

TOP INCOMES IN NEW ZEALAND 1921–2005: UNDERSTANDING  
THE EFFECTS OF MARGINAL TAX RATES, MIGRATION THREAT,  
AND THE MACROECONOMY

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Using taxation statistics, we estimate the income share held by top income groups in New Zealand over the period 1921–2005. We find that the income share of the richest fell during the 1930s, rose again after the Second World War, and steadily declined from the late-1950s until the mid-1980s. From the mid-1980s until the mid-1990s, top income shares rose rapidly, particularly at the very top of the distribution. We present evidence that top marginal tax rates and changing top income shares in Australia and the United Kingdom may have contributed to fluctuations in the income share of the richest 1 percent. Past economic growth does not seem to have a strong effect on the income share of the top percentile group.

1. INTRODUCTION

New Zealand is well known for its increased income inequality in the last decades of the twentieth century. The title of the study by Martin (1997a) was “Away from Equality.” The 2005 *Social Report* recorded that “income inequality rose between 1988 and 1991, then plateaued, and has been rising since 1994” (Ministry of Social Development, 2005, p. 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.” But was this increased inequality typical

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of the century as a whole? Was it a reversal of the earlier trend towards equalization found by Easton (1996)? What has happened since 2000?

This paper uses data from New Zealand's personal income tax to study the long-run evolution of the income distribution. The use of income tax data means that we focus on those at the top.<sup>1</sup> But the new estimates presented here cover a very long time period—85 years—allowing us to examine factors whose impact may be masked in shorter-run analysis.

The methods used here—and the limitations of taxation data—are described in Section 2. 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 U.K.? In this respect, it is also interesting to compare the top income series with its larger neighbor, Australia. In Section 4, we compare the New Zealand findings with those for the U.K. and Australia. In Section 5, we look at the factors affecting top income shares in New Zealand, focusing in particular on the impact of top tax rates, top income shares in Australia and the U.K., and the rate of economic growth.

## 2. DATA DESCRIPTION AND LIMITATIONS

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. We have annual data for each year from 1921 to 2005, with the exception of 1931, 1932, 1941–44, and 1961.

Until 1953, the tax unit in New Zealand was defined as a married couple living together or as a single adult. Children were part of their parents' tax unit unless they had 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. 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 population 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 labor force, those dying, and those migrating. Part-year incomes are by definition less likely to appear in the top income groups. Since New Zealand has relatively high levels of international migration, part-year incomes may plausibly be a more important issue than in other countries, but our data do not allow us to separate part-year and full-year incomes.<sup>2</sup>

From 1953 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

<sup>1</sup>Most recent work uses Household Economic Surveys, previously known as the Household Expenditure and Income Survey (for example, Snively, 1990; Dixon, 1998; Bakker and Creedy, 1999; Statistics New Zealand, 1999; O'Dea, 2000; Hyslop and Maré, 2001, 2005; Podder and Chatterjee, 2002) and Census data (for example, Easton, 1996; Martin, 1997b).

<sup>2</sup>Over the period 1980–2005, permanent and long term migration inflows and outflows each amounted to 1–2 percent of the population annually.

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 that the switch to independent assessment may either raise or lower the top shares (Atkinson, 2007b). Below, we present adjusted results on the assumption that top income shares did not change from 1952 to 1953.

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. Less than 1 million of New Zealand's 3 million taxpayers now file a tax return.<sup>3</sup> 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 2000–05 it exceeds 1. The New Zealand Inland Revenue Department explains this on the basis that the taxpaying population includes a small number of children, as well as any migrant who works in New Zealand at any point in the tax year.<sup>4</sup> Where the number of taxpayers is larger than the adult population, we use the number of taxpayers as our population denominator.

With regard to the income control total, 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 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).

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 have become progressively taxable. The social security benefit was made liable for income tax in 1951, 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 presupposes the existence of national accounts totals for household income. In the case of New Zealand, these exist for recent

<sup>3</sup>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.

<sup>4</sup>Email from Sandra Watson, Inland Revenue Department, October 7, 2004.

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 (for details, see Atkinson and Leigh, 2007a). For the earliest years (1921–30) we have resorted to use of GDP to extrapolate backwards. In view of the volatility of GDP at that time,<sup>5</sup> 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 percent, compared with 83 percent (Australia), 75 percent (United Kingdom), 72 percent (Canada) and 62 percent (United States). Earlier we noted that, following the 1999 changes in tax administration, the coverage of people should be virtually 100 percent. For the six years 2000–05, the total income reported in the income tax data was around 95 percent of the national accounts total. In light of these considerations, we have reduced our calculated totals for all years (1921 to 2005) by multiplying by 0.95.

Notwithstanding the adjustments that we have made to improve comparability, it is important to recognize that 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, p. 4).<sup>6</sup> 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 social security payments in 1951, and the taxation of other benefits in the 1970s and 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 five 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

<sup>5</sup>The estimates of Easton (1997, appendix 5) show nominal GDP as falling from \$366m in 1928 to \$235m in 1932.

<sup>6</sup>The limitations of the income tax data are discussed by Easton (1983, pp. 14–16). For a description of tax changes up to 1968, see the Ross Committee on Taxation (1968). We are grateful to Brian Easton for this reference.

time—leading to some anomalous results.<sup>7</sup> A further source of difference, important in the present context, is the tax treatment of farming and other primary producers.

Many of the changes in tax law affected the coverage of the population. Some reduced coverage, but 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 percent to 68 percent. This may have caused a discontinuity in our series, although the top incomes are less likely to have been affected, and our control totals do not jump.

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 1921–40 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 to 1944, and from 1945 onwards, our estimates relate to total income. There are four years (1945–48) for which information is available on both bases, and we use this to adjust our estimates for 1921–40 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 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 the opposition Labour Party made clear in late-1998 that, if elected, it planned to raise the top marginal tax rate from 33 percent to 39 percent in the 2000 tax year, many taxpayers took the opportunity to realize 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.

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

<sup>7</sup>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 realization. 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 realize a tax-free capital gain” (Oliver, 2000).

of the top  $x$  percent (assuming that they are already covered) or their calculated share.

A “conservative” approach to estimating top income shares in New Zealand might be to emphasize the breaks in definition (but not to adjust for them), not to extrapolate into the open top interval, and not interpolate for years where data are not available.<sup>8</sup> However, we appreciate that users of the data may need a continuous, rectangular series, complete for all groups and for all years. We therefore carry out 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 percent 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 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 1945–49. 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 percent. We have therefore adjusted in what follows the estimates 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 labor 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.

Another point to be noted about the adjusted series is that it does not take account of the sharp rise and fall in top income shares over the period 1998–2000, apparently induced by an anticipated increase in the tax rate. Our rationale for not smoothing the series over these three years is that it does appear to have been a “real” change, in the sense that pre-tax incomes of the richest fluctuated markedly in these years. This can be distinguished from the 1945 series break (caused by a change in the way the statistics were reported) and the 1953 series break (caused by a change in the way that taxpayers were required to file).

### 3. TOP INCOMES IN NEW ZEALAND

The “adjusted and extended” series is shown in Table 1. Figure 1 charts the shares for the top 1 percent and 0.1 percent for the full period 1921 to 2005. Figure 2 is different in that it shows the shares of the “next 4 percent” and “second quintile”: i.e. those in the top 5 percent but not the top 1 percent, and those in the top 10 percent but not the top 5 percent, respectively. This allows us to see the extent to which experience differed within the top 10 percent.

<sup>8</sup>Such an unadjusted series is provided in Atkinson and Leigh (2007a).



TABLE 1  
ADJUSTED AND EXTENDED ESTIMATES

Tax Year Starting 1 April . . .	10%	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	40.87	31.53	14.92	4.36
1925	42.16	32.29	15.16	4.36
1926	42.95	32.31	14.87	4.19
1927	42.91	32.10	14.64	4.07
1928	43.07	32.58	15.62	4.70
1929	43.80	32.65	15.05	4.31
1930	45.71	33.42	14.55	3.94
1931	45.62	33.35	14.66	4.03
1932	45.53	33.29	14.78	4.13
1933	45.44	33.22	14.89	4.22
1934	45.28	32.83	14.37	3.80
1935	43.47	31.72	14.30	4.16
1936	41.66	31.17	14.66	4.22
1937	37.36	27.11	11.88	3.03
1938	34.53	24.83	10.68	2.70
1939	36.70	26.45	11.30	2.97
1940	35.60	25.60	10.79	2.71
1941	34.69	24.75	10.40	2.59
1942	33.78	23.89	10.01	2.47
1943	32.87	23.03	9.62	2.34
1944	31.96	22.18	9.23	2.22
1945	31.05	21.32	8.84	2.10
1946	32.89	22.78	9.46	2.26
1947	34.23	23.78	9.68	2.27
1948	34.59	23.91	9.70	2.37
1949	35.35	24.56	9.98	2.42
1950	37.11	26.83	11.40	2.73
1951	35.11	24.35	9.84	2.35
1952	35.93	24.83	9.90	2.33
1953	35.93	24.83	9.90	2.33
1954	35.40	24.29	9.54	2.20
1955	34.13	22.89	8.76	1.98
1956	35.04	23.53	8.91	2.10
1957	33.94	22.69	8.65	2.00
1958	31.93	20.66	7.26	1.48
1959	32.65	21.37	7.60	1.63
1960	32.17	20.93	7.44	1.66
1961	32.07	20.76	7.34	1.64
1962	31.97	20.59	7.25	1.61
1963	31.98	20.67	7.29	1.66
1964	32.32	20.85	7.42	1.80
1965	31.06	19.69	6.72	1.43
1966	30.72	19.30	6.56	1.38
1967	30.91	19.39	6.59	1.41
1968	31.15	19.59	6.72	1.44
1969	31.02	19.47	6.70	1.45
1970	30.76	19.11	6.64	1.48
1971	30.66	19.01	6.43	1.31
1972	31.29	19.90	7.08	1.52
1973	31.84	20.35	7.47	1.69
1974	32.02	20.38	7.55	1.68
1975	29.98	18.70	6.56	1.45
1976	31.10	20.36	7.48	1.55

TABLE 1 (continued)

Tax Year Starting 1 April . . .	10%	5%	1%	0.1%
1977	28.86	17.89	6.13	1.31
1978	29.10	17.99	6.12	1.29
1979	28.22	17.29	5.77	1.21
1980	28.83	17.51	5.65	1.18
1981	28.48	17.15	5.50	1.14
1982	28.70	17.24	5.49	1.14
1983	28.92	17.52	5.68	1.22
1984	28.19	17.09	5.60	1.22
1985	27.57	16.74	5.51	1.19
1986	26.51	15.85	4.88	1.00
1987	26.61	16.29	5.48	1.27
1988	26.26	16.08	5.35	1.16
1989	28.34	17.97	6.59	1.62
1990	31.12	20.41	8.21	2.33
1991	31.48	20.53	7.96	2.08
1992	32.49	21.32	8.40	2.35
1993	32.99	21.86	8.76	2.38
1994	32.86	22.06	9.00	2.49
1995	32.62	21.97	8.98	2.46
1996	32.18	21.69	8.92	2.51
1997	32.57	22.03	9.16	2.66
1998	34.39	23.58	10.21	3.28
1999	38.68	27.74	13.77	5.45
2000	32.26	21.20	8.25	2.16
2001	32.79	21.76	8.76	2.51
2002	32.52	21.56	8.78	2.55
2003	33.01	22.17	9.45	3.10
2004	33.55	22.71	9.96	3.55
2005	32.45	21.69	8.98	2.66

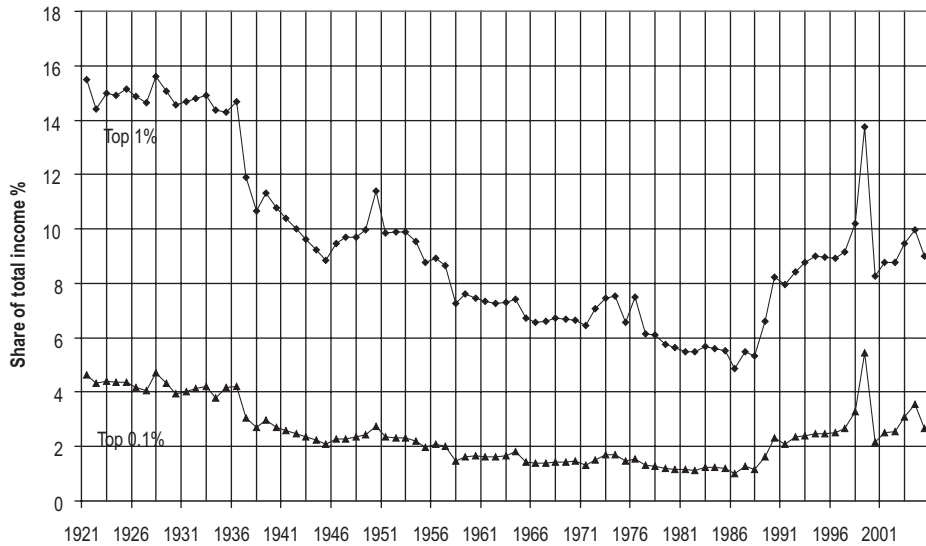


Figure 1. Shares of Top 1% and 0.1% Adjusted and Extended Series



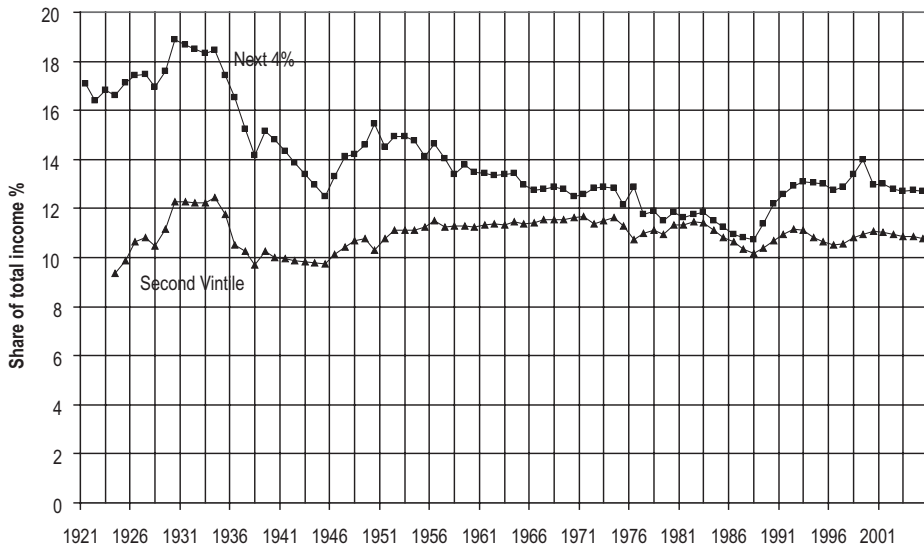


Figure 2. Shares of Next 4% and Second Vintile Adjusted and Extended Series

Beginning with the inter-war period, we can see that the share of the top 1 percent is estimated to be in excess of 10 percent from 1921 to 1942. In other words, the members of the top 1 percent on average had more than 10 times their proportionate share of total income. The top 0.1 percent had an estimated share of  $2\frac{1}{2}$  percent 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 1937–38, leaving the share of the top 1 percent at around 11 percent in 1940. For those below the top 1 percent, in the next 4 percent, 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 estimate can be given for the second vintile until 1924, but its share shows a similar pattern to that of the next 4 percent.

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).<sup>9</sup> (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 percent than on the share of either the top 0.1 percent or the next 4 percent, and that the share of the second vintile actually fell in 1950.

By construction, our series are the same in 1952, being the last year of joint taxation, and 1953, being the first year of individual taxation. (The unadjusted series show a jump in the top shares from 1952 to 1953: the share of the top 1 percent rose by some 2 percentage points, and the share of the top 5 percent by 4 percentage points.) After 1953, the share of the top 1 percent fell substantially: it

<sup>9</sup>Although account must be taken of the income smoothing provisions.

nearly halved in the next 30 years. The share of the top 0.1 percent 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 percent was reduced less proportionately than the share of the top 1 percent, although it still fell by 3–4 percentage points (allowing for the possible 1958 break). In contrast, the share of the next quintile was not much reduced, remaining broadly constant before falling a little in the 1980s: it remained in excess of 10 percent. There was a change in the shape of the distribution, not just a uniform scaling-down of all shares. The changes recorded in Figure 1 for the top 1 percent and above appear to reflect specific factors affecting the very top of the income distribution, rather than a more general reduction in income differentials.

After 1986, the top shares recovered the ground lost since 1953. This is clearly the case for the top 1 percent and top 0.1 percent. In the mid-1980s, the top 1 percent 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 2005. From 1986 to 2002, the top 0.1 percent more than doubled its share, and in the early-2000s, the top 0.1 percent had at least 25 times their proportionate share of income. We have been unable to locate data on salaries at the very top, but the Sheffield Remuneration Survey found that CEO salaries rose by 42 percent from 1996 to 2004, while average wages rose 28 percent over the same period.<sup>10</sup> This rise in CEO salaries might have been part of the explanation for the increased income share of the richest. For the next 4 percent there was also a recovery in the share of income, although it ended up some 2 percentage points lower in 2005 than in 1953. For the second quintile, in contrast, the series is virtually flat.<sup>11</sup>

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 percent), 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

<sup>10</sup>CEO salary data provided by Sherry Maier of Sheffield Consulting. Average hourly wage increase compares June 1996 with June 2004, using data downloaded from <http://www.rbnz.govt.nz> (table A3).

<sup>11</sup>In Atkinson and Leigh (2007a), we compare top income shares with two high-earning groups for which long-run data are available: the salary earned by a judge in New Zealand's highest court and the basic salary paid to a Member of Parliament—both expressed as a fraction of average earnings. The judges' pay would have placed them in the top 1 percent and the salary shows some, but not all, of the same changes as the share of the top 1 percent. 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 percent."

observed in 1998–1999, 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 1983–97, 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 to 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 percent and top 0.1 percent in 2004–05 were only a little higher than those in 1994–95.<sup>12</sup>

#### 4. COMPARISON WITH THE U.K. AND AUSTRALIA

Historical links with the U.K. 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 with Australia, we take the adjusted series constructed by Atkinson and Leigh (2007b) for the period 1921 to 2003. For the U.K. the coverage is still less complete. The estimates of Atkinson (2007a) for the shares of the top 5 percent and 1 percent in the U.K. cover 1918 and 1919, and 1937, and do not start as an annual series until after the Second World War. Two adjustments have been made. First, the statistics from 1975 relate to total income, and earlier figures are increased by a small amount.<sup>13</sup> 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 U.K. 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.

We begin in Figure 3 with the share of the top 0.1 percent. The findings for the beginning of the period are striking. In the 1920s, the shares of the top 0.1 percent are very similar, on this adjusted basis, for Australia and New Zealand, and they are around half that in the U.K. In the U.K., 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 U.K. By the end of the 1970s, the shares were 1 percent in Australia and 1.2 percent in New Zealand and the U.K. In sub-periods there were divergences. In the early 1930s, the share of the top 0.1 percent 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

<sup>12</sup>In Atkinson and Leigh (2007a), we compare our findings with those of other previous studies, including Easton (1983), Chatterjee and Srivastav (1992), Martin (1997a), Mowbray (2001), and Podder and Chatterjee (2002). For the most part, our results are consistent with the earlier literature.

<sup>13</sup>The U.K. adjustment increases the estimated share of the top 5 percent by a factor of 1.0077, the share of the top 1 percent by a factor of 1.000797, and the share of the top 0.1 percent by a factor of 1.0097.

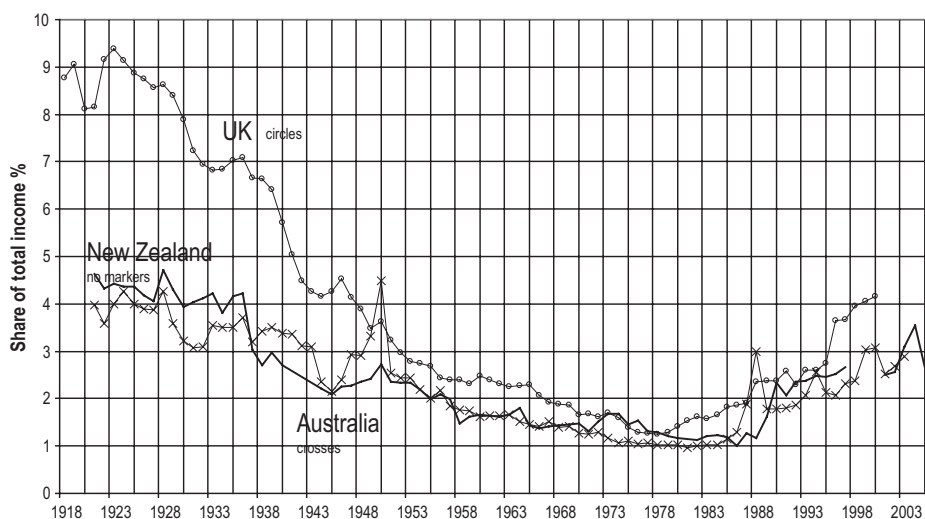


Figure 3. Share of Top 0.1% Adjusted and Extended Series, New Zealand, Australia and U.K.

moved closely together, and for the three countries there was a remarkable convergence. (This is due in large part to the fact that the top 0.1 percent share in the U.K. had fallen to Antipodean levels by the end of the Second World War.)

Since 1979, all three countries have seen a significant increase in the share of the top 0.1 percent, but there appear to be differences between Australia and New Zealand, on the one hand, and the U.K. 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 percent to around  $2\frac{1}{2}$  percent. There is year-to-year variation, for reasons we have discussed in the case of New Zealand, but no clearly continuing upward trend by the end of the series. In the U.K., 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 percent in the U.K. was around 4 percent, and that in Australia and New Zealand around 3 percent. (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 4 shows the evidence for the top 1 percent and the top 5 percent, where the estimates for Australia and the U.K. are less complete. For these groups, the convergence story with the U.K. is less clear. In 1949, when the continuous series for the top 1 percent in the U.K. 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 percent fell from 1979 to 1988 in New Zealand, whereas it rose by some 5 percentage points in the U.K.

Comparing New Zealand and Australia, for the top 1 percent and 5 percent, 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

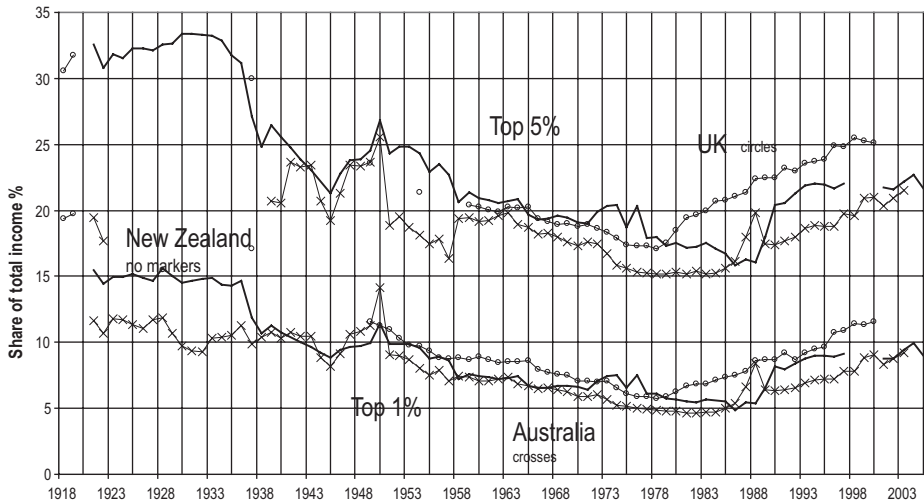


Figure 4. Share of Top 1% and 5% Adjusted and Extended Series, New Zealand, Australia and U.K.

adjustments, the shares of the top 1 percent are close to 7 percent 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 1951–57, when there was a 5 percentage point gap in the share of the top 5 percent.

What about the recent decades? From Figure 4 we may observe that, with the top 1 percent, and particularly the top 5 percent, 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 percent, for example, are close in the two countries in 2003, and the share in New Zealand is similar to 1993, whereas the Australian share in 1993 was distinctly lower than in 2003.

## 5. EXPLAINING CHANGES IN TOP INCOME SHARES

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 emphasized, 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 labor force participation, which is likely to have increased total income without adding proportionately to the top income shares.

In this section, we empirically analyze three theories. First, we consider the impact of top marginal 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 percent in 1930 to 65 percent in 1940, peaking at 77 percent from 1942 to 1945. 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 percent to 33 percent. Lower tax rates may induce top wage earners to work more; they also raise post-tax investment returns, thus boosting the amount that the rich could invest in subsequent years. We have also noted the impact of the taxation of fringe benefits.

Second, the evolution of top income shares in New Zealand over the century may have been affected by what is happening elsewhere. In their analysis of top incomes in Canada, Saez and Veall (2005) show that the threat of emigration to the United States had the effect of increasing Canadian top incomes. Similarly, top incomes in other countries may have affected New Zealand top incomes. We focus in particular on top incomes in Australia and the U.K. In recent decades, Australia and the U.K. accounted for 49 percent and 20 percent respectively of permanent and long-term emigrants from New Zealand (the next most common destination was the United States, with just 4 percent).<sup>14</sup> Given the high level of *actual* emigration to these countries, it seems reasonable to assume that the *threat* of emigration is most salient in respect of Australia and the U.K.

Third, New Zealand top income shares may be affected by the macro-economy. To the extent that high-income earners are insulated from economic fluctuations, their shares may be counter-cyclical. On the other hand, to the extent that top incomes are derived from share market earnings, one might expect them to be pro-cyclical. We test this by analyzing the relationship between the growth rate of real per-capita GDP and top income shares.

To test these three theories, we regress the top 1 percent share on the after-tax share (1 minus the top marginal rate), top income shares in Australia and the U.K., and GDP growth. In the case of the migration threat and growth hypotheses, it is plausible that there may be some reverse causation, so we lag these variables by one year. We show results from specifications without a time trend, and with a quadratic time trend.

Table 2 presents our results. With or without a quadratic time trend, we find evidence that the top 1 percent share in New Zealand is positively associated with the after-tax share, based on the top marginal tax rate. New Zealand top income shares are positively related to lagged top income shares in Australia and the U.K., though the effect of U.K. top income shares is not robust to the inclusion of a quadratic time trend.<sup>15</sup> The coefficient on growth is generally negative, but statistically insignificant in each of the specifications.

<sup>14</sup>This comparison is based on New Zealand migration statistics covering 1980–2005.

<sup>15</sup>The results shown in Table 2 use lagged shares (to reduce the potential for reverse causality), but another approach is simply to look at the correlation between the New Zealand top 1 percent share and each of the other two countries' top income shares in the same year. The correlation between the Australian and New Zealand top 1 percent shares is 0.84, and the correlation between the U.K. and New Zealand top 1 percent shares is 0.93.

TABLE 2  
EXPLAINING CHANGES IN TOP INCOME SHARES (DEPENDENT VARIABLE IS TOP 1% SHARE)

	[1]	[2]	[3]	[4]	[5]
<i>Panel A: No time trend</i>					
1-top tax rate	0.109** [0.048]				0.045*** [0.011]
Australian top share (t-1)		1.128*** [0.217]			0.304** [0.131]
UK top share (t-1)			0.667*** [0.058]		0.446*** [0.091]
Growth rate (t-2 to t-1)				-0.048 [0.107]	-0.036 [0.024]
Observations	82	82	82	82	82
R-squared	0.34	0.69	0.86	0.01	0.91
<i>Panel B: With quadratic time trend</i>					
1-top tax rate	0.037*** [0.009]				0.056*** [0.011]
Australian top share (t-1)		0.314** [0.133]			0.319*** [0.111]
UK top share (t-1)			0.348* [0.208]		0.282 [0.174]
Growth rate (t-2 to t-1)				0.01 [0.019]	-0.027 [0.026]
Observations	82	82	82	82	82
R-squared	0.88	0.88	0.88	0.86	0.91

Note: Standard errors in brackets, corrected for heteroskedasticity and autocorrelation using the Newey–West procedure with 10 lags.

\*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

Overall, the results in Table 2 provide support for the hypothesis that higher top marginal tax rates in New Zealand have a negative effect on the top 1 percent share. For example, in Panel B, Column 5, the coefficient on the after-tax share is 0.056. This suggests that a 10 percentage point cut in the top marginal tax rate would increase the income share of the top percentile group by 0.6 percentage points.<sup>16</sup> Across the sample period, the mean for the top 1 percent share is 9 percent, with a standard deviation of 3 percentage points. So our results suggest that the effect of cutting the top marginal rate by 10 percentage points would be to increase the top 1 percent share by about one-fifth of a standard deviation. Thus while top marginal tax rates are statistically related to the top 1 percent share, they explain a relatively small portion of the total variance in that share.

By contrast, the coefficients on lagged top income shares in Australia and the U.K. suggest effects that are quantitatively large. For example, the specification in Panel A, Column 5 suggests that  $TopI_t^{NZ} = 0.304TopI_{t-1}^{Australia} + 0.446TopI_{t-1}^{UK}$ , while the specification in Panel B, Column 5 suggests that  $TopI_t^{NZ} = 0.319TopI_{t-1}^{Australia} + 0.282TopI_{t-1}^{UK}$  (though the U.K. top share is not significant in this specification). The  $R^2$  statistics in Columns 2 and 3 of Panel A imply that top income shares in Australia and the U.K. can explain at least two-thirds of the variation in New Zealand top income shares. However, it is possible that the

<sup>16</sup>Across the sample period, the mean for the after-tax share is 50 percent, with a standard deviation of 16 percentage points.



Australian and U.K. coefficients may be capturing factors other than migration threat. For example, an exogenous technological shock that led to an increase in top income shares in all English-speaking countries might upwardly bias these coefficients.

The coefficients on growth are not statistically significant. While three out of four of the growth coefficients are negative (consistent with the hypothesis that top income shares are counter-cyclical), the point estimates are close to zero. For example, the 95 percent confidence interval on the growth estimate in Panel B, Column 5 ranges from  $-0.079$  to  $0.024$ . Since the standard deviation of the growth rate is 3.7 percentage points, we can rule out (at the 95 percent confidence level) effects of a one standard deviation increase in growth on the top 1 percent share of more than 1/3rd of a percentage point in either direction.

## 6. 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 to 1993, the share of the top 10 percent rose from 27 percent to 33 percent, while the top 1 percent share rose from under 5 percent to around 9 percent.

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 85 years and to give estimates for individual years. The recent rise in top shares followed a 60 year period in which the income share of the rich had occasionally risen, but had mostly been on a downward trajectory. There had been a distinct change in the shape of the distribution at the top of the scale. In the 1920s, the top 1 percent accounted for 1/3rd of the top 10 percent; this fell to less than 1/5th in the early 1980s, before rising towards its historical high in the early-2000s. The reversal appears, however, to have been a step change, rather than a continuing trend; top shares in 2004–05 were little different from those in 1994–95. Comparisons with the U.K. and Australia showed that, while top income shares had risen in both these countries, the time paths were not identical.

Finally, we test three hypotheses of changes in New Zealand top incomes: top tax rates, emigration threat, and economic growth. We find evidence that higher marginal tax rates are associated with lower top income shares, and that lagged top income shares in Australia and the U.K. are positively related to top income shares in New Zealand. Past economic growth does not seem to have a strong impact on the top 1 percent share in New Zealand.

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