

NEW ZEALAND NOW

Incomes

— 1999 Edition —



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Preface

Income Trends is one of the *New Zealand Now* series, a set of publications that discuss a diverse range of topical New Zealand subjects, such as Maori, women, children and demographic trends. Each book draws on census data, as well as data from other sources.

This publication draws on census data from 1981 to 1996, but primarily draws on data from the Household Economic Survey.

Income distribution is an extremely challenging and important area. The distribution of income is one of the yardsticks by which a nation is judged and is a topic of intense public interest. I am confident that this publication will make a significant contribution to the general debate on the subject.

This publication has been prepared by John Scott, with the expert assistance of Des O'Dea and many Statistics New Zealand staff. I would like to thank the authors for their hard work, and also thank the many people who have reviewed or otherwise been involved in the production of this publication.

A handwritten signature in black ink that reads "Len Cook". The signature is written in a cursive, flowing style.

Len Cook
Government Statistician

Behind the information presented in *Incomes* is an even more expansive range of data.

Basic information from the Census of Population and Dwellings is widely released in an extensive series of published reports. Additional, more-detailed information is made available in a series of cross-classified tables and database products, including the compact disc product, Supermap. The department also offers customised services to clients with special needs.

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Contents

Introduction	9
Chapters	
1. Economic and Demographic Background	11
2. Personal Market Incomes	21
3. From Personal Market Income to Disposable Income	39
4. Household Market Incomes, Transfers and Taxes	51
5. Household Disposable Incomes	67
6. Low Income Households	79
7. International Comparisons	93
Technical Appendices	
1. Comparing Households - The Use of Equivalence Scales	97
2. Statistical significance of the change in the gini coefficient	99
3. Post-stratification effects	101
4. The relative contributions of different income components to shifts in income inequality	109
5. Data Issues and Assumptions	111
6. Definitions, abbreviations, explanations and income concepts	117
Bibliography	125

Introduction

This report traces what has happened to the distribution of New Zealanders' incomes over the period 1982 to 1996; one of the more eventful periods in our economic history.

The analyses focuses on cash income and does not cover the broader range of government activities. It must be recognised that income is not the only measure of economic well-being and it may not even be the most appropriate in all cases (eg does not take into account asset holdings).

The report gives a brief overview of changes in the New Zealand economy (Chapter 1) before discussing trends in income at a personal level (Chapters 2 and 3). Trends in income at a household level are outlined in Chapters 4, 5 6 and 7. It is from these chapters that many of the report's conclusions are drawn.

While the book does not try and explain the causes of changes in New Zealand's income distribution (this would involve quite a different exercise than the one undertaken), it does show how income distribution has changed.

Of particular interest is the make-up of those towards the bottom of the income distribution. We can conclude that Maori, the elderly and children are over-represented in positions of low income relative to other New Zealanders.

Changes in income distribution are a result of many social, demographic and economic factors. Different methods of analysis can give different results, and it is not always possible in studies such as this to say unequivocally whether income inequality has increased or not. What is striking about the results in this report is that the results are unequivocal: income inequality has increased substantially.

Data sources

Most of the information is derived from Statistics New Zealand's Household Economic Survey (HES, formerly known as the HEIS). That information is supplemented by data from the five-yearly Censuses of Population and Dwellings and the Household Labour Force Survey (HLFS).

Data from four years of the HES has been used. These years are the survey years ended March 1982, 1986, 1991 and 1996, and are referred to as the **study years**. They were chosen because they align (as closely as possible) with the censuses of 1981, 1986, 1991 and 1996. The HES for the year ended March 1982 was chosen because disposable income has not been calculated using the 1981 HES.

Statistical validity

There are a number of technical areas that are the topic of debate in the area of income distribution. It is the view of Statistics New Zealand that while elements of the techniques used in this report reflect the analytical judgement of the authors, the conclusions drawn in this report are robust, given the methodological choices made.

It has been impossible, due to time and resource constraints, to produce tests of statistical significance for all results in this publication. Statements about significance through the text are largely based on the authors' knowledge of sampling errors of the relevant data sources. The central result of this publication, the increase in inequality of equivalent household disposable income as measured by the gini coefficient, has been validated by tests of its statistical significance. These tests show that the increase in income inequality is indeed statistically significant.

Technical notes

This report aims to avoid comment on technical issues such as equivalence scales, or post-stratification of various data sources. It is impossible to avoid such issues totally, however, and some of these issues are discussed, predominantly in the Appendices.

Three income measures that are used regularly in this report: market income, gross (pre-tax) income and disposable (after-tax) income. These are discussed at both a personal and a household income level.

If readers wish to study the numbers underlying the graphs in this report, these can be obtained from Statistics New Zealand's website, <http://www.stats.govt.nz>.

Unless stated otherwise, all dollar values in this report are adjusted to constant prices (March 1996 dollar terms), to enable comparisons over time to be unaffected by inflation.

There is a great deal of further work that could be done in the area of income distribution. Some potential areas for further work are mentioned in the report; anyone who wishes to comment on these should contact Statistics New Zealand.

Chapter 1

Economic and Demographic Background

Macro-economic conditions and their changes have significant impacts on standards of living and income distribution. This chapter outlines some of the major changes affecting the New Zealand economy in the last 50 years, particularly the last 15 years, to set a backdrop for further chapters. Unless otherwise stated, all years refer to the year ending March.

This chapter uses National Accounting income concepts based on international standards. These are slightly different from the concepts of income included elsewhere in the report. National Accounts data is also subject to revisions. For this reason, the numbers behind the graphs in this chapter are not on Statistics New Zealand's website. The general trends discussed in this chapter are, however, accurate.

The background

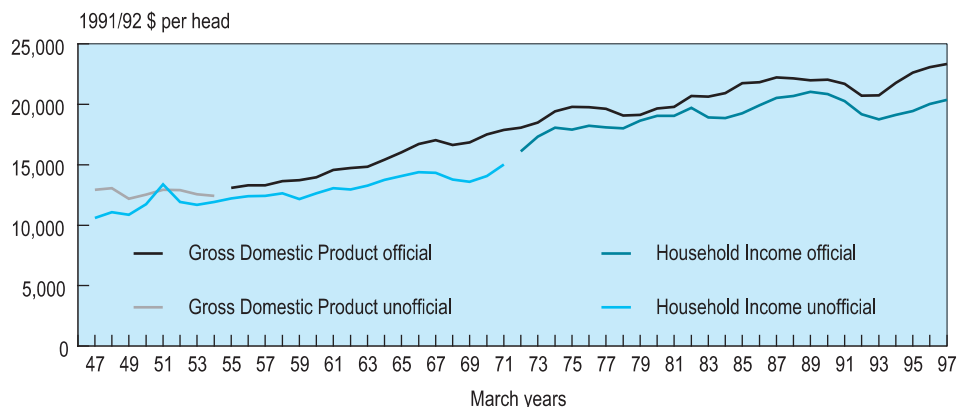
In the 50-year period since 1947, New Zealand's real Gross Domestic Product (GDP) per capita has almost doubled. Following a slow period immediately after the war, including a significant fall in 1949, real GDP growth per capita was consistent (apart from a small dip in 1953) right through to 1968. By the first half of the 1960s New Zealand's real growth was steady at about 5 percent, inflation was at a low and acceptable level and unemployment was less than 1 percent of the labour force. In 1968 international wool prices fell sharply and New Zealand experienced a marked increase in unemployment. Unemployment was below 1 in 1976 but rose in subsequent years. Falls in farm product prices were also a significant factor in 1978 and again in 1983. The 1978 fall in real GDP was signalled with a definite slowing of growth in the two previous years, following the oil price rise "shock", and it was not until 1981 that GDP rose above the 1977 level. This is shown in figure 1.1.

By 1986 unemployment had risen to 4 percent. It was now generally agreed that the policy settings of the 1970s and early 1980s were unsustainable. Growth was poor, both the budget and the balance of payments deficits were of concern, and inflation was considered to be too high. In 1984 the new government introduced a wide range of policies intended to promote efficiency, by encouraging a more competitive and open economy. The New Zealand economy underwent a period of rapid and unprecedented structural change. Tariff reform was already underway before this period, but it was greatly accelerated and public sector and financial market reforms were both given priority. Price stability became the overriding objective of monetary policy by 1987, and was formalised in the Reserve Bank Act (1989). Industrial relations were reformed radically with the Employment Contracts Act (1991).

By 1992, the economy had been in its most prolonged recession since World War II. From 1992 to 1996 (the final period covered by this publication), the economy regained strength, the rate of economic growth increased, the unemployment rate fell, the inflation rate was low and New Zealand ran fiscal surpluses (starting in 1993/94).

Figure 1.1

Real Per Capita Gross Domestic Product and Household Income, 1947-1997¹



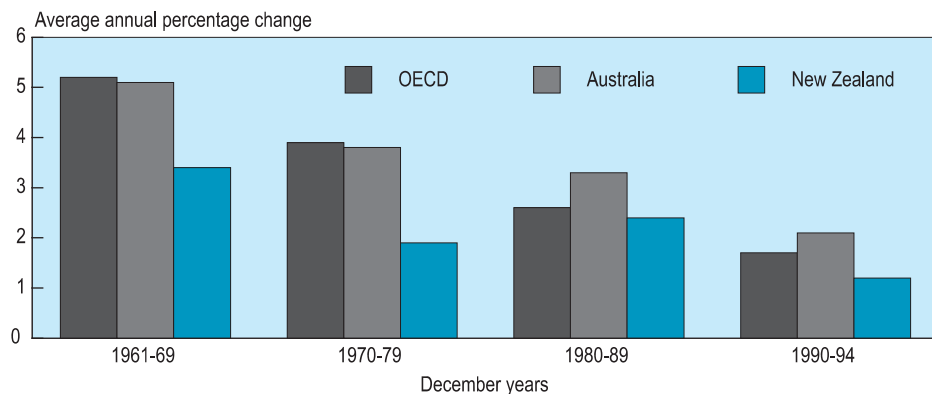
Source: Statistics New Zealand System of National Accounts

Figure 1.1 also gives some idea of how households, in total, have fared over the same period. Not surprisingly, household incomes have closely tracked the productive output of the economy. Beyond 1993, however, note that there has been a widening in the ratio of household income per capita to GDP per capita.

New Zealand's economic performance in an international context is illustrated by comparing it with other developed countries. Figure 1.2 shows that since 1960 New Zealand's annual average growth in real GDP has been consistently below the average for the Organisation for Economic Co-operation and Development (OECD, 1996). Australia's growth, on the other hand, has been either above, or close to, the OECD average.

Figure 1.2

Growth in Real Gross Domestic Product: International Comparisons, 1961-1994



Source: OECD

¹ This graph is in 1991/92 dollars as this is an official SNZ series. The unofficial GDP series is drawn from Easton (1990) while the unofficial household income series is from the Private Income Account published as part of the National Income and Expenditure estimates that preceded the New Zealand System of National Accounts.

The OECD and the United Nations have developed purchasing power parities to facilitate international comparison. Since exchange rate conversion is insufficient in itself, adjustment is required for relative purchasing power. Purchasing power parities are essentially price indexes which compare the relative price levels between countries over time. Economic measures such as GDP can be converted from local currencies into a common unit of measure using the appropriate purchasing power parity, enabling meaningful comparison. Figure 1.3 shows that New Zealand's real GDP per capita ranked against other countries has fallen steadily over the 1960 to 1993 period. A 1996 study of 24 OECD countries dropped New Zealand from fourth in 1960 to nineteenth by 1993.

Figure 1.3

Gross Domestic Product Per Capita Index for Selected Countries, 1960 and 1993

Selected Countries	1960		1993	
	Index	Rank ⁽¹⁾	Index	Rank ⁽¹⁾
OECD	100		100	
United States	177	1	142	2
Norway	90	16	108	8
Japan	54	21	116	5
Germany	130	5	128	4
Australia	117	9	102	15
United Kingdom	121	7	99	17
New Zealand	132	4	89	19
Spain	56	20	75	21
New Zealand as a percentage of Australia	113		87	

⁽¹⁾ Rank is out of 24

Source: OECD

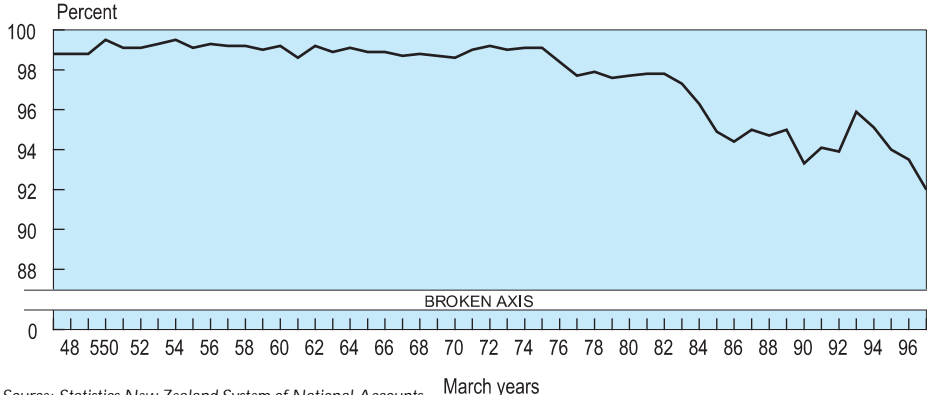
Gross National Income

GDP represents the income earned from production in New Zealand, both production of New Zealanders and foreign firms operating within New Zealand. It does not measure the final incomes which New Zealand residents earn. Gross National Income (GNI), which in the past has been referred to as Gross National Product, is a better measure of New Zealanders' income or claim on resources as it excludes income remitted abroad (dividends, interest and other transfers) and includes similar income earned by New Zealanders from overseas investments. (Further adjustments to take account of depreciation and transfers from the rest of world give an even better measure of income (National Disposable Income) from which New Zealanders can actually save and consume). For the purposes of this chapter, however, the focus is on the difference between GNI and GDP.

Figure 1.4 presents the ratio of GNI to GDP and shows what proportion of income from domestic production remains available to New Zealanders after adjusting for net profits, interest and dividends remitted abroad.

The New Zealand ratio of GNI to GDP remained steady at above 98 percent for over 25 years. Following the oil price rise in 1974 the New Zealand government increased its overseas borrowing, and the ratio began to fall. The ratio declined markedly through to 1986, and by 1997 the ratio was the lowest recorded in the post-war period.

Figure 1.4
Ratio of Gross National Income to Gross Domestic Product, 1947-1997



Source: Statistics New Zealand System of National Accounts

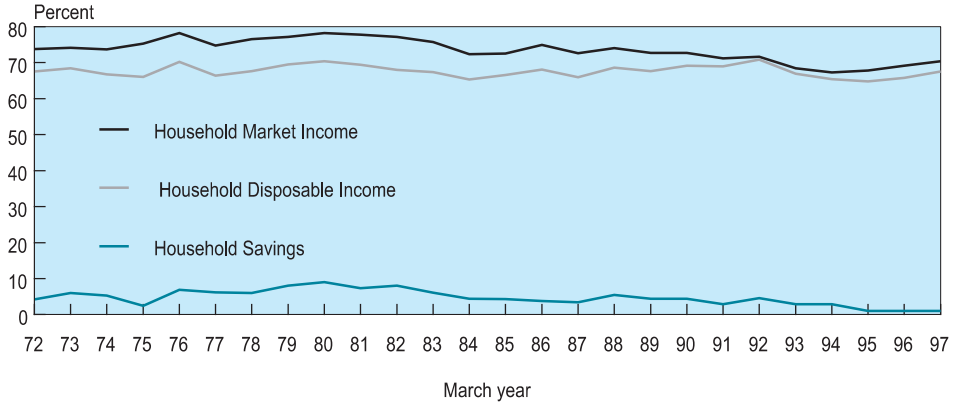
Gross National Income and household income

Figure 1.5 shows what proportion of income accruing to New Zealand residents (GNI) is earned by households in the form of market income (from wage employment, self-employment and net investments), what proportion is available as disposable income (after receipt of government benefits, payment of income tax and other net transfers) and how much is saved.

In 1982, for example, 77 percent of GNI was earned by households as market income, with 68 percent being available as disposable income. Households saved 8 percent of GNI. By comparison, in 1992 less than 72 percent of GNI was gained as market income, although almost 71 percent was available as disposable income, partly because the gap between tax paid and benefits received had narrowed. Less than 5 percent of GNI was saved. Since 1992, the market income and savings proportions of GNI have reached their lowest level of the series (which begins in 1972).

Figure 1.5

Household Incomes and Household Savings as a Percentage of Gross National Income, 1972-1997



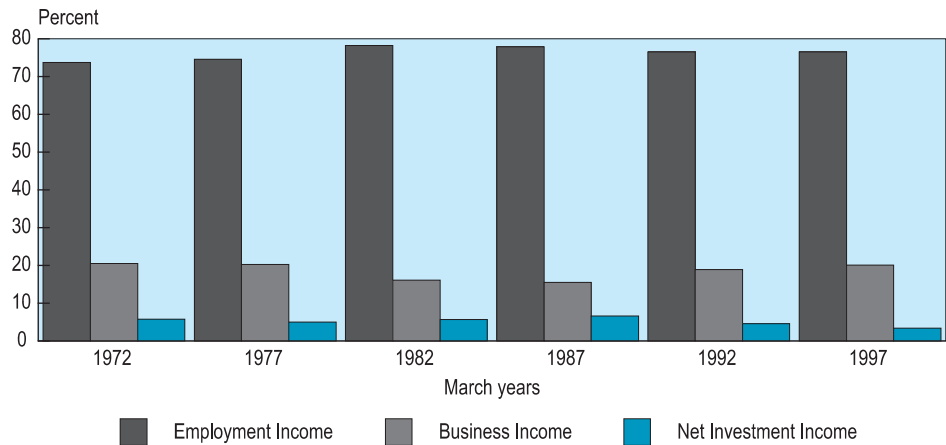
Source: Statistics New Zealand, System of National Accounts and Household Income and Outlay Account

Household market income

Figure 1.6 compares the relative contributions of the main income components of total household market income. Employment income in this case (National Accounts definitions) is gross of tax and includes salaries and wages, employer superannuation contributions and employer ACC contributions. Business income includes entrepreneurial income earned from farms and businesses owned by households as sole proprietorships or partnerships; net investment income includes interest (actual and imputed) and dividends received less interest paid on mortgages and other debt.

Figure 1.6

Sources of Household Market Income, 1972-1997



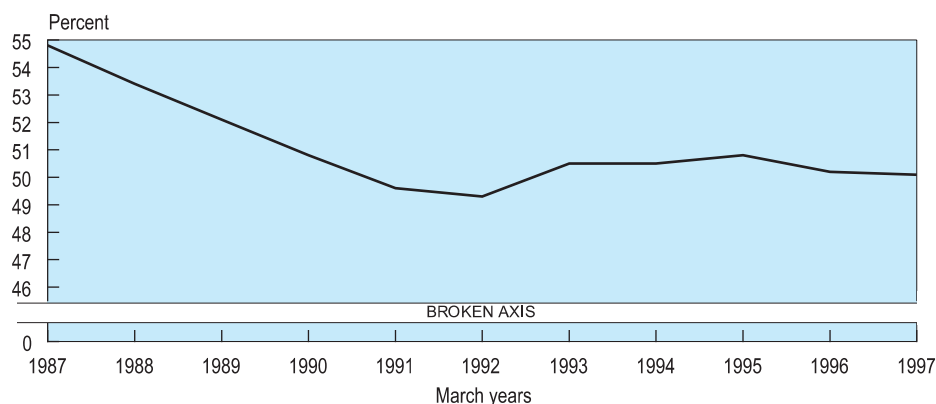
Source: Statistics New Zealand, Household Income and Outlay Account

Employment income

The largest source of income for householders, compensation of employees, rose by more than \$9,000 million in the five years ended March 1997, an increase of almost 28 percent over the 5-year period. However its contribution towards total income and, indirectly, savings has fallen. In the 12-year 1972-1983 period, employee income averaged over 59 percent of total household income. From 1986 to 1997, however, the average has been below 51.5 percent.

Figure 1.7

Employment Income as a Percentage of Household Income, 1987-1997



Source: Statistics New Zealand, Household Income and Outlay Account

Tax changes

The study years saw a significant change in the tax base, from a taxation system heavily reliant upon direct personal taxation to one that is less reliant on personal taxation and includes the Goods and Services Tax (GST). The personal income tax rates for the various study years are outlined in figure 1.8.

Figure 1.8

Marginal Personal Income Tax Rates, 1982-1996

1982		1986		1991 and 1996 ⁽¹⁾	
Income	Tax rate	Income	Tax rate	Income	Tax rate
<i>Dollars</i>	<i>Percent</i>	<i>Dollars</i>	<i>Percent</i>	<i>Dollars</i>	<i>Percent</i>
Up to 5,500	14.5	Up to 6,000	20.0	Up to 30,875	24.0
5,501 to 12,600	35.0	6,001 to 25,000	33.0	Over 30,875	33.0
12,601 to 17,600	48.0	25,001 to 30,000	45.1		
17,601 to 22,000	55.0	30,001 to 38,000	56.1	Low income earners rebate	
Over 22,000	60.0	Over 38,000	66.0	Below 9,500	15.0

(1) While only two statutory tax rates exist for 1991 and 1996, the low income earner rebate creates an effective three rate scale, with the effective marginal tax rate from \$0 to \$9,500 being 15 percent, and from \$9,500 to \$30,875 being 28 percent.

Source: Statistics New Zealand, Year Books

Demographic and social changes

Underpinning the economic changes discussed above have been various social and demographic changes.

Age structure

Since World War II, the New Zealand population has undergone a significant change in terms of its age structure. The proportion of the population under 15 has steadily decreased as the post-war baby boom bulge has moved up the population. At the same time, the proportion of the population aged over 65 has increased. During the 45 years between 1951 and 1996, the number of people aged 65 and over in New Zealand more than doubled from 180,000 to 427,000.

Labour force participation

The labour force participation rate (calculated as the percentage of the population aged 15 years and over either employed or unemployed) as recorded in the five-yearly Censuses of Population and Dwellings is shown in figure 1.9. The general increasing trend masks several different changes which have been occurring. The first is that the male participation rate has been falling throughout the period, while the female rate has been rising. Full-time participation has also been falling while part-time participation has been rising.

Figure 1.9

Labour Force Participation Rates by Sex, 1961-1996

	1961	1966	1971	1976	1981	1986	1991	1996
	<i>Percent</i>							
Male	83.8	83.6	82.1	80.7	79.3	77.5	70.2	73.5
Female	29.6	33.9	38.7	42.8	47.2	53.3	51.1	57.9
Total	56.6	58.6	59.7	61.5	63.0	65.2	60.4	65.4

Source: Statistics New Zealand, *Censuses of Population and Dwellings*

Much of the rise in women's participation has been the result of increasing numbers of married women remaining in, or re-entering the labour force. In 1991 just over half of married women worked in paid employment, and of these, almost 40 percent worked part time.

Women make up three-quarters of all part-time workers, but just over a third of full-time workers. Further analysis of trends in the labour market, using Household Labour Force Survey data, can be found in Chapter 2.

Status in employment

Since 1981 the proportion of the full-time workforce who are employers or self-employed has risen significantly, from just under 13 percent to 19 percent in 1996. At the same time the proportion employed as wage and salary earners declined to a post-

war low in 1991 of just over 70 percent, partly the result of high unemployment. Figure 1.10 shows a small increase, since 1991, in the proportion of workers classified as wage and salary earners.

Figure 1.10

Status in Employment, 1961-1996

Status in employment	1961	1966	1971	1976	1981	1986	1991	1996
	<i>Percent</i>							
Employers	7.5	7.2	6.1	6.6	5.9	7.9	7.7	8.2
Self-employed	7.6	6.8	6.5	7.2	7.0	9.8	10.1	10.8
Wage and Salary earners	83.9	85.0	85.9	83.8	81.7	81.0	70.5	71.2
Unemployed	0.8	0.9	1.4	2.1	4.5	na	9.8	8.0

Source: Statistics New Zealand, *Censuses of Populations and Dwellings*

Household size

The last two decades have seen large and rapid shifts in the number of families and households who do not fit a stereotypical nuclear family. Census data (Statistics New Zealand, 1997) shows significant numbers of sole-parent families, single-person households, families without children living at home, de facto-couple families, same sex-couple families and multi-generational households. They are increasing both in number and in proportion to all households.

The effect of this increased diversity of household types and the reduction in family size is that the average household size has decreased. Between the 1976 and the 1996 censuses the average household size has continued to fall from 3.5 people to 2.7. As a result, the number of households has grown faster than the population in general.

Marital breakdown

Marital breakdown has contributed to the increase in household numbers. While the proportion of the adult population never married has fluctuated at around a third, the proportion divorced and separated has climbed significantly. With the divorce rate rising from around 3 divorces per 1,000 married women in 1961 to a current level of around 12 per 1,000, the proportion of divorced/separated has increased from 1.7 percent of the adult population in 1956 to 9.4 percent in 1996 (Statistics New Zealand, 1997).

Educational qualifications

An increasing proportion of the population have gained educational qualifications. In 1971, 69 percent of adults over the age of 15 had no educational qualification. This proportion had fallen to almost 50 percent by 1986 and ten years later was down to 42.5 percent. The proportion of the population with various qualifications has large implications for income distribution and this is examined later.

Occupational shifts

The changing skill levels of the population reflected in educational qualifications is demonstrated in shifts in occupations, where significantly more of the labour force is now employed in professional, technical, administrative and managerial occupations than was 15 years ago. In 1981 less than a fifth were employed in these occupations, but by 1996 more than a quarter were. Conversely, the number employed in production-based occupations such as primary and manufacturing industries has fallen from close to half of the labour force to little more than a third over the same period.

Summary

There have been significant changes to both the world economy and the New Zealand economy over the study years. In addition to deregulation of many sectors of the New Zealand economy, there was a significant decrease in personal marginal tax rates. At the same time, a Goods and Services Tax was introduced.

In the post-war period, New Zealand Gross Domestic Product per capita has increased in real terms. Household income has closely tracked the increase in Gross Domestic Product per capita.

Gross National Income as a proportion of the Gross Domestic Product has fallen since 1975.

The proportion of Gross National Income that households are saving has fallen since 1992.

Demographic and social changes suggest that income distribution within the household sector may have changed significantly over the last 15 years. Average household size has dropped and the age structure of the population has changed.

Female labour force participation rates have increased since 1961, offsetting the decrease in male labour force participation rates. Labour force participation rates overall have increased. Many women, however, are employed part time.

Chapter 2

Personal Market Incomes

Introduction

This chapter first summarises some of the key labour market developments in recent years. It then analyses trends in market income at a personal level and changes in the inequality of market income distribution. Particular attention is paid to wage and salary income, as this is the major source of market income.

Overview of labour market developments

Between 1951 and 1986 the New Zealand labour force expanded faster than the working-age population, due mostly to an increase in the participation of women in the labour force. Census figures show this steady rise in the number of women employed or available for work (ie in the labour force). In 1961, 29.6 percent of women aged 15 years and over were in the labour force compared to 53.3 percent in 1986. There was a slight decrease in the labour force participation rate of men over the same period. Between 1986 and 1991 male participation fell sharply, but both male and female participation rates increased from 1991 to 1996.

The increase in the labour force is linked with a large increase in the numbers involved in part-time employment. In 1961 just 5 percent of all employment was part time compared with 23 percent in 1996.

While the labour force continued to grow steadily, census figures show that unemployment began increasing also, from a low in the 1960s. In March 1986, the first full year of the Household Labour Force Survey (HLFS), unemployment was recorded at 67,500. In the March 1992 quarter, unemployment peaked at 182,100 before dropping to 118,500 by March 1996.

Figures 2.1 to 2.3 present key results from the HLFS for March quarters over the 1986 to 1998 period.

Figure 2.1

Key Labour Market Statistics, 1986-1998

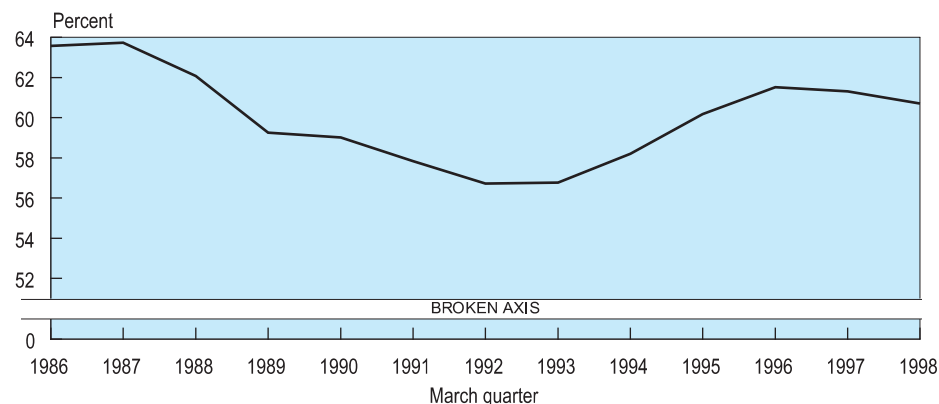
March quarter	Employed	Unemployed	Not in labour force	Labour force participation rate	Unemployment rate	Employment rate
	<i>Thousands of people</i>			<i>Percent</i>		
1986	1,544.1	67.5	817.3	66	4	64
1987	1,559.0	67.0	819.9	67	4	64
1988	1,533.7	80.9	856.0	65	5	62
1989	1,472.0	116.6	895.4	64	7	59
1990	1,480.0	116.2	911.5	64	7	59
1991	1,471.3	160.9	911.4	64	10	58
1992	1,465.8	182.1	936.3	64	11	57
1993	1,489.6	169.9	964.8	63	10	57
1994	1,554.5	163.1	953.2	64	10	58
1995	1,638.9	121.9	962.3	65	7	60
1996	1,711.0	118.5	951.6	66	7	62
1997	1,731.2	126.8	965.7	66	7	61
1998	1,731.5	140.9	980.1	66	8	61

Source: Statistics New Zealand, Household Labour Force Surveys (HLFS)

The employment rate, shown in figure 2.2, shows the proportion of those who are 15 and over who are in employment. This data, drawn from the HLFS, shows a significant drop in the employment rate in the 1987-1992 period. The employment rate then increased in the 1993-1996 period but did not reach the levels experienced in 1986.

Figure 2.2

Employment Rate, 1986-1998



Source: Statistics New Zealand, Household Labour Force Surveys (HLFS)

Figure 2.3

Part-time, Full-time and Total Employment by Sex, 1986-1998

	March quarter												
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	<i>Thousands of people</i>												
PT Males	50.4	54.8	52.7	60.6	60.0	73.3	84.3	78.4	80.0	85.9	90.5	92.6	96.2
PT Females	191.1	209.1	211.4	210.9	214.1	220.1	229.6	226.0	245.7	260.9	274.5	281.9	281.2
FT Males	860.1	854.7	830.6	784.9	780.0	754.4	740.1	758.4	788.8	830.5	859.3	866.7	862.2
FT Females	442.5	440.5	439.0	415.6	425.9	423.4	411.9	426.7	440.1	461.6	486.6	490.1	491.8
Males	910.5	909.4	883.3	845.5	840.0	827.7	824.4	836.8	868.7	916.4	949.9	959.3	958.4
Females	633.5	649.6	650.4	626.5	640.0	643.6	641.4	652.7	685.8	722.5	761.1	772.0	773.1
Total	1,544.1	1,559.0	1,533.7	1,472.0	1,480.0	1,471.3	1,465.8	1,489.6	1,554.5	1,638.9	1,711.0	1,731.2	1,731.5

FT = Full-time, PT= Part-time

Source: Statistics New Zealand, Household Labour Force Surveys (HLFS)

Figures 2.1 and 2.2 show the rise in unemployment and the fall in employment levels and in labour force participation, for the 1986-1992 period, and the reversal of these trends in the period to 1996.

The drop to 1992 was driven by the large decrease (almost 10 percent) in male employment between 1986 and 1992. The level of female employment changed little over this period.

From 1992 to 1996 employment increased significantly for both men and women, with female employment increasing slightly more than male employment in percentage terms. The bulk of this rise in female employment was in part-time work. In absolute terms, male employment rose slightly more than female employment and this rise for males was almost entirely in full-time work.

The most noticeable trend in employment by age group (figure 2.4) is a drop in the younger age brackets. In particular, employment in the 15 to 19-year-old age group fell from 176,000 to 126,200 between 1986 and 1998. Employment in the 20-24 age bracket fell from 218,300 to 179,500.

Figure 2.4

Employment Levels by Age Group, 1986-1998

March quarter	Age group										
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65 +
	<i>Thousands of people</i>										
1986	176.0	218.3	200.4	184.7	192.2	164.7	135.0	106.0	95.8	42.5	28.6
1987	174.1	216.2	198.5	189.1	193.6	169.8	142.5	110.3	92.8	43.1	28.9
1988	164.2	198.8	199.0	185.5	191.2	177.9	143.3	112.8	94.4	40.2	26.5
1989	148.4	183.9	195.1	183.7	182.8	180.5	146.0	111.8	84.8	32.4	22.6
1990	139.9	186.7	189.1	185.9	185.9	187.4	149.7	116.4	81.8	35.0	22.1
1991	127.4	181.7	186.8	189.9	190.1	189.8	150.0	119.5	80.2	33.8	22.2
1992	116.6	178.2	179.3	195.1	188.8	192.1	155.8	123.1	82.2	33.7	20.8
1993	105.7	186.1	182.0	198.6	195.2	191.3	169.4	123.1	84.5	35.7	18.0
1994	109.1	194.7	185.8	208.6	199.5	195.1	178.2	131.4	85.9	43.6	22.7
1995	119.5	201.3	199.6	215.3	206.1	199.6	190.6	141.4	96.9	45.1	23.5
1996	126.7	198.0	207.7	219.1	224.5	203.7	201.2	148.5	104.7	51.7	25.2
1997	127.6	190.9	206.6	212.1	229.0	212.7	205.5	156.0	109.9	55.0	25.9
1998	126.2	179.5	201.9	210.5	237.0	214.3	203.8	166.2	112.3	56.6	23.1

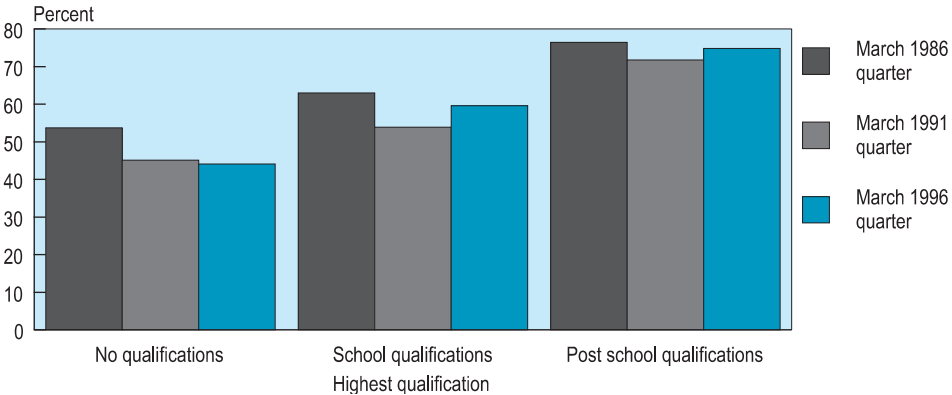
Source: Statistics New Zealand, Household Labour Force Surveys (HLFS)

Education

Figure 2.5 illustrates the correlation of educational attainment and levels of employment. People with higher educational qualifications are more likely to be employed. The groups with lower qualifications had the lowest employment rate between 1986 and 1991. The “no qualifications” group experienced a further drop in employment in 1996 (it is possible that many in this group are reaching retirement age), while the two higher qualification groups had rising employment rates between 1991 and 1996.

Figure 2.5

Percentage in Employment by Highest Qualification, 1986-1996



Source: Statistics New Zealand, Household Labour Force Surveys (HLFS)

Wages and salaries

Wages and salaries contribute close to 80 percent of market income and about two-thirds of income from all sources. Analysis of trends in average wages and salaries, and in their distribution, is therefore an important step to understanding overall changes in income distribution.

Figure 2.6

Average Wage and Salary Income, 1982-1996

Year	Wage and salary earners	Total population aged 15 years and over	Percentage of market income from wages and salaries	Percentage of gross income from wages and salaries
	<i>March 1996 \$</i>		<i>Percent</i>	
1982	24,700	16,300	80	71
1986	22,100	15,200	78	67
1991	23,100	14,800	80	67
1996	23,800	15,500	78	68

Source: Statistics New Zealand, Household Economic Surveys

Figure 2.6 gives average wages and salaries for the study years, both for those earning wages and salaries and for the entire population aged 15 years and above.

Average wages and salaries for the entire population were lowest in 1991. This was a period of high unemployment and low labour force participation (figure 2.1). However, trends in average market income are also affected by the tax-base change of October 1986 which increased indirect taxes and reduced direct taxation. The introduction of the Goods and Services Tax (and its further increase from 10 percent to 12.5 percent in 1989) increased prices, so reducing pre-tax income in real terms. It is not therefore possible to compare directly the 1986 and 1991 averages.

The proportion of market income from wages and salaries in 1991 is relatively high, suggesting that other forms of market income were relatively low in that year. Wages and salaries in 1991 made up less than 67 percent of gross income - the lowest proportion of the study years.

Figures 2.7 and 2.8 present the same data as Figure 2.6 by sex.

Figure 2.7

Average Wage and Salary Income for Males, 1982-1996

Year	Male wage and salary earners	Total male population aged 15 years and over	Contribution to market income	Contribution to gross income
	March 1996 \$		Percent	
1982	31,900	24,000	79	74
1986	28,600	21,600	77	71
1991	30,200	20,900	79	71
1996	30,500	21,400	77	71

Source: Statistics New Zealand, Household Economic Surveys

Figure 2.8

Average Wage and Salary Income for Females, 1982-1996

Year	Female wage and salary earners	Total female population aged 15 years and over	Contribution to market income	Contribution to gross income
	March 1996 \$		Percent	
1982	15,700	9,000	84	63
1986	14,600	9,100	81	61
1991	15,600	9,200	81	59
1996	16,800	10,200	81	63

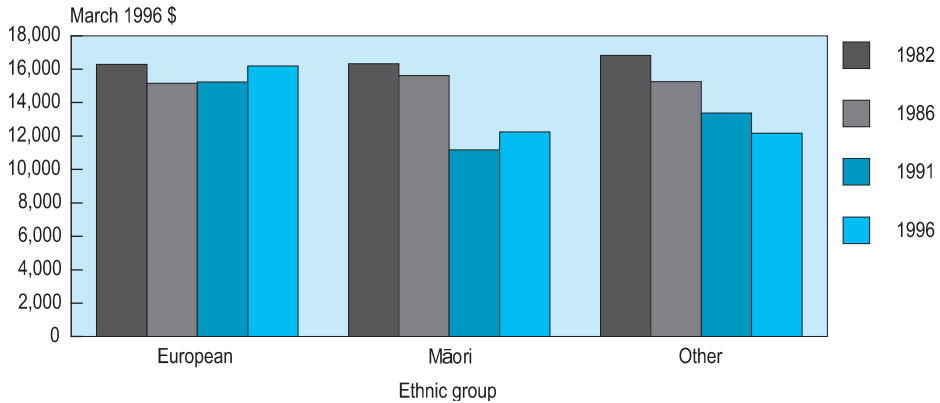
Source: Statistics New Zealand, Household Economic Surveys

Figures 2.7 and 2.8 provide some interesting contrasts between men and women. Over the 1986 to 1991 period, it is clear that women's average wages and salaries increased, both absolutely and relative to, the male average.

Figure 2.9 compares average wages and salaries, in March 1996 prices, for earners in the three ethnic groups analysed. These are Europeans, Maori, and Other - the last named including Pacific Islands people and those of Asian origin. The notable feature is the decline since 1982 of Maori average earnings, and to a lesser extent average earnings for the Other group, relative to the European average.

Figure 2.9

Average Wage and Salary Income by Ethnic Group, 1982 - 1996



Source: Statistics New Zealand, Household Economic Surveys

Changes in the distribution of wages and salaries

Dixon (1997) analysed wage and salary distribution from 1984 to 1997 using HES data on weekly earnings for wage and salary earners working at the time of the survey. She concluded that there had been an increase in inequality of earnings over her study period.

Figure 2.10 extends Dixon's analysis beyond those working at the time of the survey to include those who earned any wages and salaries over the year, and then further extends the study to analyse distribution of earnings among the population as a whole. The analysis includes a grouping by age. (For a description of the gini coefficient, see Appendix A6. In a nutshell, the higher the value of the gini coefficient, the greater the inequality of, in this case, wages and salaries.)

Figure 2.10

Dispersion in Wages and Salaries: Gini Coefficients, 1982-1996

	1982	1986	1991	1996
	<i>Gini coefficients</i>			
Dixon analysis *	N/A	0.310	0.336	0.362
Wage and salary earners 15-64 **	0.427	0.421	0.466	0.479
Wage and salary earners 15+ **	0.432	0.430	0.472	0.485
All people 15-64 ***	0.577	0.554	0.609	0.611
All people 15+ ***	0.624	0.608	0.662	0.664

* Dixon (1997). Covers weekly earnings for only those respondents working at the time of survey. Figures for 1982 are not available. Dixon's 1992 figure has been used in place of the 1991 figure.

** Those who earned wages and salaries at any time during the year.

*** Including those who did not earn any wages and salaries during the year.

Source: Statistics New Zealand, Household Economic Surveys

Figure 2.10 shows that there is a large jump in wage inequality when all wage and salary earners are included in the data (comparing Dixon's results to the wage and salary earner group). This is not surprising as the latter includes all those who have worked part of the year only, whereas Dixon's analysis includes only those working at the time of the survey.

The coefficients increase only marginally when wage and salary earners aged 65 or older are included. There are, of course, relatively few people in this category.

When those 15-64-year-olds who did not receive any income from wages and salaries during the year are included in the analyses, the gini coefficients are significantly higher. There is a further increase when the entire population is included, reflecting the large proportion of those aged 65 and over who are not earning wages and salaries. This time series (the bottom line of figure 2.10) is the most appropriate in terms of wage and salary distribution for the whole population, as it includes those not earning as well as those who are earning wages and salaries.

Figure 2.10 shows a substantial increase in the gini coefficients between 1986 and 1991, reflecting an increase in wage and salary inequality over this period. The gini coefficients for 1986 are relatively close to those of 1982 while the 1991 and 1996 gini coefficients are also similar to each other, but at a higher level than for the earlier years. This result recurs throughout this study.

Figure 2.11 shows the same analyses as Figure 2.10 for each sex.

Figure 2.11

Dispersion in Wages and Salaries by Sex: Gini Coefficients, 1982-1996

Males				
	1982	1986	1991	1996
<i>Gini coefficients</i>				
Wage and salary earners 15-64	0.340	0.339	0.408	0.434
Wage and salary earners 15+	0.350	0.353	0.415	0.442
All males 15-64	0.459	0.450	0.541	0.554
All males 15+	0.511	0.511	0.594	0.609
Females				
	1982	1986	1991	1996
<i>Gini coefficients</i>				
Wage and salary earners 15-64	0.479	0.459	0.481	0.486
Wage and salary earners 15+	0.481	0.463	0.486	0.490
All females 15-64	0.657	0.616	0.640	0.635
All females 15+	0.701	0.665	0.696	0.690

Source: Statistics New Zealand, Household Economic Surveys

It is apparent that the measures of dispersion of wages and salaries for men and women have followed quite different paths from 1982 to 1996.

There has been a sharp increase in wage and salary inequality for men, primarily in the 1986 to 1991 period, whereas the increase for women in that period was much smaller. This holds for all the series in Figure 2.11. For the whole of the 1982 to 1996 period, inequality for female wage and salary earners has increased only a little, while for the entire female population the inequality of wages and salaries has fallen.

The level of wage and salary inequality among women is, however, significantly higher than for men. This results from the higher proportion of women either not in the paid workforce, or working only part time. (Easton, in Silverstone et al (1996), also discusses relative trends in male and female income inequality.)

Market income

Market income includes not only wages and salaries but also self-employment income, investment income (rents, dividends, interest), and other regular market income, including private superannuation. Although wages and salaries are the biggest component of market income (78 percent in 1996), market income in some form or other is received by a far higher proportion of the population than wages and salaries. The proportion of market income contributed from each source of market income is shown in figure 2.12.

Figure 2.12

Percentage of Personal Market Income by Source, 1982-1996

Source	1982	1986	1991	1996
	<i>Percent</i>			
Wages and salaries	80	78	80	78
Self employment	12	12	10	12
Investment income	5	9	7	6
Other market	2	2	2	3

Source: Statistics New Zealand, Household Economic Surveys

Figure 2.13

Average Personal Market Income by Sex, 1982-1996

Year	Market income earners	Total population aged 15 years and over	Percentage of population gaining market income	Percentage of gross income from market sources
	March 1996 \$		Percent	
	Males			
1982	32,900	30,400	92	94
1986	29,600	28,200	95	92
1991	29,700	26,400	89	90
1996	30,600	27,900	91	92
	Females			
1982	14,200	10,800	76	75
1986	13,300	11,300	85	75
1991	14,400	11,400	79	72
1996	14,900	12,600	84	77
	Total			
1982	24,200	20,300	84	88
1986	21,700	19,500	90	87
1991	22,100	18,500	84	83
1996	22,600	19,800	88	87

Source: Statistics New Zealand, Household Economic Surveys

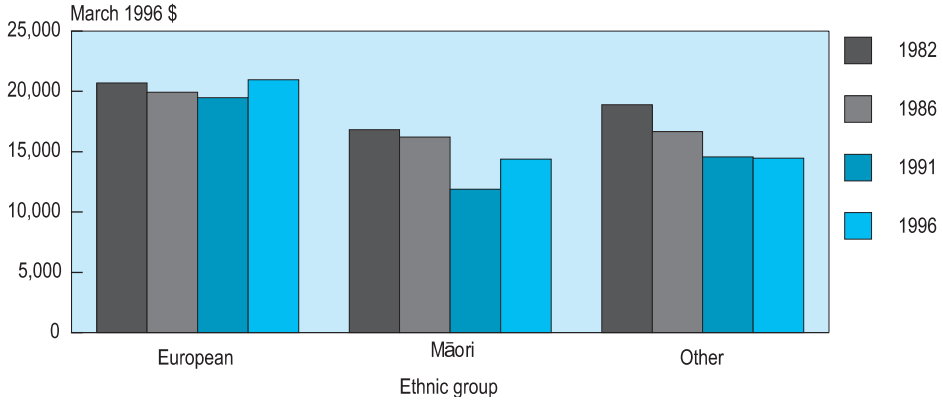
Figure 2.13 shows that real average market income fell between 1982 and 1986, but rose between 1991 and 1996. There is a clear contrast between the sexes; women's average market income rose over the 1986-1991 period and for the 1982-1996 period as a whole, even with the tax changes, whereas men's average market income fell.

The proportion of gross income that is contributed from the market is also shown in figure 2.13. For men, this proportion was reasonably steady, although there was a drop in 1991. For women, there was also a drop in 1991 but by 1996 the proportion was higher than for any of the other study years.

A similar trend is seen in the proportions of each sex gaining income from the market. For men, this proportion was relatively steady over the study years while for women, the proportion increased by nearly 10 percentage points from 1982 to 1996, with a dip in 1991.

Figure 2.14

Average Personal Market Income by Ethnic Group, 1982- 1996



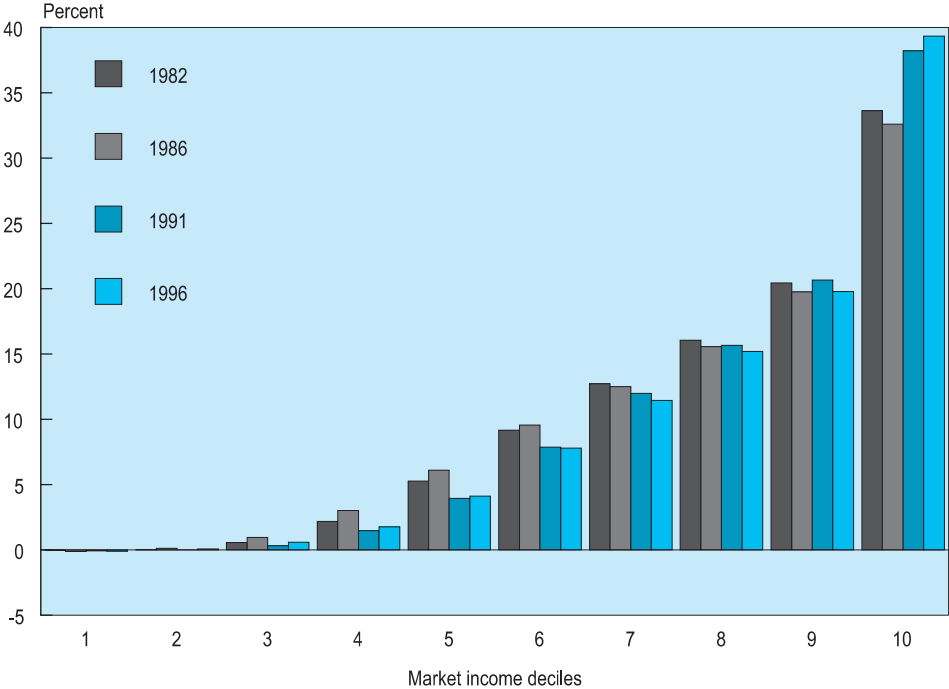
Source: Statistics New Zealand, Household Economic Surveys

Figure 2.14 shows average market income by ethnic group. The general picture is similar to that shown for wages and salaries. There is some relative recovery by Maori in the 1991-1996 period, presumably from better labour market conditions. In general, however, the difference in market income between the European ethnic group and other ethnic groups is larger than that for wages and salaries. This reflects the larger share of market income for the European ethnic group coming from sources such as self-employment and investment income.

Distribution of market income

Figure 2.15

Shares of Personal Market Income Received by Each Personal Market Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

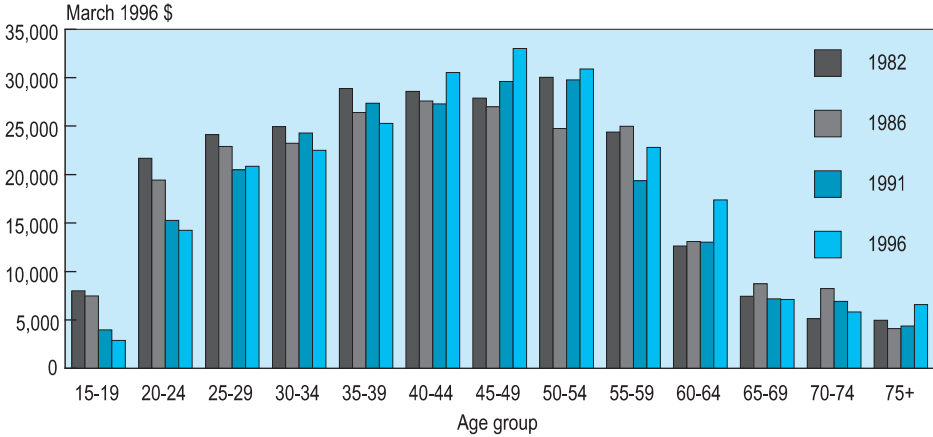
Figure 2.15 shows the share of market income by market income deciles (see Appendix A6 for definition). A shift occurred in the period 1986-1991 in the share of market income received by the top decile of market income earners; and the top two deciles gained 59 percent of total market income in 1991 and 1996. For the earlier study years, this proportion was less than 55 percent of total market income. There has been a decline in the share of market income gained by those in market income deciles 4-7 over the same period.

Although the numbers are not given here, a more detailed examination shows that women predominate in the lower income deciles, and men in the top four deciles. This, however, is gradually changing. The proportion in the bottom two deciles who are male has increased from about a quarter to about a third over the study period. The proportion of the top decile who are female has increased from approximately 10 percent to nearly 20 percent.

It is also evident that both the young (15 to 24-year-olds) and the retired age groups (65 and over) are concentrated in the lower income deciles.

Figure 2.16

Average Personal Market Income by Age Group, 1982-1996

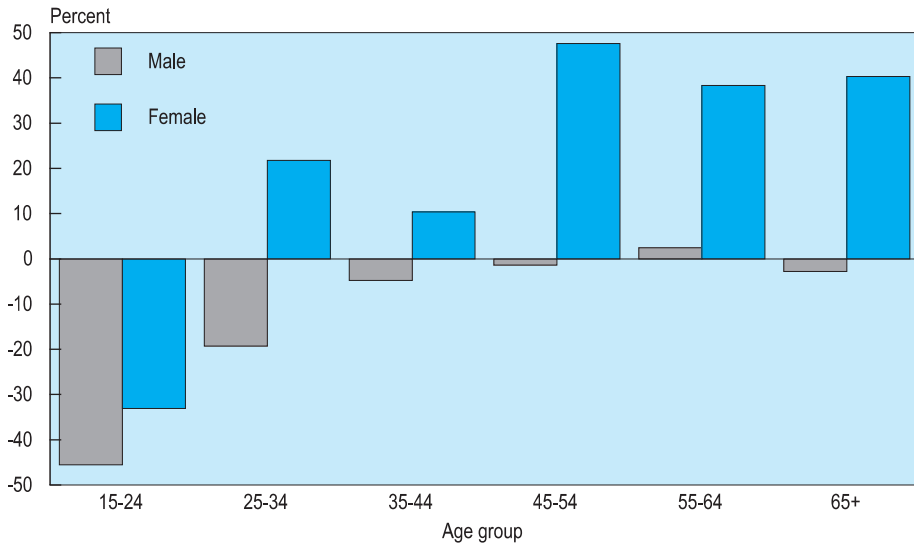


Source: Statistics New Zealand, Household Economic Surveys

Figure 2.16 shows average market income by age group. Average income is at its highest for people aged 35 to 54. Average market income for people aged up to 39 tended to decrease over the period from 1982 to 1996, whereas it increased over the same period for those in their forties.

Figure 2.17

Percentage Change in Real Personal Market Income, by Age Group and Sex, between 1982 and 1996

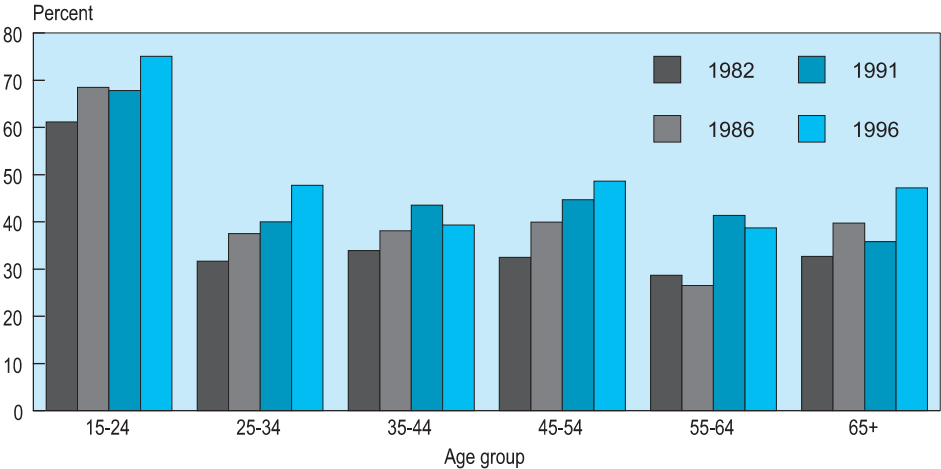


Source: Statistics New Zealand, Household Economic Surveys

Although the tax changes in the late 1980s mean that the changes in figure 2.17 should not be taken as being very precise, the relative changes for the different age-sex groups still have meaning. In line with rising unemployment and falling labour force participation, the young (15-24-year-olds), particularly young men, suffered the largest fall in average market income between 1982 and 1996 - 30 percent or more. Women aged 25 years and over improved in terms of average market income over this period. In all age groups female market income increased relative to male income.

However, there is still a large difference between the sexes in terms of market income. Figure 2.18 shows female market incomes as a percentage of male market incomes for ten-year age groups. The gap is smallest for the youngest age group.

Figure 2.18
Females' Average Personal Market Income as a Percentage of Males' Average Personal Market Income by Age Group, 1982-1996

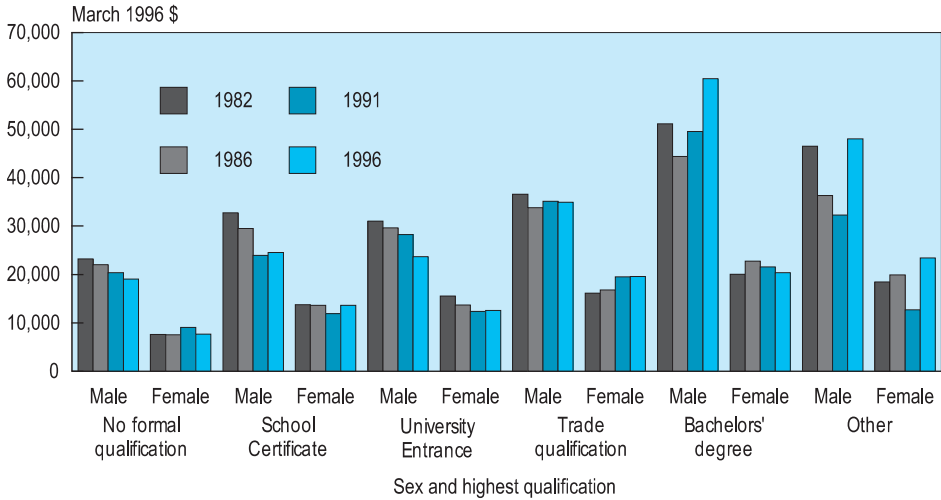


Source: Statistics New Zealand, Household Economic Surveys

Education

Figure 2.19

Average Personal Market Income by Sex and Highest Qualification, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 2.19 shows how market income generally increases with an increased level of educational qualification, from those with no formal qualification, to those with a Bachelors degree or higher. (See also Maani (1997) for analyses using census data for 1981 to 1991, concluding that there has been an increasing rate of return to education through the 1980s.) Again, however, there is a substantial gap between male and female average market incomes for each level of qualification. In part this is because of lower female participation in the paid workforce. It also appears that, for men at least, average incomes have been falling over time for those with no or lower levels of qualification. (The earlier proviso about tax-change effects applies in making these comparisons over the 1986 to 1991 period.) It is not possible to say definitely, however, that average incomes have increased for those with higher qualifications, perhaps apart from men with a Bachelors degree or higher. To reach more definite conclusions it would be necessary to examine changes over time in the age composition of each group.

Changes in the distribution of personal market income

Figure 2.20 shows the gini coefficients of market income at a personal level, using similar analyses to those presented earlier for wage and salary income.

Figure 2.20

Personal Market Income Gini Coefficients, 1982-1996

	1982	1986	1991	1996
<i>Gini coefficients</i>				
Market income recipients only (15-64 year age group)	0.451	0.452	0.498	0.519
Market income recipients only (15 years and above)	0.483	0.491	0.534	0.554
All 15-64 year olds	0.530	0.503	0.575	0.572
All people 15 years and above	0.566	0.542	0.611	0.609

Source: Statistics New Zealand, Household Economic Surveys

The trends are similar to the trends for wages and salaries shown in figure 2.10. This is not surprising given that wage and salary income is by far the largest component of market income. Again, the increase in inequality from 1986 to 1991, shown by the increase in the gini coefficients over this period, is very apparent.

Summary

Unemployment rose and employment fell from 1986 to 1992. However, strong employment growth resumed from 1992 to 1996.

Throughout this period, the long-established upwards trend in female workforce participation continued.

Wages and salaries contributed approximately 80 percent of market income for the study years. Women's wages and salaries rose steadily over the 1982-1991 period relative to men's. But women's average earnings and market income are still significantly lower than men's.

Wages and salaries, and market income fell for the Maori and Other ethnic groups relative to the European group. They also fell for those with no, or lower, educational qualifications.

When analysed by age and sex, the largest drop in market income from 1982 to 1996 was experienced by the young, particularly young males.

Wages and salaries, and market income overall became more unequally distributed. This increased inequality in wage and salary distribution was primarily driven by greater inequality in male wages and salaries. This changed largely between 1986 and 1991 and is at least partly caused by the fall in men's employment over those years. In contrast, there was no marked change in the inequality of women's wages and salaries.

Overall, a significant change occurred in labour market conditions and in the distribution of personal market incomes in the later part of the 1980s. Despite improved labour market conditions between 1991 and 1996, the increased inequality in the distribution of personal market income did not change correspondingly.

Chapter 3

From Personal Market Income to Disposable Income

This chapter builds on the previous chapter on market income. It contains analyses of the extent to which government transfers (benefits and pensions) and personal income taxes modify the distribution of individual market income.

The term “transfer income” is used to describe monetary transfers from the government to individuals, either as New Zealand Superannuation, or as social welfare benefit payments. The term “benefit income” covers the latter only.

Gross income is defined as the sum of market income plus transfer income. Disposable income is gross income less direct personal taxation.

The analyses in this chapter are in all cases for the population aged 15 or over, or for sub-groups of that population.

The social welfare system

Government transfer payments, although only about 13 percent of gross income from all sources, are important for many people. Some background knowledge of New Zealand’s social welfare system, and the direction of recent changes, is useful.

New Zealand’s social welfare system, unlike that of many countries, is financed almost entirely from general taxation. The framework of the present system was largely put in place in the 1930s by the then Labour government. The main benefit payments were:

- Income-tested pension from age 60 to 65.
- A universal pension from age 65.
- Income-tested benefits of which the main ones were the unemployment benefit, widows benefit, sickness and invalids benefit.

All had supplements for dependants. In addition, a universal family benefit was paid for each child. The domestic purposes benefit (DPB) was introduced in the 1970s as the number of sole-parent families increased.

Significant changes in the last couple of decades have included:

- The replacement in 1977 of earlier pension schemes by National Superannuation (later Guaranteed Retirement income, now New Zealand Superannuation). This provided a universal pension to people aged 60 and over. The age of entitlement to New Zealand Superannuation is being raised gradually from 60 to 65 over the period 1991 to 2001, and until recently, special surcharges on higher-income retired people have applied.
- A trend towards providing assistance to families in forms more targeted to lower-income families.

The social welfare system underwent reforms in 1991. The stated aim of these reforms was two-fold; to improve the government's fiscal situation by cutting expenditure and consequently bringing the country out of a "deep recession", and to encourage independence and decrease the "pattern of permanent dependency on the state".

These reforms entailed tightening of the eligibility criteria for all benefits and the establishment of work tests and stand-down periods, the incorporation of the formerly universal family benefit into targeted family support, and the cutting of most major benefit rates.

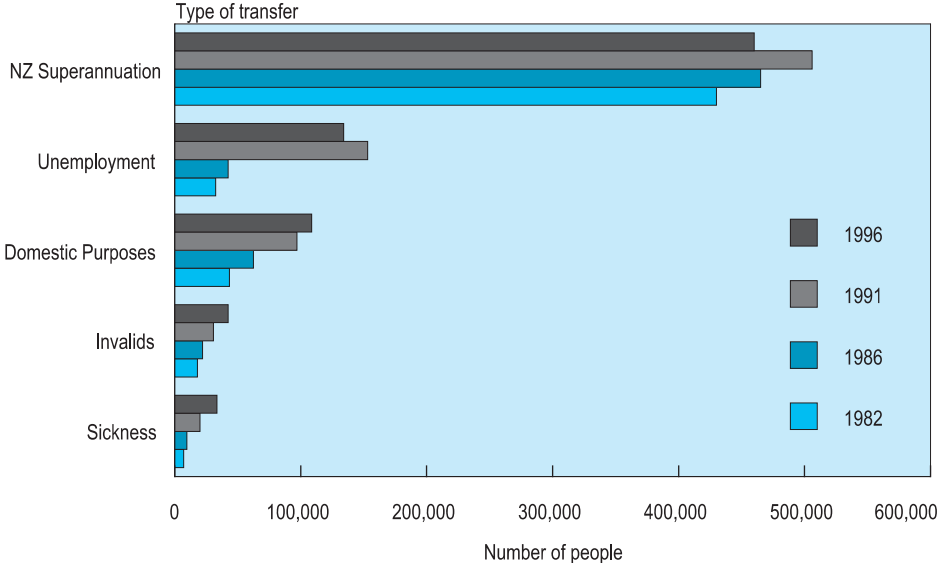
Government transfer income

The numbers of people receiving New Zealand Superannuation and social welfare benefits (with the exception of the family benefit) increased between 1982 to 1996. The family benefit was paid for every child until 1991, at which date it was incorporated into family support. Government expenditure on transfers and benefits, in March 1996 dollars, increased from \$6.8 billion in 1982 to \$9.1 billion in 1996.

As figure 3.1 shows, more people receive New Zealand Superannuation than any benefit, or the sum of the main benefits (defined here as the Unemployment, Invalids, Sickness and domestic Purposes benefits). There was a large increase between 1986 and 1991 in the numbers of people receiving the main "income-tested" benefits. The largest increase over this time was in numbers receiving the unemployment benefit, which increased from 42,000 to 153, 000.

Figure 3.1

Numbers of People Receiving the Major Government Transfers, 1982-1996



Source: Department of Social Welfare, Statistics Report, 1996

Transfer and benefit income as a proportion of gross income has increased over the period as shown in figure 3.2. These proportions for both transfer and benefit income decreased, however, from 1991 to 1996, reflecting the changes to the social welfare system which occurred on April 1 1991 and the economic recovery during the period.

Figure 3.2

Transfer and Benefit Income as a Percentage of Gross Income, 1982-1996

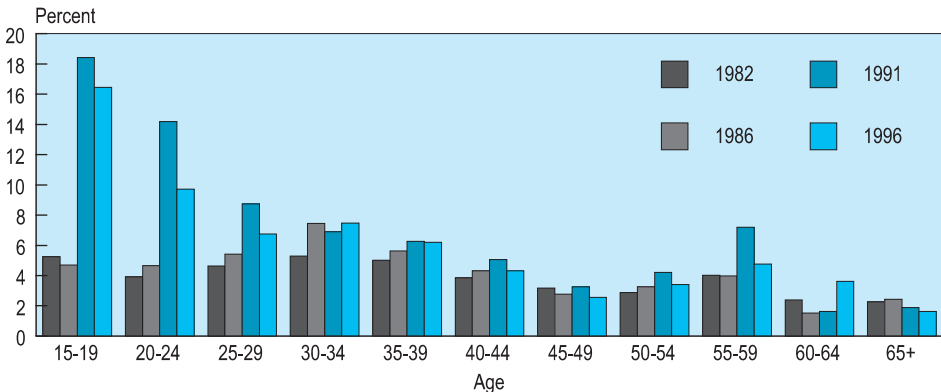
Type of income	1982	1986	1991	1996
	<i>Percent</i>			
Transfer income	12	13	17	13
Benefit income	4	4	6	5

Source: Statistics New Zealand, Household Economic Surveys

Over most age groups benefit income as a proportion of gross income increased from 1982 to 1996. Most age groups show a peak in this proportion in 1991, with the most significant increase occurring between 1986 and 1991 as figure 3.3 shows. This increase was particularly large for the 15 to 24-year-old group.

Figure 3.3

Benefit Income as a Percentage of Gross Income by Age, 1982-1996

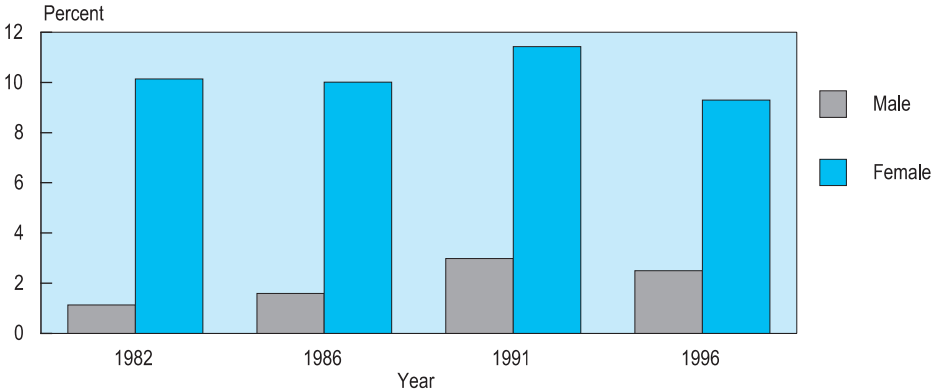


Source: Statistics New Zealand, Household Economic Surveys

Women receive significantly more of their income from benefits than do men. The proportion of gross income received from benefits increased for both sexes from 1982 to 1991, as seen in figure 3.4. From 1991 to 1996, this proportion decreased for both sexes.

Figure 3.4

Benefit Income as a Percentage of Gross Income by Sex, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Māori and the Other ethnic group receive a greater proportion of their gross income from benefits than do Europeans. (The European ethnic group, because of its older age structure, receives a larger proportion of New Zealand Superannuation payments.) As figure 3.5 shows, the proportion of gross income received from benefits increased from 1982 to 1991 for the Maori and the Other ethnic group before decreasing in the 1991 to 1996 period.

Figure 3.5

Benefit Income as a Percentage of Gross Income by Ethnic Group, 1982-1996

Ethnic group	1982	1986	1991	1996
	<i>Percent</i>			
European	3	4	5	4
Māori	10	14	23	15
Other	6	7	12	10

Source: Statistics New Zealand, Household Economic Surveys

Figure 3.6 shows that benefit income as a proportion of gross income increased dramatically from 1982 to 1996 for those with no formal qualifications from 6 percent to 15 percent. This reflects the changing labour market, where there has more recently been an emphasis on skills and knowledge, and also the gradual exit from the labour force of older people with experience but without qualifications. From 1982 to 1996 benefits increased as a proportion of gross income over all categories except for those with a Bachelors degree, and those with an “Other” qualification.

Figure 3.6

Benefit Income as a Percentage of Gross Income by Highest Qualification, 1982-1996

Highest qualification	1982	1986	1991	1996
	<i>Percent</i>			
No formal qualification	6	7	14	15
School Certificate	4	5	8	6
University Entrance	2	3	5	4
Trade qualification	2	3	3	3
Bachelors degree	1	1	2	1
Other qualification	2	2	4	2

Source: Statistics New Zealand, Household Economic Surveys

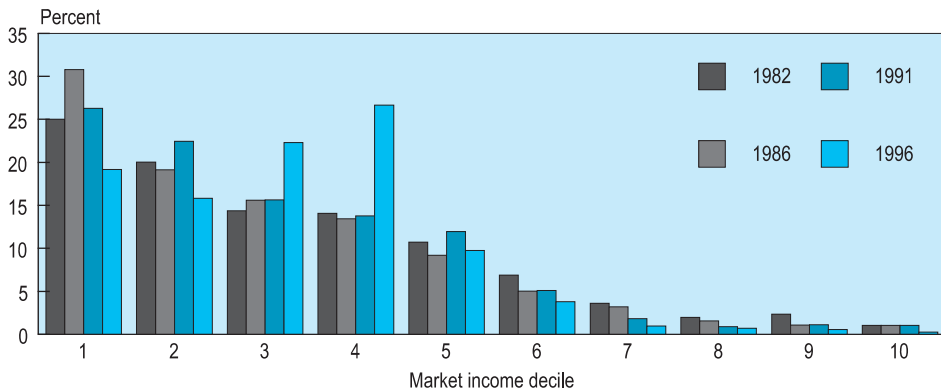
Distribution of transfer income across deciles

Figures 3.7 and 3.8 show the distribution of benefit income and New Zealand Superannuation respectively, across personal market income deciles.

People in the lower market income deciles one to four receive over three quarters of the benefit income transferred to individuals by government, and this has been increasing over time. From 1982 to 1996 the share of benefit income received by deciles three and four has increased markedly, so that by 1996, their share was greater than that of deciles one and two. All other deciles experienced a decrease in their share of benefit income over the period.

Figure 3.7

Distribution of Benefit Income Across Market Income Deciles, 1982-1996

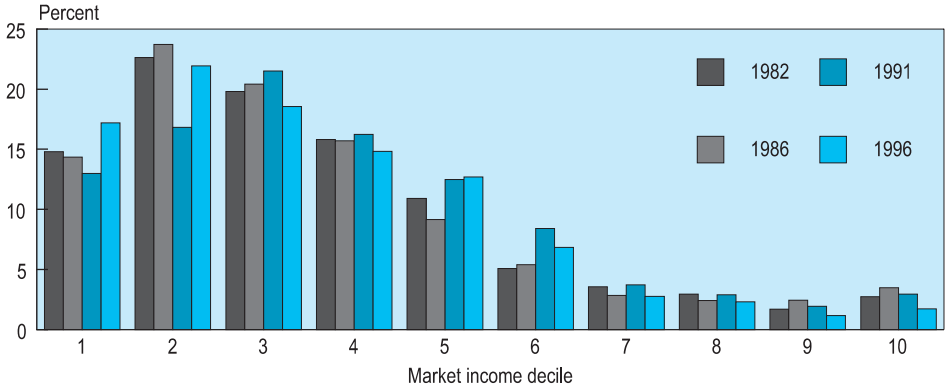


Source: Statistics New Zealand, Household Economic Surveys

Figure 3.8 illustrates no marked shift in the distribution of New Zealand Superannuation income over time. The largest shares are received in the second and third market income deciles although substantial proportions of New Zealand Superannuation are received in all market income deciles below decile six.

Figure 3.8

Distribution of New Zealand Superannuation Income Across Personal Market Income Deciles, 1982-1996



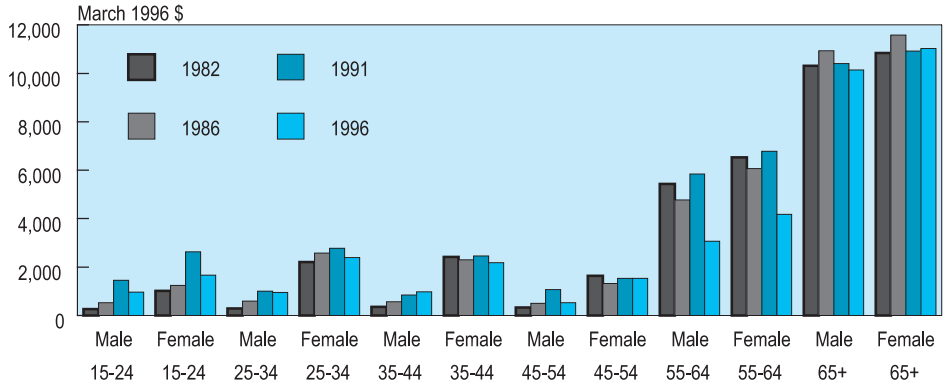
Source: Statistics New Zealand, Household Economic Surveys

Transfer income

Transfer income, as defined in this book, consists of benefit income, New Zealand Superannuation and student bursaries. Figure 3.9 shows transfer income by age and sex for the study years. Women gain more transfer income than men for all age groups in these years.

Figure 3.9

Average Transfer Income by Sex and Age Group, 1982-1996



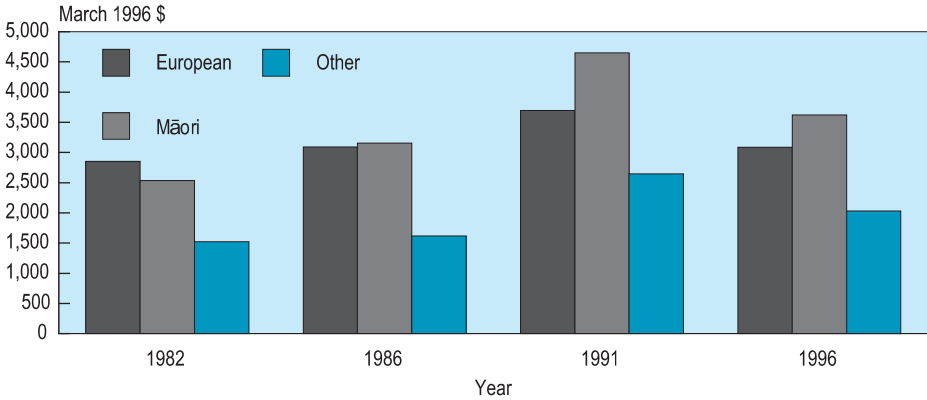
Source: Statistics New Zealand, Household Economic Surveys

Figure 3.10 shows that the average transfer income was relatively even across the ethnic groups analysed for the study years. The exception was in 1991 when average transfer income was higher for Maori than other ethnic groups, reflecting high Maori

unemployment at this time. The European ethnic group gains significantly more income from New Zealand Superannuation than the other ethnic groups, reflecting its older age structure.

Figure 3.10

Average Transfer Income by Ethnic Group, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Personal gross income

Government transfers add to individuals' market income, particularly to that of individuals or households who would otherwise have low or zero income. Figure 3.11 shows market income plus New Zealand Superannuation and benefits adding to gross income for the study years.¹

Figure 3.11

Average Personal Market, Transfers and Gross Incomes

	1982	1986	1991	1996
	<i>March 1996 \$</i>			
Personal market income	20,300	19,500	18,500	19,800
plus NZ Superannuation	1,800	2,000	2,200	1,800
Benefits	900	1,000	1,400	1,200
<i>equals</i>				
Personal gross income	23,100	22,500	22,100	22,800

Source: Statistics New Zealand, Household Economic Surveys

It is important to note that trends in these numbers are affected by the changes in the tax system from October 1986 onwards (including the cuts in middle and upper-income-bracket tax rates in October 1988, and the increase in GST from 10 percent to 12.5 percent in 1989). These changes increased indirect taxes and decreased direct

¹ Included in this is a small amount for student bursaries. These are not included in benefits or New Zealand Superannuation but are included in total transfer income.

taxation on personal incomes. Pensions and benefits were adjusted for the effect on prices of the increases in indirect taxation. But market and gross income were reduced in real terms as a result of the price increases. Offsetting this was the increase in after-tax income as a result of the reduction in direct tax rates.

This means that it is not possible to make comparisons of market income and gross income between 1986 and 1991 on a consistent basis. Comparisons of after-tax disposable income are valid if it is assumed that the changes were approximately fiscally neutral overall which in this context means that total taxation before the introduction of GST was similar to total taxation after the introduction of GST.

The fall in real average gross income from 1986 to 1991, seen in figure 3.11, is therefore in part at least a consequence of the tax changes in that period. The subsequent increase, however, does reflect the economic recovery from 1991 to 1996.

The components of gross income are wage and salary income, income from self-employment, investment income, income from New Zealand Superannuation, benefit income and income from other sources. The contribution each of these components makes to gross income, for each of the study years, can be seen in figure 3.12.

Figure 3.12

Percentage of Gross Income by Source, 1982-1996

Type of income	1982	1986	1991	1996
	<i>Percent</i>			
Wages and salaries	71	67	67	68
Self employment	11	10	9	11
NZ Superannuation	8	9	10	8
Benefits	4	4	6	5
Investment income	5	7	6	5
Other (incl. Private superannuation)	2	2	2	3

Source: Statistics New Zealand, Household Economic Surveys

Over the period 1982 to 1996 women's average gross income increased as a proportion of men's average gross income from 44 percent to 54 percent, as seen in Figure 3.13. This increase reflects both the increased participation of women in the labour force, and for earners, a reduction in the gap between women's and men's incomes.

Figure 3.13

Average Personal Gross Income by Sex, 1982-1996

Year	Male gross income	Female gross income	Female income as a percentage of male income
	<i>March 1996 \$</i>		<i>Percent</i>
1982	32,300	14,300	44
1986	30,500	15,000	49
1991	29,400	15,700	54
1996	30,200	16,200	54

Source: Statistics New Zealand, Household Economic Surveys

Disposable income

Disposable income is money a person has after government transfers and taxes are taken into account. Figure 3.14 shows that average personal disposable income increased from 1982 to 1996 in real terms, although it did decrease from 1982 to 1986.

Figure 3.14

Average Personal Disposable Income by Sex, 1982-1996

Year	Average disposable income	Male disposable income	Female disposable income	Female income as a percentage of male income
		<i>March 1996 \$</i>		<i>Percent</i>
1982	16,900	22,500	11,500	51
1986	16,300	21,200	11,600	55
1991	17,200	22,000	12,800	58
1996	17,500	22,500	13,000	58

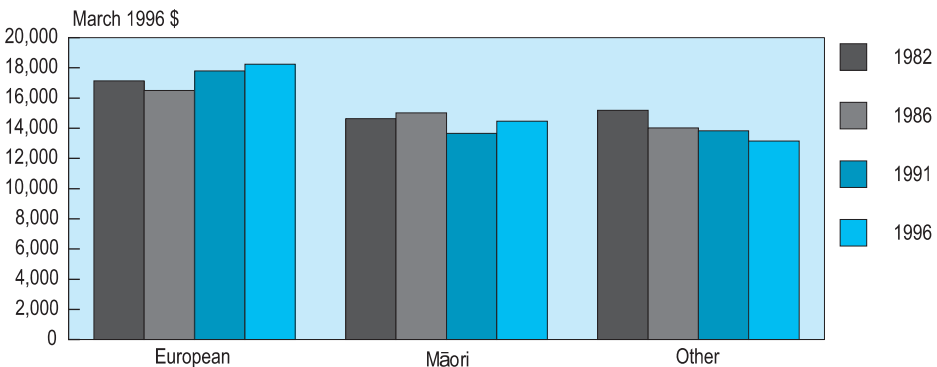
Source: Statistics New Zealand, Household Economic Surveys

From 1982 to 1996 women’s disposable income as a percentage of men’s disposable income increased from 51 percent to 58 percent. Like the increase for gross income, it is due to growing numbers of women joining the labour force and their average incomes increasing relative to men’s. The ratio did not continue to improve in the 1991 to 1996 period.

Figure 3.15 shows disposable income over time by ethnic group. The significant feature is the increase from 1982 to 1996 in European average disposable income, and a downward trend for the “Other” ethnic group. Average disposable income for Maori was relatively steady over this period.

Figure 3.15

Average Personal Disposable Income by Ethnic Group, 1982-1996



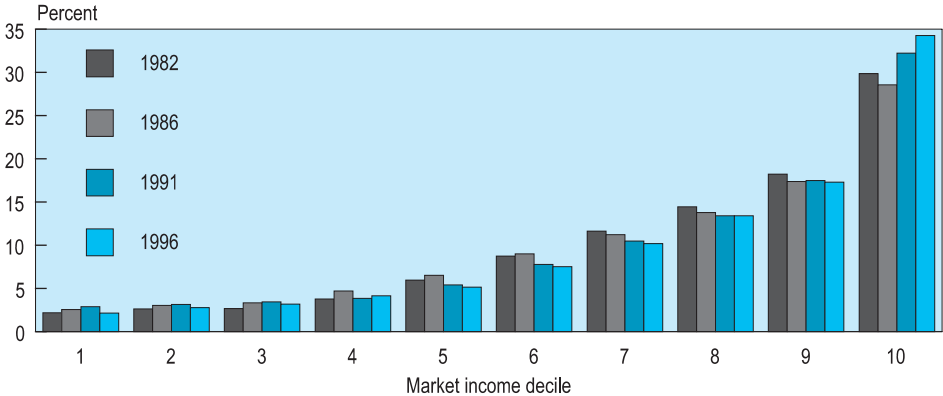
Source: Statistics New Zealand, Household Economic Surveys

Distribution of personal incomes

Market income is unequally distributed, as discussed in Chapter 2. The intention of government’s transfer payments and tax deductions is to distribute income more equally. Income distribution and income inequality are usually examined at a household level, as a person’s standard of living is determined more by household income than personal income. Income distribution at a personal level provides, however, an indication of the fundamental forces underlying household income differences.

Figure 3.16

Distribution of Personal Gross Income Across Personal Market Income Deciles, 1982-1996



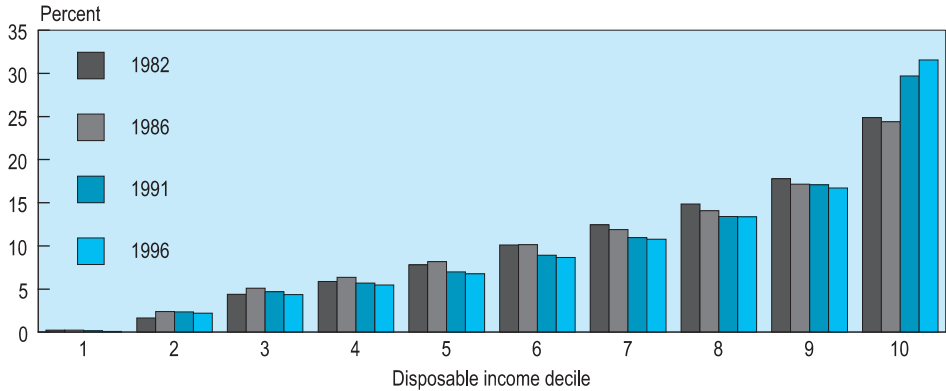
Source: Statistics New Zealand, Household Economic Surveys

Figure 3.16 shows that those in the highest market income decile receive around one-third of total gross income. Between 1986 to 1996 this figure rose from 29 percent to 34 percent of gross income.

For disposable income analysed by disposable income decile, the pattern is much the same, as figure 3.17 shows. Decile ten, the highest disposable income decile, receives the greatest share of disposable income (32 percent in 1996) and this share has been increasing over time. Figures 3.16 and 3.17 show while the top decile’s share of income has increased, the share of total gross income gained by those in the middle deciles has dropped.

Figure 3.17

Distribution of Personal Disposable Income Across Personal Disposable Income Deciles, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Do the changes over time in the distribution of income across deciles indicate that the distribution of individuals' incomes in New Zealand is becoming more unequal? Gini coefficients are one way to measure income inequality. The gini coefficient ranges between zero and one. The closer the number is to one the more unequal is the income distribution (see Appendix A6 for further explanation). Figure 3.18 shows gini coefficients for market, gross and disposable income, for individuals.

Figure 3.18

Distribution of Personal Income - Gini Coefficients, 1982-1996

Type of income	1982	1986	1991	1996
<i>Gini coefficient</i>				
Market income	0.566	0.542	0.611	0.609
Gross income	0.472	0.437	0.474	0.495
Disposable income	0.414	0.386	0.437	0.456

Source: Statistics New Zealand, Household Economic Surveys

For all years the distribution of disposable income is the most equal. This is to be expected, as taxes and transfers are designed to equalise income distribution. From 1982 to 1996 income distribution became more unequal for all three types of income. 1986 was the year of greatest equality. From 1986 to 1991 there was a significant increase in income inequality in personal incomes. From 1991 to 1996, the income distribution of disposable income did not become more equal. The apparent increases in this period however, unlike those in the previous period, may not be statistically significant (the measurement of the statistical significance of changes in the gini coefficients for household income are discussed in this Appendix A2).

Summary

The number of people receiving benefits and New Zealand Superannuation increased from 1982 to 1996. The largest increase was in the numbers on the unemployment benefit. The increase was concentrated in the period between 1986 and 1991.

Numbers of people receiving benefits and New Zealand Superannuation fell in the 1991 to 1996 period.

From 1986 to 1991 New Zealand Superannuation and benefit income became a greater proportion of gross income. This increase was particularly significant for the young, for Maori and "Other" ethnic groups, and for those with no formal qualifications.

Women's average gross income increased relative to men's, to 54 percent of the average male gross income in 1996. Women's average disposable income increased to 58 percent of men's average disposable income in 1996.

The European ethnic group was the one group to experience a significant increase in average disposable income between 1982 to 1996.

The top disposable income decile's share of disposable income has been increasing over time.

Income inequality at a personal level increased between 1986 and 1991 for market, gross and disposable income and was steady between 1991 and 1996. These trends in income inequality are similar to the trends in inequality of wages and salaries.

Chapter 4

Household market incomes, transfers and taxes.

In earlier chapters we examined individuals' incomes. We now examine the incomes of households. It is within households that income and wealth are pooled, and consumption and savings decisions made. An individual's standard of living is determined not by their income, but by the resources available as a whole to the household in which that individual lives. Thus in examining differences in the standard of living, the natural unit of study is the household.¹

This chapter classifies households into 15 life-stages for analytical purposes. These lifestages are described in more detail in Appendix A6. The chapter initially analyses market income trends at a household level before focusing on trends in transfers and taxes at a household level.

Households and household income

New Zealand households are of many types. Their composition has changed over the years, with an increasing diversity of living arrangements. This section of the chapter discusses the changing composition of New Zealand households, before going on to discuss the income outcomes for those households. Definitions of terms used are in Appendix A6.

Household incomes are then discussed from a number of viewpoints:

- Measures of "average" (mean) and median household incomes, and trends in these from the 1980s to the mid 1990s.
- The experience of different household types; eg families with children, pensioners, sole-parent households and so on.
- How much, and by what means (income-tested benefits, pensions and taxes) government redistributes income among different types of households, and between households at different income levels.

This discussion builds towards the following question which is addressed in Chapter 5:

- Whether the resulting degree of inequality in household incomes is decreasing or increasing over time.

For the market income analyses in this chapter, incomes are analysed without any adjustment for household size and composition. This is referred to as "actual" income. For the subsequent chapters on disposable income, however, a different approach is followed. A household's standard of living is determined by its disposable income in relation to the number of people in the household, and their life-stage, in particular, how many children there are in relation to the number of adults. The different commitments households have because of their size and composition need to be taken into account in considering the distribution of income. We use "equivalence scales" to

¹ It can be argued that the natural unit of analysis is the family as opposed to the household, as income is perhaps more likely to be shared at a family level than a household level. In the Household Economic Survey (HES), the bulk of households are family groupings, so the practical difference is relatively small.

adjust household incomes to allow for these differing commitments. Comparisons of “equivalent disposable income” are better for measuring differences in “standards of living” than are comparisons of “actual” (non-equivalent) household disposable income.

Actual household market income rather than equivalent household market income is presented in this chapter as it allows a direct answer to the question, “by how much does government change the original distribution of market income through taxes, benefits, and other government activity?” In Chapter 5, equivalent household market income has been presented where a comparison with equivalent household disposable income has been made.

New Zealand households by life-stage, 1982 to 1996

Figure 4.1 shows the number of households in each of the 15 life-stage types for the last four censuses. The life-stage household classification is described in Appendix A6. Household types 1 to 3 are single-person households, types 4 to 6 are couple-only households; 7 to 12 are couple-with-children households in increasing order of the female partner’s age, household type 13 consists of sole-parent households, type 14 of “other” family, and type 15, non-family households. It should be noted that in this classification “children” includes adult children as well as dependent children.

Figure 4.1

Number of Households by Life-stage Type, 1981-1996

Life-stage type	1981	1986	1991	1996
	<i>Number of households</i>			
Sole occupant - aged less than 40	35,910	43,173	50,667	55,617
Sole occupant - aged 40 to 64	52,176	62,730	73,929	86,592
Sole occupant - aged 65 or over	81,159	97,572	111,390	122,154
Couple without children - female aged less than 40	58,539	70,881	75,810	80,439
Couple without children - female aged 40 to 64	94,692	114,657	130,527	148,689
Couple without children - female aged 65 or over	53,046	64,230	72,384	78,651
Couple with children - female aged less than 30	75,411	78,261	61,653	47,181
Couple with children - female aged 30 to 34	76,128	79,005	77,160	71,919
Couple with children - female aged 35 to 39	80,799	83,850	79,809	84,351
Couple with children - female aged 40-44	60,303	62,580	72,732	72,237
Couple with children - female aged 45-49	42,462	44,067	44,493	51,858
Couple with children - female aged 50 or over	54,498	56,556	52,557	51,150
Sole parent households	62,514	85,377	108,435	114,957
Other family groups and non family households	175,461	145,662	166,122	210,534
All households	1,003,113	1,088,601	1,177,668	1,276,329

Source: Statistics New Zealand, Censuses of Populations and Dwellings

Some general trends are apparent from figure 4.1:

- The increase in retired-living-alone households.
- The increase in middle-aged couple-only households.
- A decline in couple-with-children households, especially for the youngest age group (female partner aged under 30).
- An increase, at least until 1991, in the number of sole-parent households.

These shifts are an outcome of demographic factors - people living longer, couples choosing to have fewer children and having them later in life - and social changes - an increase in family breakdown, and changes in work patterns.

The shifts in household type also have an effect over time on income distribution - both on average household income and on the distribution of household incomes. In particular, increases in the proportions of retired households and sole-parent households are likely to reduce average household income, and also to increase income inequality. (This is discussed further in Appendix A3. Inconsistencies in the proportions of each life-stage type between the HES and the census are discussed and the effect of these inconsistencies on the income distribution are investigated in this Appendix. In general, retired households appear to be over-represented in HES.)

Average household size as recorded in the HES has fallen over the study years, from 3.02 people per household in 1982 to 2.74 people in 1996. This reflects not only the shift towards retired-alone and sole-parent households, but also a tendency for the average size to fall for most couple-with-children households. Figure 4.2 shows average numbers by life-stage type.

Figure 4.2

Average Household Size by Life-stage Type, 1982-1996

Life-stage type	1982	1986	1991	1996
	<i>Number of people</i>			
Sole occupant - aged less than 40	1.0	1.0	1.0	1.0
Sole occupant - aged 40 to 64	1.0	1.0	1.0	1.0
Sole occupant - aged 65 or over	1.0	1.0	1.0	1.0
Couple without children - female aged less than 40	2.0	2.0	2.0	2.0
Couple without children - female aged 40 to 64	2.0	2.0	2.0	2.0
Couple without children - female aged 65 or over	2.0	2.0	2.0	2.0
Couple with children - female aged less than 30	3.9	4.0	3.7	3.6
Couple with children - female aged 30 to 34	4.5	4.5	4.4	4.3
Couple with children - female aged 35 to 39	4.7	4.5	4.4	4.4
Couple with children - female aged 40-44	4.5	4.3	4.1	4.2
Couple with children - female aged 45-49	4.1	4.0	3.8	3.8
Couple with children - female aged 50 or over	3.6	3.7	3.4	3.4
Sole parent households	2.8	2.9	2.7	2.9
Other family groups	5.4	5.1	4.5	4.2
Non-family households	3.0	2.4	2.3	2.8
Total	3.0	2.9	2.7	2.7

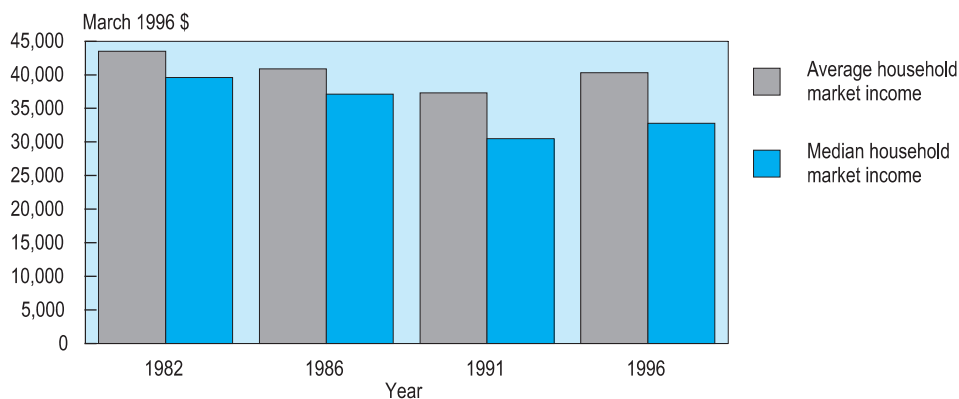
Source: Statistics New Zealand, Household Economic Surveys

Average household market incomes - trends and source of income

Average household income from the market amounted to \$40,300 in 1996. Median household market income was lower at \$32,800.

Figure 4.3

Average and Median Household Market Income, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 4.3 shows that average actual household market income fell significantly from 1982 to 1991, and then recovered somewhat by 1996. The 1996 average, however, was still less than the 1982 and 1986 averages.^{2, 3}

Figure 4.4 shows that median real household market income fell sharply between 1982 and 1991 and recovered somewhat in the 1991-1996 period. In the first two periods considered, average household income exceeded median income by approximately 10 percent. In the later two periods, the excess was over 20 percent. This in itself suggests an increase in income inequality for household market incomes. Either the household income for those at the upper end of the income distribution has increased, causing the average to increase relative to the median, or many households in the middle part of the income distribution have had a fall in income, causing the median to fall relative to the average. Both effects are present.

² Most trends in this report did not change significantly once the HES data was adjusted to account for census life-stage proportions. The trend in average household market income did change slightly, however. See Appendix A3 for more details.

³ The effect of the introduction of GST on the CPI and the associated tax cuts must be considered when data such as figure 4.3 (which report on level of market or gross incomes) are examined. GST had the effect of increasing prices, so is therefore included in the CPI. At the time of the GST introduction, there was a decrease in personal income taxes which had the effect of increasing disposable incomes. Comparisons of levels of disposable income deflated by the All Groups CPI over time are valid, while comparisons of pre-tax income (either market or gross) are somewhat less valid. More discussion on this point is in Appendix A6.

Figure 4.4

Sources of Average Household Market Income, 1982-1996

	1982	1986	1991	1996
	<i>March 1996 \$</i>			
Wages and salaries	34,900	31,800	29,800	31,500
Self employment	5,400	4,800	3,900	5,000
Investment income	2,400	3,500	2,800	2,500
Other market	800	800	900	1,300
Average market income	43,500	40,900	37,300	40,300
	<i>Percent of average market income</i>			
Wages and salaries	80	78	80	78
Self employment	12	12	10	12
Investment income	5	9	7	6
Other market	2	2	2	3

Source: Statistics New Zealand, Household Economic Surveys

Figure 4.4 shows the sources of household market income. In broad terms, wage and salary income accounts for nearly 80 percent, self-employment income for another 10 to 12 percent and the remainder is investment and other market income.

Figure 4.5 sets out differences in household market income by life-stage type, and also examines market income sources. As would be expected, the household types with particularly low market incomes on average are retired households and sole-parent households. High average incomes from the market are received by couple and older couple-with-children households, which are larger, as discussed above. Larger households have on average more earners, but they also require more income to satisfy their consumption needs.

Self-employment and investment income increase in importance, relative to wages and salaries, with the increasing age of the household.

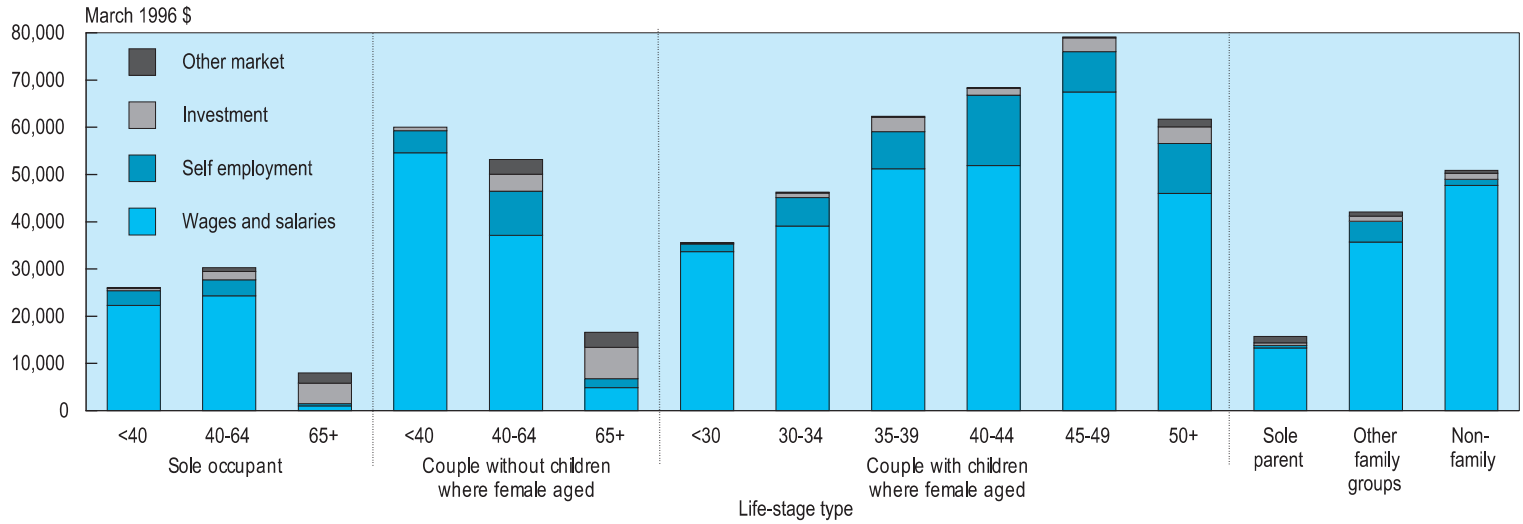
Changes in average market income for the different life-stage types are shown in figure 4.6. For sampling error reasons it is necessary to be cautious about highlighting trends. The figure does suggest, however, that sole-parent households and younger households have seen their position worsen relative to older households.

The distribution of actual household market income

Clearly household market income is distributed unevenly. This is to be expected. There will always be a substantial proportion of households who receive little market income, particularly many pensioner households. The questions to be answered are

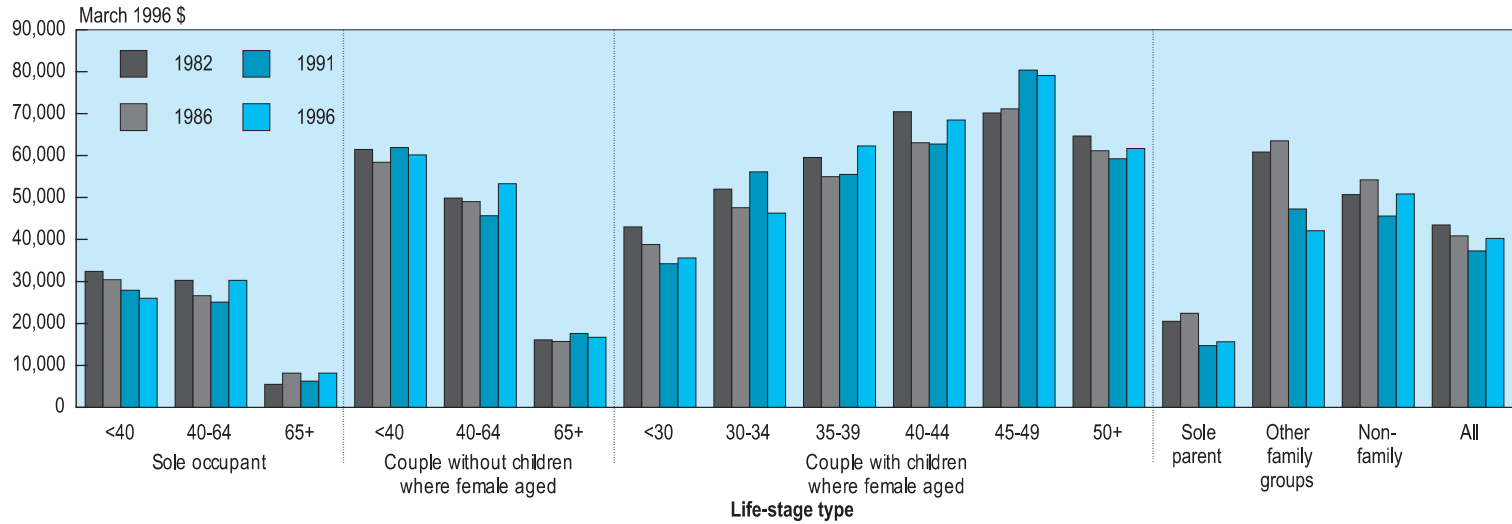
- whether the distribution has been getting less equal or more equal over time (and if so, why), and
- to what extent the inequality of market income distribution is reduced by income transfers and taxation. The latter question is addressed in subsequent sections of this chapter.

Figure 4.5
Average Household Market Income by Source and Life-stage Type, 1996



Source: Statistics New Zealand, Household Economic Survey

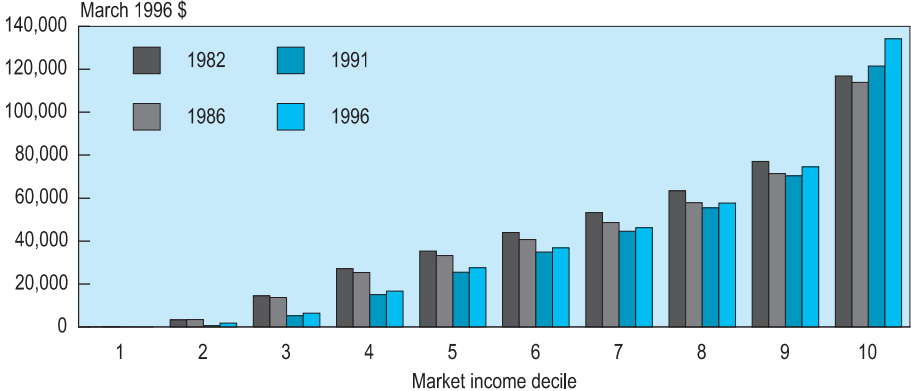
Figure 4.6
Average Household Market Income by Life-stage Type, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 4.7 presents average household market income for 1982 to 1996 in real dollars by market income deciles.

Figure 4.7
Average Household Market Income by Household Market Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

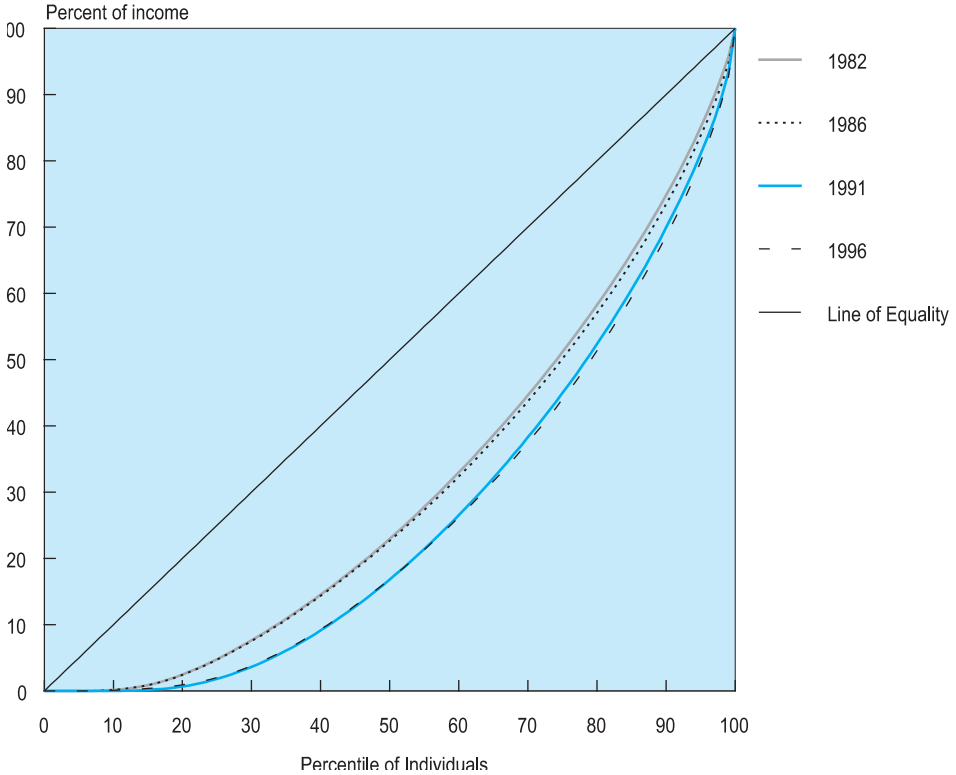
Real market income fell for all deciles between 1982 and 1986 (in part a result of the 1982-84 wage and price freeze), with the marginal exception of the bottom two deciles. Between 1986 and 1991 significant differences emerged. In particular, the top decile experienced an increase in average market income, while all other deciles experienced a decline in real terms. The fall was particularly marked for households from decile 3 to decile 6 of the distribution.

Between 1991 and 1996 all deciles recorded a recovery in market incomes.

Households in decile 10 were the only ones to have a significantly higher average market income in 1996 than in 1982, increasing from \$116,800 to \$134,100. This conclusion and the comments in the paragraph above, are subject to the condition previously footnoted (footnote 3) which discusses the effect of GST on the CPI.

Another way of presenting these changes is in the form of Lorenz curves (Lorenz curves are described in Appendix A6). This is done in figure 4.8. The curves dramatically show the break between the earlier and later periods. The two curves for 1982 and 1986 are virtually indistinguishable. Likewise for 1991 and 1996. But between the mid-1980s and early 1990s the curves become significantly more “bowed”. That is, there is a noticeable shift towards greater inequality of market income during the 1986-1991 period. Figure 4.8 shows that despite the economic recovery from 1991 to 1996 and improvement in labour market conditions over this period, market income inequality did not reduce, but rather remained at about the 1991 level.

Figure 4.8
Household Market Income Lorenz Curves, 1982-1996

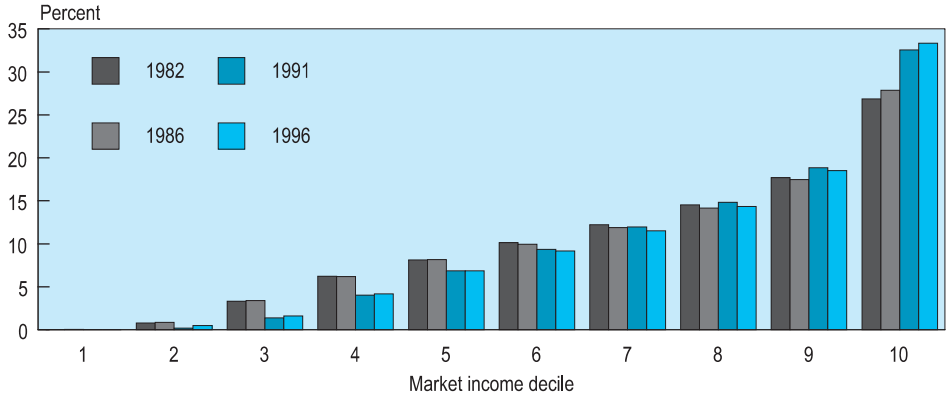


Source: Statistics New Zealand, Household Economic Surveys

Figure 4.9 shows a further way of presenting these shifts. It shows the shares of market income received by each market income decile from 1982 through to 1996. The figure shows similar trends to figure 4.7. There was an overall increase in market income share for decile 10. Deciles 1 and 2 recorded very low shares of market income in all of the study years. Deciles 3 to 6 showed noticeable declines in their share of total market income while decile 10 showed a large increase in its share of market income. This increase largely occurred in the 1986-1991 period. The shift to greater market income inequality primarily took place at the middle to the top of the income distribution.

Figure 4.9

Distribution of Household Market Income Across Household Market Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

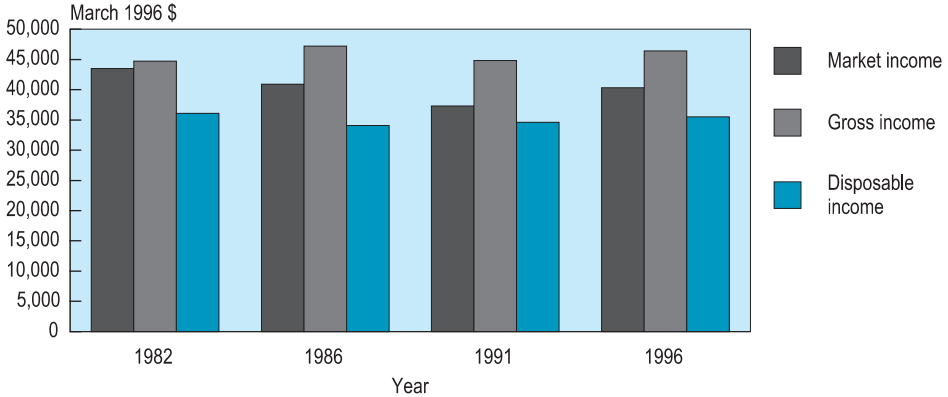
Government's redistribution of income

The government intervenes to alter the distribution of market income among households. It transfers income to households in the form of New Zealand Superannuation (and veterans' pensions), income-tested benefits (eg Domestic Purposes Benefit (DPB), widows' benefit, unemployment, sickness and invalids' benefits), as well as supplementary benefits such as the accommodation supplement. These, added to market income, make up gross income (the income concept normally collected in population censuses). The government taxes income to pay for these transfers and other government operations. The deduction of personal income tax from gross income gives net or disposable income; the "cash in hand" available to households for consumption and savings.

Figure 4.10 depicts these transitions, measured in March 1996 dollars. Average household market income fell, as discussed earlier, from 1982 to 1991, and then recovered somewhat by 1996. The effect of the government's redistributive activities is to smooth out fluctuations in market income. In particular, benefits increase and taxes decrease during a recession. Thus average disposable income fell much less than market income during the 1980s, and in 1996 was not much lower than 14 years earlier.

Figure 4.10

Average Household Market, Gross and Disposable Income, 1982-1996



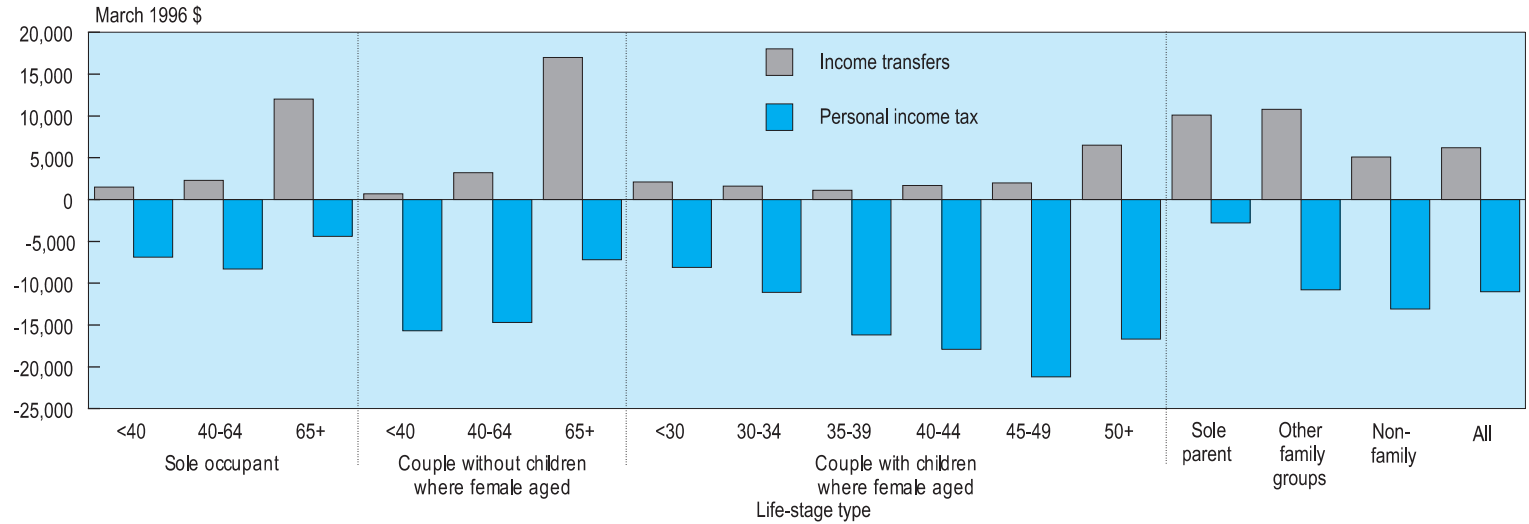
Source: Statistics New Zealand, Household Economic Surveys

Figures 4.11 and 4.12 show average income transfers to households (gross less market income), and average direct income taxes paid by households (disposable less gross income) including family support adjustments, during 1996; first by life-stage type, and then by market income deciles. Figures 4.13 and 4.14 exhibit the net income shift (transfers less taxes - or disposable less market income) for these categories for the four years analysed. A description of inclusions and exclusions in the various concepts of income is in Appendix A6.

From Figure 4.11, we see that income transfers are highest on average for households which include a number of people qualifying for New Zealand Superannuation. Income transfers are also high on average for sole-parent households, and other family households. Taxes are high on average for couple households, and older couple-with-children households.

It is important to remember that these are household life-stages and that people move between these during their lives.

Figure 4.11
Average Taxes and Transfers by Life-stage Type, 1996

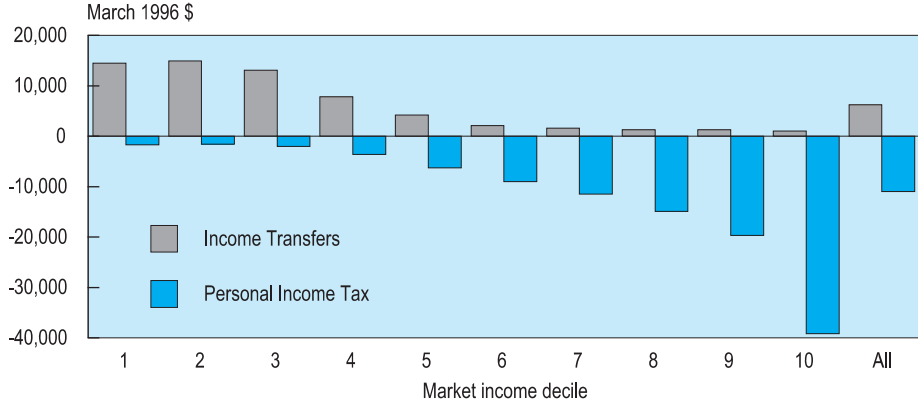


Source: Statistics New Zealand, Household Economic Surveys

Figure 4.12 shows income transfers to be highest on average for households in the three bottom deciles, though some households in all deciles receive benefits or pensions in one form or other. Generally, tax payments increase progressively with the income decile, approaching \$40,000 per year for households in decile 10 in 1996.

Figure 4.12

Average Taxes and Transfers by Household Market Income Decile, 1996

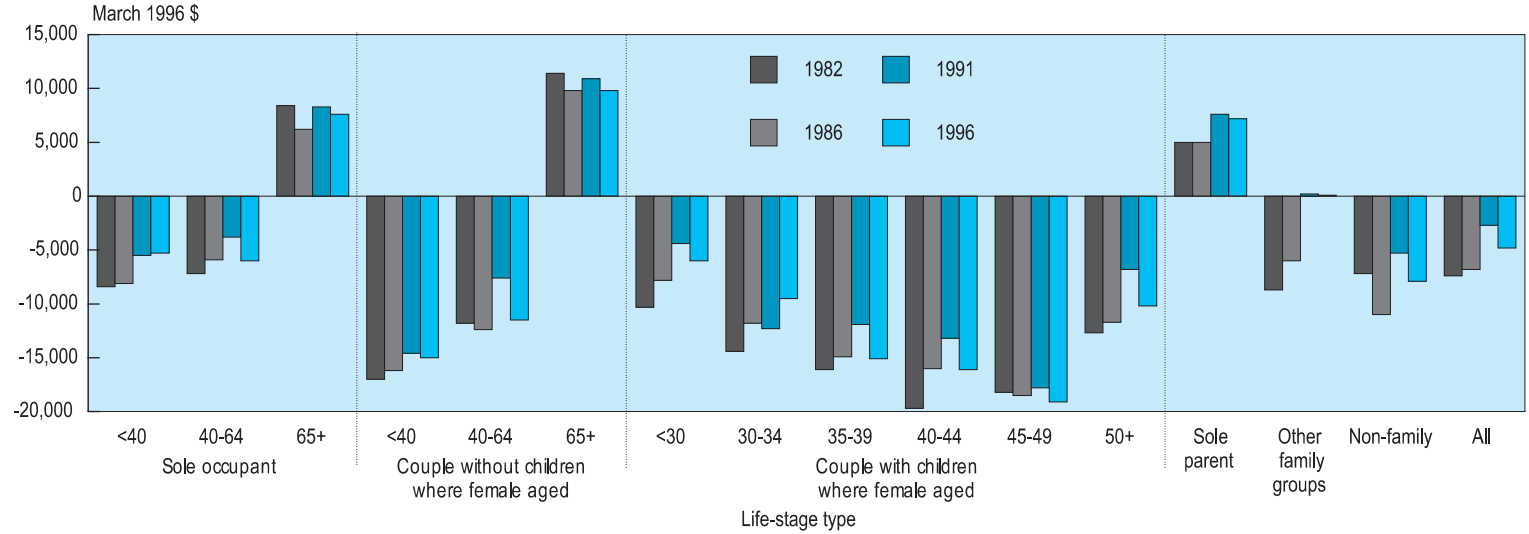


Source: Statistics New Zealand, Household Economic Surveys

Figures 4.13 and 4.14 show changes over time in the net difference of transfers less taxes. Figure 4.13 shows that the major net gainers from government redistribution are retired and sole-parent households. It appears that sole-parent households have gained more from income transfers in 1991 and 1996 than in earlier years. In general, for most household types the net negative impact of transfers less taxes has diminished. This is especially so for younger couple with children households. This is probably a result of the fall in market income for these, and sole-parent households (as shown in figure 4.6).

Figure 4.13

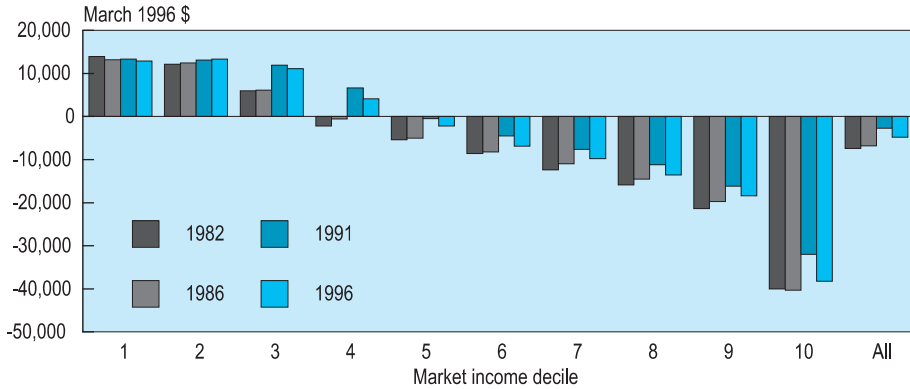
Average Transfer less Taxes by Life-stage Type, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 4.14

Average Transfers less Taxes by Household Market Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 4.14 shows that net recipient households have extended further up the income scale (in terms of household market income ranking) in recent years. In 1982 and 1986, income transfers on average exceeded taxes paid only for households in the bottom three deciles. In the later periods, 1991 and 1996, households in decile 4 also gained on average from government’s cash redistribution.

Summary

The introduction of GST and associated decrease in personal tax rates mean that comparisons over the 1986-1991 period of pre-tax income are flawed somewhat. Having said this, average actual household market income fell in real terms between 1982 and 1996. Average actual market income fell by 7 percent from \$43,500 to \$40,300. Median household actual market incomes fell more sharply. Median market income fell by 17 percent from \$39,600 to \$32,800.

The fall in average household market income occurred in both the 1982-1986, and 1986-1991 periods. The fall in median income was, however, very much concentrated in the later 1980s, from 1986 to 1991.

There has been an increase in average household market incomes in the 1991-1996 period.

In part, the fall in average household incomes is due to the fall in average household size as measured in the HES; from 3.0 people in 1982 to 2.7 in 1996.

The distribution of actual market income at a household level became more unequal from 1986 to 1991, but was steady from 1982 to 1986 and 1991 to 1996.

In 1982 and 1986, households from deciles 1-3 of household market income deciles gained more transfer income on average than they paid in tax. In 1991 and 1996, households in market income decile 4 also gained more on average in transfer income than they paid in tax.

Chapter Five

Household Disposable Incomes

This chapter focuses on trends in household disposable income. This is the most appropriate measure for analysing trends in income inequality.

Disposable income and equivalent disposable income

Disposable income is the amount of cash available for consumption or savings after transfers and taxes. For households we refine this further by applying equivalence scales. These seek to adjust the incomes of households of differing sizes and composition so that they can be measured on a common “scale of well-being” (in terms of income - there are of course many other factors which influence household well-being). The equivalence scale used here is the Revised Jensen scale (RJS), assigning a value of one to couple households. Larger households have their actual incomes scaled down and smaller households have their income scaled up. It should be noted that the equivalent income which results is a statistical artefact, useful for comparing households on a standardised basis, but not otherwise corresponding to any “real life” income concept.

Figure 5.1

Household Actual Disposable Income and Equivalent Disposable Income, 1982-1996

Type of income	1982	1986	1991	1996
Actual disposable income				
		<i>March 1996 \$</i>		
Average	36,100	34,100	34,600	35,500
Median	32,800	31,100	28,300	28,400
Ratio	1.10	1.10	1.22	1.25
Equivalent disposable income				
		<i>March 1996 \$</i>		
Average	30,900	29,800	31,100	31,800
Median	27,800	27,000	26,000	25,600
Ratio	1.11	1.10	1.20	1.24

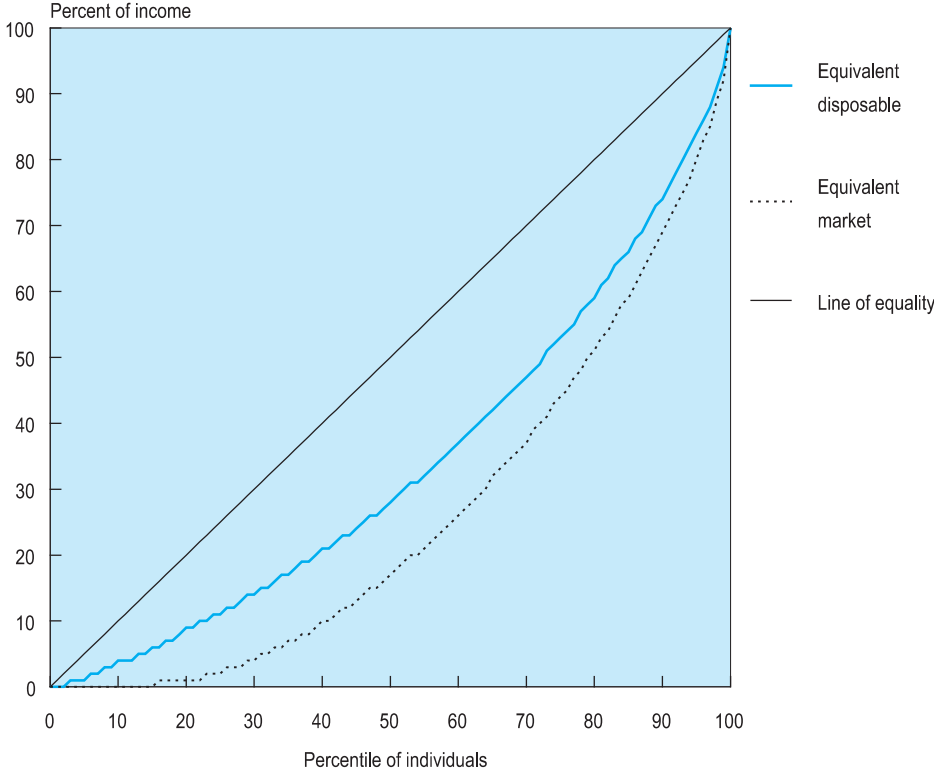
Source: Statistics New Zealand, Household Economic Surveys

Average household disposable income amounted to \$35,500 in 1996, and the median household income was \$28,400. The ratio of mean to median follows a very similar path to that commented on earlier for household market income - around 1.1 for the first two years examined; and ranging from 1.20 to 1.25 for the later two years. The consequence is that mean incomes in 1996 have either virtually recovered to 1982 levels in real terms (actual disposable incomes), or more than recovered (equivalent disposable incomes), whereas the median incomes are still significantly lower in 1996 than in 1982.

The redistribution effect of government is summarised in figure 5.2 which presents Lorenz curves for market income and disposable income. All of these figures are equivalent income. It is evident from figure 5.2 that disposable income is much more equally distributed than market income. For an explanation of a Lorenz curve, see Appendix A6.

Figure 5.2

Lorenz Curves for Household Equivalent Disposable and Household Equivalent Market Incomes, 1996

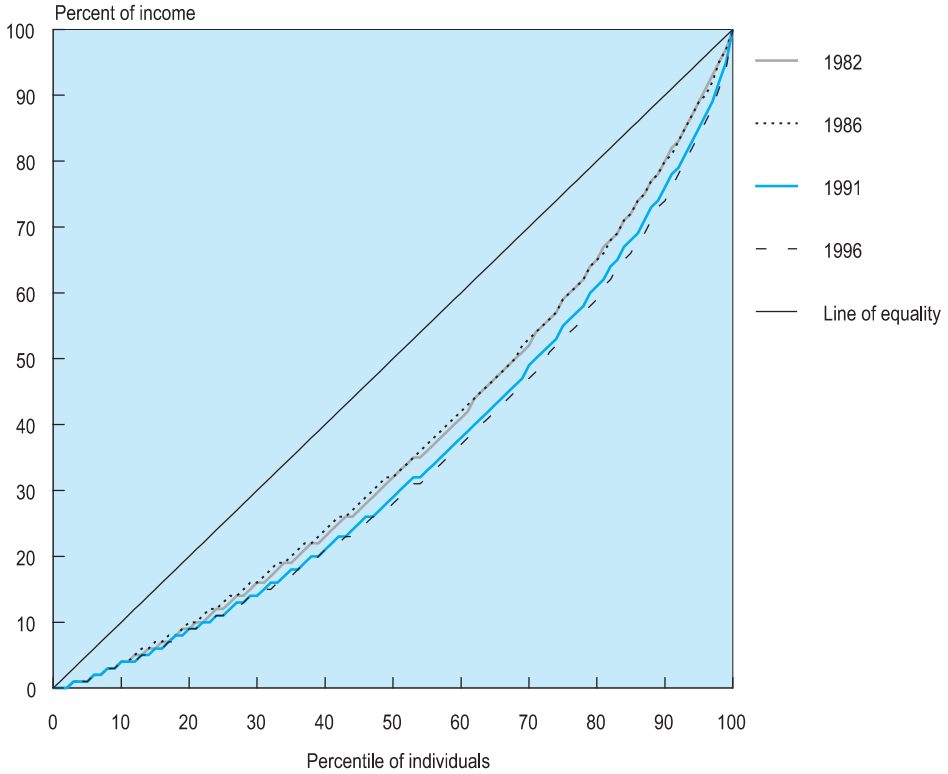


Source: Statistics New Zealand, Household Economic Survey

Figure 5.3 presents Lorenz curves for household equivalent disposable income covering the four years analysed. While the distribution is less unequal than that of market income, the changes over time are similar (see figure 4.8). That is, income distribution shows little change between 1982 and 1986, but then there is a marked increase in inequality between 1986 and 1991.

Figure 5.3

Lorenz Curves for Household Equivalent Disposable Income, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 5.4

Gini Coefficients, 1982-1996

Type of income	1982	1986	1991	1996
	<i>Gini coefficients</i>			
Household equivalent market income	0.384	0.395	0.469	0.478
Household equivalent disposable income	0.259	0.253	0.307	0.322

Source: Statistics New Zealand, Household Economic Surveys

The gini coefficients in figure 5.4 show numerically what the Lorenz curves in figure 5.3 show graphically. Figure 5.4 shows that there has been an increase in income inequality between the years of 1982 and 1996 which largely occurred between 1986 and 1991. This result is central to this study. This trend of increased inequality in equivalent household disposable income is similar to the equivalent household market income trend. The periods 1982-1986 and 1991-1996 were periods in which the income distribution was reasonably steady.

The data underlying the results in figure 5.4 is survey data and as such is subject to error that is known as sampling error or sampling variation. Tests of statistical significance allow researchers to verify whether apparent changes are genuine, or whether they could just be due to sampling variation. Tests carried out on the gini coefficients confirm that there has been a statistically significant increase in income inequality as measured by the gini coefficient over the period of 1986 to 1991. Appendix A2 provides further details about these tests of statistical significance, and also lists gini coefficients that were calculated using comparable methodology for intermediate years.

Podder and Chatterjee (1998) developed a technique to assess relative contributions of different income components on changes in the gini coefficient. The application of this technique is outlined in Appendix A4.

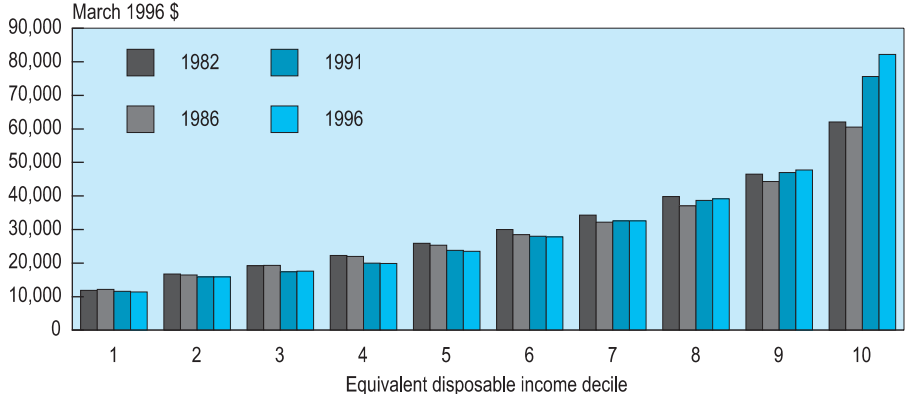
How real incomes have been affected

An increase in income inequality such as that observed in figure 5.4 may be due to either those households at the top of the income distribution increasing their income, or households at the bottom and/or middle of the income distribution suffering a decrease in income, or a combination of both factors.

Figure 5.5 shows average household equivalent disposable income by household equivalent disposable income decile. This shows that the top deciles have increased their level of income significantly while there has been a decrease in incomes for those households in the middle of the income distribution. Average income in the bottom decile has not changed significantly over the study years. The increase in income inequality has therefore been driven by the increase in income at the top end of the distribution and the decrease in income for those in the middle of the income distribution.

Figure 5.5

Average Household Equivalent Disposable Income by Household Equivalent Disposable Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

It is worth stressing again that this analysis covers cash income only. There are many other forms of income that determine whether a household is better or worse off, eg access to services such as education and health that are not covered in this study. As such, this report covers some, but not all, of the overall picture. It is also worth noting that income levels at both ends of the income distribution have a relatively high sample variation.

One potential source of misreporting of data may be due to changes in the benefit system in 1986. At this time, the main benefits became taxable and although the HES questionnaire attempts to collect information on income before taxation, it is possible some respondents supply after-tax income instead of before-tax income. If this number is significant, then the results in figure 5.5 would understate the incomes of those households at the bottom end of the income distribution. Alternatively, it is possible to identify potential scenarios in which the incomes for those at the lower end of the income distribution are overstated. Asset (the model for calculating taxation - see Appendix A6) imputes Family Support for all those who are entitled to receive it, regardless of whether they actually do receive Family Support or not. If there are a significant number of households who are entitled to Family Support but do not receive it, the income for those households would be overstated in this study.

Figure 5.6 shows changes in equivalent disposable income averages by life-stage type. In brief:

- Sole-parent households have the lowest incomes, followed by one-person-pensioner households and the youngest couple-with-children category.
- Highest income households are couple-no-children households, mature couple-with-children households, and non-family households.
- The position of sole-parent households appears to have worsened.
- Pensioners alone and mature couple-with-children households appear to have improved their positions.

The sensitivity of the results to the choice of equivalence scale

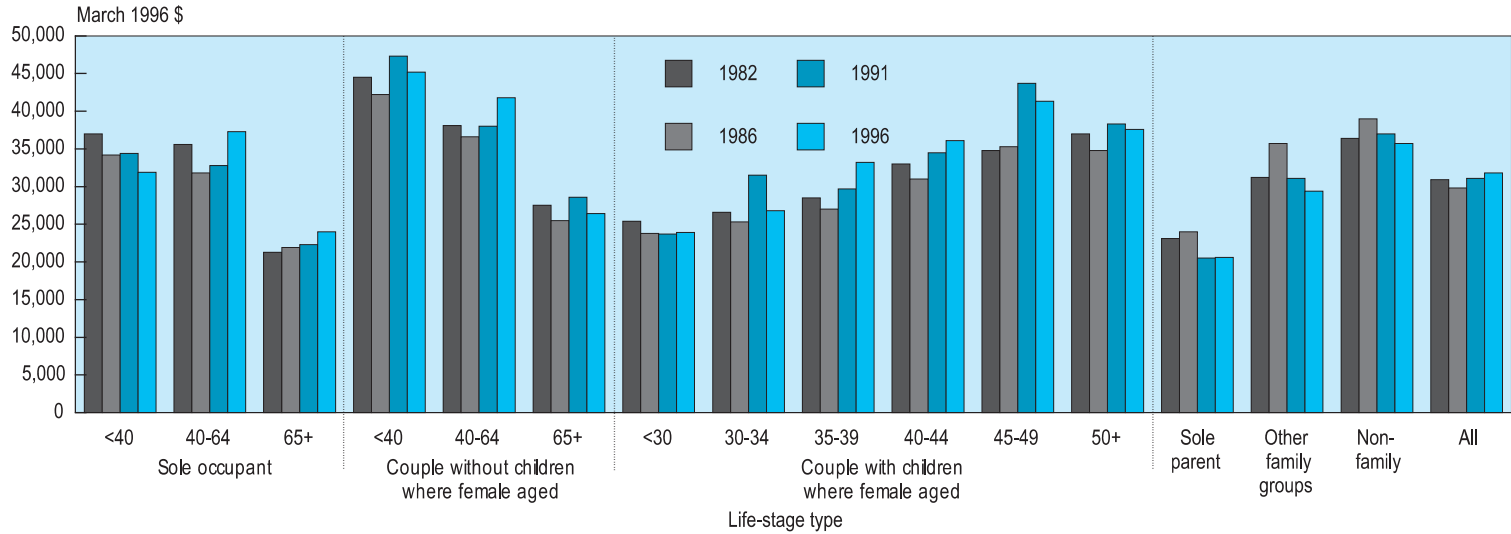
The analyses so far have been on equivalent income data, which has been calculated from the original incomes data by applying the Revised Jensen Equivalence Scale (RJS). This scale has been much used in New Zealand for income distribution analyses.

A wide range of equivalence scales has been used internationally (Atkinson et. al., 1995, page 19) and domestically. It is well known that the results of income analyses can be sensitive to the choice of equivalence scale (Perry, 1995).

To test the sensitivity of the analyses to the choice of equivalence scale, the calculations have been repeated using an alternative scale. The alternative chosen is one used by the OECD in their Luxembourg Income Study (LIS) report (Atkinson et al, 1995), namely the S0.5 scale. This simply takes as the scale the square root of the number of people in the household. The S0.5 scale is intermediate between not adjusting at all for household size - the S0 scale in their terminology - and adjusting directly in proportion to the number of people in the household - the S1 scale. The S1 scale in effect divides

Figure 5.6

Average Household Equivalent Disposable Income by Life-stage Type, 1982 to 1996



Source: Statistics New Zealand, Household Economic Surveys

income equally between household members. That is, it assumes no economies of scale whatsoever from joint household living; whereas the S0.5 scale builds in some economies of scale, intermediate between S0 and S1. We refer from now on to the S0.5 scale simply as the LIS scale.

There are grounds for using an additional New Zealand equivalence scale. Resources have not allowed this to be done; the LIS scale was chosen in part to facilitate international comparability of results (see Chapter 7).

The figures that are included at the end of this chapter present the proportions of each household type by quintile of household disposable income, equivalised using the RJS and LIS scales respectively. Further results of this sensitivity analysis are presented in Appendix A1.

There are many ways in which an equivalence scale may affect results. The two we discuss are the effects of the choice of scale on the level of income inequality and on the spread of particular types of individuals and households across the income distribution.

The results from figure 5.4 have been reproduced here, showing the gini coefficient using both the RJS and the LIS scales.

Figure 5.7

Household Equivalent Disposable Income Gini Coefficients, Revised Jensen and the LIS Scales, 1982-1996

Scale	1982	1986	1991	1996
	<i>Gini coefficients</i>			
Revised Jensen scale	0.259	0.253	0.307	0.322
LIS scale	0.269	0.264	0.316	0.331

Source: Statistics New Zealand, Household Economic Surveys

It can be seen from figure 5.7 that the choice of equivalence scale has little effect on the level of income inequality as measured by the gini coefficient. The trend of increasing inequality is apparent and the sharp rise between 1986 and 1991 is common to both scales.

Relative incomes over time - two methodologies

This section attempts to explain details of relative movements of households' incomes over time.

Two approaches are used. Initially, we report on a technique used by the OECD (Atkinson et al, 1995, page 48) in comparing income distribution internationally, and find what proportions of households fall within given bands about the median. The bands are expressed as percentages of the median. Thus, for a given year, the proportion of households whose equivalent disposable income is less than 50 percent of median household income lies in the 50 to 60 percent band, and so on up to greater than 200 percent of the median.

The proportions of households or individuals around the median must be interpreted with care. The median income of a population changes over time (see figure 5.1) so the distribution around the median income is a measure of relative position to the “middle” household in terms of income at any given point in time. It is not a measure of whether households are better or worse off over time.

We also calculate the proportions of households and people whose income is below 1996 household income levels, having adjusted these benchmarks for inflation. For example, the upper boundary of the second decile (bottom quintile) in 1996 is \$16,600. We simply calculate the number of households in earlier years with equivalent disposable income less than this value (after adjusting their incomes to March 1996 values using the CPI), to compare movements in the number of people or households below certain income levels. This is referred to as methodology two.

Methodology One - Distributions around the Median

Using this methodology, households are split into three categories - those with equivalent disposable income less than 80 percent of the median, those lying in the range 80 to 150 percent of the median, and those with income greater than 150 percent of the median.

The number of households in the “middle” range fell significantly between 1982 and 1996, with the bulk of this decrease occurring between 1986 and 1991. In 1982 the proportion was 43 percent; by 1996 it was down to 37 percent.

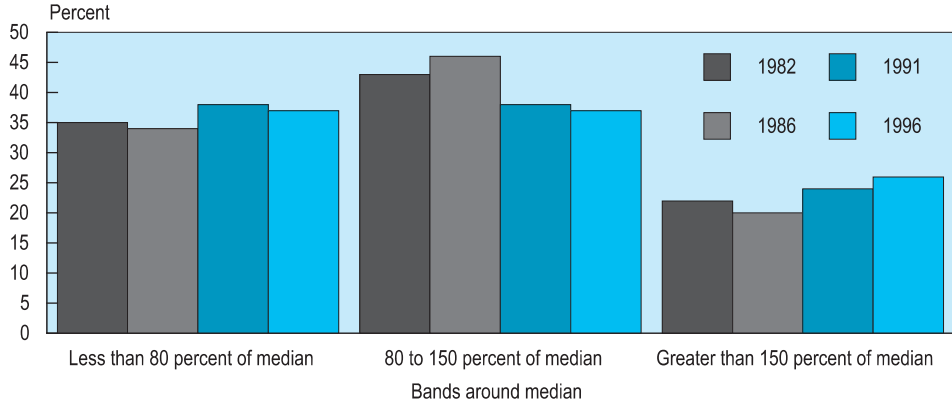
Offsetting this were increased proportions of households in both the “lower” and “upper” income brackets. Between 1982 and 1996, the proportion of households with incomes less than 80 percent of the median increased from 35 percent to 37 percent. The largest increase, however, was for households with “upper” incomes exceeding 150 percent of the median; from 22 percent to 26 percent.

Household incomes have therefore become more dispersed over the income range than previously. The bulk of the shift out of the “middle” range has been into the “upper” income bracket, with some to the “lower” bracket.

Figures 5.8 and 5.9 show the proportion of households in each of the three bands around the median household income identified for the RJS and LIS scales respectively. They show similar patterns to those described above, of fewer households being in the middle of the income distribution and more in both the top and the bottom income brackets in the later study years.

Figure 5.8

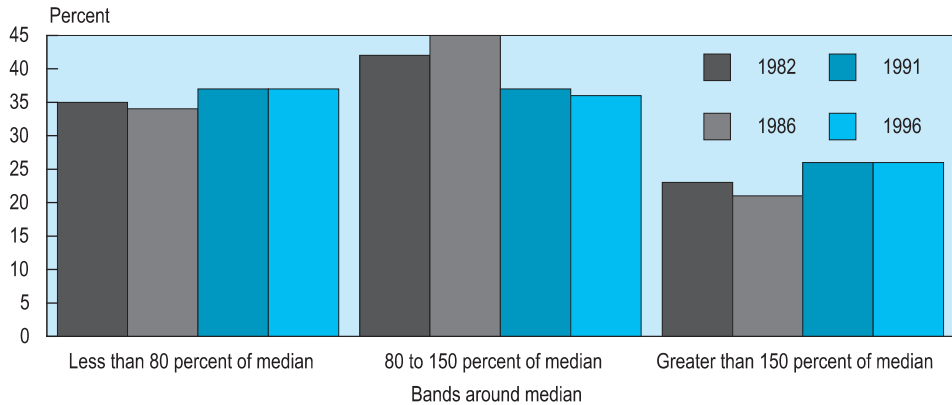
Distribution of Households Relative to Bands Around the Median of Household Equivalent Disposable Income, Revised Jensen Scale, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Figure 5.9

Distribution of Households Relative to Bands Around the Median of Household Equivalent Disposable Income, LIS Scale, 1982-1996

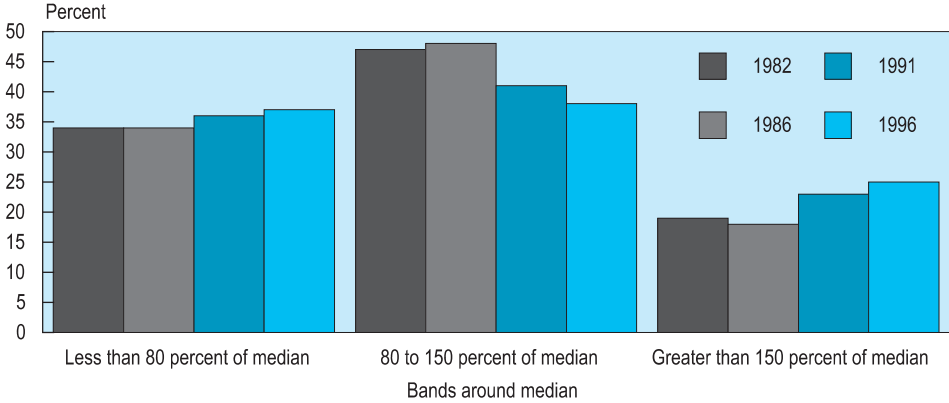


Source: Statistics New Zealand, Household Economic Surveys

Figure 5.10 examines the distribution of individuals rather than households measured relative to the same household equivalent disposable income benchmarks using the RJS scale. In this figure, individuals are categorised according to the income ranking of their households. The outcomes are very similar to those analyses which examine the position of households, shown in figures 5.8 and 5.9.

Figure 5.10

Distribution of Individuals, Classified by Their Household Income, Relative to Bands Around the Median of Household Equivalent Disposable Income, 1982-1996

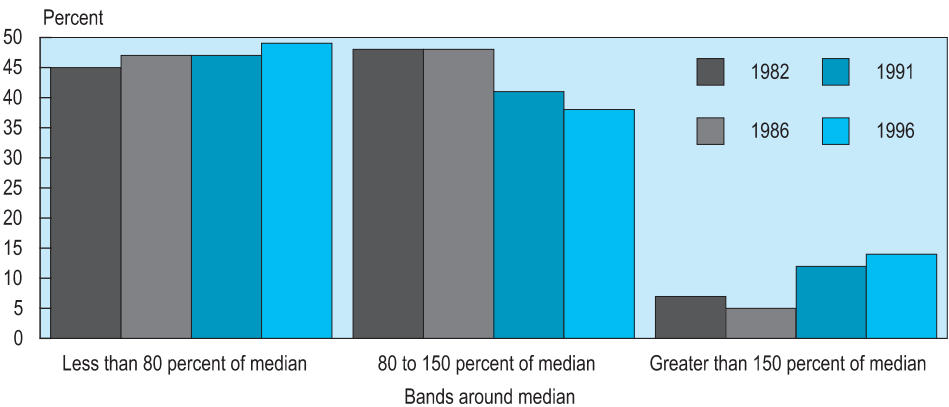


Source: Statistics New Zealand, Household Economic Surveys

Figure 5.11 shows the proportion of those under 15 years of age in each of the income brackets. This analysis, which is not particularly sensitive to the choice of equivalence scale, shows that nearly 50 percent of people less than 15 years of age are in the bottom income bracket while less than 15 percent are in the top income bracket. Again, movement away from the middle income bracket is evident.

Figure 5.11

Distribution of Children, Classified by Their Household Income, Relative to Bands Around the Median of Household Equivalent Disposable Income, 1982-1996



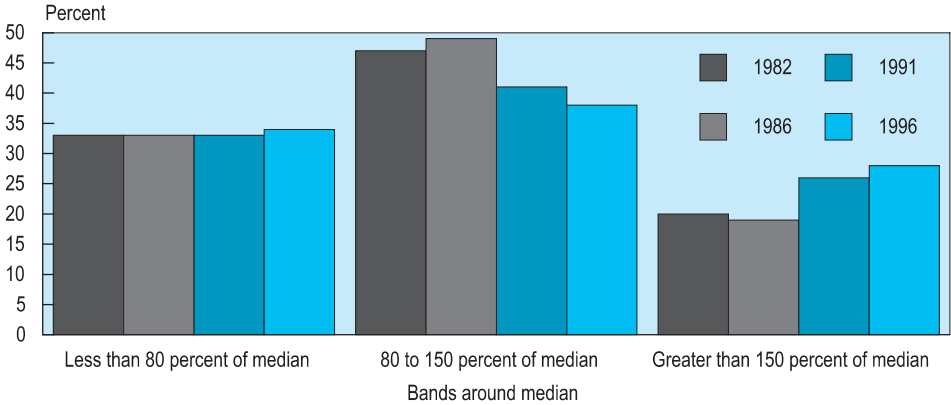
Source: Statistics New Zealand, Household Economic Surveys

Analysis of figures 5.12 and 5.13 shows a marked disparity between the European population and the Maori population in terms of household income. The European

population has tended to move from the middle income bracket to the top income bracket while the proportion of European in the bottom bracket has remained relatively steady.

Figure 5.12

Distribution of Europeans, Classified by their Household Income, Relative to Bands Around the Median of Household Equivalent Disposable Income, 1982-1996

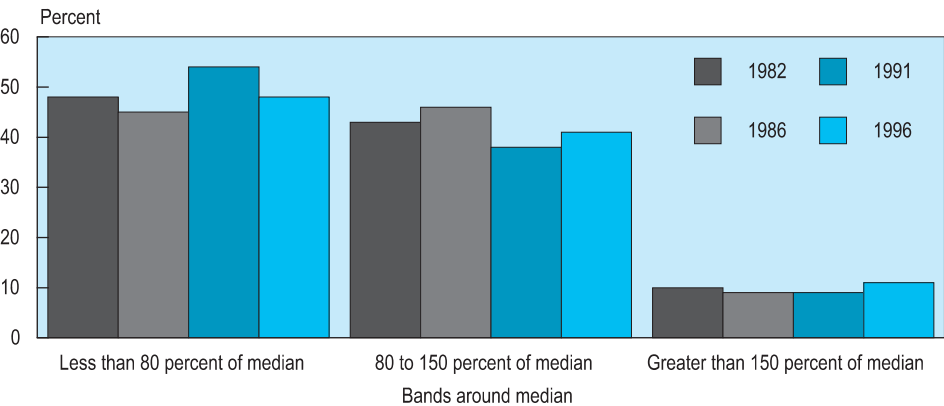


Source: Statistics New Zealand, Household Economic Surveys

The proportion of Maori in each of the income brackets however has remained relatively steady over the study years. Figure 5.12 and 5.13 also show that the proportion of Maori in the bottom income bracket is close to 50 percent whereas the proportion of the European ethnic group in the bottom income bracket is less than 35 percent for all of the study years.

Figure 5.13

Distribution of Maori, Classified by their Household Income, Relative to Bands Around the Median of Household Equivalent Disposable Income, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

Methodology Two - benchmarking decile boundaries

Using this methodology, 1996 levels of household income are taken as fixed benchmarks, and the proportions of households and people in earlier years below these fixed income benchmarks are calculated. For example, the upper boundary of the second decile (bottom quintile) in 1996 is \$16,600. We simply calculate the number of people (or households) in earlier years with equivalent disposable income less than this value (after adjusting incomes to March 1996 values using the CPI).

This type of analysis answers the following question:

- Has the number of people (or households) below a certain absolute dollar value changed over time?

The results for 1991 are similar to those of 1996 in that close to 20 percent of households have income below the 1996 benchmarks. For the earlier years, however, there were a smaller proportion of households below the 1996 dollar benchmarks (14 percent in 1982 and 16 percent in 1986). This indicates that there are more households in 1996 with equivalent disposable income less than \$16,600 than in the 1980s study years, once inflation has been taken into account.

A similar pattern emerges when the proportion of individuals in households below the 1996 dollar benchmarks is analysed. The 1991 and 1996 figures are similar (roughly 20 percent of individuals) while the earlier study years show that less than 20 percent of the population were below the 1996 dollar benchmarks (14 percent in 1982 and 15 percent in 1986) of \$16,600.

Summary

There has been a statistically significant increase in income inequality as measured by the gini coefficient of equivalent household disposable income over the study years.

The bulk of the increase in income inequality occurred between 1986 and 1991.

This increase in income inequality is primarily due to those at the top of the income distribution becoming better off, while those in the middle of the distribution range became slightly worse off in terms of income.

The trend in income inequality (measured by household equivalent disposable income), is similar to the trend in household actual market income noted in chapter 4.

There has been a spreading out of household income around the median over time. The major movement has been an increase in those whose household income is more than 150 percent of the median, although there has also been an increase in the proportion of households with incomes of less than 80 percent of the median.

Chapter 6

Low income households

This chapter examines the characteristics of those households and individuals at the bottom end of the income distribution.

The questions we are seeking to answer are:

- What are the characteristics of low-income households?
- What are the characteristics of the people in them?

Inevitably these questions require some discussion of how “poverty” is defined, and of the current New Zealand research on the extent of poverty.

As in chapter 5, the choice of equivalence scale is tested by using the LIS equivalence scale.

Various definitions of low income

Low-income households can be defined in several ways. This chapter uses a definition of those households in the bottom 20 percent (quintile) of income. Other measures include those households whose income is less than 80 percent of the median income (used in chapter 5) or those households whose income is less than 50 or 60 percent of the median.

One could also use proportions of average income although this is not an especially common unit for this type of analysis.

These techniques takes no account of movements in the level of income across time, and as such are relative to the income distribution.

Low income can also be analysed in terms of a fixed income level. A variant of that is used in chapter 5 (described there as methodology two). Using this methodology, a point in time estimate of low income is determined and this dollar figure is inflated or deflated by an index such as the CPI, to allow comparisons across time. This type of methodology accounts for movements of the entire income distribution over time, whereas a low income measure relative to the median or average will not.

Analysing the bottom quintile

Figure 6.1 shows household equivalent disposable median and average income over time in real dollars, for the bottom quintile and for all households.

Figure 6.1

Median and Average Household Equivalent Disposable Income of the Bottom Quintile Relative to All Households, 1982-1996

Type of income	1982	1986	1991	1996
Medians				
		<i>March 1996 \$</i>		
Bottom quintile	15,600	15,300	15,000	14,800
All households	27,800	27,000	26,000	25,600
		<i>Percent</i>		
Ratio	56	57	58	58
Average				
		<i>March 1996 \$</i>		
Bottom quintile	14,300	14,300	13,800	13,700
All households	30,900	29,800	31,100	31,800
		<i>Percent</i>		
Ratio	46	48	44	43

Source: Statistics New Zealand, Household Economic Surveys

Median equivalent disposable income of the bottom quintile fell steadily over the period, from \$15,600 to \$14,800, or by 5 percent in real terms. However, there was a similar decline in the median equivalent income of all households, so that the relative situation of bottom quintile households changed little. In fact in relative terms it improved slightly, as shown by the ratio in figure 6.1.

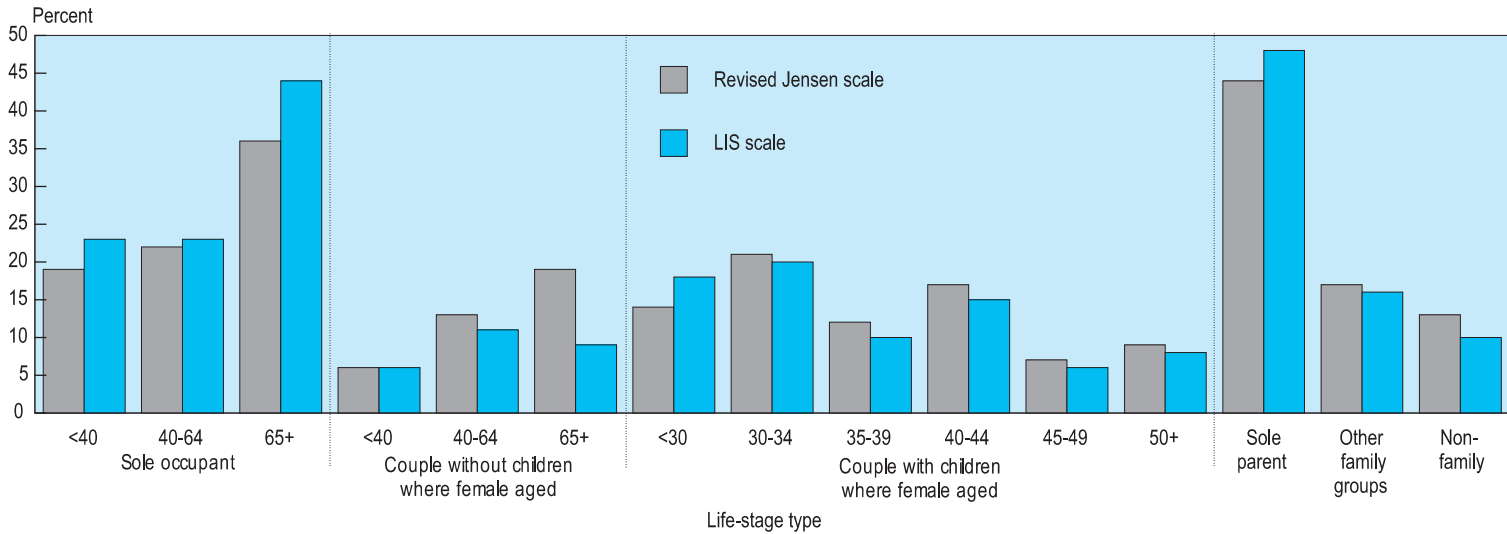
The story is different when average equivalent disposable incomes are compared. The average income of bottom quintile households fell over the period, by 4 percent in real terms, or nearly the same amount as the median. However, the average equivalent disposable income of all households has recovered strongly from its low point in 1986, as discussed in the previous chapter. The relative position of bottom quintile households, in terms of average equivalent household disposable income has deteriorated as a consequence.

Bottom quintile households - Who are they?

Figure 6.2 shows, for 1996, the proportion of each life-stage type that is in the bottom quintile of household equivalent disposable income.

Figure 6.2

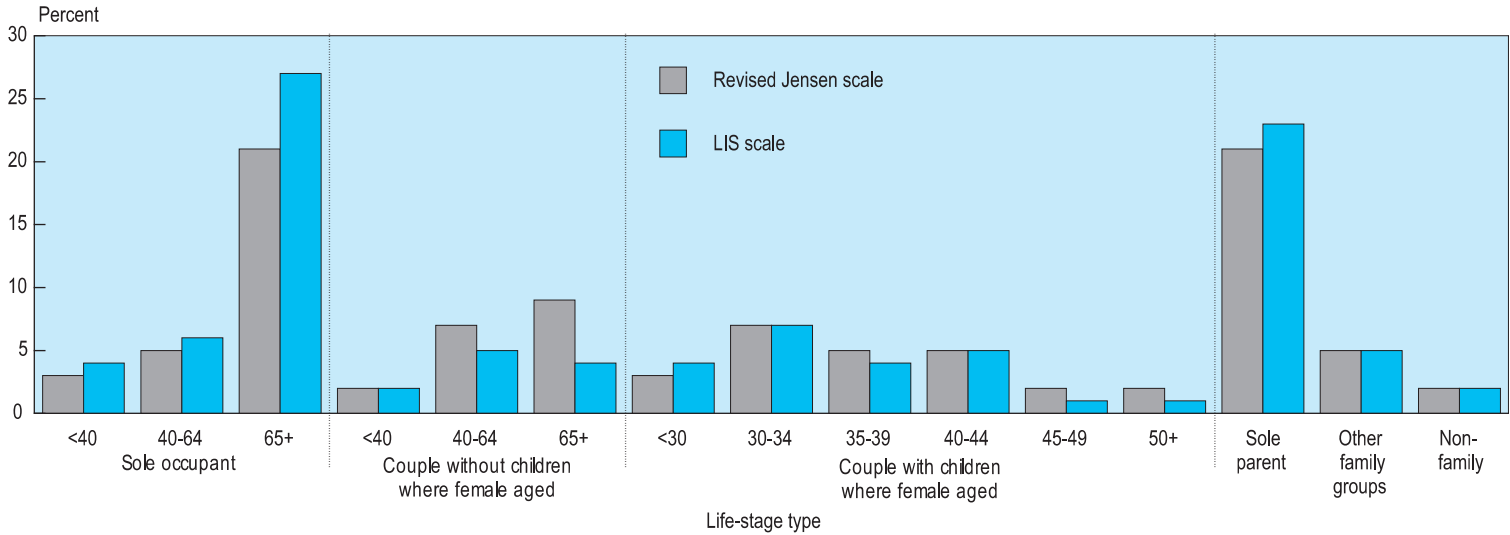
Proportion of Each Life-stage Type Within the Lowest Quintile of Household Equivalent Disposable Income, Revised Jensen and LIS Scales, 1996



Source: Statistics New Zealand, Household Economic Survey

Figure 6.3

Composition of the Lowest Quintile of Household Equivalent Disposable Income, Revised Jensen and LIS Scales, 1996



Source: Statistics New Zealand, Household Economic Survey

Were there no relationship between household type and income, about 20 percent of each household type would fall within each quintile. This is not what actually happens. In the bottom quintile there is a disproportionately high percentage of persons living alone aged 65 and over and sole-parent households. Conversely, couple-without-children households, and older couple-with children households are underrepresented in the bottom quintile.

Figure 6.3 shows a different analysis of the bottom quintile, illustrating the proportion of the life-stage types within quintile 1. This figure shows that over 40 percent of all households in the bottom quintile are from just two household types; sole-parent households and sole-occupant households aged 65 and over.

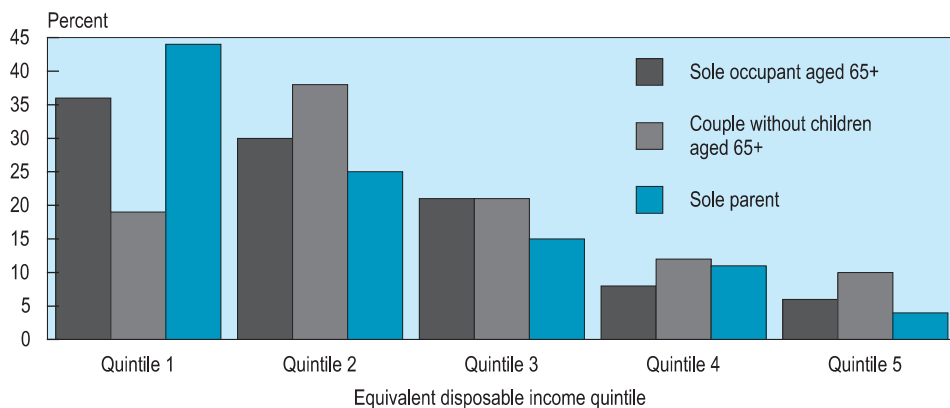
Results such as those presented in figures 6.2 and 6.3 are subject to significant sampling variation. For this reason, trends over time have not been highlighted in this section.

The data underlying figures 6.2 and 6.3 for all household disposable income quintiles (this chapter only focuses on the bottom quintile) is available on Statistics New Zealand’s website for all quintiles, using both the RJS and LIS equivalence scales.

Figure 6.4 shows the proportion of certain life-stage types across the quintiles of household equivalent disposable income. This figure shows the high proportion in the bottom quintiles of the selected life-stages; sole-parent households, sole-occupant households aged 65 and over, and couples with the female partner aged 65 and over.

Figure 6.4

Distribution of Selected Life-stage Types Across Quintiles of Household Equivalent Disposable Income, 1996



Source: Statistics New Zealand, Household Economic Survey

The sensitivity of these results to the choice of equivalence scale is clear in figures 6.2 and 6.3. In particular, the proportion of people living alone in quintile 1 changes when a different equivalence scale is applied. Figure A1.1 in Appendix A1 gives an explanation for this.

The individuals in bottom quintile households

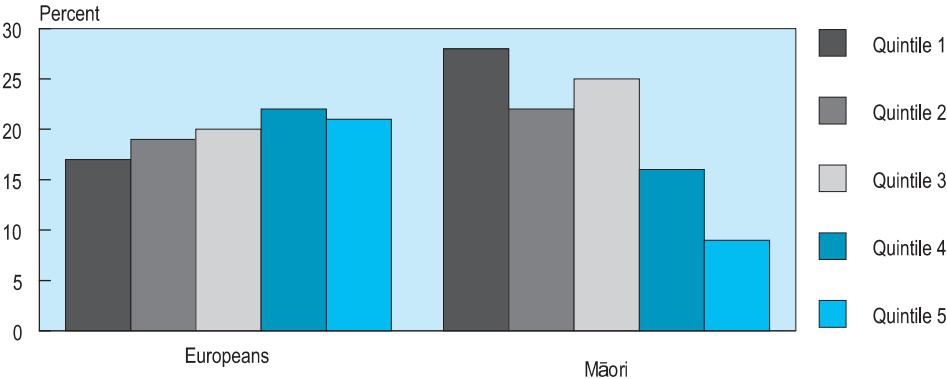
The quintile boundaries are based upon numbers of households, so 20 percent of households are present in the bottom quintile. This is not true of individuals, however. Larger households, mainly couples with children, tend to fall mainly in the middle quintiles. Smaller households (people living alone, or couples without children) tend to be more concentrated at either the top or bottom ends of the income distribution. Thus the middle income quintiles each have rather more than 20 percent of the total number of individuals; and the bottom and top quintiles fewer - around 19 percent each.

This section discusses the distribution of individuals of various characteristics, across household income quintiles.

Figure 6.5 shows the distribution of Europeans and Maori across household income quintiles. Individual Maori are more likely to live in households in the bottom two income quintiles than are Europeans. In 1996, 28 percent of Maori belonged to households in the bottom income quintile, and 22 percent to households in the second quintile. That is, almost exactly 50 percent of Maori were in households in the bottom 40 percent of the income distribution. By comparison, 37 percent of Europeans lived in households belonging to these two quintiles. Only 9 percent of Maori live in households in the top income quintile, compared to 21 percent of Europeans.

Figure 6.5

Distribution of European and Maori Across Quintiles of Household Equivalent Disposable Income, 1996

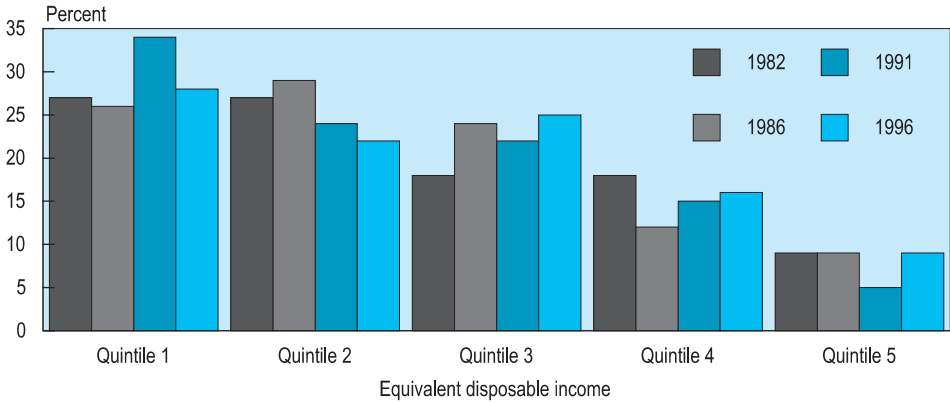


Source: Statistics New Zealand, Household Economic Survey

The concentration of Maori in the lower household income quintiles is shown in figure 6.6. The proportion of Maori in the bottom two quintiles was highest in 1991, although there has been some subsequent improvement in the position of Maori between 1991 and 1996.

Figure 6.6

Distribution of Maori Across Quintiles of Household Equivalent Disposable Income, 1982-1996



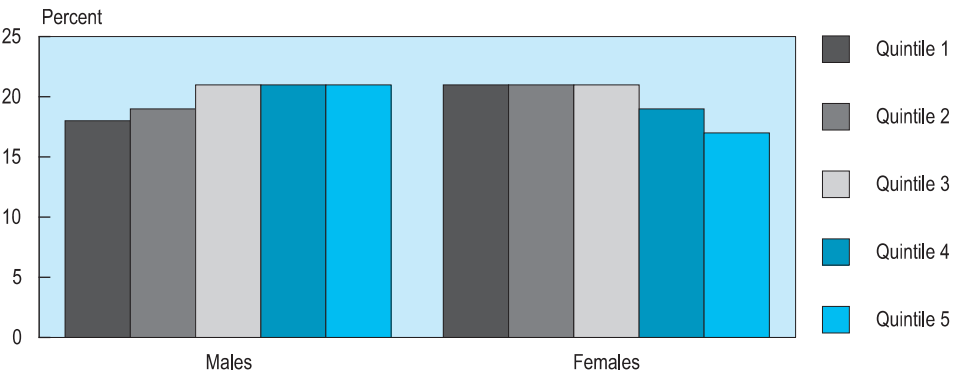
Source: Statistics New Zealand, Household Economic Surveys

Figure 6.7 shows that women are more concentrated in the lower household income quintiles than men. In 1996, 21 percent of women were in each of the bottom two household income quintiles respectively, and only 17 percent were in the top household quintile. Conversely, 18 and 19 percent of men were in the bottom two quintiles while 21 percent of men were in the top quintile.

In part, this reflects the greater life expectancy of females. There are other factors, however, in particular the fact that most sole-parent families are headed by women, and most of those households are in the lower part of the income distribution.

Figure 6.7

Distribution of Males and Females Across Quintiles of Household Equivalent Disposable Income, 1996

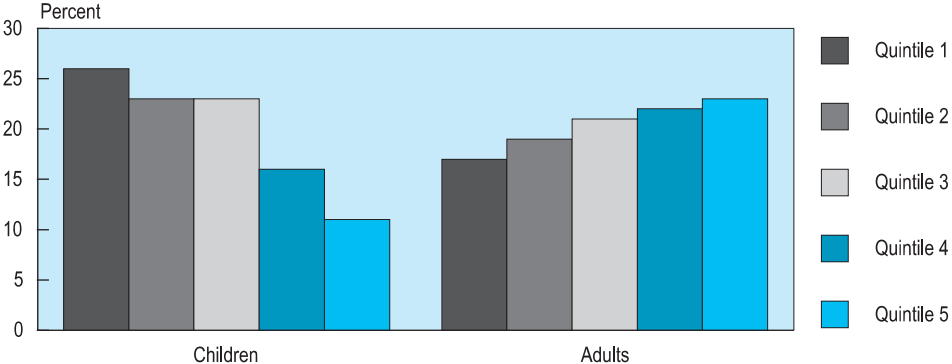


Source: Statistics New Zealand, Household Economic Survey

Children are likely to live in households in the lower part of the income distribution. This is shown in figure 6.8. Of all children in 1996, 26 percent were in households in the bottom income quintile, and 23 percent in the next-to-bottom quintile, compared to only 11 percent in the top quintile.

Figure 6.8

Distribution of Children and Adults Across Quintiles of Household Equivalent Disposable Income, 1996



Source: Statistics New Zealand, Household Economic Survey

Children require a share of family budgets, and to some extent these figures are simply saying that. Another important factor, however, is that many of the children in the bottom income quintiles are members of sole-parent families. As shown in figure 6.2, a disproportionate number of sole-parent households are in the bottom income quintile.

The middle and top income quintiles

The preceding material on the bottom quintile has in passing also thrown some light on the distribution of household types, and individuals in those households, in the middle and upper income quintiles.

Figures 6.2 and 6.3 analyse life-stage type for the bottom quintile. The detailed breakdown, available on Statistics New Zealand’s website, shows that the households which tend to be concentrated towards the upper end of the income distribution comprise of couples without children, and older-couple-with children households. Indeed, the couples-without-children households (not counting those where the female partner is 65 or over), account for around a third of all households in the top household income quintile. In 1996 the three oldest couple-with-children households (female partner aged 40 or over) accounted for almost another quarter of the top quintile.

Poverty

Among the households in the bottom income quintiles, it is likely that some people are living in economic deprivation, or in other words, living in poverty. Poverty is not easily defined (Stephens, 1988). In the context of this report, it refers to income falling

below a specified poverty threshold or “poverty line”. The extent of poverty is then usually shown by either headcount measures - the proportion of the population with income below the poverty line - or poverty gap measures - the total shortfall of income from the poverty line for households below the line.

There is no agreed poverty threshold in New Zealand, though some other countries do have an “official poverty line”. Statistics New Zealand does not seek to define a poverty line, but does seek to provide statistical data that enable alternative estimates of poverty to be prepared. The arbitrary selection of any poverty measure involves assumptions that may not enable robust estimates to be drawn over time. Relevant issues include:

- What does a poverty line mean, and what conceptually underpins a poverty line?
- At what level should the threshold (or series of thresholds for different household types) be?
- How should poverty threshold(s) be updated over time?
- How to handle those who change their position in the income distribution over time.
- How to handle costs that may be fixed in the short to medium term, such as housing costs.
- How to handle different cost structures in different parts of the country.

Conceptually, poverty can be thought of in terms of absolute poverty or in terms of relative poverty. Absolute poverty means a lack of resources sufficient to provide household members with “adequate” nutrition, housing, and other “essential” needs (the quotation marks signal a seemingly unavoidable fuzziness in definition). Relative poverty means that a household lacks sufficient resources to be able to fully take part in activities which most members of the community would regard as normal. Thus a household which cannot afford the fees for its children to go on school trips might not be considered to be suffering from absolute poverty, but would be poor in relative terms. In New Zealand the term tends to presume a composite of both absolute and relative poverty notions.

The concept of a poverty line implies that a household with income just above that line is not in poverty, and a household with income just below that line is in poverty. Practically, however, there is little difference in the economic position of the two households.

Work done by the New Zealand Poverty Measurement Project carried out by the Family Centre in Lower Hutt, in association with economists from Business and Economic Research Ltd (BERL) and Victoria University of Wellington (Stephens, Frater and Waldegrave, 1995) illustrates the difficulty of fixing a uniform poverty line for the nation as a whole. Housing costs are substantially higher in urban areas, especially in Auckland. (For a discussion on related technical issues and a critique of this work, see Easton (1997a) and Stephens, Waldegrave and Frater (1997)). This project has worked with poverty lines both excluding and including housing costs. They judged that a national poverty line including housing costs in 1993 would be set at 60 percent of median equivalent disposable household income.

Figure 6.9 shows, for the study years, the proportion of households with income less than 60 percent of median household equivalent disposable income; and also the proportion of individuals in such households, using the data prepared for this report. The results are given for two different equivalence scales - the RJS used in most of this report, and the LIS scale.

Figure 6.9

Percentage of Households and Individuals with Household Equivalent Disposable Income less than Sixty Percent of the Median, Revised Jensen and LIS Scales, 1982-1996

	1982	1986	1991	1996
	<i>Percent</i>			
Revised Jensen scale				
Households	14	14	12	12
Individuals	14	14	14	14
LIS scale				
Households	16	15	18	16
Individuals	15	14	17	15

Source: Statistics New Zealand, Household Economic Surveys

Concentrating on trends for individuals, the RJS shows the proportion of people in the population below the 60 percent-of-median-household-income line was 14 percent for all of the study years.

The LIS scale gives a slightly more variable picture, suggesting that around 15 percent of New Zealanders were below 60 percent of median household equivalent disposable income for the study years.

The numbers of people and households whose household income was below 60 percent of the median is most sensitive to the choice of equivalence scale in 1991. Indeed, the trend from 1986 to 1991 and then 1991 to 1996 is different, depending on the scale chosen. From a more detailed examination of the data it appears that the differences in the results between the two scales are mainly because of differing effects on sole-occupant, 65-and-over households. The LIS equivalence scale for this group has a higher value than the RJS scale. This is sufficient to keep a half to a third of such households below the 60 percent-of-median line in 1991 and 1996, whereas use of the RJS scale lifts almost all such households above the 60 percent line.

Figure 6.10 shows the same analyses as figure 6.9 using 50 percent and 80 percent-of-median rather than the 60 percent used in figure 6.9.

Figure 6.10

Percent of Households and Individuals with Household Equivalent Disposable Income less than Fifty and Eighty Percent of the Median, Revised Jensen and LIS Scales, 1982-1996

	1982	1986	1991	1996
<i>Percent</i>				
Less than fifty percent of the median				
Revised Jensen scale				
Households	6	5	5	6
Individuals	7	6	7	7
LIS scale				
Households	7	5	6	6
Individuals	8	6	7	7
Less than eighty percent of the median				
Revised Jensen scale				
Households	35	34	38	37
Individuals	34	34	36	37
LIS scale				
Households	35	34	37	37
Individuals	34	34	35	37

Source: Statistics New Zealand, Household Economic Surveys

Other researchers and organisations have identified other approaches to fixing a poverty line, for example as a given multiple of spending on food (Brashares and Aynsley, 1990), or the 1972 Royal Commission on Social Security's estimate of the benefit level required for beneficiaries to be able to belong and participate in the wider community.

Were some single threshold of income to be given significance in judging the adequacy of incomes, the next question is how it should be adjusted over time. The two main approaches are:

- Keeping the selected income threshold constant in terms of real purchasing power, by adjusting it for inflation. If the economy is growing, and therefore real incomes are growing on average, the income threshold will fall relative to average income over time, and it would be expected that the number of people judged to be living in economic deprivation would also fall.
- Fixing the income threshold in relative terms, as a given percentage of median income, or of average income. If real incomes increase, then the selected income threshold would also increase in real terms, and the number of people judged to be in economic deprivation would not necessarily decrease, though it might do so if income inequality reduces.

What has happened since 1981, as discussed earlier, is that real average incomes fell in the earlier part of the period. When this happens, any selected real income threshold

will tend to show increased numbers of people judged to be in economic deprivation. Then, as when average incomes began increasing again, median incomes did not. Thus an income threshold indexed to changes in average income would show for this later period increasing numbers of people judged to be in economic deprivation; whereas one linked to median income is likely to show instead decreasing or constant numbers, as in figure 6.9 (for comment on this see Easton 1997b).

Measuring changes in numbers judged to be in economic deprivation is thus more difficult in periods in which there have been significant changes in income inequality, and in which the different measures of central tendency - the average and median - have diverged. Another general difficulty is that the poverty measures are quite sensitive to small changes in the selected income threshold. Unless the threshold is defined at a very low level, there are substantial numbers of low income households close to it. The choice of equivalence scale in itself will affect the level of the income threshold, and also the nature and number of the households falling below it.

Individuals and households move between different income states over time, and the defining of an income threshold at a given point in time below which a person is judged to be in economic deprivation does not reflect this fact. A concept of long-term economic deprivation is sometimes discussed; unfortunately it is not possible to undertake relevant analysis using cross-sectional data such as the HES.

Despite these difficulties, policy makers do need some idea of the extent of economic deprivation, and attempts to develop better measures will continue. It is apparent, however, that there are severe difficulties hindering the construction of an official poverty line - in terms of setting the level, the choice of equivalence scale, of how to take account of geographical variation in living costs (particularly housing), how to handle short-term periods of low income, and of how to adjust the measure over time. These difficulties are not only those of judgements about household needs, but are also methodological and measurement difficulties.

It is the judgement of the Government Statistician, and the advice of the 1991 Review of Income and Wealth Statistics, that a poverty line should not be an official statistic. A poverty line tells nothing of the changes in the degree of deprivation by those below it and risks oversimplifying our understanding of poverty.

Summary

Various definitions of low-income households are identified. These include those in the bottom 20 percent (quintile) and those whose income is less than 60 percent of the median.

The income of households in the bottom quintile, whether measured by average income or median income, fell by about 5 percent in real terms from 1982 to 1996. In relative terms, these households did not fall behind all households if the comparison is made in terms of median income. In terms of average income, however, they did fall behind - because average real household disposable income increased 3 percent over the period.

The household types most concentrated in the bottom quintile are elderly people living alone, sole-parent households, and to a lesser extent elderly couples. (However, the use of the alternative equivalence scale assigns many elderly-couple households to higher quintiles.)

The groups who are more concentrated in the bottom quintile include Maori (about 28 percent of all Maori in 1996) and children (about 26 percent in 1996). Females are also more concentrated towards the lower end of the household income distribution - with 21 percent in the bottom quintile, and 17 percent in the top quintile.

New Zealand does not have an official poverty line. There are severe difficulties hindering the construction of an official poverty line - in terms of setting the level, the choice of equivalence scale, how to take account of geographical variation in living costs (particularly housing), how to handle short-term periods of low income, and how to adjust the measure over time. These difficulties are not only those of judgements about household needs, but are also methodological and measurement difficulties.

Chapter 7

International comparisons

Traditionally New Zealanders have thought of their country as one of the world's more egalitarian societies. This report, however, shows that there has been a significant increase in income inequality in recent years. This raises the issue of comparisons of trends in income inequality in New Zealand when compared to trends in other countries.

The obvious questions are:

- How does income inequality in New Zealand compare with that in other countries?
- Given income inequality has increased in New Zealand, has that also happened in other countries, and to the same degree?

These questions are easier to pose than to answer. Substantial research resources are needed to carry out an income distribution study such as this for just one country. The various individual country studies which have been done have tended to vary in their timing, the income concepts used, data sources, treatment of "outliers", the definitions of family or household, and in the household equivalence scales used. It is surprisingly difficult to answer the question whether income is more or less unequally distributed in one country than in another (Atkinson et al, 1995).

Fortunately, in recent years income data from various countries has been collected as part of the Luxembourg Income Study (LIS). LIS standardises the data drawn from different countries as far as reasonably possible, and reports have been published comparing income inequality in the various countries taking part in LIS. New Zealand has not joined LIS, although this is currently being considered.

It is possible, however, to analyse New Zealand data in the same manner as the Luxembourg Income Study studies, and this has been done for this report - for example, using the LIS equivalence scale as an alternative to the Revised Jensen Scale. Our results are therefore comparable with some results derived from LIS data.

Although there are problems in comparing levels of inequality between countries, it is likely that comparisons of trends in inequality over time are less affected by differences in analysis.

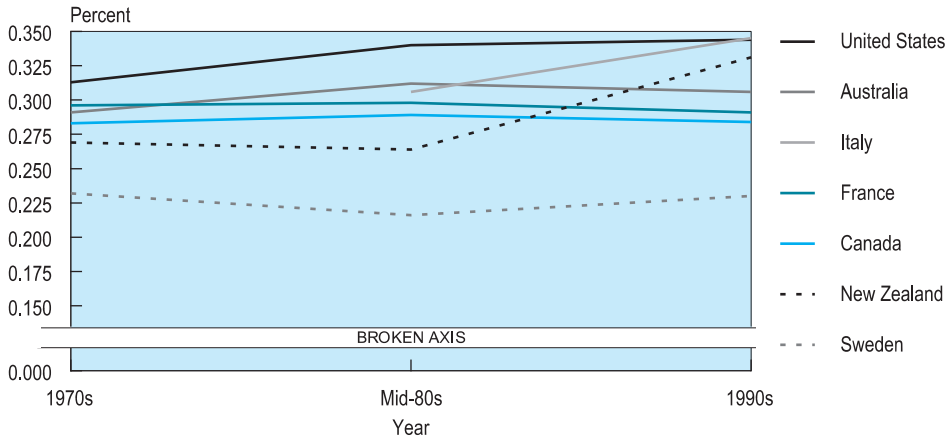
This chapter draws on data for a number of countries from a recent OECD (1998) paper. In this paper (New Zealand is again among those not included), gini coefficients were calculated using equivalent household disposable income. The LIS equivalence scale was used. The authors of this OECD paper concluded that trends differ substantially across countries, and that inequality, in terms of disposable income, rose in most countries between the mid 1970s and the mid 1990s.

Figure 7.1 shows estimated gini coefficients from selected countries, sourced from the OECD paper, along with the New Zealand gini coefficient, calculated as for the other

countries, i.e. using the LIS scale. The New Zealand figure for the 1970s is in fact the 1982 estimate, and that for the 1990s is the 1996 estimate. The time period is deliberately vague on the chart, as each country supplied gini coefficients relating to different years.

Figure 7.1

International Comparisons of Trends in Gini Coefficients, 1970s-1990s



Source: Statistics New Zealand, Household Economic Surveys, OECD

Figure 7.2 shows the gini coefficients for all countries covered in the OECD report, along with the years to which the various gini coefficients relate. New Zealand is included in figure 7.2 for comparative purposes.

Figure 7.2

Gini Coefficients for some OECD Countries, 1970s-1990s

	1970s	Year	Mid-80s	Year	1990s	Year
Australia	0.291	1976	0.312	1984	0.306	1994
Belgium			0.259	1983	0.272	1995
Canada	0.283	1975	0.289	1985	0.284	1994
Finland			0.210	1986	0.230	1995
France	0.296	1979	0.298	1984	0.291	1990
Germany ⁽¹⁾			0.265	1984	0.282	1994
Italy			0.306	1984	0.345	1993
Netherlands	0.230	1977	0.234	1985	0.253	1994
Norway			0.234	1986	0.256	1995
Sweden	0.232	1975	0.216	1983	0.230	1994
United Kingdom ⁽²⁾	0.280	1981	0.330	1987	0.330	1996
United States	0.313	1974	0.340	1984	0.344	1995
New Zealand	0.269	1982	0.264	1986	0.331	1996

(1) It is not clear from the reference whether this is West Germany, or the combined Germany, or West Germany in 1984 and the combined Germany in 1994.

(2) The UK reference is from an Office for National Statistics (ONS (1997)) publication which uses similar methodology to the OECD report. The gini coefficients are quoted to two decimal points in this ONS publication.

Source: Statistics New Zealand, Household Economic Surveys, OECD

From the data presented, income inequality does appear to have increased more in New Zealand over the past decade than in any of the other countries charted. Other countries show increases in income inequality in recent years, but not to the same extent as New Zealand.

Summary

It is difficult to compare income inequality across nations and results of such comparisons must be interpreted with care.

Having said this, the increase in income inequality in New Zealand from 1982 to 1996 appears to have been as large as, or larger than, that in other countries for which similar data is available.

Appendix A1

Comparing households - the use of equivalence scales

Households share the consumption made possible from the incomes received by individual members of the household. (Households also share the benefits of the unpaid household services contributed by members of the household. For this report however, the focus is on monetary transactions.)

Households differ in size and in composition. An income which provides one household with an adequate standard of living may be inadequate for another. For example, an income of \$20,000 will provide a relatively higher standard of living for a person living alone than for a household consisting of a couple and two children. It is necessary to allow for such differences if we are to make meaningful analyses of the distribution of income and well-being among households.

Although a larger household requires a larger income to achieve the same standard of living, there are economies of scale in the sharing of many household expenses. In addition to this, children generally require less expenditure than adults. All of these factors have to be taken into account in investigating how equally income is distributed among households.

Equivalence scales are one tool for adjusting household incomes to allow for differences in household size and composition. Household incomes are divided by factors from the scale to give an equivalent income. Thus, in the example given above, and using factors from the 1988 Revised Jensen Scale (RJS), the sole-person household would have an equivalent income of $\$20,000 / 0.65 = \$30,800$. The couple-plus-two-children household would have an equivalent income of $\$20,000 / 1.37 = \$14,600$. These equivalent incomes are a more realistic measure for comparing households' standard of living than non-equivalent incomes.

The equivalence scale factors used in this report adjust a household's income to what a two-adult household would need to maintain the equivalent standard of living. That is, the value of one on the scale is assigned to two-adult households.

Such scales are used in several ways. The first is as illustrated above; to compare the standard of living of households of different size and composition. Alternatively, the scales can be used to determine the extra income needed as family size increases; for example, a sole-parent two-child family as compared with a person living alone. This is of relevance in calculating the amounts of social welfare benefits and pensions payable to households of different composition. Finally, equivalence scales are needed if attempts are to be made at estimating the number of people living in poverty. Poverty lines are generally defined in terms of some level of equivalent household income, and those households with lower equivalent income are defined as in poverty. The determination of poverty levels is of course a much debated matter, as discussed in chapter 6.

The main equivalence scale used in this report is the RJS. The scale was developed by John Jensen of the Department of Social Welfare (Jensen, 1988). It takes account of the number of adults and children in the household with an adjustment also for the age of the children. The RJS derives from the original Jensen scale (Jensen, 1978), but is

closely based on the Whiteford Geometric Scale (Whiteford, 1985). That scale, used in *Who Gets What?* (New Zealand Planning Council, 1990), is in fact the geometric average of a large number of individual scales used internationally.

The various scales, and there are many more, have been determined in many different ways. Theoretical models applied to actual expenditure data have not by and large produced intuitively convincing scales. See, for example, Smith (1989) and Chatterjee and Michelini (1997).

The alternative equivalence scale used in this report for testing the sensitivity of results to the choice of scale is the Luxembourg Income Study (LIS) 0.5 scale, which simply sets the scale value proportional to the square root of the number of persons in the family, regardless of whether they are adults or children (Atkinson et al, 1995).

Figure A1.1 compares the two scales (taking children as aged 7). The differences between the scales are largest for one adult and sole-parent households, for which the LIS scale exceeds the RJS scale by about 10 percent, and multi-adult households, for which the RJS scale is higher by several percent. The two scales are in reasonable agreement for couple-with-children households.

The effect of these differences is that the LIS scale will rank one-adult and sole-parent households lower in the income distribution than the RJS scale, and multi-adult households higher. This is illustrated in figure 6.2. Thus if some poverty line is defined, the LIS scale will tend to identify more of the former household types as being in poverty, and fewer of the latter.

Figure A1.1

Comparing and Analysing Equivalence Scales

Household size and composition		Revised Jensen scale	LIS	Ratio LIS/Jensen
<i>Adults</i>	<i>Children</i>			
1		0.65	0.71	1.09
2		1.00	1.00	1.00
3		1.29	1.22	0.95
4		1.54	1.41	0.92
5		1.77	1.58	0.89
1	1	0.89	1.00	1.12
1	2	1.10	1.22	1.12
1	3	1.28	1.41	1.10
1	4	1.45	1.58	1.09
2	1	1.19	1.22	1.03
2	2	1.37	1.41	1.03
2	3	1.53	1.58	1.03
2	4	1.69	1.73	1.03
3	1	1.46	1.41	0.97
3	2	1.61	1.58	0.98
4	1	1.69	1.58	0.93
4	2	1.84	1.73	0.94

Appendix A2

Statistical significance of the change in the gini coefficient

Statistics New Zealand, using replicated sampling techniques, conducted statistical tests to check whether the change in gini coefficients between 1986 and 1991 discussed in this report is statistically significant. This well-known technique described by Wolter (1985) creates a number of replicate samples which are used to create half-sample estimates of the statistic in question; in this case the gini coefficient.

From these estimates of the gini coefficient (128 were produced), it is possible to calculate the variance of the gini coefficient for any given year. This is done in figure A2.1 for the years 1995, 1996 and 1997 using HES data. It is not easily possible to calculate variances for the gini coefficients for 1986 and 1991 for technical reasons.

Figure A2.1

Variance of Gini Coefficient, 1995-1997

Year	Gini coefficient	Variance
1995	0.318	0.00007
1996	0.322	0.00014
1997	0.331	0.00010

Notice that the variances over those three years are reasonably similar and that the variance of 1996 is the largest of these years. This variance will be used as a conservative guide to the errors associated with changes in gini coefficients using HES data.

Calculating statistical significance from the variance.

It is necessary to make two assumptions in order to use the 1996 HES variance to assess whether the change in the gini coefficient from 1986 to 1991 is significant.

Firstly, it is necessary to assume that the 1996 variance can be used for other HES years and secondly, it is assumed that the covariance term is zero, as the space of five years makes these samples independent.

The error of change is equal to the variance associated with the gini coefficient for 1991 plus the variance associated with the gini coefficient of 1986 minus twice the covariance between the gini from 1991 and the gini from 1986. Alternatively, this can be written as:

$$\text{var}(\hat{G}_{91} - \hat{G}_{86}) = \text{var}(\hat{G}_{91}) + \text{var}(\hat{G}_{86}) - 2 \text{cov}(\hat{G}_{91}, \hat{G}_{86})$$

while the standard error (the half width of a 95 percent confidence interval) is calculated as:

$$SE(\hat{G}_{91} - \hat{G}_{86}) = 1.96\sqrt{\text{var}(\hat{G}_{91} - \hat{G}_{86})}$$

If the standard error as calculated using the formula above is less than the difference between the gini coefficients of 1986 and 1991, then the difference is said to be statistically significant at the 95 percent confidence level.

Applying the formulae and assumptions to the data one gets:

the variance for the estimate of change in gini coefficients

$$2 \times 0.00014 = 0.00028$$

and the standard error equal to

$$SE = 1.96 \times \text{sqrt}(0.00028) = 0.033 \quad (\text{to three decimal places}).$$

The estimate for the change in gini coefficients from 1986 to 1991 is:

$$0.307 - 0.253 = 0.054 \quad (\text{to three decimal places}).$$

Since $0.054 > 0.033$ the change in gini coefficients is statistically significant at the 95 percent confidence interval.

Time series of gini coefficients

In the course of this work, a time series of gini coefficients was constructed for many of the years between 1982 and 1996. This is reproduced below for the interest of readers.

Figure A2.2

Gini Coefficients for Household Equivalent Disposable Income, Revised Jensen Scale, 1982-1997

Year	Gini coefficient
1982	0.259
1984	0.260
1986	0.253
1988	0.258
1989	0.280
1990	0.299
1991	0.307
1992	0.299
1993	0.318
1994	0.310
1995	0.318
1996	0.322
1997	0.331

Appendix A3

Post-stratification effects

This Appendix deals with the effect on household income measures of HES variation in sampling of different life-stage types; and the effects of changes over time in population composition. Two factors have been identified which affect estimates of the change over time in average household incomes, and estimates of changes in household income inequality. These issues are:

- The proportions of different life-stage types surveyed in HES in different years will, because of sampling variation, depart to some extent from the true underlying proportions in those years. In addition, the HES representation is to some extent biased, because some life-stage types tend to be over-represented and others under-represented in the survey. That is, there is HES survey error in life-stage type representation, composed of both sampling error and bias.
- Even without survey error, the relative proportion of different life-stage types is changing over time. This can be expected to have some effect on measures of income change. It is desirable to be able to estimate this “demographic” effect, so that the effects of economic change and changes in government transfers and taxes can be more precisely identified.

The benchmark data for estimating these effects is provided by the five-yearly population censuses. Census data on life-stage type proportions allow us first to “post-stratify” the HES data to counter the effect of survey error; then to standardise to estimate the magnitude of the demographic effect over time.

In the work reported here the post-stratification is in terms of life-stage types. Post-stratification could equally be carried out on other demographic variables, for example adjusting to match census proportions of individuals by age, gender, ethnicity, etc. See earlier work by Holwell (1987).

Under and over-representation of certain life-stage types

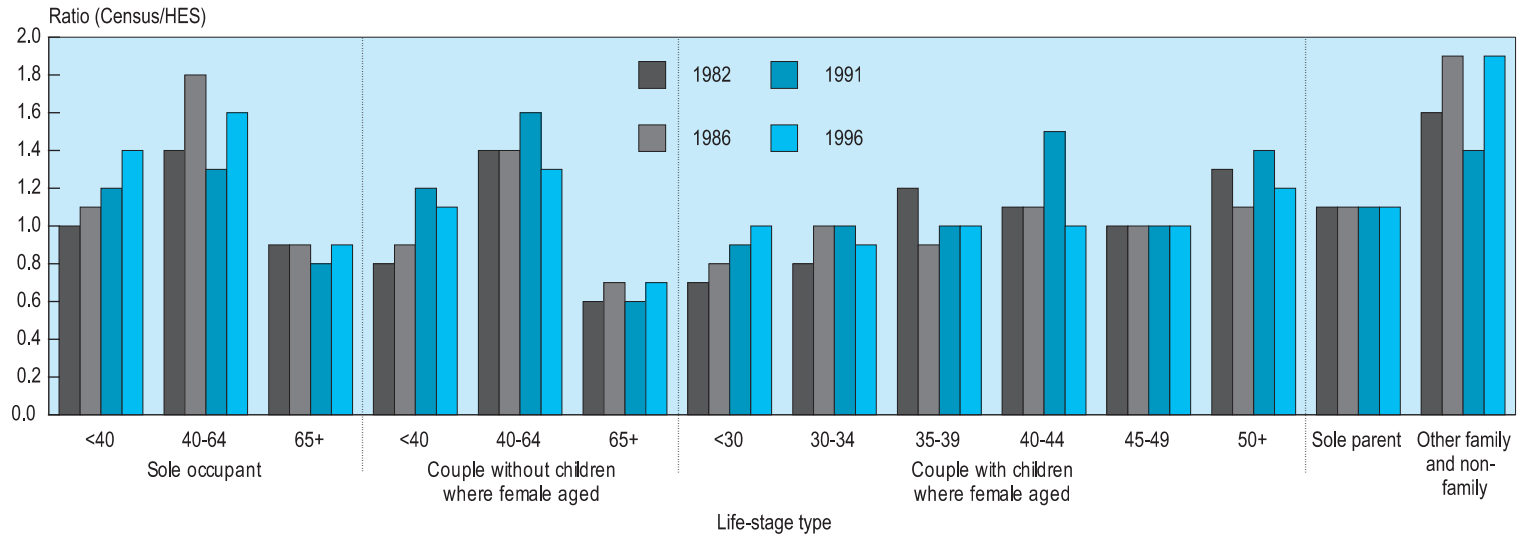
Figure A3.1 shows the ratio of census representation of the different life-stage types, relative to representation in the nearest HES for 1982 to 1996 data.

It was not possible to do these calculations exactly for the 1981 Census although it was possible to construct some aggregated life-stage type totals. This total was then multiplied by age-group proportions in each life-stage type in 1986 eg the number of sole-occupant households aged less than 40 in 1986 as a proportion of the total number of sole-occupant households in 1986 was multiplied by the aggregated 1981 sole-occupant household total, to give an estimate for the 1981 Census. This figure was then divided by the HES 1982 total to give the 1982 figures shown in figure A3.1.

The other and the non-family life-stage types were combined, in all years, in this post-stratification exercise for technical reasons.

Figure A3.1

Proportion of Households in the Census Relative for the HES, by Life-stage Type, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys, 1982-1996 and Censuses of Population and Dwellings, 1981-1996

Ideally, the ratios would vary closely around one. As can be seen this is not the case. The ratios are particularly low for retired households and younger couple-with-children households. These relatively low income households are over-represented in HES. Mature households and other and non-family households combined are relatively high income households and are under-represented in HES.

Post-stratification results

If we adjust the HES life-stage type proportions to consistency with the nearest census, and then to 1996 life-stage type proportions, we obtain the results outlined below.

Income averages

Figure A3.2 shows the effect on actual household market income, and on equivalent household disposable income.

The term “original” denotes the non post-stratified results. The “HES variation” controls for the variation between HES life-stage types and census life-stage types for that particular year and the “demographic effect” applies 1996 census life-stage type proportions to all years of HES data.

The “HES variation” results for 1982 are subject to error, due to the coarseness of the adjustment required.

Figure A3.2

Effects of Post-stratification on Average Actual Household Market Income and Equivalent Disposable Income, 1982-1996

	1982	1986	1991	1996
	<i>March 1996 \$</i>			
Actual market income				
Original	43,500	40,900	37,300	40,300
HES variation	45,900	42,800	40,200	41,500
Demographic effect	39,100	42,300	40,100	41,500
Equivalent disposable income				
Original	30,900	29,800	31,100	31,800
HES variation	31,700	30,900	32,100	32,500
Demographic effect	30,500	31,400	32,300	32,500

Source: Statistics New Zealand, Household Economic Surveys, 1982-1996 and Censuses of Population and Dwellings, 1981-1996

For market incomes, the income averages are generally adjusted upwards. This is not surprising as the HES tends to over-represent low income households. The decrease in average market income in 1991 is lessened somewhat although it is still clear in figure A3.2. The effect of the demographic effect on average market income is small.

When household equivalent disposable income is considered, a similar trend of increased average incomes arises. The lowest point in the time series of disposable income is raised somewhat, although other years' averages are raised also.

Figure A3.3

Post-stratified Gini Coefficients, 1982-1996

	1982	1986	1991	1996
<i>Gini coefficient</i>				
Household actual market income				
Original	0.388	0.399	0.474	0.479
HES variation	0.377	0.394	0.453	0.471
Demographic effect	0.446	0.407	0.454	0.471
Equivalised disposable income				
Original	0.259	0.253	0.307	0.322
HES variation	0.258	0.254	0.305	0.322
Demographic effect	0.269	0.255	0.303	0.322

Source: Statistics New Zealand, Household Economic Surveys, 1982-1996 and Censuses of Population and Dwellings, 1981-1996

Note that for 1996 distributions, the “HES variation” gives the same result as the “demographic effect” in the figures above, as they both use 1996 census proportions as their base.

The “HES variation” gini coefficients are similar to the original. What is relevant, however, is the trend over time shown by the coefficients. The HES variation disposable income coefficients show, like the original coefficients, a sharp increase in inequality between 1986 and 1991. For the other periods, 1982 to 1986 and 1991 to 1996, the gini coefficients were relatively stable.

Figure A3.3 shows an interesting demographic effect. The “HES variation” gini coefficients are very similar to the “demographic” gini coefficients. This suggests that the increase in income inequality was not as a result of differing proportions of life-stage types over the study years.

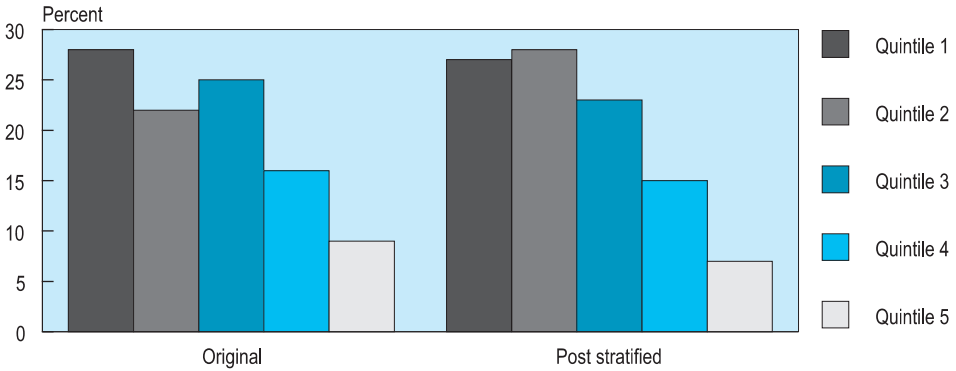
The effect of post-stratification on the distribution of individuals across income quintiles

It is of interest to ascertain whether certain groups change their position significantly in the income distribution as a result of post-stratification. The 1996 distribution of Māori and European, children and adults, and males and females across quintiles of equivalent household disposable income are shown for the “original” and the “HES variation” scenarios.

Figure A3.4 shows that the proportion of Maori in the bottom two quintiles changes once post-stratified figures are examined. Fifty-five percent of Maori are in the bottom two quintiles using post-stratified figures, while only 22 percent of Maori are in the top two quintiles of the income distribution. This compares to 50 percent of Maori being in the bottom two quintiles and 25 percent of Maori being in the top two quintiles using the original data.

Figure A3.4

Effects of Post-stratification on the Distribution of Māori Individuals by Quintiles of Household Equivalent Disposable Income, 1996

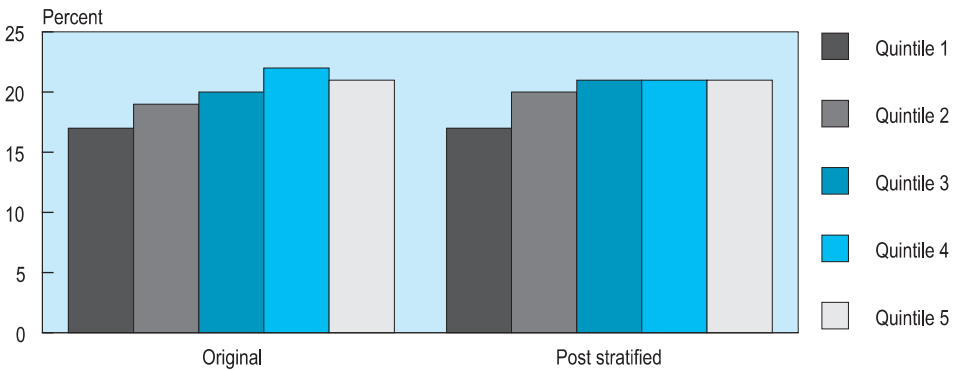


Source: Statistics New Zealand, Household Economic Survey, 1996 and Census of Population and Dwellings, 1996

The effect on the distribution of the European population (figure A3.5) is less marked, and, apart from a slight decrease in the proportion of Europeans in the bottom quintile, is hardly noticeable.

Figure A3.5

Effects of Post-stratification on the Distribution of European Individuals by Quintiles of Household Equivalent Disposable Income, 1996

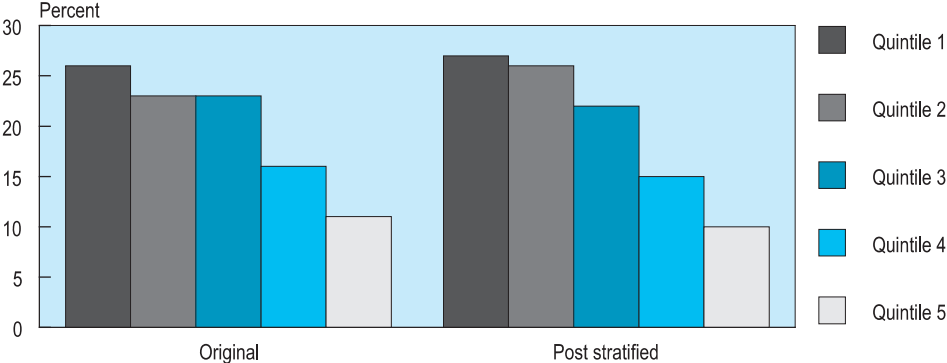


Source: Statistics New Zealand, Household Economic Survey, 1996 and Census of Populations and Dwellings, 1996

Similar to the trends described for Maori, post-stratification increases the proportion of children in the bottom two quintiles. This can be seen in figure A3.5. Once post-stratification is applied, 53 percent of children are in the bottom two quintiles compared to 49 percent using the original data. There is a slight decrease in the proportion of children in the top quintile of the income distribution once post-stratification is applied.

Figure A3.6

Effects of Post-stratification on the Distribution of Children by Quintiles of Household Equivalent Disposable Income, 1996

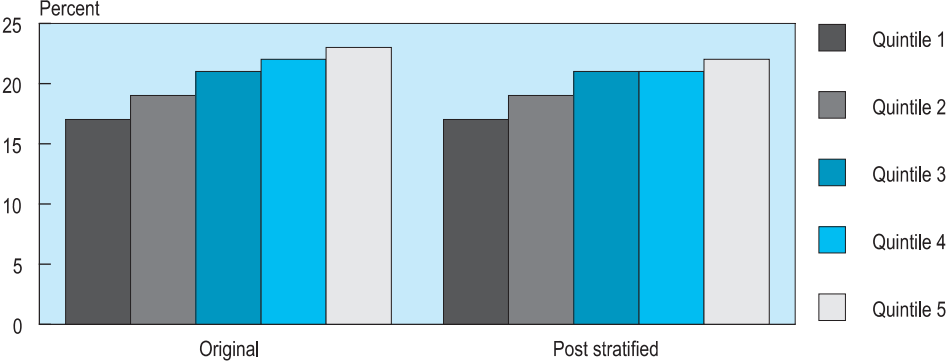


Source: Statistics New Zealand, Household Economic Survey, 1996, Census of Population and Dwellings, 1996

The adult population shows little movement across quintiles when post-stratification is applied to the data.

Figure A3.7

Effects of Post-stratification on the Distribution of Adults by Quintiles of Household Equivalent Disposable Income, 1996

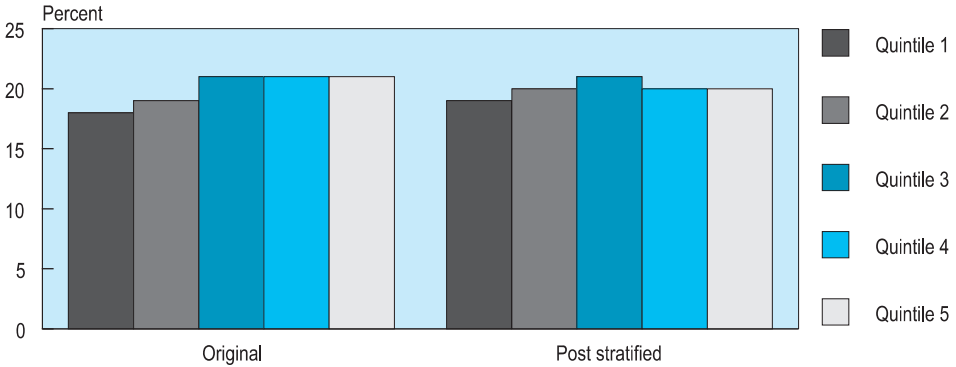


Source: Statistics New Zealand, Household Economic Survey, 1996, and Census of Population and Dwellings, 1996

There is little difference in the distribution of males and females when post-stratified figures are compared to the original figures.

Figure A3.8

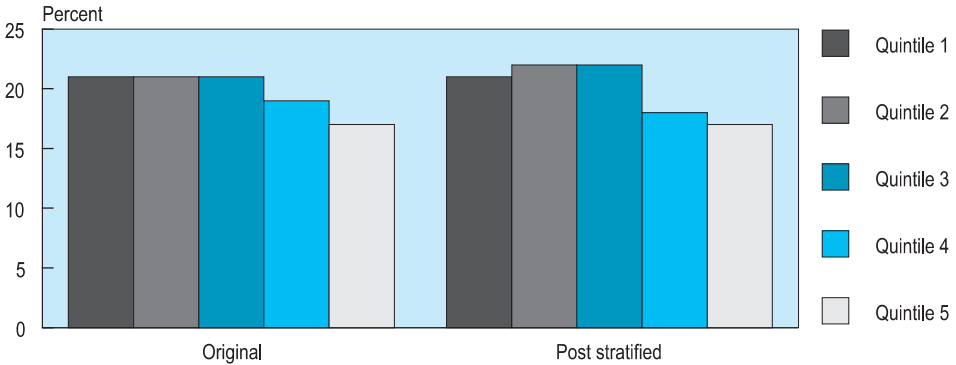
Effects of Post-stratification on the Distribution of Males by Quintiles of Household Equivalent Disposable Income, 1996



Source: Statistics New Zealand, Household Economic Survey, 1996 and Census of Population and Dwellings, 1996

Figure A3.9

Effects of Post-stratification on the Distribution of Females by Quintiles of Household Equivalent Disposable Income, 1996



Source: Statistics New Zealand, Household Economic Survey, 1996 and Census of Population and Dwellings, 1996

The effect of post-stratification on the distribution of various age groups was also analysed. There was no major difference between post-stratified and the original distributions. Associated graphs for some of these analyses have not been presented for reasons of brevity.

Summary

There is a difference between the proportions of life-stage types in the census and the HES. The HES tends to over-represent retired households and younger couples with children, while others, such as middle-aged couples without children, are under-represented.

When correction is made for the difference between the HES and the census by proportions of life-stage, there is some effect on average incomes and measures of income inequality. Average incomes have generally risen. The impact has not been especially large on income inequality as measured by the gini coefficient.

The same general trends that are discussed in the bulk of the report apply to post-stratified results.

Post-stratification has an effect on the distribution of certain population groups across the income distribution. In particular, the proportions of Maori and children in the bottom two quintiles increase once the HES data is post-stratified.

Appendix A4

The relative contribution of different income components to shifts in income inequality.

This report has identified an increase in income inequality between 1982 and 1996 in New Zealand. A question that naturally follows is:

- What elements of income caused the changes in income inequality?

As stated in the *Introduction*, it is not the purpose of this report to attempt to identify the causes of the change in income distribution. This would involve a very different exercise than the one undertaken.

An analytical approach developed by Podder and Chatterjee (1998) gives a way of answering the question raised, in terms of the contributions from different income sources. Their analysis of gross income is extended here to cover disposable income. The technical details are available in their paper, referenced in the bibliography.

A number of different income sources contribute to disposable income. The contribution of a given income source to overall income inequality depends on how unequally income from that source is distributed. Some income sources, such as benefits and New Zealand Superannuation, are weighted towards the lower end of the income distribution. The contribution of a given income source to overall income inequality also depends on the relative share of that income source in the overall total. A change over time in the contribution of that income source to overall income inequality will depend firstly on whether income from that source has become more or less unequally distributed; and secondly on whether the share in the total of that income source has increased or decreased.

That is, the contribution to changing inequality of a given income source will have:

- A “concentration” component, measuring changes in how equally or unequally that component is distributed.
- A “share” component, measuring changes in the share of that income source.

The sum of the two is the total contribution to any changes in inequality (as measured by changes in the gini coefficient) from that income source.

Figure A4.1 summarises the results. It gives the estimated contribution of each income source to the overall change in the gini coefficient for the early 1980s, late 1980s, and early 1990s.

Figure A4.1

Contribution of Specified Income Sources to Changes in the Gini Coefficient for Household Equivalent Disposable Income, 1982-1996

Income source	1982-1986	1986-1991	1991-1996
Wages and salaries	-0.010	0.023	0.030
Self employment	-0.009	0.014	0.017
Investment	0.021	-0.004	-0.014
Benefits	-0.005	-0.006	0.001
New Zealand Superannuation	-0.003	0.001	-0.003
Other gross income	0.005	-0.001	0.002
Direct taxes	-0.005	0.028	-0.017
Total	-0.006	0.054	0.015

It is apparent that changes in wages and salaries account for the largest part of the changes in income inequality over the study period. This is not too surprising because wages and salaries account for a very high proportion of disposable income over the period. Other large contributions are made by investment income from 1982 to 1986, by direct taxes from 1986 to 1991, and by self-employment from 1986 to 1991 and 1991 to 1996. The contributions of benefits and New Zealand Superannuation, though not insignificant, are relatively less important.

This kind of approach is limited because it ignores the ever-changing nature of the economy and of people's behaviour. This analysis has identified which components of disposable income have contributed most to the increase in income inequality, but has not identified the causes of that increase in income inequality.

Appendix A5

Data issues and assumptions

In a report of this nature, it is important to examine the key issues and assumptions, as well as the data underlying the conclusions drawn. Seemingly small decisions made by the analyst can sometimes have a relatively large influence on the results of any analysis. This Appendix discusses some of these underlying issues.

Income or expenditure?

It can be argued that expenditure is a better measure of economic well-being than income. In this report, however, income is analysed as the measure of economic well-being. This is consistent with international practice.

Whether to analyse income or expenditure is partially an issue of accuracy of measurement and partially one of philosophy.

To deal with the philosophical debate first, both expenditure and income are measures (albeit indirect measures) of household consumption. Income, if measured accurately, includes a temporal element that analyses of expenditure do not include, in that income is more likely to measure long-term consumption whereas expenditure represents short-term consumption.

A household may spend more than its income for a short period of time but will not be able to maintain that level of spending for a significant period. Any household that does spend consistently more than its income would erroneously appear to be in a relatively well-off position in terms of expenditure. Conversely, a household that spends less than its income may appear poorly off in terms of expenditure, but may actually be in a relatively well-off economic position. For these households, income gives a better indication of their economic well-being than expenditure.

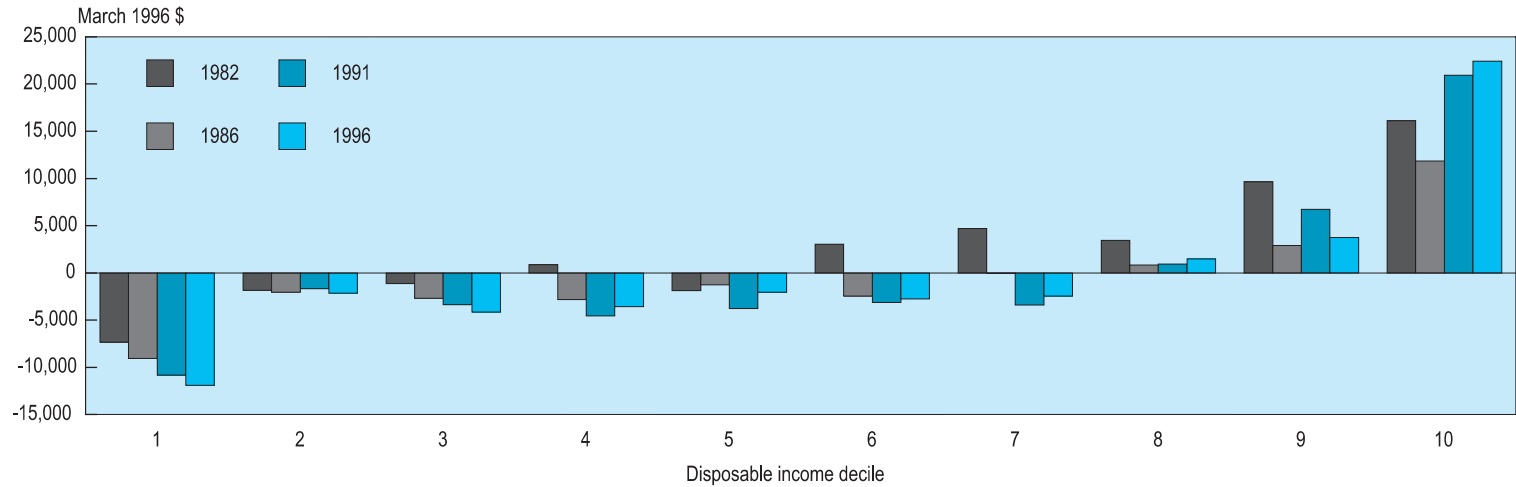
There are some exceptions to this general rule and these exceptions relate to people (or households) that are in an abnormal income state during the time of the survey. For a person who is changing their net worth position significantly (and in a one-off manner) over the period that the survey data relates to, such as a student who is borrowing to support themselves, expenditure would tend to give a better measure of economic well-being than income.

There are problems with the collection of income data but there are also issues associated with the collection of expenditure data. These issues, discussed in depth in the Background Notes to the Household Economic Survey (Statistics New Zealand, various years), involve the time periods of collection of expenditure data, the lumpiness of expenditure on particular items and respondents' unwillingness to report expenditure on certain items such as alcohol and gambling.

Figure A5.1 shows the difference between household income and household expenditure by equivalent household income decile for the study years. This suggests that, on average, there is a good match between household income and expenditure for

Figure A5.1

Difference Between Household Actual Expenditure and Household Actual Income by Household Equivalent Disposable Income Decile, 1982-1996



Source: Statistics New Zealand, Household Economic Surveys

households in the middle of the income distribution. At the bottom of the income distribution, expenditure is greater than income, while at the top of the distribution the opposite is true. Possible reasons for this are that either expenditure or income (or both) are being misrepresented, or that households' wealth position is changing.

Figure A5.1 also implies that the distribution of household expenditure is more even than the distribution of income. Those at the bottom of the income distribution, on average, overspend their income (as reported in the HES), while those at the top underspend their income.

Choice of equivalence scale

The choice of equivalence scale has been discussed in this report on a number of occasions. Suffice to say that the choice of equivalence scale affects the distribution of income to some extent and certainly affects the relative position of different groups through the income distribution. Appendix A1 discusses the issues in more detail.

Match of survey data against National Accounts totals

Internationally, household survey data does not exactly match National Accounts aggregates of income (Harris, 1998 and others from the Canberra Group). These National Accounts measures tend to be regarded as the best measure of total income at a national level, so ideally, survey-based measures of income should match against National Accounts totals (once definitional and coverage differences are allowed for).

A brief examination of the income data used in this report against the National Accounts income figures from the Household Income and Outlay Account suggests that the HES tends to underestimate income. This is true for all of the study years.

The gap between National Accounts totals and income figures in this report is significantly smaller once the household-type adjustment described in Appendix A3 has been applied.

A detailed analysis differences between the survey data and the National Accounts income totals is required to discuss this issue meaningfully. There has been insufficient time to carry out this detailed analysis while preparing this report.

This report, while reporting on levels of inequality, has focused on changes over time. The real issue is not therefore whether there is an exact match of income against National Accounts totals (although that certainly would be ideal), but whether any biases in the survey data have changed significantly over time.

One common issue in household surveys is differential non-response. While the HES response rate of over 80 percent is excellent by international standards, it is still possible that some biases resulting from non-response are present in the data. Research suggests that there tends to be response biases at the top end of the income distribution (US Bureau of the Census, 1983), and also possibly at the bottom end (Laaksonen, 1992).

Under-reporting of incomes at the top end of the income distribution is one potential explanation for under-reporting of incomes in the HES (and Asset) when compared to National Account totals. Statistics New Zealand is planning to compare various

features of the different data available on income in New Zealand - the New Zealand Income Survey, IRD tax records, the HES and the population census. It is hoped that the issue of non-response bias will be addressed in that work.

As mentioned in chapter 5, a potential source of misreporting of data is the changes to the benefit system in 1986. At this time, the main benefits became taxable and although the HES questionnaire attempts to collect income before taxation, it is not known how many respondents supply after-tax income instead of before-tax income.

One particular problem in household-based surveys such as the HES is under-reporting of self-employment income. This is a common problem around the world (Harris 1998 and Cleveland 1998 discuss this). This is one of the reasons for under-reporting of overall income in household surveys. Investment income which is typically smaller in magnitude than self-employment income suffers from a similar under-reporting problem.

The non-private household population

The HES does not cover people who do not live in private households. In the 1996 Census, 2 percent (approximately) of New Zealanders were living in non-private dwellings. These people, concentrated among the relatively young (15-25), or the elderly (65 plus), tend not to have representative incomes, so their exclusion may bias the income distribution slightly (Statistics New Zealand, 1998).

Consumer durables

This report, which has primarily analysed the period of 1982 to 1996, has spanned a period where the availability (including the falling cost) of certain consumer durables to households, such as video recorders and microwaves, has increased significantly.

The declining cost of consumer durables is included in the CPI but improvements in quality and the benefits of new products are harder to quantify. It is possible to argue that improvements in products (either improved quality or new products) has improved living standards, but it is difficult to argue that this factor is especially significant, especially for those at the bottom of the income distribution.

Conversion of income from nominal to real dollars

In this report, the All Groups CPI has been used to deflate incomes over time for all groups within the income distribution. It is known, however, that different groups within the income distribution spend different proportions of their income on various items (Robins 1995), so the issue of whether those in different parts of the income distribution experience different price movements is valid.

There is little New Zealand research on this issue but United States literature (Garner, Johnson and Kokoski 1996) offers some clues. It suggests that in an analysis over a relatively long time period such as this a measure such as the All Groups CPI is valid for use across all groups in the income distribution.

Income mobility

This report has focused on trends in income inequality using cross-sectional data sources such as the HES. Analyses of this type do not include movements of individuals throughout the income distribution, either as the income of their household changes or as that person moves between households over time.

International evidence suggests that there are some people who move significantly through the income distribution over time, while others are relatively static.

While there has been work done in New Zealand on income dynamics at an individual level (Creedy 1997, Smith and Templeton 1990) using Inland Revenue data, there is no data available that will allow analysis of household income dynamics. Statistics New Zealand is currently working on the development of such a survey.

Non-cash income

This report uses disposable cash income to assess economic well-being. This measure excludes government services provided “in kind” such as health, education and defence. A fiscal impact study is required to provide an assessment of income including these government services. The term “final income” is used to describe a person’s income after all taxes have been deducted and after all government services have been included in that person’s income.

(Capital gains, fringe benefits and the like are excluded from this analysis; for further information see the income concepts section of Appendix A6).

Previous work in New Zealand has highlighted the importance of including government services in the income distribution equation, as different household types gain different amounts of their final income from government services. Given that the last major work in this area used the 1988 HES and that since then there has been increased targeting of government services, a further fiscal impact study is needed to determine the distribution of final income.

Sharing of income within households

Throughout this report, we have assumed income sharing within households occurs, and that all members of the household have the same access to the income of the household or the goods and services that are purchased with that income. This may not be the case in all households.

In particular, households of non-related people are especially vulnerable to this assumption. It is likely that in many flatting situations the finances of household members are not shared, although there certainly will be economies of scale for people living in a shared household. The same may well be true within families; there is not a great deal of research in New Zealand on this topic although Easting and Fleming (1994) identified some cultural differences in this area.

Summary

Many of the assumptions underlying the results in this report are outlined in this Appendix. The effect of these assumptions on the overall conclusions drawn in the report is hard to quantify.

Given, however, the strong significance of the increase in income inequality over the study period, the reader can have confidence that the trends discussed in this report are valid and accurate.

Appendix A6

Definitions, abbreviations, explanations and income concepts

Actual Income

The term actual income describes non-equivalent income.

Average

In this report, the term average describes the mean. The mean income is the sum of all income, divided by the number of people or households within the relevant population. Median incomes are also reported and are referred to as medians.

Canberra Group

An international group of statisticians whose remit is to work towards improving the international statistics on household income distribution, and in particular aim to improve the comparability of such statistics internationally. New Zealand is a member of this group which met first in Canberra in 1996. Details can be found on the LIS website, <http://lissy.ceps.lu/canberra.htm>.

Consumers Price Index (CPI)

The All Groups CPI for the March quarters have been used to inflate dollar values into 1996 dollar terms where appropriate. These figures are as follows:

Figure A6.1

Consumers Price Index for the March Quarter, 1982-1996

	Index
March 1982	433
March 1986	647
March 1991	970
March 1996	1063

Source: Statistics New Zealand

This discussion builds on footnote 3 in chapter 4 and concerns the changes to the tax system that occurred in the late 1980s.

The effect of the introduction of GST and the associated tax cuts on the CPI must be taken into account when considering data such as figure 4.7, which report on level of pre-tax incomes. GST had the effect of increasing prices so therefore is included in the CPI. At the time of GST introduction, there was a decrease in personal income taxes which had the effect of increasing disposable incomes. Comparisons of levels of disposable income deflated by the All Groups CPI over time are valid, while comparisons of pre-tax income (either market or gross) are somewhat less valid.

Note that this only affects levels of income, not the distribution of income within any particular year.

See “GST” and “Income Data from HES” for further relevant information.

Decile

Grouping of tenths of the population, either in terms of houses or persons, ranked by income (in this report). The bottom decile therefore has the bottom 10 percent of the population in terms of income.

Decile Share

The share of income received by that particular decile of people or households.

Definition of Adult and Child

For the purposes of output in this report, a child has been defined as a person under 18, or a person 21 or under who is still in full-time education. Those who do not fit this definition are classified as adults. The exception to this occurs when a household, using this definition, does not have an adult present. In this case (and they are rare), a person who is less than 18 will be classified as an adult.

Employment Rate

The proportion of the population aged 15 years and over who are employed.

Ethnicity

The outputs in this publication are limited to three ethnic groups, primarily for sample size reasons. These groups are European, Māori and Other.

Respondents to the HES are classified for output purposes using a prioritised ethnic coding system. If a person identifies as Māori, or Māori and any other ethnic group, then that person is classified as being Māori. If a person does not identify with the Maori ethnic group but does identify with a non-European ethnic group then that person is classified as being in the Other ethnic group. Only a person who identifies solely with the European ethnic group is therefore classified as being European.

Equivalent Income

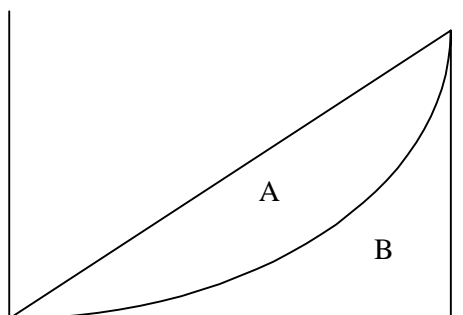
Income after an equivalence scale has been applied to it. Equivalent income is a ranked measure of income and does not represent actual dollar values.

The reference point on the Revised Jensen scale used in this report is the two-adult couple household, given a value of one. Thus incomes of all other households are expressed in terms of the equivalent income for the reference two-adult household. See Appendix A1 for more detail.

Gini Coefficient

A measure of income inequality used throughout this report. The gini coefficient, along with a Lorenz curve, may be illustrated diagrammatically as follows:

The X-axis represents cumulative proportion of people and the Y-axis represents cumulative share of income. The gini coefficient is defined as the ratio of area (A) to area (A+B). Complete equality occurs when A=0, and complete inequality occurs when B=0 (or at least imperceptibly close to it). In other words, the gini coefficient is bounded by zero (perfect equality) and one (perfect inequality).



All gini coefficients measuring household income in this report are calculated taking into account the number of people in the household. This is the methodology used by LIS. Therefore, if a household has five members it receives five times the weight of a household in which there is only one member.

Gini coefficients are quoted to three decimal places in this report.

Goods and Services Tax (GST)

The Goods and Services Tax was introduced in 1986, accompanied by a decrease in personal income tax. The rate of GST was increased to 12.5 percent in 1988, along with a further flattening of the income tax scale. In terms of the study years, these changes occurred between 1986 and 1991

The All Groups CPI is used as the deflator in this report included the effect of GST. This will affect trends in means and median income for pre-tax income measures such as wages and salaries, market income and gross income, because the tax cuts that were introduced at the corresponding points did not have any (direct) effect on pre-tax incomes. After-tax incomes increased at the same time due to cuts in the personal tax rates. It is therefore valid to compare levels of after-tax income over the 1986 to 1991 period, assuming that the increase in indirect tax (GST) was offset by the decrease in personal income tax.

Household Economic Survey (HES)

The Household Economic Survey, is a comprehensive income and expenditure survey of approximately 3,000 households per year.

Household Labour Force Survey (HLFS)

The primary goal of the Household Labour Force Survey is to produce national estimates of labour force status; ie the numbers of people employed, unemployed or not in the labour force.

Income Concepts/Income Data from HES

The bulk of the income data in this report comes from the Household Economic Survey (HES) which collects before-tax income data from every person 15 years and over in roughly 3,000 households. The HES data for the study years has been run through Asset, to calculate after-tax incomes¹ from the pre-tax HES data.

There are two significant steps in this process; firstly, synchronisation and secondly, the actual calculation of the disposable income.

Synchronisation of the data involves the adjustment of the income data in one year's HES so that it all refers to a common point in time. The HES data is collected over 12 months and involves obtaining every respondent's income data for the last 12 months. This means that a respondent in the 1985/86 HES who participates in late April 1985 provides their income data from May 1984 to April 1985, while a respondent who is part of the survey in March 1986 provides income data from April 1985 to March 1986. The income data in any HES therefore covers a two-year period, which can be

¹ Statistics New Zealand now uses a model called Taxmod to calculate after-tax incomes from the HES.

significant especially in years of high inflation. The process of synchronisation brings the HES income data for any particular year to a single point in time. In the case of the HES years used in this report, these dates are March 1982, March 1986, March 1991 and March 1996.

Asset then estimates taxation and disposable income by calculating an individual's taxable income and calculating tax. A tax credit such as Family Support is imputed through Asset and forms part of the disposable income but not a part of the gross income of either the household or the person.

Household income, whether market, gross or disposable, is calculated as the sum of the income of all people in the household.

A small number of records have been deleted from the dataset prior to the commencement of analysis as these records had zero or negative household income. These were deleted on the basis that these households were unrepresentative outliers and that their reported income is likely to be unrepresentative of that household's ability to consume.

Several definitions of income have been taken from Asset and are used widely throughout the report. These definitions build on, and modify slightly, the HES definitions.

Wages and Salaries

Includes wages and salaries from current and previous employment held throughout the year, redundancy payments, "hobby" and "odd" jobs, earnings-related ACC, and other employment such as fees for school trustees.

Self-Employment

The sum of income from self-employment throughout the year.

Market Income

Gross income less benefits, New Zealand Superannuation and university bursaries.

Benefit income

Relates largely to income-tested benefits. The precise make-up of benefit income has changed over the years as the benefit system has changed. New Zealand Superannuation is not included in benefit income.

Transfer Income

The sum of New Zealand Superannuation, benefit income and university bursaries.

Gross Income

The sum of wages and salaries, self-employment income, investment income, social welfare benefits, New Zealand Superannuation and other income such as bursaries and job superannuation.

Disposable Income

Income after personal income tax that the person, family or household receives. It includes tax rebates such as Family Support that are not included in gross income. Taxes are imputed through the Asset model.

Omissions from the data used in this report

The income measures used in this report, based on the above concepts, and derived largely from HES, have the following omissions:

- Capital gains (and losses). Capital gains/losses are a part of income, in a broad definition of income.
- Imputed rent. That is, the benefits from home-ownership of not having to pay rent (partly offset for home-owners, of course, by the expenses of home-ownership).
- Imputed interest. For example, in pension funds.
- Fringe benefits.
- Omissions from GDP. In particular, production for home-consumption.
- Irregular or non-recurring income. Including bequests, gifts, lottery wins, etc. Some of these are more in the nature of capital transfers.

Chapter one of this report draws on National Accounts data which uses slightly different concepts of income than the rest of the publication. For more information about the income concepts underlying National Accounts data, contact Statistics New Zealand.

Labour Force Participation Rate

The proportion of the population aged 15 and over who are in the labour force, ie. they are either employed or unemployed.

Life-stage Household Type

The household is the unit in which income and wealth are often pooled together. It is the main unit of analysis in this report.

For purposes of analysis and presentation, households have been grouped together into life-stage categories, based broadly on the stage of their life-cycle adult household members have reached, more especially female members. The reason for this grouping is that individual and household incomes vary significantly over the different stages of life, as do the number of dependants for whom the adults in the household are responsible. The analyses can be made more precise, and of increased usefulness for policy-making, by grouping households into these generally more homogeneous categories. Each life-stage group has enough members to permit statistical analysis of HES data, although survey errors for these groups will, of course, be larger than for all households.

The fifteen life-stage categories are as follows:

Persons living alone

1. Sole occupant, aged less than 40
2. Sole occupant, aged between 40 and 64
3. Sole occupant, aged 65 or more

Couples without children

4. Couple only, with the female aged less than 40
5. Couple only, with the female aged between 40 and 64
6. Couple only, with the female aged 65 or more

Couples with children (note - children here include adult children)

7. Couple with children, with female aged less than 30
8. " " " between 30 and 35
9. " " " " 35 and 39
10. " " " " 40 and 44
11. " " " " 45 and 49
12. " " " aged 50 or more

Sole-parent households

13. Sole-parent households

Other

14. Other family groups
15. Non-family households

In this classification, couples are of opposite sex, and female is the female partner of the couple who are the occupants of the household. Children can be of any age. That is, adult children are included as well as dependent children. (The different definition given in *Fiscal Impact* (1990) was in error.) Other family groups are households that include a nuclear family as well as members of the extended family, for example, grandparents, uncles, aunts, nieces and nephews. Non-family households are households in which the occupants of the household are not all related to one another. This category includes, therefore, unrelated individuals flatting together and multi-family households.

The classification used in this report differs in one aspect from that used in the *Fiscal Impact* report. The age of qualification for New Zealand Superannuation is being phased upwards this decade from 60 to 65. The age boundaries between household types 2 and 3 and household types 5 and 6, have therefore been changed from 60 to 65.

Appendix A3 provides summary information on the number of households of different life-stage type, and on numbers and characteristics of people in households of different types.

Luxembourg Income Study (LIS)

The Luxembourg Income Study is a body set up to promote the analysis of income and income distribution within and between countries. Based in Luxembourg, it provides researchers the ability to access data on personal and household incomes from different countries. Publications using LIS data (Atkinson et al, 1995, among others) have attempted to standardise international analyses of income inequality as much as possible. This report draws on several of the techniques used in this Atkinson work.

New Zealand is not currently a member of LIS although Statistics New Zealand is currently considering becoming a member. For more information, see <http://lissy.ceps.lu/canberra.htm>.

Lorenz Curve

A Lorenz curve of income plots the cumulative share of income against the cumulative proportion of the population. For example, the first percent of the population might have 0.5 percent of the income, and the second percent might have 1.0 percent of the income (including the 0.5 percent of the first percentage of the population).

There is a line of equality drawn on every Lorenz curve presented in this report. If income were distributed evenly throughout the population then there would be no difference between the Lorenz curve and the line of equality. In other words, the first percent of the population would have 1 percent of the income, the second percent would have 2 percent of the income, and so on. The larger the gap between the Lorenz curve and the line of equality, the more unequal is the distribution of income.

Lorenz curves have been plotted in this report using percentiles of the population.

Median

The middle point of the distribution. If the population consists of 100 households, the median income would be the income of the fiftieth household, when the households are ordered in terms of income.

The significance of the median is that the mean (the term average is used in this report) income is affected significantly by those with extremely large incomes. One person with a very large income will have a large effect on the average but will only have a small effect on the median.

New Zealand Superannuation

New Zealand Superannuation, and precursors to this.

Quintile

Grouping of fifths of the population, either in terms of households or people, ranked by income (in this report). The bottom quintile therefore has the bottom 20 percent of the population in terms of income.

Study Years

These are the HES survey years ended March 1982, 1986, 1991 and 1996, sometimes described by Statistics New Zealand and others as 1981/82, 1985/86, 1990/91 and 1995/96. They were chosen because they align (as closely as possible - 1981 HES data was not available) with the censuses of 1981, 1986, 1991 and 1996. Data for each HES is collected over the period April 1 to March 31. The 1996 HES therefore was collected over the period from April 1995 to March 1996.

Real Dollars

In this report, the term real dollars has been used to describe dollars that have been adjusted for inflation. This is done by using the All Groups CPI to convert dollar values to a common base, in this case March 1996 dollar terms. This concept is also described as constant dollars.

Retired Household

This term has been used to describe households in life-stages 3 and 6. Not all members of these households will be retired, and some members of other households will also be retired.

Rounding

Dollar values in this report have been rounded, typically to the nearest \$100. Reporting results to exact dollar values would imply spurious accuracy of the data. For the same reason, percentages are quoted to zero decimal points with the exception of census data, which is quoted to one decimal place. The data on the web is rounded to the same level of accuracy.

When numbers of people or households are quoted, the same rules apply. Survey data is usually rounded to the nearest hundred people, or hundred households. Census data, when reporting on numbers of people or numbers of households, has been randomly rounded to base 3.

The graphs in the report have been produced using unrounded data.

Sampling Error

Sampling error is a measure of the variability that occurs by chance because a sample rather than an entire population is surveyed. A change in an estimate (such as average income) over time is said to be statistically significant if it is larger than the associated sampling error.

Standardisation

A mathematical technique which when used, allows a characteristic of two populations to be compared while controlling for differences in a related variable. For more details, contact Statistics New Zealand.

Unemployment Rate

The proportion of the labour force (the employed plus the unemployed) who are unemployed.

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