledge is at best scant and often non-existent.

The position is worse when we extend our analysis to examine inequality from a social dimension and to elucidate the inter-connection of aspects of inequality. A priori, strong apparent connections exist between socio-economic status and health status, current educational status and likely future opportunities. Despite the apparent mass of available data, we cannot completely examine the intricacies of these relationships because of lack of data on, for example, local environmental conditions, housing quality, and occupational working conditions.

Moreover, most of the research to date has examined a single phenomenon either in education or health and then sought to test a series of hypotheses on the contribution of various factors including 'socioeconomic status'. Little research has adopted the opposite methodological approach of taking socioeconomic status, or proxy measures thereof, and examined the range of education or health phenomena affected in consequence of changes in this status. For that reason, the work of the National Health Strategy in adopting such a framework will be an exceedingly important contribution to our understanding not just of health issues but also of social justice issues.

From this perspective, and our conceptual analysis above, it is important to extend such work to examine firstly, the inter-connection between aspects of social phenomena and secondly, as a contributing cause of further and more long term economic inequality.

Faced with this, the temptation could well be to give up in despair, and place inequality in the 'too hard' basket. Worse still is the policy response that stems from this, that either inequality does not matter or that government can do little to affect it. Such a response, which is too typical of our past, reflects more on the ethical and analytical capacity of our disciplines than on the reality of the propositions.

Increasingly, economists who are more concerned with real-world applications of policy than theoretical textbook exposition of ideals are recognising that inequality is not merely an outcome but a central causal factor in our economic phenomena. This recognition stems from an understanding that distributional impacts in turn have efficiency effects, and that the achievement of those efficiency goals requires consideration of these equity impacts. In many ways, the Accord and income policy mark an institutional recognition of this.

In a more limited way, there is also increasing recognition that public policy cost efficiencies in health and other social areas can be best achieved by the implementation of policies directed more at the causes of problem than their symptoms. To the extent that measures to reduce poverty and enhance equality also reduce the incidence of 'social problems', then the costs attendant on addressing

these problems can be more effectively reduced by the implementation of those measures.

Over-riding all this, of course, is an increasing appreciation of the extent of interaction and consequences across the range of dimensions of the spectrum of inequality in our society: firstly, in a willingness to face up to an often unpalatable reality and secondly, in a willingness to accept that our goals as a society accept the need to provide as bare minimum the reality of social justice.

The task of providing the analysis and research to enable formulation of appropriate policies is the fundamental objective of both this Conference and the Inequality study. The challenge may appear daunting, even insurmountable, given our relatively uninformed starting position. However, its significance cannot be underestimated and its rewards are immeasurable. The challenge is not undertaken merely 'because it is there' but because, if it is not done, at best we will sustain and aggravate our social problems and ultimately place our very society in jeopardy. Inequality is ignored at our peril; nor is it inevitable and immutable. As John Stuart Mills noted just on one hundred years ago:

The laws and conditions of the production of wealth partake of the character of physical truth ... It is not so with the Distribution of Wealth. That is a matter of human institution solely. The things once there, mankind, individually or collectively, can do with them as they like ... The distribution of wealth, therefore, depends on the laws and customs of society. The rules by which it is determined are what the opinions and feelings of the community make them, and are very different in different ages and countries; and might be still more different if mankind so chose. (Mills, 1891: 143-4)

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The Contribution of Some Socioeconomic Factors to Income Inequality in Australia

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1 Introduction

Social security policies of any country are normally targeted to specific socioeconomic groups, such as single mother families or the unemployed. While the apparent purpose of such policies is to ensure a certain minimum standard of living for all, their impact on overall economic inequality of the country is of no less importance. Also, it is commonplace to encourage economic growth in geographic areas that are considered backward in terms of per capita income. In such a case it is important to study the effects of growth in those regions on the economic inequality of the country as a whole. This paper studies such effects of various socioeconomic, demographic, and regional groups on the inequality of household income in Australia using a method of decomposition of the Gini index recently developed by Podder (1991). The method is powerful enough to deal with any kind of grouping. However, in the present study, we confine ourselves to grouping of households based on occupation of the head, age of the head, sex of the head, place of birth of the head, state of residence of the household and the household size. This selection is largely based on the availability of data. The method of decomposition used in this study is different from the type studied by Shorrocks (1980) following Theil (1967). It is now well established that Theil type of decomposition of the Gini coefficient leads to an additional term explained by the phenomenon of overlapping of income. The method used in this study does not lead to any confusion due to an overlapping term and can be used to answer important questions regarding inequality caused by subgroups of population.

Since the method of analysis is described at length elsewhere (Podder, 1991) we intend to provide only a brief outline of the steps in this paper. When the population is divided into a number of subgroups based on a characteristic such as the state of residence of the unit, it is possible to compute the concentration coefficient for each subgroup when all units are arranged in ascending order of their incomes. Suppose

¹ The author wishes to acknowledge his debt to Professor J. W. Nevile for his support and encouragement at various stages of this research.

the income vector of the whole population has n elements arranged in ascending order. For a specific subpopulation we can construct another vector again, with the same number of elements. In this new vector, income of the members of the subpopulation will appear in the places corresponding to the population vector while all other elements will be zeros. Similarly, a new vector can be constructed for each subpopulation. If the subpopulations are mutually exclusive and exhaustive then the sum of the new vectors will be equal to the population vector. In that case the concentration ratio can be estimated for each of the subpopulation. Let the concentration index for the r th group be denoted by C_r and the Gini coefficient for the whole population be denoted by G . Also, let us denote the total income of the population by X and that of the r th group by X_r , then $S_r = X_r/X$ will stand for the income share of the r th group. Then immediately we can write

$$G = \sum S_r C_r$$

and

$$\sum S_r (C_r - G) = 0$$

It is shown that the sign of quantity $C_r - G$ indicates whether the presence of income of the r th group in the community increases or decreases total inequality. Thus, if it is negative, the presence of the r th group's income decreases total inequality and if it is positive then the income of the group increases total inequality. A zero value indicates neutrality of the group's income. In other words, the sign of the quantity indicates if a reduction of income in the r th group will lead to a higher or lower inequality of the community as a whole. In general, it is not possible to attribute various segments of total inequality to specific groups (see Podder and Tran-Nam, 1991, for a detailed discussion of this problem). However, the most important result is

$$(1) \quad \frac{\partial G}{\partial e} = S_r (C_r - G)$$

where e stands for a small percentage of income of each unit in the r th group. This important result was derived by Larman and Yitzhaki (1985). Thus this equation gives us the exact change in the Gini coefficient of the country due to a small percentage change in income in the r th group. Therefore, the elasticity of the overall Gini coefficient with respect to income of the r th group may then be computed by the formula

$$(2) \quad \eta = \frac{1}{G} \frac{\partial G}{\partial e} \frac{1}{G} \cdot S_r (C_r - G)$$

Equations (1) and (2) then are of crucial importance for our analysis. It should be mentioned that the sum of the derivatives over all the subgroups in Equation (1), and the sum of the elasticities over all the subgroups in Equation (2) will vanish. This can be understood by the simple fact that if every group experiences the same

percentage change in income the total inequality of the community will remain unchanged. The usefulness of these results for practical policy decisions is obvious.

Intuitively it can be inferred that if members of a particular group are concentrated at the lower end of an income distribution then a proportionate increase in their income will reduce the overall inequality when the incomes of other groups remain unchanged. On the other hand, if the members of a group are concentrated at the upper end of the distribution then a proportionate increase in their income will lead to a higher degree of overall inequality. While this is true, in reality the situation is not that simple. Consider the members of a group all of whom belong to the lower half of the income spectrum. If some or many of them have zero income, a proportionate increase in their incomes may lead to either higher or lower inequality depending on the proportion that has zero income. However, while the direction of change can be guessed, the exact magnitude of change is impossible to estimate using only intuition.

2 Applications to Australian Data

In this section we shall apply the technique of decomposition described in the previous section to Australian data obtained from the Household Expenditure Surveys (HES) of 1984-85 and 1988-89. Although HES has been carried out regularly since 1974 at four year intervals, unit record data have been made available to individual researchers only recently. All estimations in this paper are based on microdata and two sets of estimations for two different survey periods are made for the purpose of comparisons over time.

For the details of the survey the interested reader is referred to the Australian Bureau of Statistics (1989). However, it should be mentioned that the main unit of the survey is the household which may consist of more than one family. However, if we consider single member households as families, then there are 44 households out of 7225 that consist of more than one family. Therefore, for practical purposes, the words household and family can be used interchangeably in this context. Assuming that each member of a household should be given equal weight from the point of view of economic welfare, the analysis is done in terms of income per head of a household. This means that in computing the Gini or concentration indices all households are arranged in ascending order of their income per member and then the households are given weights equal to their respective sizes. Thus, the analysis is in terms of per capita income. Also, it is important to note that the income concept used in this study is the total household income received from all sources before income taxes are paid.

The grouping variables included in this study are: age of head of the household; occupation of head; state of residence of the household; country of birth of head; household size; and sex of household head, in that order. Other variables could have been included but have been dropped to keep the study within limits.

2.1 Age of Household Head

Table 2 presents the crucial results based on the method described in the previous section. However, Table 1 is presented for the purpose of a fuller understanding of Table 2.

In Table 1 we see that average family income with respect to age follows the normal pattern of an inverted U-shaped curve. However, the average income per person does not follow the same pattern. This is probably because of the effects of the stages of family life cycle. For example, the lowering of average income per person for the age group 35-39 is definitely because of the existence of dependent children in the family and the wife not working. Because the analysis is done in terms of income per person these phenomena are important. Also we should keep in mind that the total household income does not necessarily represent the income of the head of the household only.

The next table presents the relevant statistics about changes in the overall inequality with respect to changes in the incomes of specific age groups. Thus, the second column represents the concentration indices for different age groups. To use these ratios to obtain the direction of change in the overall inequality index, that is, the Gini index, we need to know the magnitude of the Gini index itself. This has been estimated to be .36 for Australia. Thus, the third column shows that the change in the overall Gini coefficient due to the presence of income in specific age groups does not vary monotonically with respect to the age of the head. The income of the age groups below 29, and in the range 45-64, have positive effects on total inequality, meaning that the absence or reduction of income in any group in those ranges will lead to a lower overall inequality. On the other hand, the age groups in the age ranges 30-44 and 65-90 have negative effects on total inequality. The next column which presents the derivatives of the overall Gini coefficient with respect to percentage change in income in the specific groups, shows that the maximum increase in total inequality can be achieved by increasing the incomes of households with the head in the age group 25-29. At the same time the maximum decrease in total inequality can be achieved by increasing the incomes of the households with a head in the age group 35-39. If the size of the change in income were to be 10 per cent, in the former case the Gini coefficient changes from .36 to .3614 and in the later case it changes from .36 to .3503.

The fact that the two age groups just discussed are so close to each other and so opposite in their effects on overall inequality, warrants further comment. It will be quite safe to infer that the first stage of the family life cycle starts at 25 when both the partners join the workforce and it is unlikely that a significant number of them start having children until they are above 30. When the head is in the age group 35-39, most families are likely to have dependent children and, because of that, the wife normally leaves the workforce. This makes the family relatively poorer in terms of per capita income. However, they have accumulated some assets, especially some equity in the house they live in, having gone through the struggle of saving the

Table 1: Age-Income Profile

Age of head	No. of households	Income per household	Income per person	% Share of income
below 25	422	610.15	274.25	5.49
25-29	753	681.07	261.79	11.09
30-34	828	679.42	208.36	12.17
35-39	857	712.73	192.44	13.21
40-44	898	811.23	219.36	15.76
45-49	615	868.58	258.06	11.56
50-54	548	801.62	279.80	9.50
55-59	477	680.59	292.73	7.02
60-64	551	457.90	231.90	5.46
65-69	457	349.93	188.81	3.46
70-74	389	299.87	174.37	2.52
75-79	260	305.69	190.60	1.72
above 79	170	281.36	188.31	1.03
Total	7225	639.82	229.95	100.00

Table 2: Inequality Decomposition Among Age Groups

Age of head	C_T	$C_T - G$	$S_T(C_T - G)$	η
below 25	.53	.17	.0093	.0258
25-29	.49	.13	.0144	.0400
30-34	.29	-.07	-.0085	-.0236
35-39	.23	-.13	-.0172	-.0478
40-44	.30	-.06	-.0095	-.0264
45-49	.44	.08	.0092	.0256
50-54	.50	.14	.0133	.0369
55-59	.54	.18	.0126	.0350
60-64	.36	.00	.0000	.0000
65-69	.23	-.13	-.0045	-.0125
70-74	.04	-.32	-.0081	-.0225
75-79	.16	-.20	-.0043	-.0119
above 80	.14	-.22	-.0023	-.0064

initial deposit. Nevertheless, the results of our analysis suggests that the households with dependent children, particularly when the wife is not working, deserve more government attention than they are getting at present.

The life cycle effect continues as the head gets older. From our everyday experience we know that as the children grow up the wife tends to rejoin the workforce, making

the family relatively richer in per capita terms. As a result, after 44 the effect of age on total inequality of income becomes positive again. It is easy to understand why the effect of age on total inequality becomes negative after retirement at the age of 65. Obviously, the elasticities of the Gini coefficient with respect to income of various age groups will show a pattern similar to the derivative of the Gini coefficient. For policy purposes, in addition to obtaining the exact effect on overall inequality due to a percentage change in income of the target group, the policy maker should also be interested in the total cost of implementing such an increase. This can be worked out from the last column of Table 1 that gives the shares of various groups in total income.

2.2 Occupation of the Head

The results of our inequality analysis based on occupational grouping are presented in Tables 3 and 4. Again, Table 3 is presented solely for the purpose of a fuller understanding of Table 4. From Table 3 we see that among occupations the professional group has the highest income per household while the group not in employment has the lowest income per household. The heads of the latter group are either retired, receiving pensions, or unemployed, receiving unemployment benefits. The last column of Table 3, presenting the percentage of total income received by each occupational group, is also important in determining the impact of a percentage change of income of a particular group on total inequality of the society. Also, it may be of some interest to know the percentage of households in each group which can be easily computed from the second column of Table 3. Thus, the households not in employment constitute nearly 34 per cent of total households. It should be mentioned that since the income figures are total household incomes, they should not be misconstrued to be incomes received solely from pursuing specific occupations.

The second column of Table 4 presents the concentration ratios for various occupation groups. Presenting the deviations of the concentration ratios from the Gini index, the next column tells us which occupation groups increase total inequality and which ones decrease total inequality by the presence of their income. Thus, the four groups namely (a) Not employed, (b) Tradespersons, (c) Machine operators and drivers, and (d) Labourers are inequality reducing meaning that an increase in their income makes the total inequality lower. On the other hand, the remaining groups are inequality augmenting in this sense. The fourth column is probably the most interesting because the figures tell us the exact effect of a percentage change in income of the specific groups on the Gini index of the nation. Thus, if there is 10 per cent increase in income of households with heads not employed the national Gini will reduce from .36 to .3531. On the other hand, a 10 per cent rise in the income of the households with heads in Managerial or Administrative positions will increase the national Gini from .36 to .3628. In this way, a rise in income of the Professional group will lead to the maximum increase in the Gini coefficient. The last column of the table gives us the elasticity of the Gini index with respect to income of the specific groups.

Table 3: Occupational Income Profile

Age of head	No. of households	Income per household	Income per person	% Share of income
Not employed	2439	311.11	145.08	16.41
Managerial and Administrative	744	949.22	287.90	15.28
Professionals	712	1019.81	337.41	15.71
Para-professionals	357	799.67	268.31	6.18
Tradespersons	940	722.24	221.57	14.69
Clerks	526	721.92	280.66	8.21
Sales and Service Workers	422	759.46	263.78	6.93
Machine operators and drivers	516	733.15	213.85	8.18
Labourers	569	683.05	215.56	8.41
Total	7225	639.82	229.95	100.00

Table 4: Inequality Decomposition by the Occupation of Head

Age of head	C_T	$C_T - G$	$S_T(C_T - G)$	η
Not employed	-.06	-.42	-.0689	-.1915
Managerial and Administrative	.54	.18	.0275	.0764
Professionals	.62	.26	.0408	.1135
Para-professionals	.46	.10	.0062	.0172
Tradespersons	.30	-.06	-.0088	-.0245
Clerks	.50	.14	.0115	.0319
Sales and Service Workers	.49	.13	.0090	.0250
Machine operators and drivers	.28	-.06	-.0049	-.0136
Labourers	.28	-.06	-.0050	-.0140

2.3 State of Residence of the Household

From Table 5 we find a wide disparity of both average household income and average income per person among households in different states and territories in Australia. Thus, the highest average household income which exists in the Australian Capital Territory is nearly 50 per cent higher than the average in Tasmania. However, the two larger states, New South Wales and Victoria, have average household incomes near the national average. As expected, the average income per person follows the same pattern as that of average income per household over the states and territories, indicating insignificant variation of household size over different regions. The wide disparity of average income among regions leads one to suspect that there must be wide variations in the cost of living among the regions. This calls for the adjustment of income for cost of living variations to understand relative economic position of the households. This is also important for the purpose of poverty analysis. Since our primary preoccupation in this paper is the decomposition of inequality we shall leave that problem to the experts.

Table 6 presents the results of inequality decomposition among states and territories in Australia. The first thing to notice is that out of the eight states and territories, four are inequality augmenting and the other four are inequality reducing which becomes obvious from the signs of the quantity $C_r - G$ for different regions. As for the effects of regions on overall inequality we can make the general comment that a small percentage change in income of any region will lead only to a very small change in overall inequality. This is clearly shown by the figures for the derivatives of the Gini coefficient in the table. Yet, the Northern Territory has the highest positive elasticity and Tasmania has the highest negative elasticity, while Queensland is close by. In general it can be concluded that in spite of substantial differences in both average income per household and average income per person among the states and territories in Australia, their effects on overall income inequality in the country are markedly subdued.

2.4 Country of Birth of the Head

Compared to the size of the population, Australia has a high intake of immigrants. Therefore it will of some interest to study the effects of the country of birth of the head of the household on income inequality in the country. It appears that nearly 30 per cent of the households are immigrants. Among them the overwhelming majority are of European origin. Table 7 indicates that there are no substantial differences in the average household incomes among different immigrant groups. However, the average income per person is the lowest among Asian households, indicating that the average household size is bigger among them. Both by the proportion of all the households as well as the percentage share of income, the households with the heads born in Australia dominate the picture.

Table 5: Regional Income Profile (a)

State of residence	No. of households	Income per household	Income per person	% Share of income
New South Wales	1832	650.71	231.16	25.05
Victoria	1332	684.40	239.65	19.15
Queensland	1106	580.02	209.10	13.48
South Australia	815	573.03	218.74	9.81
Western Australia	772	686.24	219.52	10.41
Tasmania	711	553.51	204.65	8.27
Northern Territory	414	743.02	267.72	6.46
Australian Capital Territory	423	828.90	279.83	7.37
Total	7405	642.74	229.42	100.00

Note: a) Our data tape does not contain information about state of residence. Tables 5 and 6 are based on computations done by the Australian Bureau of Statistics on special request. The sample size is now 7405.

Table 6: Inequality Decomposition by State of Residence

State of residence	C_T	$C_T - G$	$S_T(C_T - G)$	η
New South Wales	.37	.01	.0025	.0069
Victoria	.39	.02	.0038	.0106
Queensland	.30	-.06	-.0081	-.0225
South Australia	.35	-.01	-.0010	-.0028
Western Australia	.33	-.03	-.0031	-.0086
Tasmania	.26	-.10	-.0083	-.0231
Northern Territory	.49	.13	.0084	.0233
Australian Capital Territory	.41	.05	.0037	.0103

Table 8 presents the results of inequality decomposition among households with heads born in various countries. It appears that groups titled Other Europe, and Asia have inequality decreasing effects and the groups titled Australia, and Others have inequality increasing effects while UK and Ireland are inequality neutral. Since all the groups except Australia are insignificant in terms of their share of income their individual effects appear to be insignificant. Although the concentration ratio for the households with heads born in Australia is not much different from the overall Gini coefficient the elasticity of the Gini with respect to their income becomes significant.

Table 7: Income Profile by Country of Birth

Country of birth	No. of households	Income per household	Income per person	% Share of income
Australia	5158	640.41	235.53	71.46
UK and Ireland	810	636.56	233.31	11.15
Other Europe	709	605.98	202.47	9.29
Asia	274	634.01	189.24	3.76
Others	274	730.52	242.03	4.33

Table 8: Decomposition by Country of Birth of Head

Country of birth	C_T	$C_T - G$	$S_T(C_T - G)$	η
Australia	.39	.03	.0214	.0594
UK and Ireland	.36	.00	.0000	.0000
Other Europe	.23	-.13	-.0121	-.0336
Asia	.24	-.12	-.0045	-.0125
Others	.41	.06	.0025	.0069

2.5 Household Size

Table 9 gives the income profile by the household size. We should mainly concentrate on the column presenting income per person in different size groups. Thus, the average income per person steadily declines with the size of the household. However, this may not be the true representation of relative economic position of the household. For that we need to adjust household income for differences in size and composition by an equivalent income scale. Also there may be economies of scale in family living. Since, the present study has a different motivation we shall ignore those problems here. Apart from declining average income per person, it should be noted that the percentage share of income of the single member households is significantly low.

From the inequality decomposition presented in Table 10 we see that the quantity $C_T - G$ also declines steadily from positive to negative. It shows that once the household size reaches four and over, the effects of household income on total inequality becomes negative. The derivatives of the total inequality with respect to a percentage change in income in a group also show that substantial improvement in

Table 9: Income Profile of Household Size

Household size	No. of households	Income per household	Income per person	% Share of income
1	1415	309.83	309.83	9.48
2	2296	579.31	289.65	28.77
3	1198	750.27	250.09	19.44
4	1378	836.56	209.14	24.94
5	684	867.67	173.53	12.84
6	208	834.96	139.16	3.76
7 or more	46	770.02	110.00	0.77

Table 10: Decomposition by Household Size

Household size	C_r	$C_r - G$	$S_r(C_r - G)$	η
1	.57	.21	.0199	.0552
2	.55	.19	.0547	.1519
3	.42	.06	.0117	.0325
4	.27	-.09	-.0225	-.0625
5	.07	-.29	-.0372	-.1033
6	-.15	-.51	-.0192	-.0533
7 or more	-.34	-.70	-.0054	-.0150

total inequality can be achieved by increasing the income of larger households, especially those with five or more members. The very high value of the derivative of the Gini index for households consisting of two members indicate that a substantial improvement in total inequality can be achieved by reducing their incomes through taxation or otherwise. The variation of elasticity of the Gini coefficient, naturally, follows the same pattern. Overall, the analysis clearly demonstrates the need for a closer examination of families with several dependent children when determining government assistance.

2.6 Sex of Household Head

This is the last grouping variable to be studied in this paper. Households headed by females are mostly single parent families. In Table 11 we see that the average household income with a male head is substantially higher than that with a female head. However, contrary to popular belief, we see that the households with female

Table 11: Income Profile by Sex of Head

Sex of head	No. of households	Income per household	Income per person	% Share of income
Male	5547	705.91	232.33	84.71
Female	1678	421.35	217.61	15.29

Table 12: Decomposition by Sex of Head

Sex of head	C_T	$C_T - G$	$S_T(C_T - G)$	η
Male	.37	.01	.0084	.0233
Female	.31	-.05	-.0076	-.0211

heads are not so much worse off in terms of average income per person. Obviously, these households are of smaller size and they represent nearly 22 per cent of all households but a much smaller proportion of the population. As a result their percentage share of income which is about 15 per cent does not look too bad.

Looking at the decomposition table (Table 12), the derivative of the Gini coefficient with respect to percentage change in female income is negative, while it is positive for males. This is exactly what one expects to find. However, the absolute magnitude of these derivatives clearly shows that they will affect the overall Gini coefficient only very slightly. In the study of the effects of sex of head on income inequality the main conclusion to be drawn is that the sex of the head has an insignificant effect on overall inequality of the country.

3 Some Concluding Remarks

The elasticity of the Gini coefficient with respect to income of a specific group as presented in the paper is a universally intelligible concept to all students of economics. The method of decomposition of the Gini index used in this study helps us to answer questions that have hitherto been considered intractable. Thus, even if the present study is considered to be illustrative, it is clear that the method can be applied to data relating to refined concepts of income as well as of consumption.

The study of the effects of socioeconomic factors on income inequality in Australia show that all the grouping variables considered here have more or less significant effects on total income inequality. Among the more significant factors, age of the head, household size, and occupation of the head, household size, and occupation of the head are more prominent. Inequality decomposition by the age of the head clearly brings out life cycle effects while that by the household size calls for closer attention to larger households or families with dependants. The occupational grouping demonstrates the significance of the retired and the unemployed in the overall inequality. On the other hand, the place of birth of the head and sex of the head are less significant. The cyclical pattern in the variation of the elasticity with respect to the age of the head is interesting, both intellectually and for policy decisions, and calls for further exploratory work. The study is done in terms of income per person. One can immediately suggest refinements in terms of adjustments of income by an equivalent income scale and economies of scale of family living. In this respect, the present study could be considered experimental and illustrative. However, the method of analysis is universal and can be used with any kind of adjustment.

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Factors Causing Inequality in Earnings Between Men and Women

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1 Introduction

'Women are second class workers in Australia ... the average female wage is some 30 per cent lower than the average wage of males' (Mumford, 1989: 3). In this context, wage means weekly earnings not the wage rate. As shown in Table 1 it is female average weekly earnings that are 'some 30 per cent' lower than those of males. Weekly earnings are affected by the number of hours worked as well as the wage rate and even average hourly earnings may differ from the hourly wage rate because of the effect of more higher paid hours of overtime worked. There are many reasons which could explain the difference between female earnings and male earnings. Some are important and others are trivial. If one wants to remove the gap in earnings between males and females it is prudent to try and identify the major reasons for the gap. In Australia today, where many people have hopes that a widespread and vigorous adoption of EEO programs will significantly reduce the gap between male and female earnings, it is of particular interest to see how much of the gap is due to the sort of discrimination that a successful EEO program will overcome and how much is due to other factors.

The first goal of this paper is to identify the relative importance of those factors which are significant in explaining the gap between male and female earnings. The second aim is to divide the factors causing the gap between male and female earnings into those arising from the actions of employers (the demand side as economists would put it), and those arising from differing characteristics of male and female employees (or the supply side). In general only the former, actions by employers, are susceptible to influence by EEO programs.² To give a simple hypothetical example: if all of the gap could be explained by higher levels of educational attainment among males than females, equal opportunity employment

1 The authors are grateful to David Plowman, Bob Gregory and Bruce Chapman for comments on a draft, but bear all responsibility for errors of omission or commission.

2 Despite this generalisation there are a small number of actions by employers which affect the supply side, e.g. the provision of child care facilities at the work place.

Table 1: Ratio of Female to Male Earnings

	May 1981 %	May 1989 %
Average Weekly Earnings		
All employees	65.6	64.3
Adult Full-Time Employees	n.a.	79.1
Adult Full-Time Managerial Employees	n.a.	74.7
Adult Full-Time Non-Managerial Employees	80.1	82.5
Junior Full-Time Non-Managerial Employees	90.1	96.5
Average Hourly Earnings		
Adult Full-Time Non-Managerial Employees	86.2	88.6
Junior Full-Time Non-Managerial Employees	93.5	98.3

Sources: Australian Bureau of Statistics, *Distribution and Composition of Employee Earnings and Hours*, Cat. No. 6306.0, May 1989 and May 1981 issues.

practices could do little to remove it. Those wishing to diminish the gap would be advised to try and change the attitudes and values which discourage or prevent women from seeking as much education as men.

Both in identifying the relative importance of different factors responsible for the earnings gap, and in categorising the factors as demand side or supply side, only a broad brush analysis is attempted. Neither the data, nor to be honest, the conventional methods of analysis, are good enough to allow any confidence to be placed in figures correct to the last percentage point. However, worthwhile conclusions can be drawn from a broad brush analysis.

The following section describes the various factors that might be thought to contribute to the gap between male and female earnings. The effects of some of these factors are clear and can be precisely identified. Where this is possible, it is done, when the factor is described, in Section 2. In most cases, however, effects can only be estimated using an econometric model. The type of model most widely used in the literature is described in Section 3, its strengths and weaknesses are noted and a strategy proposed to overcome the most important weakness. Then, in Section 4, answers obtained from using the model are discussed, before the threads are drawn together in Section 5.

Empirical studies, to which this paper makes reference, are based on data from the early 1980s: the census of 1981, the income and housing survey of 1981-82 and the special supplementary survey of 1982. However, as Table 1 shows, there was little change over the 1980s in the earnings of females relative to those of males. For all employees the ratio declined slightly, but this was because of the increase in the proportion of part-time female employees. For full-time adult employees the ratio

rose slightly and it rose rather more for full time junior employees. Table 1 also gives figures for 1989 which show that females do less well at the managerial level than at the non-managerial level.

2 Possible Causes of Inequality Between Male and Female Earnings

2.1 Differences in the Number of Hours Worked Per Week

One important cause of the gap between male and female earnings is that men in employment, on average, work more hours in paid employment than do women in employment. In Australia more than 90 per cent of employed men work full-time (defined as 35 hours or more per week) whereas only about 60 per cent of employed women work full-time. This difference does not reflect discrimination on the part of employers. Most women who work part-time state when surveyed, that they do not want to work any more hours per week. This difference in the proportion of those working full-time accounts for about 15 percentage points out of the gap of 35 per cent between male and female earnings. Moreover, even if one compares only full-time workers, men on average, work more hours than women, partly because of differences in occupational and industry mix but also because they work more overtime. This accounts for a further five percentage points of the gap so that the hourly wage received by women is on average 85 per cent of that received by men.

Thus, over half the gap between male and female earnings is due to the difference in the number of hours worked. To a large extent this reflects differences in the number of hours men and women wish to work and not discrimination on the part of employers.³ It may reflect social or cultural discrimination against women; for example, in most Australian families women are expected to take the major role in child care and do the major part of the housework, even when both spouses are in paid employment. It may also reflect another type of discrimination in that in our society men are expected to work full-time to support their families, and most feel it is not acceptable for them to work only part-time to supplement the earnings of wives who work full-time. In any case the propensity of women on average to seek less hours of paid work per week is a cause of the inequality between male and female earnings which will not be much affected by EEO programs. Those who wish to reduce the effects of this cause of inequality of earnings have to change the attitudes in society as a whole, not those of employers in particular.

2.2 Differences in Educational Attainment

A second possible factor contributing to inequality in earnings is the one mentioned in the hypothetical example in Section 1: that men in the labour force have received more education than women. This explanation can be disposed of very quickly. It is

3 Unless failure to provide child care facilities at the work place is considered to be discrimination.

valid in some overseas countries - even in the United Kingdom whose society and values are perhaps closer to our own than those in most foreign countries, but in Australia women in employment are, if anything, more highly educated than employed men (see e.g. Chapman and Mulvey, 1986 or Daly, 1990). While it is still true in Australia that overall, men are more highly educated than women, the greater the educational attainments of women, the more likely they are to be in the labour force. Also, though less important, employed women are, on average somewhat younger than employed men and younger adults tend to be more highly educated than older adults. Differences in educational attainment are not a cause of the gap between male and female earnings.⁴

2.3 Effects of Award Conditions for Part-Time and Overtime Work

A third cause of the difference in earnings between men and women could be the special award wage provisions for part-time and overtime work. As is well known overtime work usually attracts extra payment above the normal hourly rate, typically time and a half. Similarly, part-time work is often paid at a higher hourly rate to compensate for the lack of paid holidays, sick leave etc. Overall the effect of each of these is fairly small, and since men work much more overtime than women, whereas many more women are part-time workers than are men, the two effects work in opposite directions and may more or less offset each other. A little arithmetic will show that this is the case.

Suppose on average the extra overtime men work compared to women is five per cent of their normal working week. The actual amount will depend on the stage of the business cycle that the economy is in; this figure is about right for the first couple of years of the 1980s. Then, if the overtime were paid at time and a half, it would increase the hourly wage received by men by 2.4 per cent. On the other hand, given that around eight per cent is the typical increase in hourly wages received because employment is part-time, and that about 40 per cent of women work part-time as opposed to 10 per cent of men, the extra paid for part-time work increases hourly wages of women, over those of men, by 2.4 per cent. Thus, given the broad brush analysis in this paper, it is appropriate to assume that the two effects offset each other.

4 At least this is true in terms of years spent in education. Glen Withers (1991) has argued that education is not the same for men as it is for women, in that men are more likely to study accounting or engineering and women English or history. Certainly at the trade level this difference in the types of courses undertaken must have an effect on earnings. The majority of women with trade certificates are hairdressers, who, it can be assumed, do not usually earn as much as plumbers, electricians or carpenters. As far as higher education is concerned the situation is changing. In 1989, at the University of New South Wales, 44 per cent of bachelor degree students in Commerce and Economics were women, as were 46 per cent of bachelor degree students in Law and 37 per cent in Medicine. Overall the effect may be small enough to ignore in a broad brush analysis, but to the extent that it does exist it strengthens the general conclusion of this paper.

2.4 Differences in Experience

As in other countries, in Australia earnings rise with years in the workforce, rapidly at first, then more and more slowly. This is generally thought to reflect the values of skills acquired through experience in work, or on-the-job training. Employed women in Australia are, on average, three years younger than employed men. Thus, they would have less experience than men (especially since on average they have spent very slightly more years in schooling) even if both women and men were actually in employment for the whole time since they left school. In fact women are more likely to have spent periods out of the workforce or working part-time rather than full-time, so that women have rather less experience compared to men than the age differential suggests. Unfortunately we do not know just how much less. In Section 3 below we will consider various ways of coping with this problem, which is essentially one of lack of data.

2.5 Different Effects of Marital Status on the Earnings of Men and Women

Studies of male earnings have produced overwhelming evidence that, other things being equal, on average married men earn more than single men. It is not difficult to explain this. With the responsibility of being the principal income earner in a family, many married men may give greater priority to high pay and less to congenial work in choosing jobs. They probably are less likely to change jobs just for the sake of change or to take a working holiday and generally may be more likely to behave in ways that increase their chances of promotion. Many of these arguments do not apply when one compares married women with single women. Indeed one might expect married women to earn less than single women, even apart from any discrimination against them by employers. The location of their home, and hence where they can seek work, is usually determined by their husbands' job not their own. They may have to shift where they live, and hence jobs, for reasons connected with their husbands' promotion prospects, but at times harmful to their own chances of promotion. They are much more likely to work part-time than single women, and part-time work experience is less highly valued in determining earnings than is full-time work experience, and they may be restricted in their choice of jobs to those where the working hours can be reconciled with the demands on them for parenting. Finally, they may prefer more congenial to better paid jobs and feel able to take such jobs because they are the secondary rather than the primary income earner.

In any case, whether or not being married tends to reduce a women's earnings, there is no doubt that being married is associated with a larger positive differential in earnings in the case of men than it is in the case of women. Moreover, even if marriage had a similar positive effect on the earnings of men and women, on average it would raise male earnings a little more, since a somewhat greater proportion of employed men are married than is the case for employed women.

2.6 Occupational and Industrial Segregation

This is commonly thought to be an important reason for the gap between male and female earnings. It is certainly true that the Australian workforce has a high degree of segregation by gender. Nevertheless, research done on this matter has found occupational segregation contributes surprisingly little to the differential between male and female earnings. Indeed Chapman and Mulvey (1986) found that 'if women had been distributed across jobs in the same way as men they would have earned ... 3.79 per cent less than they did earn' (Chapman and Mulvey, 1986: 513). One should take this and similar results (see e.g. Rimmer, 1990) with several grains of salt. As Chapman and Mulvey point out, their occupational classifications are very broad, e.g. both doctors and nurses are included in the classification of professional. Nevertheless, it is unlikely that occupational and industrial segregation is a major cause of the differential between male and female earnings in Australia when the research that has been done shows it working in the opposite direction.

Occupational and industrial segregation is the result both of supply factors, society encourages women to seek certain types of jobs and not others, and demand factors, many employers are still reluctant to hire women for certain types of jobs. If indeed it is not important in contributing to the earnings gap it is not important, for our purposes, to judge accurately the relative importance of demand and supply factors in this case. When, in Section 4 below, empirically based judgements are made about the relative importance of demand and supply factors in determining the earnings gap, any effects of occupational segregation will be included in the demand side; that is, they will be included in the things that can be changed by changing employer attitudes and actions.

2.7 Discrimination Against Women by Employers

Employers may discriminate against women (with equal qualifications as men) for at least six reasons:

- They may believe (rightly or wrongly) that women are not as productive as men.
 - They may believe women are more likely to leave so that is more profitable to favour men in training and promotion.
 - They may believe men are more likely to have families to support and feel that it is therefore better to favour them in hiring or promotion.
 - They may believe that their employees prefer working with other men and will be happier and more productive the fewer women there are in their workforce.
 - They may believe that their employees (male or female) prefer to be supervised by a man rather than a women and therefore favour men in promotion.
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- Finally, they may themselves have a preference for male workers and therefore hire men, without any influence from profit or social motives.

There is undoubtedly a great deal of this type of discrimination against women (see e.g. Riach and Rich, 1987). Discrimination in promotion obviously contributes to the earnings gap between employed males and females. Discrimination in hiring may also, as it may make it harder for women to find jobs and hence ready to accept a lower wage.

Of the above possible causes of the earnings gap, those labelled 2.1 to 2.5 above, largely or entirely reflect cultural and social attitudes, which affect the characteristics of women seeking employment, and not actions by employers. We will assume that their effects are not likely to be significantly reduced by EEO programs, but, if they are to be reduced, require broader action. The final two causes, occupational and industrial segregation and employer discrimination, will both be assumed to reflect actions of employers that can be changed by EEO programs.

3 A Theoretical Framework for Estimating the Importance of Various Causes of the Earnings Gap

A view of the labour market, known as human capital theory, is the basis of the dominant method in the economics literature of identifying the different factors that determine the earnings of men and women and hence determine the earnings gap. This method assumes that wages are, in the absence of discrimination, equal to the productivity of workers, which in turn is determined by characteristics of workers such as education, work experience and perhaps other factors such as marital status and the industry in which the worker is employed. Usually the natural logarithm of earnings is regressed on these characteristics of workers, with job experience and the square of job experience both included to capture the fact that at first earnings rise rapidly with job experience, but then taper off.

This method works well for men in the sense that studies using different data sets, and slightly different specifications, come up with similar results, and with results which accord with a priori hypothesising. However, it does not work well for women. The problem is the difficulty of getting adequate data on the length of women's work experience. With men this problem is solved by assuming men's work experience is equal to their age, minus the number of years of schooling, minus five (which is assumed to be the age at which children start schooling). While not completely accurate, this convention is accurate enough to give worthwhile results. Most studies have used the same convention to measure women's work experience. Women are much more likely to have had time out of the workforce after leaving school than men so that the convention gives an inaccurate measure of women's experience. The problem is compounded by the fact that the more educated a woman is the less likely she is to leave the workforce for a long period, or even at all, when she has children. Thus, the number of years a woman withdraws from the workforce and education are negatively correlated with the result that in the case of

women the estimated coefficients associated with education and work experience in increasing earnings are unreliable and vary substantially from study to study. Since differences in educational attainment are not a cause of the gap between male and female earnings, the problem is not important, in the present context, as far as education is concerned. It is important when considering how much of the gap is due to the lesser work experience of women.

Chapman and Mulvey (1986) try to overcome this problem by multiplying each year of a woman's potential work experience by the employment rate in that year of women the same age as the woman in question was in the year in question. As the authors realize this method has two problems, which work in opposite directions so that one can not even say there is a clear bias in one direction or another. First, the employment rate in the past of women who are employed when the data are gathered will probably be higher than that of women in the same cohort who are not currently employed. Secondly, the employment rate used in these calculations does not distinguish between full-time and part-time employment. Overseas studies have shown that part-time employment is valued far less highly than full-time employment. For example, Ermisch, Joshi and Wright (1990) found that it took up to 10 years of part-time employment to have the same effect in increasing earnings as one year of full-time employment. Moreover, the method adopted by Chapman and Mulvey assumes that periods spent out of work have no effect on the value of work experience. It is possible that employers believe that skills gained through work experience deteriorate over a long period not in the workforce.

There is one Australian study (Rummery, 1989) which does utilise survey data on men and women's actual work experience as opposed to potential work experience. However, Rummery's sample is relatively small so that the numbers in some categories are too small. The extreme case is the category 'women with higher degrees', which contains only three women. Rummery finds that the difference in actual work experience explains six percentage points of the gap between male and female earnings. This is consistent with the results obtained in the following section.

This paper does not try to measure what the ratio of women's actual work experience is to potential work experience. Instead it calculates by how much women's potential work experience (age less years of schooling less five) must be discounted if there is to be no residual gap between male and female earnings, to be explained by employer discrimination against women. If this discount factor is implausibly large we can deduce that employer discrimination against women is important. If it is very small, the implication is that employer discrimination against women is not important.

4 Estimates of the Importance of Different Factors Causing the Gap

We have already noted that over half of the gap of 35 per cent between the earnings of men and women is due to the different numbers of paid hours worked on average

each week, so that women's earnings per hour are about 15 per cent lower on average than those of men. We have also noted that differences in educational attainment explains virtually none of this remaining gap of 15 per cent. Indeed, if anything, women in paid employment are more highly educated than men in paid employment.

An important factor explaining part of the 15 per cent gap is the difference marriage has on the earnings of men and women. There is widespread agreement among Australian studies using different samples that married men earn 13 to 14 per cent more than single men, once allowance is made for experience, education etc.. The earnings of separated, widowed and divorced men fall between those of married and single men. Tran-Nam and Nevile (1988) find a difference of only 12 per cent, but their estimate is biased downwards because they consider only two categories, and lump separated, widowed and divorced men together with single men. Daly (1990) finds a difference of 13 per cent and Chapman and Mulvey (1986) a difference of 14 per cent. There is not universal agreement. For example, Gregory and Daly (1990) find a much larger differential between the earnings of married and single men while Rummery (1989) finds a smaller one. Nevertheless, it seems safe to accept the results obtained by most studies and assume a figure of, say, 13.5 per cent.

The a priori theorising in Section 2 above suggested that married women will probably earn less than single women, other things being equal. Empirical studies in Australia give mixed results but generally are not in support of this hypothesis. Some studies (e.g. Rummery, 1989 and Daly, 1990) find that marriage makes little difference to the earnings of women in full-time employment. Chapman and Mulvey (1986) find that it actually has a positive effect on hourly earnings though not as large as the positive effect in the case of men. Gregory and Daly (1990) find that it does have a negative effect but only once the married woman has had a child. However, both Daly (1990) and Gregory and Daly (1990) are studies of weekly full-time earnings and it is quite possible that married women earn more per hour, other things being equal, than single women, but work less hours per week even when both are full-time workers. This could not explain the whole of the discrepancy, but could explain some part of it.

In the light of this inconclusive evidence, this study will consider three possibilities:

- a) that marriage makes no difference to hourly earnings in the case of women, presumably because positive and negative influences offset each other;
- b) that marriage tends to reduce earnings of women by about five per cent;⁵ and
- c) that marriage tends to increase earnings of women by nine per cent. This is the Chapman and Mulvey figure which is at the top end of estimates of the effect of marriage on female earnings.

5 As will be shown below, it is not important how big a percentage is assumed in case (c). Any significant negative effect of marriage on the earnings of women turns out to be inconsistent with other evidence on women's earnings.

In the first case, even if there was no gap between the earnings of single men and all women, women on average would earn substantially less than men on average. Since about two thirds of employed men are married, if married men received 13.5 per cent more than single men (and all women) other things being equal, then all men on average will receive nine per cent more than women because of marital status, leaving six percentage points of earnings still to be explained by differences in experience, occupational and industrial segregation and discrimination against women by employers.

If married women receive, other things being equal, five per cent less than single women, marital status reduces the earnings of women by three per cent on average (compared to an increase of nine per cent for men) leaving only three percentage points to be explained by the remaining factors.

If married women receive, other things being equal, nine per cent more than single women, on average marital status will raise the earnings of women by five per cent. This is about half the amount that marital status raises the earnings of men, leaving 10 percentage points of earnings gap to be explained by the remaining three factors.

For reasons explained in the previous section, estimates of the value of work experience in increasing female earnings are dubious, and, in any case we do not have completely satisfactory measures of how much work experience women in paid employment actually have. We do know the number of years since they left full-time education and this represents the maximum number of years of work experience that they could have. One can start by assuming no discrimination against women, so that actual experience has the same value for women as for men, and see what this implies about how much the maximum possible numbers of years of work experience must be discounted for time out of the labour force if the assumption of no discrimination is to be consistent with the difference between men's and women's earnings.⁶

In the case where marriage makes no difference to women's earnings one hardly has to discount women's experience at all. The difference in potential experience (or the maximum possible experience) is nearly enough to explain the unexplained six percentage points of earnings gap. This implies that industrial and occupation segregation and discrimination against women by employers have virtually no effect on the size of the earnings gap. This implication may seem sufficiently implausible to cast doubt on the assumption that marital status has no effect on women's earnings.

6 To do this it is assumed that the effect of work experience, x , on the natural logarithm of earnings, v , is given by the equation

$$v = 0.03x - 0.00055x^2$$

The parameters are chosen as ones at the mid-points of quite a small range given by various studies of male earnings.

If marriage reduces the hourly earnings of women by five per cent (or any other significant amount), other things being equal, the result is even more implausible. Even if all women in the workforce had worked full-time since completing formal education, assuming married women are paid per hour any significant amount less than single women, makes the gap between male and female hourly earnings greater than 15 per cent unless employers discriminate positively in favour of women, or the occupational and industrial structure raises rather than lowers the earnings of women compared to men. The first alternative can be completely ruled out, and although Chapman and Mulvey (1986) find a slight tendency towards the second, they do not think it is significant. Thus at this stage we can reject the case where married women are paid less than single women, other things being equal.

In the third case where, other things being equal, married women are paid nine per cent more than single women, leaves a remaining gap of 10 percentage points to be explained. If this is to be ascribed solely to the difference in length of work experience between men and women, what assumptions are necessary about the length of time women currently employed have spent out of the labour force? We start with the assumption that they worked full-time between completing formal education and the age of 25. Given this assumption they must have only worked on average less than 55 per cent of the time since their 25th birthday. When the data, on which this section is based, were collected, half the women currently employed were single and half married. Thus, assuming that the single women had spent no time out of the labour force, the married women, currently employed, must on average only have worked one year in 10 since their 25th birthday. This figure is probably too low to be plausible. It certainly gives no reason to reject the hypothesis that there is employer discrimination against women.

How important is this discrimination? A feel for this can be obtained by looking at a case which makes extreme assumptions in the opposite direction. If all women, married or single, who are currently employed had worked full-time for the same proportion of time since they finished full-time education as do men, women would still receive about five per cent less than men just because a greater proportion of women in employment are in younger age groups than is the case with men. Thus, of the 10 percentage points earnings gap we are trying to explain, more than five per cent must be due to differences in length of work experience.

How much more than five per cent is difficult to say: a reasonable, but conservative estimate would put the size of the gap due difference in experience at around six percentage points leaving four percentage points to be explained by employer discrimination, including any effects of occupational segregation. Thus, even in case (c), the case which gives the maximum value to employer discrimination the qualitative effect of this is small. At the most it is responsible for only 4 percentage points of the earnings gap.

The true situation probably lies somewhere between case (a) and case (c). These cases can be taken as representing the opposite extremes of any plausible assumptions about the effect of marriage on the earnings of women.

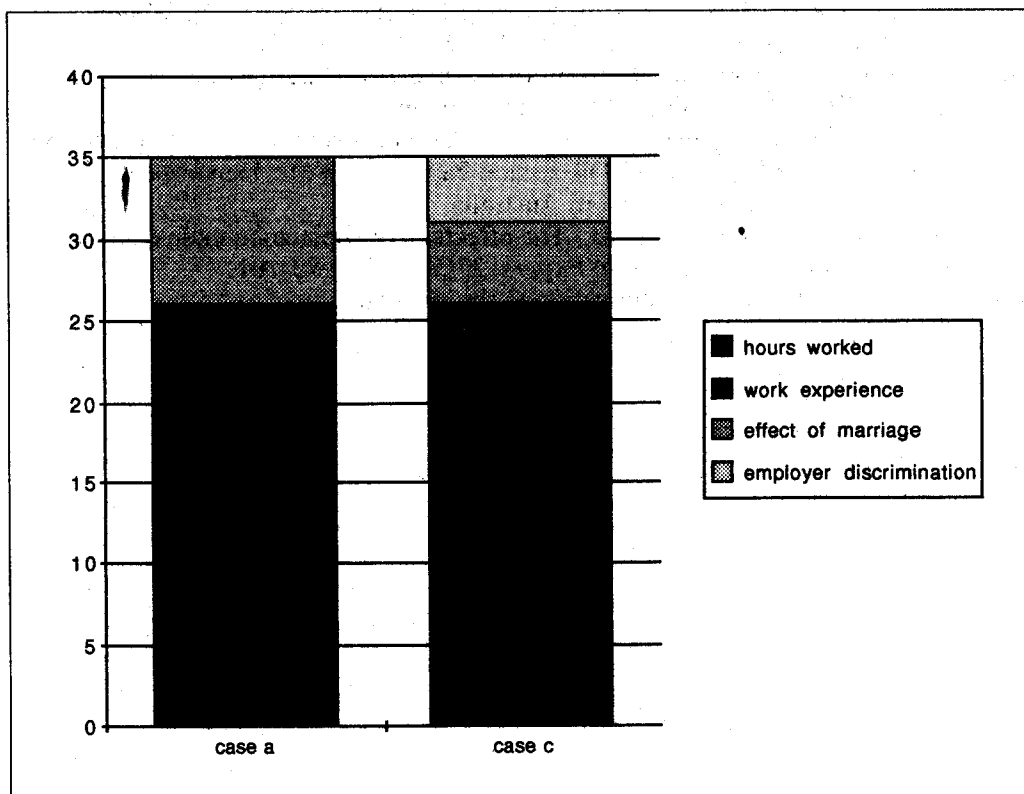
5 Conclusion

The gap between male and female earnings in Australia is some 35 per cent. Reliable survey data shows that 20 percentage points of this is due to men working more hours per week, on average, than women. Splitting up the remaining 15 per cent between different causal factors cannot be done so confidently. However, it is likely that about six percentage points is due to the fact that on average women are both younger and have less work experience than men of the same age. At least another five per cent, and perhaps as much as nine, is due to the fact that married men receive on average a bigger differential over single men than do married women over single women. This is probably not due to any discrimination on the part of employers against women. We noted in Section 2 a number of reasons why, apart from any actions or attitudes of employers, one would expect married women to receive less than single women, other things being equal. In fact they appear to receive up to nine per cent more than single women which suggests that, if anything, employers discriminate in favour of married women (compared to single women) not against them. The remainder, somewhere between zero and four percentage points is due to discrimination against women by employers, including discrimination which segregates women into particular occupations and industries.

Figure 1 shows the relative influences of the various causes under each of the two extreme assumptions about the effects of marriage on women. In case (a), in which, other things being equal, married women earn the same as single women (and single men), there is nothing left to be explained by employer discrimination. In case (c), in which married women are paid nine per cent more than single women, other things being equal, employer discrimination accounts for four percentage points of the earnings gap between men and women. The true situation almost certainly lies somewhere between case (a) and case (c), but even if it is very close to case (c), employer discrimination against women is still a relatively unimportant cause of the earnings gap between men and women.

This is not to argue that discrimination against women by employers is trivial. Nor is it to argue that removing such discrimination need not have a high priority. But it is to argue that if one wishes to substantially diminish the earnings gap between men and women it is necessary to change those attitudes in society generally, which influence the characteristics of female employees. While it is very desirable to reduce discrimination against women by employers, in Australia this will not have a very large effect on the earnings gap.

Figure 1: Factors Causing Differences Between Male and Female Earnings (in percentage points)



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Family Incomes and Economic Growth in the 1980s

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1 Introduction

Between 1983 and 1990, the Australian economy experienced its strongest period of economic growth since the early 1970s. Between 1983-84 and 1989-90 average real GDP growth averaged over four per cent per annum, and total employment grew by almost a quarter. Though this strong growth was partly a reflection of the depth of the 1983-84 recession, and is now being followed by yet another recession, it is still claimed by many as a major achievement of the Labor government of the period.

This period of economic growth has been accompanied by a number of other factors of major importance for family incomes. First, there has been a significant decrease in real wages. Between 1984-85 and 1989-90, real wages fell by six per cent, returning to their level of the early 1980s – despite a decade of productivity growth.¹ This wage fall has been attributed by many commentators to the Wage and Prices Accord between the Labor government and the trade union movement. Even those critical of other aspects of the Accord process generally concede that this policy has had some success in moderating wage growth (e.g. Fane, 1990; Blandy, 1990). These wage falls in turn are generally accepted to be an important reason for the strong employment growth of the period.

Part of the trade-off sought by the trade union movement for this wage moderation has been in the extension of 'social wage' benefits. The social wage can be considered as all those aspects of government expenditure which directly benefit individuals or families. Major initiatives of the Labor government over this period included the (re)introduction of universal public funded health insurance (Medicare), significant increases in income support payments for low income families with children, and expansion of government services in the housing, education and child care areas. In addition, attempts have been made to integrate income support payments for the unemployed and sole parents with labour market programs.

1 This estimate is for ordinary time Average Weekly Earnings for full-time adults. Unless otherwise indicated, statistics in this section are from dX time series data service.

At the same time social expenditures have been curtailed in some areas. Eligibility criteria and the administration of entitlement have been tightened (e.g. via assets tests, and restrictions on sole parent pension and unemployment benefit eligibility) and charges have been introduced for some services such as higher education.

One of the key goals of these social policy initiatives by the Labor Government has been to address concerns of the persistence of poverty, especially among families with children. The Prime Minister's famous statement that 'by 1990 no child will need to live in poverty' (Hawke, 1987) may have been ill-conceived, given the difficulty of achieving consensus on the definition of poverty, but was in fact matched by significant changes. The two main planks upon which the government's anti-poverty policy rested were employment growth and income support increases and, up until the end of the 1980s at least, significant achievements were made in both these areas.

The primary goal of this paper, however, is not to present a detailed account of all these economic and policy changes over the 1980s. Rather, this report has two main goals,

- To estimate the overall impact on family incomes of these economic and policy changes between 1983-84 and 1989-90, both in terms of average incomes and distributional outcomes.
- To decompose these overall changes into those due to different influences.

Some specific questions that we address include:

- Which family types benefited most from this period of strong economic growth?
- What was the main proximate cause of their income growth?
- What impact did strong economic growth have on income inequality? Which factors had the most impact?
- How did growth influence the rates of poverty among different family types?
- Which changes were most important in alleviating poverty? In particular, to what extent were employment growth and income support policy changes responsible for any poverty reduction?
- What does the experience of the 1980s tell us about likely trends into the recession of the early 1990s? How much will poverty increase and which groups will be most severely affected?

The focus of the paper is primarily historical, looking in detail at the impact on incomes of a sustained period of economic growth. Though these years of growth are now fast receding, this analysis is not just of historical interest. In particular, the counterfactual simulations presented here can be used to provide some insight into

the likely impact of the current recession on family incomes. Moreover, the 1983 to 1989 period seems to represent the best in terms of economic growth that the Australian economy can deliver. Estimates of the impact of growth will thus be relevant to considerations of the likely trends in family incomes as the economy recovers from the present recession. If poverty persists even after such a period of strong employment growth and increases in income support payments, perhaps alternative policies will need to be found.

The present paper is organised into six main sections. In the next section we briefly review the aggregate income trends and the income support and taxation policy changes of the 1980s. Section 3 then introduces the simulation model which we use to impute these aggregate trends to individual families. This model is then used in Section 4 to provide estimates of the income changes between 1983-84 and 1989-90. Estimates of mean incomes, as well as of poverty rates and income shares are presented.

In Section 5 a series of counterfactual simulations are undertaken in order to identify the different influences on the family income distribution over the period. These involve modifying the simulation of 1989-90 incomes presented in Section 4 to hold each factor in turn at its 1983-84 value. Changes separately identified include unemployment, married women's labour force participation, wage rates, capital/business incomes, income support and income tax scales. Results from these simulations are presented both for mean incomes in each family type, as well as for the measures of poverty and inequality used in Section 4.

Section 6 summarises the main conclusions of the report, considering the implications of these results for future economic and social policies.

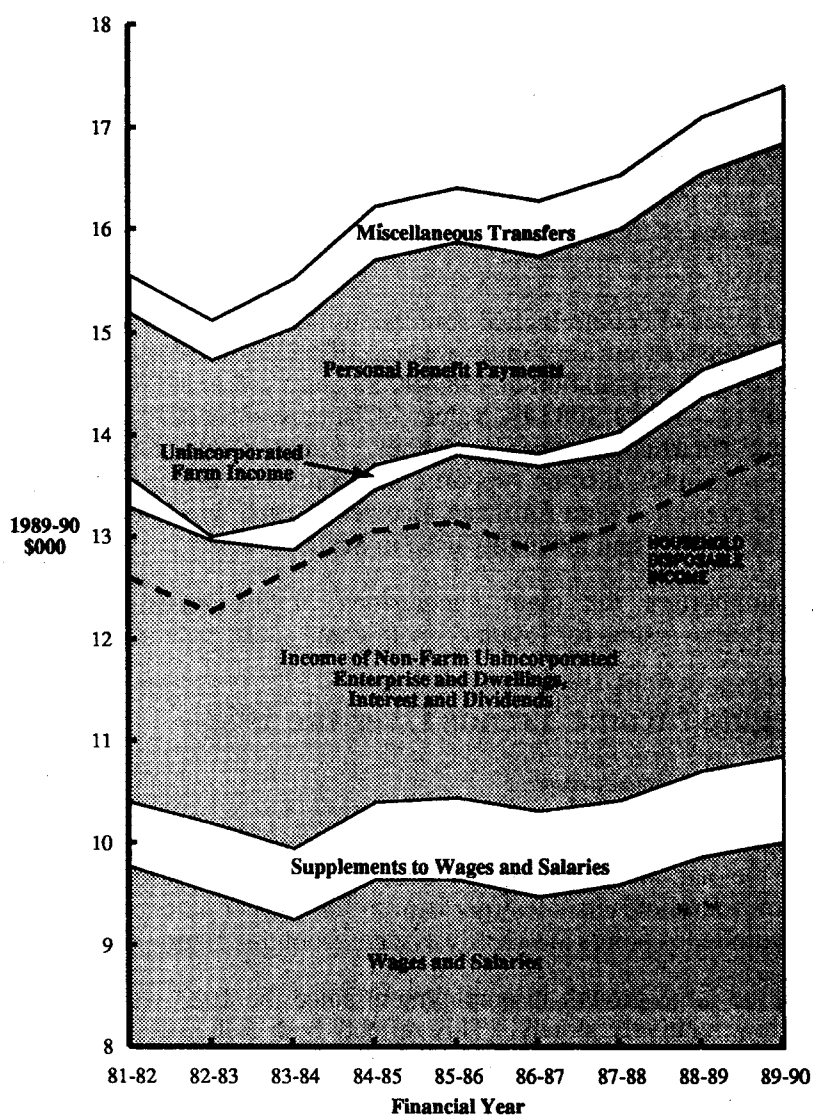
2 Aggregate Income Trends Over the 1980s

Household Disposable Incomes

One of the more convenient means of summarising trends in household incomes can be found in the national accounts. Figure 1 shows the trends in the different components of household incomes (per capita) for the period between 1981-82 and 1989-90. A number of points are clearly evident from this figure.

First, despite the large growth in employment since the 1983 recession, per capita real wages grew relatively slowly. This reflects both falls in real wages, together with the fact that many new jobs were only part-time. (It should be noted that Figure 1 is truncated and does not clearly show that wages and salaries comprise around 60% of total household incomes.) Because some wage rises during this period were taken in the form of increased employer contributions to superannuation, supplements to wages and salaries grew proportionately much faster (though this may not be clear from the figure).

Figure 1: Components of Real Household Incomes Per Capita, 1981-82 to 1989-90



Source: ABS Unpublished National Accounts tabulations as at June quarter 1990.

Even faster growth, however, was recorded in the various forms of capital based incomes. Because of the high interest rates and profit levels over the second half of the decade, the share of household income accruing in the form of interest, dividends, rent and (non-farm) business income rose from 18.6 to 22 per cent.

After expanding during the 1983 recession, personal benefit payments (on a national accounts basis) fell slowly during the remainder of the decade.

Employment

Further information on labour market changes between the peak of the recession in 1983-84 and 1989-90 is shown in Table 1. From an (annual) peak of 9.6 per cent, unemployment rates fell by 3.4 percentage points to 6.2 per cent in 1989-90. Though this left the unemployment rate still higher than it was at the very beginning of the 1980s, it was nonetheless a significant improvement.

Even more dramatic was the increase in labour force participation rates of married women, which rose by almost ten percentage points over the period. This participation growth, however, has been far from uniform. Bradbury (1990a) has shown that it has been primarily in families where one member was already employed that married women's employment has grown most. Where the husband was either unemployed or not in the labour force, employment growth has been negligible.

Table 1 shows that these two changes contributed to a significant increase in the proportion of the working age population employed. However because many married women are employed in part-time jobs, the full-time employment rate fell, and the number of full-time employed per working age person grew by only 2.7 percentage points.

Market Incomes

Table 2 presents some indicators of trends in real income levels between 1983-84 and 1989-90. As was noted in the introduction, real wages suffered a significant fall during this period. Whilst the weekly wage rate changes for part-time workers probably reflect changes in hours as much as in hourly wage rates, an across the board fall in wages is clear.

At the same time there have been significant changes in the distribution of wages. Between August 1983 and August 1989, the variation in the weekly earnings of single full-time employed males increased significantly, with the 90th percentile rising 62 per cent, compared to only a 50 per cent rise at the 10th percentile (ABS *Weekly Earnings of Employees (Distribution)*, Cat. No. 6310.0). This trend towards increasing inequality has not been uniform however. For full-time employed females no clear trend is apparent, whilst for full-time married males there is a trend

Table 1: Unemployment, Employment and Participation Rates: 1983-84 and 1989-90

	1983-84 %	1989-90 %
(1) Unemployment rate difference from 1983-84	9.6	6.2 -3.4
(2) Married women's participation rates difference from 1983-84	42.4	52.1 9.7
(3) Other participation rates difference from 1983-84	68.0	68.0 0.0
(4) Employed per persons aged 15-64 difference from 1983-84	62.3	68.6 6.3
(5) Full-time employment rate (full-time/full-time + part-time) difference from 1983-84	82.7	79.1 -3.6
(6) Full-time employed per persons aged 15-64 difference from 1983-84	51.5	54.2 2.7

Source: ABS, *The Labour Force, Australia*, Cat. No. 6202.0 and 6203.0 (via dX EconData).
ABS, *Australian Demographic Statistics*, Cat. No. 3101.0, June 1984, 1985 and 1990.

towards increasing inequality up to the 70th percentile, though the 90th percentile had income increases similar to the 20th percentile.² Unfortunately the Weekly Earnings of Employees Distribution (WEED) survey only records incomes in ranges, with little detail on incomes at the very top of the earnings distribution, and so does not provide information on income trends within the top decile. Anecdotal evidence would suggest, however, that the 'boom' of the late 1980s led to an above average increase in earnings at the very top of the income distribution.

Table 2 indicates that the tight monetary policy that was pursued in the latter part of the 1980s also had the effect of significantly raising income from interest. This was almost 70 per cent higher than in 1983-84. Whilst farm incomes showed little real

2 These estimates have been calculated by linear interpolation within the income ranges provided in ABS publications. They have been used in the simulation of wage inflation for the model described in the next section. The trends in part-time earnings have not been described here because of the difficulties of interpretation when hours are very variable. See Bradbury and Doyle (1992) for more information.

Table 2: Changes in Income Components: 1983-84 to 1989-90

Income Component	Real change %
Wage rates:	
Male full-time	-2.47
Male part-time	-26.45
Female full-time	-2.70
Female part-time	5.94
Unincorporated enterprise - farm income	-0.28
Unincorporated enterprise - non-farm income	13.45
Interest	69.15
Dividends	19.90

Source: Wage rates derived from *ABS Weekly Earnings of Employees (Distribution)*, (Cat. No. 6310.0), with adjustment to an annual basis using *ABS Average Weekly Earnings* (Cat. No. 6302.0). Other income data from unpublished ABS National Accounts as at June quarter 1990.

change over the period, income from both non-farm self-employment and dividends grew significantly.³

Income Transfers

In Table 3 the changes in rates of payments for the more important elements of the Australian income support system between 1983-84 and 1989-90 are summarised. These have been presented here using two different price deflators. In the first column the standard Consumer Price Index (CPI) has been used, whilst the second shows real income changes when deflated by the CPI excluding Hospital and Medical charges. The introduction of Medicare in 1984 meant a significant fall in medical expenses, and so the first column indicates a larger real income growth than the second. Since most pensioners and beneficiaries were already entitled to free or low cost health care, this fall in costs was not applicable for them, and so the second column is probably the most appropriate for assessing the changing real value of the income support payments.

3 It should be noted that the last four estimates in Table 2 are not adjusted for the growth in the population of persons receiving these incomes. Such an adjustment for population growth is incorporated in the simulation results presented in the next section.

Table 3: Real Changes (per cent) in Social Security and Related Payments: 1983-84 to 1989-90

Type of payment	Real change (%)	
	CPI	CPI (ex. HM)
Married rate of pension and benefit	+1.4	+0.6
Standard rate of pension	+1.5	+0.6
Single unemployment benefit		
16-17 years (JSA)	-16.8	-17.6
18-20 years	-9.7	-10.5
adult	+10.6	+9.6
Single sickness benefit		
16-17 years	-16.8	-17.6
18-20 years	-22.8	-23.5
adult	-5.5	-6.4
Additional pension/benefit for children		
less than 13 years	+37.5	+36.3
13-15 years	+98.1	+96.3
Mothers/guardians allowance	+26.7	+25.7
one child under 6 years	-3.5	-4.3
Rent assistance		
no children	+17.5	+16.5
with children	+50.0	+48.8
Family allowances		
one child	+13.1	+12.1
two children	-6.8	-7.6
Secondary assistance scheme	+59.6	+58.0
Tertiary education assistance	+11.2	+10.2
Note: CPI is the standard Consumer Price Index. CPI (ex.HM) is the Consumer Price Index net of hospital and medical costs.		

A number of features can be noted in Table 3. The largest (proportionate) increases were for additional pension/benefit for children, which almost doubled in real terms for those with children aged 13 to 15. Other increases were in rent assistance, educational allowances and adult unemployment benefit, which was aligned with sickness benefit in 1987. This alignment process was also associated with a decline in the real value of sickness benefit. The main reductions in maximum rates of payment have been for young beneficiaries. The alignment of youth benefit rates with educational allowance rates, and the introduction of Job Search Allowance

(JSA) led to significant falls in these rates of payment (the JSA estimates in the table are for the maximum entitlements).

As well as these changes in rates of payments, there have also been major changes in coverage and eligibility requirements. Prominent among the multitude of changes over the period were the (re)introduction of the assets test for pensioners (and the extension of the assets test to beneficiary, family, and educational payments), the introduction of income testing for Family Allowances (FA), and the imposition of more restrictive eligibility criteria for sole parents and the unemployed. The latter have included increased waiting periods, parental income tests for JSA recipients, and stricter administration of the work test. The most important expansion in coverage was probably the introduction of Family Allowance Supplement (FAS) in 1987 (an expansion of the earlier Family Income Supplement or FIS program).

Income Taxation

Tables 4 and 5 summarise the changes in the personal income tax scales between 1983-84 and 1989-90. Table 4 shows the basic scales and effective tax-free thresholds for different family types, whilst Table 5 shows the impact of these on the disposable incomes of some hypothetical families. In general, the trend was towards lower marginal tax rates, but with correspondingly lower thresholds. Table 5 shows the net effect of these changes (also incorporating the changes in Family Allowances, FIS and FAS, but not the Medicare levy). The main gainers were the very high income earners (because of the cut in the top marginal rate), and low income families with children (because of the expansion of FAS).

As for income support payments, major changes in coverage and administration make interpretation of these changes difficult. For example, the distributive impact of the fringe benefits and capital gains taxes are hard to estimate, but have probably led to a greater tax take from the higher income groups.

However, even when we restrict our attention to the relatively easily observed changes such as those of the labour market, income support and tax rate scales, the use of hypothetical families, as in the tables of this section, is still very restrictive. Whilst of use in identifying the direction of economic and policy changes in particular areas, such a description does not permit any overall analysis of the impacts of these changes on income levels and distributions. To address these questions, a different method of analysis is required.

3 Simulating the Income Distribution

The most direct way to collect information on the level and distribution of income is to conduct sample surveys. In Australia such surveys have long been used to analyse the income distribution and poverty levels. Similarly, the most straightforward way to analyse changes in these characteristics over time is to compare information from several such surveys.

Table 4: Personal Income Tax Arrangement: 1983-84 and 1989-90

A. Rate Scales

Income range (\$89-90 per year)	Marginal rate (cents per dollar)	
	1983-84	1989-90
0 - 5,099	0	0
5,100 - 7,065	0	21
7,066 - 17,649	30	21
17,650 - 20,599	30	29
20,600 - 29,986	30	39
29,987 - 34,999	46	39
35,000 - 49,999	46	47
50,000 - 55,034	46	48
55,035+	60	48

B. Tax Thresholds

Type of taxpayer	1983-84	Effective tax threshold 1989-90	Change %
Single	7,065	5,100	-27.8
Sole parent	11,063	9,576	-13.4
Single income couple			
- without children	11,320	9,862	-12.9
- with children	12,345	10,814	-12.4
Pensioner			
- single	8,347	8,262	-1.0
- married couple ^(a)	8,347	7,624	-8.7
Beneficiary			
- single			
16-17 years	7,065	5,100	-27.8
18-20 years	7,065	5,471	-22.6
21 years or more	7,065	6,719	-4.9
60-64 years	7,065	6,786	-4.0
- married			
without children	11,320	12,033	6.3
with children ^(b)	12,345	12,033	-2.5

- Notes:
- a) The difference between the effective thresholds for single married pensioners in 1989-90 reflects the decision to increase the rebates to cover the basic pension plus the pensioner free area, which is less for each of a married couple than for a single pensioner.
 - b) Until March 1984, Additional Benefit for Children was taxable.

Table 5: Effects of Changes to the Tax-Transfer System: Change (per cent) in Real Disposable Incomes for Different Family Types: 1983-84 to 1989-90

Taxable income ^(a) (\$p.a.)	Change in real disposable income ^(b) (%)			
	Single person	One income couple, two children ^(c)	Two income couple, no children	Two income couple, two children ^(d)
10,000	-1.6	4.9	-1.2	4.9
15,000	2.4	3.2	-3.0	0.0
20,000	3.5	10.4	-1.6	7.6
25,000	0.9	-1.3	0.7	0.4
30,000	-1.2	-2.8	2.3	1.9
35,000	0.3	-1.3	2.6	2.3
50,000	-0.2	-1.4	0.7	0.5
70,000	3.8	0.5	-0.2	-2.1
100,000	9.6	6.7	0.7	-0.8

- Notes:
- a) Expressed in constant 1989-90 dollars.
 - b) FA, FIS/FAS included. Medicare levy not included.
 - c) Dependent spouse assumed to have no taxable income. Two children both under 13 years.
 - d) Income is assumed to be earned in the ration 60:40. Two children both under 13 years.

However such an approach has several limitations. First, survey techniques change over time and data may not be strictly comparable. This is particularly a problem when researchers are forced to rely upon published data. Second, the timing of surveys is often not appropriate, or inevitable processing delays mean that the data may not be available when required. For example, this present paper looks at the distribution of incomes in 1989-90. Whilst an income survey for this year has been conducted by the ABS, at the time of writing this data had not yet been processed and released. Finally, whilst income surveys may provide the best estimate of the distribution of income at any particular time, changes in the income distribution will be a function of many different influences. A simple comparison of the data from different surveys will only allow the combined effect to be observed.

Because of these limitations this paper uses an alternative **static microsimulation** methodology. The essence of this approach is quite simple. The goal is to combine the information from one base data source, in this case the *ABS 1986 Income Distribution Survey (IDS)*, with information on important changes over time, to provide an estimate of the data that might have been obtained had the income survey been conducted in a different period. Because the data for this different period is entirely simulated, it is then quite simple to carry out counterfactual simulations to separately identify the impact of different factors.

For this present paper, two primary simulations are carried out to simulate income data for the 1983-84 and 1989-90 years. The first of these years corresponds to the election of the Hawke Federal Labor government (in March 1983), and also to the trough of the 1983 recession.⁴ The second corresponds to the peak of the business cycle, prior to the increase in unemployment in 1990-91. A comparison of these two years thus can be used to derive a picture of the income trends resulting from a period of sustained economic growth.

In addition to simulating income distributions for these two years, we also present results for a number of counterfactual simulations. These describe the simulated income distribution in 1989-90 assuming that some specified factors remained constant at their (real) 1983-84 levels. For example, we simulate the likely income distribution if the unemployment rates in 1983-84 had continued to prevail in 1989-90, or if wages had been held constant at their real 1983-84 values. As well as enabling us to decompose the sources of income change over the period, these counterfactual simulations can also be of assistance in predicting the impact of future changes. A key example that we consider is the likely impact upon incomes of a return to 1983-84 unemployment levels.

It should not be forgotten, however, that these counterfactual simulations are just that - contrary to fact - and certainly must be interpreted with caution. For example the fall in unemployment is often attributed to the reduction in real wages over this period. If this is the case it will certainly not be consistent to hold wages at their 1989-90 level whilst describing the counterfactual impact of continuing high unemployment levels. On the other hand, this counterfactual may be of more relevance in describing the projected impact of increasing unemployment after 1989-90 - because this is now perhaps due to reasons other than wage levels. In general, the interpretation of these counterfactual results will always be dependent upon the underlying causal model between the variables of interest. Nonetheless we believe a presentation of the results of this exercise to be a useful input into a range of wider questions.

Simulation Methods

There are number of ways in which changes in the income distribution can be simulated.⁵ One method is to model the changes in the incomes of individual families over time. This **dynamic simulation** method, however, requires a large amount of data and/or assumptions about how people move from one set of

4 Note that in an earlier paper we take as our starting point the 1982-83 financial year (Bradbury, Doyle and Whiteford, 1990). The year has been changed here to capture the full impact of unemployment on family incomes (average unemployment rates were higher during 1983-84 than in the year before) and to avoid some of the distorting effects of the drought in 1982.

5 For an overview of the different approaches to microsimulation in Europe, the United States and Australia respectively, see the collections by Atkinson and Sutherland (1988), Lewis and Michel (1990), and Bradbury (1990b).

circumstances (e.g. labour market state) to another. As a consequence most simulation analyses use the **static simulation** approach followed here. Rather than following individuals, the goal of this simulation is to simply estimate the **distribution** of incomes in different periods.

The implications of this should be clearly understood. This means for instance, that when we talk of the incomes of the bottom decile growing by X per cent, we do **not** mean that, of the people who were in the bottom decile in 1983-84, their average income increased by this amount. Rather such statements mean that the average income of the bottom decile in 1989-90 was X per cent higher than the average income of the bottom decile in 1983-84. The static simulation method says nothing about whether the same people were in the bottom decile in both periods.

The focus of this paper is on the incomes of families, defined here by the **income unit** concept used by the ABS. Income units comprise either single adults, sole parents (and their dependent children), couples, or couples with dependent children (non-dependent children treated as single adults).⁶ In this paper the term 'family' is used synonymously with this income unit concept.

There are two main stages to the simulation of family incomes. First, population and employment changes are simulated by an adjustment to the **case structure** of the base data file. This is done by altering the weights attached to each income unit record which describe the number of income units in the Australian population which the record represents. Second, income changes are simulated by adjusting the income variables to reflect the trends in income growth over the period. More specifically, the following adjustments are made:

- Income unit weights are adjusted according to the total size and distribution of the population across eight different income unit types (in decreasing size, couples with dependants, couples without dependants, adult children, single person households, persons in group households, sole parents, other family heads, and other relatives). This data was obtained from the ABS *Labour Force Status and Other Characteristics of Families* (LFSOCF) surveys (Cat. No. 6224.0) with some adjustments to compensate for changes in definitions (see Bradbury, 1990a).
- Income unit weights are then adjusted to account for the different participation, unemployment and part-time employment rates of persons within each of these income unit types. For couples, adjustment is made according to the 16 cell interaction of these labour force categories. The basic method used to link this data from the LFSOCF with the annual income data of the IDS is described in Bradbury (1990a).⁷

6 See ABS Cat. No. 6545.0 for definitions.

7 This method has been slightly modified to take better account of the distribution of unemployment spells across the year (see Bradbury and Doyle, 1992).

- Wage and salary incomes are inflated by the increases in mid-quintile incomes as indicated by the ABS *Weekly Earnings of Employees (Distribution)* (WEED) survey. This is done separately for five different categories of wage earner: full-time employed married males; full-time single males; full-time married females; full-time single females; and part-time married females. (Part-time males and part-time single females are inflated by trends in mean incomes because there are fewer cases with these characteristics). From the WEED survey, the 10th, 30th, 50th, 70th and 90th percentiles are calculated for 1983 and 1989. These are used to inflate the wages of persons in the five income quintiles in the IDS data. An adjustment based on average weekly earning data is then made to bring these wages into line with the financial years.
- Other private income sources (interest, investment income, rents, self-employment income) are inflated in line with movements in the corresponding National Accounts aggregates (taking into account the effect of population growth).
- Pension, benefit and educational allowance income recorded in the IDS is disaggregated into separate payments (e.g. base pension rate, allowances for children, rent assistance etc.). These components are then inflated according to trends in the rates of payment for these components. In general, coverage changes over the period are not modelled. However the parental income test for youth receiving JSA is incorporated into the 1989-90 simulation.
- Family payments - FA, FIS and FAS - are imputed on the basis of recorded characteristics of the family. The income test for FAS and FA in 1989-90 is based upon 90 per cent of simulated 1989-90 taxable income. A take-up rate of 15 per cent for FIS (in 1983-84) and around 50 per cent for FAS (in 1989-90) was assumed. The FAS take-up rate was assumed to increase with entitlements, and was calculated to replicate the known expenditure on FAS payments.
- Personal income tax is then calculated on the basis of the simulated incomes. Some allowance is made for income averaging for farm income, and only 50 per cent of dividend income in 1989-90 is assumed taxable.

Apart from the method used to adjust for labour force changes, these simulations largely follow the methods described in Bradbury, Doyle and Whiteford (1990). Information on the labour market adjustment methods can be found in Bradbury (1990a). More detail on the changes to this methodology made for the present paper are described in Bradbury and Doyle (1992).

As well as these simulations of incomes in 1983-84 and 1989-90, several counterfactual simulations have also been undertaken. These simulations are based upon the 1989-90 simulation but with one factor held at its real 1983-84 value. The difference between the overall simulated 1989-90 incomes and those simulated under this counterfactual can thus be used as an estimate of the importance of the particular influence on family income growth over the period. The specific factors

held at their 1983-84 value (with all other factors at their 1989-90 value) are described below:

- **Unemployment:** Weights are defined so that unemployment rates are held at their simulated 1983-84 value. For computational simplicity in married couple income units, only husbands' unemployment rates have been set to 1983-84 values. Hence the changes in unemployment rates for couples will be underestimated.
- **Married Women's Participation:** For single adult income units, weights are the same as for the overall simulation of 1989-90 incomes. For married couples, the participation rate of wives (within each category of husbands' labour force status) is set equal to the participation rate in 1983-84.
- **Unemployment, Participation and Full-Time/Part-Time Rates:** Within each family type, the 1983-84 labour force status weighting is applied. (Note that the population and family type distribution is maintained at the 1989-90 level.)
- **Pension/Benefit/Allowance Rates:** The payments recorded in the IDS are deflated to their 1983-84 values following the methods described above. These incomes are then inflated to (counterfactual) 1989-90 values using the CPI excluding medical costs. Family Allowance and FIS are imputed using inflated rates of payments (and income test thresholds in the case of FIS).
- **Wage Rates:** Wage and Salary income is deflated to 1983-84 values using the method described above, and then inflated to 1989-90 values using the CPI.
- **Income Taxation:** Personal income tax is calculated using the 1983-84 rate scales and family rebates, with the thresholds inflated by the CPI to 1989-90 values. The definition of taxable income and the Medicare levy are not adjusted from their 1989-90 structure.
- **Everything:** This is the full simulation of the 1983-84 incomes, but with disposable incomes inflated to 1989-90 values (using the CPI ex-medical for pensioners and beneficiaries, and the standard CPI for other families).

Some Important Qualifications

Though the simulation method used here is much more comprehensive than the comparison of trends in aggregate income components as used in Section 2 of this paper, there are several important respects in which the simulated data for the different years falls short of reflecting all the important changes of the period. Because the simulation process can only be finite, some such limitations are an inevitable part of any simulation results. Certainly we cannot claim that the simulated data are as rich as the data that might be obtained from actual surveys. Rather, the simulation method aims to provide estimates which are 'in-between', in

terms of complexity, those obtained by the examination of either entirely hypothetical or actual families.

With regard to income support payments, whilst the methods used are quite appropriate for the measurement of trends in the rates of payments of different pensions and benefits, much less attention has been given to coverage changes. Whilst we have made an attempt to model the introduction of income tests for family allowances and youth unemployment benefits, other important changes have not been addressed. These include the (re)introduction of the assets test for pensioners in 1985 (and subsequent changes to the definition of income for the income test), increased waiting periods and administrative supervision generally of unemployment beneficiaries, and changes to the qualifying age for children of sole parents. These have all led to a decrease in aggregate income support expenditures over the period not included in the model. Another omitted factor which has had the opposite effect has been the expansion of AUSTUDY coverage. Such changes have generally been omitted because of a lack of information available to assign them appropriately, and this should be taken into account in considering the results presented below.

However the interpretation of these omissions is not always easy. For example, if we were to model the lack of an assets test in 1983-84 this would lead to an increase in the simulated incomes of aged persons in 1983-84. Since many of the asset-rich have low incomes, this would imply a lower poverty rate for this group in 1983-84 than currently simulated, and this might lead us to the conclusion that the introduction of the assets test led to an increase in poverty among the aged. Would this be an appropriate conclusion? Only if we assume that the asset rich but income poor are actually poor. In the absence of a method of separately identifying the asset rich, the best approach is probably to simply ignore the impact of the assets test in the simulation (as we have done here).

In the Appendix a summary of an analysis comparing the simulation results with other external estimates is presented. The most important qualification is probably the model's lack of full accounting for aggregate wage growth over the period. In part this represents limitations in the re-weighting method used to simulate employment changes (i.e. we underestimate the fall in unemployment and the growth in participation over the period by about 10%). A significant component of this difference, however, remains unexplained.

As a consequence, the estimates of mean income growth presented in the subsequent sections of the paper are probably underestimates, though the large differences in definition between the different data sources make it impossible to be precise about the extent of any bias. In a revised version of this paper (Bradbury and Doyle, 1992) the simulation method has been adjusted to bring the estimates of wage and employment growth closer in line with external aggregates.

4 Overall Distributional Outcomes

Table 6 presents the simulation estimates of the mean real disposable incomes of seven different family types in 1983-84 and 1989-90. The first panel of the table is

for the whole population,⁸ whilst the second panel excludes income units where either the head or spouse worked in their own business during the year. As with all tables in this paper, 1983-84 incomes have been inflated to 1989-90 dollars using the CPI excluding medical expenses for pensioner/beneficiary families, and the standard CPI for other families. On average, real family incomes are estimated to have grown by 2.8 per cent over the six year period (3.1% for non self-employed families).

This can be compared with an estimate of a nine per cent growth provided by the National Accounts estimate of real Household Disposable Income Per Capita (HHDIPC) (deflated by CPI). A significant part of the difference between these two estimates lies in the distinction between disposable incomes per capita and per income unit. Between 1983-84 and 1989-90 the proportion of income units that comprised couples with dependants fell from 27.9 to 26.0 per cent. As a consequence, there was a fall of 2.3 per cent in the average number of persons per income unit. Hence if the overall mean incomes in Table 6 were calculated per person rather than per income unit, the increase over the period would be 5.2 rather than 2.8 per cent.⁹

The remaining difference between this and the National Accounts estimate can be attributed primarily to three factors. First, the National Accounts have a much wider scope than the income measures considered here. For example, the growth in superannuation and some social wage expenditures are included in the National Accounts measures, but not in our estimates. Second, the model probably underestimates the growth in wage-earning employment over the period. This is due both to a 10 to 15 per cent underestimation of unemployment and participation changes, and to an overestimate of the growth of self-employment. Third, despite matching other indices of average wages, the model appears to have omitted an additional component of aggregate wages (see Appendix). The most likely sources of this omission appear to be in either the agricultural sector, or at the very upper end of the income distribution, but the available data are inconclusive.

Table 6 indicates that across family types, the largest increase in average incomes has been for sole parents, who benefited significantly both from the improved labour market after 1983, and from the family package increases in payments for children. Since a large proportion of sole parents are pensioners, these increases had a

8 Both sets of estimates exclude incomplete income units and income units where annual income was not considered to be representative (the standard ABS exclusion for annual income tables, see Cat. No. 6545.0). Income unit income is defined as the sum of the income of the head and spouse (if present).

9 This changing demographic structure also explains why the overall percentage increase is lower than in almost all the individual family types. Further differences can also be explained by the use of the CPI ex-medical expenses rather than the standard CPI for pensioner/beneficiary households, and also because the simulation does not account for the falling average numbers of dependants within married couple families. These effects are relatively minor however (less than one percentage point combined).

Table 6: Mean Incomes by Family Type (\$1989-90)

Family type	1983-84	1989-90	% increase	Cases
(Full population)				
Person <25	12,278	12,762	3.9	1,651
Person 25-64	17,381	18,024	3.7	1,852
Person 65+	9,444	9,974	5.6	883
Couple head 65+	17,830	18,900	6.0	746
Couple head <65	32,244	32,982	2.3	1,736
Couple with dependants	32,753	33,692	2.9	2,743
Sole parent	13,816	15,522	12.3	383
All families	22,373	22,989	2.8	9,994
(Non-self-employed)				
Person <25	12,022	12,574	4.6	1,570
Person 25-64	17,283	18,051	4.4	1,641
Person 65+	9,259	9,821	6.1	865
Couple head 65+	16,810	17,965	6.9	687
Couple head <65	32,057	33,372	4.1	1,350
Couple with dependants	33,291	34,581	3.9	2,059
Sole parent	13,557	15,318	13.0	363
All families	21,430	22,094	3.1	8,535

particularly large impact upon their overall average incomes. It should be noted however that these estimates do not take account of the narrowing of coverage of sole parent pensions with the reduction in the child qualifying age, nor do they incorporate any increase in sole parent incomes associated with the child support scheme. These two changes have respectively led to decreases and increases in sole parent incomes.

The aged fared relatively well, partly as a result of the increases in the real value of the aged pension (see Section 2) but mainly because of the increases in investment and interest income associated with the high interest rates of the late 1980s.¹⁰ The other side of these high interest rates, reductions in 'disposable' income due to high home loan interest payments, are not considered here. In Bradbury, Doyle and Whiteford (1990) it is shown that these have impacted most upon families at the other end of the life cycle, with repayment increases greatest for those aged under 30.

10 In 1985-86 around one quarter of the income of families with head aged over 65 came from personal investments, 54 per cent from government pensions, nine per cent from periodical superannuation payouts and eight per cent from wages.

Finally, Table 6 shows that the families with the smallest increase in average real incomes over the period were younger couples. The reasons for these different outcomes are considered further in Section 5.

Poverty Rates

The definition and measurement of poverty is a controversial issue, and one that has attracted much debate (see Bradbury and Saunders, 1990, and the references therein for an introduction). Rather than enter this debate here, we confine our analysis to a relatively simple, income based, measure of poverty. The basic poverty measure that we employ is the simplified Henderson Poverty Line for 1983-84.¹¹ Since the choice of the absolute level of the poverty line is essentially arbitrary (within reasonable bounds), we also look at the proportions of people in each family type below 80, 120 and 140 per cent of the poverty line. It should be remembered that the original Poverty Commission report recommended that all families with incomes below 120 per cent of the standard poverty line be included in the description 'poor' (Commission of Inquiry into Poverty, 1975).

For comparing poverty rates at different times, a crucial issue is how the poverty line is adjusted in response to changes in community incomes and prices. The Henderson poverty line, for example, is usually adjusted in line with changes in the National Accounts measure of household disposable income per capita (HHDIPC). Such poverty lines adjusted in line with community incomes are typically referred to as *relative* poverty lines. The justification for this mode of adjustment is that people should be considered poor when their income is so low that they cannot participate in the social and economic life of the community. Hence increases in real community incomes should be reflected in increases in the poverty line.

Whether HHDIPC is the best way of reflecting these changes in incomes is debatable. Originally the Henderson poverty line was updated in line with trends in average weekly earnings, but this was abandoned as it did not adequately reflect net (or after-tax) incomes nor changes in non-wage incomes. Whilst the HHDIPC measure is probably the best easily available index to use for most applications, for the present simulation exercise it is probably inappropriate. As was noted above, the simulation model estimates a significantly lower growth rate of family incomes than does HHDIPC. Hence to maintain internal consistency, the relative poverty line that we employ here is calculated by inflating the 1983-84 Henderson poverty line by the changes in mean incomes simulated by the model.¹² The same updating procedure is employed when we consider the counterfactual simulations in the next section.

11 For the Henderson standard family of a couple with two children (with the head working) this is \$10,689 p.a. Source: Social Policy Research Unit (1991), *Newsletter*, January.

12 The inflation factor is thus the nominal equivalent of the 2.8 per cent shown in Table 6. If a per person measure were used instead, relative poverty in 1989-90 would be higher than that

Whilst this measure has the advantage of internal consistency, the disparity between the simulated and National Accounts estimates of overall income growth implies caution in the interpretation of these estimates. If HHDIPC were used as the index of community living standards, relative poverty rates would be higher in 1989-90 than shown here.¹³ Saunders and Matheson (1991) present poverty estimates for 1989-90 (based on an earlier version of the simulation model used here) using HHDIPC as the inflator.

As well as presenting these relative poverty estimates, we also present estimates using a poverty line which only takes account of price movements between the two years. This **absolute** poverty line is the 1983-84 poverty line inflated by changes in prices to 1989-90.¹⁴ Such a poverty line would be appropriate if we were to consider poverty in terms of the income needed in order to purchase some minimum bundle of goods.

Since mean incomes rose in real terms over the period, the estimates of absolute poverty will always be lower than the estimates of relative poverty. It should be noted that neither of these poverty lines corresponds to the conventional Henderson poverty line for 1989-90. Finally, because of concerns of the appropriateness of the very low incomes recorded by many self-employed families, all poverty estimates presented here exclude the self-employed.

Estimates of poverty rates for the different family types are presented in Table 7. Overall, we estimate a standard poverty rate (below 100%) of 11.3 per cent in 1983-84. This falls to either 9.6 or 10.9 per cent in 1989-90 using the absolute and relative poverty lines respectively. Thus across all poverty lines shown here, and using either updating method, overall poverty rates unambiguously fell. This should not be surprising given the growth in employment and payment rates of most income support payments. It is perhaps surprising that the fall was so small.

The family types with the highest poverty rates in both years are those with least attachment to the labour force - the aged and sole parents. It is also for these family types that the calculation of poverty incidence is most sensitive to the choice of poverty line. This follows from the fact that income support payment levels are

shown here. The choice of these two measures has less impact for the counterfactual simulations in the next section, as demographic structure is held constant.

13 A rough estimate of poverty rates under this measure can be gained by noting that HHDIPC grew (in nominal terms) by a factor of 1.68 between 1983-84 and 1989-90. Simulated mean incomes (and hence the relative poverty line) grew by a factor of 1.58, and prices grew by 1.54 to 1.55 (depending upon the price index used). Hence the conventional Henderson poverty line is 6 and 9 per cent higher than the relative and absolute poverty lines respectively (e.g. $1.06 = 1.68/1.58$). Very roughly, the 'standard' 1989-90 poverty rate will be half way between the 100 and 120 per cent levels of the absolute poverty line.

14 As in the calculation of real incomes, we have used the CPI excluding medical expenses for pensioners and beneficiaries.

Table 7: Percent Below Different Poverty Lines

Income Relative to Henderson Poverty Line	1983-84	1989-90 Absolute	1989-90 Relative	Difference Absolute Poverty	Difference Relative Poverty
Person <25					
Below 80%	10.3	9.9	10.2	-0.4	-0.1
Below 100%	14.2	13.7	14.1	-0.4	-0.0
Below 120%	19.9	19.7	20.6	-0.2	0.7
Below 140%	27.6	26.5	27.9	-1.1	0.3
Person 25-64					
Below 80%	4.1	3.9	4.1	-0.2	-0.0
Below 100%	10.8	9.1	10.9	-1.7	0.1
Below 120%	18.7	17.2	17.8	-1.5	-0.9
Below 140%	25.0	23.1	24.3	-1.9	-0.8
Person 65+					
Below 80%	2.3	2.1	2.4	-0.2	0.1
Below 100%	20.8	18.1	24.9	-2.7	4.0
Below 120%	50.5	46.6	48.4	-3.9	-2.1
Below 140%	67.5	65.3	66.8	-2.2	-0.7
Couple head 65+					
Below 80%	2.7	2.8	2.8	0.1	0.1
Below 100%	4.2	3.8	3.9	-0.5	-0.4
Below 120%	23.2	18.1	23.2	-5.1	-0.0
Below 140%	50.5	44.3	46.1	-6.2	-4.4
Couple head <65					
Below 80%	1.7	1.4	1.4	-0.3	-0.3
Below 100%	2.6	2.2	2.3	-0.4	-0.3
Below 120%	6.8	6.1	7.4	-0.7	0.5
Below 140%	13.6	12.9	13.4	-0.8	-0.2
Couple with dependants					
Below 80%	2.9	2.1	2.4	-0.8	-0.5
Below 100%	6.9	4.9	5.3	-2.0	-1.6
Below 120%	13.3	10.3	11.8	-3.0	-1.5
Below 140%	21.7	21.3	23.1	-0.5	1.4
Sole parent					
Below 80%	24.5	14.9	16.2	-9.6	-8.3
Below 100%	46.5	33.1	35.9	-13.4	-10.6
Below 120%	66.2	55.0	55.9	-11.3	-10.3
Below 140%	72.2	63.9	64.8	-8.3	-7.4
All families					
Below 80%	5.2	4.5	4.7	-0.7	-0.5
Below 100%	11.3	9.6	10.9	-1.7	-0.4
Below 120%	21.3	19.2	20.6	-2.1	-0.7
Below 140%	31.1	29.6	30.9	-1.5	-0.1

Notes: For non-self-employed population
 Absolute Poverty Line: Inflated by CPI from 1983-84
 Relative Poverty Line: Inflated by Mean Incomes from 1983-84

generally close to the value of the poverty line. Between the two years, the largest fall in poverty rates occurred among sole parents, though this fall was from a very high base. In general the smallest falls in poverty are among young single persons. This represents the fact that falling unemployment rates were offset by decreases in income support payments for those aged under 21.

These poverty rates are estimates of the proportion of income units below the poverty line. Given the particular importance of child poverty, it is also interesting to examine estimates of the proportion of children living in income units with incomes below the poverty line. This is done in Table 8. Particularly for married couple families, child poverty rates are generally higher than family poverty rates. This reflects the fact that families with more children have greater needs, and so are more likely to be below the poverty line. Under either measure of poverty, child poverty rates fell significantly between 1983-84 and 1989-90, with the largest fall being 4.3 percentage points at the 120 per cent threshold of the absolute poverty measure. This represents a fall of almost one fifth from the 1983-84 estimate.

The fall in child poverty rates is greatest in sole parent families where the absolute poverty measure indicates a fall of 13.6 percentage points, from the very high level of 51.6 per cent in 1983-84. This represents around 62 thousand children in sole parent families moved out of poverty during the period.¹⁵ Nonetheless, though the percentage point drop in poverty for those children in married couple families (at the standard absolute poverty line) was only 3.0, this represents a greater number of children (around 87 thousand).

Income Distribution

Whilst the simulation model used here is only of limited use for estimating trends in the incomes of very high income earners, it is of interest nonetheless to consider how the trends modelled have affected the broad features of the income distribution. Table 9 thus presents estimates of the income shares of different quintiles and deciles in the two years. Overall, the last panel of the table indicates that it is the bottom and very top of the income distribution that increased their income share, though all income quantiles experienced increases in their mean income.

Table 10 indicates that for all family types apart from the elderly, the Gini coefficients either fell or were essentially stable. The distributional trends for the elderly are, however, quite different. For both singles and couples, the top quintile, and in particular the top decile, significantly increased its income share. This is a result of the increase in profits and the tight monetary policy of the late 1980s. High interest rates (and other investment yields) leads to significant increases in the incomes of the high income elderly. As a consequence the income shares of the bottom deciles of the elderly fell.

15 This holds constant the total number of children. That is, 62 thousand equals 13.6 per cent of the number of children in sole parent families in 1989-90.

Table 8: Child Poverty Rates

Income Relative to Henderson Poverty Line	1983-84	1989-90 Absolute	1989-90 Relative	Difference Absolute Poverty	Difference Relative Poverty
In married couple families					
Below 80%	3.8	2.7	3.1	-1.0	-0.7
Below 100%	9.4	6.4	6.9	-3.0	-2.5
Below 120%	16.8	12.7	14.7	-4.1	-2.1
Below 140%	26.5	26.4	28.7	-0.1	2.2
In sole parent families					
Below 80%	28.6	18.2	19.9	-10.5	-8.8
Below 100%	51.6	38.0	40.7	-13.6	-10.8
Below 120%	70.5	59.2	59.9	-11.3	-10.6
Below 140%	75.5	66.5	67.9	-9.0	-7.5
In all families					
Below 80%	6.8	4.8	5.3	-1.9	-1.4
Below 100%	14.5	10.7	11.5	-3.8	-3.0
Below 120%	23.2	19.0	20.8	-4.3	-2.5
Below 140%	32.4	31.8	34.0	-0.5	1.6

Notes: For non-self-employed population
 Absolute Poverty Line: Inflated by CPI from 1983-84
 Relative Poverty Line: Inflated by Mean Incomes from 1983-84

For non-elderly couples, the distributional picture was more mixed, with the main gains being experienced by the middle quintile, whilst for couples with dependants, it was the bottom and top quintiles which experienced most income growth.

In general, it is difficult to say much about these changes, as they represent the combined impact of many different factors. The advantage of simulation methods, however, is that they allow us to separately identify these influences. This is the goal of the next section.

5 Decomposing Family Income Trends

Mean Incomes

Table 11 presents the changes in mean incomes that result from the various counterfactual simulations. To recap the previous discussion, these simulations estimate the

Table 9: Decile and Quintile Income Shares and Means

	Share 1983-84	Share 1989-90	Percentage increase of share	Mean 1983-84 (\$1989-90)	Mean 1989-90	Percentage increase of mean
Person <25						
Bottom decile	1.39	1.43	2.9	1,668	1,795	7.6
Second decile	4.47	4.63	3.7	5,370	5,823	8.4
Second quintile	13.86	14.14	2.0	8,329	8,887	6.7
Middle quintile	19.77	19.94	0.9	11,885	12,539	5.5
Fourth quintile	25.52	25.46	-0.2	15,338	16,007	4.4
Ninth decile	15.37	15.16	-1.3	18,473	19,064	3.2
Top decile	19.64	19.24	-2.0	23,608	24,194	2.5
Total	100.00	100.00	0.0	12,022	12,574	4.6
Person 25-64						
Bottom decile	2.49	2.55	2.4	4,300	4,598	6.9
Second decile	4.01	3.98	-0.8	6,934	7,185	3.6
Second quintile	11.23	11.80	5.0	9,705	10,646	9.7
Middle quintile	19.88	19.77	-0.5	17,178	17,848	3.9
Fourth quintile	25.81	25.10	-2.8	22,304	22,651	1.6
Ninth decile	15.45	15.05	-2.6	26,696	27,169	1.8
Top decile	21.13	21.76	2.9	36,552	39,271	7.5
Total	100.00	100.00	0.0	17,283	18,051	4.4
Person 65+						
Bottom decile	5.74	5.59	-2.6	5,311	5,488	3.3
Second decile	7.35	7.05	-4.0	6,806	6,929	1.8
Second quintile	15.39	14.75	-4.2	7,123	7,241	1.7
Middle quintile	16.41	16.01	-2.4	7,598	7,863	3.5
Fourth quintile	19.46	19.31	-0.8	9,007	9,481	5.3
Ninth decile	12.37	12.67	2.4	11,456	12,448	8.7
Top decile	23.29	24.62	5.7	21,563	24,177	12.1
Total	100.00	100.00	0.0	9,259	9,821	6.1
Couple head 65+						
Bottom decile	5.18	4.97	-4.1	8,707	8,922	2.5
Second decile	6.95	6.59	-5.1	11,683	11,846	1.4
Second quintile	14.72	14.09	-4.2	12,369	12,660	2.4
Middle quintile	16.46	16.16	-1.8	13,834	14,520	5.0
Fourth quintile	19.50	19.41	-0.5	16,390	17,437	6.4
Ninth decile	13.38	13.47	0.6	22,489	24,190	7.6
Top decile	23.81	25.30	6.3	40,031	45,461	13.6
Total	100.00	100.00	-0.0	16,810	17,965	6.9

(continued)

Table 9: Decile and Quintile Income Shares and Means
(Continued)

	Share 1983-84	Share 1989-90	Percentage increase of share	Mean 1983-84 (\$1989-90)	Mean 1989-90	Percentage increase of mean
Couple head <65						
Bottom decile	3.22	3.22	-0.3	10,336	10,730	3.8
Second decile	4.55	4.63	1.9	14,575	15,462	6.1
Second quintile	13.60	13.71	0.8	21,796	22,873	4.9
Middle quintile	18.80	19.19	2.1	30,141	32,029	6.3
Fourth quintile	24.36	24.05	-1.3	39,054	40,136	2.8
Ninth decile	14.72	14.28	-3.0	47,204	47,670	1.0
Top decile	20.74	20.91	0.8	66,476	69,783	5.0
Total	100.00	100.00	0.0	32,057	33,372	4.1
Couple with dependants						
Bottom decile	3.94	4.18	6.0	13,122	14,444	10.1
Second decile	6.17	6.29	1.9	20,548	21,741	5.8
Second quintile	15.62	15.45	-1.1	26,008	26,714	2.7
Middle quintile	18.93	18.65	-1.5	31,503	32,244	2.4
Fourth quintile	22.72	22.37	-1.5	37,813	38,673	2.3
Ninth decile	13.56	13.24	-2.3	45,136	45,784	1.4
Top decile	19.06	19.83	4.0	63,460	68,580	8.1
Total	100.00	100.00	0.0	33,291	34,581	3.9
Sole parent						
Bottom decile	3.22	3.44	6.7	4,371	5,268	20.5
Second decile	5.23	5.39	2.9	7,096	8,252	16.3
Second quintile	13.22	13.40	1.4	8,961	10,264	14.5
Middle quintile	16.30	16.71	2.5	11,051	12,795	15.8
Fourth quintile	22.55	24.03	6.5	15,287	18,402	20.4
Ninth decile	16.30	15.69	-3.7	22,099	24,033	8.8
Top decile	23.17	21.35	-7.8	31,408	32,706	4.1
Total	100.00	100.00	0.0	13,557	15,318	13.0
All families						
Bottom decile	2.12	2.20	3.6	4,550	4,860	6.8
Second decile	3.52	3.56	1.2	7,543	7,868	4.3
Second quintile	10.79	10.96	1.6	11,566	12,113	4.7
Middle quintile	16.69	16.68	-0.0	17,880	18,426	3.0
Fourth quintile	25.05	24.64	-1.7	26,846	27,218	1.4
Ninth decile	16.93	16.75	-1.1	36,281	36,998	2.0
Top decile	24.89	25.21	1.3	53,346	55,697	4.4
Total	100.00	100.00	0.0	21,430	22,094	3.1

Note: For non-self-employed population.

Table 10: Gini Coefficients

Family type	Gini coefficient 1983-84	Gini coefficient 1989-90
Person < 25	0.296	0.288
Person 25-64	0.317	0.315
Person 65+	0.217	0.237
Couple head 65+	0.241	0.262
Couple head < 65	0.281	0.278
Couple with dependents	0.224	0.226
Sole parent	0.303	0.285
All families	0.368	0.367

Note: For non-self-employed population.

disposable incomes that would have been received in 1989-90 had the designated factor been held constant at its (real) 1983-84 level. The mean income thus estimated is then compared with the base line simulation for 1989-90 shown in Table 6 to obtain the percentage changes shown in Table 11. The numbers shown in Table 11 are the percentage difference between the counterfactual and base line simulations for 1989-90.

Thus the first column indicates that the imposition of 1983-84 unemployment rates onto the 1989-90 simulation leads to a decrease in the incomes of all family types. This decrease is probably underestimated for two reasons. First, the counterfactual simulation for couples adjusts husbands unemployment rates back to the simulated 1983-84 unemployment levels, but leaves the distribution of wives employment status unchanged. Second, as was noted above the overall simulation of unemployment changes between the two years is probably underestimated by 10 to 15 per cent.

The counterfactual simulation shown in the first column of Table 11 implies an increase in male unemployment rates of 3.1 percentage points, but only 1.6 percentage points for females. This can be compared with the actual change between 1983-84 and 1989-90 of 3.6 and 3.4 percentage points respectively. Alternately, this can be compared with the significant increase in unemployment since 1989-90. By May 1991 (preliminary seasonally adjusted estimates), the unemployment rates for males and females respectively had risen by 4.0 and 2.3 percentage points from their 1989-90 level. Thus an alternative way of interpreting the income changes shown in the first column of the table is that they represent around three-quarters of the decrease in incomes associated with the rise in unemployment since 1989-90. This of course assumes that the pattern of unemployment rises across demographic groups mirrors that shown in the 1983-84 recession, but this is probably a reasonable first approximation.

Table 11: Percentage Increase in Mean 1989-90 Incomes Due to Different Counterfactual Simulations

Family type	Factor Held at (Real) 1983-84 Value								(Residual)
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/part-time rate	Pension/Benefit/allowance rates	Wage rates	Interest/dividends/self-employed	Income taxation	Everything	
Person <25	-5.0	0.0	-4.6	-0.1	1.4	0.2	-1.1	-3.8	0.4
Person 25-64	-2.3	0.0	-2.0	-0.3	0.1	-0.7	-1.0	-3.6	0.2
Person 65+	-0.1	0.0	0.1	-0.7	0.1	-4.2	-0.2	-5.3	-0.5
Couple head 65+	-0.2	0.1	-0.2	-0.3	0.4	-5.1	-0.1	-5.7	-0.4
Couple head<65	-1.0	-2.5	-3.4	-0.0	2.2	-0.3	-0.9	-2.2	0.2
Couple with dependants	-0.7	-3.4	-4.4	-1.1	2.0	0.2	-0.5	-2.8	1.1
Sole parent	-2.0	0.0	-7.1	-5.4	0.4	-0.4	0.2	-11.0	1.0
All families	-1.4	-1.9	-3.5	-0.7	1.5	-0.6	-0.7	-2.7	1.2
(Non-self-employed)									
Person <25	-5.0	0.0	-4.6	-0.1	1.5	-0.4	-1.1	-4.4	0.4
Person 25-64	-2.5	0.0	-2.3	-0.3	0.1	-1.3	-0.8	-4.3	0.3
Person 65+	-0.0	0.0	0.1	-0.7	0.1	-4.7	-0.1	-5.7	-0.4
Couple head 65+	0.0	0.1	0.1	-0.3	0.4	-6.2	-0.1	-6.4	-0.3
Couple head<65	-1.3	-2.7	-3.8	-0.0	2.4	-2.1	-0.9	-3.9	0.4
Couple with dependants	-1.0	-3.8	-5.1	-1.0	2.2	-0.8	-0.4	-3.7	1.4
Sole parent	-2.1	0.0	-7.2	-5.8	0.4	-0.5	0.3	-11.5	1.2
All families	-1.7	-1.4	-3.1	-0.7	1.6	-1.7	-0.6	-3.0	1.5

Notes: The counterfactual for the income variables is that they have increased in line with prices (the CPI for wages, CPI ex-health for pensions). Taxes are the 1983-84 scale with the thresholds inflated by the CPI. 'Everything' is the overall simulation for 1983-84 (inflated to 1989-90 dollars).

Turning to the remainder of Table 11, the 'everything' column reflects the overall 1983-84 simulation described in the previous section, whilst the 'residual' reflects those changes which the overall simulation incorporated, but are not separately specified in the table (this also incorporates demographic changes and the interactions between the different variables).¹⁶ For the 'everything' counterfactual simulation, the percentage change in incomes is identical to that given in Table 6, except that the signs are reversed, and the percentage change is calculated with the 1989-90 rather than the 1983-84 estimate as the denominator.

Overall, a move back to 1983-84 conditions in 1989-90 would decrease average family incomes by 2.7 per cent (3.0% for the non self-employed). Unemployment increases would contribute 1.4 percentage points, falls in married women's labour force participation, 1.9 percentage points, and the combined effect of labour market status changes, 3.5 percentage points. Offsetting these changes would be the higher level of real wages in 1983-84. For both income transfers and income taxation, a return to 1983-84 (real) values would lead to a small fall in incomes. Finally the sum of these individual changes over-explain the total fall in incomes by 1.2 percentage points (the residual). That is, demographic changes and the interactions between these variables led to a small decrease in average family incomes over the period.

The relative importance of the factors identified varies considerably across the different family types. For non-aged single persons, changes in unemployment rates were the main factor increasing their incomes over the period. For the aged, the most significant factor was their increase in income from savings and investments. As was noted in Section 2, interest income in particular grew rapidly over the 1980s. In the aggregate, this had a much larger effect on the incomes of the aged than the slight increases in real pensions over the period.

For couples, the most important influences on incomes over the period were increasing wives' participation and falling wage rates, whilst for sole parents, both labour force and income support changes were very important.

Poverty Rates

Tables 12 and 13 show the impact of these same counterfactual simulations on poverty rates. In the first of these tables, counterfactual poverty rates are calculated

16 The residual column is calculated as,

$$100 \left[(1+f_e/100) / \prod_i (1+f_i/100) \right]$$

where f_e is the 'everything' percentage change shown in Table 11, and the f_i terms are the specific counterfactual changes shown in the table (not including the unemployment and participation estimates which are included in the combined labour force change estimate).

assuming the 1989-90 poverty line to be unchanged.¹⁷ This is what would occur if 'absolute' poverty lines, adjusted on the basis of price changes, were used.

Estimating counterfactual relative poverty rates, is however, more complicated. This is because the relative poverty line is itself a function of overall mean incomes. These will also be altered by the counterfactual simulation. The estimates in Table 13 take these changes into account. For example, Table 11 shows that a return to 1983-84 unemployment rates would lead to average incomes falling by 1.4 per cent. Hence the relative poverty line also needs to be lowered by this amount.

For the most part, poverty calculations based upon relative poverty lines will be less sensitive to changes in incomes than those based upon absolute poverty lines. This applies for both income increases and decreases. Hence the changes in poverty due to the counterfactual simulations are generally lower in Table 13 than 12. The reason they are not always lower is because the base 1989-90 relative poverty line is quite different to the base absolute poverty line (Table 7) and so they are not always comparing the same part of the income distribution.¹⁸

In general, however, the conclusions provided by the two different poverty line definitions are similar. Because the results are somewhat easier to interpret, discussion here focuses more closely upon the absolute poverty results (Table 12). Overall, a return to 1983-84 unemployment rates, *ceteris paribus*, would lead to increases in the poverty rate by 0.3 to 1.6 percentage points. The higher increase in poverty rates with the higher poverty thresholds, is a reflection of the fact that much unemployment is part rather than full-year, with a significant proportion of the unemployed likely to have some work during a twelve month period even when unemployment rates are high. In other words, higher unemployment rates tend to move many people down to a 'near poor' annual income level.¹⁹

As was noted above, for several reasons these estimates are probably underestimates of the change in incomes that would be associated with a return to 1983-84 unemployment levels. To adjust for the underestimation of unemployment changes, these estimates of percentage point changes should probably be around 15 to 25 per cent higher than that shown in Table 12. Similarly, to use these results to provide

17 For example, the 'everything' column uses the overall 1983-84 simulation with incomes inflated by price changes to 1989-90 levels. These are then compared with the 1989-90 absolute poverty lines.

18 Another reason why the relative poverty estimate might be more variable than an absolute estimate is if the incomes of people near the poverty line change in a direction **opposite** to that of mean incomes.

19 In fact the patterns of unemployment duration are largely constrained to follow those apparent in 1985-86. However we believe that the re-weighting process does at least approximately reflect the changing distribution of unemployment experience with different unemployment rates. See Bradbury (1990a) for a more detailed discussion of these duration patterns, and the re-weighting method used.

Table 12: Percentage Point Increase in 1989-90 Absolute Poverty Rates Under Different Counterfactual Simulations

Income relative to Henderson Poverty Line	Factor Held at (Real) 1983-84 Value							
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/ part-time rate	Pension/ Benefit/ allowance rates	Wage rates	Interest/ dividends/ self-employed	Income taxation	Everything
Person <25								
Below 80%	1.1	0.0	1.0	-0.2	-0.6	0.0	-0.1	0.4
Below 100%	1.8	0.0	1.5	-0.3	-0.8	0.2	-0.2	0.4
Below 120%	2.8	0.0	2.4	0.1	-1.6	0.2	-0.9	0.2
Below 140%	3.8	0.0	3.4	0.4	-1.8	0.3	-0.8	1.1
Person 25-64								
Below 80%	0.1	0.0	0.1	0.1	-0.1	0.2	0.0	0.2
Below 100%	0.3	0.0	0.2	1.5	-0.3	0.6	-0.4	1.7
Below 120%	1.0	0.0	0.8	0.8	-0.5	1.0	-0.5	1.5
Below 140%	1.6	0.0	1.4	0.9	-0.8	0.6	-0.0	1.9
Person 65+								
Below 80%	0.0	0.0	-0.0	0.0	0.0	0.2	0.0	0.2
Below 100%	-0.0	0.0	-0.3	2.1	-0.1	1.9	0.0	2.7
Below 120%	0.0	0.0	-0.8	0.9	0.0	4.2	0.0	3.9
Below 140%	0.0	0.0	-0.5	0.6	0.0	2.6	-0.6	2.2
Couple head 65+								
Below 80%	-0.1	-0.0	-0.1	0.0	-0.2	0.2	0.0	-0.1
Below 100%	-0.1	-0.0	-0.1	0.0	0.0	0.5	0.0	0.5
Below 120%	-0.1	-0.0	-0.1	2.7	0.0	2.4	0.0	5.1
Below 140%	-0.1	-0.1	-0.1	0.6	0.0	6.2	-0.2	6.2
Couple head <65								
Below 80%	0.0	0.1	0.1	0.1	-0.1	0.3	0.0	0.3
Below 100%	0.1	0.0	0.2	0.0	-0.0	0.6	0.0	0.4
Below 120%	0.5	-0.0	0.5	0.1	-0.4	0.9	-0.3	0.7
Below 140%	1.1	0.1	1.1	0.0	-1.0	0.9	-0.1	0.8

Table 12: Percentage Point Increase in 1989-90 Absolute Poverty Rates Under Different Counterfactual Simulations (Continued)

Income relative to Henderson Poverty Line	Factor Held at (Real) 1983-84 Value							
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/part-time rate	Pension/Benefit/allowance rates	Wage rates	Interest/dividends/self-employed	Income taxation	Everything
Couple with dependants								
Below 80%	0.5	-0.1	0.4	0.7	-0.0	0.1	-0.0	0.8
Below 100%	0.9	0.1	1.1	1.2	-0.4	0.1	-0.1	2.0
Below 120%	1.5	0.6	2.0	2.9	-0.8	0.2	-0.1	3.0
Below 140%	1.4	2.0	3.6	1.2	-1.8	0.4	-0.5	0.5
Sole parent								
Below 80%	0.8	0.0	1.9	9.3	-0.4	0.2	0.0	9.6
Below 100%	1.3	0.0	4.4	10.5	0.0	0.0	0.0	13.4
Below 120%	1.6	0.0	6.0	6.0	-0.6	0.7	-0.3	11.3
Below 140%	1.9	0.0	6.5	2.9	-0.9	0.0	0.0	8.3
All families								
Below 80%	0.4	-0.0	0.4	0.6	-0.2	0.2	-0.0	0.7
Below 100%	0.7	-0.1	0.7	1.2	-0.3	0.5	-0.1	1.7
Below 120%	1.2	0.0	1.2	1.4	-0.7	1.1	-0.4	2.1
Below 140%	1.6	0.4	2.1	0.8	-1.1	1.2	-0.4	1.5
Child poverty (all families)								
Below 80%	0.9	-0.2	0.8	2.2	-0.1	0.1	-0.1	1.9
Below 100%	1.3	-0.1	1.7	3.2	-0.5	0.1	-0.1	3.8
Below 120%	1.9	0.3	2.8	4.4	-0.9	0.4	-0.1	4.3
Below 140%	1.7	1.8	4.4	1.6	-1.6	0.4	-0.6	0.5

Notes: The counterfactual for the income variables is that they have increased in line with prices (the CPI for wages, CPI ex-health for pensions). Taxes are the 1983-84 scale with the thresholds inflated by the CPI. 'Everything' is simply the overall simulation for 1983-84 (inflated to 1989-90 dollars). For non-self-employed population only.

Table 13: Percentage Point Increase in 1989-90 Relative Poverty Rates Under Different Counterfactual Simulations

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Income relative to Henderson Poverty Line	Factor Held at (Real) 1983-84 Value							
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/ part-time rate	Pension/ Benefit/ allowance rates	Wage rates	Interest/ dividends/ self-employed	Income taxation	Everything
Person <25								
Below 80%	1.0	-0.2	0.6	-0.2	-0.3	0.1	-0.1	0.1
Below 100%	1.7	-0.1	1.0	0.0	-0.4	0.1	-0.4	0.0
Below 120%	2.3	-0.8	1.3	-0.2	-0.7	0.2	-1.3	-0.7
Below 140%	3.1	-1.0	1.6	-0.1	-0.5	0.0	-1.1	-0.3
Person 25-64								
Below 80%	0.0	-0.2	-0.1	0.3	0.1	0.1	0.0	0.0
Below 100%	-0.8	-1.8	-2.7	0.8	0.6	0.5	-0.8	-0.1
Below 120%	0.4	-0.6	-0.4	0.6	-0.2	0.7	-0.7	0.9
Below 140%	0.8	-1.0	-0.1	0.6	-0.3	0.3	-0.5	0.8
Person 65+								
Below 80%	-0.3	-0.3	-0.3	0.1	0.3	0.0	-0.1	-0.1
Below 100%	-5.1	-6.8	-12.0	0.7	3.4	-0.6	-4.1	-4.0
Below 120%	-1.4	-1.7	-3.4	0.5	2.1	4.0	-1.0	2.1
Below 140%	-1.2	-1.5	-3.2	0.1	0.7	2.5	-0.8	0.7
Couple head 65+								
Below 80%	-0.1	-0.0	-0.1	0.0	-0.0	0.2	0.0	-0.1
Below 100%	-0.2	-0.1	-0.2	0.0	0.3	0.5	0.0	0.4
Below 120%	-2.9	-5.1	-8.7	0.1	1.7	1.7	-1.7	0.0
Below 140%	-0.7	-1.9	-4.1	0.2	2.5	6.9	-0.7	4.4
Couple head <65								
Below 80%	0.0	0.1	0.1	0.1	-0.0	0.3	0.0	0.3
Below 100%	0.0	-0.0	0.1	0.0	0.1	0.5	-0.1	0.3
Below 120%	-0.3	-1.1	-2.0	-0.2	-0.5	0.4	-0.9	-0.5
Below 140%	0.8	-0.3	-0.1	-0.1	0.0	1.4	-0.1	0.2

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Table 13: Percentage Point Increase in 1989-90 Relative Poverty Rates Under Different Counterfactual Simulations (Continued)

Income relative to Henderson Poverty Line	Factor Held at (Real) 1983-84 Value							
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/part-time rate	Pension/Benefit/allowance rates	Wage rates	Interest/dividends/self-employed	Income taxation	Everything
Couple with dependants								
Below 80%	0.4	-0.3	0.1	0.6	-0.1	0.0	-0.1	0.5
Below 100%	0.7	-0.3	0.4	1.3	-0.1	0.1	-0.3	1.6
Below 120%	0.8	-0.5	0.1	2.4	-0.3	-0.0	-0.7	1.5
Below 140%	0.6	0.6	1.1	0.9	-0.2	0.2	-0.9	-1.4
Sole parent								
Below 80%	-0.3	-1.3	-1.1	8.6	1.2	-1.0	-1.0	8.3
Below 100%	-0.5	-2.8	0.3	8.5	0.5	-0.9	-1.2	10.6
Below 120%	0.9	-1.0	4.4	5.4	0.6	0.3	-0.4	10.3
Below 140%	1.0	-0.9	5.2	2.3	-0.3	-0.3	-0.0	7.4
All families								
Below 80%	0.3	-0.2	0.0	0.5	0.0	0.1	-0.1	0.5
Below 100%	-0.2	-1.3	-1.5	0.9	0.4	0.2	-0.8	0.4
Below 120%	0.3	-1.3	-1.1	0.8	0.1	0.8	-0.9	0.7
Below 140%	0.9	-0.7	-0.0	0.4	0.1	1.1	-0.7	0.1

Note: For non-self-employed population only.

estimates of the likely increase in poverty with the current recession, one would need to add around one third to these estimates.

These modifications apply to the absolute poverty estimates only. Because unemployment changes also alter the poverty line, the adjustments required for the relative poverty estimates would be more complicated, though generally less than those for the absolute poverty line.

For the different family types shown in Table 12, there are significant variations in the impact of unemployment rates returning to something like their 1983-84 level. The largest impact is for the young singles, for whom the model simulates a 7.0 percentage point increase in unemployment rates, with a maximum poverty increase of 3.8 percentage points. For the other non-aged family types, the simulated increases in unemployment are as follows: persons aged 25-64, 3.1 percentage points; non-aged couples, 1.2 percentage points (2.2 for husbands); couples with dependants, 1.2 percentage points (2.0 for husbands) and sole parents, 5.2 percentage points.

Note that for single persons, the maximum percentage point increase in poverty is around half the percentage point change in unemployment rates. This relatively loose association between unemployment and poverty reflects three factors. First, not all people are in the labour force, and so a given percentage point change in unemployment rate represents a smaller change in the percentage of the population unemployed. Second, unemployment does not necessarily lead to annual income poverty as many of the unemployed will have some work over a twelve month period. In 1989-90, for example, of those income units with head more than half year unemployed, we calculate that only two-thirds were below the 140 per cent absolute poverty line. Finally, some persons predominantly employed during the year are still below the poverty line. In 1989-90, nine per cent of income units with head predominantly full-time employed were below the 140 per cent line. This comprised almost half of those income units with head in the labour force who were below this poverty line (even using the 80% line 30% are predominantly full-time employed). Some of these income units may be low-wage earning youth, and others may have many dependants (also the poverty line is higher for families with employed members to take account of the costs of working). However further identification of these low income employed is an important question for further research.

As was noted above with respect to average incomes, the results of this counterfactual simulation can also be used to provide an indication of the impact of the current high unemployment rates. The rise in unemployment has been higher than that simulated in Table 12, and so as for average incomes, these estimates of poverty change due to unemployment rates should be inflated by around a third. Whilst this can still be only an approximate estimate of likely poverty rates they are the best we are likely to have for some time.

Making this adjustment would suggest that the current recession would see (absolute) poverty levels of between 0.5 and 2.1 percentage points higher than in

1989-90, depending upon the poverty threshold chosen. This corresponds to an increase of between 33,000 and 137,000 in the number of (non-self-employed) families in poverty. Given that the 140 per cent threshold is still a very low income level, we would argue that the higher estimate is more appropriate as a measure of the impact of the recession. Note however, that even this high estimate is greater than the increase in the number of unemployed between 1989-90 and May 1991. Over this period the number of unemployed has increased by 289,000, and the unemployment rate by 3.2 percentage points. Again this is around twice the increase in the number of families in poverty.

In terms of child poverty a similar calculation implies an increase of about 1.2 to 2.5 percentage points in the percentage of children below the poverty line. This corresponds to an increase of between 40,000 and 84,000 children in poverty as a result of increasing unemployment rates. Note that during the 1983 recession, labour force participation rates of sole parents also fell dramatically. If this were to occur with the current recession, this would lead to up to another 20,000 children in families with below poverty line incomes.

Whilst the increase in married women's participation rates over the period had a comparable effect on aggregate incomes as the decrease in unemployment (Table 11), its impact upon poverty rates was significantly lower. This is because the growth in participation rates was primarily among families where the husband was in employment (and hence already above the poverty line). It is interesting to note, however, that for couples with dependants, the increase in married women's participation did have a significant impact upon incomes near the 140 per cent threshold. Without the increase in participation rates for this group, the absolute (140%) 1989-90 poverty rate of 21.3 per cent (Table 7) would have been 2.0 percentage points higher.

As might be expected, given the increases in most pension and benefit payment rates, a return to 1983-84 rates of payments would generally lead to an increase in poverty. The only exception to this is for youth, for whom the introduction of Job Search Allowance instead of Unemployment Benefit has generally led to reduced levels of income support.

It is also interesting to note how the effect of real increases in payments is generally only significant for one of the four poverty lines shown. Thus the effect of pension increases for the single aged is concentrated around the standard poverty line, whilst that for couples has most impact to the 120 per cent poverty rate. This is simply a result of the clustering of pension incomes around the base payment rate, but does imply caution when considering changes in poverty rates based upon a single poverty threshold.

The most significant impact of changing rates of payment has been for sole parents. At the Henderson poverty line, the family package increases over the period led to a 10.5 percentage point decrease in the poverty rate. This decrease, of course, was from an exceedingly high base, and the larger change in poverty rates for sole parents than for couples with children, simply reflects the fact that a larger

proportion of sole parents were income support recipients. In fact, because there are many more couples than sole parents, the 2.9 percentage point change in poverty incidence (at the 120% level) for couples with dependants actually represents more families than does the 10.5 point change in poverty rates for sole parents (43,000 versus 29,000).

Compared to the other changes described, the impact of wage rates on poverty rates is generally very small, with the only changes above one percentage point being for young people (low wage rates mean that some will be below the poverty line when employed), and for couples with dependants (large family size may imply poverty line incomes for those employed).

Similarly, changes in taxation rates have had little impact on either relative or absolute poverty rates. This reflects both the fact that the aggregate real changes in taxation have been small (Table 11) and that most changes affect those families with incomes above poverty line levels. What changes there are have generally been to slightly increase poverty rates (i.e. poverty rates would be lower under 1983-84 tax scales).

Income Distribution

Just as for poverty rates, one can also decompose the changes in income inequality between 1983-84 and 1989-90. This is done in Table 14 which shows the per cent increase in 1989-90 income shares of different income quantiles, under different counterfactual assumptions. A return to 1983-84 unemployment levels would in general lead to increased income inequality among working age families, though for some groups such as single people aged 25 to 64, and sole parents, the bottom of the income distribution contains many people not in the labour force - who would be relatively unaffected. For (non-self-employed) couples with dependants, the bottom decile would lose almost 5 per cent of its income share were 1983-84 unemployment levels to return, whilst for young single people, the loss would be 7.4 per cent. As noted above, these estimates of change due to unemployment are probably underestimates, though it is more difficult to estimate the magnitude of this effect on income shares.

A return to lower levels of married women's participation would tend to reduce the income shares of the middle of the income distribution, whilst increasing that of both extremes. There are basically two reasons why this participation increase has had most impact upon the middle of the (married couple) income distribution. The first is simply that the top income deciles were predominantly two earner couples in 1983-84, and so increases in participation would have little impact. Secondly, and perhaps of more policy relevance, the increase in married women's participation was primarily in families where the husband was already employed. Participation rates

Table 14: Per Cent Increase in 1989-90 Income Shares Under Different Counterfactual Simulations

	Factor Held at (Real) 1983-84 Value							
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/ part-time rate	Pension/ Benefit/ allowance rates	Wage rates	Interest/ dividends/ self-employed	Income taxation	Everything
Person <25								
Bottom Decile	-7.4	0.0	-6.2	1.7	4.5	-0.7	1.1	-2.8
Second Decile	-6.6	0.0	-6.3	-0.2	1.5	-0.3	2.9	-3.5
Second Quintile	-5.9	0.0	-5.5	-0.3	1.7	0.0	3.0	-2.0
Middle Quintile	-2.1	0.0	-1.8	-0.1	0.7	0.2	-0.6	-0.9
Fourth Quintile	1.7	0.0	1.6	0.1	0.4	0.1	-2.2	0.2
Ninth Decile	3.2	0.0	2.9	0.1	-1.0	-0.0	-0.8	1.4
Top Decile	3.8	0.0	3.5	0.1	-2.4	-0.3	1.1	2.1
Person 25-64								
Bottom Decile	0.0	0.0	-0.3	-3.2	1.1	-0.2	2.1	-2.3
Second Decile	0.6	0.0	0.3	-1.5	0.3	0.6	1.7	0.8
Second Quintile	-6.1	0.0	-6.2	-0.6	2.8	-0.9	0.3	-4.8
Middle Quintile	-1.2	0.0	-0.9	0.2	1.5	0.6	-1.6	0.5
Fourth Quintile	1.1	0.0	1.2	0.3	-0.6	0.4	1.1	2.8
Ninth Decile	1.8	0.0	1.7	0.3	-1.5	0.5	0.7	2.6
Top Decile	1.8	0.0	1.5	0.3	-1.4	-1.0	-1.0	-2.9
Person 65+								
Bottom Decile	0.0	0.0	-0.2	-0.9	-0.1	3.7	0.2	2.7
Second Decile	0.0	0.0	-0.1	-0.5	-0.1	4.5	0.1	4.2
Second Quintile	0.0	0.0	-0.1	-0.4	-0.1	4.4	0.1	4.3
Middle Quintile	0.0	0.0	-0.1	-0.4	-0.1	2.6	0.1	2.5
Fourth Quintile	0.0	0.0	0.0	0.1	-0.1	0.3	1.0	0.8
Ninth Decile	-0.0	0.0	-0.1	0.2	-0.0	-1.9	-0.6	-2.4
Top Decile	-0.0	0.0	0.2	0.6	0.2	-5.7	-0.7	-5.4

Table 14: Per Cent Increase in 1989-90 Income Shares Under Different Counterfactual Simulations
(Continued)

Factor Held at (Real) 1983-84 Value								
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/ part-time rate	Pension/ Benefit/ allowance rates	Wage rates	Interest/ dividends/ self-employed	Income taxation	Everything
Couple head 65+								
Bottom Decile	0.3	0.2	0.5	-0.3	0.6	3.2	0.1	4.3
Second Decile	0.0	-0.1	-0.0	-0.3	-0.4	5.7	0.2	5.4
Second Quintile	-0.0	-0.1	-0.1	-0.3	-0.4	4.7	0.2	4.4
Middle Quintile	0.0	-0.1	-0.0	-0.2	-0.3	1.9	0.4	1.8
Fourth Quintile	0.2	-0.0	0.1	0.0	0.1	-0.5	0.5	0.5
Ninth Decile	0.7	-0.3	0.3	0.2	0.1	-1.7	0.1	-0.6
Top Decile	-0.5	0.3	-0.3	0.3	0.4	-4.7	0.8	-5.9
Couple head <65								
Bottom Decile	-0.5	2.6	1.8	-0.5	-1.3	-0.9	1.7	0.3
Second Decile	-2.5	2.6	0.2	-0.3	-0.5	-2.2	1.1	-1.9
Second Quintile	-1.5	-0.9	-2.1	-0.0	0.2	-0.5	0.9	-0.8
Middle Quintile	-0.3	-3.1	-3.3	0.0	0.4	0.1	0.1	-2.0
Fourth Quintile	0.6	-0.7	-0.1	0.0	-0.0	0.7	0.0	1.3
Ninth Decile	0.8	0.4	1.1	0.0	-0.2	1.2	0.6	3.1
Top Decile	0.6	3.0	3.4	0.0	-0.0	-0.7	-1.7	-0.8
Couple with dependants								
Bottom Decile	-4.8	4.0	0.1	-5.4	-0.1	0.2	0.7	-5.6
Second Decile	-2.6	1.5	-0.3	-2.6	0.2	0.2	0.5	-1.8
Second Quintile	-0.4	-0.3	-0.6	-0.6	-0.5	0.4	1.2	1.1
Middle Quintile	0.4	-0.5	-0.2	0.1	-0.3	0.4	0.7	1.5
Fourth Quintile	0.6	-0.7	-0.4	0.3	0.2	0.2	0.2	1.6
Ninth Decile	0.7	0.0	0.6	0.6	0.4	0.1	-0.0	2.4
Top Decile	0.6	0.2	0.7	1.6	0.1	-1.2	-2.2	-3.9

Table 14: Per Cent Increase in 1989-90 Income Shares Under Different Counterfactual Simulations
(Continued)

Factor Held at (Real) 1983-84 Value								
	Unemployment	Married women's labour force participation	Unemployment, participation + full-time/ part-time rate	Pension/ Benefit/ allowance rates	Wage rates	Interest/ dividends/ self-employed	Income taxation	Everything
Sole parent								
Bottom Decile	2.4	0.0	0.4	-4.9	-0.1	0.0	-0.3	-6.3
Second Decile	1.7	0.0	3.2	-8.0	-0.2	0.1	-0.3	-2.8
Second Quintile	0.8	0.0	2.8	-5.0	0.5	0.3	-0.2	-1.4
Middle Quintile	-0.1	0.0	-0.6	-3.8	1.1	-0.1	-0.0	-2.4
Fourth Quintile	-1.7	0.0	-5.2	0.3	0.6	-0.0	-0.6	-6.1
Ninth Decile	-0.2	0.0	0.9	4.8	-0.8	-0.4	0.7	3.9
Top Decile	0.9	0.0	3.0	5.0	-1.2	0.2	0.4	8.5
All families								
Bottom Decile	-4.0	2.0	-1.8	-1.4	-0.1	0.6	1.3	-3.5
Second Decile	-1.7	1.9	0.1	-1.2	-0.5	0.1	1.5	-1.2
Second Quintile	-2.4	2.2	-0.4	-0.9	-0.1	-0.3	0.1	-1.6
Middle Quintile	-1.1	1.8	0.9	-0.3	-0.3	-0.1	-0.5	0.0
Fourth Quintile	0.4	-0.7	-0.1	-0.0	-0.6	0.3	0.9	1.7
Ninth Decile	1.1	-2.0	-1.0	0.2	0.5	0.3	0.3	1.1
Top Decile	1.2	-0.6	0.5	0.7	0.6	-0.4	-1.1	-1.3

Notes: As for Table 13.

for women whose husband was unemployed or not in the labour force hardly grew over the period (Bradbury, 1990a).²⁰

Since the real value of most pensions and benefits increased over the period (albeit only slightly in some cases), a return to 1983-84 levels would lead to a decrease in the income shares of the lower income deciles. The only exception to this is for young single people, where the bottom decile had a higher level of income in 1983-84. The reduction in income share since then reflects the lower rates of payment for unemployed youth in 1989-90 (see Table 3).

Interestingly, this bottom decile also contained a significant number of wage earners, as is evidenced by the fact that a return to 1983-84 wage rates would have led to an increase in the income share of the bottom decile. This is because of the significant increase over the period in wage inequality among single males. Data from the WEED survey (which was used to update wages) indicates that between 1983 and 1989, the 90th percentile wages of single males grew eight per cent faster than the 10th percentile.

As was noted in the previous section, income inequality amongst the aged was significantly boosted by the rise in capital incomes over the 1980s. A return to 1983-84 rates of return would lead to a significant fall in the income share of the top deciles, and a corresponding increase for lower deciles.²¹

Finally, the impact of changes to the income tax scales on income inequality have been mixed, with patterns varying across family types. The trend for the highest decile to lose with a return to the 1983-84 tax scale is evident overall and in most family types. This is a result of the cut in the top marginal tax rate to 48 per cent. It should be noted however that only the changes to the tax rate scale have been modelled. Other base-broadening measures (in particular the capital gains tax), probably had a progressive impact on the distribution of the income tax burden.

6 Summary and Conclusions

The goal of this paper has been to describe the changes in the various components of family incomes over the period 1983-84 to 1989-90. Of the many economic and policy developments of this period, the most important were:

- significant falls in unemployment rates, accompanied by even more dramatic increases in married women's labour force participation;

20 Whether these changes in income distribution were matched by equal changes in welfare, is more difficult to answer however, and depends fundamentally upon the reasons for the increase in participation.

21 Note that the increase is lower for the bottom decile than for the second decile. This probably reflect the presence of some people excluded from the aged pension by the assets test and with low (measured) incomes from investments.

- falls in real wage rates;
- increases in some (particularly child related) income support payments, accompanied by reduced coverage and tighter administration of other payments;
- increases in the share of national income accruing to capital, and consequent increases in investment and interest incomes; and
- a flattening of the income tax scale, accompanied by a broadening of the tax base (e.g. via the capital gains and fringe benefit taxes).

In this paper, microsimulation methods have been used to describe both the combined and separate impacts of (most of) these changes on family incomes between 1983-84 and 1989-90. Whilst the simulations are of necessity limited in scope, and certainly do not provide the same data that actual income surveys conducted in these two years could provide, they do permit comparisons which are both timely and capable of being decomposed.

The main conclusions of the comparison of these two years are:

- Overall, we estimate a small increase in average real family disposable incomes over the period (around 3%). This, it should be noted, is significantly less than the growth in the national account estimates of household disposable income per capita. The main reasons for this divergence are: the wider scope of the national accounts measure; our use of a per-family rather than per-person index; an underestimate of employment changes; and a possible underestimation of wage growth (Table 6).
- Using a range of poverty lines, absolute poverty is estimated to have fallen by between 0.7 and 2.1 percentage points, and relative poverty to have fallen by between 0.1 and 0.7 percentage points. Absolute child poverty rates fell by between 0.5 to 4.3 percentage points. Across family types, the fall in the poverty rate was greatest for sole parent families (Tables 6 and 7).
- Although the simulation method used is not ideal for looking at the income of the very top of the income distribution, some broad trends are apparent. Across all families both the bottom and top of the income distribution increased their income share at the expense of middle income families. This was particularly marked for couples with dependants, where the top and bottom deciles increased their shares by four and six per cent respectively. All income deciles, however, experienced an increase in average incomes (Table 9).

When the sources of these income changes are disaggregated, the patterns which emerge vary significantly across the different family types.

- The aged benefited from some small increases in pension rates, but much more important was the increase in investment and interest income. This led to a
-

large increase in income inequality among the aged, with Gini coefficients increasing by about nine per cent (Tables 10 and 11).

- For single people aged under 65, the most important influence on aggregate incomes between 1983-84 and 1989-90 was the fall in unemployment. This was particularly important for those aged under 25. As might be expected, this unemployment fall led to a reduction in poverty - with the reduction greatest for the higher poverty lines. For people aged under 25, a simulated unemployment rate decrease of 7.0 percentage points (between the two years), is estimated to lead to a 3.8 percentage point decrease in the poverty rate (at the 140% poverty line). The percentage point change in poverty is less than the change in unemployment because some people are not in the work force, because many part-year unemployed will still have an annual income sufficient to place them above the poverty line, and because a significant proportion of full-time employed are below the poverty line. Offsetting the fall in unemployment rates were falls in real wages and income support payments for the younger unemployed (Tables 11 and 12).
- For (non-aged) married couples the two most important influences upon average incomes were the increase in married women's labour force participation, and the fall in real wage rates. The main influences upon poverty rates, however, were the falls in unemployment and the increases in income support payments for low income families. (However the wage and participation rates do have an impact on the number of families with dependants in poverty using the highest poverty threshold). If income support payments for couples with children had remained at their real 1983-84 level, (absolute) poverty rates in 1989-90 may have been up to 2.9 percentage points higher (Tables 11 and 12).
- If married women's participation rates had not increased, the main 'losers' would have been middle income families, as there was little participation increase among women with husbands not employed, and upper income families were generally two earner families in both years. Whether welfare gains and losses will mirror these income trends, is however, a much more complicated question and outside the scope of this present paper (Table 14).
- For sole parents, the main influences on both average incomes and poverty rates were the significant increases in employment and income support payments over the period. Without the increases in income support payment rates over the period, poverty rates for sole parents in 1989-90 could have been up to 10.5 percentage points higher. Nonetheless, poverty rates for sole parents were still at a very high level in 1989-90 (Tables 11, 12 and 7).²²

²² Note that these estimates include neither the increases in maintenance income associated with the child support scheme, nor the reduced sole parent pension child qualifying age.

- Both unemployment falls and income support increases led to child poverty rates falling significantly over the period (by up to 4.3 percentage points, or one-fifth of the 1983-84 poverty incidence). Because unemployment changes are underestimated in the simulation, this also will be a slight underestimate. Even when taking this into account, however, it is clear that increases in income support payments have generally been more important in reducing child poverty than was the fall in unemployment. It is only at the highest poverty threshold that unemployment falls are relatively more important (in which case they are offset by falls in real wages) (Tables 8 and 12).

As well as being used to describe the changes in family incomes over the 1980s, the results of these simulations can also be used to provide insights into the likely income trends in the current recession. Using the assumption that things will generally remain as they were in 1989-90, except that unemployment will return to a level slightly higher than the 1983-84 average, the following estimates are made:

- The main impact of rising unemployment will be on the proportion of families in 'near poverty', for which we might see a rise of up to 2.1 percentage points.
- This corresponds to an increase of around 140,000 families below the poverty line, or 84,000 children. If the participation rates of sole parents were to also fall as they did in the 1983 recession, this could lead to an additional 20,000 children living in families with incomes below the poverty line.

Note that these increases are much less than the additional numbers of people likely to become unemployed. This is partly because, like all the estimates in this paper, these are based on annual incomes. Many unemployed people will be likely to have at least some employment during the year - providing enough income to move them over the poverty lines used here (though still leaving them with a very low income). Similarly, some families will have wages sufficiently low, or needs sufficiently high, to place them under the poverty line even when they have employed members.

Appendix: Comparison with External Aggregates

One of the most difficult aspects of microsimulation analysis is the validation of results against independent data sources. Whilst there are usually many data sources describing concepts similar to those defined in the base data, inevitably there will be major differences in scope and coverage. Moreover, those data sources which are closest in definition will usually be used in the simulation itself, and so are not suitable for validation.

For the present analysis a range of comparisons with other aggregate ABS and Budget data have been carried out. Because of lack of comparability these cannot provide conclusive results. Nonetheless the more important conclusions are summarised here.

Whilst the original case weights in the 1986 IDS are defined so that aggregate population size is estimated reasonably accurately, the re-weighting method suffers from a number of limitations. Because it does not adjust for the falling family size of families with children, nor the 'greying' of the population, the numbers of children and the numbers of elderly persons are over- and underestimated in 1989-90 respectively. Whilst this has little impact upon results based upon averages or rates, it does make the process of validation against external aggregates more difficult.

One of the key goals of the simulation process was to reflect the major changes in unemployment and participation rates between 1983-84 and 1989-90. Comparison with Labour Force Survey (LFS) data suggests that both these changes may have been slightly underestimated in the simulation. For example, the simulation suggests a 3.0 percentage point drop in unemployment rates between 1983-84 and 1989-90, whereas the LFS suggests a drop of 3.4 percentage points. The increase in married women's participation is also underestimated by around 10 per cent.

Turning to income aggregates, there are number of important differences between the model's estimates and those of the National Accounts and other sources of aggregate income data which need to be borne in mind. The concept of real family disposable income used in this paper is estimated to have increased by 15.3 per cent between 1983-84 and 1989-90. The National Accounts concept of household disposable income, however, increased by 19.7 per cent. The total population grew by around 10 per cent.

Some of these differences reflect the different scopes of these two measures. For example, our estimates do not include employer contributions to superannuation, whilst in the National Accounts increases in these contributions have contributed around 1.8 percentage points of the 4.4 point difference in income growth.

However, there are also important differences in measures where the scope should correspond reasonably closely. For example, the growth in wage and salary income is underestimated by around 5 per cent. There are several explanations for this. First, as was noted above, the simulation underestimates the growth in employment. This is estimated to be responsible for at most 1.5 percentage points of this gap.

Second, because the self-employed are not distinguished in the re-weighting process, and because they tend not to experience unemployment, the decrease in the weights of the unemployed inappropriately increases the proportion of the working population who are self-employed (and hence not receiving wage income). This is estimated to explain about 1.25 percentage points.

For the remaining 2.25 point gap we have no definitive explanation. Though we use an alternative source of data to inflate wages (the WEED survey), our estimates for average wage growth correspond quite closely to those in the Average Weekly Earnings (AWE) survey. However the AWE multiplied by estimates of the number of employees also provides an underestimate of wage growth (compared to the National Accounts). One possibility is that this reflects wage or employment growth in the industry sectors (mainly agriculture) not covered by the employer based AWE surveys. But this should be reflected in the WEED data.

Another possibility is that we have failed to pick up a large growth in the wages of the top decile of the population (as anecdotal evidence might suggest). Though the WEED data has been used to take account of distributional changes in wages, any above average increase in incomes that occurred entirely within the top decile could not be modelled (because of limitations in the published WEED data). This growth, however, should be included in the AWE data.

Neither of these explanations, therefore, are entirely convincing as to why the simulated wages differ so much from the National Accounts averages over the period. As shall be seen below, there is some suggestion from the taxation statistics that a significant amount of high wage incomes have been omitted, but this conclusion must remain speculative.

For income support payments, the main limitation of the simulation method is that it does not adjust for some of the major coverage changes over the period. In quantitative terms, the most important coverage change was probably the introduction of the assets test for pensioners in March 1985. Also particularly important were the reductions in unemployment benefit coverage (relative to the number of persons unemployed). This involved both direct reductions in coverage, such as through the introduction of parental income tests and longer waiting periods for the young unemployed, as well as tighter administration of eligibility requirements. Because these changes were, on balance, in the direction of restricted coverage, the model estimates growth in pension/benefit/allowances income between 1983-84 and 1989-90 to be eight per cent higher than the corresponding increase in expenditures.

Comparing our figures with budget paper estimates, it appears that aggregate income tax is overestimated by 10 per cent in 1983-84 and underestimated by six per cent in 1989-90. In part this reflects the fact that the budget estimates refer to income tax **collections** whilst our estimates refer to **liabilities**. For example, the 1982-83 drought may have led to lower tax collections in 1983-84. It also reflects the fact that many features of the tax system, such as income averaging, have not been fully incorporated into the model.

The budget papers also provide an estimate of tax paid by PAYE income tax payers. Whilst the precise definition of this group is not clear, we would expect it to be reasonably close to the income tax liable on wage and salary income. We find this to be the case in 1983-84, but not in 1989-90, where the model apparently underestimates PAYE taxation by 11 per cent. This can be compared with the underestimation of wage growth by five per cent. Whilst the differences between tax liabilities and collections imply the need for caution in making this comparison, this is suggestive that the missing wage income may come from people with twice the average tax rate - i.e. very high income earners.

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Imputed Income and Income Distribution

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1 Introduction

In 1977 the United Nations (UN) issued a set of Provisional Guidelines on Statistics of Distribution of Income, Consumption and Accumulation of Households (UN, 1977). These guidelines recommended that imputed income from owner-occupied housing be included in the property income component of household income along with interest, dividends and rent receipts and that this, along with transfer and benefit income, be added to primary income to give the preferred measure of total household income. In a like manner, rental expenditure should also be imputed as an item of household consumption.

Questions surrounding the use of income as a measure of well-being and the choice of an appropriate measure of income are perhaps the most well established of all of the issues associated with income distribution analysis. However, as internationally comparable microdata sets have become more readily available, researchers have been able to experiment with the data collected. This has resulted in a shift in the focus of attention away from conceptual issues underlying the source data and towards methodological issues such as the appropriate choice of income unit, methods for adjusting for family size, or the choice of equivalence scale and the appropriate basis for ranking, all of which can be dealt with from within the confines set by existing unit record data. Cowell (1984) provides an overview of the earlier work. Buhmann et al. (1988) and O'Higgins et al. (1989) are illustrative of the more recent work.

The work currently being done on the appropriateness of income as a measure of well-being (Travers and Richardson, 1991), on the treatment of noncash income in the Luxembourg Income Study (Saunders, 1992) and the dynamic simulation work being undertaken on the lifetime distribution of income (Harding, 1992), however, is

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indicative of a return of interest to the issues which were at the focus of the earlier income distribution work.

This paper similarly returns to a focus on the implications of the underlying definition of income in income distribution studies and examines both the ways in which the UN recommendation to incorporate imputed income into income distribution statistics can be implemented and the impact of expanding the definition of household income in this way. It represents the first attempt to implement the fifteen year old UN recommendation in Australia.

The following section provides an overview of the approaches which have been proposed to impute rental income for owner-occupiers and outlines the approach used in the Australian National Accounts. This is based on the UN recommended approach and provides the benchmark approach used in this study. The third section provides an empirical assessment of the extent and distribution of net imputed rental income in Australia based on unit record data from the 1988/89 Household Expenditure Survey.

2 Imputing Housing Income

The most widespread inclusion of imputed rent into income statistics occurs in the National Accounts. The United Nations System of National Accounts (UN, 1968), first published in 1953 with the intent of providing a uniform basis for reporting national income statistics, defines a preferred approach:

The total of owner-occupied dwellings which is to be included in gross output should, in principle, be valued at the rent on the market of the same facilities. It may be necessary to approximate the market rent by an estimate which should cover items such as operating, maintenance and repair outlays, water charges, insurance service charges, taxes, depreciation and mortgage interest in addition to interest on the owners investment in the dwelling and other elements of net return. (UN, 1968)

When the issue of an equivalent system of distribution statistics was first placed on the agenda of the Statistical Commission in 1966 it was recommended that imputed income be included in a manner which was consistent with its inclusion in the National Accounts (UN, 1977). This recommendation has subsequently been adopted by the World Bank/ILO Income Distribution Statistics Project (van Ginneken, 1982).

In the first report of what was to be a series published every 3 or 4 years, the UN Compendium of Income Distribution Statistics (UN, 1985) provided income distribution data from 57 countries. Of these 57 countries, only 18 failed to incorporate some measure of imputed income for housing in the published data. Those countries who did not incorporate imputed income in this particular source of official income distribution statistics include most of the English speaking western

world (Australia, Canada, Ireland, New Zealand, UK and US) and, from the OECD countries (Japan and France).²

Despite an expressed desire to develop a system of income distribution statistics equivalent to the standardised approach employed for the development of National Accounts, attempts to incorporate imputed income in a manner consistent with its inclusion in the National Accounts have been constrained by the difficulties arising from the lack of suitable data on gross rents and have been affected by differences in the treatment of imputed income in the income tax systems which operate in the various countries. This section of the paper examines the approaches which have been used to imputed rental income in Australia both as a means of focusing on these difficulties and as a background to the approach taken in this study.

National Accounts Approach

In the Australian National Accounts gross operating surplus from the ownership of dwellings is derived from gross rent less operating expenses. The way in which gross rents are imputed from private sector rents suggests that the estimates embodied in the National Accounts are conservative. Yates (1991) provides a detailed analysis of the assessment of imputed rent in the National Accounts. Briefly, census data on rents paid in the private sector for unfurnished dwellings are used as a benchmark for imputing gross rents for owner-occupied dwellings. The level of disaggregation of the data employed is significant in terms of the physical characteristics of the dwelling but much of the benefit of this level of disaggregation is lost by the extent of aggregation in terms of the spatial characteristics of the dwelling. One indication of the distortions created by the level of aggregation employed is that, in the data used for the major urban areas in NSW, rent for a four bedroom medium density dwelling exceeded that for a four bedroom separate house. This arises because the highest proportions of rented medium density dwellings are in the inner and middle ring suburbs in the metropolitan areas; conversely, separate houses for rent are located disproportionately in the outer ring suburbs and in the non-metropolitan areas. Hence, it is quite feasible for the average rent paid for a four bedroom medium density dwelling to exceed that paid for a four bedroom house because of the location premium embodied in the former. Further downward biases are imposed by the failure of size and type classifications to distinguish quality.

Given the estimate of gross housing worth for owner-occupied housing from the 1988/89 Household Expenditure Survey (HES), the gross annual imputed rent recorded in the 1988/89 National Accounts represented a gross rental rate of return for housing of approximately five per cent per annum. However, rules of thumb

2 The former set of exclusions, combined with the cultural dominance of sources of information, may explain why there has not been much focus on this issue in the English language literature on income distribution. When combined with the OECD exclusions, it could also explain how this lack of focus has been extended to such cross-cultural attempts as that being undertaken by the Luxembourg Income Study, which has begun to recognise the potential importance of imputed income as a relevant and potentially significant force in affecting income distribution only in its most recent papers.

employed by real estate agents suggest this represents a lower bound for net, not gross, returns.³

This measure of gross imputed rent less operating costs for maintenance, repairs, rates and insurance yields gross operating surplus which is the income attributed to owner-occupied housing in the income-based measure of gross domestic production. Operating costs are excluded to avoid double counting although gross rent including operating costs is included in the expenditure-based measure. The measure of housing income embodied in the National Accounts at the aggregate level neither includes all housing income nor excludes all housing costs; it therefore does not have an intuitively obvious counterpart in micro-level data.

The measure of housing income embodied in the sectoral accounts, however, does have an intuitively obvious counterpart at the micro-level. At the household level, housing income is obtained by deducting both depreciation and interest costs as well as operating costs to obtain a measure of net income. This measure is designed to ensure consistent aggregation over all households and all sectors; deductions are excluded as intermediate transactions representing intra- or intersectoral transfers of income from the household sector to other households or to other sectors. Again estimates of gross imputed rent are included on the expenditure side of the Household Accounts.

In the measure of housing income at the household level, the inclusion of depreciation based on the capital component of housing creates some cause for concern in the absence of any consideration of potential appreciation arising from the land component of housing. This inconsistency has been compounded in the Australian accounts by a switch in 1985/86 from a historic cost estimate of depreciation to a current replacement cost estimate.⁴

Alternative Approaches

The above suggests that several difficulties arise in determining how imputed rent should be treated in income distribution statistics if it is to be in line with the

3 Evidence collected for the NSW Department of Housing suggests that gross rental rates of return on houses have averaged about 8 per cent over a 20 year period to 1990 (Dweczyk, 1990). Estimates undertaken by the Victorian Ministry of Housing and Construction (1990) suggest that net rental yields in Melbourne in 1990 on a metropolitan-wide basis averaged 5.9 per cent on houses and 5 per cent on units. The NSW calculations were seen as robust enough on which to price the recently released AMP package for the privatisation of NSW public housing. Both State based figures are consistent with attempts undertaken elsewhere to assess a rate of return on housing. EPAC (1988), for example, suggests that housing has exhibited an average after tax (real) net rate of return of between 5-6 per cent at the end of the 1980s.

4 This change had the effect of more than trebling the deduction for depreciation. Edey and Britten-Jones (1990) express concern at the use of any measure which is so sensitive to estimates of depreciation.

National Accounts measures. Difficulties arise because the aggregation constraint imposed by the National Accounts measures means that the treatment of housing income differs according to the level of aggregation and that not all measures have an obvious counterpart in microdata. At the household level of disaggregation, where there is an intuitively obvious counterpart to the National Accounts treatment, difficulties arise from the inclusion of gross rent on the expenditure side and net rent on the income side and from the asymmetric treatment of depreciation and capital gain.

In this paper, the treatment of imputed rent in line with the National Accounts approach to measuring housing income, is based on the measures incorporated on the income side of the accounts but both depreciation and capital gains are ignored. On these grounds, the measure of housing income to be included in income distribution statistics is equal to net rental income (equal to gross rental income less any associated operating and interest costs).

This approach is generally in line with the statutory approaches to defining imputed income in those countries where it is incorporated into the tax base for income tax purposes. Two recent OECD reports (OECD, 1990, 1988) give specific illustrations of the way in which rental income and deductions are assessed in some of those countries which include imputed rent in the income tax base. Imputed rental income is generally calculated by an administrative valuation procedure as a flat percentage of the capital value of housing and operating costs are taken into account either directly or via an allowance fixed in terms of the capital value.⁵

The asymmetric treatment of depreciation and capital gains is more problematic. Eisner (1988) has advocated inclusion of capital gains into the National Accounts although inclusion of unrealised gains is argued against on the grounds that these do not provide a cash flow to sustain expenditure. However, neither accrued nor realised capital gains are currently incorporated into the National Accounts and, in line with the UN recommendation, this practice will be adhered to in the empirical estimates presented in the next section of this paper. Data limitations also inhibit consideration of either depreciation or capital gains since information is available neither on the relative importance of capital and land in the estimates of gross housing wealth nor on changes in this value over time. The question of whether capital gains which are merely a reflection of the capitalised value of future rental income streams should be included is a question which as yet has not been resolved.

5 More detailed information is provided in the national position papers upon which the 1988 report was based and, in particular, Talon (1985). The Scandinavian countries, Belgium, Greece, Italy, Luxembourg, the Netherlands, Spain and Switzerland all assess imputed income for tax purposes. Unless property valuations are kept up to date, the approach used tends to understate the rental of the property. This has been one of the reasons why the policy of taxing imputed rent has been abandoned in some countries (e.g. UK abandoned its Schedule A taxation in 1963 because valuations were based on 1939 figures; France abandoned it in 1965 and (West) Germany in 1987). Most countries which allow interest deductions set limits on the extent of these.

Implementation of Recommended Approach

Using the preferred National Accounts approach outline above, gross imputed rent is assessed in this paper as a fixed (real) rate of return on the estimated dwelling value and net rent is determined by subtracting the actual costs associated with earning that gross rent. This approach allows for both positive and negative net imputed rents. In line with the estimates of gross imputed rent which are incorporated into the 1988/89 Australian National Accounts and the estimate of gross owner-occupied housing wealth obtained from the 1988/89 HES, a benchmark gross rate of return is taken as five per cent of dwelling value.

As indicated above, this represents a conservative estimate of gross market rates of return on rental property. It also represents a conservative estimate if an alternative opportunity cost approach is used to estimate rental rates of return. The average annual dividend yield on Australian share markets over the year to June 1989 was 5.5 per cent and the return on Treasury indexed bonds issued during 1988 was 4.55 per cent for 15 year bonds and 4.65 per cent for 10 year bonds. These returns provide an indication of the net return which might be earned on alternative investment options which yield a real return.

In the empirical estimates which follow a range of gross rental rates of 2.5 per cent to 7.5 per cent is also considered, in order to provide some indication of the sensitivity of the results to the rate chosen. The upper limit of 7.5 per cent represents a conservative industry estimate of gross rental returns for investment in private rental housing.

These assumed rates of return do not take into account any of the costs incurred in earning rental income. In determining net rates of return, operating costs covering rates, repairs, maintenance and insurance and interest costs are based on the actual costs incurred by owner-occupiers as reported in the Household Expenditure Survey.

3 The Impact of Housing Income on Income Distribution

The previous section provided an indication of how the UN recommended approach could be used to determine imputed income for income distribution purposes. The impact of imputed income on household income distribution in Australia as estimated by the approach which was outlined will depend on the distribution of gross and net housing wealth.

Aggregate Results

The data from the 1988/89 HES provide an estimate of \$537 billion for Australia's gross owner-occupied housing wealth. Outstanding debt on this housing is estimated to be a mere \$51 billion. The top half of Table 1 indicates how this owner-occupied housing wealth and debt is distributed over the 5.42 million households in Australia.

Table 1: Owner-Occupied Housing Wealth, Debt and Alternative Estimates of Net Imputed Income: All Households, 1988/89

	Gross income decile										Total
	1 (\$)	2 (\$)	3 (\$)	4 (\$)	5 (\$)	6 (\$)	7 (\$)	8 (\$)	9 (\$)	10 (\$)	(\$)
Value of owner-occupied dwellings ^(a)	63893	69218	82193	73468	78293	103339	96302	102262	126188	195315	99118
Outstanding debt ^(a)	1612	1625	2854	5857	8673	12047	13525	14697	15552	17577	9418
	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)	(\$ p.w.)
Gross household income	92	195	271	378	484	595	720	870	1064	1680	636
Net imputed income											
.025 value - costs	13	11	17	1	-5	-6	-15	-23	-20	14	-1
.050 value - costs	44	45	56	36	32	43	31	26	41	108	46
.075 value - costs	74	78	96	72	70	93	77	76	102	202	94

Note: a) These values have been averaged over all households; over all owner-occupiers, average dwelling values are \$136,367 and average debt is \$13,525. The equivalent outcomes for each decile group can be obtained by adjusting the results presented by the percentage of owners given in Table 2. Detailed results are given in Yates (1991).

Source: 1988/89 Household Expenditure Survey, unit records

Averaged over the 3.93m or 72.7 per cent of households who are owners, it represents an average value of \$136,367 for owner-occupied dwellings. Averaged over all households, this represents the average value of \$99,118 indicated in Table 1. Average outstanding debt amounts to \$9,418 per household.

The results presented in Table 1 aggregate the effect of decile differences in dwelling values and debt amongst owner-occupiers, and differences in ownership rates amongst households. In general, average dwelling values increase with income. However, in the top half of the income distribution, the proportion of owner-purchasers is above average and, in the bottom half, the proportion of households who have gained or who are in the process of gaining access to owner-occupation is below average. Thus, lower average dwelling values in the lower income deciles arise both from lower underlying values and from relatively low ownership rates. Lower average debt in these deciles, however, arises primarily from very low rates of purchase. It is this combined effect of dwelling values and debt combined with the proportions of households who are owners or purchasers which influences the aggregate net imputed income estimated for each decile group.

Households with no housing wealth derive no advantages from the ownership of housing; outright owners with no housing debt derive only advantages; and purchasers with gross wealth which exceeds their net wealth benefit from the gross rental services provided by their housing but potentially suffer disadvantages because of the cost of servicing the loan required to generate those services.

The bottom half of Table 1 summarises these effects in the estimates for net imputed rent for all households. Using the National Accounts preferred approach and the benchmark rate of five per cent, Table 1 shows that imputed rent is estimated to contribute an average of \$46 per week to household income. This amounts to seven per cent of average weekly gross household income.⁶ On the less conservative assumption of a gross rental rate of 7.5 per cent, imputed rent is estimated to contribute an average of \$94 per week or almost 15 per cent to average weekly gross household income.

6 At an aggregate level, this \$46 per week represents a total of \$12,965m. This is broadly consistent with the 1988/89 National Accounts data which record an aggregate gross rent from owner-occupied dwellings of \$12,127m. This allows for operating and interest costs but does not take into account depreciation. This figure is obtained by subtracting the \$10591m interest paid from the \$26556m gross operating surplus from dwellings owned by persons and scaling the result by the 76 per cent share of owner-occupied gross rent in total gross rent. Depreciation allowances in 1988/89 were of the same order as interest payments and, in total, amounted to \$10591m. If depreciation is to be taken into account, a rental return of 3.5 per cent would need to be applied to generate an aggregate imputed rent figure equal to the \$3824m share of income from dwelling rent which can be attributed to owner-occupiers in the 1988/89 National Accounts. This would yield an average net imputed income of \$13 per week to be added to average gross household income. The impact of this can be determined from the data presented in Table 1 by interpolating between the results given for the 2.5 per cent return and the 5 per cent return presented in rows 2 and 3.

As Table 1 shows, the estimates of net imputed rent are sensitive to the assumed rate of return. At a gross rental rate of return of 2.5 per cent, average net imputed rent is close to zero; at five per cent it amounts to \$46 per week and is consistent with the pre-depreciation National Accounts figures; at the lower bound of the industry's conventional rule of thumb of 7.5 per cent, average net imputed rent amounts to a significant \$94 per week.

The impact of using the UN recommended approach to assess net imputed income can be clearly seen from these results. The lower is the weight assigned to the value of the housing services provided by the dwelling (that is, the lower is the assumed gross rental rate of return), the more likely is it that the value of these services will not compensate purchasers for the cost of obtaining them. As can be seen from Table 1, for very low gross rental rates of return, net imputed income can be negative for households in a wide range of upper-middle income groups using the preferred approach. In part this arises because of the above average proportion of purchasers in these income groups and the resultant impact of relatively high interest costs. As the assumed gross rate of return increases, however, although the underlying pattern of net imputed rent remains unchanged, the aggregate level of net imputed rent increases, becoming positive for all income groups for a relatively low gross rate of return.

In the first instance, further results will be presented on the basis of the benchmark return of five per cent⁷ where aggregate net imputed rent is positive for all income groups and represents approximately seven per cent of gross household income.

To assist in placing the results which follow into some perspective, Table 2 provides a breakdown both of the components of this benchmark net imputed rent averaged across all owner-occupiers and an indication of average rent paid by households in the private rental sector. According to the 1988/89 HES, the average rent paid by all renters in the private rental sector was \$103 per week. This result, however, includes the 2.6 per cent of households who live rent free as well as those who obtain concessional rents from employers or relatives. In order to provide a more appropriate basis for comparing the rents imputed for owner-occupiers with private market rents, Table 2 indicates average rents paid for unfurnished dwellings in the private rental sector when households paying non-market rents are excluded. In line with the calculations of imputed rent in the National Accounts, any households with rents below \$28 per week were excluded on the grounds that any rent below this figure does not represent a realistic market rent. On these calculations, average rents paid in that part of the private rental sector which can best be compared with the owner-occupied sector amounted to \$113 per week.⁸ The estimated gross imputed

7 As indicated, this rate can be regarded as a very conservative gross rate of return if depreciation is ignored (because the appreciation of land is not taken into account) or as a moderately conservative rate if it is assumed to embody the impact of depreciation.

8 This figure is likely to underestimate gross rental value of owner-occupied dwellings because of systematic differences in the locations of owner-occupied dwelling stock and the rental stock from which the underlying rental values were based.

Table 2: Rent and Components of Benchmark Net Imputed Rent by Tenure: 1988/89

	Gross income decile										Total
	1 (\$ p.w.)	2 (\$ p.w.)	3 (\$ p.w.)	4 (\$ p.w.)	5 (\$ p.w.)	6 (\$ p.w.)	7 (\$ p.w.)	8 (\$ p.w.)	9 (\$ p.w.)	10 (\$ p.w.)	(\$ p.w.)
Gross household income	92	195	271	378	484	595	720	870	1064	1680	636
Renters: private unfurnished rent > \$28 p.w.	89	91	97	98	99	112	118	126	139	158	113
Owners: gross imputed rent	93	100	112	110	113	125	118	128	155	232	131
operating costs	21	26	22	28	28	33	32	37	46	45	32
interest costs	7	7	11	26	37	40	47	56	55	55	35
net imputed rent	66	67	79	56	48	55	39	35	52	132	63
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Tenure: Outright owners	59.0	56.7	56.9	40.3	35.5	37.7	35.5	30.8	33.7	41.8	42.8
Owner-purchasers	6.7	10.0	13.5	24.1	31.1	39.9	42.8	46.1	45.4	39.2	29.9
Owner-occupiers	65.7	66.7	70.4	64.4	66.6	79.6	78.3	76.9	78.1	81.0	72.7

Note: Rents and costs have been averaged over households in each tenure and not over the whole population; for income distribution purposes these have been weighted by the proportion of households in each tenure.

Source: 1988/89 Household Expenditure Survey, unit records.

rent for owner-occupiers of \$131 indicates the effect of adjusting this aggregate figure for differences in dwelling size and type.

Distributional Outcomes

Although the average net imputed rent amounted to \$46 per week over all households, this additional income was not distributed evenly across households. This is illustrated in both Table 1 and Table 2. Households in the middle deciles tend to receive below average net imputed incomes whereas those in the top income decile have a net imputed income of more than double the average value.

This pattern indicates that households in the middle deciles are those for whom the average value of owner-occupied housing wealth does not provide sufficient level of housing services to compensate for the costs incurred in accumulating that wealth. In these deciles there are either a below average proportion of owner-occupiers (and hence below average owner-occupied net housing wealth) or an above average proportion of purchasers (and, in conjunction with this, above average housing debts). The higher incidence of the aged in the lower income deciles contributes to both a higher incidence of home ownership and a higher incidence of outright ownership. This, in turn, contributes to a higher average net imputed income and a higher average gross imputed income than observed for households in the middle income deciles. The greater savings capacity of households in the top income deciles likewise contributes to a greater incidence of home ownership and a higher level of average net imputed rent. A more detailed analysis of the characteristics of households in each decile will be given below.

The impact of including imputed rent on the distribution of income can be seen in Table 3 which compares income distributions when households are ranked on the basis of gross household income with the outcomes when they are ranked on the basis of gross household income plus the various assessments of net imputed income. From these results, net imputed income appears to have little impact on income distribution at an aggregate level. For households ranked on the basis of gross household income the Gini coefficient is .39; that for households ranked on the basis of gross household income plus net imputed rent at best is reduced to .38. However, the insensitivity of these Gini coefficients partly arises from the result that the redistribution which has taken place is from households in the middle income deciles to those at the lower and the highest decile. The implications of this will be discussed below.

As can be seen from the results in Table 1 as well as those in Table 3, the impact of net imputed income is greatest on households in the lowest income groups. From Table 1, the benchmark estimate increases gross household income by almost 50 per cent for households in the bottom income decile; it increases gross household income by less than one per cent for households in the top income decile. From Table 3, households in the bottom quintile receive 4.6 per cent of original gross income compared with 5.0 per cent of total income when income is expanded by the inclusion of net imputed rent. Although such a change does not appear large in

Table 3: Distributional Impact of Inclusion of Net Imputed Income

	Decile share of total income (%)										Gini coefficient
	1	2	3	4	5	6	7	8	9	10	
Gross income	1.5	3.1	4.3	6.0	7.6	9.4	11.5	13.7	16.7	26.4	.39
+ net imputed income											
.025 value - costs	1.4	3.2	4.5	6.0	7.5	9.2	11.2	13.5	16.6	26.9	.39
.050 value - costs	1.6	3.4	4.7	6.1	7.5	9.2	11.1	13.3	16.3	26.7	.38
.075 value - costs	1.7	3.6	4.9	6.2	7.6	9.2	11.0	13.1	16.1	26.7	.38

Note: Households have been re-ranked with each different measure of income.

Source: 1988/89 Household Expenditure Survey, unit records.

aggregate terms, the impact of net imputed income on the relative share of those in the lowest quintile is relatively large compared with the small changes in inequality which have been observed in Australia in the 1980s (Saunders et al., 1989).

Disaggregate Outcomes

These aggregate effects disguise an uneven impact of the inclusion of imputed income within each income group. The benchmark average weekly net imputed income of \$46, for example, is the weighted average of a net imputed income of \$63 for the 72.7 per cent of households who are owners and an imputed income of zero for the remainder. In turn, the \$63 is shared unevenly amongst owners, with the 42.8 per cent of households who own outright deriving a positive weekly income of \$137 and the 29.9 per cent of households who are still purchasing deriving a negative weekly income of \$41. Similar disparities arise when households are examined by any other characteristics such as State of residence, age and household type.

In order to facilitate such an analysis, Table 4 indicates the incidence of households by each of these characteristics (that is, State of residence, tenure and age) when households are ranked by gross household income. The results for household type can be found in Yates (1991). Table 5 illustrates the impact on this incidence when households are ranked on the basis of this gross income plus the benchmark estimate of net imputed income.

In the absence of any assessment of net imputed rent, Table 4 records the disproportionate share of households in the lowest and highest income deciles in NSW; the disproportionate share of households in the lower income deciles in Queensland and South Australia; and the disproportionate share of households in the upper income deciles in Victoria. It points to the high incidence of outright owners amongst those in the lower income groups and the age and household data confirms that this arises from lifecycle factors.

Comparison of the results in this table with those presented in Table 5 shows the impact of net imputed rent. The significantly higher dwelling values in NSW combined with only marginally higher levels of outstanding debt result in a reduction in the proportion of households in NSW in the lowest income decile and a small increase in the proportion of those in the highest income decile. The tendency for households in both Queensland and South Australia to be concentrated at the lower end of the income distribution is exacerbated by the below average dwelling values in those States.

More significant changes, however, occur amongst the life-cycle variables of age and household type which, in turn, influence household tenure. As expected, outright owners have moved to higher income groups while the proportion of owner-purchasers in the lower income group has increased. When imputed income is ignored, as in Table 4, 59 per cent of households in the lowest income decile are outright owners and 51.2 per cent have a reference person aged 65 or over. When

Table 4: Incidence of Households Ranked by Gross Household Income: 1988/89

	Gross income deciles										
	1	2	3	4	5	6	7	8	9	10	Total
	Percentage of households (%)										
<hr/>											
Location:											
New South Wales	36.5	32.9	33.7	35.1	34.6	30.8	31.3	33.2	32.9	38.1	33.9
Victoria	19.7	25.0	23.8	24.5	23.2	27.5	28.7	27.0	27.4	30.1	25.7
Queensland	20.0	19.2	17.3	18.9	20.2	18.1	16.2	14.8	14.9	11.8	17.1
South Australia	12.2	10.4	10.3	8.9	8.3	8.9	9.0	9.8	8.0	5.9	9.2
Western Australia	7.3	7.9	10.0	7.6	9.3	9.9	9.8	8.8	11.0	9.1	9.1
Tasmania	2.8	3.3	3.5	3.4	3.0	3.2	2.8	3.2	2.5	0.9	2.9
Northern Territory	0.7	0.2	0.5	0.8	0.4	0.3	0.9	1.0	0.9	1.0	0.7
Australian Capital Territory	0.8	1.3	0.9	0.9	1.0	1.2	1.5	2.2	2.4	3.1	1.5
Tenure:											
Outright owners	59.0	56.7	56.9	40.3	35.5	37.7	35.5	30.8	33.7	41.8	42.8
Owner-purchasers	6.7	10.0	13.5	24.1	31.1	39.9	42.8	46.1	45.4	39.2	29.9
Renters	34.3	33.3	29.6	35.6	33.1	20.4	21.7	23.1	21.9	19.0	27.3
Age:											
under 25	3.7	6.8	5.6	7.2	6.0	4.7	7.0	6.5	5.7	3.0	5.6
25 - 44	16.1	19.6	26.4	48.5	55.3	59.1	60.8	58.6	57.8	49.4	45.2
45 - 64	29.1	26.6	26.5	30.9	29.8	29.5	27.1	30.1	32.3	43.6	30.6
65 and over	51.2	47.0	41.4	13.4	8.9	6.7	5.0	4.8	4.3	3.9	18.6

Source: 1988/89 Household Expenditure Survey, unit records.

Table 5: Incidence of Households Ranked by Gross Household Income Plus Benchmark Net Imputed Income: 1988/89

	Gross income deciles										
	1	2	3	4	5	6	7	8	9	10	Total
	percentage of households (%)										
<hr/>											
Location:											
New South Wales	32.1	32.3	30.7	36.7	33.6	33.9	32.7	32.7	34.6	39.8	33.9
Victoria	20.4	21.6	25.7	25.7	25.9	23.3	27.6	27.5	27.9	31.2	25.7
Queensland	21.2	20.1	20.0	17.6	17.4	19.3	16.6	14.2	13.9	11.0	17.1
South Australia	12.8	11.0	10.4	7.6	9.5	8.1	8.9	9.4	8.4	5.4	9.2
Western Australia	8.2	9.5	8.5	8.0	9.1	10.3	9.3	9.7	9.7	8.4	9.1
Tasmania	3.6	3.7	3.2	3.1	3.1	3.2	2.5	3.0	2.3	0.9	2.9
Northern Territory	0.7	0.4	0.6	0.6	0.3	0.5	0.9	1.2	0.8	0.8	0.7
Australian Capital Territory	1.0	1.4	1.0	0.7	1.1	1.5	1.5	2.4	2.4	2.5	1.5
Tenure:											
Outright owners	39.2	53.6	56.3	41.2	38.4	36.2	38.5	35.2	38.2	50.7	42.8
Owner-purchasers	11.3	11.6	17.8	26.8	32.1	39.8	40.9	42.5	42.3	34.0	29.9
Renters	49.5	34.8	25.9	32.0	29.4	23.9	20.6	22.3	19.5	15.3	27.3
Age:											
under 25	8.1	5.2	5.9	6.2	5.3	6.9	6.5	4.4	4.9	2.8	5.6
25 - 44	25.8	22.7	29.0	45.5	54.2	57.6	58.6	59.1	56.3	43.2	45.2
45 - 64	25.8	26.2	27.4	27.8	29.1	26.8	28.0	31.8	34.3	48.2	30.6
65 and over	40.4	45.8	37.8	20.5	11.3	8.7	6.9	4.7	4.5	5.8	18.6

Source: 1988/89 Household Expenditure Survey, unit records.

imputed income is taken into account, only 39.2 per cent of households in the lowest income decile are outright owners and the reference person is aged 65 or over in only 40.4 per cent of those in the lowest income decile.

The exclusion of imputed rent from the income base in studies concerned with poverty before and after housing costs results in an inability to separate out housing income from housing consumption effects in those studies (e.g. Bradbury et al., 1987). The results presented in Tables 4 and 5 clearly suggest that it is the positive income from housing which protects outright owners from low incomes and hence from after-housing poverty; conversely, it can be the negative income from housing which pushes owner-purchasers into lower income deciles.

Impact on Ranking

Table 6 indicates the extent to which the income ranking of individual households has shifted as a result of redefining income to include this rental income. If the inclusion of net imputed income had no impact on decile rankings, each of the elements on the main diagonal in Table 6 would be 10.0 per cent and all off-diagonal elements would be zero. However, as can be seen, there is a significant number of observations in the off-diagonal elements. In total, some 2.07m households or 38 per cent of the 5.42m households in the population move to a different income ranking when imputed income is added to gross household income. Of these households, 1.11m are pushed down the income scale and 0.96m move to higher income deciles. In total, almost 90 per cent of this re-ranking implies a move up or down of one income decile but the income ranking of almost 60,000 households is changed up or down by at least three income deciles.

Within each decile group, the ranking of between 13 per cent and 49 per cent of households is changed depending on whether household income excludes or includes the rental income from housing. Table 6 shows that the extent of this re-ranking is greatest for households in the lower middle income deciles. Whereas 74 per cent of the 10 per cent in the lowest income decile when ranked on the basis of gross household income remain in the lowest income decile when ranked on the basis of gross household income plus net imputed rent, and 87 per cent of the 10 per cent in the highest income decile remain there on re-ranking, the ranking of only 51 per cent to 56 per cent of households in deciles two to seven remains unchanged.

Almost 450,000 renters have their relative income status decreased by one income decile when the benchmark assessment of net imputed income is added to the definition of household income. This represents 30 per cent of all renting households. No renters have their relative status decreased by more than one decile and none have it improved. Outright owners are almost unambiguously advantaged by their positive imputed rental income. Almost 900,000 outright owners have their relative income position improved by one or more income deciles and only 100,000 are pushed into a lower income decile by those owner-purchasers whose net rent makes a greater positive contribution to income despite offsetting housing costs. In general, when a conservative gross rental rate of five per cent is employed, owner-

Table 6: Cross-Classification of Decile Ranking Gross Income and by Gross Income Plus Benchmark Imputed Rent

Gross income plus benchmark imputed income deciles	Percentage of households (%)										Total
	Gross income deciles										
	1	2	3	4	5	6	7	8	9	10	
1	7.4	2.3	0.2								10.0
2	2.1	5.2	2.5								9.9
3	0.3	2.0	5.2	2.4	0.2						10.0
4		0.5	1.6	5.5	2.3						10.0
5			0.5	1.5	5.7	2.1	0.2				10.0
6				0.3	1.5	5.6	2.3	0.2			10.0
7					0.2	1.9	5.4	2.2			10.1
8						0.2	1.7	6.2	1.7		10.0
9							0.2	1.4	7.1	1.3	9.9
10									1.1	8.7	10.0
Total	9.9	10.0	10.0	10.0	10.0	10.0	9.9	10.0	10.1	10.0	100.0

Note: Totals may not sum due to rounding.

Source: 1988/89 Household Expenditure Survey, unit records.

purchasers are relatively disadvantaged by the inclusion of imputed income. Over 500,000 owner-purchasing households have their relative income position decreased by one or more income deciles whilst less than one quarter of this number have gross imputed income sufficiently great to offset their negative costs to an extent sufficient to improve their relative income position.

The extent of this re-ranking increases as the estimates of net imputed income increase. The proportion of households whose ranking is changed increases from 27 per cent if a gross rental rate of 2.5 per cent is used, through the 38 per cent reported in Table 6 where the benchmark measure of net imputed income based on a five per cent gross rental return is used, to 49 per cent if one of 7.5 per cent is used.

With the benchmark assessment of imputed rent, this re-ranking is greatest in NSW and Victoria; the proportion of households whose ranking is changed ranges from 43 per cent in NSW to 28 per cent in Tasmania. It is greatest for owners; 41 per cent of outright owners and 48 per cent of owner-purchasers are re-ranked compared with only 28 per cent of renters. It is greatest in the downward direction for the young with almost 35 per cent of those under 44 moving down the income distribution; in contrast, 40 per cent of those 65 and over move up the income distribution. Finally, it is greatest for single parent households with 53 per cent of these households being re-ranked compared with just over 40 per cent of married couple households.

4 Conclusions

The conclusions which can be drawn from this paper are self-explanatory. The results reinforce the conventional wisdom that owner-occupation has a significant impact on the well-being of many households and that this impact may be beneficial or otherwise when a cross-sectional analysis is undertaken. Averaged over all households, however, net imputed rent increases gross household income by seven per cent; it increases the gross household income of owners by 10 per cent; and that of renters by 0 per cent. To the extent that cross-sectional results can be taken as representative of the lifetime effect for an individual household, these outcomes suggest that, on average, home ownership contributes an additional 10 per cent to lifetime income, the benefits to owners of which are ignored when imputed income is excluded from income distribution measures. The fact that cross-sectional results ignore cohort effects and only approximate lifecycle effects is unlikely to affect this conclusion.

This aggregate outcome combined with the evidence of the strong lifecycle effects on housing costs and gross imputed income and hence on whether net imputed rent has a positive or negative impact on household income, suggests that consideration of housing income will be of considerable importance in studies of lifetime inequality.

Outright ownership unequivocally enhances the command that households have over resources and contributes positively to their capacity to enjoy housing and non-housing commodities alike. That outright owners are amongst those who benefit

from a positive re-ranking and an improved relative income status can be inferred from the reduction in the incidence of households in the lowest income deciles once imputed income is taken into account. That this eventual benefit may be obtained only as a result of initial significant costs by households forced to face high housing outlays as owner-purchasers is seen in the increased incidence of owner-purchasers in the lowest income deciles when imputed income is taken into account. That renters derive no increase in their command over resources as a result of their housing decisions is seen in the increased incidence of renters in the lowest income deciles when imputed income is taken into account.

The question of whether or not increases in the value of owner-occupied dwellings contribute to the well being of owners in any absolute sense may be controversial. In a physical sense, owners consume no more housing services when the value of their housing wealth increases. However, the question of whether or not these increases contribute to the relative well-being of owners is incontrovertible. Owners of dwellings which have maintained or increased their relative value experience no restraints on their housing choices as a result of house price inflation. Even though the housing services cost more than those provided elsewhere, households who have benefited from the house price inflation in Sydney, for example, both have the additional imputed income from which those costs can be borne and can move anywhere in Australia without diminishing their housing and non-housing consumption standards. However, those whose housing wealth is tied up in dwellings which have not kept pace with the general level of house-price inflation, such as those in South Australia or Tasmania and those who have no housing wealth, do not have these options open to them. A move to the Eastern States or a move into owner-occupation can mean facing a reduction in their standard of living in relation to both housing and non-housing consumption. To the extent that well-being is measured by the command that households have over resources, such households are relatively disadvantaged. They do not have the same resources nor the same opportunities available to them.

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