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The Distribution of Top Incomes in New Zealand

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ABSTRACT

Using taxation statistics, we estimate the income share held by top income groups in New Zealand over the period 1921-2002. We find that the income share of the richest fell during the 1930s, rose again after World War II, and steadily declined from the late-1950s until the mid-1980s. From the mid-1980s until the mid-1990s, top income shares rose rapidly. We also estimate shares-within-shares, and find that the income share of the super-rich as a share of the rich followed a similar trajectory, rising sharply over the past quarter-century. Throughout the twentieth century, top income shares in New Zealand followed a very similar pattern to top income shares in Australia. We speculate that the reduction in top marginal tax rates, the deregulation of the economy, and the internationalisation of the market for English-speaking CEOs may have contributed to the recent rise in top income shares.

JEL Codes: D31, N37

Keywords: Inequality, New Zealand

Introduction

In 1900, New Zealanders were richer than the citizens of any other country except Britain. Yet over the course of the century, living standards in New Zealand steadily slipped behind many other developed nations, particularly after the Second World War. The immediate post-war decades saw government policies that maintained low unemployment, but did not lead to high levels of economic growth. These policies changed radically in the last two decades of the twentieth century, as New Zealand experienced substantial free market reforms. Tariff reductions, privatisations, deregulation of the labour market, and welfare cuts were notable features of this period.

What happened to income inequality over this eventful century? As has been widely reported, in the latter decades income inequality has increased in New Zealand. The title of Martin (1997) is “Away from Equality”. According to *The Social Report 2005*, “income inequality rose between 1988 and 1991, then plateaued, and has been rising since 1994.” (Ministry of Social Policy, 2005, page 62). The *Report* goes on to say “Most of the observed increase in inequality has been due to a larger overall rise in incomes for those in the top 20 percent”. However, was this recent rise in inequality a continuation of an earlier trend, or a reversal of an earlier trend towards less inequality? Have top income shares been rising for a long time? Here, the results of Easton (1996) for the period from 1945 to the mid-1970s are of considerable interest. It had been argued in the 1970s that egalitarianism in New Zealand had ended and that inequality was rising. One of the main conclusions of Easton was that this was not the case: the before-tax personal distribution was continuing to become less unequal. The share of the top 10% fell from 37.5% in 1959-60 to 33.5% in 1973-74. (He added a qualification concerning the effects of high inflation in the mid-1970s.) A reversal did however come in the 1980s. The rise in income inequality in New Zealand in the late 1980s has been widely discussed, and there have been a number of important contributions to the study of income distribution.¹ Most recent work uses Household Economic Surveys² (for example Snively, 1990; Dixon, 1998;

¹ We are drawing here on the survey by Waldegrave (2000).

² Previously known as the Household Expenditure and Income Survey, this survey samples approximately 3,000 households annually.

Statistics New Zealand, 1999; Bakker and Creedy, 1999; O’Dea, 2000; Hyslop and Maré, 2001 and 2005; Podder and Chatterjee, 2002;) and Census data (for example Easton, 1996; Martin, 1997).

The aim of this paper is to provide a longer-run perspective, using tabulated data from New Zealand’s personal income tax to study the long-run evolution of the income distribution, focusing on the top income groups, not just the top 20 per cent but the top 1 per cent and even smaller groups at the very top. The personal income tax was first introduced in 1892. From 1921 onwards, taxation statistics were tabulated separately for individuals, excluding companies, and thus allowing estimates of the personal distribution. We present estimates from that year to 2002.³ Our data cover, therefore, over three-quarters of a century.

In using the income tax data, we are following in the steps of Easton (1983), who employed annual income tax data from 1945-46 to 1976-77 to calculate a Pareto coefficient for the upper tail, the income shares of different decile groups, and the Gini coefficient. We have followed a similar method, in that we use as a control total the total population aged 15+, but we differ in that we have constructed an independent control total for income, rather than use that reported in the tax statistics. The latter was affected by the introduction of PAYE on 1 April 1958, and Easton shows a break in the series in that year.

The methods used here are described in Section 1, and in Section 2 we consider a number of caveats that have to be entered regarding the use of income tax data. The findings are presented and discussed in Section 3. Much of the interest in the long-run series is to make a comparison with other countries. Is New Zealand like the United Kingdom in having experienced a long period of diminishing inequality at the top, which is now being reversed (see Atkinson, 2005)? Or was New Zealand different in that it has historically had low inequality, not having the long established fortunes of the UK? In this respect, it is interesting to compare the top income series

³ The New Zealand tax year begins on April 1. Throughout this paper, any reference to a tax year should be taken to refer to the start of the tax year – for example, the 1980 tax year is the tax year starting April 1, 1980, and ending 31 March 1981.

with that for Australia. In Section 4, we compare the New Zealand findings with those for the UK and Australia.

1 Data Description

The basic data from the personal income tax statistics consist of tabulations of incomes by income ranges, giving the total number of taxpayers and the total amount of income declared. The sources for each year from 1921 to 2002 are given in Appendix A, which also explains why no data are available for 1931, 1932, 1941-1944, and 1961. Even with these omissions, we have 75 annual observations, which is a long series and one that spans much of the century with the exception of the period before and during the First World War.

Definition of the Tax Unit and Control Total

To what do the data relate? Until 1953, the tax unit in New Zealand was defined as a married couple living together, with dependent children (without independent income), or as a single adult, with dependent children, or as a child with independent income. We use as our control total for 1921-52 the total adult population, defined as number of people aged 15 and over, and from this subtract the number of married females. The sources are given in Appendix B. This total is too high to the extent that people aged 15 and over are still dependent, and too low to the extent that children aged under 15 have an independent income. The use of a control total for a fixed date means that we ignore people who appear in the tax statistics for part of the year: those entering the labour force, those dying, and those migrating. Part-year incomes are by definition less likely to appear in the top income groups.⁴

From the tax year 1953-54 onwards, the tax unit became the individual, and the control total used from that point onwards is simply the total number of people aged 15 and over. There is therefore a break in comparability in 1953: the series before that date relates to tax units, and the figures from 1953 relate to individuals. Consideration of different assumptions about the joint distribution of income suggests

⁴ For a discussion of part-year incomes in the UK, see Atkinson (2005a).

that the switch to independent assessment may either raise or lower the top shares. As shown in Atkinson (2005b), where all rich people are either unmarried or have partners with zero income, the share rises on moving to independent assessment, since we have to include a larger number of observations in order to arrive at a given percentage of the population. But if, at the other extreme, all rich tax units consist of couples with equal incomes, then the same amount (and share) of total income is received by a larger fraction of the population (since not everyone is married), so that the measured share falls. It is not therefore easy to suggest a correction, and the necessary adjustment may well have changed over the century. In earlier parts of the century, the former assumption may have been more appropriate. In accounting for a change in the filing rules that occurred in the US in 1948, Piketty and Saez (2003) adjust the US estimates, increasing the recorded income shares by “about 2.5%” for the earlier period 1913-1947 (Piketty and Saez, 2001, 35n). Towards the end of the century, incomes may have been less unequally distributed within the tax unit. In particular, increasing female labour force participation is likely to have had a major impact. Female labour force participation increased from 29.6% in 1961 to 57.9% in 1996 (Statistics New Zealand, 1999, Figure 1.9). We return to the change in unit of analysis in Section 3.

In 1999, New Zealand implemented a substantial overhaul of its tax system. Under the overhauled system, only those taxpayers who receive unusual forms of income (such as self-employment earnings, rental income or overseas dividends) are required to file a tax return. As a result, less than 1 million of New Zealand’s 3 million taxpayers now file a tax return.⁵ However, non-filers remain within the taxation statistics, since their incomes are now reported by their employers or other government agencies. Thus, while the 1999 reforms reduced the number of New Zealanders who file tax returns, the total number of people included in the taxation statistics has expanded significantly. As a result, the ratio of the number of taxpayers to the over-15 population is virtually 1. Indeed in some years it exceeds 1 (see Appendix Table 2). The New Zealand Inland Revenue Department explains this on the basis that the taxpaying population includes a small number of children, as well as

⁵ The figure of less than one million is those who are required to file an IR3 return. Additionally, about two-thirds of a million New Zealanders are required to verify information on a Personal Tax Summary which is sent to them by the Inland Revenue Department.

any migrant who works in New Zealand at any point in the tax year. Anyone dying in the year is recorded as having a part-year income, as is anyone who enters the taxpaying population mid-way through the year. By contrast, the population statistics are based on calendar year means, and so will invariably miss some migrants, some who die during the year, and some who turn 15 during the year.⁶ Where the number of taxpayers is larger than the adult population, we use the number of taxpayers as our population denominator.

The resulting series for the population control totals is given in Appendix Table 2; the series used in our central estimates is shown in bold.

Control Total for Income

What income is covered? How does the total relate to the national accounts aggregates? Our aim is to provide a control total comparable with the definition of income applied in the data for top incomes. This is referred to here as Household Gross Returnable Income (HGRI). Each of these words is carefully chosen. We are interested in the incomes of *households*, not the wider personal sector, which typically includes non-profit bodies serving persons (such as charities and trade unions) and life assurance and pension funds. We want to use income tax data that relate to persons and not to limited companies. Prior to 1921, individuals and companies cannot be separated in the New Zealand tax tabulations, and we are therefore unable to use data for the first two decades of the century. We are interested in *Gross* income, in the sense of income before tax. We are interested in the total *returnable* income that would enter the tax-base if there were no exemptions (income after subtracting the exemptions is referred to as taxable income). As put by Saez and Veall in their study of Canada (2003, 38), “we need to estimate total income that would have been reported on tax returns, had everybody been required to file a tax return”. Our concept corresponds to their Gross Tax Income, with the qualification that we do not exclude realized capital gains.

⁶ Email from Sandra Watson, Inland Revenue Department, 7 October 2004.

With this aim in mind, our approach to the control total for income starts from the national accounts totals for household income: i.e. excluding non-household elements, such as charities, life assurance funds, and universities. We then exclude items not included in the tax base, such as imputed rent, and employers' social security contributions. Transfer payments pose particular problems, as they became progressively taxable. The social security universal superannuation benefit was made liable for income tax in 1951 (*Monthly Abstract of Statistics*, September 1953, 11), other benefits in the 1970s and in 1986. We have adopted the simplest procedure in that we have included transfers in the control total throughout the period. This is not entirely satisfactory, but is unlikely to generate any major discontinuity in the estimated top shares.

The method adopted here pre-supposes the existence of national accounts totals for household income. In the case of New Zealand, these exist for recent decades, but we have had to construct our own series for much of the period. This has involved assembling different elements from the official statistics and from academic sources, as described in Appendix C. For the earliest years (1921-1930) we have resorted to use of GDP to extrapolate backwards. In view of the volatility of GDP at that time,⁷ this potentially introduces considerable error, and the estimates of the top shares prior to 1931 should be regarded with particular caution.

The procedure we have adopted is that of working back from the national accounts, rather than forward from the income tax totals, adding an estimated amount for those not covered. It is therefore probable that the totals are too inclusive. Grounds for believing this to be the case are provided by the fact that our New Zealand constructed total, expressed as a percentage of the UN SNA total for household current receipts, is larger than for four other Anglo-Saxon countries: for example, in 1996, the figure was 86%, compared with 83% (Australia), 75% (UK), 72% (Canada) and 62% (US). Earlier we noted that, following the 1999 changes in tax administration, the coverage of people should be virtually 100%. For the four years 1999-2000 to 2002-3, the total income reported in the income tax data was some 90 to 95% of the national accounts total. In the light of these considerations, we have

⁷ The estimates of Easton (1997, Appendix 5) show nominal GDP as falling from \$366m in 1928-9 to \$235m in 1932-3.

reduced our calculated totals for all years (1921 to 2002) by multiplying by 0.95. The resulting series is shown in Appendix Table 3.

2 Caveats Surrounding the Use of Tax Sources⁸

Changes in taxation legislation occur frequently. It was well put by the New Zealand Census and Statistics Department: “income-tax law is dynamic rather than static and there are few years in which amendments, some major and others minor, to the law have not affected the statistics” (1953, 4).⁹ They go on to reassure the reader that “while a comparison of the results for one particular year with those for another year may be uncertain without an examination of the law applying to those years, the broad picture presented by the tables is significant”.

We have already referred to three important changes in the New Zealand income tax system: the change from joint to individual filing in 1953, the decision to tax superannuation payments in 1951, and the taxation of other benefits in 1986. However, there are other potential differences and these can affect the comparability of the estimates across time.

Some changes extend the tax base. For example in 1940, the New Zealand Government brought within returnable income the proprietary income received by the shareholders in closely-held companies (not more than 5 shareholders). This was partially reversed in 1953, from which date only dividends paid were included. With respect to capital gains, New Zealand is unusual among developed nations for not having a separate capital gains tax. Instead, the extent to which capital gains are brought within the scope of taxable income has evolved steadily over time – leading to some anomalous results.¹⁰ A further source of difference, important in the present context, is the tax treatment of farming and other primary producers.

⁸ The limitations of the income tax data are discussed by Easton (1983, pages 14-16).

⁹ For a description of tax changes up to 1968, see the Ross Committee on Taxation (1968). We are grateful for Brian Easton for this reference.

¹⁰ Robin Oliver of the Inland Revenue Department, gives the following example: “An entity holding a portfolio of shares, such as a mutual fund, is usually taxed on profits on realisation. The rationale is that shares held in a portfolio are on revenue account because selling shares is a normal part of the business of such an entity. A small investor holding shares directly, on the other hand, can realise a tax-free capital gain.” (Oliver 2000).

Many of the changes in tax law affected the coverage of the population. Some reduced coverage. For example, in 1959 a special exemption from social security income tax was introduced that had the effect of eliminating the liability for those with small incomes to file tax returns; this mainly affected those in receipt of purely investment income (New Zealand Department of Statistics, 1968, 8). However, most changes have expanded the coverage of the statistics, such as the move to PAYE taxation in 1958. This led the coverage of individuals to jump from 53% to 68% (see the final column of Appendix Table 2). This may have caused a discontinuity in our series, although the top incomes are less likely to have been affected,¹¹ and our control totals do not jump. With the reduction in the tax threshold relative to average incomes, the income tax has become a mass tax. In 1924, only 9% of New Zealanders aged 15 and over filed a tax return, but since the 1999 tax filing reforms, the coverage has been close to 100%.

The coverage of the statistics is also affected by changes in administrative practice, particularly the form in which information is published. Most importantly for our purposes, the statistics for 1921-1940 are based upon assessable income, which excludes certain income that is not included in the tax base but is taken into account in determining the tax rate. The statistics are then unavailable from 1941-1944, and from 1945 onwards, our estimates relate to total income. There are four years (1945-1948) for which information is available on both bases, and we use this to construct an alternative, less accurate, set of estimates for 1921-40 adjusted to account for the shift from assessable to total income.

The interpretation of the data not only depends on the *personal* tax law. Of particular significance are changes in the taxation of *corporations*. For shareholders, the relative attractions of dividend income and capital gains can be significantly affected by the company tax regime. One key feature is the extent to which there is an imputation system, under which part of any corporation tax paid is treated as a pre-payment of personal income tax. Payment of dividends can be made more attractive by the introduction of an imputation system, in place of a “classical” system where

¹¹ It may be noted that many of those entering the statistics in 1958 were women: the percentage of women rose from 23.9% to 32.8% according to Easton (1983, Table 10.3).

dividends are subject to both corporation and personal income tax. Insofar as capital gains are missing from the estimates but dividends are covered, a switch towards (away from) dividend payment will increase (reduce) the apparent shares. The effect of the introduction of imputation in New Zealand in 1989 is very evident – see below.

Similarly, when it was announced that the marginal tax rate on earnings over \$60,000 would be raised from 33 percent to 39 percent in the 2000 tax year, many taxpayers took the opportunity to realise business earnings in the 1999 tax year, significantly boosting top income shares in that year, and perhaps to a lesser extent also in the 1998 tax year. Although the increase was not legislated until 2000, the Labour Party had made clear in late-1998 that if elected, it planned to raise the top marginal tax rate from 33% to 39% (for an example of commentary on Labour's plans during that period, see Main 1998). The Labour Party easily beat the incumbent National Party in November 1999, a result that was widely predicted by political pundits (see Bennett 2000).

The caveats above suggest that these findings should be interpreted carefully, and that the figures for individual years may be particularly affected by fiscal and other changes. Notwithstanding this, a number of these changes do not affect the shares of top incomes. The extension of coverage for example may bring new taxpayers into the statistics, changing total recorded income, but the purpose of using control totals is to ensure that such changes do not affect the identification of the top x% (assuming that they are already covered) or their calculated share.

3 Top Incomes in New Zealand

Table 1 shows the estimated shares of the top income groups for the full period 1921 to 2002, while Figures 1 and 2 present the results graphically. The table gives the shares of the top 20%, 10%, 5%, 1%, 0.5% and 0.1%. The last of these groups is small: 3,000 people or fewer. For this reason, we do not give estimates for any smaller group. Moreover, from 1989 the top 0.1% falls within the open top interval of the available tabulations, and we do not here make any attempt at extrapolation – see Section 4 below. Figure 1 shows the shares for the top 1%, 0.5%, and 0.1%. Figure 2 is different in that it shows the shares of the “next 4%” and

“second vintile”: i.e. those in the top 5% but not the top 1%, and those in the top 10% but not the top 5%, respectively. This allows us to see the extent to which experience differed within the top 10%. It is important to note that there are two major breaks in continuity, marked by heavy vertical lines in Figures 1 and 2. The estimates for 1921 to 1940 relate to assessable income, which excludes certain income not included in the tax base but taken into account in determining the tax rate; those from 1945 relate to total income. The estimates before 1953 relate to tax units, whereas those from 1953 onwards are for individuals only.

Table 1 New Zealand - Top income shares

	20%	10%	5%	1%	0.5%	0.1%
1921			25.39	11.34	7.82	3.13
1922			23.84	10.47	7.22	2.89
1923			24.72	10.94	7.54	2.96
1924		33.73	24.47	10.89	7.51	2.91
1925		34.97	25.16	11.08	7.60	2.92
1926		35.73	25.18	10.84	7.36	2.79
1927		35.69	24.99	10.64	7.20	2.69
1928		35.85	25.42	11.47	7.98	3.17
1929		36.54	25.48	10.99	7.48	2.88
1930		38.38	26.17	10.57	7.06	2.60
1931						
1932						
1933		38.13	25.99	10.86	7.39	2.81
1934		37.97	25.64	10.42	6.96	2.49
1935			24.65	10.36	6.93	2.77
1936	49.98	34.49	24.15	10.66	7.28	2.81
1937	45.03	30.36	20.51	8.33	5.48	1.91
1938	41.74	27.64	18.47	7.32	4.79	1.66
1939	44.55	29.72	19.92	7.85	5.15	1.86
1940	43.42	28.67	19.16	7.42	4.83	1.67
1941						
1942						
1943						
1944						
1945	38.00	25.26	17.08	6.88	4.49	1.60
1946	40.12	27.10	18.54	7.50	4.90	1.76
1947	41.75	28.44	19.54	7.72	5.03	1.77
1948	42.50	28.80	19.67	7.74	5.09	1.87
1949	43.21	29.56	20.32	8.02	5.26	1.92
1950	43.77	31.32	22.59	9.44	6.17	2.23
1951	43.17	29.32	20.11	7.88	5.11	1.85
1952	44.33	30.14	20.59	7.94	5.11	1.83
1953	53.17	35.93	24.83	9.90	6.41	2.33
1954	52.90	35.40	24.29	9.54	6.15	2.20
1955	51.98	34.13	22.89	8.76	5.61	1.98

Table 1 New Zealand - Top income shares

	20%	10%	5%	1%	0.5%	0.1%
1956	52.99	35.04	23.53	8.91	5.74	2.10
1957	51.63	33.94	22.69	8.65	5.61	2.00
1958	49.87	31.93	20.66	7.26	4.51	1.48
1959	50.44	32.65	21.37	7.60	4.77	1.63
1960	50.01	32.17	20.93	7.44	4.71	1.66
1961						
1962	50.15	31.97	20.59	7.25	4.60	1.61
1963	50.08	31.98	20.67	7.29	4.63	
1964	50.66	32.32	20.85	7.42	4.82	1.80
1965	49.37	31.06	19.69	6.72	4.23	1.43
1966	49.19	30.72	19.30	6.56	4.12	1.38
1967	49.43	30.91	19.39	6.59	4.14	1.41
1968	49.73	31.15	19.59	6.72	4.23	1.44
1969	49.69	31.02	19.47	6.70	4.23	1.45
1970	49.69	30.76	19.11	6.64	4.21	1.48
1971	49.47	30.66	19.01	6.43	4.00	1.31
1972	49.61	31.29	19.90	7.08	4.47	1.52
1973	50.35	31.84	20.35	7.47	4.79	1.69
1974	50.84	32.02	20.38	7.55	4.95	1.68
1975	48.40	29.98	18.70	6.56	4.20	1.45
1976	47.82	31.10	20.36	7.48	4.74	1.55
1977	46.58	28.86	17.89	6.13	3.86	1.31
1978	46.89	29.10	17.99	6.12	3.85	1.29
1979	45.69	28.22	17.29	5.77	3.62	1.21
1980	46.80	28.83	17.51	5.65	3.52	1.18
1981	46.53	28.48	17.15	5.50	3.44	1.14
1982	47.03	28.70	17.24	5.49	3.41	1.14
1983	47.09	28.92	17.52	5.68	3.56	1.22
1984	45.97	28.19	17.09	5.60	3.53	1.22
1985	44.90	27.57	16.74	5.51	3.48	1.19
1986	43.45	26.51	15.85	4.88	3.01	1.00
1987	42.87	26.61	16.29	5.48	3.52	1.27
1988	42.16	26.26	16.08	5.35	3.38	1.16
1989	44.34	28.34	17.97	6.59	4.33	
1990	47.42	31.12	20.41	8.21	5.66	
1991	48.13	31.48	20.53	7.96	5.37	
1992	49.51	32.49	21.32	8.40	5.71	
1993	49.87	32.99	21.86	8.76	5.94	
1994	49.19	32.86	22.06	9.00	6.12	
1995	48.68	32.62	21.97	8.98	6.11	
1996	48.00	32.18	21.69	8.92	6.12	
1997	48.39	32.57	22.03	9.16	6.32	
1998	50.40	34.39	23.58	10.21	7.23	
1999	54.90	38.68	27.74	13.77		
2000	48.97	32.26	21.20	8.25	5.50	
2001	49.55	32.79	21.76	8.76	5.98	
2002	49.86	32.86	21.79	8.86	6.09	

Figure 1: New Zealand - Shares of top 1%, 0.5% and 0.1%

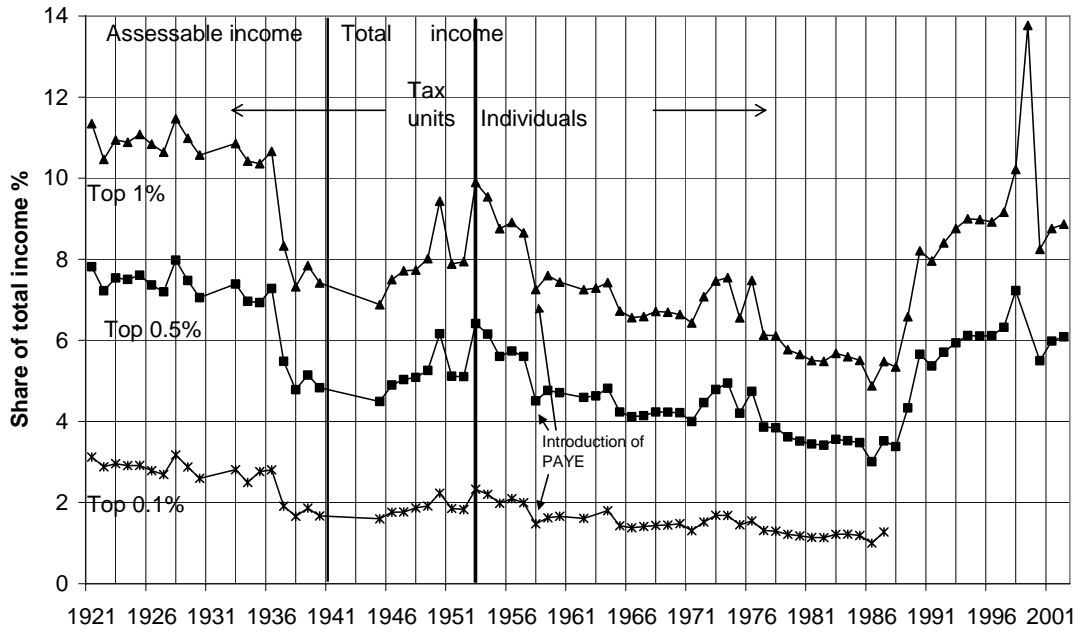
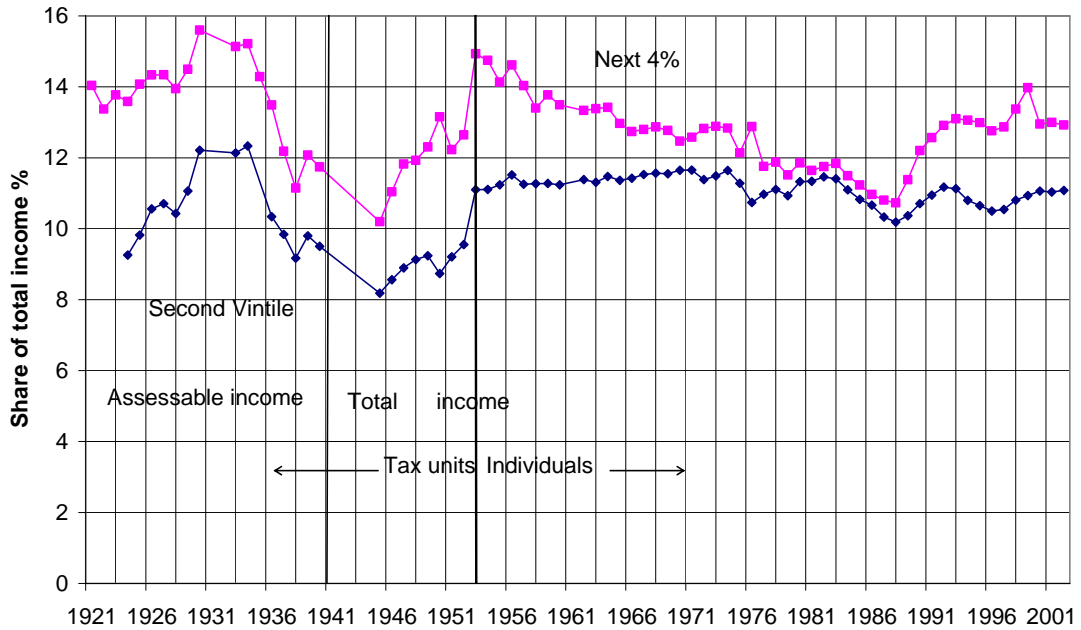


Figure 2: New Zealand - Shares of next 4% and second vintile



Beginning with the inter-war period, we can see that the share of the top 1% is estimated to be in excess of 10% from 1921 to 1936. In other words, the members of the top 1% had on average more than 10 times their proportionate share of total income. The top 0.5% had 7% or more, and the top 0.1% an estimated share of 2½% or more, giving them at least 25 times their proportionate share. These shares were

broadly stable over the 1920s and the first half of the 1930s, but fell sharply in 1937-8, leaving the share of the top 1% at around 7½% in 1940. For those below the top 1%, in the next 4%, there appears to be an inverse-U shape (see Figure 2), with a rise at the beginning of the 1930s and a sharper fall starting in 1935. No figure can be given for the second vintile until 1924, but its share shows a similar pattern to that of the next 4%.

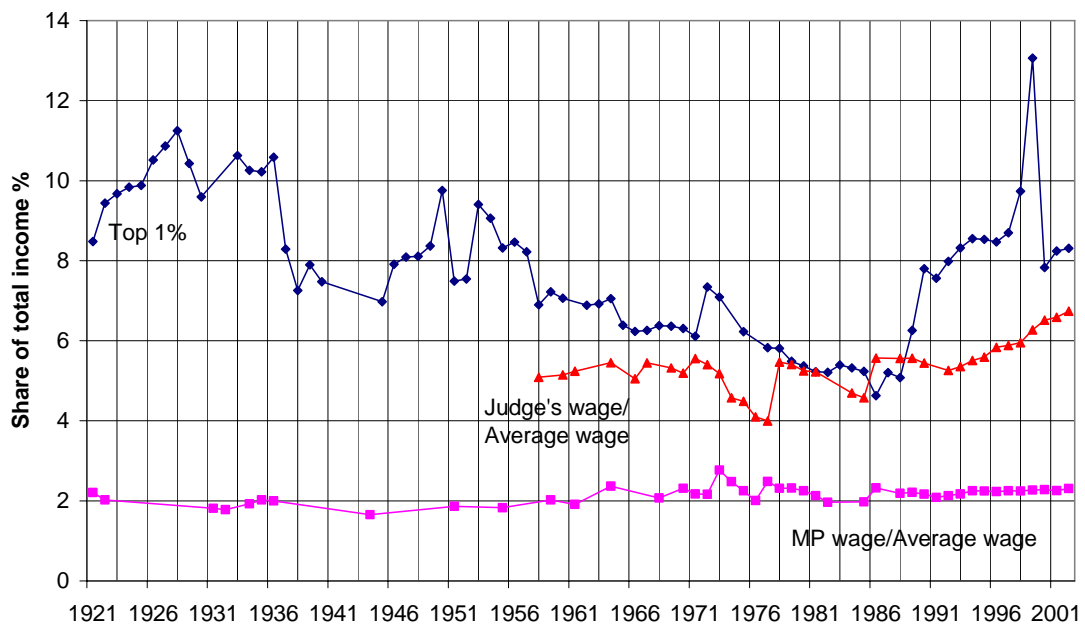
The immediate post Second World War period saw the effects of the commodity price boom. According to those tabulating the statistics at the time, "the increases in the higher income groups in 1950-51 and the decreases in the same groups in 1951-52 were mainly due to the peak wool prices which sheep farmers received in 1950-51" (*Monthly Abstract of Statistics*, August 1954, 3).¹² (The same pattern can be seen in Australian top incomes.) It may be noted that the 1950 boom had a more marked impact on the share of the top 1% than on the share of either the top 0.1% or the next 4%, and that the share of the second vintile actually fell in 1950.

The introduction of individual taxation was associated with a jump in the top shares: the share of the top 1% rose by some 2 percentage points, and the share of the top 5% by 4 percentage points. After 1953, the share of the top 1% fell substantially: it nearly halved in the next thirty years. The share of the top 0.1% similarly halved. As noted earlier, the introduction of PAYE in 1958 may have affected the estimates, but if we subtract the difference between 1958 and 1957, this still leaves a sharp reduction in the top shares. The share of the next 4% was reduced less proportionately than the share of the top 1%, although it still fell by 3-4 percentage points (allowing for the possible 1958 break). In contrast, the share of the next vintile was not much reduced, remaining broadly constant before falling a little in the 1980s: it remained in excess of 10%. There was a change in the shape of the distribution, not just a uniform scaling-down of all shares. In this connection, it is interesting to look at Figure 3, which charts the top 1% share against two comparison groups – the salary earned by a judge on New Zealand's highest court (the Supreme Court until 1980, the High Court from 1981-2002) and the basic salary paid to a Member of Parliament – both expressed as a fraction of average earnings. More detail on these measures is set out

¹² Although account must be taken of the income smoothing provisions.

in Appendix D. The judges' pay would have placed them in the top 1% and the salary shows some, but not all, of the same changes as the share of the top 1%. In contrast, parliamentary salaries as a percentage of average earnings showed little variation over this period. This is consistent with MPs being in the "next 4%". The changes recorded in Figure 1 for the top 1% and above appear to reflect specific factors affecting the very top of the income distribution, rather than a more general reduction in income differentials.

Figure 3: New Zealand - Comparison with other top income groups



After 1986, the top shares recovered the ground lost since 1953. This is clearly the case for the top 1% and top 0.5%. In the mid-1980s, the top 1% had on average around 5 times their proportionate share of total income; by the mid-1990s this figure had become more like 9 times, and it remains around that value in 2002. From 1986 to 2002, the top 0.5% doubled its share, which in 2002 was virtually the same as that in 1953. We have been unable to locate data on salaries at the very top, but a survey by Sheffield Remuneration Survey found that CEO salaries rose by 29% from 1996-2002, while average hourly wages rose 18% over the same period.¹³ This rise in CEO salaries might have been part of the explanation for the increased income share of the

¹³ CEO salary data provided by Sherry Maier of Sheffield Consulting. Average hourly wage increase compares June 1996 with June 2002, using data downloaded from <http://www.rbz.govt.nz> (Table A3).

richest. For the next 4% there was also a recovery in the share of income, although it ended up some 2 percentage points lower than in 1953. For the second quintile, in contrast, the series is virtually flat, as is the relative wage of MPs in Figure 3.

A number of important tax changes occurred in the 1980s and 1990s, which may explain some of the variation in the data. A fringe benefits tax was put in place in 1985 (initially at a rate of 45%), which may have resulted in executive remuneration that was previously paid in the form of low interest loans, company vehicles or retirement income schemes being switched to being paid as salary. Another change was the introduction of dividend imputation in 1989, allowing income to be released in the form of dividends without the risk of double taxation. It was also pre-announced that the top individual rate would be reduced to the company tax rate in 1990, causing a postponement of payments out of company income until 1990. As we have explained in the previous section, similar anticipation of tax changes is likely to have caused the sharp spike in top income shares is observed in 1998-9, and may have caused the 2000 figure to be depressed. Since these observations are clearly misleading, in some of the following analysis we omit the years 1998, 1999 and 2000.

In their analysis of changes in income distribution over the tax years 1983-1997, Hyslop and Maré (2001) conclude that most of the increase in inequality across New Zealand households occurred in the 1980s, with only a modest rise taking place in the 1990s. Our data are consistent with that pattern, in the sense that there has been little rise in top income shares since 1994. If we ignore the three years from 1998-2000, the top income shares in New Zealand did not change a great deal around the turn of the century. The shares of the top 1% and top 0.5% in 2002 were little different from those in 1994.

The conclusions for percentiles, shown in Table 2, largely mirror the findings for income shares. In the 1920s, to belong to the top 1%, one needed an income of at least 5½ times the mean. To belong to the top 0.1%, some 700 taxpayers, one needed an income about 18 times the mean. These numbers had fallen to 4½ and 12 by 1940. (It should be noted that the errors of interpolation may be quite large, and that there is considerable year-to-year variation.) The figures for 1959 were not dissimilar, but

they fell to 3½ and 7 by the mid-1980s, only to increase again, so that at the end of the century, one needs around 5 times mean income to belong to the top 1%.

Table 2 New Zealand - Top income percentiles (% of mean)						
	20%	10%	5%	1%	0.5%	0.1%
1921			2.59	5.40	9.06	17.78
1922			2.41	5.45	7.92	17.44
1923			2.49	5.67	8.20	18.53
1924		0.79	2.46	5.67	8.02	18.31
1925		1.06	2.53	5.83	8.22	18.38
1926		1.75	2.64	5.86	8.25	17.89
1927		1.85	2.61	5.81	8.16	17.25
1928		1.80	2.54	5.84	8.21	19.50
1929		1.91	2.67	5.94	8.23	17.91
1930		2.25	2.93	6.03	8.49	17.01
1931						
1932						
1933		2.10	2.85	5.91	8.41	17.84
1934		2.14	2.86	5.95	8.28	17.01
1935			2.65	5.69	8.38	12.44
1936	1.25	1.84	2.44	5.68	7.98	17.52
1937	1.30	1.77	2.29	4.83	6.81	12.99
1938	1.35	1.65	2.13	4.33	6.02	11.38
1939	1.38	1.74	2.28	4.71	6.11	11.70
1940	1.33	1.70	2.22	4.62	5.72	11.33
1941						
1942						
1943						
1944						
1945	1.14	1.46	1.90	3.97	5.60	10.51
1946	1.15	1.50	2.01	4.54	6.06	11.36
1947	1.18	1.53	2.14	4.80	6.33	11.72
1948	1.21	1.60	2.16	4.73	6.28	11.67
1949	1.20	1.60	2.25	4.77	6.54	12.12
1950	1.08	1.48	2.17	5.67	7.65	14.26
1951	1.22	1.61	2.20	4.85	6.47	11.63
1952	1.26	1.65	2.29	5.01	6.55	11.69
1953	1.54	1.97	2.65	6.13	8.11	14.55
1954	1.57	1.99	2.59	6.05	7.86	14.01
1955	1.60	2.03	2.60	5.60	7.26	12.57
1956	1.60	2.03	2.70	5.67	7.29	12.71
1957	1.58	2.00	2.61	5.42	7.04	12.83
1958	1.61	2.04	2.58	4.97	6.20	10.30
1959	1.59	2.02	2.61	5.13	6.44	10.78
1960	1.60	2.02	2.58	4.95	6.20	10.47
1961						
1962	1.63	2.06	2.60	4.81	6.01	10.34
1963	1.63	2.05	2.58	4.80	5.96	
1964	1.64	2.08	2.62	4.69	5.94	10.83

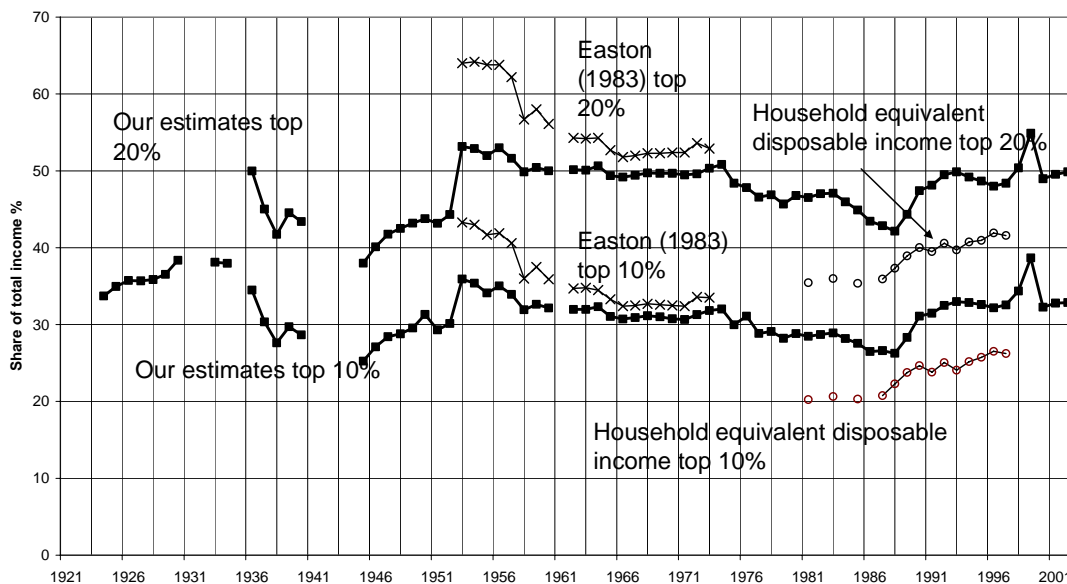
Table 2 New Zealand - Top income percentiles (% of mean)

	20%	10%	5%	1%	0.5%	0.1%
1965	1.64	2.07	2.57	4.48	5.66	9.50
1966	1.66	2.08	2.59	4.38	5.55	9.31
1967	1.66	2.09	2.61	4.43	5.55	9.32
1968	1.67	2.10	2.62	4.48	5.69	9.49
1969	1.67	2.11	2.59	4.38	5.67	9.45
1970	1.69	2.14	2.58	4.30	5.55	9.38
1971	1.68	2.13	2.60	4.36	5.51	9.15
1972	1.63	2.08	2.56	4.66	5.99	9.46
1973	1.64	2.10	2.57	4.73	6.20	11.39
1974	1.68	2.12	2.65	4.62	5.93	11.48
1975	1.64	2.07	2.51	4.08	5.47	9.65
1976	1.52	1.91	2.50	4.53	6.49	10.44
1977	1.57	2.01	2.44	4.06	5.18	8.72
1978	1.57	2.03	2.48	4.04	5.19	8.77
1979	1.54	2.00	2.43	3.87	4.90	8.26
1980	1.58	2.07	2.52	3.88	4.81	7.96
1981	1.58	2.07	2.50	3.73	4.70	7.75
1982	1.60	2.10	2.53	3.77	4.67	7.71
1983	1.59	2.09	2.53	3.84	4.77	8.09
1984	1.55	2.04	2.45	3.75	4.68	8.09
1985	1.51	1.99	2.39	3.66	4.66	7.79
1986	1.48	1.94	2.37	3.48	4.11	6.79
1987	1.42	1.87	2.30	3.55	4.49	8.08
1988	1.39	1.84	2.28	3.55	4.48	7.74
1989	1.39	1.87	2.33	3.99	5.19	
1990	1.41	1.92	2.43	4.50	6.10	
1991	1.44	1.96	2.50	4.55	6.17	
1992	1.46	2.00	2.54	4.77	6.32	
1993	1.45	1.99	2.55	4.92	6.63	
1994	1.40	1.92	2.49	4.96	6.84	
1995	1.38	1.89	2.48	5.00	6.81	
1996	1.37	1.86	2.44	4.86	6.69	
1997	1.36	1.86	2.45	4.92	6.74	
1998	1.36	1.90	2.53	5.15	7.13	
1999	1.41	1.92	2.57	5.70		
2000	1.45	1.98	2.52	4.86	6.41	
2001	1.44	1.98	2.52	4.86	6.54	
2002	1.47	2.00	2.52	4.81	6.58	

Comparison with other studies

How do our estimates compare with those of earlier studies? Using data from the census of population, Martin (1997, page 30) concluded that the period 1951 to 1991 could be divided into four sub-periods. From the early 1950s to the mid-1970s, the dispersion of income was decreasing slowly; from the mid-1970s to the early 1980s, dispersion was increasing slowly; there then followed a period in the early to mid-1980s when dispersion decreased slowly; finally, from the mid-1980s to the early 1990s, dispersion increased rapidly. The estimates presented in Figure 1 follow broadly this pattern, but place the temporary increase in the early rather than the late 1970s. Indeed for the share of the top 0.1% , 0.5% and 1% our findings are better described as a steady downward trend from 1953 to 1985, with a brief hiatus in the first half of the 1970s. As already noted, the distribution at the very top was moving in a different way from lower parts of the distribution. This is brought out in Figure 4 where we show our estimates of the shares of the top 10% (previously shown in components in Figures 1 and 2) and top 20%.

Figure 4 New Zealand - Comparison with other studies: shares of top 10% and 20%



As explained at the outset, we have followed Easton (1983) in using the income tax data, but our method differs in that we have applied independent control totals for income. As may be seen from Appendix Table 3, in 1953 when Easton's

series begins, our control total was some 20% larger than the total reported in the tax statistics (and used by Easton). Over the ensuing 20 years, the proportion fell to under 10%. As a result, our estimates of the top shares are lower than those of Easton, but the difference narrows over the 1950s and 1960s.

The main source used today is the Household Economic Survey (HES). In the right hand part of Figure 4, we show the results for the period 1981 to 1997 from the work of Mowbray (2001).¹⁴ These relate to a quite different concept of income: household total income, after taxes, and adjusted for household composition. It is not therefore surprising that both level and time patterns are different. For example, the HES series is virtually flat from 1981 to 1987, whereas our series shows the share of the top 10% falling by some 2 percentage points. Nonetheless, the two sources show the same pattern of a sharp rise at the end of the 1980s.

Podder and Chatterjee (2002) make a comparison between their estimates of the share of the top 5% based on the HES and those derived from the income tax returns, referring to the study by Chatterjee and Srivastav (1992), which gave a figure for the share of the top 5% of income-tax payers of 14.3% in 1983/4. They cite evidence from the tax data supplied by Statistics New Zealand that shows the share increasing to 21.1% by 1991/2 and 22.7% by 1995/6. As they comment, “this represents an increase of nearly 59% over the 12-year period – more than double the increase when measured with Survey data” (2002, page 14). Their own data shows the share of the top 5% rising from 15.3% in 1983/4 to 17.0% in 1991/2 and 19.0% in 1995/6. The estimates both relate to gross income, but the Podder and Chatterjee figures take the household unit, whereas the tax data relate to individuals. We should not therefore expect the figures or the trends to be the same, but this cannot explain the large discrepancy. In fact, the difference lies in the fact that the income tax estimates cited are based on the total number of taxpayers, not the total adult population, and on the total income reported in the tax returns, not on total incomes. Our estimates in Table 1 show the share of the top 5% rising from 17.5% in 1983 to 20.5% in 1991 and 22.0% in 1995, a rise of 26%,

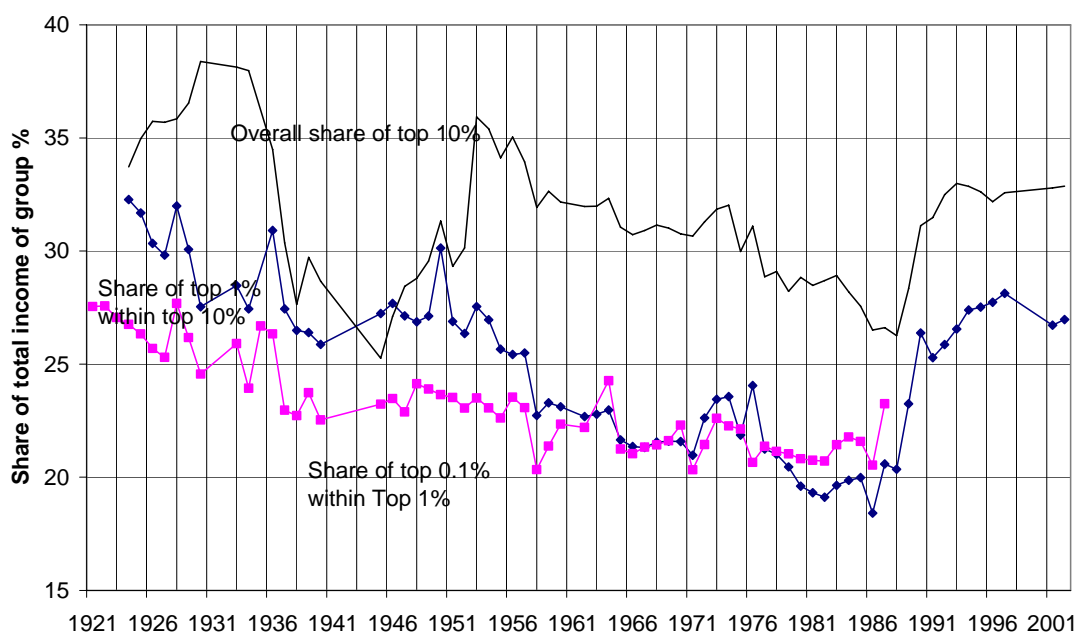
¹⁴ Easton (1999) explains that the March 1996 HES, or the HES 1995/6, covers households interviewed between April 1995 and March 1996, and that they reported their income for the previous year. The observations are therefore intermediate in timing between those reported from the tax data. Easton notes that the HES procedure “gives an average of the incomes for the year ended September 1995” (1999, page 56, footnote 1), and we have therefore allocated the HES observation to the year 1995 on the basis that the greater part of this average lies in this year.

which is close to that recorded in the HES estimates of Podder and Chatterjee (2002, Table 1).

Shares within shares

We have suggested above that there was a change in the shape of the distribution, not simply redistribution between rich and poor. This can be investigated further by looking at the “shares within shares”: for example the share of the top 1% within the total income of the top 10%. This is shown in Figure 5, together with the overall share of the top 10% (shown without year markers). One advantage of this calculation is that it does not involve the control total for income, allowing some test of the sensitivity of the findings. As we stressed in Section 1, the control totals must be regarded with considerable caution, particularly those for the earlier years. We have not shown the estimates for 1998, 1999 and 2000 for the reason discussed above.

Figure 5: New Zealand - Shares within shares

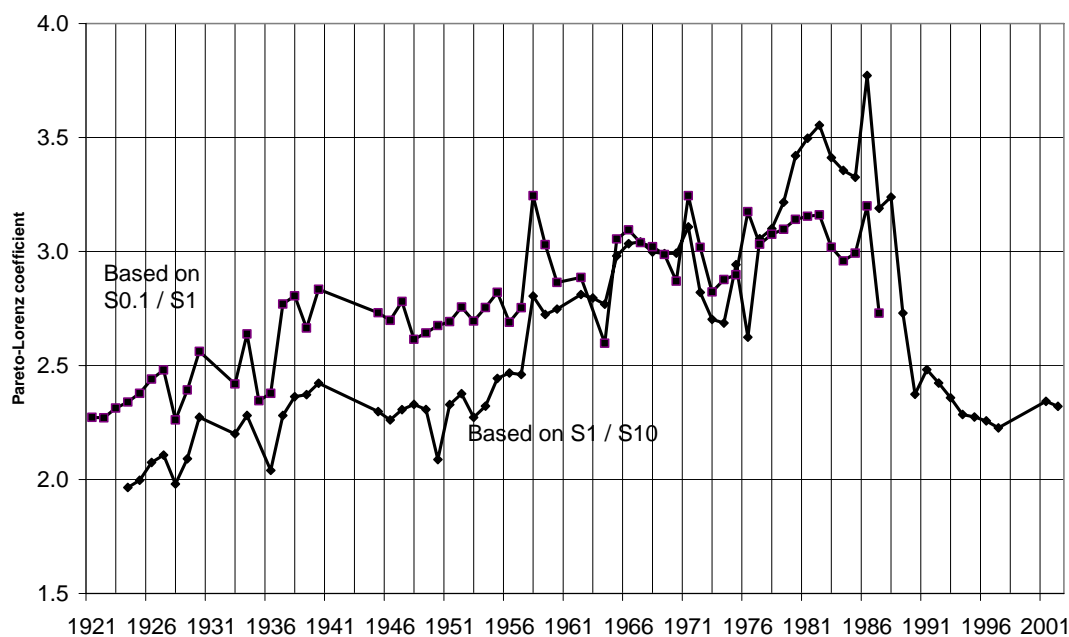


The value of the share within share is similar in magnitude, at both the beginning and end of the period, to that of the overall share, but the time path is definitely different. In 1924, the top 1% had some third of the total income of the top 10%. The percentage trended downwards to reach a little more than a quarter in 1940.

In 1953, the percentage was 27½% and then fell, with some ups and downs, to 18% in 1986. The fall was then reversed, the figure reaching 27% again in the 1990s and remaining at around that level – back as it was at the time of the Coronation. The share of the top 0.1% within the top 1% was initially a little lower, and the decline less rapid, so that by the late 1950s the values were similar.

An alternative formulation of the shares within shares is shown in Figure 6 in the form of Pareto-Lorenz coefficients.¹⁵ The Pareto-Lorenz coefficient for the share of the top 0.1% within the top 1% trended fairly steadily upwards from 1921 (2.3) until 1986 (3.2). In 1987, it dropped to 2.7, and the taxation statistics do not allow us to calculate it for subsequent years. The Pareto-Lorenz coefficient for the share of the top 1% within the top 10% peaked in 1986 at 3.8, before declining to 2.3 in 2002, about the same value as in 1930.

Figure 6: New Zealand - Pareto-Lorenz coefficients



¹⁵ Defined as $1/[1 + \text{Log}_{10}[S_1/S_{10}]]$

Sensitivity of estimates

How sensitive are the results to the assumptions made? Taking a control total for income of 90% of the constructed total would raise the estimated share in 1975 of the top 1% by 0.7 percentage points, and that of the top 10% by 3.1 percentage points. This would not affect our broad conclusions about the trends, but could be relevant to cross-country comparisons – see the next section. For the reasons indicated earlier, it does not seem likely that our control total is 10% too *low*, at least in recent years.

Adjusting for series breaks and gaps

The series presented above is “conservative” in the sense that we have emphasised the breaks in definition, have not extrapolated into the open top interval, and have not interpolated for years where data are not available. At the same time, we appreciate that users of the data may need a continuous, rectangular series, complete for all groups and for all years. In Appendix we describe a series of adjustments to produce a full series by means of additional assumptions, interpolation and extrapolation. Specifically, we adjust to a total income basis, we extrapolate into open upper intervals to get estimates of the share of the top 0.1% where this is missing, we interpolate linearly for missing years, and we apply a constant adjustment to convert the tax unit series to an individual basis. (No adjustment is made for the introduction of PAYE in 1958.) The “adjusted and extended” series is shown in Table 3, and used in the next section. In some cases, the assumptions are relatively well-founded. We make use, for example, of the fact that there are overlapping estimates for assessable and total incomes for the five years 1945-1949. These indicate that the estimates based on total rather than assessable incomes are significantly higher: by about a fifth in the case of the share of the top 1%. We have therefore adjusted in what follows the estimates for New Zealand for 1921 to 1940 by the average of the factors for the five post war years. In other cases, our assumptions add nothing, as where we linearly interpolate for missing years. The tax unit adjustment is the most problematic. As noted earlier, the difference between the two definitions (individual and tax unit) is likely to be particularly affected by changes in female labour force participation. In this respect, the fact that the change took place early in the post war period (1953)

may mean that the assumed constancy of the adjustment is relatively innocuous, but the reader is cautioned not to place too much weight on the adjustment.

Table 3 New Zealand: Adjusted and extended estimates

	5%	1%	0.1%
1921	32.55	15.47	4.64
1922	30.82	14.43	4.32
1923	31.80	14.99	4.42
1924	31.53	14.92	4.36
1925	32.29	15.16	4.36
1926	32.31	14.87	4.19
1927	32.10	14.64	4.07
1928	32.58	15.62	4.70
1929	32.65	15.05	4.31
1930	33.42	14.55	3.94
1931	33.35	14.66	4.03
1932	33.29	14.78	4.13
1933	33.22	14.89	4.22
1934	32.83	14.37	3.80
1935	31.72	14.30	4.16
1936	31.17	14.66	4.22
1937	27.11	11.88	3.03
1938	24.83	10.68	2.70
1939	26.45	11.30	2.97
1940	25.60	10.79	2.71
1941	24.75	10.40	2.59
1942	23.89	10.01	2.47
1943	23.03	9.62	2.34
1944	22.18	9.23	2.22
1945	21.32	8.84	2.10
1946	22.78	9.46	2.26
1947	23.78	9.68	2.27
1948	23.91	9.70	2.37
1949	24.56	9.98	2.42
1950	26.83	11.40	2.73
1951	24.35	9.84	2.35
1952	24.83	9.90	2.33
1953	24.83	9.90	2.33
1954	24.29	9.54	2.20
1955	22.89	8.76	1.98
1956	23.53	8.91	2.10
1957	22.69	8.65	2.00
1958	20.66	7.26	1.48
1959	21.37	7.60	1.63
1960	20.93	7.44	1.66
1961	20.76	7.34	1.64
1962	20.59	7.25	1.61
1963	20.67	7.29	1.66
1964	20.85	7.42	1.80

Table 3 New Zealand: Adjusted and extended estimates

	5%	1%	0.1%
1965	19.69	6.72	1.43
1966	19.30	6.56	1.38
1967	19.39	6.59	1.41
1968	19.59	6.72	1.44
1969	19.47	6.70	1.45
1970	19.11	6.64	1.48
1971	19.01	6.43	1.31
1972	19.90	7.08	1.52
1973	20.35	7.47	1.69
1974	20.38	7.55	1.68
1975	18.70	6.56	1.45
1976	20.36	7.48	1.55
1977	17.89	6.13	1.31
1978	17.99	6.12	1.29
1979	17.29	5.77	1.21
1980	17.51	5.65	1.18
1981	17.15	5.50	1.14
1982	17.24	5.49	1.14
1983	17.52	5.68	1.22
1984	17.09	5.60	1.22
1985	16.74	5.51	1.19
1986	15.85	4.88	1.00
1987	16.29	5.48	1.27
1988	16.08	5.35	1.16
1989	17.97	6.59	1.62
1990	20.41	8.21	2.33
1991	20.53	7.96	2.08
1992	21.32	8.40	2.35
1993	21.86	8.76	2.38
1994	22.06	9.00	2.49
1995	21.97	8.98	2.46
1996	21.69	8.92	2.51
1997	22.03	9.16	2.66
1998	23.58	10.21	3.28
1999	27.74	13.77	5.45
2000	21.20	8.25	2.16
2001	21.76	8.76	2.51
2002	21.79	8.86	2.58

4 Comparison with the UK and Australia

Historical links with the United Kingdom (UK) and geographical links with Australia suggest that comparisons with both countries would be of interest. How far have the top shares in New Zealand moved in a similar way?

For purposes of making the international comparison, we make use of the “adjusted rectangularised” series for New Zealand described at the end of the previous section. For Australia, we take the adjusted series constructed by Atkinson and Leigh (2005) for the period 1921 to 2001, where the adjustment is applied for those years where the data relate to taxable rather than actual income. These adjustments are quite modest.¹⁶ There is no need to extrapolate the Australian data to cover the top 0.1%. At the same time, for many years (1923 to 1934) the Australian estimates do not extend down to cover the top 5%. We do not consider there is any basis for interpolating over this 11 year period, so that the rectangularised series covers only the top 1% and top 0.1%. For the UK the coverage is still less complete. The estimates of Atkinson (2005a) for the shares of the top 5% and 1% in the UK cover 1918 and 1919, 1937, and do not start as an annual series until after the Second World War. The UK rectangularised series covers therefore the full period for only the top 0.1%; the series for the top 1% and 5% only becomes continuous after 1949 and 1959, respectively. The series have been interpolated for three missing years: 1950 (top 1% only), 1960 (top 5% only), 1961 and 1980. The share of the top 0.1% has been extrapolated using the Pareto method for a small number of years (1987 to 1992). Two adjustments have been made. First, the statistics from 1975 relate to total income, and earlier figures are increased by a small amount.¹⁷ Second, it is assumed that the whole of the increase in the top shares from 1989 to 1990 was attributable to the move from a tax unit to an independent basis, and this amount (in percentage points) subtracted from the shares from 1990 onwards, to give a consistent tax unit series.

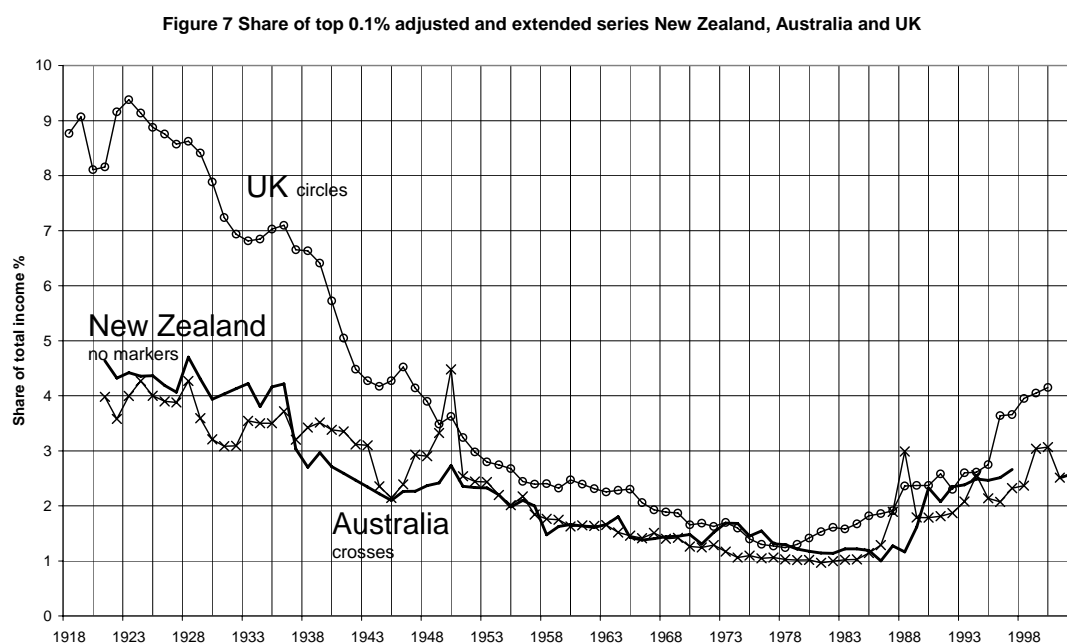
The UK series relates to tax units, whereas the Australian and New Zealand series relate to adult individuals, but otherwise the series are derived from very similar sources and applying the same methods. They are therefore considerably closer to comparability than many series employed in cross-country studies of income distribution.

¹⁶ The adjustment, applied to the Australian data for the years 1921 to 1943 and 1947-1957 increases the estimated share of the top 5% by a factor of 1.02, the share of the top 1% by a factor of 1.034, and the share of the top 0.1% by a factor of 1.0765.

¹⁷ The UK adjustment increases the estimated share of the top 5% by a factor of 1.0077, the share of the top 1% by a factor of 1.000797, and the share of the top 0.1% by a factor of 1.0097.

Changes at the very top

We begin in Figure 7 with the share of the top 0.1%. The findings for the beginning of the period are striking. In the 1920s, the shares of the top 0.1% are very similar, on this adjusted basis, for Australia and New Zealand, and they are around half that in the UK. In the UK, this group received some 90 times their proportionate share; on the other side of the world they received some 40-45 times. Then, over the next 50 years, the series converged: shares fell in New Zealand and Australia, but they fell faster in the UK. By the end of the 1970s, the shares were 1% in Australia and 1.2% in New Zealand and the UK. In sub-periods there were divergences. In the early 1930s, the share of the top 0.1% fell more in Australia than in New Zealand. The rise in 1950 was larger in Australia. But over the period as a whole, the series for Australia and New Zealand moved closely together, and for the three countries there was a remarkable convergence.

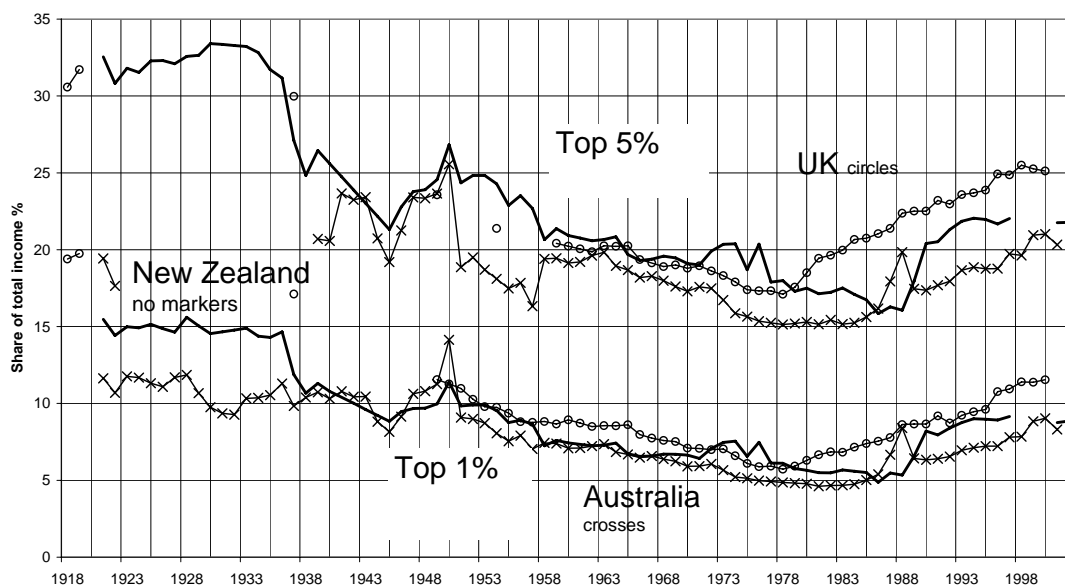


Since 1979, all three countries have seen a significant increase in the share of the top 0.1%, but there appear to be differences between Australia and New Zealand, on the one hand, and the UK, on the other hand. In Australia and New Zealand, the share exhibits a step change from the late 1980s to the 1990s, the share rising from

around 1% to around 2½%. There is year-to-year variation, for reasons we have discussed in the case of New Zealand, but no clearly continuing upward trend. In the UK, the rise began earlier, in 1979, and exhibits an upward trend over the 1980s and 1990s. At the end of the century, the share of the top 0.1% in the UK was around 4%, and that in Australia and New Zealand around 2½%. (As explained earlier, we have left out the New Zealand observations for 1998, 1999 and 2000.)

Does this pattern of cross-country differences apply less as we move down from the very top of the income distribution? Figure 8 shows the evidence for the top 1% and the top 5%, where the estimates for Australia and the UK are less complete. For these groups, the convergence story with the UK is less clear. In 1949, when the continuous series for the top 1% in the UK starts, the share is already close to that in New Zealand, and the narrowing of the gap appears to have happened before that date. The divergence in recent decades, however, is if anything more marked. The share of the top 5% fell from 1979 to 1988 in New Zealand, whereas it rose by some 5 percentage points in the UK.

Figure 8 Share of top 1% and 5% adjusted and extended series New Zealand, Australia and UK



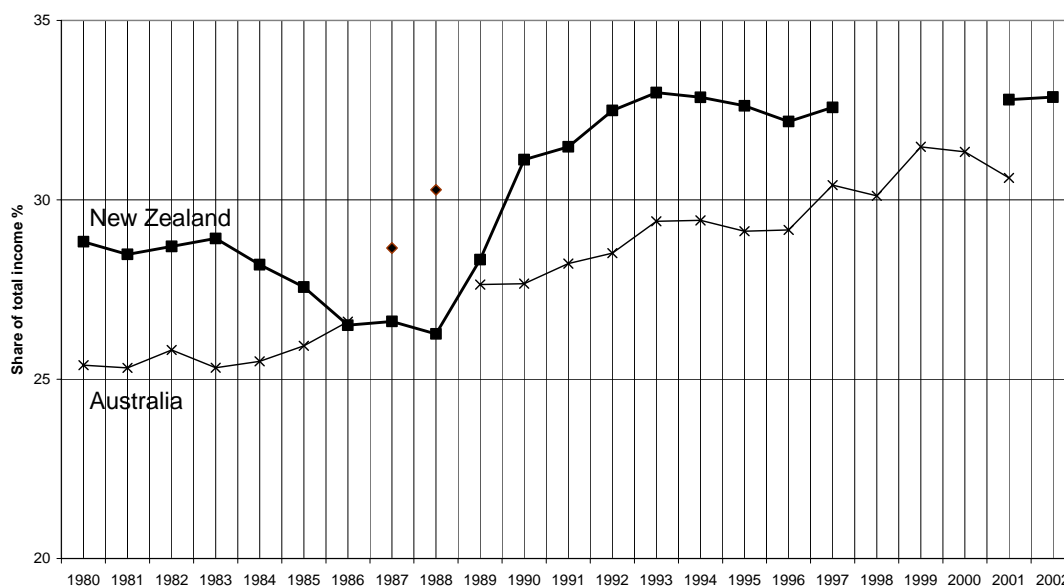
Comparing New Zealand and Australia, for the top 1% and 5%, the shares in Australia appear to have been distinctly lower in the interwar period. The New Zealand top shares fell in 1937 in a way not followed by Australia, and the shares are

thereafter close. In 1960, for example, a year not affected by our adjustments, the shares of the top 1% are 7.1% in both countries. There have however been a number of occasions in the post war period on which the Australian figures have been lower, including 1951-7, when there was a 5 percentage point gap in the share of the top 5%.

What about the recent decades? From Figure 8, we may observe that, with the top 1%, and particularly the top 5%, there is more evidence of a recent upward trend in the Australian estimates, whereas the New Zealand shares continue to show more of a step change. The shares of the top 1%, for example, are close in the two countries in 2001, and the share in New Zealand is the same as in 1993, whereas the Australian share in 1993 was distinctly lower than in 2001

Using survey evidence to estimate shares of equivalent disposable income, Saunders (1994) concluded that the rise in the top 10% share from 1981-82 to 1989-90 was slightly larger in New Zealand (20.2%–23.9%) than in Australia (21.2%–23.3%). In Figure 9 we plot the shares of the top 10% in the two countries as estimated from the tax data for the period since 1980 (again omitting 1998, 1999 and 2000 for New Zealand). These years are not affected by adjustments or extrapolations. (Although it should be borne in mind that these data refer to gross income, on an individual basis, and therefore are not directly comparable with estimates of the distribution of equivalent net family income.) The graph brings out the importance of looking at a full run of years. The results for individual years, as we have already noted, may be affected by particular events, and simply comparing two years may give a misleading impression of the longer-run tendency. For example, the share of the top 10% in Australia in the late 1980s was affected by the property boom (see Atkinson and Leigh, 2005). On this basis, we have in Figure 9 shown separately the years 1987 and 1988 for Australia, marked by diagonals.

Figure 9 Share of top 10% in New Zealand and Australia 1980-2002



Leaving aside the years indicated, we can see that, as noted for the top 1% and 5%, the income tax evidence suggests rather different trajectories in the two countries for the share of the top 10%. For Australia there was a fairly steady upward trend over both the 1980s and 1990s, with the share in 1999 being some 6 percentage points higher than in 1980. There was a sustained upward trend. In contrast, in New Zealand, the share of the top 10% fell modestly (some 2 percentage points) between 1980 and 1988, reaching a figure of around 25%, which had been the starting point for Australia in 1980. The New Zealand share then rose sharply after 1988 by some 6 percentage points over 5 years. Having attained a level of some 31%, the share of the top 10% remained broadly stable from 1992 onwards, with the exceptions already noted.

Conclusions

In a widely cited report published in 1999, Statistics New Zealand identified a substantial increase in inequality (measured by after-tax equivalized household income) from 1982 to 1996. It concluded that this rise “appears to have been as large as, or larger than, that in other countries for which similar data is available”. Our research on the top of the income distribution suggests that this was a period in which (pre-tax) top income shares rose dramatically. From 1986-1993, the share of the top

10% rose from 26.5% to 33%, while the top 1% share rose from under 5% to around 9%.

Our findings allow this recent increase to be placed in historical perspective. The tax data used have evident shortcomings, but they allow us to cover a period of 80 years and to give estimates for individual years. The recent rise in top shares followed a sixty year period in which the income share of the rich had occasionally risen, but had mostly been on a downwards trajectory. There had been a distinct change in the shape of the distribution at the top of the scale, reflected in the rise of the estimated Pareto-Lorenz coefficient from around 2 to around $3\frac{1}{2}$, a rise that was reversed much more sharply after 1986. The reversal appears, however, to have been a step change, rather than a continuing trend, and top shares in 2002 were little different from those in 1994. Comparisons with the UK and Australia showed that, while top income shares had risen in both these countries, the time paths were not identical.

In seeking to understand the underlying causal mechanisms, the reader can readily identify a number of factors specific to the situation of New Zealand. These include the heavy dependence of the economy on agriculture, and the impact of changes in the farm sector, such as its increasingly corporate nature. The recent policy experiments in New Zealand have received much attention (see, for example, Evans et al, 1996). These include, in the late-1980s and early-1990s, the rapid deregulation of the economy. In considering the relative importance of policy changes, as against the structural factors emphasised, for example, by Hyslop and Maré (2005), it is helpful to separate those factors that specifically affect the shares of the top income groups, and those that affect directly the incomes of the rest of the population (and indirectly the top shares). In the latter group would come for instance increased female labour force participation, which is likely to have increased total income without adding proportionately to the top income shares. In the former group come changes in top income tax rates. Progressive taxation may have contributed to the fall in top income shares over the 1930s and 1940s, with the top marginal tax rate rising from 25% in 1930 to 65% in 1940, peaking at 77% from 1942-45. Likewise, top tax rates may have been a factor in the growth in top income shares during the late-1980s. Between 1985 and 1989, the top marginal tax rate was halved from 66% to 33%. Lower tax rates

have several possible effects – they may induce the rich to work more, they may increase their investment returns, thus boosting the amount they could invest in subsequent years, and they may induce companies to increase top salaries. We have also noted the impact of the taxation of fringe benefits.

The evolution of top income shares in New Zealand over the century is likely to have been affected by what is happening elsewhere. As an English-speaking country, New Zealand CEO salaries were most likely affected by the internationalisation of the market for executives. And just as a rapid rise in top US salaries placed upward pressure on top salary income in neighbouring Canada (Saez and Veall 2003), so the rise in top incomes in Australia, which continued through the 1980s and 1990s, is likely to also have been a factor in the rise of top incomes in New Zealand. The combination of long time series, and of data broadly comparable across countries, promises to provide a valuable source of evidence about the underlying determinants of top income shares.

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Appendix A: Sources of Income Tax Data for New Zealand

The paper relies solely on tabulated data, which means that we have to interpolate. Typically, for each income range, there is information on the number of taxpayers and the total amount of income declared to the taxation authorities. In order to calculate the shares of specified percentages of the population, we have used the *mean-split histogram*, as discussed in Atkinson (2004). Gross bounds on the top income shares are obtained by assuming that all of the density is located at the interval mean (lower bound) or that the density is concentrated at the end points (upper bound). Assuming, as seems reasonable in the case of top incomes, that the frequency distribution is non-increasing, then more refined upper and lower bounds for the shares can be calculated; these are limiting forms of the split histogram, with one of the two densities tending to zero or infinity. Guaranteed to lie between these is the histogram split at the interval mean with sections of positive density on either side. We check for each interval whether the non-increasing density assumption is consistent with the interval mean; in the cases where this is not satisfied, and there is a significant difference between the gross bounds, we substitute the lower gross bound. In our main series, we have not interpolated shares that lie in the top open interval. For the percentiles, the same mean-split histogram technique is used, although it should be noted that the refined bounds do not apply in this case (an equalising mean-preserving transfer can raise the top, percentile).

The publications and sources used here are shown in Appendix Table 1. Estimates for 1980-2002 are based on data supplied by Te Tari Taake/Inland Revenue, and show the distribution of income broken down into some 40-60 ranges, with the top interval in 2002 starting at an annual income of \$200,000 (0.4 percent of taxpayers were in this band). Figures for 2002 are progress totals, based only on data available to the Inland Revenue Department as at 16 September 2004.

Prior to 1980, information on the distribution of persons by total income was published regularly in the publication *Income(s) and Income Tax Statistics for the Income Year*, referred to here as IITS. The year in the title referred either to the year covered by the full survey (e.g. *Report on the Income(s) and Income Tax Statistics for the Income Year 1957-58*), or the year to which the data had been projected using a preliminary set of returns (e.g. *Incomes and Income Tax Statistics to 1966-67*). The latter type of publication, which included information on income trends, is illustrated by *Incomes and Income Statistics to 1972-73*, containing final data for the 1970-71 income year. The next publication was in fact *Statistics of Incomes and Income Tax for the Income Year 1971-2*, containing data for that year (1971-2). The data were also published in Supplements to the *Monthly Abstract of Statistics* or the *Monthly Abstract of Statistics* (MAS) itself: for example, the final estimates for 1964-65 were published in the MAS for November-December 1968. Figures for 1921 to 1930 were published in the *Statistical Report on Prices, Wage-Rates and Hours* (SRPWH).

The statistics are based on a sample of 5% (10% from 1945-46 to 1967-68) with a complete enumeration of all persons with incomes above a certain level (\$8,000 in 1968-69 – see IITS to 1970-71, 9). There are no data for 1961 (information not processed or published), 1941-1944 (not collected on account of staff shortages during the war), or for 1931-1932 (not collected as an economy measure during economic depression). The data for 1974 and 1976 are taken from provisional

estimates made on the basis of a restricted sample (the regular statistics were not processed for these years).

In using the resulting estimates, the following needs to be borne in mind:

- a) The estimates from 1945 to 2002 relate to total income. Total income is before deduction of exemptions and includes non-assessable income. Examples of non-assessable income include certain types of overseas income, and certain types of tax-exempt government security.
- b) The estimates from 1921 to 1940 relate only to assessable income.
- c) Independent taxation was introduced in 1953.
- d) Dividend imputation was introduced in 1989, allowing income to be released in the form of dividends without the risk of double taxation; it was also pre-announced that the top individual rate would be reduced to the company tax rate in 1990, causing a postponement of payments out of company income until 1990.
- e) In 1999, New Zealand implemented a substantial overhaul of its tax system. Under the present system, residents whose only income is wage earnings, welfare benefits or superannuation are not required to file a tax return. However, wage and salary earners, and welfare and superannuation recipients, remain within the taxation statistics, since their incomes are now reported by their employers or other government agencies.
- f) When it was announced that the marginal tax rate on earnings over \$60,000 would be raised from 33 percent to 39 percent in the 2000-01 tax year, many taxpayers took the opportunity to realise business earnings in the 1999-2000 tax year, significantly boosting top income shares in that year.

Appendix B: Sources of Population and Tax Unit Totals

The estimated resident population of New Zealand relates to all people who usually live in New Zealand at a given date. It includes all residents present in New Zealand and counted by the census, residents who are temporarily overseas (who are not included in the census), and an adjustment for residents missed or counted more than once by the census (net census undercount). Visitors from overseas are excluded. The census count of the usually resident population of New Zealand at a given census date is used to derive the base population for post-censal population estimates.

From 1953, the data relate to individuals aged 15+. The figures for 1953 to 1957 are linearly interpolated from the Census figures for 1951 and 1961 (source: Mitchell, 1995, p 64 and p 65). The sources from 1958 are listed below (where MAS denotes *Monthly Abstract of Statistics*):

- Dec 1958 from MAS Oct 1959, p 19
- Dec 1959 from MAS Apr 1961 p 19
- Dec 1960 from MAS Feb 1963 p 9
- Dec 1961 from MAS Nov 1963 p 13
- Dec 1962 from MAS May 1964 p 15
- Dec 1963 from MAS Jan 1965, p 11
- Dec 1964 from MAS Jan 66 p 14
- Dec 1965 from MAS Apr 1967 p 9
- Dec 1966 from MAS 1968 p 9
- Dec 1968 from MAS Feb 1970 p 9
- Dec 1969 from MAS Aug 1970 p 15
- Dec 1970 from MAS May 1972 p 7
- Dec 1971 from MAS Dec 1973 p 9
- Dec 1972 from MAS May 1974 p 11
- Dec 1973 from MAS Jan/Feb 1975 p 8
- Dec 1974 from MAS Dec 1975, p 8
- Dec 1975 from MAS May 1978 p 7
- Dec 1976 from MAS Aug 1978 p 7
- Dec 1977 from MAS July 1979 p 5
- Dec 1978 from MAS Apr 1980 p 8
- Dec 1979 from MAS Nov-Dec 1981 p 10
- Mar 1981 from MAS Aug 1982, p10
- Dec 1981 from MAS Apr 1983, p 10
- Mar 1983 from MAS Mar 1984 p 10
- Dec 1983 from MAS June 1984 p 10
- Dec 1984 from MAS June 1985 p 1
- Dec 1985 from MAS Apr 1986 p 10

The figures from 1986 to 1990 are interpolated linearly between 1985 and 1991. The data for the population by age from 1991 onwards are from the Statistics New Zealand website (www.stats.govt.nz).

Prior to 1953 the figures relate to tax units, calculated by subtracting the estimated number of married women from the adult population. The population by age is available for the Census years 1921, 1926, 1936, 1941, 1951 and 1961 (Source: Mitchell, 1995, p 64 and p 65). We have linearly interpolated these figures to give an annual series. The number of married women in Census years is from United Nations,

1954, p 192 (for 1945 and 1951) and New Zealand Census and Statistics Department, 1940, Table 16. We then expressed the number of tax units in Census years as a percentage of the population aged 15+ and interpolated the percentages linearly (for 1952 we took the percentage in 1951).

Our population series are set out in Appendix Table 2. As noted in the text, for the years 2000 to 2002 we take the total number of taxpayers, since this exceeds the calculated total shown in Appendix Table 2.

Appendix C: Derivation of personal income series

The New Zealand financial year runs from 1 April to 31 March.

Working backwards in time, for the period 1971-72 to 2002-03, we use tables headed “8.8 Household Income and Outlay Account” helpfully provided by Stephen Flanagan of Statistics New Zealand. We have taken the total of compensation of employees, entrepreneurial income, actual interest, and dividends, social security benefits in cash and social assistance benefits in cash (termed “Social Assistance Grants-Social Welfare” in the 1971-72 to 1985-86 table), and pension fund benefits. The last of these categories is only distinguished in the tables covering the period from 1986-7 onwards, and this may cause a minor break in comparability between the estimates up to 1985 and those from 1986 onwards. As explained in the text, we have reduced all figures by multiplying by a factor of 0.95.

For the preceding period 1938-39 to 1970-71, a series on Private Income was published regularly in the Monthly Abstract of Statistics (MAS). The sources are in the Supplement to MAS March 1975, Table 5, except for 1939-40, 1940-41 and 1945-46 from the Supplement to MAS January 1973, Table 5. This source gives salary and wage payments, pay and allowances of Armed Forces, social security benefits and pensions, and other personal income (excluding company dividends). The element missing compared with later years is company dividends. These have been interpolated using the series for company income (before distribution). There is reason to suppose that the proportion distributed has fallen since the immediate post-war period, when the total company income was some \$100m. Inspection of the value for 1971-72 (see previous paragraph) and the dividends reported in the income tax statistics led us to assume that 50% were distributed as dividends to NZ households up to \$100m and that 10% was distributed on income in excess of that amount. This generates a percentage of around 15% for 1971-72, which is in line with the observed figure. The “private income” series may include some income of non-household institutions, which we allow for by linking the series to that from 1971-72 (which involves a reduction of some 0.7%). We have not included the rental value of owner-occupied houses. Again, as explained in the text, we have reduced all figures by multiplying by a factor of 0.95.

For the period 1931-32 to 1938-39, we used the figures on total private income published regularly in MAS: 1938-39 from MAS June 1941, 13, applying the same assumption about dividends as above, 1931-32 to 1937-38 from MAS June 1939, where no assumption about dividends is required. The figures cover wages, salary, pensions, investment income, and the net income of the self-employed. Undistributed company income is excluded. The series is linked, using the 1938-39 observation to give figures comparable with those for later years. For the period prior to 1931-32, we linked the series at 1931-2 to that for nominal GDP constructed by Easton (1997, Appendix 5). As explained in the text, we have reduced all figures by multiplying by a factor of 0.95.

Our personal income series are set out in Appendix Table 3. It should be noted that New Zealand switched from pounds to dollars on 10 July 1967, at the ratio of £1=\$2. While some of our original sources are in pounds, we present all our tables in

millions of dollars. For the years 2000 to 2002, the mean income is calculated using the number of taxpayers.

Appendix D: Comparison groups for New Zealand top income shares

To calculate average wages, we use the average wage of a full-time employee, published annually by Statistics New Zealand since 1998 (*New Zealand Income Survey*, Table 11). That publication shows average weekly wages, and we multiply these by 52 to obtain average annual wages. From 1921-1997, we calculate average wages using a nominal wage index kindly supplied by Claire Stent, Librarian at Statistics New Zealand, and link this to the 1998 average wage.

Remuneration of judges refers to a puisne judge on New Zealand's highest court. This was the Supreme Court until 1980, when that body was renamed the High Court. Our period of analysis stops at 2002, so does not encompass the creation of a new Supreme Court in 2004 (following abolition of appeals to the Privy Council). Figures supplied by Patricia Gordon of the New Zealand Remuneration Authority.

Salaries of members of parliament are the base salary for an MP, excluding allowances. Figures for 1921-2001 were supplied by Ruth Graham of the New Zealand Parliamentary Library. Recent years were obtained from the annual *Parliamentary Salaries and Allowances Determination*.

Data on salaries of top public servants are not included, since deregulation of public service salaries makes it difficult to discern an appropriate comparison group.

Each of these series is presented in Appendix Table 4.

Appendix E: Adjusted rectangularised series

In order to arrive at an “adjusted rectangularised” series for the complete period 1921-2002, and covering the top 5%, top 1% and top 0.1%, we have made a number of approximate adjustments and interpolations to arrive at the “adjusted estimates” for the distribution of *total income* among *individuals* given in Table 2 and used in Figure 6. In particular,

- a) We make use of the fact that there are overlapping estimates for assessable and total incomes for the five years 1945-1949. These indicate that the estimates based on total rather than assessable incomes are significantly higher: by about a fifth in the case of the share of the top 1%. We have therefore adjusted the estimates for 1921 to 1940 by the average of the factors for the five post war years (1.115 for the share of the top 5%, 1.191 for the top 1% and 1.324 for the top 0.1%).
- b) Where the top 0.1% lies in the open top interval, we have extrapolated assuming a Pareto distribution, using the relation between the starting level of income and the interval mean to calculate a value for the Pareto exponent, with this value using the cumulative distribution function to calculate the 0.1 percentile, and the mean income above this level then provides the desired income share.
- c) For the years where there are gaps (1931 and 1932, 1941 to 1944, and 1961), we have interpolated linearly.
- d) We have assumed that the whole of the increase in the top shares from 1952 to 1953 represented the effect of the move from a tax unit to an individual basis, and applied this constant adjustment (4.24 percentage points for the top 5%, 1.96 for the top 1% and 0.50 for the top 0.1%) to 1952 and all previous years.

These adjustments may be seen as involving decreasing amounts of information and increasing amounts of guesswork. In the first two cases, we are adding some information to the series already constructed; in the third case the linearity assumption is neutral (and has already been applied in the graphs); the final adjustment assumes arbitrarily that the appropriate adjustment is constant over the 30-year period,

Appendix Table 1 Sources of income tax data for New Zealand

Year	Source	Notes
1921-22	SRPWH 1922, p 150	Total assessable income by range. Data until 1949-50 refer to the assessment year: data for the assessment year 1922-23 is taken to relate mainly to incomes in year 1921-22.
1922-23	SRPWH 1923, p 154	Assessable income
1923-24	SRPWH 1924, p 184	Assessable income
1924-25	SRPWH 1925, p 126	Assessable income
1925-26	SRPWH 1926, p 122	Assessable income
1926-27	SRPWH 1927, p 124	Assessable income
1927-28	SRPWH 1928, p 132	Assessable income
1928-29	SRPWH 1929, p 132	Assessable income
1929-30	SRPWH 1930, p 108	Assessable income
1930-31	SRPWH 1931, p 75	Assessable income
1931-32 & 1932-33	Unavailable	
1933-34	MAS Jan 1936, p xx	Assessable income
1934-35	MAS Jan 1937, p xxvi	Assessable income
1935-36	OY 1940, p 774-775	Assessable income. Calculated using information on increases. Only 6 ranges.
1936-37	MAS Sept 1938, p xviii	Assessable income
1937-38	MAS Feb 1940, p xi	Assessable income
1938-39	MAS April 1941, p 12	Assessable income
1940-41	MAS April 1942, p 9	Assessable income
1941-42 to 1944-45	Unavailable	
1945-46	IITS for 1946-47, 1947-48, 1948-49, and 1949-50, p 16	Total (returnable) income; assessable income in OY 1950 p 681; from 1940-41 assessment year, proprietary income of closely held companies included.
1946-47	MAS Nov 1949, p 2	Total (returnable) income; assessable income in OY 1950 p 681.
1947-48	MAS Aug 1950, p 4-5	Total (returnable) income; assessable income in OY 1950 p 681.
1948-49	MAS Oct 1951, p 7	Total (returnable) income and assessable income.
1949-50	IITS for the Income Year 1949-50, p 15	From this year, the data refer to the income year; previous data refer to the assessment year (data for the assessment year T was taken to relate mainly to incomes in year (T-1).
1950-51	MAS Sep 1953, p 12	
1951-52	MAS Aug 1954, p 3	
1952-53	MAS Sep 1955, p 5	
1953-54	IITS for the Income Year 1953-54, p 16	From this year, aggregated assessments of husband and wife now counted as two assessments; increase for 1952-53 from 612.7k to 641.3k; from this year, company proprietary income excluded and company dividends received included
1954-55	IITS for the Income Year 1954-55, p 17	
1955-56	IITS for the Income Year 1955-56, p 17	
1956-57	IITS for the Income Year 1956-57, p 17	
1957-58	IITS for the Income Year 1957-58, p 15	Year of transition to PAYE. All tax for 1957-58 income year remitted in full. Figures for 1957-58 estimated.
1958-59	IITS for the Income Year 1958-59, Table 2	
1959-60	IITS for the Income Year 1959-60, Table 2	
1960-61	IITS or the Income Years 1960-61 and 1961-62, Table 2	

Appendix Table 1 Sources of income tax data for New Zealand

Year	Source	Notes
1961-62	Unavailable	
1962-63	IITS to 1965-66, Table 8	
1963-64	Supplement to MAS Oct 1967, p 3	First published in \$
1964-65	IITS to 1966-67, Table 1	
1965-66	IITS to 1967-68, Table 1	
1966-67	IITS to 1968-69, Table 1	
1967-68	IITS to 1969-70, Table 1	
1968-69	IITS to 1970-71, Table 1	
1969-70	IITS to 1971-72, Table 1	
1970-71	IITS to 1972-73, Table 1	
1971-72	IITS for the Income Year 1971-72, Table 1	
1972-73	IITS to 1975-76, Table 1	
1973-74	IITS to 1977, Table 1	
1974-75	OY 1979, page 692	
1975-76	IITS to 1979, Table 1	
1976-77	OY 1979, page 692	
1977-78	IITS 1977-78, Table 1	
1978-79	IITS 1978-79, Table 1	
1979-80	IITS 1979-80, Table 1	
1980-81 to 2002-03	Computer file supplied by Inland Revenue	Data supplied on 30 September 2004.

Note: SRPWH denotes the *Statistical Report on Prices, Wage-Rates and Hours*. OY denotes *The New Zealand Official Yearbook*; MAS denotes *Monthly Abstract of Statistics*; IITS denotes *Income(s) and Income Tax Statistics for the Income Year*.

Appendix Table 2 New Zealand population totals (thousands)

Tax year starting 1 April	Total tax units aged 15 and over	Total individuals aged 15 and over	Total taxpayers	Total taxpayers as % total tax units (italics) or total individuals
1921	669		89	<i>13.3</i>
1922	688		71	<i>10.3</i>
1923	704		75	<i>10.7</i>
1924	721		76	<i>10.5</i>
1925	741		80	<i>10.7</i>
1926	761		99	<i>13.1</i>
1927	779		104	<i>13.3</i>
1928	793		109	<i>13.7</i>
1929	806		113	<i>14.1</i>
1930	822		126	<i>15.3</i>
1931	838			
1932	850			
1933	862		121	<i>14.0</i>
1934	873		134	<i>15.3</i>
1935	883		149	<i>16.9</i>
1936	896		188	<i>21.0</i>
1937	893		214	<i>24.0</i>
1938	891		257	<i>28.9</i>
1939	891		298	<i>33.5</i>
1940	884		315	<i>34.8</i>
1941	869			
1942	862			
1943	849			
1944	848			
1945	856		392	<i>45.8</i>
1946	882		463	<i>52.5</i>
1947	894		519	<i>58.0</i>
1948	905		546	<i>60.3</i>
1949	917		585	<i>63.8</i>
1950	927		605	<i>65.3</i>
1951	939		585	<i>62.3</i>
1952	958		613	<i>64.0</i>
1953		1,432	661	<i>46.1</i>
1954		1,459	649	<i>44.5</i>
1955		1,487	663	<i>44.6</i>
1956		1,514	689	<i>45.5</i>
1957		1,541	814	<i>52.9</i>
1958		1,568	1,058	<i>67.5</i>
1959		1,589	1,050	<i>66.1</i>
1960		1,611	1,085	<i>67.4</i>
1961		1,649		
1962		1,690	1,157	<i>68.5</i>
1963		1,728	1,189	<i>68.8</i>
1964		1,765	1,228	<i>69.6</i>
1965		1,804	1,274	<i>70.6</i>
1966		1,827	1,309	<i>71.6</i>
1967		1,853	1,343	<i>72.5</i>
1968		1,878	1,368	<i>72.8</i>
1969		1,908	1,414	<i>74.1</i>
1970		1,947	1,461	<i>75.0</i>
1971		1,984	1,517	<i>76.5</i>
1972		2,036	1,574	<i>77.3</i>

Appendix Table 2 New Zealand population totals (thousands)				
Tax year starting 1 April	Total tax units aged 15 and over	Total individuals aged 15 and over	Total taxpayers	Total taxpayers as % total tax units (<i>italics</i>) or total individuals
1973		2,094	1,650	78.8
1974		2,157	1,673	77.5
1975		2,196	1,577	71.8
1976		2,231	1,710	76.7
1977		2,253	1,649	73.2
1978		2,273	1,686	74.2
1979		2,291	1,716	74.9
1980		2,327	1,664	71.5
1981		2,356	1,712	72.7
1982		2,401	1,763	73.4
1983		2,445	1,748	71.5
1984		2,484	1,772	71.3
1985		2,507	1,810	72.2
1986		2,537	1,848	72.9
1987		2,567	1,855	72.3
1988		2,597	1,795	69.1
1989		2,628	1,809	68.9
1990		2,658	1,865	70.2
1991		2,688	1,896	70.5
1992		2,717	2,002	73.7
1993		2,748	2,085	75.9
1994		2,785	2,139	76.8
1995		2,826	2,139	75.7
1996		2,873	2,054	71.5
1997		2,913	2,001	68.7
1998		2,939	1,915	65.1
1999		2,958	2,937	99.3
2000		2,980	3,011	101.0
2001		3,007	3,075	102.3
2002		3,061	3,125	102.1

Notes:

1. The estimates presented in this paper use the population denominator of tax units aged 15 and over until 1952, and individuals aged 15 and over from 1953 onwards (reflecting the change from joint to individual taxation in 1953).
2. As noted in the text, for the years 2000 to 2002 we take the total number of taxpayers.

Appendix Table 3 New Zealand personal income totals and coverage

Tax year starting 1 April	Personal income \$ million	Total covered by tax data \$ million	Total covered as % personal income	Mean annual income per tax unit (<i>italics</i>) or individual \$
1921	192	75	39.0	288
1922	203	67	33.0	295
1923	214	74	34.6	304
1924	231	79	34.2	321
1925	233	83	35.6	315
1926	232	93	40.1	305
1927	240	97	40.4	308
1928	254	104	40.9	320
1929	247	105	42.6	306
1930	211	99	46.9	257
1931	189			226
1932	175			205
1933	192	87	45.3	223
1934	199	94	47.3	227
1935	231	110	47.7	261
1936	289	146	50.5	322
1937	318	158	49.7	356
1938	350	182	52.0	393
1939	372	225	60.5	418
1940	405	244	60.3	458
1941				
1942				
1943				
1944				
1945	618	372	60.2	722
1946	663	453	68.3	752
1947	750	558	74.4	839
1948	789	614	77.8	872
1949	888	712	80.2	969
1950	1,104	857	77.6	1,191
1951	1,138	911	80.1	1,212
1952	1,208	1,003	83.0	1,261
1953	1,333	1,110	83.3	931
1954	1,444	1,189	82.3	990
1955	1,520	1,243	81.8	1,022
1956	1,622	1,352	83.4	1,071
1957	1,735	1,448	83.5	1,126
1958	1,754	1,523	86.9	1,118
1959	1,891	1,650	87.3	1,190
1960	2,046	1,813	88.6	1,270
1961	2,110			
1962	2,225	2,025	91.0	1,317
1963	2,406	2,190	91.0	1,392
1964	2,599	2,394	92.1	1,472
1965	2,799	2,569	91.8	1,552
1966	2,926	2,772	94.7	1,601
1967	3,017	2,821	93.5	1,628
1968	3,138	2,945	93.9	1,671

Appendix Table 3 New Zealand personal income totals and coverage

Tax year starting 1 April	Personal income \$ million	Total covered by tax data \$ million	Total covered as % personal income	Mean annual income per tax unit (<i>italics</i>) or individual \$
1969	3,445	3,226	93.6	1,806
1970	4,011	3,764	93.8	2,060
1971	4,696	4,422	94.2	2,367
1972	5,482	5,089	92.8	2,693
1973	6,391	6,052	94.7	3,052
1974	7,211	7,047	97.7	3,343
1975	8,593	7,908	92.0	3,913
1976	9,978	9,343	93.6	4,472
1977	11,393	10,223	89.7	5,057
1978	13,198	11,832	89.6	5,807
1979	15,693	13,788	87.9	6,850
1980	18,332	15,904	86.8	7,878
1981	21,988	19,138	87.0	9,333
1982	24,521	21,758	88.7	10,213
1983	25,773	22,455	87.1	10,541
1984	28,612	24,346	85.1	11,519
1985	33,697	28,122	83.5	13,441
1986	40,303	32,611	80.9	15,886
1987	46,980	36,969	78.7	18,302
1988	50,108	37,350	74.5	19,294
1989	53,114	40,352	76.0	20,211
1990	54,657	43,861	80.2	20,563
1991	54,179	43,926	81.1	20,156
1992	54,554	45,921	84.2	20,079
1993	57,023	48,826	85.6	20,751
1994	61,084	51,496	84.3	21,933
1995	65,632	54,571	83.1	23,224
1996	69,888	54,996	78.7	24,326
1997	72,279	55,819	77.2	24,813
1998	73,677	56,226	76.3	25,069
1999	77,520	76,837	99.1	26,207
2000	79,226	75,128	94.8	26,312
2001	84,160	80,389	95.5	27,371
2002	86,529	83,767	96.8	27,691

Appendix Table 4 New Zealand: Comparison groups for top income shares

Year	Average annual wage	Basic salary of a member of parliament	Annual wage of a judge on the highest court
1921	453	1,000	
1922	445	900	
1923	438		
1924	444		
1925	451		
1926	458		
1927	467		
1928	481		
1929	482		
1930	482		
1931	446	810	
1932	409	729	
1933	395		
1934	398	765	
1935	407	823	
1936	450	900	
1937	491		
1938	512		
1939	521		
1940	535		
1941	554		
1942	579		
1943	598		
1944	604	1,000	
1945	654		
1946	680		
1947	703		
1948	751		
1949	795		
1950	846		
1951	966	1,800	
1952	1,013		
1953	1,081		
1954	1,164		
1955	1,204	2,200	
1956	1,228		
1957	1,284		
1958	1,277		6,500
1959	1,385	2,800	
1960	1,554		8,000
1961	1,623	3,100	8,500
1962	1,688		
1963	1,742		
1964	1,816	4,300	9,900
1965	1,938		
1966	2,013		10,170
1967	2,129		11,600
1968	2,246	4,650	
1969	2,372		12,620

Appendix Table 4 New Zealand: Comparison groups for top income shares

Year	Average annual wage	Basic salary of a member of parliament	Annual wage of a judge on the highest court
1970	2,637	6,100	13,688
1971	3,144	6,832	17,456
1972	3,518	7,604	19,002
1973	3,974	11,000	20,590
1974	4,618	11,440	21,130
1975	5,304	11,933	23,799
1976	6,033	12,121	24,744
1977	6,882	17,088	27,512
1978	7,772	18,000	42,500
1979	9,144	21,187	49,452
1980	10,817	24,326	56,779
1981	13,201	28,145	68,978
1982	15,058	29,552	
1983	15,606		
1984	16,128		75,741
1985	17,716	34,976	81,043
1986	21,323	49,500	118,800
1987	23,665		
1988	26,072	57,000	145,000
1989	27,588	61,000	153,500
1990	29,310	63,500	159,500
1991	30,421	63,500	
1992	31,006	66,000	163,000
1993	31,085	67,500	166,500
1994	31,517	71,000	173,500
1995	32,270	72,500	180,500
1996	33,413	74,500	195,000
1997	34,671	78,000	204,000
1998	35,640	80,000	212,200
1999	36,552	83,000	229,200
2000	37,289	85,000	243,000
2001	38,532	87,000	253,900
2002	39,208	90,500	264,100