The Distribution of Top Incomes in Australia*

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*Using taxation statistics, we estimate the income share held by top
income groups in Australia over the period 1921–2003. We find that the
income share of the richest fell from the 1920s until the mid-1940s, rose
briefly in the postwar decade, and then declined until the early 1980s.
During the 1980s and 1990s, top income shares rose rapidly. At the start
of the twenty-first century, the income share of the richest was higher
than it had been at any point in the previous 50 years. Among top income
groups, recent decades have also seen a rise in the share of top income
accruing to the super-rich. Trends in top income shares are similar to
those observed among other elite groups, such as judges, politicians, top
bureaucrats and chief executive officers.*

I Introduction

Sir Timothy Coghlan, Government Statistican of Australia, wrote in 1886 that 'the contrast between rich and poor, which seems so peculiar a phase of modern civilisation, finds no parallel in these Southern lands' (quoted by Raskall, 1992,

p. 1). Did Australia live up to this idealised view? How unequal were incomes at the start of the twentieth century? Has there been a long-run trend towards greater inequality? Or has Australia followed the same pattern as in other OECD countries, such as the USA and the UK, where income inequality declined over the first three quarters of the century, and then increased in the final decades? We take such a long-run perspective of the Australian income distribution, focusing on the top incomes for whom information is available in the income tax returns.

Long-run trends are a source of fascination: 'the paucity of survey evidence regarding inequality in Australia has not prevented speculation about long-run trends' (McLean & Richardson, 1986, p. 68). 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

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individuals and corporations from 1921 onwards, and provide a rich source of information about individual incomes. (Because the tax year begins on 1 July, any reference to a tax year should be taken to refer to the start of the tax year: e.g. the 1980 tax year is the tax year starting 1 July 1980 and ending 30 June 1981.)

As Brown (1957) notes, 'The use of income tax statistics in Australia as a basis for size distribution of income has been found to raise many problems'. However, this is not a reason for dismissing the data. Brown himself uses special data for 1942–1943 that identifies year of birth and category (employees, proprietors and rentiers). These data are re-analysed by Saunders (1993). Others use taxation data for particular years. Lydall (1965, 1968) uses the data for tax years 1949, 1952, 1955, 1958 and 1962, to estimate the distribution of incomes among wage earners. Hancock (1970) uses data from 1950 to 1966 (see Ingles, 1981, p. 17) for actual income, taxable income and after tax income. Harris (1970) uses income tax data to examine the distribution for tax years 1955 and 1965; Ternowetsky (1979) uses data from 1955 to 1974. As these dates illustrate, one of the attractions of income tax data is that they cover a long span of years. The long period covered has been exploited by Berry (1977), who uses data for tax years 1922, 1932, 1942, 1952, 1962 and 1972; by Hamilton and Saddler (1997), who calculate the income share of the bottom quintile of taxpayers from 1950 to 1996; and by Smith (2001), who use data from 1916 to 1996 to measure tax progressivity. It is the long run of years covered by the income tax data that lead us to use them here. The taxation data provide estimates from 1921 to 2003 (and with some estimates for Victoria going back to 1912).

Our use of the income tax data does not mean that we are underestimating their shortcomings. 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) emphasises the importance of the exclusion of zero incomes. For this reason, most studies of the income distribution as a whole have used other sources. Butlin (1983) uses variation in minimum wages across industries, and found 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 to 1968 and from 1933 to 1980,

respectively. In recent years, the major source has been household surveys, notably the Survey of Income and Housing (previously the Income Distribution Survey and the Survey of Income and Housing Costs): see, for example, Australian Bureau of Statistics (2005) and its predecessor reports, published consistently under the title *Income Distribution, Australia*. There have been a number of studies of trends in Australian inequality in the 1980s and 1990s, including Bradbury *et al.* (1990), Saunders *et al.* (1991), Saunders (1997, 1998), Harding (1997) and Harding and Greenwell (2002). 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 per cent. The official results from the Survey of Income and Housing, for example, are typically presented in terms of the share of the top 20 per cent. 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. 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, p. 73).

It is clearly important to study the relation between the evidence from different sources. Butlin (1983), for example, draws an explicit contrast between his use of the skilled/unskilled wage ratio with use of the income tax data on top incomes. Leigh (2005) attempts to deal with the exclusion of non-taxpayers by deriving a series on income distribution for males only, from 1942 to 2001 (a period when four-fifths of males paid tax). Comparing census data and tax data for years where both are available, he derives a distribution for non-taxpayers in terms of the average annual salary for male workers, and uses this to impute incomes to non-taxpayers in all years. Our focus here, however, is on the top of the income distribution. 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.

The methods used here are described in Section II; the findings are presented in Section III; and the conclusions are summarised in Section IV.

II Data Description

(i) Definition of the Tax Unit and Control Total for Population

In Australia the tax unit is the individual. Our results are based on using those aged 15 years and over as the control population, but we also show the effects of taking 20+ years. In applying a constant age cut-off in determining the 'adult' population, we follow Saez and Veall (2005) for Canada and Piketty and Saez (2001, 2003) for the USA.

The tax returns cover only part of the population and the rate of coverage has varied greatly over the century. The fraction of Australians aged 15 years and over who filed a tax return was around 11–12 per cent in 1921–1922. The figure then dropped to 5–7 per cent in 1923–1938, 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 per cent. For more details, see Atkinson and Leigh (2005a, appendix A).

(ii) Control Total for Income

Our aim is to provide a control total comparable with the definition of income applied in the data for top incomes, referred to here as Household Gross Returnable Income. We are interested in the incomes of *households*, not the wider personal sector, which typically includes non-profit bodies serving persons (such as charities and trade unions) and life assurance and pension funds. We want to use income tax data that relate to persons and not to limited companies (e.g. in the early Australian data they cannot be separated). In this paper, 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): 'total income that would have been reported on tax returns, had everybody been required to file a tax return' (Saez & Veall, 2005).

To estimate the control total, we start with the personal sector total income from the national accounts. We 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. In Australia, transfers have been taxed to a signi-

ficant degree since 1944.[1] We therefore switch our personal income denominator to include transfers from this point onwards. The total also excludes non-household income and imputed rent. In order to give some idea of the sensitivity of the results, we also experiment with the effect of taking 90 per cent of the constructed total. Using the calculated total income series, we find that the total recorded in the tax data is some 80 per cent in the mid-1960s, when the number of calculated tax units was 60 per cent of the population aged 15+ years and 69 per cent of the population aged 20+ years. The former figure, and our constructed total income, implies that non-taxpayers had on average an income of 40 per cent of those filing. Again we take the constructed total as our central case, but experiment with taking 90 per cent of the constructed total.

One reason for making a link with national accounts is that it helps to ensure consistency over time. There are official series for total household income, and for transfers, for recent decades, but we have had to construct our own series for much of the period. This has involved assembling different elements from the official statistics and from academic sources, as described in Atkinson and Leigh (2005a, appendix B). For the years 1913–1927, we have resorted to use of gross domestic product to extrapolate backwards.

(iii) Categories of Income and Deductions

We have already referred to two important differences between income tax systems – the definition of the tax unit and the non-taxation of certain transfer payments – but there are other potential differences and these can affect the comparability of the estimates.

One potentially important difference lies in the deductions that may be made from gross income. Income tax systems differ in the extent of their provisions allowing the deduction of such items as interest paid, depreciation, pension contributions, alimony payments, and charitable contributions. (We are not referring here to personal exemptions.) Income from which these deductions have been subtracted is referred to here as 'taxable income'; we refer to total income before deductions

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[1] For the most part, Australian family benefits have been delivered in the form of tax rebates rather than transfer payments (Hodgson, 2005). Hence, they do not show up in either our numerator (pretax income of the richest X per cent) or denominator (household income plus transfers).

as 'actual income'. As in other studies, our pre-
ferred 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 accord-
ing to which individuals are classified. These two
are not always identical in that we may have the
distribution of variable *Y1* by ranges of variable
Y2. In Australia, the statistics from 1958 onwards
are in our preferred form, relating to the distribu-
tion of actual income by ranges of actual income.
From 1947 to 1957, the published figures give the
distribution of taxable income by range of actual
income; from 1944 to 1946, there are distributions
of both actual and taxable income by range of
actual income; prior to 1944 the taxation statistics
related to the distribution of taxable income by
range of taxable income. To create a continuous
series, we use the ratio of the actual and taxable
income top income shares in 1944–1946 to adjust
the shares in the years 1921–1943 and 1947–
1957.[2] However, it is possible that our adjustment
procedure understates the effect on the top 10 per
cent and top 5 per cent shares for the later years.
Even the adjusted series both show a sharp jump
between 1957 and 1958, and we are not aware of
any other factors that might have led to a rapid
rise in inequality in these years.

Another issue is the treatment of capital gains.
The basic series presented for the USA by Piketty
and Saez (2001, 2003) excludes capital gains. In
Australia, as with the UK (Atkinson, 2007), the
approach has been different, with certain gains
brought under the regular income tax (and, there-
fore, included in the estimates), but other gains
taxed, since 1986, under a separate capital gains
tax.[3] Another feature is the extent to which there
is an imputation system, under which part of any

corporation tax paid is treated as a prepayment 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
Australia in 1987 is evident in the statistics.

Finally, we should note that, although there
have been significant changes in the personal
income tax in Australia, these have been less
far-reaching than in a number of other countries
(such as those that have changed the tax unit) and
there have been considerable periods of stability.
As was summarised by Smith, 'there were some
significant changes to the nature of income taxation
between 1942 and 1955, but between 1954–55
and 1969–70 the Australian income tax schedules
and structure were substantially unchanged'
(2001, p. 264).

III Top Income Shares

Australian tax data are published in the annual
Reports of the Commissioner of Taxation (see
Atkinson & Leigh, 2005a, appendix C). Table 1
shows the estimated shares of the top income
groups for the period 1921–2003. As noted in
Section I, 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 an 83-year span.

Figure 1 shows the very top shares, about
which little has previously been written. We tend
conventionally to stop at the top 1 per cent, but
we need to look within this group as well. The
top 0.5 per cent may be a small number of people,
but they receive a significant fraction of total
income. In the 1920s their share was some 9 per
cent, and the share of the top 0.1 per cent was
around 4 per cent, or 40 times their proportionate
share. From 1920, these top shares fell signifi-
cantly. The share of the top 0.1 per cent had fallen
to 1 per cent in 1980. The share of the top 1 per
cent, which had begun at more than 10 per cent,
had fallen to under 5 per cent by 1980. At the
same time, the fall was far from steady. There
were periods, such as the 1920s and 1933–1943,
when the top shares were broadly constant.

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[2] 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 per cent share, 1.020
for the 5 per cent share, 1.033 for the 1 per cent share,
1.042 for the 0.5 per cent share, 1.073 for the 0.1 per
cent share, 1.091 for the 0.05 per cent share, and 1.126
for the 0.01 per cent share. Two things should be noted
about this adjustment procedure. First, the years 1944–
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.

[3] Because of the manner in which Australian income
tax statistics are tabulated, we have not attempted to
estimate top income shares excluding capital gains.

TABLE 1
Australia: Top Income Shares

	10 per cent	5 per cent	1 per cent	0.5 per cent	0.1 per cent	0.05 per cent	0.01 per cent
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
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

TABLE 1
Continued

	10 per cent	5 per cent	1 per cent	0.5 per cent	0.1 per cent	0.05 per cent	0.01 per cent
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	
2003	32.04	21.49	9.18	6.46	2.89	2.05	

Note: Figures are for tax years (e.g. 1921 denotes the tax year 1 July 1921 to 30 June 1922).
*Source*: Authors' calculations.

The long-run series allows us to see the impact on Australian top incomes of major events. McLean and Richardson (1986) used the 1933 census data to explore the impact of the Depression. They adjust for unemployment and underemployment, 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 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. Neither is the Second World War associated with a permanent fall in the share of the top 1 per cent: the shares in 1947 were similar to those in 1939 (although the top 0.5 per cent and 0.1 per cent did show a decline). This stands in contrast to several other Anglo-Saxon nations: in Britain, Canada and the USA (although 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 that sheep farmers received in that year.[4] Jones (1975, p. 31, n26) noted this spike, comparing the figures for 1949 and 1950. This illustrates again how one could be misled by relying on a single observation. If we just compared 1921 and 1950, we might conclude that top

[4] We are unable to separate out top income shares for wool growers, but other evidence points to the importance of wool prices. Copland (1954) notes that wool income was £60–70 million per year at the end of the Second World War, £250 million in 1949–1950, and £636 million in 1950–1951. Even after a 20 per cent levy on wool incomes, this 'left the grower with a wool cheque far beyond his rosiest dreams'.

FIGURE 1
Shares of Top 1, 0.5 and 0.1 Per Cent
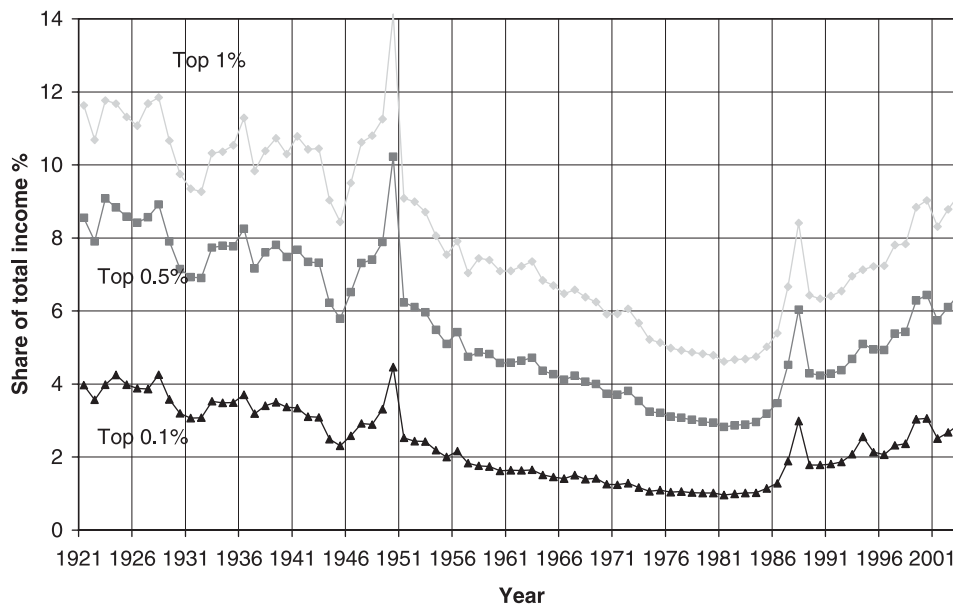
shares had significantly increased. (The same pattern can be observed in New Zealand top incomes in these years; see Atkinson & Leigh, 2005b.)

Taken overall, the 60 years from 1921 were apparently a period of major decline at the top of the distribution. From 1980, however, the pattern reversed. By the late 1990s, the top shares were back well above their 1958 levels. The share of the top 1 per cent, which had fallen to under 5 per cent, by 2003 was back to 9 per cent. The share of the top 0.1 per cent, which had been 1 per cent 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 per cent in 1985–1986 to 49 per cent in 1987–1988) and the property price boom of the late 1980s.

Is the upward trend continuing? As documented by Saunders (2004), there has been considerable debate as to whether income inequality in Australia increased in the second half of the 1990s. He studied this issue with the aid of data from the Survey of Income and Housing, concluding that the share of the top 20 per cent increased between tax years 1995 and 2000. Our estimates provide additional evidence, which differs in that it relates to gross individual incomes, but which is com-

plementary 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. However, even if we discount the higher observations for 1999 and 2000, the direction of change seems clearly upwards. The share of the top 1 per cent is approximately 2 per cent higher in 2003 than in 1996.

(i) Supporting Evidence

As a check on our results, we calculated top income shares using microdata from the 10 available Surveys of Income and Housing, covering the years 1981, 1986, 1990, 1994, 1995, 1996, 1997, 1999, 2000 and 2002. Although these surveys show a rise in top income shares over this period, it is not as large as the increase in top income shares derived from taxation data. For example, from 1981 to 2002, the top 1 per cent share rose from 4.6 per cent to 8.8 per cent according to the taxation data, but from 5.6 per cent to 7.1 per cent according to the Surveys of Income and Housing. Of course, when estimating top income shares, the Surveys of Income and Housing should not necessarily be regarded as the 'gold standard', given the possibility that survey
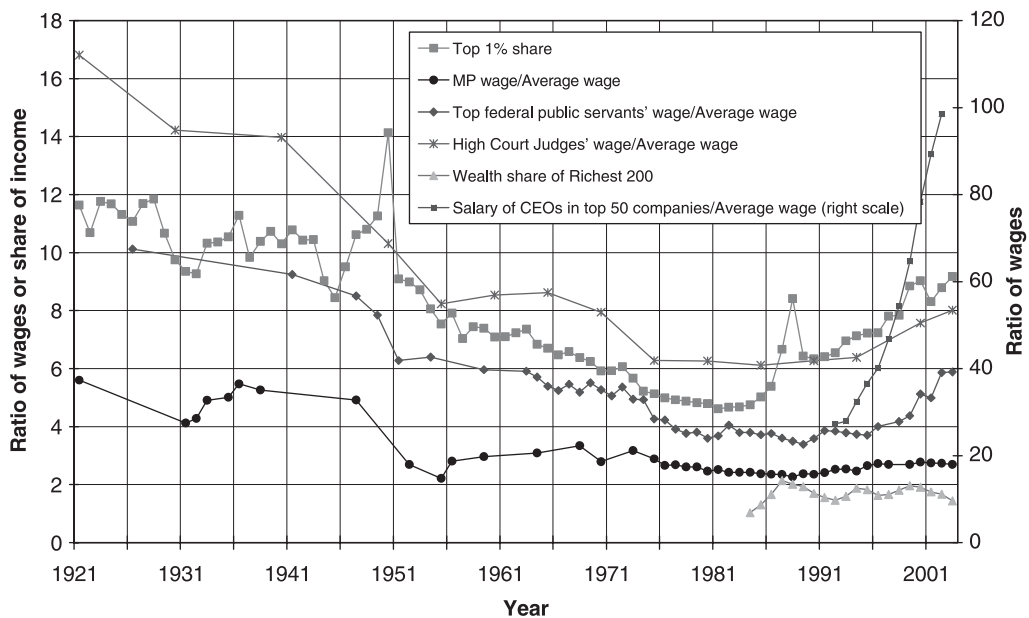
data under-represent high income earners. Across the 10 years, the correlation between top income shares derived from taxation data and top income shares derived from survey data is 0.88 for the top 10 per cent share, 0.83 for the top 5 per cent share, and 0.79 for the top 1 per cent share.

What other supporting evidence can we bring to bear? As a comparison, Figure 2 presents several other series. We show the salaries of members of Federal parliament, top public servants, high court judges and a typical chief executive officer (CEO) in the 50 largest companies: each presented as a ratio of the average worker's salary. Atkinson and Leigh (2005a, appendix D) contains details on the derivation of these series. Each appears to support the general trends in our data. The relative earnings of members of parliament and top public servants declined from 1921 to the late 1980s, but rose through the 1990s. For example, the basic salary of a member of Federal parliament, as a fraction of average earnings, was 5.6 in 1921, 2.3 in 1988 and 2.7 in 2003. The relative salary paid to high court judges declined even more markedly from 1921 to 1985, and has since risen steadily. The most dramatic change is in the earnings of top CEOs. In 1992, the remuneration of a typical

executive in Australia's top 50 companies was 27 times the wage of an average worker. By 2002, this had risen to 98 times the wage of an average worker (suggesting that CEO pay may be a significant factor explaining the rise in top Australian incomes during recent decades).

Figure 2 also depicts the wealth share of the richest 200 Australians (0.001 per cent of the 2003 population). The share of national wealth held by this group rose from 1 per cent in 1984 to 2 per cent in 1999, before falling to 1.4 per cent in 2003. Another source of wealth data, not shown in Figure 2, is Podder and Kakwani (1976), who found that the wealth share of the top percentile group fell from 39 per cent in 1915 to 9 per cent in 1966, a much more dramatic decline than we observe in the incomes data.

Because our series starts only in 1921, Table 2 presents data from 1912 to 1921 for the state of Victoria, Australia. Alone among the Federal government and the other Australian States, Victorian income tax statistics in the 1910s separated individual taxpayers from corporations. Figure 3 shows the top income shares in both Victoria and Australia over the period 1912–1931. Comparing the two series in overlapping years (1921–1923),

TABLE 2
Top Income Shares: Victoria, Australia

	10 per cent	5 per cent	1 per cent	0.5 per cent	0.1 per cent	0.05 per cent	0.01 per cent
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 to 30 June 1915).
Source: Authors' calculations.

FIGURE 3
Comparing Victoria 1912–1923 with Australia 1912–1931
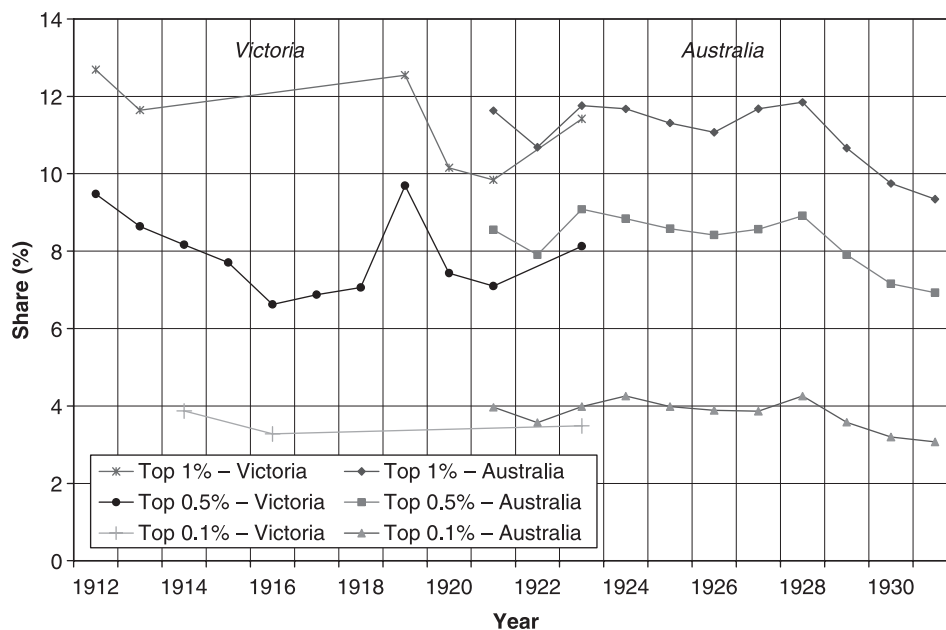
Victorian top income shares are very close to those in Australia as a whole. Assuming, therefore, that the Victorian series was representative of Australia as a whole during the 1910s, this suggests that Australian top income shares fell, although only modestly, during the First World War.

(ii) Distribution within the Top Groups

How generalised were these changes among top income groups? The evidence of Piketty and Saez for the USA (2003, figure 2) shows that the rise of the 1980s and 1990s was concentrated at the top. Whereas the share of the top 10 per cent as a

FIGURE 4
Share of Next 4 Per Cent and Second Vintile
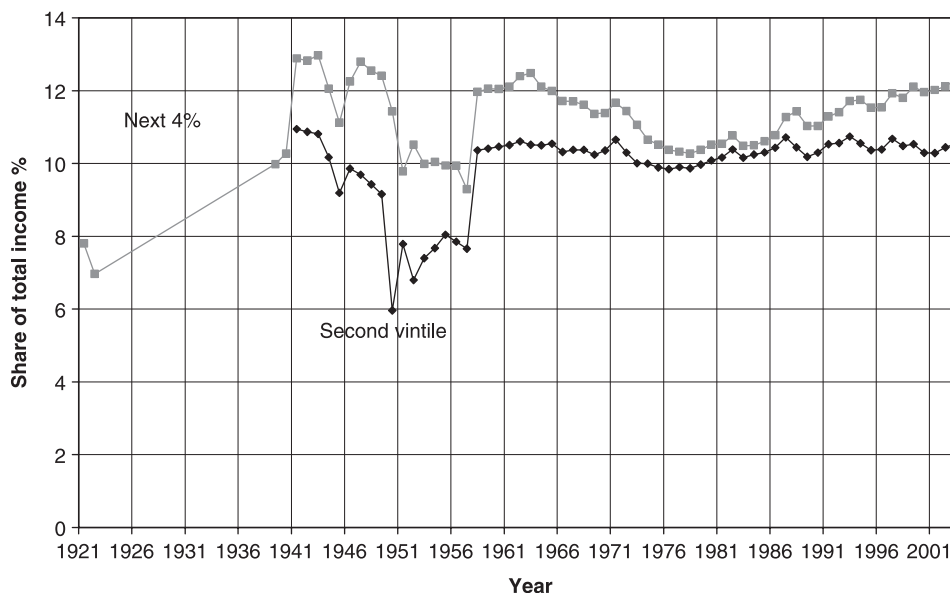
whole increased by some 10 per cent, that of the second vintile (i.e. those in the top 10 per cent but not the top 5 per cent) was essentially stable. Figure 4 shows for Australia the second vintile and the shares of those in the top 5 per cent but not the top 1 per cent (referred to as the 'next 4 per cent'). It should be noted that the Australian tax data do not allow us to estimate the share of the top 5 per cent 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 per cent (see Figure 1). The scale on Figure 4 is the same as that for Figure 1, making apparent that in 1945 the top 1 per cent had approximately the same amount of income as the second vintile. There is very considerable inequality within the top 10 per cent. 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 (1950) and the property boom (1988) had a positive effect only at the very top. As noted above, the increase from 1957 to 1958 may be at least partly due to our adjustment ratio being too low. After 1958, the downward trend continued for the next 4 per cent but not for

the second vintile. Equally, after 1980, there is little increase for the second vintile. For the next 4 per cent, the share rose from 10.5 per cent in 1980 to 12.3 per cent in 2003.

Looking at the distribution within the top 10 per cent has the advantage that the estimates do not depend on the control total for income. Figure 5 shows the share of the top 1 per cent within the top 10 per cent and the share of the top 0.1 per cent within the top 1 per cent. Also shown for reference, as a solid line without markers, is the share of the top 10 per cent 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 per cent is as relatively unequal as the overall distribution: the top 10 per cent of the top 1 per cent have a similar share to the top 10 per cent overall. The 'within' distribution got steadily less unequal from 1921 to 1982, and then returned: by 1998 the share of the top 0.1 per cent within the top 1 per cent was similar to the level at the end of the 1930s. Figure 6 shows the shares within shares in the form of Pareto–Lorenz coefficients. On the assumption that the distribution follows the form $(1 - F) = Ay^{-\alpha}$, where F is the cumulative distribution and y denotes income, then the Pareto exponent, α, can be estimated from the Lorenz
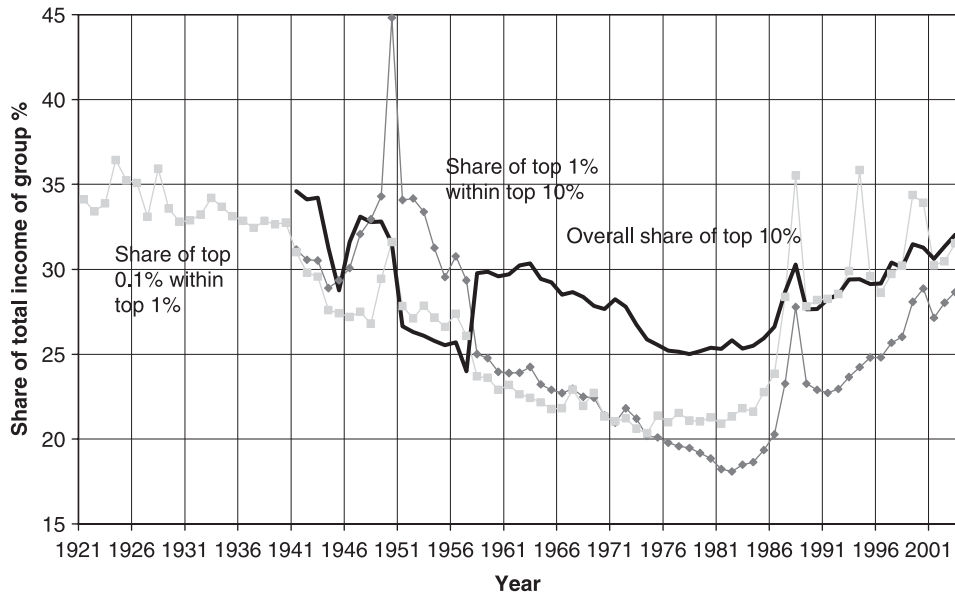
FIGURE 5
Shares within Shares
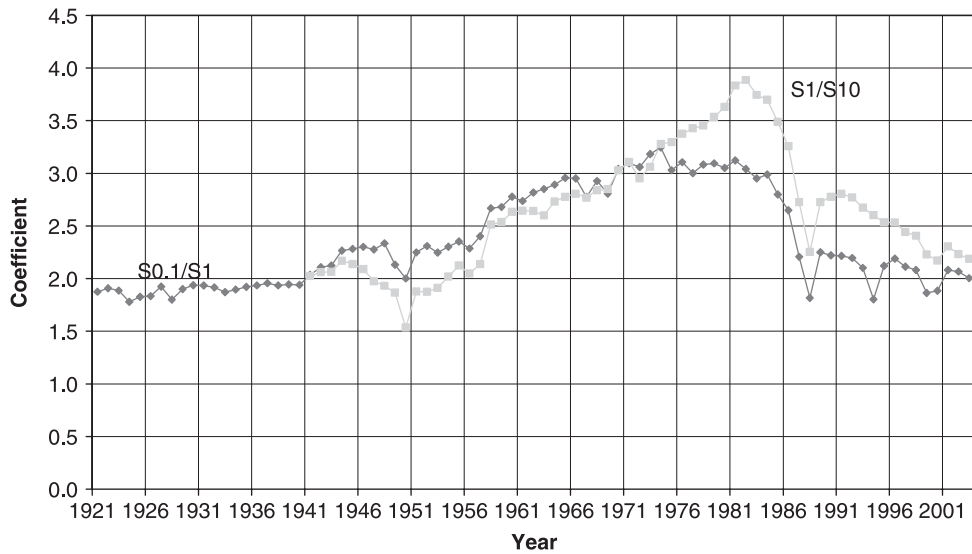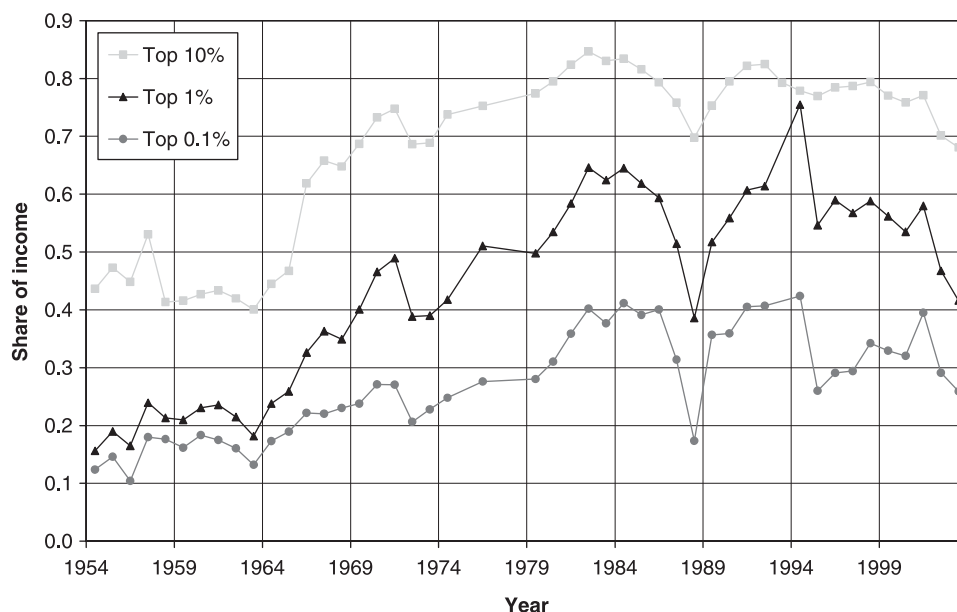

FIGURE 6
Pareto–Lorenz Coefficients

FIGURE 7
Fraction of Income from Salary and Wages

curve. To distinguish this estimate from those obtained directly from the cumulative distribution, we refer to it as a Pareto–Lorenz coefficient.[5] The larger the coefficient, the less the inequality for distributions with the same mean. The Pareto–Lorenz coefficient for the share of the top 0.1 per cent within the top 1 per cent peaks in 1974 at 3.2, before declining to 2.0 in 2003, only marginally above its value in 1921. The coefficient for the share of the top 1 per cent within the top 10 per cent peaks in 1982 at 3.9, before declining to 2.2 in 2003, only slightly higher than in 1941, the first year for which it can be calculated.

How sensitive are these results to changes in the control totals? Suppose first we try to reduce the estimated shares. On average, changing the population control to those aged 20 and over (a lower bound for the population total) reduces our estimate of the share of the top percentile group by 0.5 per cent, and the share of the top decile group by 1.9 per cent. Going in the opposite direction, maintaining a population control total of those aged 15 and over, but reducing the

personal income denominator to 90 per cent of personal income increases our estimate of the top percentile group share by an average of 0.7 per cent, and the share of the top decile group by 3.1 per cent. These calculations mean that the share of the top 1 per cent in, for example, 1960 would be 6.6 per cent on a lower bound calculation and 7.9 per cent on an upper bound.

What do we know about the sources of top incomes? From 1954 onwards, it is possible to separate salary and wage income from other income sources. Figure 7 charts the fraction of income that came from salary and wages earnings for three top income groups: the top 10, 1 and 0.1 per cent. 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.[6]

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[5] Where S1 is the share of the top 1 per cent and S10 is the share of the top 10 per cent, the Pareto–Lorenz coefficient for S1 in S10 is defined as $1/[1 + \text{Log}_{10}(S1/S10)]$.

[6] Unfortunately, during the earlier period (1929–1930 to 1953–1954), Australian taxation statistics were only separated into income from 'personal exertion' (wages, salaries and self-employment income) and 'property'. In addition, 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 USA.

FIGURE 8
Contributions to Share of Top 1 Per Cent
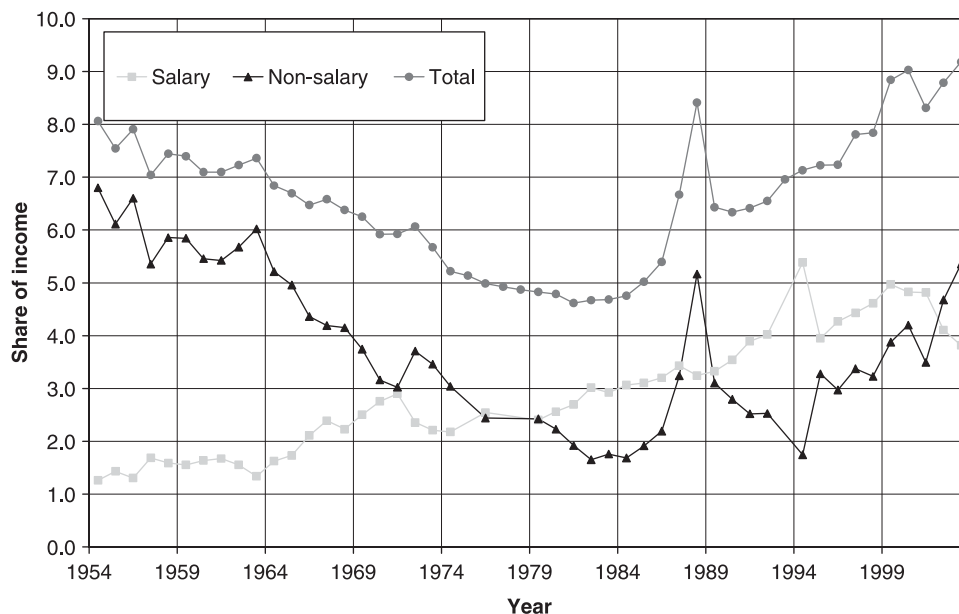
Over the last two decades of the twentieth century, salary and wage income fluctuated somewhat, but the proportion of salary and wage income for top income groups in 2003 was quite similar to the proportion in the early 1970s.

Figure 8 breaks down the top 1 per cent 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 per cent.[7] During the 1980s and 1990s, both salary and non-salary income have contributed approximately an equal amount towards the rising share of the top 1 per cent, with non-salary income (not surprisingly) fluctuating more than salary income. The rise in the top 1 per cent share in 1988 was due entirely to non-salary income, suggesting that this spike in top income shares was most likely caused by the property price boom. In the early twenty-first century, the salary

income of the richest 1 per cent appears to have declined slightly.

IV Concluding Remarks

The share of income accruing to the very top groups is of importance both because their share of the total is significant and on account of the economic power that it conveys. They are also a 'marker' of social and economic evolution. Tracing these shares over much of the twentieth century provides insights into the long-run development of societies and the impact of events, such as the World Wars and the Great Depression.

The path of top income shares in Australia has much in common with four other Anglo-Saxon countries: Canada (Saez & Veall, 2005), New Zealand (Atkinson & Leigh, 2005b), the UK (Atkinson, 2005, 2007) and the USA (Piketty & Saez, 2001, 2003). As we show in our comparison of these five Anglo-Saxon countries (Atkinson & Leigh, 2007), 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. At the start of the twenty-first century, the income share of the richest 1 per cent of Australians was higher than it had been at any

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[7] Using taxation statistics, Lydall (1965) notes that the ratio of wages for those in the top percentile group to median wages grew during the 1950s. However, as Figure 8 shows, this trend was swamped by the fall in non-salary income for those in the top percentile group.

point since 1951, while the share of the richest 10 per cent was higher than it had been since 1949. The rapid rise in Australian CEO salaries during the 1990s suggests that much of this recent increase was caused by higher executive pay, possibly driven by the internationalisation of the market for CEOs. Another factor is Australia's top marginal tax rates, which have steadily fallen over the past three decades: from 69 per cent in 1970, to 60 per cent in 1980, and 47 per cent in 1990. Reductions in top marginal tax rates could increase pretax top income shares in the short term by increasing work incentives or by reduced tax avoidance, and in the medium term by raising the share of investment returns that can be re-invested. Beyond this, it is possible that skill-biased technological change, and evolving social norms about inequality, may have helped underpin the rise of the rich.

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