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TOP INCOMES A GLOBAL PERSPECTIVE

Edited by A. B. ATKINSON & T. PIKETTY

Top Incomes

A Global Perspective

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Preface

In Volume I, we assembled studies of top incomes covering ten OECD countries and focused on the contrast between continental Europe (France, Germany, the Netherlands, and Switzerland) and English-speaking countries (Australia, Canada, Ireland, New Zealand, the UK, and the USA). The present volume goes beyond this in several respects. Within Europe, the chapters in this volume cover both Nordic countries (Finland, Norway, and Sweden) and southern Europe (Italy, Portugal, and Spain). The Nordic countries have traditionally pursued more egalitarian policies and have typically lower levels of overall inequality. In contrast, overall inequality usually seems to rise as one moves further south in Europe. The chapters assembled here allow the reader to see whether the same geographical pattern is found at the top of the income distribution. Moreover, we can examine whether top income shares have risen in these countries in recent decades, as in the USA, or whether they have exhibited the relative stability found in a number of continental European countries.

A second important objective of the present volume is to widen the geographical coverage to include Asia (China, India, Indonesia, Japan, and Singapore) and Latin America, of which Argentina is the sole representative (we had hoped to include Brazil, but the data were not available at the time). Particular interest attaches to the impact of rapid growth in China and India on the top of the income distribution, and to the potential role of income taxation. The different growth history of Japan provides an interesting counterpoint. Indonesia and Singapore are contrasts of scale and post-colonial experience.

The series for top income shares in Volume I covered much of the twentieth century and are extended here in Chapter 13 to cover the early years of the twenty-first century. We have also extended the coverage back in time. One of the features of the chapters in this volume is that two go back to the nineteenth century: the data for Japan start in 1886 and those for Norway in 1875.

The book starts in Asia in Chapters 1 to 5, then comes to Argentina in Chapter 6, before turning to the Nordic countries in Chapters 7 to 9, and southern Europe in Chapters 10 to 12. In the final Chapter 13, we draw together the main findings from this volume and from Volume I. The data, covering twenty-two countries, and going back before the Second World War for all except three, provide a rich source of evidence about the long-run evolution of the upper part of the income distribution.

The project that has generated these two volumes is an unusual one in that it has no formal status and did not originate in a carefully planned research proposal to a funding agency. The chapters have been written by an informal network of academics, doctoral students, and members of research institutes and statistical offices. This network grew through a process of spontaneous diffusion

rather than by any intelligent design. A number of the chapters enjoyed funding for the work on the particular country, and these are acknowledged in each case.

The informal nature of the project has meant that we have not sought to impose a rigid straitjacket on the format of the chapters, which in any case reflect the differing institutions and historical experiences of the countries. The chapters were written at different dates, and this means that some of the cross-country comparisons in individual chapters are based on earlier versions of the top income data for other countries. Those interested in exploring further cross-country comparisons are urged to look at the data collected in Chapter 13, which are the most recent at the time of completing this volume.

At the same time, the informality of the network has added to the pleasure of working with the authors, and we should like to thank warmly all seventeen for their cooperation in producing these volumes.

A. B. Atkinson and T. Piketty

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Singapore

A. B. Atkinson

5.1 INTRODUCTION

The economy of Singapore has grown rapidly. According to the estimates of Maddison (2003: 185), GDP per capita in PPP terms increased between 1959 and 2001 by a factor of 10. In 1959, GDP per capita in Singapore was around the world average; today it is more than three times the world average. Singapore was identified by the Commission on Growth and Development (2008) as one of thirteen 'success stories' of countries that have maintained high, sustained growth in the post-war period. The Singapore government has adopted distinctive policies, including state investment funds and a tripartite approach to labour relations. These policies are likely to have had implications not only for growth but also for the distribution of the benefits from that growth. In 1998 the UN Economic Commission for Asia and the Pacific commented:

> Singapore has achieved enviable economic and social progress. Absolute poverty has been virtually eliminated. Income inequality has remained relatively stable. It thus makes an interesting study on how the fruits of growth have been more or less equally distributed. (1998: 131)

More recently, the Asian Development Bank (2007: 11) concluded that there was no evidence for Singapore of a Kuznets curve, where income inequality first rises

I am grateful to Salvatore Morelli and Thomas Piketty for helpful suggestions and to the Department of Statistics, Singapore, for kindly supplying a table from a publication that I had not been able to locate in the UK. I am solely responsible for the views expressed.

and than falls as a country develops. It is however possible that, as Singapore has become richer, it has joined those OECD countries that have seen rising income inequality as a result of globalization and technological change. Singapore's response to the 1997 financial crisis was again distinctive, and may have led to a rise in inequality. A study by the Singapore Department of Statistics found that income inequality had increased at the end of the 1990s and stated that 'widening income disparity was a reflection of globalisation and Singapore's transition to a knowledge-based economy' (2002: 7).

This chapter examines one aspect of the income distribution in Singapore—the shares of top incomes—using information published as a result of the administration of the income tax. Although tax data were used in earlier studies of developing countries (see, for example, Okigbo 1968), they have tended in recent years to be rejected as a source. In one sense, this is not surprising. Income taxes only cover a part, sometimes a very small part, of the population. The resulting data cannot provide a picture of the overall distribution. The income tax data reflect the specific features of the tax system, and are very much subject to avoidance and evasion. But, despite these weaknesses, the tax data have certain advantages. Most importantly, the tax data are typically available annually and for a long run of years. The data used in this chapter begin in 1947, when the personal income tax law was enacted, and cover, with a few exceptions, the entire period up to the present day. The series therefore starts in the colonial period, spans Independence and the separation from Malaysia, and goes right through to the modern Singapore economy. As far as I know, such a sixty-year time series—parallel to those for OECD countries (see Atkinson and Piketty 2007)—has not been constructed for Singapore. Rao and Ramakrishnan, for example, show the income tax distribution for 1966 (1980: 21), but do not assemble a time series of data. No one, as far as I know, has researched the colonial period in Singapore.

The income tax data cannot be employed on their own. The published distributions of taxpayers by income ranges have to be accompanied by external control totals for the total adult population and for total household income. The production of these control totals is described, along with the basic tax data, in section 5.2. This section also describes data on the distribution of earnings among contributors to the Central Provident Fund, which can be used to supplement the information contained in the income tax tabulations. The results for top income shares 1947 to 2005 are set out in section 5.3, together with evidence for the distribution of earnings covering the period 1965 to 2007. The interpretation of the findings in the light of the development of the Singapore economy is the subject of section 5.4. The results for Singapore are compared with those for the United Kingdom (the former colonial power) and for thirteen other countries in section 5.5. The main conclusions are summarized in section 5.6.

5.2 THE UNDERLYING DATA

Income taxation was employed in many British colonial territories, and the colonial administrators were required to publish detailed reports, which typically included information on the distribution of taxpayers by income range and total incomes.[1] Income tax was introduced into the colony of Singapore with effect from 1 January 1948.[2] The first *Report of the Income Tax Department*, published in 1950, gave details of the number of taxpayers assessed in 1948 by ranges of assessed income. The same information was published in annual reports (referred to as AR) for subsequent years and continues to the present day in the form of the Annual Reports of the Inland Revenue Authority of Singapore. The information is reproduced in the *Yearbook of Statistics, Singapore* (referred to as *YSS*), which began publication in 1967. From these sources, income tax data have been located for all income years apart from 1955 and 1992. The data sources are listed in Table 5A.1.

Income Tax Data

The income tax data show the number of taxpayers assessed by ranges of assessed income and the total amounts of assessed income per range. The number of ranges was typically ten and they extended up to many multiples of the mean: for example, in 1960 the first range started at 1.46 times the mean, and the top range at approximately 100 times the mean. No information is available on the sources of income by range.

The data reflect the administrative process by which they are produced. For example, the data refer to a 'year of assessment': e.g. in *YSS* 1969 there is information for the year of assessment 1967, which refers to 'assessments made during the period 1.1.67–31.12.68'. These figures are taken to refer to incomes during the year 1966 (see Rao and Ramakrishnan 1980: 21), referred to as income year (IY) 1966. In this case, the assessments are those made in the twenty-four months after the end of the income year, but in a few cases the figures are given only after twelve months. For example, the figures for the IY 1986 are given (in *YSS* 1989) only for assessments made during the period 1 January 1987 to 31 December 1987. The twelve-months figures may be different, particularly at the very top incomes: for example, for IY 1987, the shares were as follows:

[1] This chapter is an outgrowth of a larger project on top income shares in British colonies before and after independence. The income tax data for (Dutch) colonial Indonesia have been exploited by Leigh and van der Eng (2009 and Chapter 4) to provide estimates for 1920 39.

[2] Income taxation in Singapore was first administered by the Income Tax Department, created in 1947, which became the Inland Revenue Department following self government in 1959. This was replaced in turn in 1992 by the Inland Revenue Authority of Singapore.

twelve-months assessment (*YSS* 1989: table 13.7)

share of top 10%	top 5%	top 1%	top 0.5%
33.9	25.5	10.0	6.3

twenty-four-months assessment (*YSS* 1990: table 13.7)

share of top 10%	top 5%	top 1%	top 0.5%
36.0	26.1	11.4	7.7

This needs to be taken into account when considering the estimates based on only twelve months (this applies to the seven years IY 1980 to IY 1986 inclusive, and to 1993).

The income tax was paid by non-resident as well as resident individuals. In what follows, attention is focused on Singapore residents. It is however interesting to note that in 1947, non-resident taxpayers accounted for 11 per cent of the total, and constituted 3 of the 11 people in the top tax bracket. By 2005, the percentage of non-resident taxpayers had fallen to 3 per cent, and they accounted for only 31 of the 2,121 people in the top tax bracket.

The income tax is levied on the tax unit, combining the incomes of husbands and wives, but the wife was allowed to elect for separate taxation. No information is given in the published tables about such separate elections. In what follows, I take the control total as the total number of adults, which means that the resulting estimates may overstate the top income shares among tax units. (It may be noted that this is different from the household approach adopted for Indonesia in the previous chapter.)

Use of income tax data is always open to the charge that the data take no account of tax avoidance and tax evasion. These are clearly important considerations. Since the control totals for income are based on National Accounts (see below), the estimates made here of the income *shares* understate the true top income shares to the extent that incomes are not declared. In this sense the estimates provide a lower bound. In the case of colonial Singapore, tax evasion was a concern. For example, in 1959 there was a commission of inquiry into the bank account of one citizen and 'the Income Tax Department leakage in connection therewith' (Colony of Singapore 1959). The Annual Report for 1960 announced that 'amendments to the Income Tax were introduced with a view to tightening up legislation against evasion of tax. The Comptroller is now given wider powers to obtain information and to have full and free access to all land, buildings and places, and all books and documents in the execution of his duties. The time limit for raising additional assessments is extended from six to twelve years' (State of Singapore 1963: 69). The present Inland Revenue Authority of Singapore devotes considerable resources to tax collection, and provides positive encouragement to tax compliance through emphasizing the role of taxes in financing key government services such as schools. It is therefore possible that compliance today is higher. If that is the case, today's top shares are closer to the true values. Any downward (upward) trend is therefore under (over) stated. The reader

should therefore bear in mind that both the level and the trend of the estimated shares may be affected by tax non-compliance.

Interpolation

Since the basic data are in the form of grouped tabulations, and the intervals do not in general coincide with the percentage groups of the population with which we are concerned (such as the top 0.1 per cent), we have to interpolate in order to arrive at the shares of total income. Given that there is information on both the number of persons and the total income in the range, we use the mean-split histogram. The rationale is as follows. Assuming, as seems reasonable in the case of top incomes, that the frequency distribution is non-increasing, then restricted upper and lower bounds can be calculated for the income shares (Gastwirth 1972). These bounds 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.

The ranges are in some cases quite broad, and the possible errors of interpolation need to be taken into account. For example, in 2005, taxpayers above $300,000 constituted 0.77 per cent of the adult population, and those above $200,000 were 1.59 per cent. (All dollars are Singapore dollars.) If we make no assumption about the distribution, then the 'gross' bounds for the share are from 13.05 to 13.39 per cent (these are calculated by assuming either that all incomes are equal to the mean for the range or that people are concentrated at the end points). If we assume that the frequency distribution is non-increasing (which rules out both of the bounds just described), then the restricted bounds are from 13.23 to 13.30, which are quite close. The mean-split histogram method gives a value for the share of the top 1 per cent of 13.28 per cent. In some years, however, the bounds are much wider apart. In view of this, I have not interpolated where the difference between the refined upper and lower bounds is more than 20 per cent. For example, in 2000, the refined lower bound for the share of the top 0.5 per cent was 8.6 per cent and the refined upper bound was 10.6 per cent, and no figure is used for this percentile group in this year.

In general, no extrapolation is made into the open upper interval, except in a few cases where the upper interval is close to one of the key percentages. Where the difference is less than 10 per cent, a simple Pareto extrapolation is used to calculate the share. For example, in 2001 and 2002, the top interval (above $1 million) contains 0.054 per cent of adults, and an estimate has been made of the share of the top 0.05 per cent. This has not however been done for 2005, when the top interval contained 0.075 per cent of adults.

Control Total for Population

The control totals for the adult population, defined as those aged 15 and over, have been taken from the demographic data in the *Yearbook of Statistics*. In 1991, the population estimates were revised downwards, reducing the estimated adult population for 1981 by 5.1 per cent. The figures for 1980 and earlier years have been reduced by this percentage.

For years where age composition is not available (prior to 1968 and for 1971 and 1973), the proportions of adult to total population were interpolated linearly and applied to estimates of the total population. The total population is available for census years (1947 and 1957), and then in the form of mid-year estimates from 1960; the remaining years are from Maddison (2003: 165), with 1948 and 1949 being interpolated. The resulting series is shown in Table 5A.2. As noted above, this overstates the number of tax units.

Control Total for Household Income

The construction of a control total for total household income (at current prices) proceeds here by first considering a measure of national income and then seeking to link total household income to national income.

In the case of national income, we can work backwards from 2005. For that year, current price GDP is estimated at $194,242 million (*YSS* 2007: table 5.1). As is recognized, a substantial part of GDP is generated by foreign companies and foreign individuals resident in Singapore. The Singapore Department of Statistics makes an estimate of 'Indigenous Gross National Income (GNI)' by subtracting the share of resident foreigners and resident foreign companies ($77,199 million) and adding net factor receipts of Singaporeans from the rest of the world ($31,722 million). The Indigenous GNI is some three-quarters of GDP. This percentage has fallen over the period since the Indigenous GNI series was introduced: for the first year, 1967, the percentage was 96.0. In what follows, the series for Indigenous GNI is used from 1967 to 2005, derived from successive issues of *YSS*. For the years 1960 to 1966, estimates are published only for GDP and a fixed percentage (96 per cent) has been taken of the *YSS* series.

It is not easy to obtain more than rough estimates for years before 1960. At the beginning of the period studied—the 1940s—the National Accounts were at best rudimentary. The estimates by Benham for the Federation of Malaya and Singapore combined are stated by him to 'involve a considerable amount of guesswork' (1951: 1). He goes on to say that 'separate estimates of national income for each territory would involve still more guesswork' (1951: 1), and it was not until 1959 that he attempted to make a first estimate for Singapore alone (relating to 1956). Maddison has made estimates of GDP (2003: 175), but these relate to constant purchasing power at 1990 international dollars.

Interestingly, the change over time from 1956 to 1960 is almost exactly the same as that in the current price GDP series, taking the Benham estimate for 1956 and the *YSS* figure for 1960.[3] The Maddison series is used to interpolate for the years 1957–9 and to extrapolate backwards to 1950. For the years 1947 to 1949, in the absence of other information, a growth rate of current price GDP per capita of 7.5 per cent per annum has been assumed. The resulting series is shown in Table 5A.2.

At the start of the period studied, expenditure by private households constituted a large proportion of national income: in the estimate for 1956 by Benham (1959), it was some 92.5 per cent. It seems reasonable to assume that total household income was of the same order. Later, estimates of total household income were smaller percentages of national income. The figures of Rao and Ramakrishnan (1980: 34) for employee plus property income are 79 per cent for 1966 and 73 per cent for 1975. Towards the end of the period, the results of the Household Expenditure Survey (HES) for 2003, when grossed up, give a figure of some 61 per cent (Khee and Liong 2005). The latter figure includes regular income from work, and income from investment, rentals, and other sources; it excludes imputed rent of owner-occupied accommodation.[4] We do not want to include imputed rent, but the survey amount may also be too low on account of under-reporting and differential non-response by upper income groups (and the omission of the institutional population). According to Rao, 'it must be accepted that there is considerable under-coverage (up to 15 per cent of GNP or 30 per cent of likely actual house-hold income) in the income data obtained by the HES' (2000: 144). In view of these considerations, I take a figure of 75 per cent of national income for recent years. To accommodate the fall from 92.5 per cent in 1956, the proportion is assumed to fall at the rate of 1 percentage point per year from 1956 to 1966, and then at a rate of half a percentage point per year until it reaches 75 per cent in 1981.

The resulting series for total household income is shown in Table 5A.2, together with mean income per adult. There is clearly a wide margin of error. In recent years, the error is likely to arise in the assumed percentage, rather than in the national income total. The correct percentage could be as much as a fifth higher (i.e. 90 per cent), although it is unlikely to be as much as a fifth lower (60 per cent). In the early years, the error is more likely to arise in the National Accounts total, rather than in the percentage. Use of the United Nations estimates for the 1950s, for example, would typically raise the control total by some 8 per cent, causing the estimated top shares to fall by 8 per cent. Overall, in these early years, a 20 per cent error in either direction seems quite possible, although it

[3] An alternative would be to use the figures given by the United Nations (1968: 147) for 1956 to 1966; these are typically some 8% higher than those used here.

[4] An important consideration in any overall distributional analysis is the role of housing policy, notably since the 1960s the provision of subsidized housing by the public sector (see Chia Siow Yue and Chen Yen Yu 2003: 19 20).

should be noted that, when account is taken of the (known) income of taxpayers, this means a variation of around a quarter in the income of non-taxpayers. It should also be noted that the use of total adult population, with an age cut-off of 15, may mean that the shares are overstated, which is a further reason for drawing a wide (lower) confidence interval.

Data on the Distribution of Earnings

The published income tax data for Singapore do not allow a distinction to be drawn between earned income and investment income. Information is however available since 1965 on the distribution of earnings obtained from the administrative records of the Central Provident Fund (CPF) Board. Under the Central Provident Fund Act, every employer is required to pay monthly contributions into this mandatory retirement savings scheme, so that the records provide good coverage of all employees in both the private and public sectors. (Employers, the self-employed, and unpaid family workers are excluded.) The earnings data have been described as follows:

> The statistical measure of earnings is based on the concept of wages as income to the employee. The earnings data refer to all remuneration received before deduction of the employee's CPF contributions. Earnings data include basic wages and other regular payments like shift allowances, overtime payments, incentive payments and other monet ary allowances. (Tan Yih Bin 1992: 1)

Distributions of employees by ranges of monthly earnings have been regularly published in the *Yearbook of Statistics, Singapore* (*YSS*), with typically some fifteen ranges. (The sources are listed in Table 5A.3.) The cumulative distributions have been interpolated linearly to give percentiles as percentages of the median. Since no information is published in *YSS* on the amounts per range, the bounds are simply the range interval, which means that the estimated percentiles are subject to considerable interpolation error. For example, in 1987, 64.4 per cent of workers had wages of $600 or more and 47.1 per cent had $800 or more, from which a median of $766.5 was interpolated, but it could lie anywhere between $600 and $800. The reader has therefore to be on guard against interpolation error.[5] At the same time, the results below do not suggest that this has led to any noticeable artificial volatility over time, and I believe that they are reasonably robust.

[5] For example, in that year, 11.7% of workers had wages of $2,000 or more and 7.6% had $2,500 or more, from which the top decile of $2,209 was interpolated. Combining this with the estimate for the median, we arrive at a figure showing the top decile as 288% of the median. But the grouped data are consistent, in extreme cases, with a top decile of $2,000 and a median of $800, giving a percentage of 250 or with a top decile of $2,500 and a median of $600, giving a percentage of 417.

5.3 TOP INCOME SHARES IN SINGAPORE

The estimated shares of top income groups in Singapore from 1947 to 2005 are given in Table 5.1. The percentile shares cover the following seven groups: top 10 per cent, 5 per cent, 1 per cent, 0.5 per cent, 0.1 per cent, 0.05 per cent, and 0.01 per cent. The results relate to individuals (aged 15 and over) and to assessed income before tax. The shares of all except the smallest group are graphed in Figure 5.1. The period between the two vertical lines is that when the assessments were based on twelve months rather than twenty-four months, and the top shares

Table 5.1 Top income shares in Singapore, 1947 2005

	10%	5%	1%	0.50%	0.10%	0.05%	0.01%
1947			10.94	7.72	3.34	2.31	0.99
1948			10.93	7.69	3.31	2.31	0.99
1949			10.38	7.40	3.24	2.26	0.92
1950			12.74	9.39	4.46	3.13	1.32
1951			14.79	11.21	5.79	4.28	2.12
1952			13.80	10.32	5.32	4.00	2.04
1953			12.49	9.17	4.48	3.32	1.68
1954			12.39	8.98	4.28	3.15	1.63
1955							
1956			12.42	8.72	3.68	2.49	0.98
1957			12.29	8.57	3.50	2.33	0.83
1958			11.70	8.06	3.17	2.07	0.74
1959			13.05	9.15	3.72	2.44	0.87
1960			10.97	7.72	3.15	2.12	0.80
1961			11.19	7.86	3.12	2.05	0.74
1962			11.07	7.69	3.04	1.99	0.75
1963			10.93	7.58	2.98	1.94	0.71
1964			12.62	8.65	3.37	2.20	0.84
1965			10.91	7.50	2.83	1.80	0.64
1966			10.36	7.06	2.61	1.63	0.55
1967			10.23	6.99	2.62	1.67	0.59
1968			10.63	7.44	3.06	2.09	0.92
1969		21.79	10.18	7.12	2.86	1.91	0.75
1970		22.87	10.77	7.51	2.99	2.01	0.82
1971		22.60	10.57	7.32	2.89	1.92	0.74
1972		23.22	10.80	7.50	3.08	2.07	0.85
1973		23.26	11.15	7.87	3.38	2.34	
1974	30.69	22.77	10.46	7.22	2.90	1.92	
1975	31.40	23.26	10.57	7.24	2.84	1.85	
1976	31.39	23.13	10.41	7.14	2.78	1.81	
1977	30.58	22.43	10.02	6.83	2.66	1.76	
1978	31.97	23.29	10.30	6.97	2.63	1.71	
1979	34.46	25.15	11.15	7.53	2.84	1.87	

1980	32.07	23.63	10.59	7.21	2.80	1.84	
1981	32.14	23.62	10.60	7.27	2.78		
1982	33.22	24.28	10.79	7.41	2.93		
1983	32.12	23.55	10.45	7.12	*2.81*		
1984	31.74	23.10	10.17	6.90			
1985	33.80	24.54	10.67	7.22			
1986	32.76	23.91	10.26	6.86	*2.60*		
1987	36.01	26.06	11.41	7.69	2.96	1.96	0.81
1988	33.95	24.57	10.72	7.24	2.76	1.86	0.76
1989	34.67	25.29	11.30	7.79	3.17	2.31	1.05
1990	35.04	25.50	11.22	7.65	2.99	2.18	0.79
1991	33.09	24.01	10.43	7.03	2.73	2.01	0.72
1992							
1993							
1994	30.41	22.16	10.02	6.87	3.11	2.19	
1995	30.18	21.93	9.84	6.67	3.05	2.11	
1996	30.91	22.47	9.99	6.76	3.09	2.04	
1997	30.79	22.64	10.31	7.06	3.27	2.15	
1998	32.64	24.11	11.10	7.62	3.53	2.34	
1999	36.28	27.01	12.78	8.94	4.24	2.88	
2000	38.06	28.28	13.26	9.39	4.43		
2001	43.87	32.50	15.07	10.58	4.74	*3.34*	
2002	43.53	32.19	15.06	10.70	4.95	*3.56*	
2003	41.36	30.63	14.24	10.02	4.51		
2004	38.92	28.91	13.60	9.63	4.36		
2005	37.36	27.92	13.28	9.46	4.29		

Notes: (1) Figures shown in italics are extrapolations into open upper interval.
(2) Estimates for 1980 to 1986 are based on 12 month rather than 24 month assessments.

may be expected on this account to be rather lower. The graph also indicates some of the main events in the recent history of Singapore.

The broad impression is that of stability over time—at least until the 1990s—a stability that is remarkable for a country that has seen its real income per head rise more than tenfold. It is true that there has been change. The commodities boom around 1950 saw the top shares in Singapore increase: that of the top 1 per cent rose from 10 per cent to 15 per cent. But the top shares subsequently fell back steadily over the colonial period, and by the time Singapore separated from Malaysia to become fully independent in 1965 there was little difference from the shares in 1947. There is no sign that Independence produced a marked change in top income shares. Nor did the distribution change as Singapore grew: the share of the top 1 per cent, the top 0.5 per cent, and the top 0.1 per cent were little different in 1996 from their values thirty years earlier.

Over a thirty-year period there was broad stability of the very top income shares. At the same time, there was some change lower down the distribution, below the top 1 per cent. The shares of the top 5 per cent and the top 10 per cent were higher in 1990 than in the 1970s; and they then fell back in the 1990s. It is

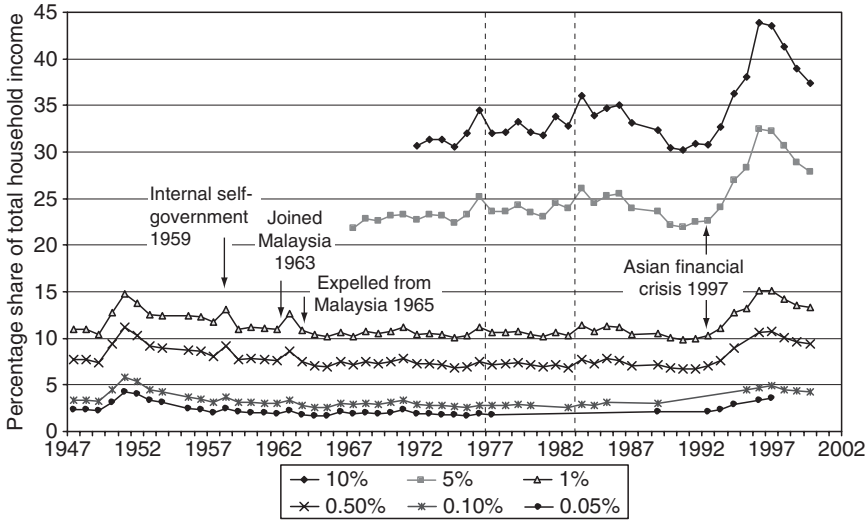

Figure 5.1 Top income shares in Singapore, 1947 2005

Source: Table 5.1.

interesting to compare these with the Gini coefficients for the entire distribution of income summarized by Chia Siow Yue and Chen Yen Yu (2003: table 14). The first observation cited is for 1966; the series then runs annually from 1972 to 1999. The Gini coefficients show a rise of about 4 or 5 percentage points between the end of the 1970s and the end of the 1980s, a magnitude around the same as the increase in the United States at that time.

Towards the end of the period, after a fall in the early 1990s, all top shares in Singapore rose following the Asian financial crisis of 1997–8. From 1997 to 2002, the share of the top 10 per cent went from 31 per cent to 44 per cent; the share of the top 1 per cent went from 10 per cent to 15 per cent; the share of the top 0.5 per cent went from 7 per cent to over 10 per cent. In other words, the shares increased to about 1.5 times their 1997 value. After 2002, these shares turned down, but in 2005 were still well above their 1997 levels. At 9.5 per cent in 2005, the share of the top 0.5 per cent was at a height comparable with that in the boom at the start of the 1950s.

The different periods as they affected the share of the top 1 per cent are summarized in Figure 5.2. This also shows a band of 20 per cent possible error. As noted above, it seems possible that the control total for income in recent years could be understated by as much as 20 per cent, causing the share to be overstated by that amount. The resulting 2005 figure is marked with an X. For the early years, the error in the National Accounts total could well be in either direction. These are marked by + and − for 1947. As may be seen, the lower figure for 2005 lies within the +/− range for 1947, but the central value for 2005 lies (just) above the 1947 range. The 2005 share of the top 1 per cent is higher than that

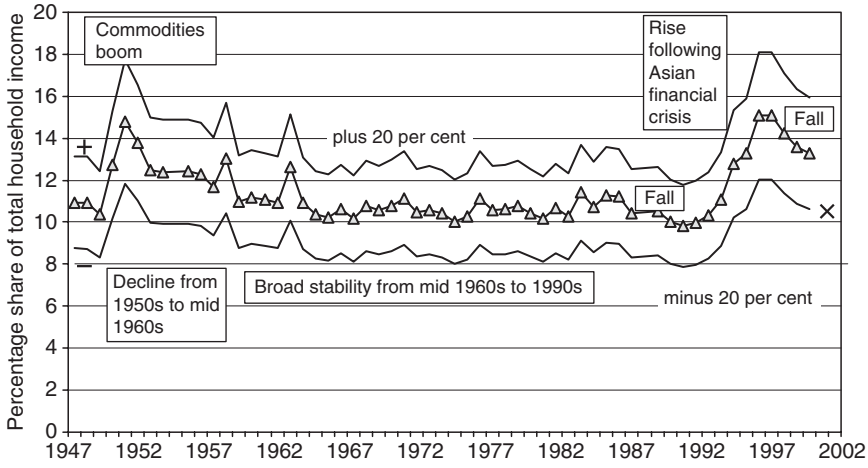

Figure 5.2 Share of top 1% in Singapore, 1947 2005

Source: Table 5.1.

in 1947 unless the National Accounts figure for 1947 is more than 20 per cent too high.

Shares within Shares

The uncertainties surrounding the control totals for income can be avoided if we look at the *shape* of the upper part of the distribution, as represented by the shares within shares. Figure 5.3 shows the share of the top 0.1 per cent within the total income of the top 1 per cent, and, from 1974, the share of the top 1 per cent within the total received by the top 10 per cent. For the earlier years, when less of the distribution was covered, we show the share of the top 0.01 per cent within the top 0.1 per cent (although it should be remembered that this is a very small group: around 1,300 taxpayers in the top 0.1 per cent in 1972, the last year shown).

The shares within shares show the same rise in the early 1950s, and this was followed by a fall to the mid 1960s. The fall was more marked than for the shares themselves, so that the distribution was less concentrated at the top in 1966 than in 1947. The ensuing period of broad stability was however similar. The share of the top 0.1 per cent in the top 1 per cent at the end of the 1980s was 26 per cent, a value little different from those observed in the mid 1960s. In contrast, the share of the top 1 per cent in the top 10 per cent was falling over this period; there was change in the distribution below the top percentile. At the end of the period, however, both showed increasing concentration: by 2005, the share of the top 0.1 per cent within

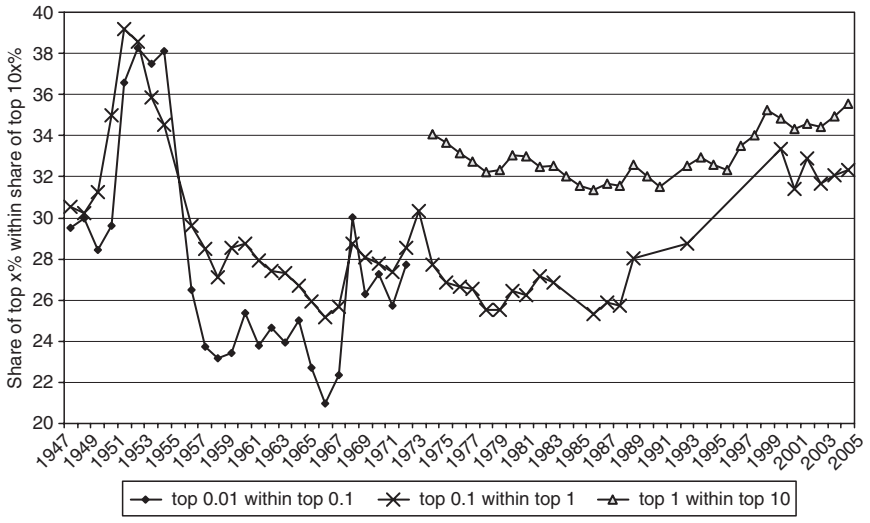

Figure 5.3 Shares within shares of top income groups in Singapore, 1947 2005
Source: Table 5.1.

the top 1 per cent had risen to 32 per cent, and a similar percentage point increase was recorded by the share of the top 1 per cent in the top 10 per cent.

The fact that the share of the top x per cent within that of the top 10x per cent is similar for the different values of x in Figure 5.3 indicates that the distribution is close to Pareto in form. The Pareto coefficients implied by these shares within shares are shown in Figure 5.4 for $x = 0.1$ and 1 (from 1974), as well as for $x = 0.5$ (from 1969). (The figures indicated by circles relate to India and are discussed in section 5.4.) At the end of the period, the coefficients were between 1.8 and 2.0. For much of the period, however, the coefficient based on the share of the top 0.1 per cent in that of the top 1 per cent has been in excess of 2.0, varying around 2.25. There was a definite rise and then fall in the Pareto coefficient. Interestingly, the fall in the coefficient (marking increased concentration) after the financial crisis in 1997 was not reversed after 2002—unlike the top income shares. Put another way, the top 1 per cent saw a fall in their income share between 2002 and 2005 of less than 2 percentage points, whereas the next 9 per cent saw a fall of 4.7 percentage points, or more than half the increase they had enjoyed between 1996 and 2002.

Upper Part of the Earnings Distribution

One of the elements driving the top income shares is the behaviour of the earnings distribution. The data from the CPF contributions allow us to estimate the upper percentiles as percentages of the median, and these are shown in

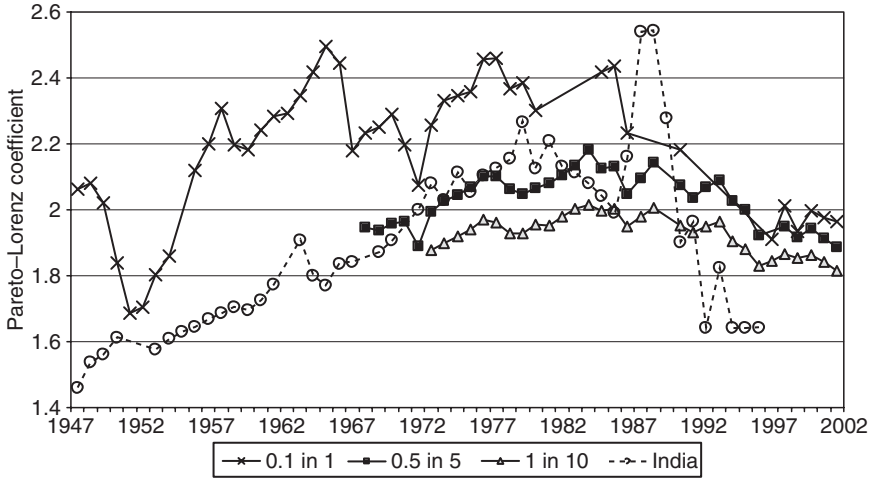

Figure 5.4 Pareto Lorenz coefficients for Singapore (and India), 1947 2005
Source: Table 5.1 and shares of top 0.1 and 1 in Table 1A.5.

Figure 5.5. Since it was independent Singapore that introduced the Central Provident Fund, the estimates do not cover the colonial period: they start in 1965. As noted above, the figures are subject to interpolation error.

The estimates of top earnings percentiles in Figure 5.5 bear out the impression of stability in the middle part of the period. The top 5 (20) per cent earned more than 403 (191) per cent of the median in both 1971 and 1986. Earlier, in the 1960s there had been an increase in the upper percentiles: the top decile rose by over 5 per cent and the top quintile by over 10 per cent. (In this period, the income tax data do not reach down this far.) After 1987, we see a decline in the top decile and top vintile, both of which by the mid-1990s had fallen by more than 15 per cent; this resembles the falls observed in Figure 5.1 for the shares in total income of the top 10 per cent and top 5 per cent. The Gini coefficients calculated by Rao, Banerjee, and Mukhopadhaya (2003) using the CPF data, which start in 1974, show the Gini as falling from 46 per cent in 1987 to 43 per cent in 1988 and as maintained at that level until the mid 1990s. The fall was reversed after 1996. The data ranges do not allow the series in Figure 5.5 to be carried forward in all cases, but the upper quartile rose between 1996 and 2007 by more than 8 per cent.

The conclusion reached about the overall earnings distribution by Rao, Banerjee, and Mukhopadhaya was that 'there are some very stable income differentials among the workers/employees of Singapore' (2003: 216). As they note, however, a single summary measure conceals possibly divergent movements. It is also clear that the stability was a property of one period, as is illustrated in Figure 5.6, which shows the changes in the earnings percentiles (defined relative to the median) since 1970. Before 1987, the variation was contained within a band of ± 5 per cent. In this respect, Singapore (solid

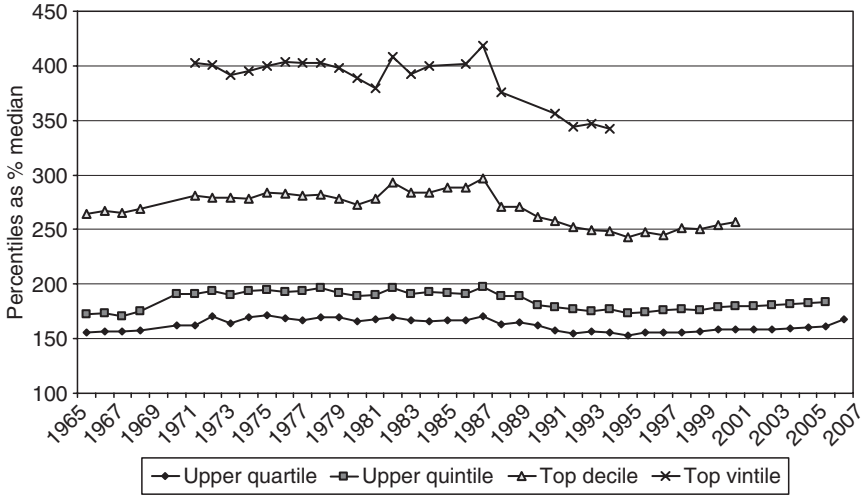

Figure 5.5 Earnings distribution in Singapore, 1965 2007
Source: Table 5A.4.

symbols) was similar to the United Kingdom, for which results are shown for comparison (hollow symbols). But after 1987 we see the fall of top percentiles in Singapore, of nearly 15 per cent for the top decile, followed by a rise starting after 1995. It is interesting to see that the rate of rise in recent years in Singapore is not dissimilar to that in the UK, where there has been a distinct fanning out of the upper part of the earnings distribution (Atkinson 2008).

Summary

The income tax data allow us to track the very top income shares in Singapore from 1947 through to the twenty-first century, covering first a colonial period, a short period as part of Malaysia, and then full independence from 1965. During the time as a colony, shares rose to a peak in 1951 and then declined over the 1950s. Following Independence there followed twenty-five years of broad stability at the very top. The 1990s saw a fall in top shares, but after 1996 they rose by around a half, and even if they have subsequently declined, they remain above earlier levels. The top percentiles of the earnings distribution were relatively stable up to 1987, and then fell, before starting an upward path after 1995. A first impression is that political events, such as Independence, have had little impact; much more potent have been economic events such as the commodities boom of 1950–1 and the Asian financial crisis. These are discussed in the next section.

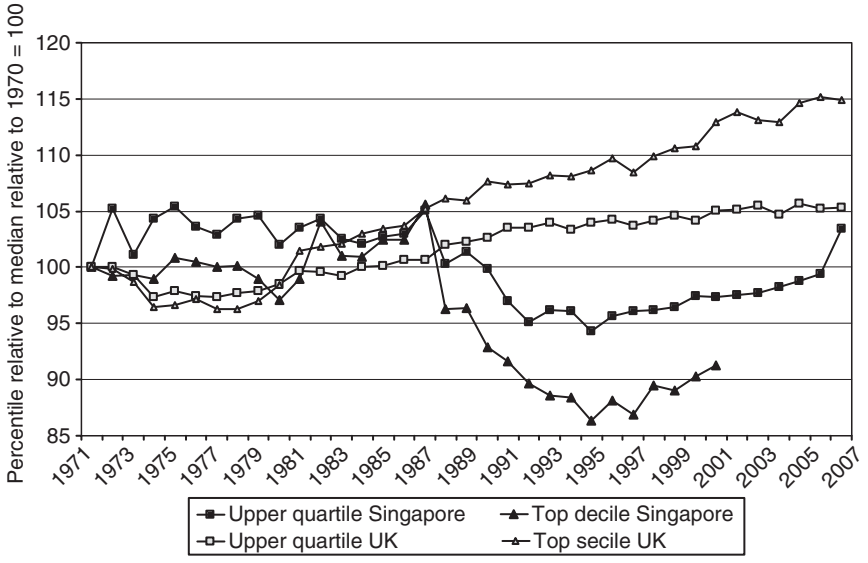

Figure 5.6 Changes in earnings percentiles relative to 1970: comparison of Singapore and UK
Source: Table 5A.4.

5.4 TOP INCOMES AND EARNINGS AND SINGAPORE'S ECONOMIC DEVELOPMENT

In considering the possible explanations for the behaviour of top income shares, in the case of Singapore we should begin with the impact of its remarkable economic growth.[6] Over the period studied in this chapter, Singapore has moved from having approximately average world income to having GDP per capita similar to that of Western Europe. It is often regarded as the archetypal Newly Industrializing Country, being labelled with Hong Kong, South Korea, and Taiwan as a member of the 'Gang of Four' or as an 'East Asian tiger'.

Growth and Structural Change

With its strategic position and natural harbour, Singapore developed in its colonial period not only as a base for British military operations but also as a centre for international commerce. As such, it was exposed to world economic conditions, notably the movements in commodity prices. Between 1948 and 1950, the price of rubber in US$ doubled, and it rose by a further nearly

[6] In this summary of Singapore's economic development, I have drawn heavily on a number of sources, including Tan and Hock (1982) and Islam and Kirkpatrick (1986).

50 per cent between 1950 and 1951. From 1951, the rubber price then fell back, and by 1953 was little higher than in 1948.[7] Given the predominance of trading activity, these price movements are likely to have been at least one of the causes of the rise and then fall in top income shares in Singapore in the early 1950s.

The decline in both military and entrepôt activity meant that economic development had to be found elsewhere. The 1959 election platform of the People's Action Party (PAP) focused on industrialization as the strategy for Singapore's future development. The PAP, which won the election and has been in power since then, set in place such a strategy, oriented first (1960 to 1967) towards import substitution. Then the shock of the announcement in the 1960s of the withdrawal of the British military base, which accounted for some 20 per cent of employment (Tan and Hock 1982: 282), led to increased incentives for exporting and measures to increase the competitiveness of Singapore exports. Inward capital investment by foreign companies was strongly encouraged. The rate of growth doubled after 1967, and by 1973 manufacturing accounted for 22 per cent of GDP, compared with 13 per cent in 1960 (Tan and Hock 1982: 308). Growth was at this time largely extensive, with an expansion of relatively labour-intensive manufacturing industries, and little evidence of increased productivity via technical progress (Tsao 1985).

If such structural change causes an inverse-U Kuznets curve relationship between growth and inequality, with inequality first rising and then falling as a country develops, then it should be evident in a case where the transformation takes place so rapidly without major interruptions (such as wars). In Figure 5.7, the share of the top 1 per cent in Singapore for the period 1950 to 2003 is plotted against the level of GDP per capita measured in $1990 PPP terms (from the estimates of Maddison 2003 and website). There is no sign of an inverse-U. Indeed, as pointed out by earlier writers, such as Rao, the data 'indicate a U-shape for the past 25 years and not an inverted-U' (2000: 152). As noted at the outset, the Asian Development Bank when considering the distribution as a whole had found no evidence of a Kuznets curve.[8] The absence of any apparent Kuznets curve may reflect a narrow wage differential between the manufacturing and agricultural/domestic sectors. According to Fields (1984), the differential was of the order of 20 per cent, which he contrasts with other parts of the world where the differential could be 100 per cent or higher.[9] These conclusions relate to the overall distribution, but the same picture is shown by the top shares, which may be seen from Figure 5.7 to be highest at low levels of per capita income and at the recent high levels. The central period, when the economy was moving from

[7] These figures are from *International Financial Statistics* (January 1954), 32, and (January 1957), 36.

[8] Although Rao and Ramakrishnan suggest that the first part of the Kuznets curve could have started earlier: 'income inequality probably increased during the one hundred or more years of transition of Singapore from the fishing village to the entrepôt trade centre' (1980: 69).

[9] The differentials assumed by Kuznets (1955) in his numerical examples were 100% (smaller case) or 300% (larger case).

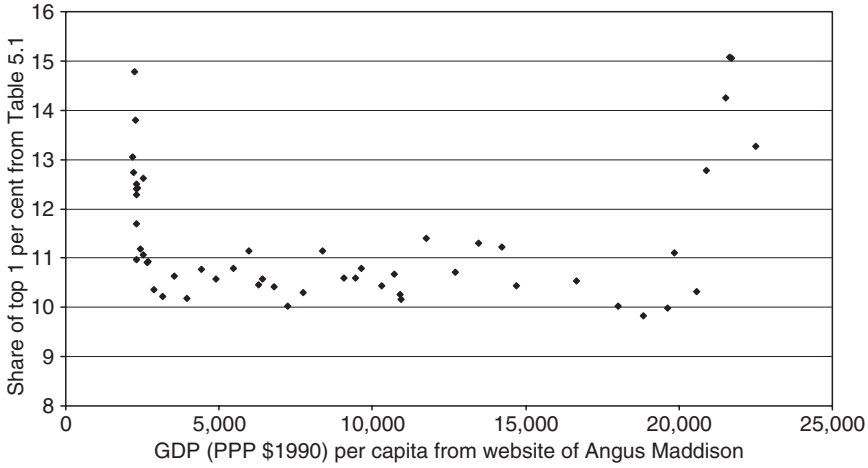

Figure 5.7 Share of top 1% plotted against GDP per capita Singapore, 1950 2003

$3,000 per head in 1966 to some $15,000 in 1991, is characterized by a long flat part of the U.

International Trade

As has been clearly identified by Rao, there are two evident reasons why Singapore has not exhibited the Kuznets inverse-U pattern: 'being an extremely open economy, wage incomes are in part determined by global influences, and in addition, government has used the wage as a policy instrument' (2000: 155). These are considered in turn.

The model underlying the Kuznets curve is that of an economy closed to international trade, whereas trade has been taken as one of the major drivers of trends in inequality. It has long been argued (for example, by Little, Scitovsky, and Scott 1970) that the adoption of a broadly based export promotion policy would increase the demand for unskilled labour in developing countries and hence reduce earnings inequality. This was spelled out by Wood in his book on north–south trade and inequality, where he supported, with qualifications, the view that 'expansion of manufactured exports raises the demand for—and hence the wages of—unskilled but literate (BAS-ED) labour relative to other sorts of labour. It thus tends to narrow the wage differential between BAS-EDs and the (higher-paid) skilled workers, reducing inequality' (1994: 13). Wood goes on to examine the time-series evidence for a number of countries, including Singapore, emphasizing that this evidence 'is by no means as clear-cut as is commonly supposed' (1994: 241). The forces described by Wood may well not have affected

the top incomes covered by the income tax data, but we have seen that the CPF earnings data show a long period of stability during the period that Singapore was growing rapidly (the same data show the lower quartile also being stable as a percentage of the median between 1965 and the 1980s).

The broad stability of the earnings distribution is striking because it continued for much of the distribution after the introduction of the 'New Economic Policy' in 1979, which marked the switch away from labour-intensive low value-added industries to a growth strategy emphasizing skill formation. According to Islam and Kirkpatrick (1986: 125), this led to an adverse shift in earnings inequality. From Figure 5.5, we can see that there was indeed a rise for the top decile and top vintile, but the rise was not sustained. From Figure 5.6 we can see that throughout the 1970s and 1980s the upper percentiles remained within 5 per cent of their 1970 values.

Government Wages Policies

The structural change described above was heavily influenced by government policies, and these same policies were directly or indirectly redistributive. These are particularly important in the case of Singapore where there has been wide-ranging state intervention, notably in the determination of wages.

Early legislation was directed at securing export competitiveness, against a historical background of labour disputes. According to Tan and Hock, the 1968 employment legislation had two objectives: 'to give greater discretion to employers in their development of their work force. Decisions on promotions, internal transfer, hiring, and dismissal were to be taken without recourse to collective bargaining. The other aim was to reduce labour costs' (1982: 283). Subsequently, the National Wages Council (NWC) was set up in 1972, as a tripartite body with representatives of employers, employees, and the government. Its function was to recommend 'orderly' wage increases, providing guidelines to be applied in labour market relations (Lim 1999). According to Islam and Kirkpatrick, 'there is a general presumption that NWC recommendations have been closely adhered to by the private sector' (1986: 116 n.). In their evaluation of the phase of industrial restructuring (1973–84), Tan Yin Ying, Eng, and Robinson conclude that the NWC 'helped ensure wage stability at a time when pressures to increase wages were substantial' (2008: 16).

The role of wage policies in determining the success of export promotion policies has been emphasized by Fields, who argues that 'real wages barely grew in the 1970s because of the strong repressive hand of the Singaporean government in the labour market' (1994: 396). But this policy of wage repression was abandoned in the 1980s, during which period real wages grew by 80 per cent (GDP per capita grew by 78 per cent). The NWC policy had also a distributional dimension. According to Rao, the NWC wage guidelines 'had a moderating impact on income inequality' (1999: 1033). In the mid 1970s, the NWC recommended combinations of fixed amount and proportional increases that favoured

lower-paid workers (Rao and Ramakrishnan 1980: 24). In 1979, the recommended increases were fixed amounts, which had an initial effect of narrowing differentials, as may be seen from Figure 5.5, but this was immediately followed by recommendations favouring performance. However, as we have seen, none of these changed the broad pattern of medium-run stability.

Progressive Income Taxation

The income tax has from the outset been charged at progressively graduated rates. For example, in 1952 (AR 1953: 3) there was a personal allowance (approximately 150 per cent of the mean income per adult for a single person), above which tax was charged at varying rates commencing at 3 per cent and rising to 30 per cent on income above $50,000 (or around 25 times mean income). These rates were increased over the colonial period to reach 50 per cent in 1959. The top rate increased to 55 per cent (on income above $100,000, or 50 times mean income) from 1 January 1961. During the Malaysia period, there was one year when the top rate was reduced to 50 per cent, but 55 per cent was maintained until the 1980s. For the income year 1977 the starting point for the 55 per cent rate was raised to $400,000 (reflecting the more than threefold increase in mean income) and for the year 1979 the starting point became $600,000 (some 50 times mean income).

For this important period of growth in Singapore, those with very high incomes—in excess of 50 times the mean—were paying marginal tax rates of 50 per cent or more. But tax policy changed, with top rates being reduced. At the end of the 1970s, the average tax rate being paid by the top income group was around 38 per cent; by the middle of the 1980s the average rate had fallen below 30 per cent. In 1987 income tax rates commenced at 3.5 per cent and reached a top rate of 33 per cent. Subsequently, they were reduced still further, the range being 2–28 per cent for income year 1996, 0–22 per cent from 2002, and 0–20 per cent from 2006. As a result, the income tax structure was still graduated but much less progressive.

As in many OECD countries, there has been a distinct shift in Singapore away from progressive income taxation. Examination of the impact on top income shares is complicated by the fact that the estimates for the 1980s are based on a shorter assessment period, but if we look at the more recent period it seems quite possible that the tax reductions since 1997 have contributed to the recent increase in top income shares. But top incomes may also have been affected by the financial crisis.

Asian Financial Crisis of 1997–1998

In their review of the distributive effect in East Asia of the financial crisis, Krongkaew and Ragayah Haji Mat Zin state that in the case of Singapore 'there has been a sharp rise in inequality since the crisis' (2006: 9). The results of

Statistics Singapore (Khee and Liong 2005: table 5) show that over the period 1998–2003 the top 20 per cent of households saw their income rise from 2.48 times the mean to 2.63 times the mean. We have seen that, even allowing for some reversal of the rise, top income shares in 2005 are well above their pre-1997 level. The fact that the crisis was associated, in Singapore, with a rise in measured top income shares may appear surprising, if one expects top shares normally to be pro-cyclical, as profit incomes, and capital incomes more generally, are adversely affected. Here the possibility should be recognized that the rise is, at least in part, a statistical artefact. To the extent that dividend payouts have increased, this would appear in the income tax data, whereas capital gains are not taxed. To the extent that more overseas capital income is now repatriated to Singapore, as a result of fiscal incentives, this may have caused an increase in the apparent top shares. On the other hand, there are reasons to expect a rise. It may be that the rich have preserved their position at a time when other groups in the population have lost, so that the gain is a relative one. It is also possible that, in a present-day financial crisis, the rich enjoy liquidity and favoured capital market access that allows them to acquire distressed income-earning assets at reduced prices.[10]

The rise in inequality after the financial crisis may be in part attributable to the liberalization packages introduced in 1998 and 2001. The UN Economic Commission for Asia and the Pacific commented in its 1998 Survey that 'the Singapore strategy of managing income inequality seems to convey the message that the market forces should not be tinkered with to alter income inequality, as it can have adverse consequences on growth. Instead, inequality should be managed through safety nets and targeted programmes for the benefit of the lower income groups' (1998: 132). It does indeed seem reasonable to consider separately the different parts of the distribution. At the same time, one cannot ignore what is happening to the top incomes on which we have focused here. They are important not least because of their impact on others, as through the formula that has linked the salaries of government ministers and senior civil servants to top wage earners in the private sector. Under the formula, 'the officials receive two-thirds of the median income of the top eight earners in six professions—bankers, lawyers, accountants, executives with multinational corporations, local manufacturing executives and engineers' (*Financial Times*, 10 May 2007). As this example illustrates, top incomes may be affected not only by global forces but also by pay norms and practices.

Summary

The evolution of the upper part of the income distribution in Singapore cannot be linked very directly to the rapid structural changes in its economy nor to the shifts in development policy nor to the different phases of real wage growth.

[10] I owe this suggestion to Salvatore Morelli.

It is remarkable that an economy whose labour market flexibility has been widely commended should have exhibited such a degree of distributional stability from the 1960s to the late 1980s. But the 1990s show a different picture, and the distributional consequences of the Asian financial crisis may have wider implications.

5.5 COMPARISON WITH TOP INCOME SHARES IN OTHER COUNTRIES

In 1947, Singapore was a British colony, administered by the Colonial Office in London. A natural first comparison therefore is with the distribution of income in the United Kingdom. I then turn to a comparison with other countries for which estimates of top income shares are available for the period since the Second World War, and end with specific comparisons with India and Indonesia.

Comparison with the United Kingdom

Ironically, at the time when the Singapore income tax data began to be recorded in 1947, the UK Inland Revenue did not publish annual distributions of income by income tax payers; the only available information being that limited to surtax payers. The data in the 1940s for Singapore are more extensive than those for the UK.[11] For this reason, I take the UK estimates for 1949, this being the first post-war quinquennial Survey of Personal Incomes. In the case of Singapore, I take the average of the estimates for 1947 to 1949. These show that the top income shares in Singapore and the UK were quite close: the share of the top 1 per cent was 10.4 per cent compared with 11.5 in the UK, which is comfortably within the 'confidence interval' shown in Figure 5.2 for Singapore. (Although it should be borne in mind that the Singapore calculations are on an adult individual basis rather than a tax unit basis, which may cause the share to be relatively overstated.) The shares of the top 0.5 per cent were 7.4 and 8.1 per cent, respectively. Given the uncertainty surrounding the control totals for income in Singapore at that time, it may be safer to take the Pareto–Lorenz coefficients: those based on the share of the top 0.1 per cent within the top 1 per cent (unless otherwise specified, the coefficients cited here are based on these two groups) are 2.05 in Singapore and 2.09 in the UK. On this basis, the top of the income distribution has a similar shape in Singapore and the UK.

We have seen that in Singapore top income shares fell over the 1950s but were then broadly stable for some thirty years. In contrast, in the UK top income shares fell for three decades from 1949. As a result, by 1979 the top income shares

[11] The surtax based estimates for the UK only extend to the top 0.5% of tax units; the Singapore income tax data in 1947 cover 1.8% of the adult population.

in the UK were a great deal lower: the share of the top 0.1 per cent in the UK was under half that in Singapore. The share of the top 1 per cent in the UK was 5.9 per cent in 1979, compared with 11.2 per cent in Singapore. The Pareto–Lorenz coefficient had increased much more in the UK: to 2.96, compared with 2.46 in Singapore. This difference was however to disappear as top income shares in the UK rose again. By the early 1990s, top shares were higher in the UK. The post-Asian crisis rise in Singapore, even allowing for the subsequent decline, leaves the two countries in a not dissimilar position. Averaging the three years 2003–5, to reduce the impact of recent volatility, we find that the share of the top 1 per cent in Singapore was 13.7 per cent, which is close to the 13.1 per cent in the UK. Again the UK estimate is well within the confidence interval shown in Figure 5.2, although the Pareto–Lorenz coefficients (1.98 for Singapore and 1.81 for the UK) suggest that the top of the distribution is more concentrated in the UK.

On this basis, top incomes in colonial Singapore at the end of the 1940s appear to have been similarly distributed to those in the UK; the subsequent fall in top income shares was much less than in the UK, with top shares around 1979 about double those in the UK; the sharp rise in top shares after 1979 in the UK reversed this position, but, after the rise in top shares after the financial crisis in Singapore, the two countries find themselves again in rather similar positions.

Comparison with Other Countries

Top income shares in Singapore just after the Second World War were quite like those in the UK. If we look at the share of the top 1 per cent, then the same was true of a number of other countries. Of the fourteen countries shown in Table 5.2, all except three lie within the ± 20 per cent interval (8.6 to 12.9 per cent) for Singapore averaging the results for 1947 to 1949. Singapore is in fact the median. Only Japan and New Zealand had a share less than 8.6 per cent (Sweden was close), and only Ireland had a share (just) in excess of 12.9 per cent. This degree of congruence may reflect the margin of uncertainty surrounding the estimates for Singapore, particularly in this early period. But if we take a narrower range of ± 10 per cent, then we still find seven of the fourteen countries are within this range of Singapore. Overall, the shares of the top 1 per cent are close: if we drop the top two and the bottom two, the range is from 8.6 to 11.6 per cent.

It may be that the share of the top 1 per cent is unrepresentative: the distribution may 'pivot' about this value. The shares of the top 0.1 per cent are less similar, with only four of the fourteen lying within ± 10 per cent. There is, to this extent, a difference in the shape of the top of the distribution in 1947–9. The difference is captured by the Pareto–Lorenz coefficients shown in Table 5.2, which also have the advantage of not being affected by the differences in the methods used to construct income totals. The degree of difference should not however be exaggerated: seven of the fourteen lie in a range of 1.9 to 2.2 surrounding the figure for Singapore.

Table 5.2 Comparative top income shares in fourteen countries

Row		Around 1947 9			Around 2003 5		
		Share of top 1%	Share of top 0.1%	Pareto Lorenz coefficient	Share of top 1%	Share of top 0.1%	Pareto Lorenz coefficient
1	Singapore	10.75	3.30	2.05	13.71	4.39	1.98
2	United Kingdom	11.47	3.45	2.09	13.09	4.66	1.81
3	France	9.22	2.59	2.23	8.04	2.10	2.39
4	The Netherlands	12.05	3.80	2.00	5.38	1.08	3.30
5	United States	10.95	3.24	2.12	16.12	6.84	1.59
6	Germany	11.60	3.90	1.90	11.10	4.40	1.67
7	Switzerland	9.88	3.23	1.94	7.76	2.67	1.86
8	Ireland	12.92	4.00	2.04	10.30		
9	Norway	9.10	2.83	2.03	11.20	5.14	1.51
10	Sweden	8.62	2.35	2.30	5.62	1.72	2.06
11	Canada	10.99	3.09	2.23	13.56	5.23	1.71
12	Australia	10.62	2.92	2.28	8.79	2.68	2.07
13	New Zealand	7.72	1.77	2.78	9.46	3.10	1.94
14	Japan	7.79	2.06	2.37	9.00	2.29	2.46
15	India	11.23	5.44	1.46	8.95	3.64	1.64

Notes: 1943 for Ireland, 1948 for Norway, 1949 for UK, 1950 for Germany. 1995 for Switzerland, 1998 for Germany, 1999 for Netherlands, 1999–2000 for India, 2000 for Canada and Ireland, 2002 for Australia, 2003 and 2004 for Norway and Sweden.

Sources: Rows 2–8 and 11–13 from Atkinson and Piketty (2007: volume 1 (updated); remainder from volume 2).

If we move to the end of the period—2003 to 2005—we find a rather different picture. The shares of the top 1 per cent in 2003–5 were within ± 20 per cent of the Singapore estimate in only five of the fourteen cases, with nine being more than 20 per cent lower. Only Canada and the UK were within 10 per cent. Overall, the shares of the top 1 per cent are further apart than in 1947–9: if we drop the top two and the bottom two, the range is from 7.8 to 13.6 per cent. The central points of these ranges are not greatly different: 10.1 per cent in 1947–9 and 10.7 in 2003–5. In short, there is now more diversity in top income shares across the fourteen countries and Singapore is no longer close to the median. This applies particularly to the top 1 per cent. For the top 0.1 per cent, the share in Singapore is close to the median. The shape of the distribution (the Pareto–Lorenz coefficient) is less concentrated than in all except five of the countries shown.

Comparison with Other Asian Countries

The Pareto–Lorenz coefficient in Singapore (1.98 in 2003–5) contrasts with the much more concentrated 1.64 in India. It may appear absurd to compare Singapore, a prosperous country with a population less than 5 million, with India, a country with a population of over 1 billion, many of whom are living on less than $1 a day. At the same time, the comparison is interesting in the light of

the differing growth trajectories and policies.[12] In their study of the income tax data in India, Banerjee and Piketty (see Chapter 1) find 'evidence of a substantial decline in the share of the elite during the years of socialist planning and a comparable recovery in the post-liberalisation era' (2005: 2). It is their estimates for India that underlie the points shown in Figure 5.4. It may be seen that the Pareto–Lorenz coefficient was higher in Singapore than in India from 1947, reflecting less concentration, and this was true even during the commodities boom. Although the shares of the top 1 per cent were similar, those of the top 0.1 per cent were higher in India. On the other hand, the coefficient steadily rose in India after Independence, indicating reduced concentration, and by 1981 the position was close to that in Singapore. There was then a reversal in India, with the degree of concentration rising again. The Indian series is volatile, but the share of the top 1 per cent broadly doubled between 1981 and 2000, and that of the top 0.1 per cent rose by a factor of 3. These are, relatively, bigger changes than those observed over the same period in Singapore. Both before and after 1981 the time paths are different.

The final comparison is with Indonesia. Here the colonial tax records have allowed Leigh and van der Eng (2009 and Chapter 4) to make estimates of the pre-war income shares up to 1939, which we may compare with those for Singapore immediately after the war (1947). Again such a comparison must be qualified, since the intervening Second World War had major consequences for both Singapore and Indonesia. Moreover, the estimates here relate to the adult population, whereas those for Indonesia relate to households. The top shares in Indonesia in 1939 were around double those in Singapore in 1947: the share of the top 1 per cent was 19.9, compared with 10.9, the share of the top 0.1 per cent was 7.0 compared with 3.3 per cent. (If we were to adjust the Singapore estimates by taking tax units rather than adults, the difference would be greater.) The larger estimated shares in Indonesia may be due to the impact of the war; they may also be due to differences in the control totals for income. If we eliminate the latter difference, by looking at the shares within shares, then the distributions look more similar: the Pareto–Lorenz coefficient in Indonesia is 1.82, compared with 2.06 in Singapore. But incomes in Indonesia—pre-war—were more concentrated.

5.6 CONCLUSIONS

This chapter has demonstrated that it is possible to study the evolution of the top of the income distribution in Singapore using income tax data combined with National Accounts and other external information. The series presented here cover the end of the colonial period and the subsequent political upheaval: self-government, union with Malaysia, and leaving the union. None of these appear to

[12] There are also historical links: Singapore, as part of the Straits Settlements, was initially under the control of British India.

be associated with changes in top shares. The series cover the period of fast economic growth, but the evolution of the upper part of the income distribution in Singapore cannot be linked very directly to the rapid structural changes in its economy nor to the shifts in development policy nor to the different phases of real wage growth. It is indeed remarkable that an economy whose labour market flexibility has been widely commended should have exhibited distributional stability from the 1960s to the late 1980s. There is a contrast with the UK, where, starting from similar top income shares, the UK has seen a much larger decline and then rise, and with India, where too there have been much larger distributional changes at the top. Since the Asian financial crisis of 1997–8, the situation appears to have changed, with top income shares rising by around a half. After 2002, these shares turned down, but in 2005 were still well above their 1997 levels. At 9.5 per cent in 2005, the share of the top 0.5 per cent was at a height comparable with that in the commodities boom at the start of the 1950s. As at that earlier time, the distribution of income in Singapore today may be influenced by global events, either directly through trade and technological change or indirectly via reduced progressivity of income taxation.

APPENDIX 5A: SOURCES FOR INCOME TAX DATA AND CONTROL TOTALS

The sources for the income tax data are shown in Table 5A.1. The control totals for the adult population and for total household income are shown in Table 5A.2. The sources of the wage distribution data are given in Table 5A.3.

Table 5A.1 Sources of Singapore income tax data

Income year	Report of Income Tax Department		actual year assessed to	year of assessment 1 SY
1947	IT 1948 and 1949	page 20	31 Dec 49	
1948	IT year ended 31 Dec 1950	Abstract E	31 Dec 50	
1949	IT year ended 31 Dec 1951	Abstract E	31 Dec 51	
1950	IT year ended 31 Dec 1952	Abstract E	31 Dec 52	
1951	IT year ended 31 Dec 1953	Abstract E	31 Dec 53	
1952	IT year ended 31 Dec 1954	Abstract E	31 Dec 54	
1953	IT year ended 31 Dec 1955	Abstract E	31 Dec 55	
1954	IT year ended 31 Dec 1956	Abstract E	31 Dec 56	
1955				
1956	IT AR 1958	Abstract E	31 Dec 58	
1957	IT AR 1959	Abstract E	31 Dec 59	
1958	IT AR 1960	Abstract E	31 Dec 60	
1959	IT AR 1961	Abstract E	31 Dec 61	
1960	IT AR 1962	Abstract E	31 Dec 62	
1961	IT AR 1963	Abstract E	31 Dec 63	
1962	IT AR 1964	Abstract E	31 Dec 64	
1963	IT AR 1965	Abstract E	31 Dec 65	
1964	IT AR 1966	Abstract E	31 Dec 66	
1965	IT AR 1967	Abstract E	31 Dec 67	SY 1968, identical Table 11.6
1966	IT AR 1968	Abstract E	31 Dec 68	
1967	IT AR 1969	Abstract E	31 Dec 69	
1968	IT AR 1970	Abstract E	31 Dec 70	
1969	IT AR 1971	Abstract E	31 Dec 71	
1970	IT AR 1972	Abstract E	31 Dec 72	
1971	IT AR 1973	Abstract E	31 Dec 73	
1972	IT AR 1974	Abstract E	31 Dec 74	
1973	IT AR 1975	Abstract E	31 Dec 75	
1974	IT AR 1976	Abstract E	31 Dec 76	
1975	IT AR 1977	Abstract E	31 Dec 77	
1976	IT AR 1978	Abstract E	31 Dec 78	
1977	IT AR 1979	Abstract E	31 Dec 79	
1978	IT AR 1980	Abstract E	31 Dec 80	

1979	IT AR 1981	Abstract E	31 Dec 81
1980	SY 1982/83	Table 12.12	31 Dec 81
1981	SY 1984/85	Table 13.11	31 Dec 82
1982	SY 1985/86	Table 13.11	31 Dec 83
1983	SY 1986	Table 13.11	31 Dec 84
1984	SY 1987	Table 13.8	31 Dec 85
1985	SY 1988	Table 13.8	31 Dec 86
1986	SY 1989	Table 13.8	31 Dec 87
1987	SY 1990	Table 13.8	31 Dec 89
1988	SY 1991	Table 13.9	31 Dec 90
1989	SY 1992	Table 13.9	31 Dec 91
1990	SY 1993	Table 13.9	31 Dec 92
1991	SY 1994	Table 13.9	31 Dec 93
1992			
1993	SY 1995	Table 16.9	31 Dec 94
1994	SY 1996	Table 16.9	
1995	SY 1997	Table 16.9	
1996	SY 1998	Table 16.11	
1997	SY 2000	Table 16.10	
1998	SY 2001	Table 18.11	
1999	SY 2002	Table 17.11	
2000	SY 2003	Table 17.11	
2001	IT AR 2002/03	App 5	31 Mar 03
2002	IT AR 2003/04	App 5	31 Mar 04
2003	IT AR 2004/05	App 5	31 Mar 05
2004	IT AR 2005/06	App 5	31 Mar 06
2005	IT AR 2006/07	App 5	31 Mar 07

Table 5A.2 Control totals for adult population and household income in Singapore

	Adult population thousands	Total indigenous national income $ million	Total household income $ million	Mean income per adult $
1947	502.5	902.3	834.6	1,661
1948	518.1	998.9	924.0	1,783
1949	533.8	1,104.8	1,022.0	1,914
1950	549.6	1,221.2	1,129.6	2,055
1951	575.1	1,295.5	1,198.3	2,084
1952	607.7	1,383.2	1,279.5	2,106
1953	643.6	1,485.0	1,373.6	2,134
1954	674.7	1,559.3	1,442.4	2,138
1955	707.0	1,657.3	1,533.0	2,168
1956	743.8	1,723.0	1,593.8	2,143
1957	784.9	1,818.9	1,664.3	2,120
1958	825.6	1,891.1	1,711.4	2,073
1959	863.7	1,882.9	1,685.2	1,951
1960	890.6	2,063.6	1,826.3	2,051
1961	920.8	2,235.9	1,956.4	2,125

(*continued*)

Table 5A.2 Continued

	Adult population thousands	Total indigenous national income $ million	Total household income $ million	Mean income per adult $
1962	946.9	2,413.2	2,087.4	2,205
1963	971.3	2,678.3	2,289.9	2,358
1964	997.2	2,606.0	2,202.1	2,208
1965	1,035.2	2,838.0	2,369.7	2,289
1966	1,062.6	3,189.8	2,631.6	2,476
1967	1,087.8	3,598.0	2,950.4	2,712
1968	1,108.2	3,922.0	3,196.4	2,884
1969	1,146.2	4,472.0	3,622.3	3,160
1970	1,205.3	4,990.0	4,017.0	3,333
1971	1,249.5	5,826.0	4,660.8	3,730
1972	1,295.1	6,884.0	5,472.8	4,226
1973	1,309.1	8,409.0	6,643.1	5,075
1974	1,391.0	9,966.0	7,823.3	5,624
1975	1,439.8	11,061.0	8,627.6	5,992
1976	1,487.3	12,073.0	9,356.6	6,291
1977	1,534.0	13,351.0	10,280.3	6,702
1978	1,580.3	14,126.0	10,806.4	6,838
1979	1,626.9	15,590.0	11,848.4	7,283
1980	1,671.5	19,039.0	14,374.4	8,600
1981	1,710.4	22,903.0	17,177.3	10,043
1982	1,748.7	26,224.0	19,668.0	11,247
1983	1,791.4	30,157.0	22,617.8	12,626
1984	1,830.5	33,232.0	24,924.0	13,616
1985	1,867.8	32,384.0	24,288.0	13,004
1986	1,907.0	32,898.8	24,674.1	12,939
1987	1,947.4	35,073.0	26,304.8	13,508
1988	1,991.1	40,776.0	30,582.0	15,359
1989	2,031.6	45,813.0	34,359.8	16,913
1990	2,050.1	51,512.0	38,634.0	18,845
1991	2,122.6	60,405.7	45,304.3	21,344
1992	2,167.8	68,367.6	51,275.7	23,653
1993	2,210.8	74,138.0	55,603.5	25,151
1994	2,255.3	86,279.0	64,709.3	28,692
1995	2,301.1	94,020.0	70,515.0	30,644
1996	2,349.8	102,007.0	76,505.3	32,558
1997	2,418.6	111,705.0	83,778.8	34,639
1998	2,451.9	110,306.0	82,729.5	33,741
1999	2,502.5	107,744.0	80,808.0	32,291
2000	2,553.1	119,099.0	89,324.3	34,987
2001	2,603.6	108,435.0	81,326.3	31,236
2002	2,654.2	109,351.0	82,013.3	30,899
2003	2,650.8	117,316.0	87,987.0	33,193
2004	2,710.6	131,182.0	98,386.5	36,297
2005	2,772.4	148,765.0	111,573.8	40,244

Note: Dollars are Singapore dollars.

Table 5A.3 Sources of Singapore wage distribution data

Year	Yearbook of Statistics Singapore (YSS)
1965	1974/75, Table 3.10
1966	1975/76, Table 3.11
1967	1975/76, Table 3.11
1968	1975/76, Table 3.11
1969	no data located
1970	1975/76, Table 3.11
1971	1980/81, Table 3.14
1972	1982/83, Table 3.14
1973	1982/83, Table 3.14
1974	1984/85, Table 3.14
1975	1984/85, Table 3.14
1976	1986, Table 3.13
1977	1987, Table 3.14
1978	1988, Table 3.14
1979	1988, Table 3.14
1980	1988, Table 3.14
1981	1988, Table 3.14
1982	1988, Table 3.14
1983	1988, Table 3.14
1984	1988, Table 3.14
1985	1988, Table 3.14
1986	1996, Table 4.13, 1992, Table 3.14 and 1988 Table 3.14
1987	1996, Table 4.13, 1992, Table 3.14 and 1988 Table 3.14
1988	1996, Table 4.13, 1992, Table 3.14 and 1988 Table 3.14
1989	1992, Table 3.14
1990	1992, Table 3.14
1991	1996, Table 4.13 and 1992, Table 3.14
1992	1996, Table 4.13 and 1992, Table 3.14
1993	1997, Table 4.13 and 1994, Table 3.14
1994	1997, Table 4.13 and 1994, Table 3.14
1995	1997, Table 4.13
1996	1997, Table 4.13
1997	1997, Table 4.13
1998	2000, Table 4.12
1999	2000, Table 4.12
2000	2001, Table 4.12
2001	2002, Table 4.12
2002	2008, Table 4.10
2003	2008, Table 4.10
2004	2008, Table 4.10
2005	2008, Table 4.10
2006	2008, Table 4.10
2007	2008, Table 4.10

Table 5A.4 Distribution of earnings in Singapore (and UK)

	Singapore				UK		
	Upper quartile	Upper quintile	Top decile	Top vintile	Upper quartile	Top decile	Top vintile
1965	155.7	172.0	264.8				
1966	157.0	173.5	267.2				
1967	156.4	171.0	265.1				
1968	157.6	175.0	269.3		135.0	174.4	207.6
1969							
1970	162.4	190.8			135.9	175.3	208.1
1971	162.4	191.4	281.3	402.5	134.4	173.3	206.4
1972	170.8	193.9	279.1	400.5	134.4	173.1	206.9
1973	164.2	190.3	279.5	391.3	133.5	171.0	203.3
1974	169.4	193.7	278.5	395.6	130.9	167.2	197.2
1975	171.1	194.5	283.7	399.6	131.6	167.5	196.5
1976	168.3	192.7	282.6	404.0	131.0	168.4	197.2
1977	167.1	193.4	281.4	403.0	130.8	166.9	195.1
1978	169.4	196.9	281.7	402.4	131.3	166.8	196.2
1979	169.9	191.7	278.5	397.7	131.6	168.1	196.2
1980	165.7	189.1	273.1	388.4	132.4	170.6	203.1
1981	168.1	189.8	278.5	379.6	134.0	175.8	208.6
1982	169.4	196.2	292.7	408.1	133.9	176.4	211.2
1983	166.5	190.9	284.2	392.2	133.4	176.9	211.5
1984	165.8	192.8	283.9	399.5	134.5	178.5	214.3
1985	166.8	191.8	288.3		134.6	179.2	215.3
1986	167.2	191.4	288.2	401.9	135.3	179.7	217.3
1987	170.6	197.5	296.9	418.7	135.3	182.3	221.4
1988	162.9	189.0	270.8	375.6	137.1	183.9	225.9
1989	164.6	188.8	271.1		137.5	183.6	226.5
1990	162.1	180.7	261.2		138.0	186.5	228.0
1991	157.4	179.1	257.7	356.7	139.2	186.1	
1992	154.4	176.8	252.2	343.9	139.1	186.3	
1993	156.2	174.9	249.1	347.3	139.8	187.5	
1994	156.1	176.6	248.7	342.5	138.9	187.3	
1995	153.1	173.7	243.0		139.8	188.3	
1996	155.3	174.5	248.0		140.1	190.1	
1997	156.1	176.0	244.5		139.4	187.9	
1998	156.1	176.8	251.6		140.0	190.4	
1999	156.6	176.3	250.5		140.6	191.7	
2000	158.2	179.1	253.9		140.0	191.9	
2001	158.0	179.6	256.8		141.2	195.6	
2002	158.3	180.0			141.3	197.3	
2003	158.6	180.4			141.8	196.1	
2004	159.5	182.0			140.7	195.7	
2005	160.4	182.9			142.0	198.7	
2006	161.4	183.9			141.4	199.5	
2007	168.0				141.5	199.2	

Sources: See Table 5A.3 and, for UK, Atkinson (2008: chapter S).

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