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Top incomes in the long run of history

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13.1 INTRODUCTION

In this book, and Volume 1 (Atkinson and Piketty, 2007), we have assembled evidence on top incomes in 22 countries, covering periods that range from 15 years (China) and 30 years (Italy) to 120 years (Japan) and 132 years (Norway). The coverage by countries and years is shown in Figure 13.1. For 7 of the 22 countries, the series start before the First World War (1914), and for all but 3 we have observations from before the Second World War. The median number of observations per country is 67.5. To avoid any possible misunderstanding, we should make clear that is not a rectangular data set: there are many missing years (if any reader can help fill the gaps, we should be pleased to hear from them). In fact, the total number of country/year observations is 1,454.

By the standards of economics, these are a rich set of time series. The results for top income shares for the 22 countries are summarised in the Appendix Tables 13A.1 to 13A.22. Estimates of the Pareto-Lorenz coefficients (and the inverse coefficients) characterizing the upper tail of

the distribution in these 22 countries are provided in Appendix Tables 13A.23 and 13A.24. In the case of the 10 countries covered in the first volume, we have been able to extend the series in some cases. We have also incorporated (under Germany) the results for Prussia for the period 1891 to 1919 (see Dell, 2008). The estimates reported in these Appendix tables are those excluding capital gains (where these can be excluded), an aspect discussed below in Section 13.2, and they relate to gross incomes, typically after transfers but before the deduction of income tax. It should be noted that we focus in this chapter on the studies of top incomes published in these two volumes, but there have been other important recent contributions, including those by Merz, Hirschel and Zwick (2005) and by Bach, Corneo and Steiner (2008) of Germany, by Gustafsson and Jansson (2007) of Sweden, and by Guilera (2008) of Portugal. The reader is also referred to the valuable survey by Leigh (2009).

In this chapter, we summarise the main findings from the two volumes, and consider the range of possible explanations. We first, in Section 13.2, discuss the quality and comparability of the data. How far can the results from different chapters be treated as comparable? What are the limitations of income tax data as a source? The qualifications set out in this section are essential reading before making use of the results on top income shares, presented in summary form in Section 13.3. Our summary starts with the sixty years since the Second World War, taking 1949 as a point of departure, before turning to the lessons from the years before 1949. We ask how far there are common patterns of change. We ask whether top incomes are different. In the final part of the chapter (Sections 13.4 and

13.5), we turn to possible explanations for the changes in top shares over time. In Section 13.4, we consider how the behaviour and functional form of top income shares can be modelled – theoretically and empirically. In Section 13.5, we examine some of the main forces that have been evoked in the individual chapter histories in both this and the previous volume. These include the impact of progressive taxation, globalisation, and political change. The final section 13.6 concludes.

In considering the 22 countries, it is natural to look for groupings. In the first volume, we contrasted the English-speaking countries and Continental Europe. In the present volume, we have added three Nordic countries. Are they part-way between being Anglo-Saxon and Continental? We have added three Southern European countries. Do they have common features? We have added five Asian countries, two with high GDP per capita, and three less developed but rapidly growing. Are top income shares rising with fast economic growth? Or does the behaviour of their top shares reflect a global pattern? These questions are discussed in more detail below, but in Table 13.0 we summarise in words the main findings from the country chapters in this volume.

Table 13.0 Summary of main findings from Chapter 1 to 12.

Country	Main findings
1. India	The shares of the top 0.01%, the top 0.1% and the top 1% shrank substantially from the 1950s until the early to mid 1980s but then went back up again, so that today these shares are only slightly below the level of the 1920s-30s. This U-shaped pattern is broadly consistent with the evolution of economic policy in India: the period from the 1950s to the early to mid 1980s was also the period of "socialist" policies in India, while the subsequent period saw a gradual shift towards more pro-business policies.
2. China	Income inequality in urban China has increased at a high rate between 1986 and 2003, with the share of the top 10 per cent increasing by more than 60 per cent. The share of the top 1 per cent more than doubled.
3. Japan	Income concentration was extremely high throughout the pre-Second World War period during which the nation underwent rapid industrialization; a drastic de-concentration of income at the top took place in 1938-1945; income concentration remained low during the rest of the century but shows some sign of increase in the last decade; and top income composition in Japan has shifted dramatically from capital income to employment income over the course of the 20th century.
4. Indonesia	Top income shares grew during the 1920s and 1930s, but fell in the post-war era. In more recent decades, there was a sharp rise in top income shares during the late 1990s, coinciding with the 1997-98 economic crisis, and some evidence that top income shares fell in the early-2000s.
5. Singapore	During the time Singapore was a colony, top income shares rose to a peak in 1951 and then declined over the 1950s. Following independence there followed 25 years of broad stability at the very top. The 1990s saw a fall in top shares, but after the Asian financial crisis they rose by around a half, and they remain above earlier levels.
6. Argentina	There was an increase in top income shares after the Great Depression, with maxima in 1942-1944, and a substantial decline during the Peronist years. However, the limits of the Peronist redistributive policy are marked by the fact that in 1956, if lower than in 1945, the top shares were still above the ones observed in the developed world; they were higher than in the United States, France, Australia and even Spain. Since the mid 1990s, top income shares followed an increasing trend, similar to the pattern found in Anglo-Saxon economies.
7. Sweden	Starting from levels of inequality approximately equal to those in other Western countries at the time, the income share of the Swedish top decile dropped sharply over the first 80 years of the twentieth century. Most of the decrease takes place before the expansion of the welfare state and by 1950 Swedish top

	income shares were already lower than in other countries. The fall is almost entirely due to a dramatic drop in the top percentile explained mostly by decreases in capital income, while the lower half of the top decile – consisting mainly of wage earners – experienced virtually no change over this period. In the past decades top income shares evolve very differently depending on whether capital gains are included or not. With capital gains included, Sweden's experience resembles that in the U.S., with sharp increases in top incomes; excluding capital gains, Sweden looks more like the continental European countries.
8. Finland	The share of the top 1 per cent of income earners declined from around 15 per cent of taxed income among the population of tax units in 1920 to just over 6 per cent in the late 1940s to rapidly increase to about 10 per cent in the later 1950s. The top 1 per cent share then declines for almost thirty years until the early 1990s. The increase in this top share in the late 1990s is steep and brings it in 2000, when it peaked, to the same level as seen in the 1950s. The total share of the highest earners fell consistently from the beginning of the 1960s to the mid 1990s but then began to rise. The results bring out clearly how the major equalization from the beginning of 1960 to the mid 1990s has been reversed, taking the shares of top income groups back to levels of inequality or even higher than those found over 40 years ago.
9. Norway	Top income shares in the nineteenth century were high: the share of the top 1 per cent was around 20 per cent and that of the top 0.5 per cent around 15 per cent. There was a rise in the shares of the top 10 per cent, 5 per cent and 1 per cent between 1875 and 1888. Between 1896 and 1902 there was a definite fall; there was some recovery in 1906, but then a further fall. After (and during) the First World War, there was some recovery in the top shares. There was a sharp drop between the 1930s and the late 1940s. Over the early part of the post Second World War period, top income shares fell steadily: the share of the richest 0.5 per cent fell from 6.4 per cent in 1948 to 2.8 per cent in 1991. There was then, as in Sweden, the UK and the US, a turning point, which came at the start of the 1990s, rather later than in the UK and the US.
10. Spain	Income concentration was much higher during the 1930s than it is today. The top 0.01% income share was twice higher in the 1930s than in recent decades. The top 0.01% income share fell sharply during the first decade of the Franco dictatorship, and has increased slightly since the 1970s, and especially since the mid-1990s. Both the level and the time pattern of the top 0.01% income share in Spain are fairly close to comparable estimates for the US and France over the period 1933-1971, especially the decades after the Second World War.
11.	Income concentration was, as in Spain, much higher during the

Portugal	1930s and 1940s than it is today. Top income shares stayed relatively stable between the end of the Second World War and the end of the 1960s, followed by a large drop. The drop began to be reversed at the beginning of the 1980s. Over the last fifteen years top income shares have increased steadily, with a considerable contribution from the rise in wage dispersion.
12. Italy	There has been a persistent increasing pattern in top income shares since the mid 1980s, mainly driven by top wages and self-employment income. Notwithstanding the increasing trend, the rise in Italian top shares has been small relative to the surge experienced by top incomes in the United States and other Anglo-Saxon developed economies

13.2 QUALITY AND COMPARABILITY OF THE DATA

The evidence presented in this, and the preceding, volume comes almost exclusively from tax and other administrative returns in different countries. The use of tax data is often regarded by economists with considerable disbelief. The index to Morgenstern's book *On the Accuracy of Economic Observations* (1963) contains the entry "income tax, as reason for lying", and this summarizes well the general – if not very specific - skepticism. In the UK, Richard Titmuss wrote around the same date a book-length critique of the income tax-based statistics on distribution, concluding, "we are expecting too much from the crumbs that fall from the conventional tables" (1962, page 191). More recently, compilers of databases on income inequality have tended to rely on household survey data, dismissing income tax data as unrepresentative.

These doubts are well justified for at least two reasons. The first is that tax data are collected as part of an administrative process, which is not tailored to our needs, so that the definition of income, of income unit, etc are not necessarily those that we would have chosen. This causes particular difficulties for comparisons across countries, but also for time-series analysis where there have been substantial changes in the tax system, such as the moves to and from the joint taxation of couples. Secondly, it is obvious that those paying tax have a financial incentive to present their affairs in such a way that reduces tax liabilities. There is tax avoidance and tax evasion. The rich, in particular, have a strong incentive to understate their taxable incomes. Those with wealth take steps to ensure that the

return comes in the form of asset appreciation, typically taxed at lower rates or not at all. Those with high salaries seek to ensure that part of their remuneration comes in forms, such as fringe benefits or stock options, that receive favourable tax treatment. Both groups may make use of tax havens that allow income to be moved beyond the reach of the national tax net.

These shortcomings limit what can be said from tax data, but this does not mean that the data are worthless. Like all economic data they measure with error the "true" variable in which we are interested. As with all data, there are potential sources of bias, but, as in other cases, we can say something about the possible direction and magnitude of the bias. Moreover, we can compensate for some of the shortcomings of the income tax data. It is true that income tax data cover only the taxpaying population, which, in the early years of income tax, was typically only a small fraction of the total population. However, following the pioneering contribution of Kuznets (1953), we can combine the tax data with external estimates of the total population and the total income. These control totals are typically based on Censuses of Population and on national accounts estimates of the total income of persons. The control totals require a number of adjustments and are surrounded by a margin of error, but the important point is that when we refer to the top 1 per cent having x per cent of income, this means the top 1 per cent of the total population and x per cent of the total income. It is *not* the top 1 per cent of taxpayers. Nor is the total of income limited to that accruing to taxpayers. We may not be able to describe the whole distribution, but we can estimate the upper part of the Lorenz curve.

But why not use household surveys, which cover the whole (non-institutional) population? Why use income tax data? There are two main answers. The first is that household surveys themselves are not without shortcomings. These include sampling error, which may be sizeable with the typical sample sizes for surveys, whereas tax data drawn from administrative records are based on very much larger samples. Indeed, in many cases the tax statistics relate to the whole universe of taxpayers, in which case traditional confidence intervals do not apply. Household surveys suffer from differential non-response and incomplete response (these two being the survey counterpart of tax evasion). Such problems particularly affect the top income ranges, as is recognised in studies that combine household survey data with information on upper income ranges from tax sources (see, for example, in the UK, Brewer, Muriel, Phillips and Sibieta, 2008). The second answer is that household surveys are a fairly recent innovation. Household surveys only became regular on most countries in the 1970s or later, and in a number of cases they are held at intervals rather than annually. We are interested here in covering the whole post war period, and indeed in going back further. This is what the income tax data allow us to do. The beauty of income tax evidence is that it is available for long runs of years, typically on an annual basis, and that it is available for wide variety of countries.

Comparability of methods

Although the authors of individual chapters in this volume and in Volume 1 have modelled their research on Piketty (2001), they have in some cases been unable to follow exactly the same methods and in other cases they

have chosen a different approach. Some of these differences in methodology are unlikely to affect the broad conclusions drawn, as has been shown by sensitivity analysis in individual chapters. This applies to the choice of interpolation method, which, at least within intervals (as opposed to extrapolation of an open interval), is not going to have a major impact (see Appendix 9C in Volume 1). The same applies to the choice of age cut-off for the adult population. The studies for Australia, Finland, New Zealand, Singapore, and the UK use persons aged 15 and over, while those for Argentina, Canada, Italy, Japan, Portugal and the US use persons aged 20 and over, which means that the former may give a higher estimate of the share of the top x per cent (since they are including more people from the tax returns). However, the effect is small: Atkinson and Leigh (Chapter 7 in Volume 1) find for Australia that using persons aged 20 and over would reduce the share of the top 1 per cent by approximately a twentieth.

Other differences are quantitatively more important. Three of the differences seem to us to be of particular significance. The first is the difference in the unit of analysis. For Argentina, Australia, Canada, China, and Italy (in the period covered), the unit is the individual. In a number of other countries, including France, Germany, Ireland, the Netherlands, Portugal, Switzerland and the US, the unit of analysis is the "tax unit" combining the incomes of husbands and wives. In India, the unit is the individual or the Hindu undivided family. In the case of China and Indonesia, the estimates relate to households. The differences between these units of analysis affect the comparability of the estimates in a way that depends on the joint distribution of income. The difference could go in either direction

(see Atkinson, Chapter 2 in Volume 1). The unit may also change over time, as in Japan (with adjustments made in Chapter 3 to the pre-1950 data), New Zealand (since 1953), Spain (with adjustments made in Chapter 10) and the UK (since 1990).

The differences in unit cannot be treated simply as a fixed effect. The growth of female labour force participation means that the joint distribution of earned incomes is now of much greater significance. The ageing of the population means that there are more single elderly persons in the distribution. On the other hand, we can learn from the cases where there was a change. In the case of the US, Piketty and Saez (Chapter 5 in Volume 1) increase the recorded income shares by "about 2.5 per cent" for the earlier period 1913-1947 when there was a degree of separate filing (Piketty and Saez, 2001, 35n).[1] In the case of the United Kingdom, the introduction of independent taxation in 1990 was associated with (Chapter 4 in Volume 1) a rise in the share of the top 1 per cent of around an eighth. In the case of New Zealand (Chapter 8 in Volume 1), the introduction of individual taxation in 1953 was associated with an upward jump of around a quarter in the share of the top 1 per cent. Not all of this change can necessarily be attributed to the introduction of independent taxation, but it suggests that the difference between individual and tax unit bases needs to be taken into account in interpreting the series for the different countries.

The second significant difference is in the derivation of control totals for income. As described in Chapter 2, there are two main approaches.

[1] It should be noted that they use throughout a control total based on tax units, so that separate filing will definitely cause the top share to be understated.

These are illustrated by those applied in the US at different dates. Piketty and Saez (Chapter 5 in Volume 1) for the second half of the period (from 1944) extrapolate from the recorded incomes, imputing to non-filers a fixed fraction of filers' average income, to arrive at a total (tax defined) income for all individuals. They note that the resulting total series is a broadly constant percentage (between 77 per cent and 83 per cent) of total personal income recorded in the national accounts if transfers are excluded. They therefore take for the earlier period 1913-1943 a control total equal to a constant percentage (80%) of total personal income less transfers. (The estimates for Switzerland involve a similar combination of the two approaches.) These two methods – estimates of the income of non-filers, and national accounts-based totals – are used to differing degrees in different countries. In the UK (Chapter 4 in Volume 1), the total income of non-filers is constructed from estimates of the different elements of income missing from the tax returns. The resulting total declines from around 95% to around 85% of total personal income minus transfers recorded in the national accounts. In the Netherlands, a similar approach is followed, with similar implications for the relationship between the control total and total personal income in the national accounts. In their estimates for Sweden (Chapter 7), Roine and Waldenström compare the two methods. They make estimates of total personal income from the categories in the national accounts (the total varies around 70 per cent of GDP); they make estimates by adding to the total in tax returns amounts for income not included and estimates of the income of non-filers. They argue that the latter gives too high a figure in the early years of the twentieth century, but that from 1930

it is close to 89 per cent of the personal income total. They therefore use throughout a figure of 89 per cent of personal income, which is around 63 per cent of GDP. The approach followed in Norway (Chapter 9) is similar, with a lower percentage (72 per cent) to correspond to the concept of assessed income in the tax data.

Most of the estimates are based on the second approach, applied in varying degrees of detail. In Canada, Saez and Veall (Chapter 6 in Volume 1) use throughout (1920 to 2000) a constant percentage (80 per cent), applied to "total personal income less transfers". The estimates for Ireland (Chapter 12 in Volume 1) follow the same method. For Japan (Chapter 3), Moriguchi and Saez construct a personal income total from the national accounts, deducting items that do not appear in taxable income such as employer social contributions and imputed rents on owner-occupied homes. For Spain (Chapter 10), Alvaredo and Saez add for 1981-2004 the national accounts figures for wages and salaries (not including social contributions), plus 50 per cent of transfers, plus two-thirds of unincorporated business income, plus all non-labour non-business income reported on tax returns. This yields a figure around 66 per cent of GDP and they apply this percentage in the earlier years 1933-1971. For Portugal (Chapter 11) in 1989-2003 and Italy (Chapter 12) the procedure is similar. For Portugal, the percentage of GDP is 60 per cent, and this is assumed to apply to the earlier period 1936-1983.

In considering the control totals for income, we need to bear in mind that the present volume covers countries where national accounting has been more recently developed and where historical data are hard to obtain.

As we saw in Chapter 5, the national income figures for the 1940s and 1950s in Singapore involved "a considerable amount of guesswork". This has meant adopting more approximate methods. The control totals for India (Chapter 1) are taken as 70 per cent of national income. In the case of Singapore, allowance has to be made for the international position of the economy, and the estimates are based on figures for indigenous GDP, taking a variable percentage to represent household income. The Indonesian estimates of Leigh and van der Eng (Chapter 4) make use of input output data.

The differences in method are greatest in the area of income totals, and the resulting estimates of top income shares need to be treated with caution. If, for example, the appropriate income total were considered to be 60 per cent rather than 70 per cent of GDP, the top share would be increased by more than 15 per cent. At the same time, we should note that the estimates of shares-within-shares, and the (inverse) Pareto-Lorenz coefficients, are not affected by differences in the income totals, since they are measures of the *shape* of the upper part of the distribution.

The definition of taxable income

Taxes affect the *substance* of the income distribution, and we return to this in Section 13.3, but they also affect the *form* of the income distribution statistics. In all cases, the estimates follow the tax law, rather than a "preferred" definition of income. The latter income concept may seek to approximate the Haig-Simons comprehensive definition, including such items as imputed rent, in kind employment benefits, capital gains and

losses, and transfer payments.[2] For a single country study, it may be reasonable to assume that taxable income is a concept well understood in that context. Alternatively, one may assume that all taxable incomes differ from the preferred definition by the same percentage. Neither of these assumptions, however, seems particularly satisfactory, and use of taxable income may well affect the conclusions drawn about changes over time. When we come to a cross-country comparison, there seems an even stronger case for adopting a definition of income that is common across countries and that does not depend on the specificities of the tax law in each country.

Approaching a common definition of income does however pose considerable problems, as illustrated by the treatment of transfers (which have grown very considerably in importance over the century), by capital gains, by the inter-relation with the corporate tax system, and by tax deductions. The studies for the US and Canada subtract social security transfers on the grounds that they are either partially or totally exempt from tax. In other countries, such as Australia, New Zealand, Norway, and the UK, the tax treatment of transfers differs, with typically more transfers being brought into taxation over time.

Perhaps the most important aspect that affects the comparability of series overtime within each country has been the erosion of capital income from the progressive income tax base. Early progressive income tax systems

[2] In principle, transfers from the government should be not be included in pre-fisc incomes as they are part of the government redistributive schemes which tax pre-fisc incomes and provide transfers. In practice, the largest cash transfer payments are public pensions which are often related to social security contributions during the work life and hence can be considered as deferred earnings. Means-tested transfer programs are in general non-taxable and excluded from the estimates presented.

included a much larger fraction of capital income than the present progressive income tax systems. Indeed, overtime, many sources of capital income, such as interest income, or returns on pension funds, have been either taxed separately at flat rates or fully exempted, and hence have disappeared from the tax base. Some early income tax systems (such as France from 1914 to 1964) also included imputed rents of home owners in the tax base, but today imputed rents are typically excluded. As a result of this imputed rent exclusion and the development of numerous other forms of legally tax-exempt capital income, the share of capital income that is reportable on income tax returns, and hence included in the series presented, has significantly decreased overtime. To the extent that such excluded capital income accrues disproportionately to top income groups, this will lead to an underestimation of top income shares. Ideally, one would want to impute excluded capital income back to each income group. Because of lack of data, such an imputation is very difficult to fully carry out. Some of the studies discuss whether the exclusion of capital income affects the series. For example, Moriguchi and Saez in the case of Japan, use survey data to try and assess to estimate how interest income - today almost completely excluded from the comprehensive income tax base — is distributed across income groups. In the case of France, Piketty has shown that the long –run decline of top income shares was robust, in the sense that even an upper bound imputation of today's tax-exempt capital incomes to today's reported top incomes would be largely insufficient to undo the observed fall. We should make clear however that there was no systematic attempt to impute full capital income on a comparable basis over time and

across countries. We view this as one of the main shortcomings – probably the main shortcoming – of our data set. As we shall see in Sections 13.4 and 13.5 below, this puts strong limitations on the extent to which one can use our data set to rigorously test the theoretical economic mechanisms at play.

The treatment of capital gains and losses also differs across time and across countries. In the US, "the tax treatment of capital gains and losses has undergone several sweeping revisions since 1913" (Goode, 1964, page 184). Capital gains have been regarded as within the purview of the income tax, but with different treatments regarding the deductibility of losses and the rates of taxation. In Volume 1, Chapters 5 and 6 present series for the US and Canada both excluding and including realised capital gains, and the same procedure has been followed here for Japan (Chapter 3), Sweden (Chapter 7), Finland (Chapter 8), and Spain (Chapter 10). The effects of the inclusion of capital gains on the share of the top 1 per cent in the period since 1949 are shown in Figure 13.2 for 5 of these countries (data are given in Chapter 3 for Japan but only for the top 0.1 per cent). The adjustments have been important in the US throughout the period but have increased in recent years. In 1949, the exclusion of capital gains reduced the share of the top 1 per cent by about a tenth; fifty years later, in 1999, it reduced the share by about a fifth. In the case of Sweden, Roine and Waldenström note that "over the past two decades the general picture turns out to depend crucially on how income from capital gains is treated. If we include capital gains, Swedish income inequality has increased quite substantially; when excluding them, top income shares have increased much less" (Chapter 7). The estimates for Spain (Chapter 10) show the share of the top

1 per cent rising between 1982 and 2002 from 6.9 to 8.5 per cent before capital gains but from 7.0 to 9.5 per cent when capital gains are included.

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. Income from which these deductions have been subtracted is often referred to as "net income". (We are not referring here to personal exemptions.) The aim is in general to measure gross income before deductions, but this is not always possible. The French estimates (Chapter 3 in Volume 1) show income after deducting employee social security contributions. In a number of countries, the earlier income tax distributions refer to income after these deductions, but the later distributions refer to gross income. In the US, the income tax returns prior to 1944 showed the distribution by net income, after deductions. Piketty and Saez (Chapter 5 in Volume 1) apply adjustment factors to the threshold levels and mean incomes for the years 1913-1943 (see Piketty and Saez, 2001, page 40). In Canada, the tax returns for 1920 to 1945 relate to net income. Deductions were smaller, and Saez and Veall (Chapter 6 in Volume 1) make no adjustment prior to 1929 and for 1929 to 1945 increase all amounts by 2%. In Australia (Chapter 7 in Volume 1), estimates for 1921-44 are based on taxable rather than total income by ranges of taxable income, while the estimates from 1947-57 are based on the distribution of taxable income by ranges of actual income. Using estimates from overlapping years, adjustments are made to account for these changes. The estimates for Norway in Chapter 9 relate to "assessed" income after deduction of interest paid and certain other deductions.

The areas highlighted above – transfers, tax-exempt capital income, capital gains, and deductions – may all give rise to cross-country differences and to lack of comparability over time in the income tax data. Any user needs to take them into account. The same applies to tax evasion, to which we devote the next sub-section.

Tax avoidance and tax evasion

As highlighted by the quotation from Morgenstern, the standard objection to use of income tax data to study the distribution of income is that tax returns are largely works of fiction, as taxpayers seek to avoid and evade being taxed. The under-reporting of income can affect cross-country comparisons where there are differences in prevalence of evasion and can affect measurement of trends where the extent of evasion has changed over time.

It is not a coincidence that the development of income taxation follows a very similar path across the countries studied in these volumes. All countries start with progressive taxes on comprehensive income using high exemption levels which limits the tax to only a small group at the top of the distribution. Indeed, at an early stage of industrial development, when a substantial fraction of economic activity takes place in small informal businesses, it is just not possible for the government to enforce a comprehensive income tax on a wide share of the population.[3] However, even in early stages of economic development, Alvaredo and Saez note "the incomes of high income individuals are identifiable because they derive

[3] Even today in the most advanced economies, small informal businesses can escape the individual income taxes.

their incomes from large and modern businesses or financial institutions with verifiable accounts, or from highly paid (and verifiable) salaried positions, or property income from publicly known assets (such as large land estates with regular rental income)."[4] Comprehensive income taxes are extended to larger groups only when economic development has reduced the number of untaxable informal income earners to a reasonably small fraction of the population. Therefore, it is conceivable that the early progressive income taxes, upon which statistics those studies are based, captured reasonably well most components of top incomes.

The extent of contemporary tax evasion is considered specifically in a number of the country chapters. In the case of Sweden, Roine and Waldenström (Chapter 7) conclude that overall evasion is modest (around 5 percent of all incomes) and that there is no reason to believe that under-reporting has changed dramatically over time. A speculative reason for this may be that while the incentives to underreport have increased as tax rates have gone up over time the administrative control over tax compliance has also been improved. The Nordic countries may well be different. In the case of Spain (Chapter 10), Alvaredo and Saez note the widely held view that income tax evasion in Spain is (and was) very high, and that consequently, the income tax data vastly under-estimate actual incomes. They go on to examine the evidence for this view. Of course, such evidence is hard to come by, and may only be partial, but it does exist. For instance, the Spanish tax administration made public the list of taxpayers for tax years

[4] Indeed, before comprehensive taxation starts, most countries had already adopted schedular separate taxes on specific income sources such as wages and salaries, profits from large businesses, rental income from large estates. Such taxes emerge when economic development makes enforcement feasible.

1933 to 1935, and from this it can be seen that virtually all the largest aristocratic real estate owners were taxpayers. More generally, a careful analysis of the income tax statistics shows that evasion and avoidance in Spain *at the very top of the distribution* during the first decades of existence of the tax was most likely not significantly higher than it was in other countries such as the United States or France. In the case of Italy, Alvaredo and Pisano note the widespread view of tax evasion being much higher than in other OECD countries. Audits and subsequent scandals involving show-business people, well-known fashion designers and sport stars help support this idea among the general public, even when they also provide evidence about the fact that top income earners are very visible for the tax administration. The evidence for Italy does indeed suggest that evasion is important among small businesses and the self-employed (traditionally numerous in Italy), for whom there is no double reporting, but that for wages, salaries and pensions at the *top of the distribution* there is little room for evading those income components that must be reported independently by employers or the paying authorities. They conclude that the evasion from self-employment and small business income is unlikely to account for the gap in top incomes between Italy and Anglo-Saxon countries.

Another source of evidence is provided by tax amnesties, and Alvaredo discusses the results for Argentina (Chapter 6). Information from the 1962 tax amnesty (which attempted to uncover all income that had been evaded by taxpayers between 1956 and 1961) suggested under-reporting of between 27 and 40 per cent. However, it varied with income.

Evasion shows a lower impact at the bottom (where income from wage source dominates) and at the top of the tax scale (where inspections from the tax administration agency might be more frequent and enforcement through other taxes higher). The evidence may be indirect. In the case of India, Banerjee and Piketty (Chapter 1) note the innovations in tax collection that may have affected the prevalence of filing. They investigate the impact by considering the evolution of wage income, where taxes are typically deducted at source, so that no change would be observed if all that was happening was improved collection. They conclude that there was a "real" increase in top incomes. As in other studies (such as that for Australia in Volume 1, Chapter 7), this is corroborated by independent evidence about what happened to top salaries.

It is important to remember that, while taxpayers may have a strong incentive to evade, the taxing authorities have a strong incentive to enforce collection. This takes the form of both sticks and carrots. For example, the Inland Revenue Authority of Singapore devotes considerable resources to enforcing tax collection, but also provides positive encouragement to tax compliance through emphasising the role of taxes in financing key government services such as schools. The resources allocated to tax administration have been substantial: for example, in Spain in the pre-1960 period the administration was able to audit a very significant fraction (10-20 per cent) of individual tax returns. The tax authorities may also be expected to target their enforcement activities on those with higher potential liabilities. The scope for evasion may therefore be less for the

very top incomes than for those close to the tax threshold, as Leigh and van Eng note to be the case in Indonesia (Chapter 4).

One important route to avoiding personal income tax is for income to be sheltered in companies. The extent to which this is possible depends on the *personal* tax law and on the taxation of *corporations*. One key feature is the extent to which there is an imputation system, under which part of any corporation tax paid is treated as a pre-payment of personal income tax. Payment of dividends can be made more attractive by the introduction of an imputation system, as in the UK in 1973, Australia in 1987 and New Zealand in 1989, 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 (as discussed above) but dividends are covered, a switch towards (away from) dividend payment will increase (reduce) the apparent top income shares. This needs to be taken into account when interpreting the results. That is why estimating series including realized capital gains is valuable in order to assess the contribution of retained profits of corporations on top individual incomes. When realized capital gains are untaxed and hence not observed, it is important to assess the effects of attributing retained profits to top income. For example, in the UK, Atkinson (Chapter 4 in Volume 1) examined the consequences of the large increase after the Second World War in the proportion of profits retained by companies. The attribution of the retained profits to top income groups would have reduced the magnitude of the fall in the share of the top 1 per cent between 1937 and 1957 but still left a very considerable reduction.

The reported shares of top incomes can also be affected by the move between incorporated and non-incorporated activities. This has been modelled by Gordon and Slemrod (2000) and others. The potential impact is particularly marked in the case of the dual income tax introduced in Nordic countries. The tax reform in Finland in 1993 combined progressive taxation of earned income with a flat rate of tax on capital income and corporate profits, with a full imputation system applied to the taxation of distributed profits. Under the dual income tax, capital income is taxed at a lower rate than the top marginal tax rate on labour income. As discussed in Chapter 8, the 1993 tax reform led to an increasing trend of the share of capital income (dividends) and declining share of entrepreneurial income. This can be interpreted as an indication of a tax induced shift in organisational form and the choice of tax regime. In Chapter 10, Alvaredo and Saez provide a model of the incentive to adopt a (wealth tax) exempt organisational form and examine the effect of the wealth tax reform undertaken in Spain. Their empirical estimates suggest that there is a very large shifting effect: the fraction of businesses benefiting from the exemption jumps from 1/3 to about 2/3 for the top 1%.

An extreme form of adjustment to income taxation is to leave the country. In their study of Switzerland (Chapter 11 in Volume 1), Dell, Piketty and Saez investigated the issue of tax evasion by foreigners relocating to that country or through Swiss bank accounts. They found that the fraction of taxpayers in Switzerland with income abroad or non-resident taxpayers had increased in recent years but remains below 20 per cent even at the very top of the distribution, suggesting that the migration to

Switzerland of the very wealthy is a limited phenomenon. They similarly conclude that the amount of capital income earned through Swiss accounts and not reported is small in relation to the total incomes of top income recipients in other countries. In the case of Sweden, Roine and Waldenström (Chapter 7) make estimates of "capital flight" since the early 1980s using unexplained residual capital flows ("net errors and omissions") published in official balance of payments statistics. They estimate that somewhere between 250 and 500 billion SEK has left the country without being accounted for. To get a sense of the order of magnitude by which this "missing wealth" would change top income shares in Sweden, they add all of the returns from this capital first to the incomes of the top decile and then to the top percentile. For the years before 1990, there is no effect on top income shares by adding income from offshore capital holdings since they are simply too small. However, after 1990, and especially after 1995, when adding all of them to the top decile, income shares increase moderately (by approximately 3 percent). When instead adding everything to the incomes of the top percentile, the income shares increase by about 25 percent which is equivalent to an increased share from about 5.7 to 7.0 percent. While this is a notable change, it does not raise Swedish top income shares above those in France (about 7.7 percent in 1998), the U.K. (12.5 percent in 1998) or the U.S. (15.3 percent in 1998).

To sum up, the different pieces of evidence indicate that tax evasion and tax avoidance need to be taken seriously and can quantitatively affect the conclusions drawn. They need to be borne in mind when considering the results, but they are not so large as to mean that the tax data should be

rejected out of hand. Our view is that legally tax-exempt capital income poses more serious problems than tax evasion and tax avoidance per se.

Summary

The data are rich but need to be used with due circumspection, particularly with respect to incomes from capital. In drawing conclusions, users need to ask themselves whether their findings could be reversed by taking into account the inherent limitations of fiscal data, of the breaks in continuity over time, and of the differences in methods that remain. Put differently, there is a wide confidence interval surrounding the estimates, reflecting not sampling error (since in many cases the statistics cover the universe) but non-sampling error. In concrete terms, the different considerations described above suggest that an error margin of ± 20 per cent is not unreasonable, although it could well be exceeded if the different errors cumulate in the same direction. In what follows, we take ± 20 per cent as a yardstick.

13.3 A SUMMARY OF THE MAIN FINDINGS

Our summary of the evidence begins in the middle of the twentieth century. The first columns in Table 13.1 show the position in 1949 (1950).[5] We take this year as one for which we have estimates for all except 4 of the 22 countries (for Indonesia we have taken the 1939 estimate and for Ireland that for 1943), and as one when most countries had begun to return to

[5] In the case of New Zealand, we have used the estimates of Atkinson and Leigh (2008, Table 1) that adjust for the change in the tax unit in 1953.

normality after the Second World War (for Germany and the Netherlands we take 1950). Moreover, it was before the 1950-1 commodity price boom that affected top shares in Australia, New Zealand and Singapore.

If we start with the top 1 per cent – the group on which attention is commonly focused – then we can see from Table 13.1 that the shares of total gross income are strikingly similar when we take account of the possible margins of error. There are 18 countries for which we have estimates. If we take 10 per cent as the central value (the median is in fact around 10.8), then 12 of the 18 lie within the range 8 to 12 per cent (i.e. with an error margin of ± 20 per cent). In countries as diverse as India, Norway, France, New Zealand, and the US, the top 1 per cent had on average between 8 to 12 times average income. Three countries were only just below 8 per cent: Japan, Finland and Sweden. The countries above the range were Ireland, Argentina and (colonial) Indonesia. The top 1 per cent is of course just one point on the distribution. If we look at the top 0.1 per cent, shown in Table 13.1 for 18 countries (Portugal replacing Finland), then we find that again 12 lie within a (± 20 per cent) range around 3.25 per cent from 2.6 to 3.9 per cent. Leaving out the 3 outliers at each end, the top 0.1 per cent had between 26 and 39 times the average income.

We also report in Table 13.1 the inverse Pareto-Lorenz coefficients associated to the upper tail of the observed distribution in the various countries in 1949 and 2005. In this table, and throughout this chapter, we choose to focus the attention upon the inverted-Pareto-Lorenz "β" coefficient rather than the standard Pareto-Lorenz "α" coefficient. Note that there exists a one-to-one, monotonically decreasing relationship

between the α and ß coefficients, i.e. ß=α/(α-1) and α=ß/(ß-1) (see the notes to Table 13.1B). The reasons for using the ß coefficient are twofold. First, as was noted by Piketty (Chapter 1 in Volume 1), the ß coefficient has arguably greater economic appeal, in that it measures the average income of people above y, relative to y. It provides a direct intuitive measure of the fatness of the upper tail of the distribution. Next, a higher ß coefficient means larger top income shares and higher top income inequality (while the reverse is true with the more commonly used α coefficient), which facilitates the presentation and discussion of the results. In practice, we shall see that the ß coefficient typically varies between 1.5 and 2.5: values around 1.5 or below indicate low top income inequality, while values around 2.5 or below indicate high top income inequality. A value of 1.5 means that people above a specified level have on average 50 per cent more income; a value of 2.5 means that they have 150 per cent more income.

Coming back to 1949, we find that 10 of the 20 countries for which ß coefficient values are shown in Table 13.1 lie between 1.88 and 2.00 in 1949. Countries as different as Spain, Norway, the US and (colonial) Singapore had Pareto coefficients that differed only in the second decimal place. As of 1949, the only countries with ß coefficients above 2.5 were Argentina and India.

1949 is of interest not just for being mid-century, but also because later years did not exhibit the degree of similarity described above. The right hand part of Table 13.1 assembles estimates for 2005 (or a close year). The central value for the share of the top 1 per cent is not too different to that in 1949: 9 per cent. But we now find more dispersion. For the top 1

per cent, 9 out of 21 countries lie outside the range of ± 20 per cent. Leaving out the 2 outliers at each end, the top 0.1 per cent had between 13 and 56 times the average income (in 1949 these figures had been 20 and 52). In terms of the ß coefficients only 4 of the 22 countries had values between 1.88 and 2.00. Of the countries present in 1949, five now have values of ß in excess of 2.5.

The post-war picture

There was in face considerable diversity of experience over the period from 1949 to the beginning of the 21st century. If we ask in how many cases the share of the top 1 per cent rose or fell by more than 2 percentage points between 1949 and 2005 (bearing in mind that two-thirds were in the range 8 to 12 per cent in 1949), then we find the 17 countries more or less evenly divided: 6 had a fall of 2 points or more, 5 had a rise of 2 points or more, and 6 had a smaller or no change. If we ask in how many cases the inverted-Pareto-Lorenz ß coefficient changed by more than 0.1, then this was true of 15 out of 20 countries in Table 13.1, with 12 showing a rise (a move to greater concentration). Examination of the annual data for individual countries in Tables 13A.1 to 13A.22 confirms that during the 50+ years since 1949 individual countries followed different time paths.

Can we nonetheless draw any common conclusions? Is it for example the case that all were following a U-shape, and that the differences when comparing 2005 and 1949 arise simply because some countries are further advanced? Is the US leading the way, with other countries lagging? In Table 13.2, we summarise the time paths from 1949 to 2005 for the 16 countries

for which we have fairly complete data over this period for the share of the top 1 per cent and top 0.1 per cent. In focusing on change, we are not interested in small differences after the decimal points. The criterion applied in the case of the share of the top 1 per cent is that used above: a change of 2 percentage points or more. For the share of the top 0.1 per cent, we apply a criterion of 0.65 percentage points (i.e. scaled by 3.25/10). In applying this, we consider only *sustained* changes. This means that we do not recognise changes due to tax reforms that distort the figures, as in the case of Norway (Chapter 9) or New Zealand (see volume 1, chapter 8), those due to the commodity price boom of the early 1950s, as for Australia, New Zealand and Singapore, or other changes that are not maintained for several years.

Applying this criterion, there is just one case – Finland – where there is a pattern of rise/fall/rise. The share of the top 1 per cent in Finland rose from below 8 per cent in 1949 (it has been lower before then) to around 10 per cent in the early 1960s. Of the remaining 15 countries, one can distinguish a group of 6 "flat" countries (France, Germany, Switzerland, Netherlands, Japan, Singapore), and a group of 9 "U-shaped" countries (UK, US, Canada, Australia, New Zealand, India, Argentina, Sweden, Norway). Broadly the same story is revealed by the ß coefficients plotted in Figures 13.3 and 13.4 for both groups of countries.

The 10 countries belonging to the second group appear to fit, to varying degrees, the U-shape hypothesis that top shares have first fallen and then risen over the post-war period. In most countries, the initial fall was of limited size, with ß coefficients declining from about 1.7 in 1949 to about

1.5 during the 1970s, before climbing towards 2-2.5-3 during the 1990s-2000s. In Argentina and India, there was higher concentration to start with (β coefficients above 2.5 in 1949), and the declining part of the U-curve was more marked (see Figure 13.4). The individual country patterns differ in other respects as well. As may be seen from Table 13.2, the initial falls in top shares were less marked in the US, Canada and New Zealand than in the UK, Australia and India. The share of the top 1 per cent was much the same in the US and UK in 1949 but in the UK the share then halved over the next quarter century, whereas in the US it fell by only a little over a quarter. From Figure 13.4 we can see that the decline in the β coefficient reached 1.7 in the US in 1969, the same value as in the UK, but the latter went on to decline to about 1.5 by the late 1970s. Norway and Sweden reached values as low as 1.3-1.4.

The frontier between the U-shaped countries and the flat countries is somewhat arbitrary and should not be overstressed. In France, after an initial reduction in concentration, the coefficient hovered around 1.7 from 1960 to the late 1990s, but has begun to rise since the late 1990s. In Japan and Singapore, the rebound in recent years is even more pronounced (see Figure 13.3 and the top income shares series in the Appendix tables). The only three countries with no sign of a rise in income concentration during the most recent period, namely Switzerland, Germany and the Netherlands, are countries where our series stop in the late 1990s. There exists some reasonable presumption that when data becomes available for the 2000s, these countries might also display an upward trend. Finally, note that Switzerland and especially Germany have always been characterized by

significantly larger concentration at the top than other Continental European countries.

What about countries for which we have only a shorter time series? The time series for China is indeed short, but there too the top of the distribution is heading for greater concentration. For instance, ß coefficients have gradually risen from about 1.2 in 1986 to about 1.5 in 2003 (see Tables 13A.23 and 13A.24). These are still very small ß coefficients by international and historical standards, but the trend is strong (and the levels might be under-estimated due to the nature of the available Chinese data, see Chapter 2). China has a way to go, but the degree of concentration is heading in the direction of the values in OECD countries. Regarding the other countries with limited time coverage (Spain, Portugal, and Italy), one also observes a significant rise in income concentration during the most recent period.

Before 1949

What happened in our 22 countries before 1949 may appear like pre-history to some readers, but the experience may be relevant for several reasons. The behaviour of the income distribution in today's rich countries may provide a guide as to what can be expected in today's fast-growing economies. We can learn from nineteenth century data, such as those for Norway, that cover the period of industrialization. Events in today's world economy may resemble those in the past. If we are concerned as to the distributional impact of recession, then there may be lessons to be learned from the 1930s.

The data assembled here provide evidence about the interwar period for 19 of the 22 countries; and for 5 of the countries we have more than one observation before the First World War. In Table 13.3 we have assembled the changes in the shares of the top 1 per cent and top 0.1 per cent for certain key periods, such as the world wars, and the crash of 1929-32, as well as for the whole period up to 1949.

The first striking conclusion is that the top shares in 1949 were much lower than thirty years earlier (1919) in the great majority of countries. Of the 18 countries for which we can make the comparison with 1919 (or in some cases with the early 1920s), no fewer than 13 showed a strong decline in top income shares. In only 1 case (Indonesia) was there an increase in the top shares. In half of the countries, the fall caused the shares to be at least halved between 1919 and 1949. For countries where one can compare 1949 with 1913-1914, the fall generally seems at least as large.

What happened before 1914? In 5 cases, shown in italics, we have data for a number of years before the First World War. Naturally the evidence has to be treated with caution and has evident limitations: for example, the German figures relate only to Prussia (see Dell, 2008, for estimates for Baden, Hesse, Sachsen and Württemberg). But it is interesting that in the two Nordic countries (Sweden and Norway) the top shares seems to have fallen somewhat at the very beginning of the 20th century, a period when they might have been in the upward part of the Kuznets inverted-U. As is noted in Chapters 7 and 9, at that time Norway and Sweden were largely agrarian economies. In neither Japan nor the UK is there evidence of a trend in top shares. (For the German states the picture is less clear and varies across states – see Dell,

2008.) Given the scarcity of reliable income data for the pre-1914 period, using wealth data is probably the most promising way to go in order to put the First World War shocks into a long run historical perspective. Using large samples of Parisian and national estate tax returns over the 1807-1994 period, Piketty, Postel-Vinay and Rosenthal (2006) have found that wealth concentration rose continuously during the 1807-1914 period (with an acceleration of the trend in the last three to four decades prior to 1914), and that the downturn did not start until the First World War. Due to the lack of similar wealth series for other countries, it is difficult to know whether this is a general pattern. But for all countries where some pre-1914 evidence does exists, available information suggests that the sharp decline in wealth concentration did not start before 1914 – or at least that the trend was much more moderate prior to the First World War.

Are top incomes different?

In Volume 1, we emphasised the differences between the very top of the distribution, the top 1 per cent, and the adjacent income recipients. In Table 13.4 we assemble the findings for the "next 4 per cent" (those in the second to fifth percentile groups) and the "second vingtile group" (those in the sixth to tenth percentile groups). The values are shown for three of the dates we have highlighted: around 1919 (or at the eve of the First World War, when available), 1949 and 2005. We have added, in the final column, text comments about these groups. In three cases, the data do not allow us to estimate shares below that of the top 1 per cent, so that there are 19 countries shown.

In many cases – 15 out of 19 - the top 1 per cent *are* different, in the sense that the changes in income concentration have been particularly affected this group. For some countries, the "next 4 per cent" exhibit some of the same features as the top 1 per cent (as in the UK in recent decades), so that it would be fairer to talk of concentration among the top 5 per cent, but typically the second vingtile group does not share the same experience. In other cases, like China, it is a matter of degree. But this is not universal, and in Table 13.4 we have shown in italics the 4 cases (Germany, Japan, Singapore and Portugal) where there have been changes in the next 4 per cent and below.

Being in the top 1 per cent does not necessarily imply being rich, and there are also marked differences within this group. The very rich are different from the rich. We have earlier considered the top 0.1 per cent (in Table 13.1), and a number of the chapters examine the top 0.01 per cent. In Chapter 1, Banerjee and Piketty show that in India in the 1990s it was only the top 0.1 per cent who enjoyed a growth rate of income faster than that of GDP per capita, in contrast to the situation in the 1980s when there was faster growth for the whole top percentile.

Composition of top incomes

In their study of the United States, Piketty and Saez found that the "rise in top incomes is due not to the revival of top capital incomes, but rather to the very large increases in top wages (especially top executive compensation). As a consequence, top executives (the 'working rich') replaced top capital owners (the "rentiers") at the top of the income hierarchy during the twentieth

century" (2006, page 204). In France (Piketty, 2003), the top capital incomes had not been able to recover from a succession of adverse shocks over the period 1914 to 1945; progressive income and inheritance taxation had prevented the reestablishment of large fortunes.

Data on the composition of top incomes are only available for around half of the countries studied here, but a number record the decline of capital incomes and the rise of top earnings. The Japanese data show that "the dramatic fall in income concentration at the top was primarily due to the collapse of capital income during the Second World War" (Moriguchi and Saez, Chapter 3, page xx). In the Netherlands, "capital and wage incomes have traded places within the top shares [although] the increased role of the latter has not been able to prevent the decline or the stability of the top shares" (Salverda and Atkinson, Chapter 10 in Volume 1, page 452). In Canada, "the income composition pattern has changed significantly from 1946 to 2000. … the share of wage income has increased for all groups, and this increase is larger at the very top. ... The share of capital income [excluding capital gains] has fallen very significantly for the very top groups" (Saez and Veall, Chapter 6 in Volume 1, page 239). The Italian data (Chapter 12) only start in 1974 and the rise in top shares is modest: the share of the top 1 per cent rose from around 7 per cent in the mid-1970s to around 9 per cent in 2004. But the Italian data show a rise in the role of wage income in the very top groups. In 1976, earnings accounted for less than 10 per cent of the income of the top 0.01 per cent, but by 2004 this had increased to over 20 per cent. Over the same period, the share of capital income more or less halved (Table 12A.4). In Spain, a similar calculation (from figures that omit capital gains) shows that in

1981, earnings accounted for less than 20 per cent of the income of the top 0.01 per cent, but by 2004 this had increased to 40 per cent.

Further evidence can be obtained from other sources for some of the countries without evidence on the composition of incomes in the income tax data. In the case of Portugal, for example, the administrative records on earnings show that the share of the very top earners increased: between 1991 and 2004 the share of the top 0.1 per cent doubled (Table 11D.6).

At the same time, the picture is not totally uniform. A major difference between the Nordic countries and the US is the continuing importance in the former of capital income. In Sweden, Roine and Waldenström find that "between 1945 and 1978 the wage share at all levels of top incomes became more important … But in 2004 the pattern is back to that of 1945 in terms of the importance of capital, in particular when we include realized capital gains" (Chapter 7, page xxx). The conclusions reached regarding Finland stress that "the main factor that has driven up the top one per cent income share in Finland after the mid 1990s is in an unprecedented increase in the fraction of capital income" (Chapter 8, page xxx). This may reflect differences in reporting behaviour following tax reforms, but it is not totally a difference between Nordic countries and the Anglo-Saxons. In Australia, Atkinson and Leigh found that "the proportion of salary and wage income for top income groups in 2000 was quite similar to the proportion in 1980" (Chapter 7 in Volume 1, page 322). In the UK, it is true that the major themes have been the fall in capital incomes over the first three-quarters of the 20th century and the subsequent rise in top earnings, but minor themes have been

an earlier fall on the share of top earners and a partial restoration of capital incomes since 1979.

Summary

It is not easy to summarise a summary, not least because to almost every statement there is a counterexample among the 22 countries we have been studying.

- At the middle of the 20th century, the top of the income distribution looked similar in many of the different countries for which we have data: for two thirds the top 1 per cent had on average between 8 and 12 times average income. Countries as different as Spain, Norway, the US and (colonial) Singapore had inverse Pareto coefficients that differed only in the second decimal place.
- This was to change: from 1950 to the present, countries followed different paths, and there is now greater diversity. Out of 17 countries we can track from 1949 to 2005, 6 had over the period as a whole a fall of 2 points or more in the share of the top 1 per cent, 5 had a rise of 2 points or more, and 6 had a smaller or no change.
- Within the period, the majority of countries appear to fit, to varying degrees, the U-shape hypothesis that top shares have first fallen and then risen over the post-war period. This was not universal: a number exhibited either no change or a limited recent rise in top shares.

- The post-war fall in top shares (where it happened) may be seen as continuing the pattern of the first half of the century, but the 1900-1945 period was particularly affected by events, including, for both combatants and non-combatants, the two world wars, and the Great Crash of 1929.
- In most countries, the changes, and particularly the recent increases, have been concentrated at the very top.
- The decline in top income shares over the first three-quarters of the 20th century was largely associated with a decline in top capital incomes; the recent rise in top shares in a number of countries has been particularly associated with increased top earnings, but this is not universal and in the Nordic countries the rise was associated largely with capital income.

One way to summarize our findings over the entire 1900-2005 period is again to plot separately top income shares and ß coefficients for the two groups of countries defined above, which now become the "L-shape" group and the "U-shape" group – keeping in mind that the frontier between both groups is fuzzy, and that L-shape countries seem to be gradually shifting towards the U-shape pattern (see Figures 13.5, 13.6, 13.7 and 13.8).

13.4 SEEKING POSSIBLE EXPLANATIONS: EMPIRICAL AND THEORETICAL MODELS

From the data on the changes in the upper part of the income distribution assembled in these two volumes certain possible explanations stand out. We have drawn attention to the falls in top income shares in countries fighting in the First and Second World Wars (and that some, but not all, non-combatant countries, were less strongly hit, or even saw an increase in top shares). According to Moriguchi and Saez, "the defining event for the evolution of income concentration in Japan was a historical accident, namely the Second World War" (Chapter 3, page xx). Much less momentous, but still distinctive as an event, was the commodity price boom of 1950, which saw a rise in top shares in Australia, New Zealand, and Singapore. In these cases, a single event is sufficiently large for us to be content with a single variable analysis. Moreover, there is unlikely to be reverse causality, with the fall or rise in shares causing the wars or the commodity boom. The slump in commodity prices in the Great Depression may also be such an event – see the discussion of Indonesia by Leigh and van der Eng in Chapter 4 – but the wider economic circumstances were also highly relevant.

Indeed, in general, explanations are likely to be multivariate, and we are confronted with the task of seeking to separate different influences. In the introductory chapter to Volume 1, Piketty suggested that the database constructed here could be exploited as a cross-country panel, and this approach has already been adopted by Roine, Vlachos and Waldenström (2008) and Atkinson and Leigh (2007). The former authors find, for example, that growth in GDP per head is associated with increases in top income shares and that financial development is pro-rich in the early stages of a country's development.

Multivariate statistical analysis may help us disentangle some of the factors at work. For example, a number of the chapters, following Piketty (2001 and 2003) highlight the role of progressive income taxation. In the UK, for example, the period of falling top income shares was one of high marginal rates of tax, and the shares began to rise again when the tax rates were sharply reduced in the 1980s. But how can we be sure that there is a causal path from progressive taxation to reduced top income shares? In the UK, high top rates of income tax were first introduced during the First World War. Could these tax rates, and the reduction in top shares, not be seen as both *resulting* from third factors associated with the War and its aftermath, such as the loss of overseas income? Statistical analysis seeks to separate out the independent variation in different variables. For example, the UK was a combatant in the First World War but the Netherlands (also a colonial power) was not. It may therefore be informative to compare the 2 countries, both of which had progressive income taxes. At the same time, there are possible third factors. Both the UK and the Netherlands faced similar global economic conditions that may have independently affected top shares. In the same way, the tax cuts of the 1980s took place under Reagan and Thatcher, just as the First World War increases in the UK had been initiated by Liberal Governments. These governments pursued other policies apart from income taxation, such as the measures to prevent profiteering in the First World War, or the liberalisation of the capital markets and privatisation in the 1980s, which may have affected the top income shares. There is also the possibility of reverse causality. The increases in top incomes as a result of changed executive remuneration

policies may have increased political pressure for cutting top taxes. We need therefore a simultaneous, as well as multivariate, model.

Statistical analysis can help us identify independent variation, but it rarely proves fully conclusive. The conclusions that we draw inevitably involve elements of judgment. Judgment in turn is likely to be influenced by a range of considerations. Here we consider two: historical narrative and economic theory (on which we particularly focus).

The conclusion regarding the role of progressive income taxation in France was reached by Piketty after an extensive discussion of the economic history of France over the twentieth century. While it would be re-inforced by regression analysis in which the relevant tax rate variable had a highly (statistically) significant coefficient of a plausible magnitude, the conclusion was based on a reading of the events of the period. In the same way, the individual chapters in these two volumes provide each a historical narrative that in itself is part of the evidence. The narrative typically draws on a variety of evidence. A number of chapters, such as that on Japan, contain evidence from a range of sources: income tax data, wealth data, estate data, and wage data. In combining these disparate sets of information, the authors are not carrying out a mechanical operation, but exercising judgment about the strengths and weaknesses of different sources. These narratives are of course subjective, reflecting the standpoints of the authors, and there will no doubt be disagreement about the interpretation of history. Again they cannot be definitive. But equally they cannot be dismissed out of hand, and they play a significant role in our summary of major mechanisms in the next section.

Theoretical models

The judgment concerning the importance of progressive taxation in France was also reached on the basis of theoretical considerations, notably simulation models of capital accumulation. This brings us to the question of the relation between theoretical models of income distribution and the specification of statistical relationships. How closely are these to be linked? In the theory of consumer demand, if a consumer maximises a logarithmic utility function (of the consumption of each good plus a constant as in the Stone-Geary form) subject to a linear budget constraint, we can derive the predicted demands as linear functions of income. This straight line curve can be fitted to expenditure data, and since the days of Engel this has provided a valuable framework for understanding how consumer spending is likely to change over time. The coefficient on income is interpreted as the marginal propensity to consume, and the specified functional form allows inferences can be drawn about the response to price changes. There is in this case a tight link between the theoretical model and the empirical implementation.

In contrast, the income inequality literature has typically a looser connection (see Atkinson and Brandolini, 2006 for a survey). Theoretical models are invoked, but to produce a list of explanatory variables rather than to generate an estimating equation. The functional form is not specified, so that it is not clear how the explanatory variables should enter the estimating equation. Should the model be linear? Should the explanatory variables interact? There is no guide to the form of the variable

to be explained. Should the left hand side be the top income share? Should it be a transformation? Should it be the (inverse) Pareto coefficient?

Modelling sectoral shifts

Building a link between theory and empirical specification is not straightforward, as may be illustrated by reference to the most popular model in the income distribution literature: the Kuznets inverse-U curve. This curve is based on the structural change that takes place in an economy as it is transformed from largely agricultural (traditional) to industrial (modern). We should note, before using this model, that its popularity seems to far exceed its demonstrated empirical relevance. As stressed by Piketty (2001 and 2003), in the first post-Kuznets study of top incomes, the inverse-U has little purchase in explaining top income shares; indeed, he argues that we should look instead at those sections of Kuznets (1955) article where he emphasises the factors counteracting the concentration of savings, notably the impact of progressive taxation – to which we return below.

If we take the Kuznets model of structural change, what does it imply for top income shares? With his numerical assumptions, the top income group is the top decile of those in the higher-paid industrial sector. They initially constitute, when the agricultural sector employs 80 per cent of the population, 2 per cent of the population. Half their share (that of the top 1 per cent) in the Kuznets numerical example is either 2.4 per cent (moderately unequal) or 3.2 per cent (more unequal) of total income. As the industrial sector grows, this share falls: with the agricultural sector

employing 70 per cent of the population, the shares become 2.2 and 2.9 per cent. With a linear top section of the Lorenz curve (as assumed in Kuznets' example) , the share of the top 1 per cent, S_1, is simply a constant divided by mean income (and hence is strictly decreasing with mean income). (More realistic would be an assumption that the upper tail of incomes in the industrial sector follows some distribution such as the Pareto.)

The basic problem with the Kuznets model as far as top shares are concerned is that it focuses essentially on labour income, whereas it is clear that we need to consider both labour and capital income, and their changing roles. Indeed it is with capital incomes that we start, since historically they accounted for the bulk of top incomes.

Modelling capital incomes

In the first part of his Presidential Address, Kuznets (1955) evokes *two* "groups of forces in the long-term operation of developed counties [that] make for *widening* inequality in the distribution of income" (1955, page xxx). The first of these is the concentration of savings in the upper income brackets and the cumulative effect on asset holding. Subsequently, Meade (1964) developed a theory of individual wealth holding, allowing for accumulation and transmission of wealth via inheritance, and this model has been analysed in a general equilibrium setting by Stiglitz (1969). With equal division of estates at death, a linear savings process, and persistent differences in earnings across generations, in the long-run the steady-state distribution of wealth simply mirrors the distribution of earnings (Atkinson and Harrison, 1978, page 211). If the society starts with a more unequal

distribution of capital than steady-state level, then the top shares will fall in the approach to this equilibrium (and conversely if it starts below steady-state levels, say if earnings inequality increased for some exogenous reason). But to explain the extent of inequality we have to have appeal to explanations of the distribution of earnings.

Alternative assumptions about bequests can however generate long-run equilibria where there is inequality of wealth even where earnings are equal. Stiglitz shows how the operation of primogeniture (leaving all wealth to one child) can lead in equilibrium to a stable distribution with a Pareto upper tail, with the Pareto coefficient

$$\alpha = \log[1+n] / \log[1+sr(1-t)] \qquad (1)$$

where sr(1-t) is the rate of accumulation out of wealth, s being the savings rate, r being the rate of return, t the tax rate, and n is the rate of population growth (Atkinson and Harrison, 1978, page 213). For stability, the population growth rate has to exceed the rate of accumulation by the wealthy, so it follows that α is greater than 1. The faster the rate of accumulation, the closer α is to 1. Equation (1) provides a – deceptively – simple answer to the questions concerning specification. Approximating log(1+x) by x, we should regress 1/α (or 1/ß) on sr(1-t)/n. This provides a natural way of testing the impact of progressive income taxation. However this is indeed deceptive, since it assumes that the parameters are constant over time, and that the primogeniture assumption is remotely plausible. The first of these concerns might be met by using a moving average of past tax rates. In countries such as the UK where the top tax rate was cut from

98 per cent to 40 per cent in the first half of the 1980s, there would then be a continuing rise in top shares until the new equilibrium was approached.

Wealth is not typically concentrated in a single line of descent. Primogeniture may have applied in aristocratic England, but it was not legally permissible in most European countries (and, after 1947, Japan) and it never became widely established in the United States. With equal division of inheritance, which seems a more reasonable assumption, Vaughan (1993) has shown that the equation for the equilibrium value of α is given by the implicit form:

$$\alpha[sr(1-t)-\tfrac{1}{2}\sigma^2r^2(1-t)^2] + \tfrac{1}{2}\sigma^2r^2(1-t)^2\alpha^2 = (\delta+n)[1-(1+n/\delta)^{-\alpha}] \qquad (2)$$

where δ is the rate of mortality. In this model, Vaughan has also introduced a random element in the return to capital (and for the underlying portfolio choice), where σ^2 is the variance of the white noise stochastic process. If there is no randomness, and n = 0, so that the population is not growing (so primogeniture is the same as equal division), then we have $(1/\alpha) = sr(1-t)/\delta$, similar to the earlier estimating equation. If n is small relative to δ, we can approximate the power on the right hand side of (2) and solve for α as a decreasing linear function of the net rate of return, r(1-t), and which falls with the contribution of the stochastic term, $\sigma^2r^2(1-t)^2$.

The models of top incomes described above relate to capital income; we need now to consider possible explanations in terms of earned incomes.

Modelling top earnings

Referees of a number of the papers in these two volumes, when they were submitted for journal publication in an earlier form, took the authors to task

for not paying sufficient attention to the dominant paradigm in labour economics, which explains rising wage dispersion in terms of skill-biased technical change. Or, as it had earlier been put by Tinbergen (1975), there is a race between the expansion of education and the increased demand for educated labour as a result of technological change. While we agree that this literature offers important insights, we do not feel that it has a great deal to say about what is happening at the very top of the earnings distribution. Empirically, labour economists have discussed the top decile as a proportion of the median, but we are interested in what happens to the top percentile and within the top percentile group. The skill-bias explanation has highlighted the premium to college education (see, for example, Katz and Autor, 1999), but that has little to say directly about why the top percentile has increased relative to the top decile. The recent "polarisation" thesis of Autor, Katz and Kearney (2006) has specifically focused on the impact of technical change in replacing routine manual jobs, which only indirectly affects top earners.

There are in fact a number of earlier theories that are directly relevant to top earnings. One such set of theories are those dealing with executive remuneration in a hierarchical structure. The model advanced by Simon (1957) and Lydall (1959) generates an approximately Pareto tail to the earnings distribution, with a Pareto exponent given by

$$\alpha = \log[\text{span of managerial control}]/\log[1+\text{ increment with promotion}] \quad (3)$$

In this form, the model is purely mechanical, but it provides a vehicle by which we may introduce a number of explanatory variables, including technological change, taxation, and changes in the size distribution of firms and other organisations. Tournament theory (Lazear and Rosen, 1981), for example, has provided an explanation of the size of the necessary increment. If one considers the position of people at particular level in an organisation, deciding whether or not to be a candidate for promotion to the next rank, then they are comparing the certainty of their present position with the risk of taking a new position in which they may fail, and lose their job. The higher rank job also involves greater effort. In the very simplest case, the worker weighs the mean gain against the risk. There are two competing effects. On the one hand, the tax reduces the financial gain from promotion and more is needed to compensate for the increased effort. On the other hand, the tax reduces the risk of the new job: the government shares part of the risk.

A second explanation of the rise in top earnings shares in a number of countries in the second half of the post-war period is provided by the "superstar" theory of Rosen (1981). The expansion of scale associated with globalisation and with increased communication opportunities has raised the rents of those with the very highest abilities. Where the “reach” of the top performer is extended by technical changes such as those in Information and Communications Technologies (ICT), and by the removal of trade barriers, then the earnings gradient becomes steeper. Moreover, Frank and Cook (1995) argue that the winner-take-all payoff structure has spread beyond fields like sport and entertainment: “it is fair to say that virtually all top-

decile earners in the United States are participants in labour markets in which rewards depend heavily on relative performance" (Frank, 2000, page 497). This could explain the fall in the Pareto α coefficient (and the rise in the ß coefficient) in the past quarter century. Indeed Rosen made precisely this prediction in 1981, referring back to Marshall's *Principles*, where Marshall identifies "the development of new facilities for communication, by which men, who have once attained a commanding position, are enabled to apply their constructive or speculative genius to undertakings vaster, and extending over a wider area, than ever before" (1920, page 685). As captured in the title of the book by Frank and Cook (1995), it is a *Winner-Take-All Society*, and this suggests that it can usefully be modelled as an extreme value process. The distribution of earnings in this case is given by the maximum values generated by the results of many separate "competitions". If we limit attention to those values exceeding some specified threshold, then for a sufficiently high threshold the distribution function takes on the generalised Pareto form (Embrechts, Klüppelberg and Mikosch, 1997, page 164 or Coles, 2001, page 75), which has a Pareto upper tail.

Finally, considerable attention has been devoted to the effects of marginal tax rates--and especially top marginal tax rate--on the earnings distribution. Higher top marginal tax rates can reduce top reported earnings through three main channels. First, top earners may work less and hence earn less—the classical supply side channel. Second, top earners may substitute taxable cash compensation with other forms of compensation such as non-taxable fringe benefits, deferred stock-option or pension

compensation—the tax shifting channel.[6] Third, because the marginal productivity of top earners, such as top executives, is not perfectly observed, top earners might be able to increase their pay by exerting effort to influence corporate boards. High top tax rates might discourage such efforts aimed at extracting higher compensation.[7]

The central concept capturing all those behavioural responses to taxation is the elasticity of reported earnings with respect to the net-of-tax rate (defined as one minus the marginal tax rate). There is a large literature (surveyed in Saez, Slemrod, and Giertz, 2009) which attempts to estimate this elasticity. In general, the literature estimate this elasticity based on the sum of labor and capital income although, as we discussed above, the effects of tax rates on capital income might have a fairly long lag.

With a constant and uniform elasticity e, and a marginal tax rate t, by definition, reported earnings will be: $z=z^0(1-t)^e$,where z^0 is reported income when the marginal tax rate is zero. Therefore, the top income share will be proportional to $(1-t_T)^e/(1-t_M)^e$

where t_T is the top group marginal tax rate on earnings and t_M is the average marginal tax rate on earnings. Therefore, top income shares, combined with information on marginal tax rates by income groups can be used to test this

[6] The taxation of stock-options varies substantially across countries, In the United States, profits from stock-option exercises are included in wages and salaries for tax purposes and hence captured in the estimates. In other countries, such as France, profits from stock-options are taxed separately and hence are not included in the estimates.

[7] The welfare consequences of taxation differ widely across the three channels. The first channel creates pure tax distortions. In the second channel, the tax distortion is reduced by "fiscal externalities" as tax shifting might generate deferred tax revenue as well. In the third channel, taxes can actually correct a negative externality if the contract between the executive and the board does not take into account the best interests of shareholders and other wage-earners.

theory and estimate the elasticity *e* with a log-form regression specification of the form:

$$log(\text{Top Income Share}) = \alpha + e\ log(1-t_T) + \varepsilon,$$

As discussed below, Saez (2004) proposes such an exercise with US data from 1960 to 2000. Atkinson and Leigh (2007) and Roine, Vlachos, and Waldenström (2008) combine data from several countries (and include several other variables) to test this relationship. In all those studies, top marginal tax rates do seem to negatively affect top income shares, although causality is difficult to establish. The main limiting factor to extend such an analysis is the absence of systematic series on marginal tax rates by income groups.[8]

Combining capital and earned income

In order to explain the shifting mix of capital and earned income, we need to bring the two income sources together in a single model. This crucially depends on their joint distribution. Are those with large capital incomes also those with high salaries, accumulating assets over their careers? Or are there, as assumed in classical distribution theories, separate classes of "workers" and "capitalists"?

The latter case, with two distinct groups with high incomes, is the easier to handle. We can consider the upper tail of the income distribution

[8] Top marginal income tax rates may not approximate well effective marginal tax rates in upper income groups because of various exemptions, special provisions, the presence of other taxes such as social security contributions or local income taxes. When top tax rates were extremely high, the fraction of taxpayers in top bracket was often extremely small as well so that the marginal tax rate in the top 1% was substantially lower than the top marginal tax rate.

being formed as a mixture of the two upper tails. For example, if the upper tail of earnings, for reasons we have just discussed, has a Pareto relative cumulative distribution with exponent α_l, and capital income is distributed according to a Pareto distribution with exponent a_k, then the overall distribution could be seen as a combination of the two: a simple mixture. The shape of the cumulative distribution depends on the relative weight on the two distributions, and in this way we can introduce the overall shares of wage and capital income (factor shares). If the exponent is assumed to be less for capital income than for earnings (i.e. $a_k < \alpha_l$), then those with capital income become increasingly dominant as we move up the income scale.

Where people receive both earned and capital income, we have to make assumptions about their correlation. Where they are independent, we have the convolution of the two distributions. This again introduces the relative shares of earned and capital income in total income. However, this approach does not offer any obvious simple functional forms (since we are adding not multiplying the two components). Moreover, it seems more realistic to assume some positive degree of correlation. In the extreme case where people are ranked the same in the two distributions, we can form the combined distribution by inverting the cumulative distribution. Expressing y as a function of (1-F), we have in the case of the Pareto distribution, $y = [A/(1-F)]^{1/\alpha}$. So that, if we add earned and capital income, we have total income as

$$[A/(1-F)]^{1/\alpha l} + [B/(1-F)]^{1/\alpha k} \qquad (4)$$

Where $a_k < \alpha_l$, the ratio of capital to earned income rises as we move up the distribution. Again the relative weight of capital and labour income enters via the constants A and B.

The different elements may be brought together in a simple decomposition. Taking for illustration the share of the top 1%, this can be broken down as follows:

Share of top 1% =

Proportion of earned income x Share of top 1% of earners

x Alignment coefficient for earnings

+

Proportion of capital income *x* Share of top 1% with capital income

x Alignment coefficient for capital income

(5)

The "alignment coefficient" for earnings (capital income) is the share in earnings (capital income) of the top 1% of income recipients divided by the share of top 1% of earners (capital income recipients). Since the top 1% of earners (capital income recipients) are not necessarily in the top 1% of income recipients, the alignment coefficient is by definition less than or equal to 1. It is equal to 1 in the case discussed at the end of the previous paragraph, but in a class model where no workers are in the top 1% the coefficient is zero. Evidence about the degree of alignment in the case of Sweden is provided in Chapter 7, which shows the distribution of wealth both ranked by wealth and by total income. As may be seen from Figure 7.8, the share in total wealth of the top 1 per cent is some 5 to 10 percentage

points lower when ranked by total income, but the two series move closely together over time.

Summary

The above examples give some idea of the strength of assumptions that are necessary to bridge the gap between theoretical models and empirical specification. For some readers the assumptions required may indeed be a bridge too far, and proof that we have simply to accept ad hoc specifications. Other readers however may see the formulation as solid ground in shifting sands, even if someway removed from where we would like to be. Our view is that micro-based models, in particular micro-based formulae for (inverse) Pareto coefficients, probably provide the most promising strategy to develop convincing empirical tests of the determinants and consequences of income and wealth concentration – probably more promising than standard cross-country regressions. However our data set, especially because of its lack of systematic decomposition between labour income and capital income components, and of systematic series on labour and capital tax rates, is unfortunately insufficient to do this in a fully satisfactory manner at this stage.

13.5 SEEKING POSSIBLE EXPLANATIONS: MAJOR THEMES

In this section we consider some of the major explanatory factors suggested by the theoretical models described in the previous section and by the country accounts given in this volume and in volume 1.

Politics and political economy

The period covered by our top income data have seen great changes in the political landscape. In 1900, all but 4 of the 22 countries studied here were (or were ruled by) monarchies (the exceptions were Argentina, France, Switzerland, and the US). Before the First World War, a quarter of the world's population lived as part of the British Empire. When the League of Nations was founded in 1920, there were just 42 member countries. Of the 22 countries studied, six gained their independence since 1900. Many of the countries saw significant changes in their boundaries, such as the partition of India, and the division and re-unification of Germany. Most of the countries were combatants in either the First or Second World Wars, and all were affected by these wars. The countries studied here include 4 of the 6 that founded the European Union, and ten are current members of the EU. In Table 13.5, we have summarised some of the main events that affected the 22 countries during the period since 1900.

The most momentous events were the world wars, and for most countries these were associated with falls in the top income shares. Starting with the Second World War, for 14 countries we can observe the shares before and after entry into the war. Of these, one showed an increase: Argentina, where the top income shares were buoyed by expanded food exports to combatant countries (see Chapter 6). The remaining 13 all saw the top shares fall (for Germany no comparison is possible). The falls were again large: the share of the top 0.1 per cent fell by a third or more in France, the US, Canada, the Netherlands, Japan and Norway. For the First World War, we

have fewer observations. The top shares rose in the Netherlands, which was a non-combatant, but they fell in all of the 3 combatants in Table 13.3 for whom data exist: Japan, the UK and the US.

What caused the falls in top shares during world wars? Two forces seem to have been in operation. The first, and probably much the most important, was the loss of capital income. For France, Piketty stresses that "the physical destructions induced by both World Wars were truly enormous in France. … about one-third of the capital stock was destroyed during the First World War, and about two-thirds during the Second World War" (volume 1, page 56). This was followed in 1945 by nationalisation and a capital levy. The UK lost during the wars much of its capital income from abroad. In 1910 UK net property income from abroad represented 8 per cent of GNP, by 1920 it had fallen to 4½ per cent; in 1938 it was close to 4 per cent, but by 1948 it had fallen to under 2 per cent (Feinstein, 1972, Table 1). In the case of Japan, Moriguchi and Saez attribute the precipitous fall in income concentration during the Second World War primarily to the collapse of capital income due to wartime regulations, inflation and wartime destruction. They go on to argue that the change in the institutional structure under the Allied occupational reforms made the one-time income de-concentration difficult to reverse. The reductions in capital incomes also reflected the rise in corporate taxes during the wars and the restrictions on the payment of dividends.

The second mechanism by which world wars led to falls in top shares is via an equalisation of earned incomes. In the US, Goldin and Katz (1992) have applied the term "the Great Compression" to the narrowing in the

United States wage structure in the 1940s: “when the United States emerged from war and depression, it had not only a considerably lower rate of unemployment, it also had a wage structure more egalitarian than at any time since.” (1992, page 2). The war economy imposed wage controls, under the National War Labor Board, as described by Piketty and Saez in Chapter 5 of volume 1. Saez and Veall find that a compression also took place in Canada during the war years (Chapter 6 in volume 1). In Japan, the share in total wages of the top 5 per cent fell from 19 per cent in 1939 to 9 per cent in 1944 (Table 3C.2).

Along with wars went changes in political regimes, either as a consequence or as a cause. The countries studied include five that were governed by dictatorships/military rule during the period covered by our data: Argentina, Germany, Indonesia, Portugal and Spain. It is not possible in all cases to use the top income series to investigate their distributional impact, since the dictatorship coincided with the virtual absence of data (Argentina and Indonesia). But for some countries conclusions can be drawn. Of Germany, Dell writes: “when the Nazis came to power in 1933, the top decile had been thoroughly equalized … The effect of Nazi economic administration changed radically this outcome … In a period of time of only five years, the pre-First World War shares were nearly recovered” (Chapter 9 in volume 1, page 374). In contrast, in the case of Spain, Alvaredo and Saez (Chapter 10) find that the top income shares fell during the first decade of the Franco dictatorship. They also conclude that the transition from dictatorship to democracy was not associated with a significant change in top shares. This latter finding in turn may be contrasted with that for

Portugal, where Alvaredo finds a downward jump in top shares after 1970, and particularly 1974. He notes that this "coincided with the final period of the dictatorship and could be attributed to the loss of the African colonies and to the leftward movement of the revolutionary government after 1974, when a process of nationalizations broke up the concentration of economic power in the hands of the financial-industrial groups." (Chapter 11, page XXX).

Within democracies, the top shares may be affected by changes over time in political partisanship – whether Clinton or a Bush was in the White House. It is naturally tempting to relate the observed changes over time to political variables. Scheve and Stasavage (2009) use a panel of top income data for 13 countries, but cannot find any strong effect of partisanship. This will doubtless be further explored. Political variables may be more relevant to explaining differences across countries, reflecting political climate and traditions. As is noted by Roine and Waldenström in Chapter 7, a distinction is often drawn between liberal (Anglo-Saxon) welfare states, corporatist-conservative (Continental European) welfare states, and social democratic (Scandinavian) welfare states. This makes it interesting to compare top income shares in Sweden and Norway with those in the US/UK and in France and Germany.

Finally, a major change in political regime is the end of colonial rule. The 22 countries include three for which we have data before and after independence. In the case of Indonesia, however, there is too large a gap in time to draw conclusions. In India, as with Indonesia, independence coincided with the end of the Second World War, so that it is hard to

distinguish the effect of independence *per se*. Only for Singapore do we have observations for a post-war colonial period. Here, as shown in Chapter 5, there is little evidence of a decisive break in the top income series with self-government.

Table 13.5 Summary of major political changes over period since 1900 for countries in Volumes 1 and 2.

Country (first observation)	Main events
	Volume 1
France 1905	Combatant in First World War 1914-1918 Occupied during Second World War
UK 1908	Combatant in First World War 1914-1918 Combatant in Second World War 1939-1945
US 1913	Combatant in First World War 1917-1918 Combatant in Second World War 1941-1945
Canada 1920	Combatant in First World War 1914-1918 Combatant in Second World War 1939-1945
Australia 1921	Combatant in First World War 1914-1918 Combatant in Second World War 1939-1945
New Zealand 1921	Combatant in First World War 1914-1918 Combatant in Second World War 1939-1945
Germany 1896 (Prussia)	Combatant in First World War 1914-1918. Republic 1918 with reduced territory. Hitler Chancellor 1933. Combatant in Second World War 1939-1945. Occupied and Federal Republic 1949. Re-unified 1990.
Netherlands 1914	Occupied in Second World War
Switzerland 1933	
Ireland 1922	Irish Free State 1922. Neutral in Second World War.
	Volume 2
India 1922	Combatant in First World War 1914-1918 Combatant in Second World War 1939-1945 Partition and independence in 1947
China 1986	
Japan 1886	Combatant in First World War 1914-1918 Combatant in Second World War 1941-1945 Occupied until 1952.
Indonesia 1920	Dutch colony. Occupied during Second World War. Independence in 1945. Military rule (Suharto) 1966-1998.
Singapore 1947	British colony. Internal self-government 1959. Joined Malaysia 1963. Expelled from Malaysia and fully independent from 1965.
Argentina 1932	Neutral in Second World War. Peron Presidency 1946, deposed in 1955 (brief return in

	1974). Military coups d'état in 1930, 1943, 1955, 1962, 1966 and 1976.
Sweden 1903	Neutral in both world wars.
Finland 1920	After declaration of independence from Russia and civil war, Finland became a republic in 1919. Engaged in Winter War 1939-40, Continuation War 1941-44 and Lapland War 1944-45. Ceded around 10% of territory to Russia in treaty of 1947.
Norway 1875	Separated from Sweden in 1905. Neutral in First World War. Occupied in Second World War.
Spain 1933	Spanish Civil War 1936-9. Franco dictatorship. Neutral in Second World War. Democracy restored in 1976.
Portugal 1936	Salazar dictatorship. Neutral in Second World War. Democracy restored in 1974 following the peaceful "Carnation" revolution.
Italy 1974	

Macro-economics and financial crises

Today there is much interest in looking back to the Great Depression. What were the distributional consequences of major recession? Was it bad for top income shares? Among the 13 countries for which we have data, the period 1928-31(2) saw a rise in top shares in Canada (top 1 per cent), India, Indonesia and Ireland, and no change in Finland and Germany. The remaining 7 all saw top shares reduced. The top 0.1 per cent lost a fifth or more of their income share in Australia, France, the Netherlands, New Zealand, the UK, and the US. In many countries, therefore, the depression reduced inequality at the top.

How far is this borne out by the historical accounts for individual countries? For the US, Piketty and Saez (Chapter 5 in volume 1) find that the share of the top 0.01 per cent fell sharply from 1929 to 1932, in the sense that their average income went from 300 times the mean to 200 times. In the UK the same group saw their average income fall from 300 to 230 times. In the Netherlands, the top 0.05 per cent saw their share fall from 5.6 to 3.4 per cent. In contrast, the fall in Japan in top shares was much smaller. In the case of Sweden, Roine and Waldenström draw attention to the depression hitting Sweden later in 1931 (although they note that the depression of the 1920s was more severe), and in particular the dramatic collapse of the industrial empire controlled by the Swedish industrialist Ivar Kreuger in 1932. They show that between 1930 and 1935 there was a drop from 50 percent to 43 percent in the top percentile wealth share but an even larger drop in the wealth of the top one percent of income earners, from 38 percent in 1930 to 26 percent in 1934.

1929, like 2008, combined the onset of a wide recession with a financial crisis. What can we say about the latter from other episodes of financial crisis? In the case of Norway, there are grounds for believing that the Kristiana crash in 1899 led to a fall on top income shares (Chapter 9). Much more recently, however, the Norwegian banking crisis of 1988-1992 does not appear to have led to a fall in top shares, although it may have postponed the increases associated with financial market liberalisation. It is possible that today's financial crises are different from those in the past in their distributional consequences. In the case of Singapore, top income shares rose following the financial crisis of 1996-7, even if they have fallen back to some extent subsequently. In Indonesia (Chapter 4), there are some similarities.

Turning to the wider macro-economic determinants of top shares, we saw in our discussion of the theoretical models, that an important role is potentially played by the relative shares of earned and capital income. These are related to, but not identical to, factor shares in GNP. As is shown by Piketty for France (Figure 3.4 in volume 1), the capital share in household income follows a different path from the corporate share in value added. The same is demonstrated for the US by Piketty and Saez (Chapter 5 in volume 1, Figure 5.6). The two shares are not the same, because the distributional figures concern households. Between households and the total economy stand various institutions, including the company sector (which retains profits), pension funds (which own shares), and the government (which levies taxes and receives profit income). The dividends paid to pension funds, for example, generate the income which is then paid to

pensioners, in whose hands it is treated as deferred earnings, so that – in these statistics – it does not appear as unearned income. It is nonetheless interesting to examine the relation between factor shares and top incomes.

The separation of national and household income is one reason why the decline of top capital incomes may have taken place even if the factor share of capital has remained unchanged. This point is made forcefully for France by Piketty (Chapter 3 in volume 1). Profits may be retained within the company sector and rents may be accruing to owner-occupiers or public authorities rather than to private landlords. (These are, of course, a reminder of the incompleteness of the measure of income in the income tax data.) On the other hand, in some other countries there is a correlation. Roine and Waldenström plot for Sweden the changes in the capital share of value added and the evolution of the top one percent income share. The series are strongly correlated over the whole period, but with a clear difference between the first and second half of the century. Between 1907 and 1950 the correlation is 0.94, while it drops to 0.55 between 1951 and 2000. This indicates that, at least during the first fifty years, even short term fluctuations of top incomes follow the fluctuations of the capital share of value added as a share of GDP. They also find a downward trend in the capital share of value added over the first 80 years.

Global forces

While popular theories of income distribution concentrate on a closed economy, top income shares are undoubtedly influenced by international movements of capital and labour. The extent of mobility has differed over

time, and our observations span a wide variety of periods, including the previous globalization of the nineteenth century and the protectionism of the interwar years.

It would clearly be interesting to use the data contained in the two volumes covering twenty two countries, with much of the data on a near-annual basis, to explore the common economic influences on the evolution of top shares and possible interdependencies. Important among the common forces are the degree of integration of capital markets and the movements in major commodity prices.

One line of approach is to contrast the time variation of different income groups. A common feature to most of the chapters has been the difference between the time paths of the very top groups and the paths followed by those just below the top. The top 1 per cent, and certainly the top 0.1 per cent, are different from the next 9 per cent (9.9 per cent). It is indeed interesting to ask whether the top 0.1 per cent are more like their counterparts in other countries than they are like the next 9.9 per cent in their own country.

If we consider possible explanatory variables, then the most obvious candidates are the rate of return, movements in commodity prices (to which we have already made references), and, in recent years, the international market for managers and for superstars.

In addition to global correlations, there are other cross-country commonalities. Saez and Veall (Chapter 6 in volume 1) use the top income share in the US as an explanatory variable in a regression explaining the top income share in Canada. Leigh and van der Eng (Chapter 4) show the

correlation between the top income share in Indonesia and those in other countries. They conclude that the correlation is highest with another developing country – India – but note that the correlation with Argentina is negative.

Progressive taxation

In the study of France that initiated this project, Piketty (2001 and 2003) highlighted the role of progressive income taxation: "how can one account for the fact that large fortunes never recovered from the 1914-45 shocks, while smaller fortunes did recover perfectly well? The most natural and plausible candidate for an explanation seems to be the creation and development of the progressive income tax" (Chapter 3 in Volume 1, page 61). It should be stressed here that this conclusion refers to the impact on the distribution of *gross* income: i. e. income before the deduction of income tax. (See Table 4.2 on the UK in volume 1 for one of the few tables that relate to the distribution of income after tax.)

Evidence about the impact of taxation is discussed in many of the chapters. In the case of Sweden, Roine and Waldenström conclude that "Progressive taxation hence seems to have been a major contributing factor in explaining the evolution of Swedish top incomes in the postwar period. However, given that much of the fall in top incomes happens before taxes reach extreme levels and largely as a result of decreasing income from wealth, an important effect of taxation in terms of top income shares has been to prevent the accumulation of new fortunes." (Chapter 7, page xxx). In the case of Finland, Jäntti, Riihelä, Sullström and Tuomala conclude that

the decline in income tax progressivity since the mid 1990s is a central factor explaining the increase of top income shares in Finland. In the case of Switzerland, a country that has never having imposed very high rates of taxation, Dell, Piketty and Saez (Chapter 11 in volume 1) conclude that the observed stability of top shares is consistent with the explanation of trends elsewhere in terms of tax effects.

Outside Europe, Moriguchi and Saez recall in the case of Japan "that the enormous fortunes that generated the high top 1% income share in the pre-Second World War period had been accumulated at the time when progressive income tax hardly existed and capitalists could reinvest almost all of their incomes for further capital accumulation" (Chapter 3, page xxx). They go on to say that the fiscal environment faced by Japanese capitalists after the Second World War was vastly different: the top statutory marginal tax rate for individual income tax stayed at 60-75% from 1950 until the 1988 tax reform. Progressive taxation hindered the re-accumulation of large wealth, resulting in more equal distribution of capital income. This is the same mechanism that Piketty had earlier identified in France, and was highlighted in the case of the US by Piketty and Saez (Chapter 5 in volume 1). Noting that "it is difficult to prove in a rigorous way that the dynamic effects of progressive taxation on capital accumulation and pre-tax inequality have the right quantitative magnitude and account for the observed facts" (volume 1, page 157), they conclude that the interpretation seems reasonable on *a priori* grounds.

On the other hand, there are different findings in some countries. Saez and Veall devote a whole section of their study of Canada (Chapter 6 in

volume 1) to the role of taxation and the consequences of the drop in marginal tax rates since the 1960s. They conclude that "the concentration of the surge in the last decade and among only the very top income shares suggests that tax changes in Canada cannot be the sole cause." (Chapter 6 in volume 1, page 257). Their econometric analysis finds that "Canadian top income changes are much more strongly associated with similar US changes than with Canadian tax developments" (Chapter 6 in volume 1, page 257). The econometric research of Leigh and van der Eng for Indonesia (Chapter 4) does not find conclusive evidence of a link with marginal tax rates. In the chapter on Portugal, Alvaredo notes the top tax rate has been constant (Figure 11.4) at a new lower rate for a long period, during which top shares continued to rise. The same is true for the UK (Chapter 4 in volume 1), where top shares rose steadily over the 20 years since the top rate of income tax was reduced to 40 per cent. As noted by Saez, "in contrast to the United States ... the increase in top share has been relatively smooth since 1979 with no break around the tax changes" (2004, page 33).

As these latter cases bring out, a key element in assessing the effect of taxation concerns the *timing* of the impact. Is the current income share a function of the current tax rate or of the past tax rates? The answer depends on how we envisage the underlying behavioural model. The models used by Saez (2004) to examine the relation between marginal tax rates and reported incomes are based on current tax rates. In Chapter 10, Alvaredo and Saez examine the response of business organisation to taxation using a model that relates current incomes to current tax rates. On the other hand, models of wealth accumulation typically treat the *change* in wealth as a

function of the current tax rate. In this case, the present top income shares may reflect a weighted average of past tax rates. Piketty (2001 and 2003) provides numerical simulations with a fixed saving rate model, which indicate that substantial capital taxes are a serious obstacle to the recovery of wealth holdings from negative shocks, and that the barriers would be further raised if the reduction in the rate of return were to reduce the propensity to save.

Summary

We have sketched in this section some of the major mechanisms influencing the development of top income shares. Understanding the relative importance of these different factors is important in the design of public policy. Concern about the rise in top shares in a number of countries has led to a range of proposals. Some countries have already announced increases in top income tax rates; others are considering limits on remuneration. These are being implemented at a time of recession, which may too lead to a decline in top shares.

13.6 ENVOI

The subtitle of this volume – A Global Perspective – is an exaggeration. Major countries are missing, such as Brazil and Russia; we have no evidence for Africa and Latin America is represented only by Argentina. At the same time, the 22 countries covered in the two volumes contain more than half (54 per cent) of the world's population. Our data cover much of the twentieth century, including the Great Depression, the Golden Age, and the

Roaring Nineties. In some cases, the data reach back before the First World War and into the nineteenth century. We hope that the data will provide a rich source for future researchers.

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Figure 13.1 Coverage of countries and years

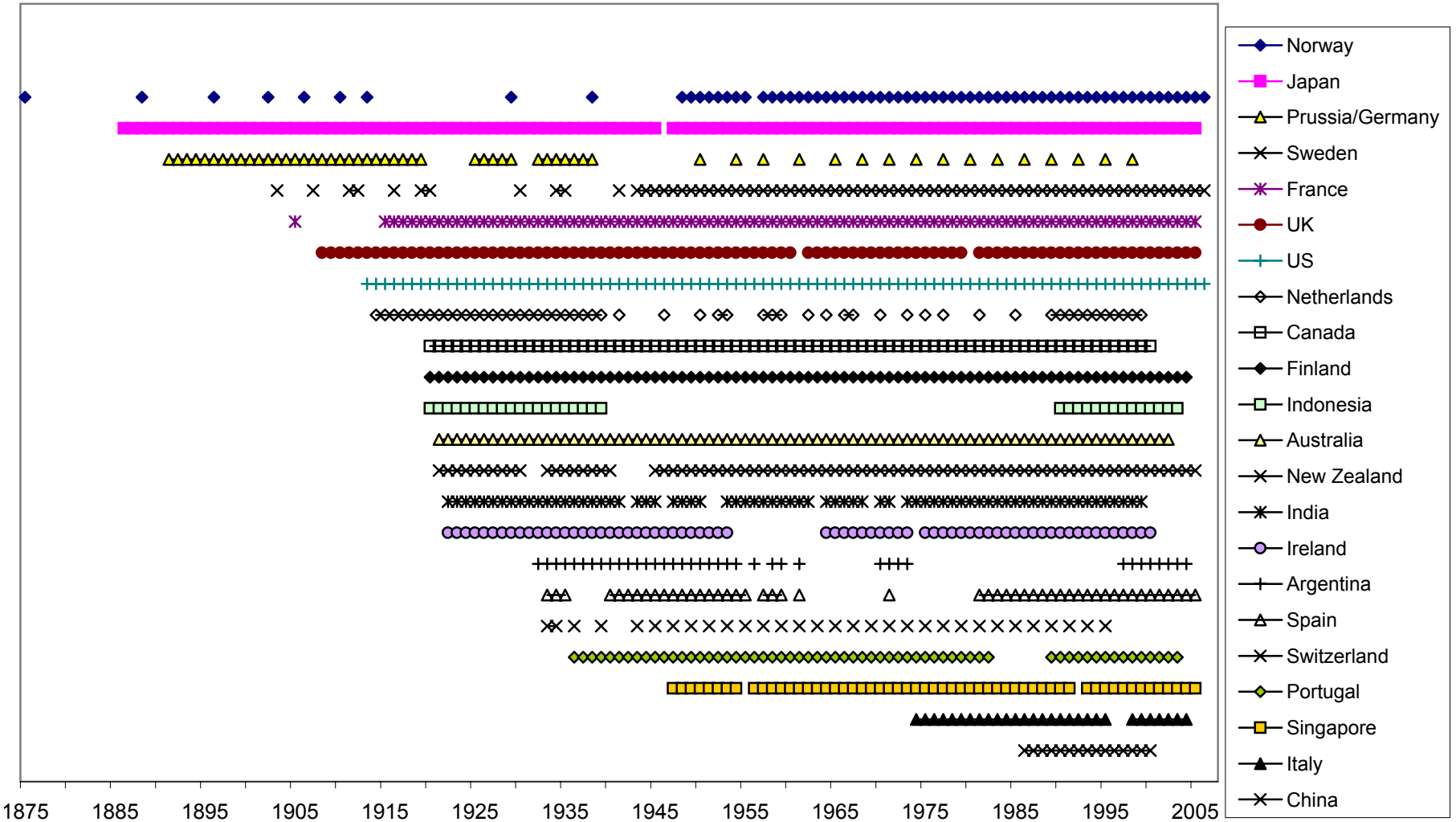

Figure 13.2 Effect of capital gains on share of top 1 per cent

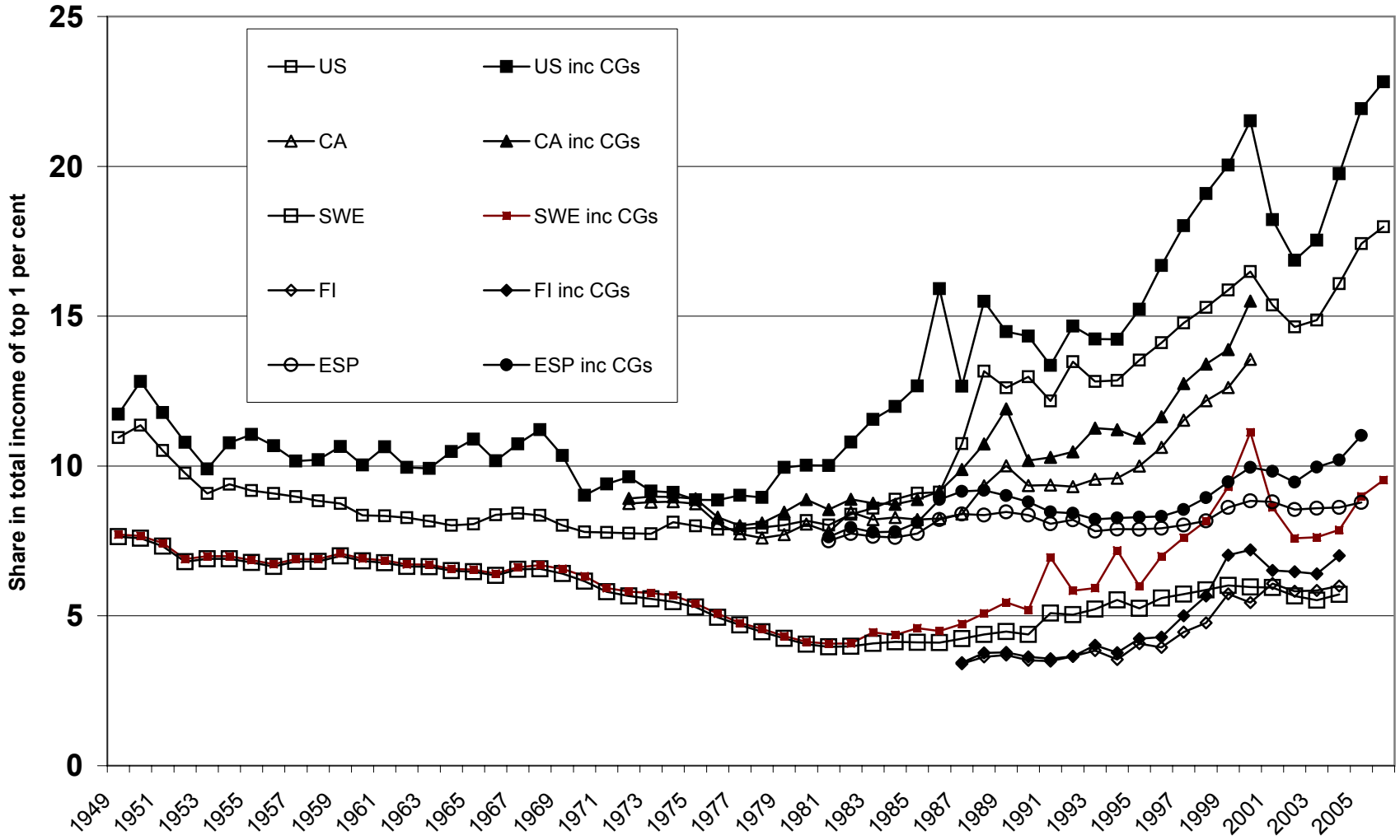

Table 13.1 Comparative top income shares

	Around 1949			Around 2005		
	share of top 1%	share of top 0.1%	β coefficient	share of top 1%	share of top 0.1%	β coefficient
Indonesia	19.87	7.03	2.22		1.34	2.94
Argentina	19.34	7.87	2.56	16.75	7.02	2.65
Ireland	12.92	4.00	1.96	10.30		2.00
Netherlands	12.05	3.80	2.00	5.38	1.08	1.43
India	12.00	5.24	2.78	8.95	3.64	2.56
Germany	11.60	3.90	2.11	11.10	4.40	2.49
United Kingdom	11.47	3.45	1.92	14.25	5.19	2.28
Australia	11.26	3.31	1.88	8.79	2.68	1.94
United States	10.95	3.34	1.94	17.42	7.70	2.82
Canada	10.69	2.91	1.77	13.56	5.23	2.42
Singapore	10.38	3.24	1.98	13.28	4.29	2.04
New Zealand	9.98	2.42	1.63	8.76	2.51	1.84
Switzerland	9.88	3.23	2.06	7.76	2.67	2.16
France	9.01	2.61	1.86	8.20	2.19	1.74
Norway	8.88	2.74	1.96	11.82	5.59	3.08
Japan	7.89	1.82	1.57	9.20	2.40	1.71
Finland	7.71		1.63	7.08	2.65	2.34
Sweden	7.64	1.96	1.69	6.28	1.91	1.93
Spain			1.99	8.79	2.62	1.90
Portugal		3.57	1.94	9.13	2.26	1.65
Italy				9.03	2.55	1.82
China				5.87	1.20	1.45

Notes:(1) 1939 for Indonesia, 1943 for Ireland,
1950 for Germany and the Netherlands, 1954 for Spain

(2) 1995 for Switzerland, 1998 for Germany, 1999 for Netherlands, 1999-2000 for India
2000 for Canada and Ireland, 2002 for Australia, 2003 for Indonesia and Portugal
2004 for Argentina, Italy, Norway and Sweden

(3) β coefficients are calculated using share of top 0.1% in top 1% (see Tables 13A.23 and 13A.24), with the following exceptions:
(i) β coefficient for Finland in 1949 calculated using share of top 1% in top 5%
(ii) β coefficient for Spain in 1949 calculated using share of top 0.01% in top 0.05%
(iii) β coefficient for Portugal in 1949 calculated using share of top 0.01% in top 0.1%
(iv) β coefficient for Ireland in 2000 calculated using share of top 0.5% in top 1%
(v) β coefficient for Indonesia in 2003 calculated using share of top 0.01% in top 0.1%

Table 13.1B: Pareto-Lorenz α coefficients vs. inverted-Pareto-Lorenz β coefficients

α	β = α/(α-1)	β	α = β/(β-1)
1.10	11.00	1.50	3.00
1.30	4.33	1.60	2.67
1.50	3.00	1.70	2.43
1.70	2.43	1.80	2.25
1.90	2.11	1.90	2.11
2.00	2.00	2.00	2.00
2.10	1.91	2.10	1.91
2.30	1.77	2.20	1.83
2.50	1.67	2.30	1.77
3.00	1.50	2.40	1.71
4.00	1.33	2.50	1.67
5.00	1.25	3.00	1.50
10.00	1.11	3.50	1.40

Notes: (i) The "α" coefficient is the standard Pareto-Lorenz coefficient commonly used in power-law distribution formulas: $1-F(y) = (A/y)^{\alpha}$ and $f(y) = \alpha A^{\alpha}/y^{1+\alpha}$ ($A>0$, $\alpha>1$, $f(y)$ = density function, $F(y)$ = distribution function, $1-F(y)$ = proportion of population with income above y). A higher coefficient α means a faster convergence of the density towards zero, i.e. a less fat upper tail.
(ii) The "β" coefficient is defined as the ratio $y^*(y)/y$, i.e. the ratio between the average income $y^*(y)$ of individuals with income above threshold y and the threshold y. The characteristic property of power laws is that this ratio is a constant, i.e. does not depend on the threshold y. Simple computations show that $\beta = y^*(y)/y = \alpha/(\alpha-1)$, and conversely $\alpha = \beta/(\beta-1)$.

Table 13.2 Summary of changes in shares of top 1 per cent and 0.1 per cent between 1949 and 2005

Country	Share of top 1 per cent	Share of top 0.1 per cent
France	No change. Rose 1 point between 1998 and 2005.	Fell 1 point between 1949 and early 1980s. Rose 0.4 point between 1998 andf 2005.
UK	Fell 6; rose 7½ points.	Fell 2; rose 3 points.
US	Fell 3; rose 10 points.	Fell 1; rose 6 points.
Canada	Fell 3; rose 6 points (up to 2000).	Fell 1; rose 3½ points (up to 2000).
Australia	Fell 7; rose 4 points.	Fell 2; rose 1½ points.
New`Zealand	Fell 3; rose 4 points.	Fell 1; rose 1½ points.
Germany	No sustained change.	No sustained change.
Netherlands	Fell 6½ points (up to 1999).	Fell 3 points (up to 1999).
Switzerland	No sustained change.	No sustained change.
India	Fell 7½; rose 4½ points (up to 1999).	Fell 4; rose 2½ points (up to 1999).
Japan	No sustained change up to 1999; rose 1½ points between 1999 and 2005.	No sustained change up to 1999; rose ¾ point between 1999 and 2005.
Singapore	No sustained change from 1960 to 1998; rose 2 points between 1998 and 2005.	No sustained change from 1960 to 1990s; rose 2 points between 1990s and 2005.
Argentina	Fell 12; rose 4 points.	Fell 5½; rose 3 points.
Sweden	Fell 3½; rose 2 points.	Fell 1¼; rose 1¼ points.
Finland	Rose 2 points up to early 1960s; fell 6 points; rose 3½ points.	
Norway	Fell 4½; rose 8 points.	Fell 1¾; rose 4½ points.

Notes
(1) "No change" means change less than 2 percentage points for top 1 per cent; less than 0.65 percentage point for top 0.1 per cent.

(2) Data coverage incomplete for part of the period for Argentina

Figure 13.3. Inverted-Pareto-Lorenz β coefficients, 1949-2005: "flat" countries

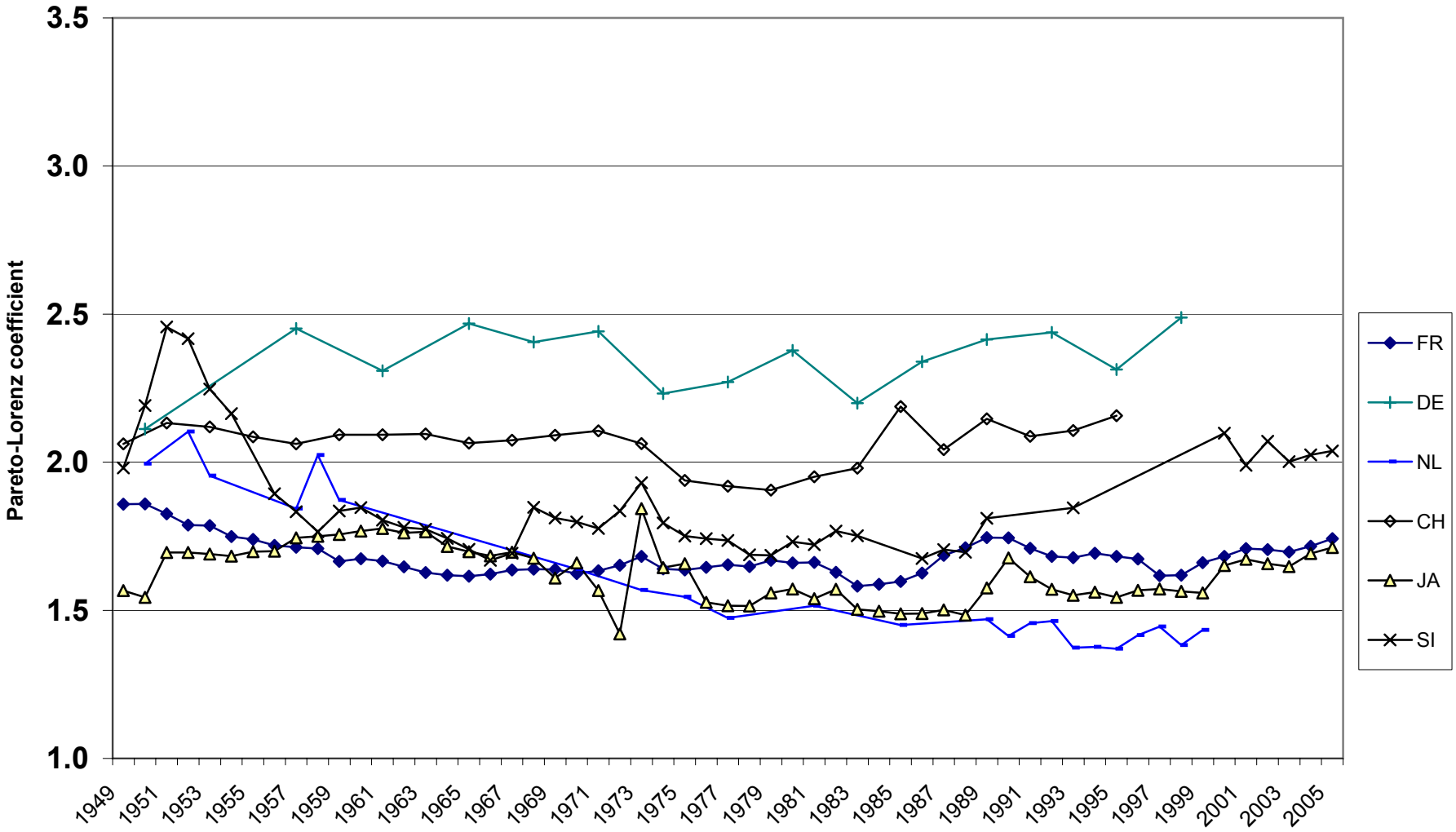

Figure 13.4. Inverted-Pareto-Lorenz β coefficients, 1949-2005: U-shaped countries

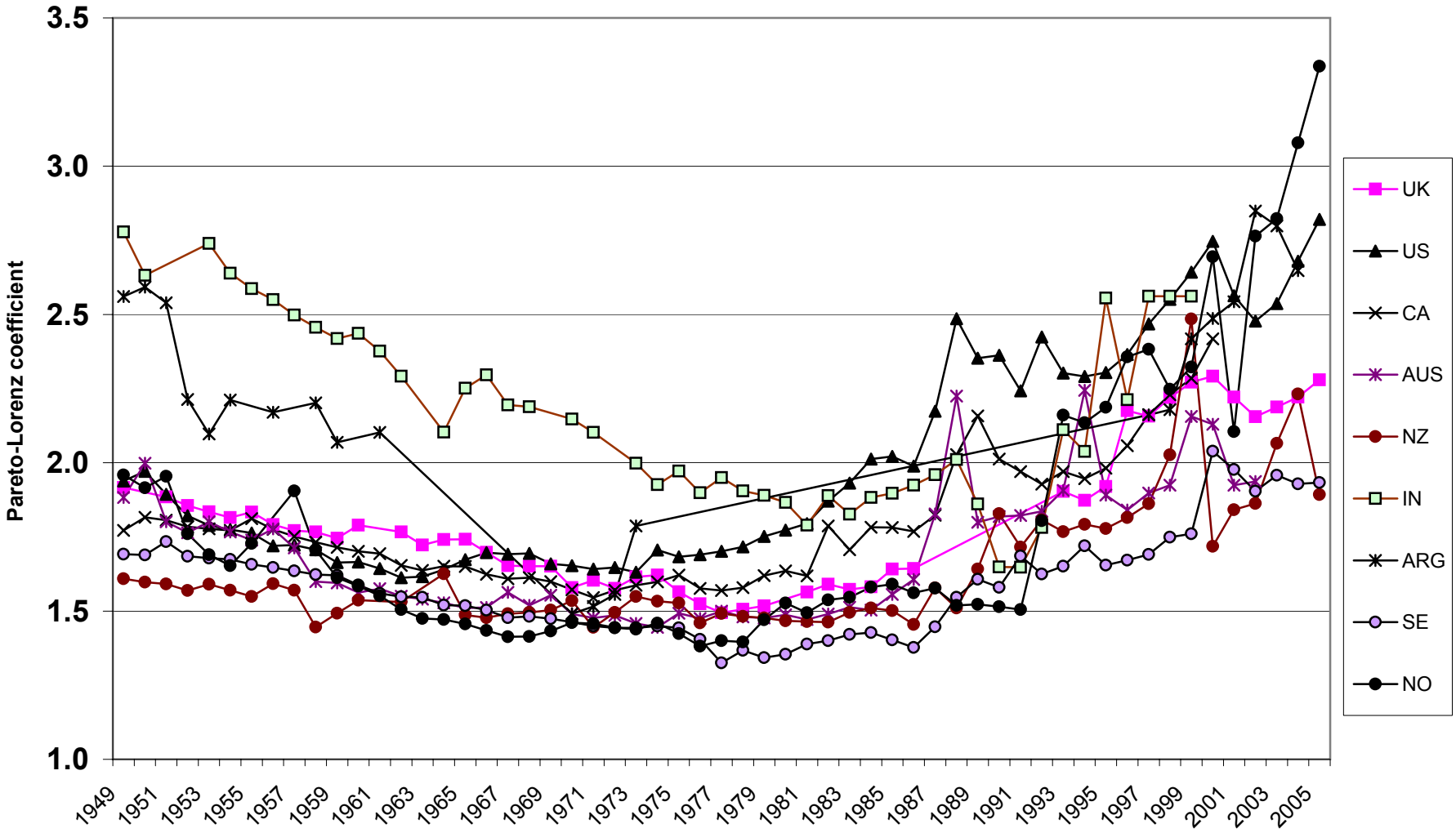

Table 13.3 Summary of changes in shares of top 1 per cent and 0.1 per cent before 1949

Country	*Share of top 1 per cent*	*Share of top 0.1 per cent*
France		
	1928-31: lose 2 points	1928-31: lose a fifth
	WW2: lose 4 points	WW2: halved
	1949 = half of 1914	1949 = a third of 1919
UK		
	-	WW1: lose a fifth
	-	1928-31: lose a fifth
	-	WW2: lose 30 per cent
	1949 = half of 1914	1949 = 40 per cent of 1919
		Pre-WW1: no obvious trend
US	WW1: lose 3 points	WW1: lose a third
	1928-31: lose 4 points	1928-31: lose a third
	WW2: lose 3 points	WW2: lose a third
	1949 = 70 per cent of 1919	1949 = half of 1919
Canada		
	1928-31: gain 1 point	1928-31: no change
	WW2: lose 6 points	WW2: halved
	1949 = ¾ of 1920	1949 = half of 1920
Australia		
	1928-31: lose 2½ points	1928-31: lose a quarter
	WW2: lose 1 point	WW2: lose a quarter
	1949 same as 1921	1949 = 85 per cent of 1921
New`Zealand		
	1928-30: lose 1 point	1928-30: lose a fifth
	WW2: lose 2 points	WW2: lose a quarter
	1949 = ⅔ of 1921	1949 = half of 1921
Germany		
	1928-32: no change	1928-32: no change
	1933-38: gain 5 points	1933-38: gain 3 points
	1950 = ⅔ of 1938	1950 = half of 1938
	Prussia: 1914 unchanged relative to 1881	*Prussia: 1914 unchanged relative to 1881*
	(Germany 1925 = 60% of Prussia 1914)	*(Germany 1925 = half of Prussia 1914)*
Netherlands		
	WW1: gain 3 points	WW1: gain a quarter
	1928-32: lose 4 points	1928-32: lose a third
	WW2: lose 5 points	WW2: lose a third
	1950 = 60 per cent of 1914	1950 = 45 per cent of 1914
Switzerland		
	WW2: lose 1 point	WW2: lose a fifth

	1949 is unchanged relative to 1933	1949 is unchanged relative to 1933
Ireland		
		28-32: gain 40 per cent WW2: lose a fifth 1949 same as 1922
India		
	28-31: gain 2 points WW2: lose 5 points 1949 is unchanged relative to 1922	28-31: gain a fifth WW2: lose a quarter 1949 is unchanged relative to 1922
Japan		
	WW1: lose 3 points 28-31: lose 1 point WW2: lose 9 points 1949 = 40 per cent of 1914 *1914 is unchanged relative to 1886*	WW1: lose a tenth 28-31: lose a tenth WW2: lose two-thirds 1949 = quarter of 1914 *1914 is unchanged relative to 1886*
Indonesia		
	28-32: gain 5 points 1939 = 8 points higher than 1921	28-32: gain 15 per cent 1939 = quarter higher than 1921
Argentina		
	WW2: gain of 2 points 1949 is unchanged relative to 1932	WW2: gain of fifth 1949 is unchanged relative to 1932
Sweden		
	1949 is a third of 1912 *1912 = ¾ of 1903*	1949 is a fifth of 1912 *1912 unchanged relative to 1903*
Finland		
	28-30: no change WW2: loss of 5 points 1949 = half 1920	
Norway		
	WW2: lose 4 points 1949 = ¾ of 1913 *1913 = ⅔ of 1875*	WW2: lose 40 per cent
Spain		
		1949 = 60 per cent of 1933
Portugal		
		1949 = ⅔ of 1936

Notes
(1) WW1 denotes the First World War; WW2 denotes the Second World War
(2) "No change" means change less than 2 percentage points for top 1 per cent; less than 0.65 percentage point for top 0.1 per cent.

(2) Data coverage incomplete for part of the period for Argentina

Table 13.4 Summary of changes in shares of top "next 4 per cent" and "second vintile"

Country	*"Next 4 per cent"*		*"Second vintile"*		*Text comments*
France					
	1919	14.3	1919	8.4	
	1949	12.7	1949	10.5	"The secular decline of the top decile income share is almost
	2005	13.0	2005	11.0	entirely due to very high incomes" (Vol 1, 48).
UK					
	1919	11.9	1919	7.2	
	1949	11.9	1949	8.9	"The highlights the 'localised nature of redistribution'" (Vol 1,
	1978	11.4	1978	10.7	96).
	2005	14.5	2005	11.2	
US					
	1919	13.5	1919	10.2	The next 4% and the second vintile "account for a relatively
	1949	12.5	1949	10.3	small fraction of the total fluctuation of the top decile income
	2005	15.2	2005	11.8	share" (Vol 1, 146).
Canada					
	1920	18.2			
	1949	14.7	1949	12.8	The "upturn during the last two decades is concentrated in the
	2000	15.4	2000	13.3	top percentile" (Vol 1, 232).
Australia					
	1921	7.8			
	1949	12.4	1949	9.1	After 1958, "the downward trend continued for the next 4% but
	2002	11.2	2002	10.4	not for the second vintile" (Vol 1, 320).
New`Zealand					
	1921	14.1			
	1949	12.3	1949	9.2	After 1953, "the share of the [second] vintile was not much
	2005	12.7	2005	10.8	reduced" (Vol 1, 343).
Germany					
	1950	13.3	1950	9.5	*"The bottom part of the top decile does not exhibit the same*
	1998	13.1	1998	11.2	*stability as the upper part. … From the early 1960s … the share of the bottom 9% of the top decile has been constantly growing" (Vol 1, 377).*

Netherlands					
	1919	15.7	1919	10.1	"Most of the inter-war decline of the top 10% is restricted to the
	1950	14.1	1950	10.6	top 1%, while its post-war decline is broader and covers the
	1999	11.7	1999	11.0	upper vintile as a whole" (Vol 1, 444).
Switzerland					
	1949	12.3	1949	10.1	
	1995	11.5	1995	9.9	"The two bottom groups [the next 4% and the second vintile] are remarkably stable over the period" (Vol 1, 488).
Ireland					
(next 9%)	1943	30.3		-	"a much sharper rise [from 1990 to 2000] the higher one goes
	2000	25.8		-	up the distribution" (Vol 1, 515).
China					
	1986	7.2	1986	7.6	
	2003	11.9	2003	10.2	"the rise in income inequality was so much concentrated within top incomes in both countries [China and India]" (xxx).
Japan					
	1919	9.6		-	*"the income de-concentration phenomenon that took place*
	1949	13.8		-	*during the Second World War was limited to within the top 1%*
	2005	16.1		-	*…[From 1992 to 2005 there has been] a sharp increase [in the share of the next 4%]" (xxx).*
Singapore					
	1974	12.3	1974	7.9	*"Over a thirty year period there was broad stability of the very*
	2005	14.6	2005	9.5	*top income shares. Ar the same time there was some change lower down the distribution" (xxx).*
Sweden					
	1919	14.9	1919	10.7	"Looking first at the decline over the first eighty years of the
	1949	12.3	1949	10.5	century, we see that virtually all of the fall in the top decile
	2005	11.1	2005	9.6	income share is due to a decrease in the very top of the distribution. The income share for the lower half of the top decile (P90–95) has been remarkably stable" (xxx).
Finland					
	1920	18.3		-	"Compared with top one per cent group, the income shares of

	1949	13.0		-	percentile groups within the rest of the 10 per cent has risen relatively modestly over the last ten years".(xxx)
	1992	12.1		-	
	1965	10.7	1965	9.8	
	2004	9.5	2004	8.7	
Norway					
	1913	12.4	1913	9.3	"Whereas the share of the top 1 per cent rose by some 7 percentage points between 1991 and 2004, the share of the next 4 per cent increased by only about 2 percentage points, and there was virtually no rise in the share of those in the [second vintile]" (xxx).
	1949	13.2	1949	11.9	
	2005	11.3	2005	9.4	
Spain					
	1981	13.6	1981	11.5	"the increase in income concentration which took place in Spain since 1981 has been a phenomenon concentrated within the top 1% of the distribution" (xxx).
	2005	13.4	2005	11.0	
Portugal					
	1976	13.2	1976	10.6	*"in Portugal, all groups within the top decile display important increases" (xxx).*
	2003	15.6	2003	11.7	
Italy					
	1974	12.4	1974	10.6	"the increase in income concentration which took place in Italy since the mid 1980s has been a phenomenon happening within the top 5% of the distribution" (xxx).
	2004	12.3	2004	10.3	

Figure 13.5. Top 1% income shares, 1900-2005: L-shaped countries

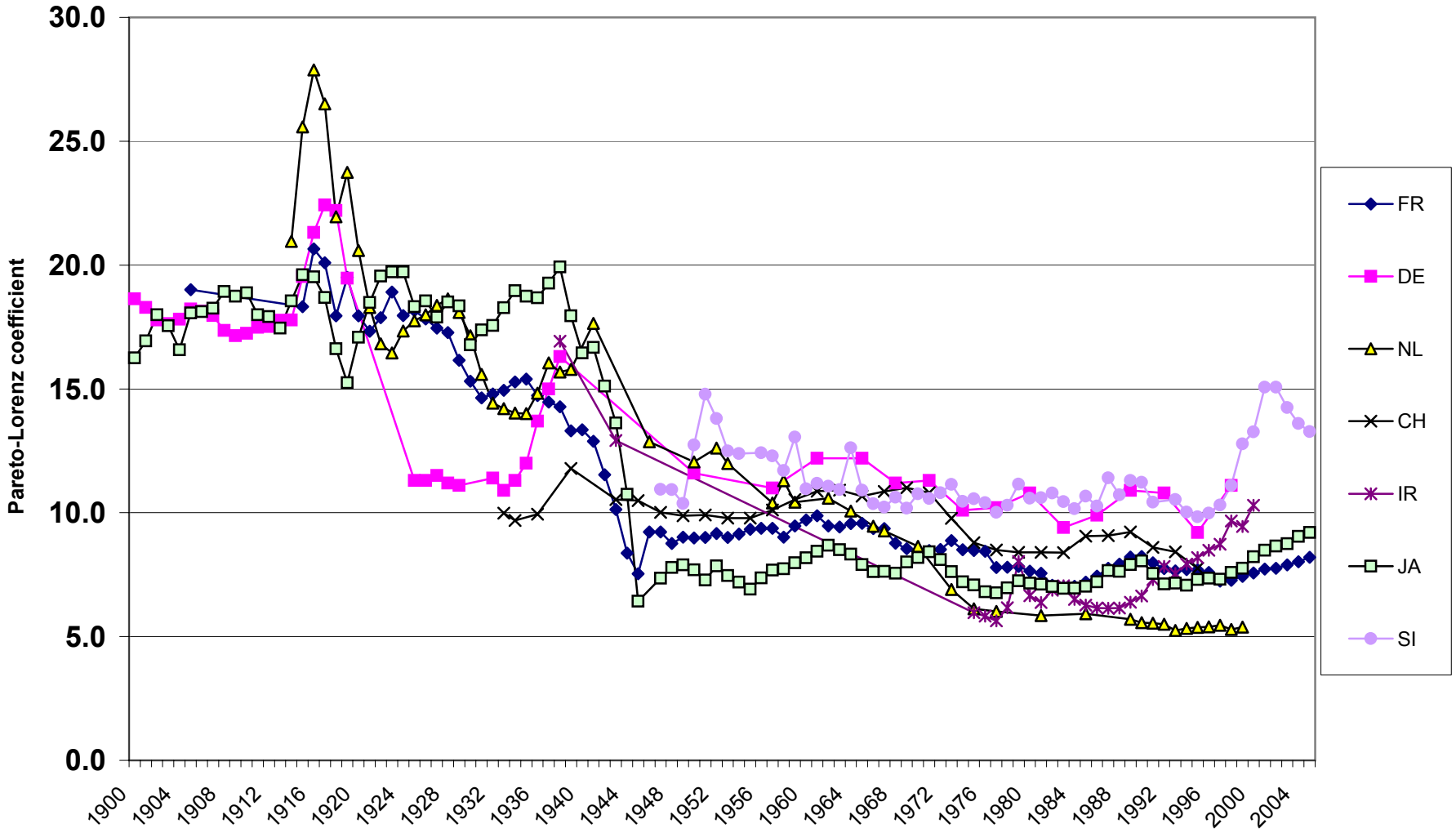

Figure 13.6. Inverted-Pareto-Lorenz β coefficients, 1900-2005: L-shaped countries

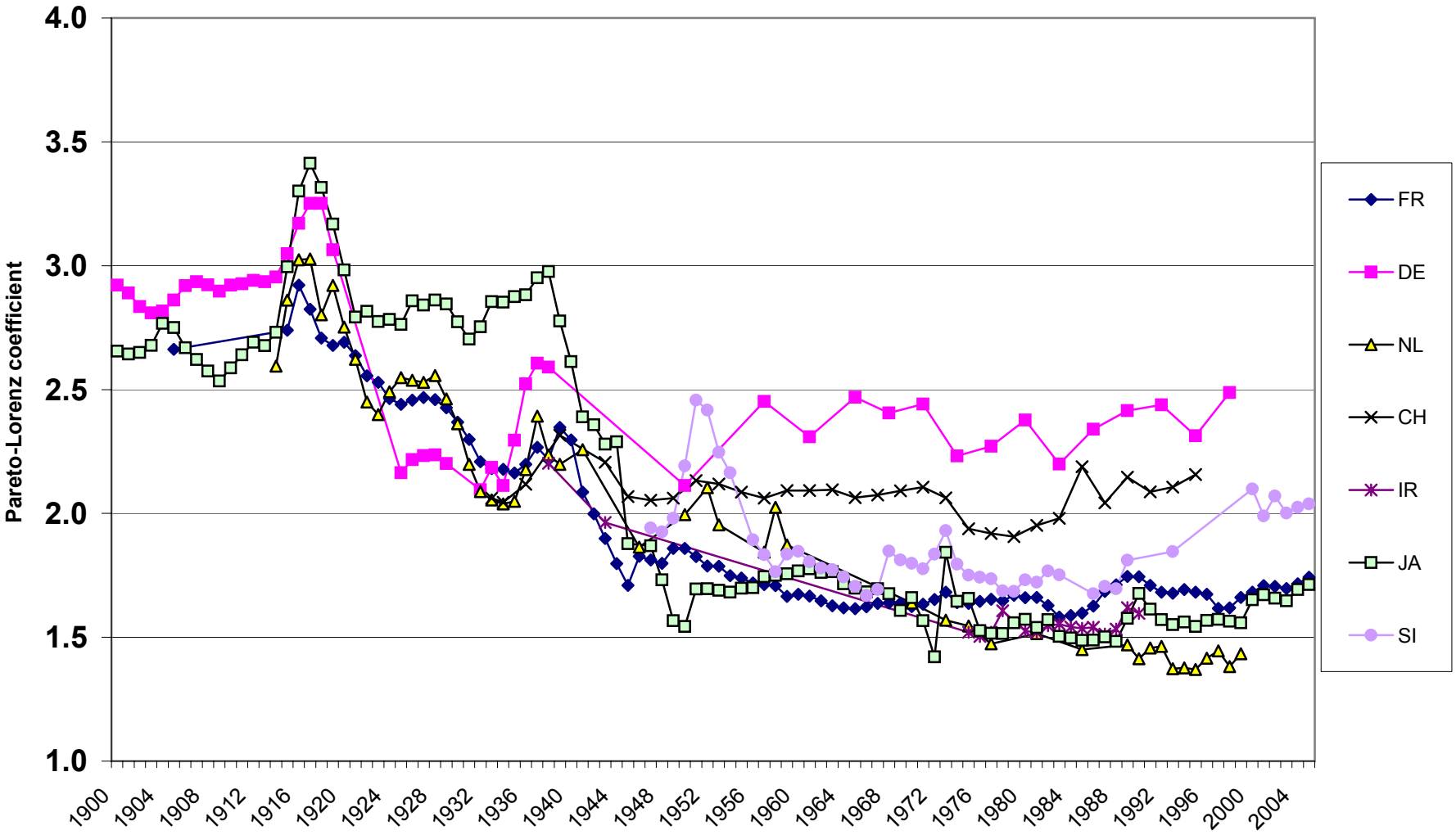

Figure 13.7. Top 1% income shares, 1900-2005: U-shaped countries

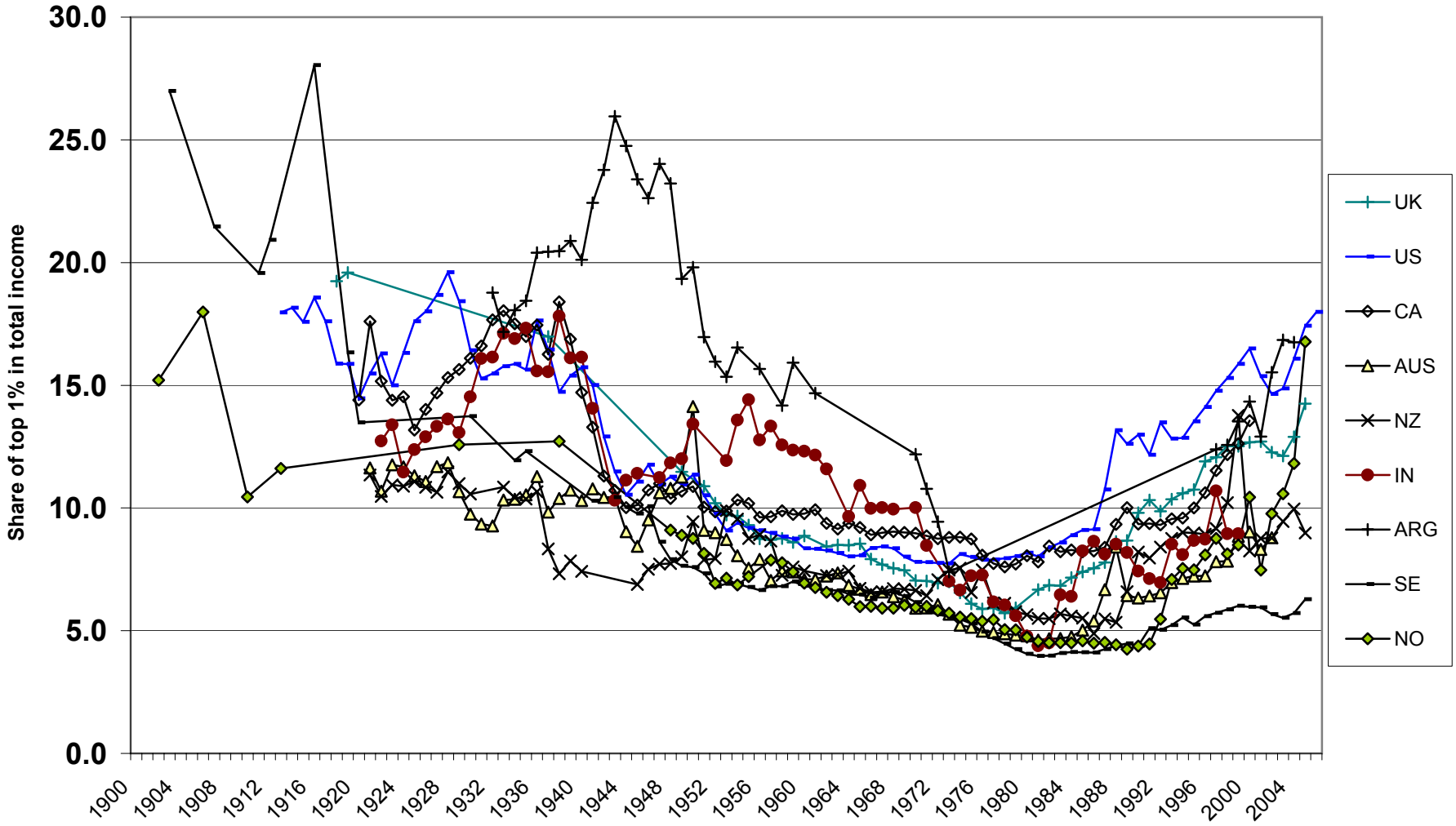

Figure 13.8. Inverted-Pareto-Lorenz β coefficients, 1900-2005: U-shaped countries