

OXFORD

**TOP**  
**INCOMES**  
OVER THE  
**20TH**  
**CENTURY**

*A Contrast Between Continental European  
and English-Speaking Countries*

*Edited by* A. B. ATKINSON & T. PIKETTY

# 7

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## The Distribution of Top Incomes in Australia<sup>1</sup>

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### 7.1 INTRODUCTION

Visiting Australia at the end of the nineteenth century, commentator Francis Adams observed that: ‘In England the average man feels that he is an inferior; in America he feels that he is superior; in Australia he feels that he is an equal’ (Adams 1892). Income inequality in Australia a century ago may therefore have been less than in the UK and the US.<sup>2</sup> This chapter takes a long-run perspective of the Australian income distribution, asking what can be learned from the income tax returns, particularly about top incomes. How far has Australia differed from the pattern in other Anglo-Saxon OECD countries, such as the United States and the United Kingdom, where income inequality declined over the first three-quarters of the century, and then increased in the final decades?

One major reason for making use of the income taxation statistics is that they do provide a quantitative basis for measuring the trends. Prior to federation in 1901, each of the six Australian colonies levied income tax, and from 1914 onwards, the federal government had its own income tax (it was not until 1941 that the state income taxes were abolished). The federal income tax returns were tabulated separately for individuals and corporations from 1921 onwards, and provide a rich source of information about individual incomes. It is these data that provide the basis for our estimate of top income shares in Australia from

<sup>1</sup> We are most grateful to those who have helped us secure access to the necessary data and publications. Specific thanks are due to Carl Obst of the Australian Bureau of Statistics, Dan Andrews, and Michael Plumb of the Reserve Bank of Australia, and Lisa Cox of the Department of Employment and Workplace Relations. We have also benefited from comments and advice from Harry Greenwell, Thomas Piketty, John Quiggin, Emmanuel Saez, Peter Saunders, Michael Schneider, and seminar participants at the Australian National University, Harvard University, Nuffield College, Oxford, and the University of Melbourne. None of the above is responsible for the conclusions reached in the chapter.

<sup>2</sup> For earlier references to the study of income and wealth in Australia, see Maddock et al. (1984) and Saunders (1993).

1921 to 2002. (Note that the Australian tax year begins on 1 July. Throughout this chapter, 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 1 July 1980 and ending 30 June 1981.)

In using the income tax data, we are not, however, under-estimating their shortcomings (see, for example, Brown 1957). As a source of information about the distribution as a whole, taxation data suffer from the fact that the figures relate only to taxpayers; Butlin (1983) emphasizes the importance of the exclusion of zero incomes. For this reason, most studies of the income distribution as a whole have employed other sources. Butlin (1983) uses variation in minimum wages across industries, and finds a fall in inequality (skilled: unskilled wage ratio) between 1901 and 1968. Jones (1975) and McLean and Richardson (1986) compare censuses conducted during the First World War and the Great Depression with more recent surveys, and conclude that inequality fell from 1915–68 and 1933–80 respectively. In recent years, the major source has been household surveys, notably the Survey of Income and Housing Costs (SIHC) (previously the Income Distribution Survey): see, for example, Australian Bureau of Statistics (1997, 1999, and 2001).<sup>3</sup> At the same time, we should also note that household surveys too have shortcomings, particularly when it comes to investigating the top of the distribution. They are affected by differential non-response and by incomplete response; the sample sizes often limit what can be said about groups such as the top 0.1%. The official results from the SIHC, for example, are typically presented in terms of the share of the top 20%. Moreover, surveys (and, of course, population censuses) in Australia have tended to be conducted periodically, not annually, which means that considerable reliance may be placed on a single, not necessarily typical, year.

One major attraction of income tax data is that they allow a long time perspective. The long period covered has been exploited by Berry (1977), who used data for 1922/23, 1932/33, 1942/43, 1952/53, 1962/63, and 1972/73, and by Smith (2001), who used data from 1916/17 to 1996/97 to measure tax progressivity. Others have used taxation data for particular years. Hancock (1971) uses data from 1950–51 to 1966–67 (see Ingles 1981: 17) for actual income, taxable income, and after tax income. Harris (1970) used income tax data to examine the distribution for 1955–56 and 1965–66; Ternowetsky (1979) used data from 1955–56 to 1974–75. Our focus here is on the top of the income distribution, as in other chapters in this volume. To establish estimates of the shares of top income groups, we need information on the total number of individuals and the total personal income, but we do not need to know the full shape of the distribution below the top ranges. (Indeed, as explained in Chapter 2, we can estimate the Pareto-Lorenz coefficients without information on total income.)

<sup>3</sup> Studies of trends in Australian inequality in the 1980s and 1990s include Bradbury et al. (1990), Saunders et al. (1991), Saunders (1997, 1998), Harding (1997), and Harding and Greenwell (2002).

The methods used here are described in Section 7.2; the findings are presented in Section 7.3; and the conclusions are summarized in Section 7.4.

## 7.2 INCOME TAX DATA AND ESTIMATION METHODS

The tax unit in Australia is the individual. In what follows we take as the principal case that where the control population is that aged 15 and over, but also show the effects of taking those aged 20 and over. If taking an age cut-off of 20 gives a control total for population that is on the low side, and hence gives a lower bound on the share of the top X%, taking a cut-off of 15 will give a control total on the high side, and hence gives an upper bound. It could be argued that the definition should vary over time, but it is not clear which direction the variation should take. Young people enter the labour force later today than a century ago, which is an argument for raising the cut-off age over time. On the other hand, young people have been becoming economically independent earlier, and in their estimates of the UK distribution of wealth over the twentieth century, Atkinson and Harrison (1978) took an age cut-off falling from 23 in 1923 to 18 in 1973. We have therefore followed other authors in this volume and applied a constant age cut-off in determining the 'adult' population.

The coverage of the tax returns has varied greatly over the century. The fraction of Australians aged 15 and over who filed a tax return was around 11–12% in 1921–22. The figure then dropped to 5–7% in 1923–38, but the general trend was upwards. By the end of the Second World War, one-third of the adult population paid tax. Between 1950 and 2000, the fraction of the Australian population paying tax fluctuated between 50% and 62%.

### Control Total for Income

In order to calculate the income shares, we need a control total for income. 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): 'total income that would have been reported on tax returns, had everybody been required to file a tax return' (Saez and Veall 2003: 38). Our concept corresponds to their Gross Tax Income, with the qualification that we do not at this stage exclude realized capital gains.

The most straightforward approach to arriving at a control total is to start from the total gross income in the tax returns and add an estimate of the total gross income of non-filers. This method was used by Piketty and Saez (Chapter 5) for the US for the period 1944–98: they impute to non-filers a fixed fraction of filers' average income (50% in 1944 and 1945 and 30% from 1945). The aim is to take account of the year-to-year variation in the proportion of filers. The different

fractions are intended to take account of the larger percentage of non-filers in the first two years.<sup>4</sup> These imputations for non-filers are closely linked with the early studies of national accounts, to which we now turn.

A different approach to the control total for income, and that followed here, starts from the national accounts totals for personal income. As explained in Chapter 2, it is not appropriate to take simply the personal sector total income. We have to exclude non-household elements, such as charities, life assurance funds, and universities. We have to exclude items not included in the tax base, such as employers' social security contributions, and non-taxable transfer payments. The exclusion of these items follows the practice in studies in other countries, but their significance is likely to differ across countries, and the appropriate adjustment may well be different. In the case of the US, Piketty and Saez (Chapter 5) use for the period 1913–43 a control total equal to 80% of (total personal income less transfers). In Canada, Saez and Veall (2005) use the constant percentage approach, applied to 'total personal income less transfers', for the entire period 1920–2000, basing the percentage (80%) on the experience since the mid-1970s when they feel that filing was close to complete.

Here, rather than apply a percentage adjustment to another series, we have attempted to construct a household income series from the national accounts—see Appendix 7B. There are official series for total household income 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. For the years 1913–27, we have resorted to use of GDP to extrapolate backwards. Our treatment also differs with respect to social security transfers. In Australia, transfers have been taxed to a significant degree since 1944. We therefore switch our personal income denominator to include transfers from this point onwards. (Throughout the total excludes imputed rent.) Using the calculated total income series, we find that the total recorded in the tax data is some 80% in the mid-1960s, when the number of calculated tax units was 60% of the population aged 15+ and 69% of the population aged 20+. The former figure, and our constructed total income, implies that non-taxpayers had on average an income of less than 40% of those filing. This appears reasonable, but, while we take the constructed total as our central case, we experiment with taking 90% of the constructed total.

## Deductions

Income tax systems differ in the extent of their provisions allowing the deduction of such items as interest paid, depreciation, pension contributions, alimony

<sup>4</sup> An alternative approach would use the exemption levels. If the lower tail of the distribution can be approximated by a reverse Pareto distribution, such that  $\beta$  gives the proportion with income below  $y$ , then the average income of those below the exemption is  $\beta/(1 + \beta)$  times the exemption level.

payments, and charitable contributions. (We are not referring here to personal exemptions.) Income from which these deductions have been subtracted is referred to in this chapter as ‘taxable income’; we refer to total income before deductions as ‘actual income’. As in other studies, our preferred variable is actual income, but the available published information is not always in this form. This difficulty arises both on account of the variable measured and on account of the variable according to which individuals are classified. These two are not always identical, in that we may have the distribution of variable  $Y_1$  by ranges of variable  $Y_2$ .

In Australia, the statistics from 1958 onwards are in our preferred form, relating to the distribution of actual income by ranges of actual income. From 1947–48 to 1957–58, the published figures give the distribution of taxable income by range of actual income; from 1944–45 to 1946–47, there are distributions of both actual and taxable income by range of actual income; prior to 1944–45 the figures related to the distribution of taxable income by range of taxable income. In order to create a continuous series, we use the ratio of the actual and taxable income top income shares in 1944–46 to adjust the shares in the years 1921–43 and 1947–57.<sup>5</sup> However, it is possible that our adjustment procedure understates the effect on the top 10% and top 5% shares for the later years. Even in the adjusted series, both show a sharp jump between 1957 and 1958.

### Capital Gains and Imputation

Another issue is the treatment of capital gains. The basic series presented for the US by Piketty and Saez (Chapter 5) excludes capital gains, but they also present series including capital gains. In Australia, as with the UK (Chapter 4), the approach has been different, with certain gains brought under the regular income tax (and therefore included in the estimates), but other gains taxed, such as those taxed since 1986 under a separate Capital Gains Tax, excluded.

Related is the 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

<sup>5</sup> The ratio of the top income shares produced using actual income to those produced using taxable income in these years is 1.016 for the 10% share, 1.020 for the 5% share, 1.033 for the 1% share, 1.042 for the 0.5% share, 1.073 for the 0.1% share, 1.091 for the 0.05% share, and 1.126 for the 0.01% share. Two things should be noted about this adjustment procedure. First, the years 1944 to 1946 are not necessarily typical. Second, the adjustment for the earlier period makes no allowance for the re-ranking necessary to give the distribution by ranges of actual income.

increase (reduce) the apparent shares. The effect of the introduction of imputation in Australia in 1987 is evident in the statistics.

### 7.3 TOP INCOME SHARES IN AUSTRALIA

Australian tax data are published in the annual Reports of the Commissioner of Taxation (see Appendix 7C). Table 7.1 shows the estimated shares of the top income groups for the period 1921–2000. As explained above, the figures for the earlier part of the period relate to taxable income. Since taxable income is less than total income, the estimated shares will be lower on this account (the fact that we are using external control totals means that the estimated share of the top X% is affected only via the numerator). Appendix Table 7A.1 shows the top income shares, with the estimated shares from 1921–43 and 1947–57 adjusted to make some allowance for this break. As noted in Section 7.1, census of population or, in Australia, household survey data, are only collected in certain years, which means that we may be placing a great deal of reliance on a single observation. It is a considerable advantage of the income tax statistics that we have observations for every year over a 80 year span.

We cannot go back to the start of the century, but in 1921 the share of the top 5% in total gross income was around 18–19%. (It should be noted that this relates to gross income among individuals, and is therefore not comparable with today's figures for disposable income among households.) The share of the top 1% was around 12%, and that of the top 0.1% (a group much smaller than those usually considered) was around 4%. If we compare these figures with those of other countries studied in this volume (see Chapter 13), then the shares of top income groups in Australia do indeed appear lower. There are a number of reasons for being cautious in making such cross-country comparisons, but the shares of the top 5% were typically around 30% in other countries. Even in New Zealand, the nearest both geographically and in its share of the top 5%, that share was around 25%. The very top shares, like that of the top 0.1%, were lower in New Zealand. But in Canada, the US, and particularly the European countries, the shares of the top 1% and top 0.1% were noticeably higher than in Australia. There may therefore have been some foundation for the view recounted at the start of this chapter.

Has this been maintained? In fact, top shares fell. Figure 7.1 shows that the top shares in Australia fell significantly over the period from 1921 to 1980. The share of the top 1%, which began at more than 10%, had fallen to under 5% by 1980. The share of the top 0.1% was nearly 4% in 1921 but had fallen to 1% in 1980. At the same time, the fall was far from steady. There were periods, such as the 1920s and 1933–43, when the top shares were broadly constant.

How far has this decline been attributable to major shocks? McLean and Richardson, for example, note that 'for the purpose of establishing trends in the income distribution over time, the fact that 1933 was a year of deep depression is a distinct drawback' (1986: 73), but the impact of the Depression is itself of considerable interest (see also McLean 1988). They adjust for unemployment and

Table 7.1 Top income shares, Australia 1921–2002

	10%	5%	1%	0.5%	0.1%	0.05%	0.01%
1921	—	19.43	11.63	8.55	3.97	2.80	1.24
1922	—	17.65	10.68	7.91	3.57	2.45	—
1923	—	—	11.76	9.08	3.98	2.80	—
1924	—	—	11.67	8.84	4.25	—	—
1925	—	—	11.31	8.58	3.99	2.81	—
1926	—	—	11.07	8.42	3.88	2.72	—
1927	—	—	11.68	8.56	3.86	2.64	—
1928	—	—	11.85	8.92	4.26	3.16	—
1929	—	—	10.67	7.91	3.58	2.50	—
1930	—	—	9.75	7.15	3.20	2.22	—
1931	—	—	9.34	6.93	3.07	2.11	0.85
1932	—	—	9.27	6.91	3.08	2.14	0.90
1933	—	—	10.32	7.73	3.53	2.46	—
1934	—	—	10.36	7.79	3.49	2.44	—
1935	—	—	10.54	7.77	3.49	2.42	—
1936	—	—	11.28	8.25	3.71	2.56	—
1937	—	—	9.83	7.17	3.19	2.20	0.89
1938	—	—	10.39	7.61	3.41	2.36	0.97
1939	—	20.71	10.73	7.81	3.50	2.44	1.04
1940	—	20.57	10.30	7.48	3.37	2.35	0.99
1941	34.61	23.67	10.78	7.68	3.34	2.32	0.94
1942	34.12	23.26	10.43	7.34	3.11	2.12	0.85
1943	34.23	23.42	10.45	7.32	3.09	2.12	0.86
1944	31.25	21.09	9.03	6.22	2.49	1.66	0.64
1945	28.75	19.56	8.44	5.79	2.31	1.55	0.62
1946	31.61	21.76	9.51	6.52	2.59	1.72	0.66
1947	33.10	23.41	10.62	7.31	2.92	1.94	0.73
1948	32.77	23.35	10.80	7.40	2.89	1.96	0.73
1949	32.82	23.66	11.26	7.89	3.31	2.23	—
1950	31.53	25.56	14.13	10.22	4.47	—	—
1951	26.65	18.87	9.08	6.23	2.53	1.67	—
1952	26.31	19.51	8.99	6.11	2.44	1.57	0.55
1953	26.10	18.70	8.71	5.97	2.43	1.58	0.58
1954	25.77	18.10	8.06	5.48	2.19	1.42	0.52
1955	25.53	17.49	7.54	5.10	2.01	1.29	0.48
1956	25.69	17.84	7.91	5.42	2.16	1.39	0.51
1957	23.99	16.33	7.04	4.75	1.84	1.19	0.43
1958	29.77	19.41	7.44	4.86	1.76	1.14	0.41
1959	29.85	19.44	7.39	4.82	1.75	1.12	0.41
1960	29.60	19.14	7.09	4.58	1.62	1.04	0.37
1961	29.71	19.20	7.10	4.58	1.65	1.06	0.40
1962	30.22	19.62	7.23	4.64	1.64	1.04	0.38
1963	30.35	19.84	7.36	4.72	1.65	1.05	0.37
1964	29.45	18.95	6.84	4.37	1.52	0.96	0.34
1965	29.22	18.68	6.69	4.27	1.46	0.92	0.31
1966	28.51	18.19	6.47	4.12	1.41	0.89	0.31
1967	28.66	18.29	6.58	4.23	1.51	0.98	0.38
1968	28.36	17.99	6.38	4.06	1.40	0.89	0.32
1969	27.85	17.61	6.25	4.00	1.42	0.92	0.36
1970	27.65	17.30	5.92	3.74	1.26	0.79	0.27

(contd.)



Table 7.1 (Contd.)

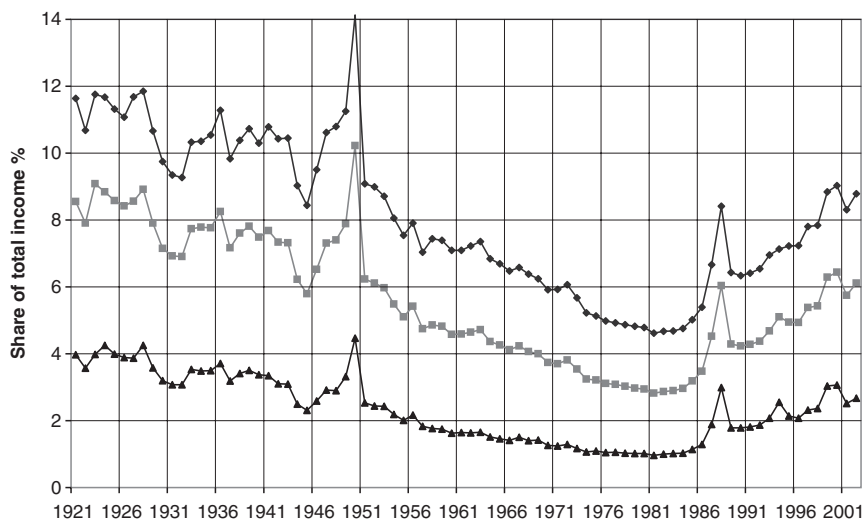
	10%	5%	1%	0.5%	0.1%	0.05%	0.01%
1971	28.24	17.59	5.92	3.70	1.25	0.78	0.27
1972	27.80	17.50	6.06	3.81	1.29	0.81	0.28
1973	26.74	16.73	5.67	3.54	1.17	0.73	0.24
1974	25.87	15.87	5.22	3.24	1.06	0.65	0.21
1975	25.54	15.65	5.13	3.22	1.10	0.68	0.23
1976	25.20	15.35	4.99	3.11	1.05	0.65	0.21
1977	25.15	15.25	4.92	3.08	1.06	0.67	—
1978	25.01	15.14	4.87	3.02	1.03	0.65	—
1979	25.17	15.20	4.83	2.97	1.02	0.65	—
1980	25.39	15.31	4.79	2.95	1.02	0.66	—
1981	25.31	15.15	4.61	2.83	0.96	0.62	—
1982	25.82	15.44	4.67	2.87	1.00	0.63	—
1983	25.32	15.16	4.68	2.89	1.02	0.66	—
1984	25.50	15.25	4.75	2.96	1.03	—	—
1985	25.93	15.63	5.02	3.19	1.14	0.75	0.35
1986	26.61	16.17	5.39	3.48	1.29	0.85	0.36
1987	28.66	17.94	6.67	4.53	1.89	1.41	0.60
1988	30.28	19.84	8.41	6.04	2.99	2.13	0.98
1989	27.64	17.46	6.43	4.29	1.79	1.31	0.51
1990	27.66	17.37	6.34	4.24	1.79	1.33	0.55
1991	28.22	17.70	6.41	4.28	1.81	1.35	0.57
1992	28.52	17.95	6.55	4.38	1.87	1.37	0.57
1993	29.40	18.66	6.96	4.69	2.08	1.46	0.61
1994	29.42	18.87	7.13	5.10	2.56	1.65	0.71
1995	29.13	18.76	7.23	4.95	2.14	1.52	0.73
1996	29.16	18.77	7.24	4.93	2.07	1.44	0.65
1997	30.41	19.73	7.81	5.38	2.32	1.64	0.75
1998	30.11	19.63	7.84	5.43	2.37	1.67	0.76
1999	31.48	20.95	8.84	6.29	3.04	2.15	—
2000	31.28	20.98	9.03	6.44	3.06	2.24	—
2001	30.61	20.33	8.31	5.75	2.51	1.75	—
2002	31.34	20.90	8.79	6.11	2.68	1.87	—

Note: Figures are for tax years (e.g. 1921 denotes the tax year 1 July 1921–30 June 1922).

Source: Authors' calculations.

under-employment, which has the effect of reducing the Gini coefficient substantially. At the same time, they note that the effect of declining capital income would operate in the opposite direction. From Figure 7.1, we can see that the top shares fell from 1928 to 1932, but then recovered about half of their loss. The Depression left only a limited permanent effect.

Nor is the Second World War associated with a permanent fall in the share of the top 1%: the shares in 1947 were similar to those in 1939 (although the top 0.5% and 0.1% did show a decline). This stands in contrast to several other Anglo-Saxon nations: in Britain, Canada, and the United States (though not in New Zealand) top income shares fell significantly during the Second World War. The immediate post Second World War period saw the effects of the commodity price boom. There is a clear spike in 1950, mainly due to the peak wool prices which sheep farmers received in that year. Jones (1975: 31, n.26) noted this spike, comparing the figures for 1949–50 and 1950–51. This illustrates again how one



**Figure 7.1** Shares of top 1%, 0.5%, and 0.1% Australia, 1921–2002

Source: Table 7.1, this volume.

could be misled by relying on a single observation. If we just compared 1921 and 1950, we might conclude that top shares had significantly increased. (The same pattern can be seen in New Zealand top incomes—see Chapter 8.)

### Recent Years

The 60 years from 1921 as a whole were apparently a period of major decline at the top of the distribution. From 1980, however, the pattern reversed. By 1998 the top shares were back well above their 1958 levels. The share of the top 1%, which had fallen to under 5%, by the end of the 1990s was back to 8%. The share of the top 0.1%, which had been 1% at the end of the 1970s, has more than doubled. Again round this trend there is year-to-year variation. There is a distinct spike in 1988, following a large reduction in the top marginal tax rate (from 60% in 1985–86 to 49% in 1987–88) and the property price boom of the late-1980s.

As documented by Saunders (2004), there has been considerable debate as to whether income inequality in Australia continued to increase in the second half of the 1990s. He studied this issue with the aid of data from the Survey of Income and Housing Costs, concluding that the share of the top 20% increased between 1995–96 and 2000–01. Our estimates provide additional evidence, which differs in that it relates to gross individual incomes, but which is complementary in that it gives detail about the very top. At the same time, the sharp fall in the top shares in 2001 warns against drawing conclusions from short-term changes about longer term developments. But even if we discount the higher observations for 1999 and 2000, the direction of change seems clearly upwards. The share of the top 1% is about 1 percentage point higher in 2001 than in 1996.

**Top Income Shares in the State of Victoria, 1912–21**

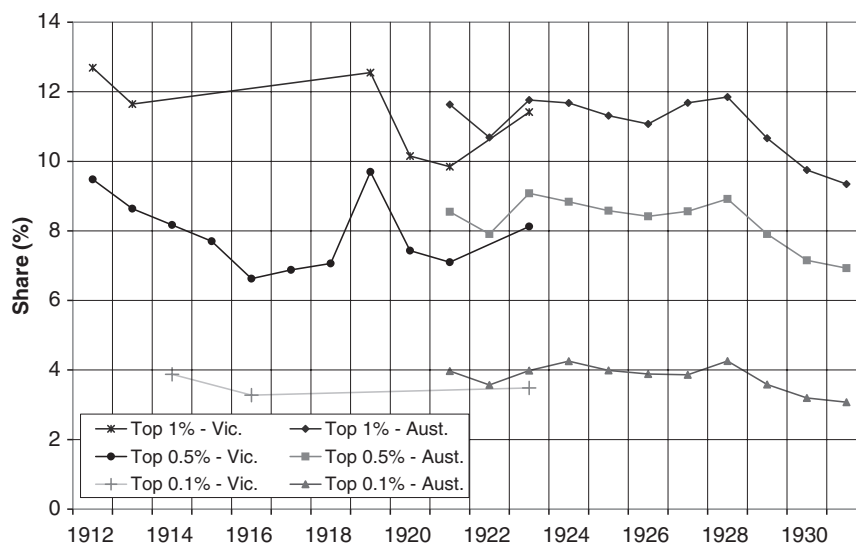
Because our series for Australia as a whole starts only in 1921, it is interesting to examine the evidence for the state of Victoria that covers the earlier period 1912–21—see Table 7.2. Alone among the Australian states, Victorian income tax statistics in the 1910s separated individual taxpayers from corporations. Comparing the two series in overlapping years (1921–23) in Figure 7.2, we can

**Table 7.2** Top income shares, Victoria, Australia, 1912–23

	10%	5%	1%	0.5%	0.1%	0.05%	0.01%
1912	—	—	12.69	9.48	—	—	—
1913	—	—	11.65	8.64	—	—	—
1914	—	—	—	8.17	3.87	—	—
1915	—	—	—	7.70	—	—	—
1916	—	—	—	6.62	3.28	—	—
1917	—	—	—	6.88	—	—	—
1918	—	—	—	7.06	—	—	—
1919	—	—	12.55	9.70	—	—	—
1920	—	—	10.15	7.43	—	—	—
1921	—	—	9.85	7.10	—	—	—
1922	—	—	—	—	—	—	—
1923	—	19.04	11.42	8.13	3.49	2.40	—

*Note:* Figures for 1912 and 1913 are for calendar years. Figures for 1914 onwards are for tax years (e.g. 1914 denotes the tax year 1 July 1914–30 June 1915).

*Source:* Authors' calculations.



**Figure 7.2** Comparing Victoria, 1912–23, with Australia, 1921–31

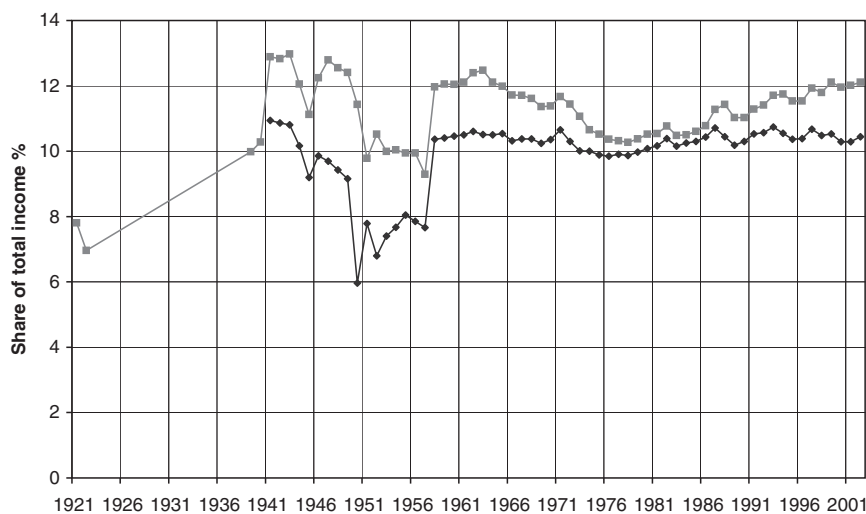
*Source:* Tables 7.1 and 7.2, this volume.

see that Victorian top income shares are very close to those in Australia as a whole. Assuming therefore that the Victorian series was representative of Australia as a whole during the 1910s, this suggests that Australian top income shares fell, though only modestly, during the First World War.

### Inequality Within the Top 10%

Earlier chapters have shown how the rise in income shares of the 1980s and 1990s in the US was concentrated at the top. The evidence of Piketty and Saez for the US (Figure 5.2, Chapter 5) shows that, whereas the share of the top 10% as a whole increased by some 10 percentage points, that of the second vintile (i.e., those in the top 10% but not the top 5%) was essentially stable. Figure 7.3 shows for Australia the second vintile and the shares of those in the top 5% but not the top 1% (referred to as the 'next 4%'). It should be noted that the Australian tax data do not allow us to estimate the share of the top 5% between 1923 and 1938. In the graphs, where there are missing data, we interpolate the series linearly, but this is clearly unsatisfactory, as may be seen by considering what would have been missed in the case of the share of the top 1% (see Figure 7.1).

The scale on Figure 7.3 is the same as that for Figure 7.1, making apparent that in 1945 the top 1% had approximately the same amount of income as the second vintile. There is very considerable inequality within the top 10%. Leaving aside the limited data for the 1920s and 1930s, we can see that these 'next' shares were declining from 1941 to 1957. It may be observed that the Korean War wool boom had a positive effect only at the very top: the share of the second vintile in Australia actually fell in 1950. After the switch in definition in 1958, which added at least 2 percentage points



**Figure 7.3** Share of next 4% and second vintile in Australia, 1921–2002

Source: Table 7.1, this volume.

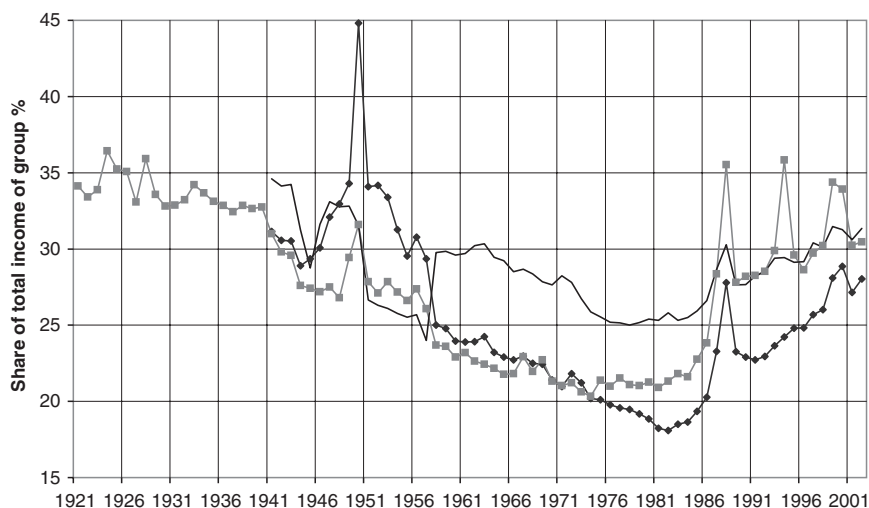
to the share of the top 10%, the downward trend continued for the next 4% but not for the second quintile. Equally, after 1980, there is little increase for the second quintile. For the next 4%, the share rose from 10.5% in 1980 to 11.8% in 1998.

As has been noted in Chapter 2, looking at the distribution *within* the top 10% has the advantage that the estimates do not depend on the control total for income. Figure 7.4 shows the share of the top 1% within the top 10% and the share of the top 0.1% within the top 1%. Also shown for reference, as a solid line without markers, is the share of the top 10% in total income (which does depend on the control total). It appears that in the 1940s and again in the 1990s the distribution within the top 1% is as relatively unequal as the overall distribution: the top 10% of the top 1% have a similar share to the top 10% overall. The ‘within’ distribution got steadily less unequal from 1921 to 1982, and then returned: by 1998 the share of the top 0.1% within the top 1% was similar to the level at the end of the 1930s.

Figure 7.5 shows the shares within shares in the form of Pareto-Lorenz coefficients.<sup>6</sup> The Pareto-Lorenz coefficient for the share of the top 0.1% within the top 1% peaks in 1974 at 3.2, before declining to 1.9 in 2000—approximately the same level as in 1921. The coefficient for the share of the top 1% within the top 10% peaks in 1982 at 3.9, before declining to 2.2 in 2000, only slightly higher than in 1941, the first year for which it can be calculated.

### Sensitivity of the Results

How sensitive are these results to changes in the control totals? On average, changing the population control to those aged 20 and over (a lower bound



**Figure 7.4** Shares within shares in Australia, 1921–2002

Source: Table 7.1, this volume.

<sup>6</sup> Defined as  $1/[1 + \text{Log}_{10}[S_1/S_{10}]]$

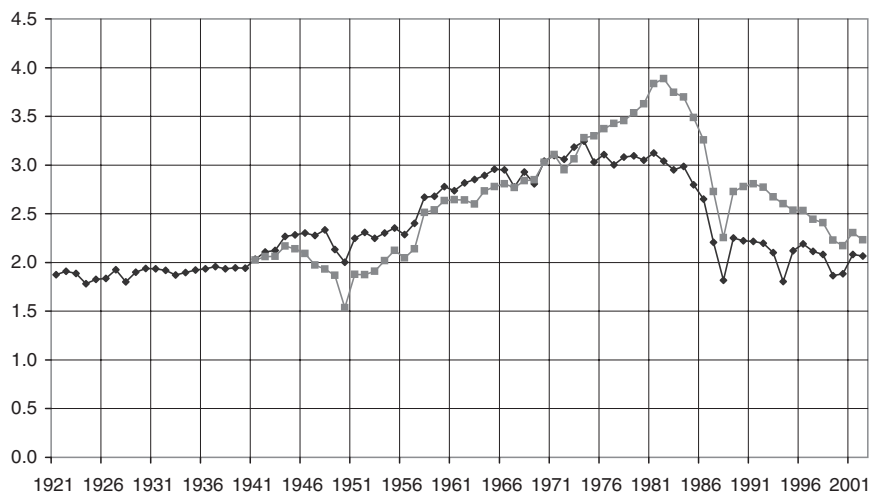


Figure 7.5 Pareto-Lorenz coefficients, Australia 1921–2002

for the population total) reduces our estimate of the share of the top percentile group by 0.5 percentage points, and the share of the top decile group by 1.9 percentage points. Going in the opposite direction, maintaining a population control total of those aged 15 and over, but reducing the personal income denominator to 90% of personal income increases our estimate of the top percentile group share by an average of 0.7 percentage points, and the share of the top decile group by 3.1 percentage points. The second of these changes would mean that the share of the top 10% in 1921 became 21.6% in place of 19.4%, and that the share of the top 0.1% became 4.4% in place of 4.0%. These changes do not affect the conclusions we drew regarding the relative position of Australia.

### Sources of Top Incomes

The findings for France, the US and other countries have demonstrated the importance of examining the sources of top incomes. From 1954–55 onwards, it is possible to separate salary and wage income from other income sources. Figure 7.6 charts the fraction of income that came from salary and wages earnings for three top income groups—the top 10%, 1%, and 0.1%. From the mid-1950s until the end of the 1970s, the proportion of income derived from salary and wages grew for all three top income groups.<sup>7</sup> Over the last two decades of the

<sup>7</sup> Unfortunately, during the earlier period (1929–30 to 1953–54), Australian taxation statistics were only separated into income from ‘personal exertion’ (wages, salaries, and self-employment income) and ‘property’. Also, because the Australian taxation statistics do not contain information on the number of taxpayers reporting wage income, it is not possible to use these data to compile a separate series on the distribution of wage income, as has been done for a number of other countries, including Canada and the US.

*The Distribution of Top Incomes in Australia*

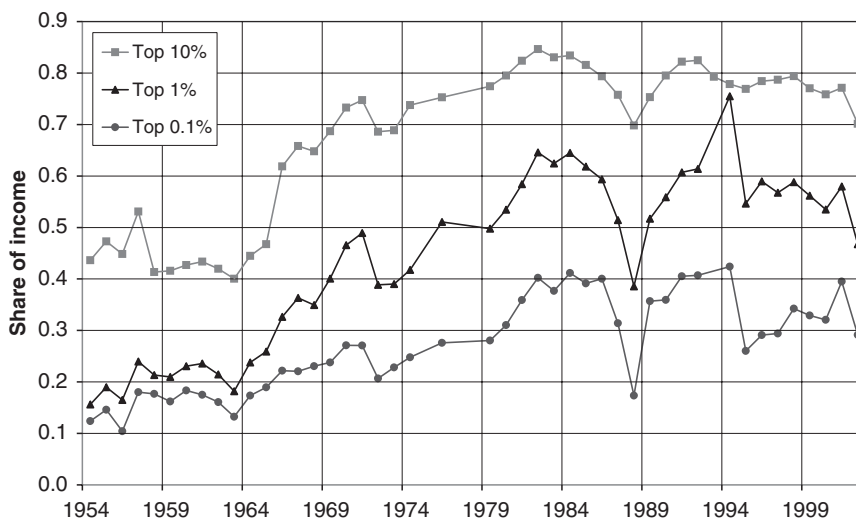


Figure 7.6 Fraction of income from salary and wages, Australia 1954–2002

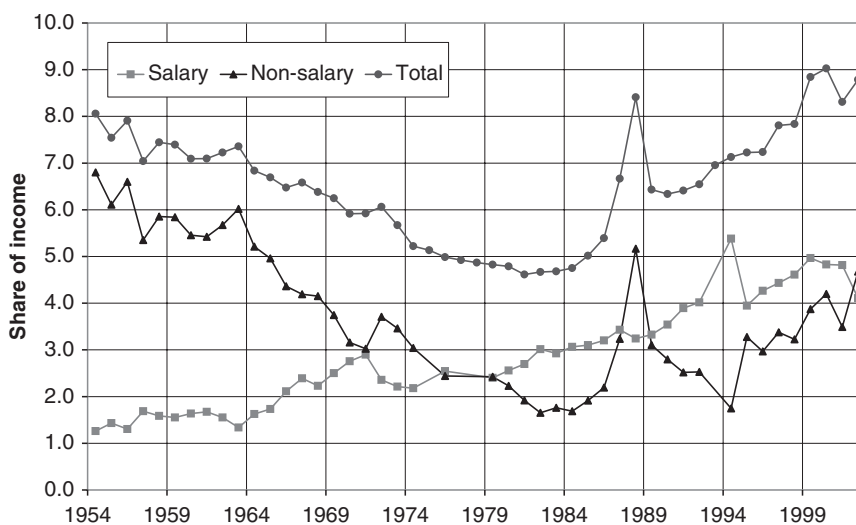


Figure 7.7 Contributions to share of top 1%, Australia 1954–2002

twentieth century, salary and wage income fluctuated somewhat, but the proportion of salary and wage income for top income groups in 2000 was quite similar to the proportion in 1980.

Figure 7.7 breaks down the income of the top 1% into salary and non-salary components. The decline in top income shares that occurred from the mid-1950s

until the late-1970s was due entirely to a reduction in non-salary income accruing to the top 1%.<sup>8</sup> During the 1980s and 1990s, both salary and non-salary income have contributed towards the rising share of the top 1%, though salary income has accounted for slightly more of the growth than has non-salary income.

#### 7.4 CONCLUSIONS

The estimates for Australia presented in this chapter run parallel to those for the other nine countries. Insofar as they are comparable (see Chapter 13), they indicate that the top shares in 1921 were less concentrated than in the Northern Hemisphere. Even so, the estimated share of the top 0.1% was around 4%, or 40 times their proportionate share.

Since the 1920s, top income shares in Australia have fallen considerably. Their path has much in common with four other Anglo-Saxon countries: Canada (Chapter 6), New Zealand (Chapter 8), the UK (Chapter 4), and the US (Chapter 5). As we show in our comparison of these five Anglo-Saxon countries (Atkinson and Leigh 2004), each saw a decline in top income shares in the three decades after the Second World War, followed by a sharp rise from the mid-1970s onwards. In 2000, the income share of the richest 1% of Australians was higher than it had been at any point since 1951, while the share of the richest 10% was higher than it had been since 1949. The top 0.1% still have some 25 times their proportionate share.

#### APPENDIX 7A: SOURCES OF POPULATION AND TAX UNIT TOTALS

Australian population data are from Australian Bureau of Statistics, Australian Historical Population Statistics, Cat No 3105.0.65.001, table 18. Figures are provided on an annual basis for 1921 onwards, and are converted into a tax-year basis by simply averaging the figures for the two calendar years covered by a tax year. Since the tax unit in Australia is the individual, no further conversion is required.

Population data for the state of Victoria are from Australian Bureau of Statistics, Australian Historical Population Statistics, Cat No 3105.0.65.001, table 23. Figures are available from the censuses of 1911, 1921, and 1933, and are linearly interpolated for intervening years.

Our population data are provided in Table 7A.1.

<sup>8</sup> Using taxation statistics, Lydall (1965) noted that the ratio of wages for those in the top percentile group to median wages grew during the 1950s. But as Figure 7.8 shows, this trend was swamped by the fall in non-salary income for those in the top percentile group.



Table 7A.1 Population totals for Australia, 1912–2002

Tax year starting 1 July	Australia: individuals 15 and over	Australia: individuals 20 and over	Australia: taxpayers	Victoria: individuals 15 and over	Victoria: individuals 20 and over	Victoria: taxpayers
1912	3,094,463	2,643,721	—	925,733	790,701	40,976
1913	3,164,345	2,711,396	—	942,060	807,520	44,172
1914	3,234,227	2,779,072	—	958,387	824,338	40,581
1915	3,304,109	2,846,747	—	974,714	841,157	45,084
1916	3,373,991	2,914,423	—	991,041	857,975	43,424
1917	3,443,873	2,982,098	—	1,007,368	874,793	49,889
1918	3,513,754	3,049,774	—	1,023,695	891,612	50,626
1919	3,583,636	3,117,449	—	1,040,022	908,430	73,548
1920	3,653,518	3,185,125	—	1,056,349	925,249	87,486
1921	3,723,400	3,252,800	457,632	1,072,676	942,067	97,470
1922	3,809,400	3,327,200	433,144	1,095,189	962,091	—
1923	3,907,800	3,410,500	193,605	1,117,702	982,114	127,818
1924	4,005,000	3,492,500	215,693	—	—	—
1925	4,110,100	3,580,300	225,398	—	—	—
1926	4,207,200	3,661,500	245,107	—	—	—
1927	4,319,300	3,755,500	257,939	—	—	—
1928	4,427,600	3,847,600	260,500	—	—	—
1929	4,519,700	3,921,700	322,799	—	—	—
1930	4,598,000	3,986,400	296,765	—	—	—
1931	4,668,600	4,052,200	230,749	—	—	—
1932	4,737,400	4,119,200	221,867	—	—	—
1933	4,805,200	4,191,200	220,240	—	—	—
1934	4,866,900	4,263,300	248,508	—	—	—
1935	4,934,100	4,336,900	245,349	—	—	—
1936	5,010,700	4,403,600	290,224	—	—	—
1937	5,085,300	4,470,100	332,380	—	—	—
1938	5,163,100	4,536,600	346,441	—	—	—
1939	5,238,900	4,602,300	623,375	—	—	—
1940	5,319,800	4,677,400	785,019	—	—	—
1941	5,390,000	4,753,600	1,493,053	—	—	—
1942	5,446,700	4,819,400	1,962,756	—	—	—
1943	5,496,600	4,874,700	2,049,694	—	—	—
1944	5,544,700	4,926,900	2,038,465	—	—	—
1945	5,594,100	4,985,300	2,051,248	—	—	—
1946	5,638,600	5,038,900	2,438,498	—	—	—
1947	5,675,200	5,090,400	2,643,440	—	—	—
1948	5,734,100	5,165,800	2,833,415	—	—	—
1949	5,847,000	5,290,000	3,051,476	—	—	—
1950	6,002,800	5,451,100	3,263,373	—	—	—
1951	6,135,600	5,587,200	3,420,265	—	—	—
1952	6,252,700	5,692,200	3,474,922	—	—	—
1953	6,336,200	5,762,800	3,549,137	—	—	—
1954	6,417,200	5,825,500	3,685,644	—	—	—
1955	6,528,200	5,914,800	3,811,004	—	—	—
1956	6,655,600	6,019,100	3,901,094	—	—	—
1957	6,782,800	6,118,700	3,921,292	—	—	—
1958	6,891,000	6,206,100	4,037,862	—	—	—
1959	7,027,200	6,303,200	4,199,374	—	—	—

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1960	7,171,400	6,402,400	4,357,805	—	—	—
1961	7,323,200	6,512,900	4,406,628	—	—	—
1962	7,485,100	6,605,900	4,555,447	—	—	—
1963	7,643,900	6,706,300	4,460,472	—	—	—
1964	7,805,400	6,832,000	4,632,025	—	—	—
1965	7,980,900	6,967,900	4,771,504	—	—	—
1966	8,179,788	7,124,349	4,927,072	—	—	—
1967	8,343,833	7,294,605	5,001,174	—	—	—
1968	8,522,217	7,456,171	5,204,042	—	—	—
1969	8,716,454	7,629,999	5,372,500	—	—	—
1970	8,901,723	7,799,368	5,570,720	—	—	—
1971	9,319,988	8,183,692	5,691,431	—	—	—
1972	9,510,934	8,347,141	5,076,252	—	—	—
1973	9,691,778	8,507,292	5,420,004	—	—	—
1974	9,898,311	8,685,640	5,551,322	—	—	—
1975	10,073,371	8,839,661	5,179,359	—	—	—
1976	10,245,988	8,985,211	5,527,309	—	—	—
1977	10,428,589	9,139,068	5,568,298	—	—	—
1978	10,616,188	9,310,408	5,538,132	—	—	—
1979	10,797,294	9,483,735	5,662,971	—	—	—
1980	10,984,362	9,676,805	5,973,373	—	—	—
1981	11,197,720	9,900,675	6,199,831	—	—	—
1982	11,439,261	10,150,267	6,104,878	—	—	—
1983	11,642,452	10,361,571	6,306,340	—	—	—
1984	11,843,586	10,556,177	6,546,544	—	—	—
1985	12,062,771	10,758,065	6,966,074	—	—	—
1986	12,318,832	10,971,610	7,181,864	—	—	—
1987	12,576,530	11,190,263	7,629,453	—	—	—
1988	12,833,133	11,425,459	7,906,142	—	—	—
1989	13,089,498	11,676,326	8,033,918	—	—	—
1990	13,310,134	11,907,731	7,800,273	—	—	—
1991	13,498,506	12,134,432	7,422,503	—	—	—
1992	13,678,327	12,355,556	7,661,794	—	—	—
1993	13,829,567	12,535,922	7,609,311	—	—	—
1994	13,994,701	12,718,015	7,861,134	—	—	—
1995	14,183,640	12,914,400	8,165,642	—	—	—
1996	14,399,399	13,120,280	8,239,600	—	—	—
1997	14,604,610	13,310,687	8,251,106	—	—	—
1998	14,810,586	13,496,995	8,019,205	—	—	—
1999	15,016,967	13,685,995	8,592,521	—	—	—
2000	15,234,957	13,886,215	8,473,317	—	—	—
2001	15,463,445	14,101,339	8,534,329	—	—	—
2002	15,656,801	14,296,696	8,665,443	—	—	—

*Note:* The estimates presented in this paper use the population denominator of individuals aged 15 and over. Estimates using a population denominator of individuals aged 20 and over are presented only as a robustness check.

## APPENDIX 7B: DERIVATION OF PERSONAL INCOME SERIES

In this chapter, two personal income series are presented—one with social transfers, and another without transfers. Until tax year 1943, transfers were largely untaxed. From 1944 onwards, transfers were taxed. We therefore switch

our personal income denominator to include transfers from 1944 onwards, but include both series for the entire period. Australia switched from pounds to dollars in the mid-1960s, at the ratio of £1 = \$2. While some of our original sources are in pounds, we present all our tables in millions of dollars.

Starting from the most recent period, for the years 1959–2001, we use Australian Bureau of Statistics, *National Accounts, 5204.0*, Table 46. We include compensation of employees (which does not include imputed interest on pension funds), interest, dividends, and gross mixed income, less other interest payable and consumption of fixed capital. For the series with transfers, we add workers' compensation and social assistance benefits. We are grateful to Carl Obst of the ABS for assistance in determining the correct series to use.

Working back in time, for the period before 1959 we have used household national accounts data supplied by the Australian Government to the United Nations. Years from 1946 to 1950 are from United Nations (1955: series H7, table 4, p. 50). For 1951–52, and 1954, we use United Nations (1958: table 2, p. 5). For 1953 and 1955–59, we use United Nations (1966: table 3, p. 10). We use the same line items from the 1955, 1958, and 1966 publications: compensation of employees (subtracting 4% to account for imputed interest from pension funds), income from unincorporated enterprises, rent and interest, and dividends. None of these publications includes social transfers, so we use figures on Commonwealth social spending, from Barnard (1986: table 5, p. 25, column D). The series are linked together as follows. The Australian Bureau of Statistics data are set at a ratio of one, and linked to the United Nations (1966) data using the ratio of the two series during the overlap period. The United Nations (1958) figures are then linked to the *adjusted* 1966 series using the overlapping years between the 1958 and 1966 series. The source for 1938–46 is the United Nations (1950: table 5, p. 32). We use wages and salaries (subtracting 4% to account for imputed interest from pension funds), pay of forces, income from unincorporated businesses and farms, rent and interest, dividends, and deferred pay of members of forces. For the series with transfers, we include cash social service benefits. The series is linked in the way described above. Prior to the Second World War, data on personal income are contained in Clark and Crawford (1938: 13). (See also Mauldon et al. 1938.) Clark and Crawford provide figures for 1928–33, and we use rows A–I of their table. We have also used their 'tentative' estimate for 1934 in Appendix A. This leaves a 'gap' from 1935 to 1937. The figure for 1938 derived from UN (1950) is 29.4% higher than that for 1934 derived from Clark and Crawford. The 'net national product at market prices' series from Butlin (1962: table 1), shows a rise of 30.8%. We therefore use the Butlin series to interpolate. Finally, for the period 1913–27, we extrapolate backwards using the Butlin series. Our personal income series are provided in Table 7B.1.

We also present a series on personal income (excluding transfers) for the state of Victoria for the years 1912–21. For the years 1913–14 onwards, we use as our base the Australian personal income series without transfers, as derived above. This is compared against GDP data from Butlin (1977: 41) to calculate a ratio of personal income to GDP (72.3%). We then use Cashin (1995: table 1, p. 26), and compare Cashin's Victorian GDP figures for 1900, 1910, and 1920 with data for

Table 7B.1 Personal income totals for Australia, 1912–2002

Tax year starting 1 July	Australia: Including Transfers (\$M)	Australia: Excluding Transfers (\$M)	Victoria, Australia: Excluding Transfers (\$M)
1912			189
1913	621	601	204
1914	600	579	198
1915	682	659	229
1916	683	659	241
1917	640	616	251
1918	678	653	270
1919	1,082	1,038	296
1920	1,063	1,015	326
1921	1,037	999	325
1922	1,123	1,085	356
1923	1,210	1,165	370
1924	1,307	1,260	—
1925	1,332	1,283	—
1926	1,410	1,357	—
1927	1,437	1,382	—
1928	1,382	1,327	—
1929	1,354	1,299	—
1930	1,107	1,057	—
1931	1,017	971	—
1932	1,026	978	—
1933	1,117	1,069	—
1934	1,167	1,116	—
1935	1,257	1,201	—
1936	1,412	1,351	—
1937	1,485	1,419	—
1938	1,525	1,458	—
1939	1,622	1,555	—
1940	1,745	1,678	—
1941	2,048	1,957	—
1942	2,340	2,238	—
1943	2,460	2,350	—
1944	2,430	2,316	—
1945	2,668	2,524	—
1946	2,715	2,572	—
1947	3,339	3,146	—
1948	3,946	3,705	—
1949	4,578	4,307	—
1950	5,973	5,678	—
1951	6,638	6,260	—
1952	7,123	6,756	—
1953	7,351	6,960	—
1954	7,893	7,474	—
1955	8,556	8,081	—
1956	9,145	8,650	—
1957	9,059	8,514	—
1958	9,771	9,160	—
1959	10,843	10,165	—
1960	11,585	10,838	—

(contd.)

Table 7B.1 (Contd.)

Tax year starting 1 July	Australia: Including Transfers (\$M)	Australia: Excluding Transfers (\$M)	Victoria, Australia: Excluding Transfers (\$M)
1961	11,912	11,076	—
1962	12,607	11,741	—
1963	13,971	13,017	—
1964	15,070	14,072	—
1965	15,925	14,865	—
1966	17,831	16,689	—
1967	18,766	17,580	—
1968	20,929	19,648	—
1969	23,109	21,672	—
1970	25,641	24,105	—
1971	28,637	26,832	—
1972	32,866	30,548	—
1973	41,074	38,159	—
1974	50,902	46,760	—
1975	59,135	53,659	—
1976	68,113	61,109	—
1977	74,498	66,315	—
1978	82,990	74,200	—
1979	92,124	82,555	—
1980	104,630	93,467	—
1981	120,459	107,675	—
1982	132,515	116,700	—
1983	146,104	127,738	—
1984	158,817	138,596	—
1985	174,633	152,589	—
1986	189,421	165,583	—
1987	205,912	180,550	—
1988	230,688	204,394	—
1989	257,389	229,361	—
1990	264,479	232,624	—
1991	268,041	230,657	—
1992	277,365	237,676	—
1993	287,510	243,463	—
1994	306,060	260,743	—
1995	331,797	282,558	—
1996	349,967	297,854	—
1997	361,404	309,423	—
1998	383,311	328,799	—
1999	404,179	346,018	—
2000	437,877	369,629	—
2001	457,891	388,724	—
2002	475,331	402,570	—

Note: The estimates presented in this paper use the income denominator 'personal income excluding transfers' until 1943, and 'personal income including transfers' from 1944 onwards (reflecting the fact that most transfers were taxed from 1944).

total Australian GDP from Butlin (1962: 460–1) and Butlin (1977: 41). Across this period, we find that Victorian GDP is a constant 33% of Australian GDP. We therefore calculate that Victorian personal income is 23.8% ( $0.723 \times 0.33$ ) of Australian GDP, and accordingly construct the Victorian personal income series from Butlin's Australian GDP figures. This series is also provided in Appendix Table 7B.1.

#### APPENDIX 7C: SOURCES OF INCOME TAX DATA

The chapter relies solely on tabulated data, which means that we have to interpolate. Typically, for each income range, there is information on the number of

**Table 7C.1** Sources of income tax data for Australia, 1921–2002

Year	Source
1921–35	Schedule 1
1936	Schedule 1B
1937	Schedule 1A
1938–40	Schedule No 6
1941–42	Schedule No 7
1943	Schedule No 6
1944–47	Schedule No 11
1948–49	Schedule No 10
1950	Schedule No 97
1951	Schedule No 98
1952	Schedule No 99
1953–54	Schedule No 1
1955	Schedule No 1(1)
1956–61	Schedule 1(1)
1962–79	Schedule 1.1
1980	Schedule 1.1(e)
1981	Schedule 1.1(a)
1982–84	Table 1.3(e)
1985	Tables 1.3(e) & 1.25
1986–88	Tables 1.3(e) & 1.24
1989	Tables 1.3(c) & 1.24
1990–91	Tables 1.3(f) & 1.24
1992	Tables 1.3(f) & 1.22
1993	Tables 1.6(i) & 1.13
1994	Tables P16 & C5
1995	Tables I4 & I14
1996	Tables I4 & I15
1997	Tables I2 & I14
1998	Tables I4 & I14
1999	Personal Tax Tables 6A, 6B & 9
2000–02	Personal Tax Tables 5A, 5B & 9

*Note:* All references are to the annual *Report of the Commissioner of Taxation*. References to years denote tax years (e.g. 1921 denotes the tax year 1 July 1921–30 June 1922).

taxpayers and the total amount of taxable income. In order to calculate the shares of specified percentages of the population, we have used the *mean-split histogram*. Assuming, as seems reasonable in the case of top incomes, that the frequency distribution is non-decreasing, then upper and lower bounds can be calculated that are limiting forms of the split histogram, with one of the two densities tending to zero or infinity—see Atkinson (2005). Guaranteed to lie between these is the histogram split at the interval mean with sections of positive density on either side. We have not interpolated shares that lie in the top open interval. In the case of Australia, Saunders (1998: 28) checked using micro-data from income distribution surveys in 1989 and 1995, and concluded that use of grouped data made ‘very little difference’. Micro-data samples of taxpayers are not presently available in Australia, as they are in some other countries.

Data on individual taxpayers are available from 1921 (prior to that date, the data included companies as well as individuals). Estimates are taken from the annual *Report of the Commissioner of Taxation* (see Table 7C.1). Tabulations have typically been published with a three year lag from the end of the financial year. From tax year 1994–95 onwards, data are available in electronic form from the Australian Taxation Office. Until 1957, the Australian taxation statistics presented tabulations of taxable income. From 1958 onwards, this switched to actual income.

Data for the state of Victoria is derived from the state yearbook (see Appendix Table 7C.2). From 1912 onwards, figures are tabulated for Personal Exertion, Property, Combined, and Companies. We sum the first three categories to derive a consistent series for the top incomes of individuals. In the calendar years 1912, 1913, and 1914, Victorian figures were presented on a calendar year basis, before switching to a standard Australian financial year (1 July to 30 June) from the 1914 tax year onwards.

**Table 7C.2** Sources of income tax data for Victoria, Australia, 1912–23

Year	Source for incomes data	Notes
1912	VY 1913–14: 132	4 income bands; calendar year basis.
1913	VY 1914–15: 138	4 income bands; calendar year basis.
1914	VY 1915–16: 144	4 income bands; calendar year basis.
1914–15	VY 1916–17: 150	Switch to financial year (starting 1 July) from this point onwards; 5 income bands.
1915–16	VY 1917–18: 50	5 income bands.
1916–17	VY 1918–19: 50	5 income bands.
1917–18	VY 1919–20: 48	5 income bands.
1918–19	VY 1920–21: 58	5 income bands.
1919–20	VY 1921–22: 52	5 income bands.
1920–21	VY 1922–23: 44	5 income bands.
1921–22	VY 1923–24: 45	5 income bands.
1922–23	—	
1923–24	VY 1925–26: 50	16 bands.

*Note:* VY denotes the *Victorian Yearbook*, various years. 1912–14 are calendar years, 1914–15 to 1923–24 are tax years.

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