7

Top Incomes in Sweden over the Twentieth Century

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7.1 INTRODUCTION

The evolution of income inequality across different economic systems has received enormous attention. A key issue in the literature has been the possible trade-offs between egalitarian ambitions and incentive effects. It is not surprising, therefore, that Sweden, thanks to its tradition as an egalitarian society, has attracted disproportionate interest from inequality scholars. However, two important aspects have largely been overlooked. First, the lack of available micro-data has led to most studies not going further back than to 1968.[1] The lack of homogeneous, long-run series means that we cannot really put the developments over the past decades in historical perspective. We do not know, for example, to what extent the equal distribution of income in Sweden is mainly the outcome of the growth of the welfare state, or if Sweden perhaps has a history of being an egalitarian society. Second, the focus on welfare issues has resulted in most studies concentrating on general measures of the distribution, such as the Gini coefficient, or on the lower parts of it, but no attention has been paid to details of top incomes. This is potentially problematic as detailed knowledge about the top of

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[1] See Lindbeck (1997) for an overview of the Swedish welfare state; Gottschalk and Smeeding (1997) for Swedish income distribution in international perspective; and e.g. Björklund and Freeman (2006) for a recent overview of income equalization in Sweden. Examples of studies of income distribution before 1968 include Björklund and Palme (2000) who study the Swedish income distribution on decile level for four years between 1951 and 1973; Spånt's (1979) study of Census data for the period 1920–76, Lydall's (1968) for the period 1920–60; Gustafsson and Johansson (2003) who study tax returns for five separate years during the period 1925–58 (restricted to people living in the city of Gothenburg); Söderberg (1991) who studies salaries in various sectors between 1870 and 1950; Lindstrand (1949) studies the period 1935–47 and Quensel (1944) the period 1930–41, both using tax return data, etc. Bentzel's (1953) study of the period 1930–48 is closest to ours in methodology.

the distribution may be crucial for distinguishing between different explanations of what drives inequality (or the lack of it). For example, to differentiate between theories which, on the one hand, focus on changes in the relative wages of skilled and unskilled workers and, on the other hand, theories that stress the importance of savings and capital formation, we must have details about top incomes.

This chapter addresses these two shortcomings by providing new homogeneous series on top income shares in Sweden, starting at the time of the introduction of the modern tax system in 1902 and until today. We also propose ways of explaining these developments. In 1902 Sweden was largely agrarian, had not yet extended the franchise to all male citizens, and was still half a century away from the expansion of the welfare state. Our series, hence, allow us to study changes in income concentration over a period during which Swedish society has undergone major structural change and also allow us to add the historical perspective on income inequality in Sweden which previously has not been available. The fact that we can decompose income shares with respect to the source of income, as well as study smaller fractiles within the top of the distribution (from the top 10 per cent to the top 0.01 per cent), enables us to discriminate between the possible economic mechanisms that could explain our findings. As changes in wealth concentration and in particular wealth distribution by income class are important for understanding changes in top income shares we provide new series for these developments over the twentieth century.

This study can, of course, also be seen as a contribution to the recent work on long-run income inequality in which series of income concentration have been constructed using a common methodology.[2] These studies have given numerous new insights to changes in income concentration and in particular noted common developments for Anglo-Saxon countries, on the one hand, and continental European countries, on the other. As our study is concerned with one of the extremes of what Esping-Andersen (1990) denotes 'the different worlds of welfare capitalism', namely the *social democratic welfare state*, it is particularly interesting to compare our findings to the previous work.[3] It turns out that Sweden is indeed different from both the Anglo-Saxon as well as the continental European group of countries, although not entirely in ways which may have been expected.

[2] Following the first studies by Piketty (2001a, 2003) on France, Piketty and Saez (2003) on the USA, and Atkinson on the UK (2004), other recent studies include Australia (Atkinson and Leigh 2007a), Canada (Saez and Veall 2005), Germany (Dell 2005), Ireland (Nolan 2007), Japan (Moriguchi and Saez 2006), the Netherlands (Atkinson and Salverda 2005), New Zealand (Atkinson and Leigh 2007b), Spain (Alvaredo and Saez, Chapter 10 in this volume) and Switzerland (Dell, Piketty, and Saez 2007). Atkinson and Piketty (2007) collect much of this work. Lindert (2000) and Morrisson (2000) provide surveys of previous studies on long-run inequality developments.

[3] In his distinction between 'The Three Worlds of Welfare Capitalism', Esping-Andersen (1990) identifies three different types of welfare states; 'liberal welfare states' (e.g., the USA and the UK), the 'corporatist-conservative welfare states' (e.g., France, Germany, Italy), and the 'social democratic welfare states'. A similar distinction is often made between an Anglo-Saxon, a continental European, and a Scandinavian group of countries; see, e.g., Lindbeck (2006).

A number of broad facts stand out from our series. Over the first eighty years of the twentieth century top income shares in Sweden decreased. Most of this decrease happened during the first half of the century, that is, before the expansion of the welfare state, and most of it was due to large falls in the income share of the top percentile (P99–100). By contrast, the income share going to the lower half of the top decile (P90–P95), which consists mainly of wages, has been remarkably stable over the entire period. Between 1903 and 2006 this share has fluctuated between 9 and 11 per cent, while the top percentile has changed by a factor of four. This suggests that decomposing the top decile into smaller fractions is crucial for understanding the development. In terms of composition, most of the early decrease seems to have been driven by falls in capital income, but after around the mid 1930s wage compression also becomes important in explaining the decreasing top shares. The drops in capital shares fit well with sharp decreases in top wealth shares during the first half of the century, in particular in the early 1930s, but notably not during the Second World War, as was the case in many other countries. Between 1950 and 1980 the continued decrease in inequality was quite steady but smaller relative to the first half of the century. Over the past two decades the general picture turns out to depend crucially on how income from capital gains is treated.[4] If we include capital gains, Swedish income inequality has increased quite substantially; when excluding them, top income shares have increased much less. This indicates that while labour incomes have not diverged dramatically over the past decades, the gains from exceptionally large increases in asset prices (mainly increases in share prices) have been very unevenly distributed.[5] This, in turn, suggests that the Swedish case over the past decades is different from both the Anglo-Saxon case as well as from the continental European case previously identified in the literature.[6]

The remainder of the chapter is organized as follows: in section 7.2 we discuss the data and methodology used, in section 7.3 we present our main findings under four sub-headings; first we account for the evolution of top income shares in terms of gross income from all sources (separating series including and excluding capital gains), second we study the composition of these shares by source, third we analyse the effect of potential tax avoidance and evasion on our series, and fourth we study separate top income series when excluding taxable transfers giving us an income concept closer to market income.[7] Thereafter we

[4] It is important to note that throughout the chapter, whenever we refer to capital gains income, this means *realized* capital gains, which is what the tax data allow us to measure. In section 7.3 below we discuss possible implications of this distinction in more detail.

[5] Our data suggest that these capital gains have accrued to those who also have the highest wages, hence magnifying inequalities in the income distribution.

[6] See, e.g., Saez (2004) and Piketty and Saez (2006) for cross-country comparisons.

[7] For most other countries this distinction is not very important when studying top incomes, but in the Swedish context (taxable) social transfers are sufficiently large to have an effect on the top income shares, even if they do not make up any large part of top incomes, as including them affects the reference total for income (see, for example, Björklund and Freeman 2006 on the importance of transfers for income distribution in Sweden).

attempt to account for our results in section 7.4 by studying changes in factor shares, the wealth distribution, tax progressivity, and changes in asset prices. In section 7.5 we highlight differences and similarities in our results for Sweden with the findings in a number of other countries for which comparable data exist. Section 7.6 concludes. A number of appendices contain detailed information about data and various adjustments as well as sensitivity analysis of our main series.

7.2 METHODOLOGY AND DATA

In recent years, a methodology for studying income concentration using long time series of tax return data has been established following Piketty (2001a), who in turn builds on the seminal work by Kuznets (1953). The basic idea is to construct shares of total personal income received by different fractiles of the entire (tax) population, had everyone been required to file a tax return. Since historically only top income earners were taxed they are the only ones directly observed over the entire period. This in turn means that the reference totals for population and income, which are aimed at also including individuals who did not file a tax return and their incomes, must be constructed using aggregate sources from the population statistics and National Accounts. Top income shares are then computed by dividing the number of tax units in the top, and their incomes, by the reference tax population and reference total income.[8] Assuming that top incomes are approximately Pareto distributed, standard inter- and extrapolation techniques can be used to calculate the income shares for various top fractiles, such as the top 10 per cent (P90–100) or the top 0.01 per cent (P99.99–100).

Our data on income distribution come mainly from the income statistics published yearly by Statistics Sweden starting in 1943, and for the period before that from scattered public investigations.[9] These sources generally provide tabulations of

[8] There are, of course, a number of potential problems with using tax statistics data; they are collected as part of an administrative routine in which individuals have incentives to under-report income, they tell us nothing per se about the welfare of individuals, etc. Nevertheless, as long as we think that tax statistics, at least for the top income earners, approximate actual incomes, and as long as the problems with the statistics have not changed systematically over time, they are a useful source. Importantly, this is also the only available source for much of the twentieth century. Our general view in the case of Sweden is that the administrative process has, compared to most countries, been very thorough and Swedish tax data are quite reliable, at least for high-income groups. The estimates of tax avoidance and evasion that we have found suggest that the levels have not changed in any systematic way over the century (see further section 7.3 below).

[9] Data come from the Ministry of Finance in 1903 (only the very top), 1907, 1911, 1912, 1916, 1919, 1920, 1934, and 1941 and Statistics Sweden in the Censuses (*Folkräkningen*) of 1920, 1930, 1935, 1945, and 1950, and its annual publication of tax-based income statistics (*Skattetaxeringarna* and later titles) published from 1943 onwards (see Appendix 7A for a listing of these sources).

the number of taxpayers and their total assessed income for a large number of income brackets. Typically, these tables also include information on the different sources of income (e.g., wages and capital income), tax liabilities, and even data on net personal wealth in different income classes for some years.[10] To make these data comparable over time, a number of adjustments have been made as described in more detail in Table 7.1. Our preferred concept of income is *total (gross) income*, defined as income from all sources before taxes and transfers, but deducting deficits at source (mainly interest payments). Capital gains are included in this concept, but the structure of the data allows us to subtract them and construct series both with and without capital gains.[11] One specific aspect of the Swedish income statistics is that after 1974, new laws made several transfer-like, non-market incomes, such as unemployment compensation, family allowances, and sick pay, fully taxable. In our main series we have added these components before 1974 so as to get a total income concept that corresponds to today's definition of total income, but we have also done the opposite, i.e., deducted these non-market incomes after 1973 to get series which are closer to *market income*.[12]

To calculate the reference totals for income there are basically two ways in which to proceed: either starting from the total income reported on tax returns and then adding items not included in the tax base as well as income estimates of individuals not filing taxes (not including children), or starting from the National Accounts item 'Total Personal Sector Income' from which (estimates of) all that is not included in the preferred definition of income can be deducted. Thanks to the relative richness of Swedish historical tax data and National Accounts, we have been able to calculate our reference total for income in a number of ways and our final preferred series combine both ways of constructing the reference total for income.[13] When creating a series for the reference tax population, we must incorporate the fact that the Swedish tax law, and income statistics, changed

[10] Between 1910 and 1948 Sweden had a peculiar kind of wealth tax, which operated through an addition of a fraction (1/60 until 1938, thereafter 1/100) of taxable wealth to total income to get 'taxable income'. This creates problems in terms of having to adjust tax data to get actual incomes (without the wealth shares) but it also means that information on wealth distribution by income class is available.

[11] Data on taxable capital gains are available in 1945, 1951, and annually from 1967. In 1945 and 1951, the capital gains shares are very low in all fractiles. We use the 1945 shares as estimates for all prior years (see Appendix 7B for more details).

[12] For some years we have direct observations on the size of transfers by income class and this data supports the assumption that these transfers constitute very small shares of total income in the top of the distribution.

[13] Our main sources for calculating the reference income total are the new National Accounts data for Sweden compiled by Edvinsson (2005) and Swedish tax statistics (*Skattetaxeringen till inkomst och förmögenhet,* various years). For details see Appendix 7A–C where we also show that our findings are robust to alternative specifications of this reference total.

Table 7.1 Definitions and adjustments of the income data and reference totals in Sweden

Income years	Income concept appearing in data sources [*Swedish term*]	Adjustments	Reference total income	Reference total population
1903–1910	Taxable income [*till statlig inkomstskatt taxerad inkomst*]. Bascially 'Total income'.	–	Share of 'total personal sector income' (from National accounts) adding estimates of items not included in the preferred definition (1903–1942)	
1911–1942	Taxable amount [*Taxerat belopp*] = Taxable income (see above) + Wealth share (share of taxable personal net wealth) –Some taxes.	Removal of wealth shares and after 1920 addition of some municipal taxes		Adult population (>15 yrs) minus married women (− 1950)
1943–1950		–	Tax statistics income plus estimates of non-taxed items included in preferred def. (mainly corrections for changed tax treatment of unemployment and sick pay insurance etc. before 1974) plus estimated incomes of 'non-filers' (1943–)	Adult population (>15 yrs) adj. for women being (partially) included in the income statistics (1951–1970)
1951–1970	Total income [*Sammanräknad nettoinkomst*] = Total (gross) income – Deficits at source	Age adjustment (excluding all <16 years old)		
1971–1990	Total (gross) income [*Sammanräknad inkomst*]	Subtracting deficits at source + Age adjustment		Adult population (>15 yrs) (1971–)
1991–2006	Total income [*Summa förvärvs- och kapitalinkomst*]	Age adjustment		

Note: All concepts are elaborated upon in Appendix 7A–C. No age-specific data were available for different income classes until 1951.

Table 7.2 Top income thresholds and average incomes in Sweden in 2004

Thres-hold	Income (incl. capital gains) in USD	Income (excl. capital gains) in USD	Fractiles	N tax units (individuals)	Ave. income (incl. capital gains) in USD	Ave. income (excl. capital gains) in USD
			Full tax pop.	7,395,545	27,875	26,801
P90	48,697	46,354	**P90–95**	369,777	55,021	51,625
P95	61,154	58,123	**P95–99**	295,822	72,943	73,665
P99	115,294	79,416	**P99–99.9**	66,560	156,915	118,619
P99.9	298,488	240,706	**P99.9–99.99**	6,656	497,511	344,027
P99.99	1,218,259	685,380	**P99.99–100**	740	3,336,038	1,554,507

Note: The calculations are based on income tax data, with income defined as total income (excluding and including capital gains, ranked in classes of total income *including* capital gains) before individual taxes expressed in 2004 USD converted from Swedish kronor (SEK) using the 2004 average exchange rate of 7.36SEK/USD.

from being household based to individual based between 1951 and 1971.[14] Our reference population total, hence, shifts from being the adult population (16 and above) minus married women, to the entire adult population (16 and above).[15] What effect this has on the top income shares is an open question. As shown by Atkinson and Leigh (2007b) it basically depends on how incomes were distributed among the married men and women.[16]

To get a sense of the size of the fractiles and what it takes in terms of income to be part of a particular income share today, Table 7.2 presents some descriptive statistics for 2004. As the incomes are highly dependent on whether capital gains are included or not we have included both in the table. The amounts have been converted into US-dollars using the average exchange rate in 2004.

7.3 THE BASIC FACTS

Figure 7.1 shows the evolution of the top decile income share in Sweden over the period 1903–2006. The broad trend is that this share has been divided by a factor of two over the first eighty years, from around 46 per cent of total income in the first years of the century, to 23 per cent in 1980. Approximately two-thirds of this decline took place before 1950, with large falls in the volatile years just after the two world wars. This means that most of the drop in pre-tax income inequality actually took place before the expansion of the welfare state. The decline thereafter is more stable with a new relatively sharp drop in the late 1960s and over the 1970s to a lowest point around 23 per cent in the early 1980s.[17] After the mid

[14] In 1951, the income statistics started being made based on a 10% individual sample (but with full coverage of high-income individuals) of the entire population, despite the fact that the in the tax laws the shift to independent taxation did not come until 1966, when married couples could decide whether they wanted to file jointly or not, and finally in 1971 when individual assessment were made compulsory.

[15] The main source for our reference population series are Statistics Sweden, Population Statistics (*SCB, Programmet för befolkningsstatistik*)—see Appendix 7C. The shift from household-based to independent taxation happened gradually between 1952 and 1970. We constructed a number of alternative reference totals to capture the possible variations across the different legal regimes, but found no significant effects on our basic findings. Moreover, we also changed the age cutoff of the adult population from 16 years to 20 years, which lowered top income shares by roughly 5% for the post-1951 period for which there are detailed age data.

[16] Using data on income distributions on both household (from public tax investigations) and individual (from censuses) for the years 1920, 1930, 1935, 1945, and 1950, we can get a rough idea of how the change in tax units affects our estimated top income shares. The individual income distribution seems to generate about 10% higher top income shares in 1920 and 1930 but the difference is almost insignificant (and even reversed) in the latter years. Overall, the two distributions are equal around the time of the actual shift (1951), but if one would account for the earlier effects the long-run decline in top income shares would be somewhat more pronounced.

[17] The period between 1951 and 1971 is potentially problematic because of the change in the definition of tax units from households to individuals. We have tried a number of different specifications for dealing with this gradual change, and while the levels may change over this period by as much 10%, the trend and our qualitative results are not altered; see Appendix 7C.

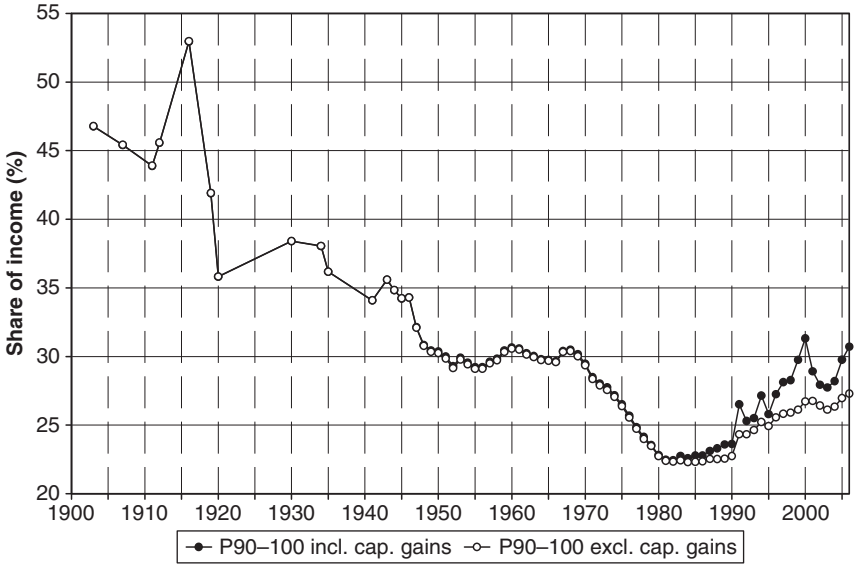

Figure 7.1 The top 10% income share in Sweden (with and without capital gains), 1903–2006

Source: Column 1 in Appendix Tables 7A.2 and 7A.3, respectively.

1980s the trend depends crucially on the treatment of capital gains incomes. When these are included, the income share for the top 10 per cent increases substantially, but when capital gains are excluded the top share remains quite stable, though it does increase slightly (we will analyse this in more detail below). The peaks in 1991 and 1994 in the series including capital gains are well-known effects of tax reforms which made it profitable to sell assets in these years.

Even though this development in itself reveals a number of interesting facts, it turns out that decomposing the top decile is crucial for understanding the development. Figure 7.2 shows the evolution of the income shares for P90–5, P95–9, and P99–100 respectively. Looking first at the decline over the first eighty years of the century, we see that virtually all of the fall in the top decile 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 (P90–5) has been remarkably stable, hovering around 10 per cent over the entire period, while the P95–9 share declines gradually from about 15 per cent of total income in the beginning of the twentieth century to around 10 per cent in the early 1980s, with the sharpest drop over the 1970s. In contrast, the top percentile income share is divided by at least a factor of four, dropping from above 20 per cent in the early 1900s, to around 7 per cent in early 1950s, to a low of 4.7 per cent in the beginning of the 1980s. Over the past decades the pattern is similar; P90–5 is stable (whether including capital gains or not), P95–9 increases slightly as does P99–100 when

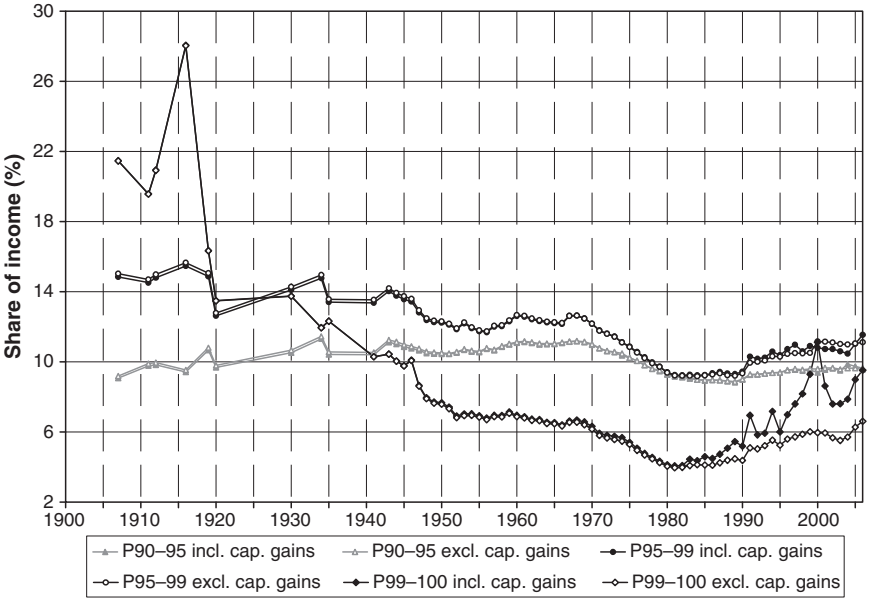

Figure 7.2 The P90–95, P95–99, and P99–100 (top 1%) income shares in Sweden (with and without capital gains), 1903–2006

Source: Columns 3, 8 and 9 in Appendix Tables 7A.2 and 7A.3, respectively.

excluding capital gains, but the major difference appears only when including capital gains for the top percentile. Over several years in the late 1990s the income share of the top percentile is about twice as large when including capital gains compared to excluding them.

The above patterns get even starker when considering higher fractiles within the top per cent. Figure 7.3 shows the income share of the top 0.01 per cent of the income distribution. This share was divided by a factor of about eight over the first half of the century, from above 3 per cent of income to around 0.4 per cent in the early 1950s. Given that most of the income in the very top consists of capital income it is interesting to note that the major falls take place during the financial crises after the First World War, in the early 1930s, and after the Second World War, but notably, not during the Second World War. This period (1939–45), which in many other countries was one of major cuts in top income shares, seems to have been a period of relative stability for the very top groups in Sweden. From the 1950s the P99.99–100 income share continues to decline steadily to their lowest points in the late 1970s after which it recovers, reaching new peaks at the time the stock market boom around 2000 given that we include capital gains.

If we compare the incomes share for this top group when including and excluding capital gains respectively, the difference is a factor ten in order of

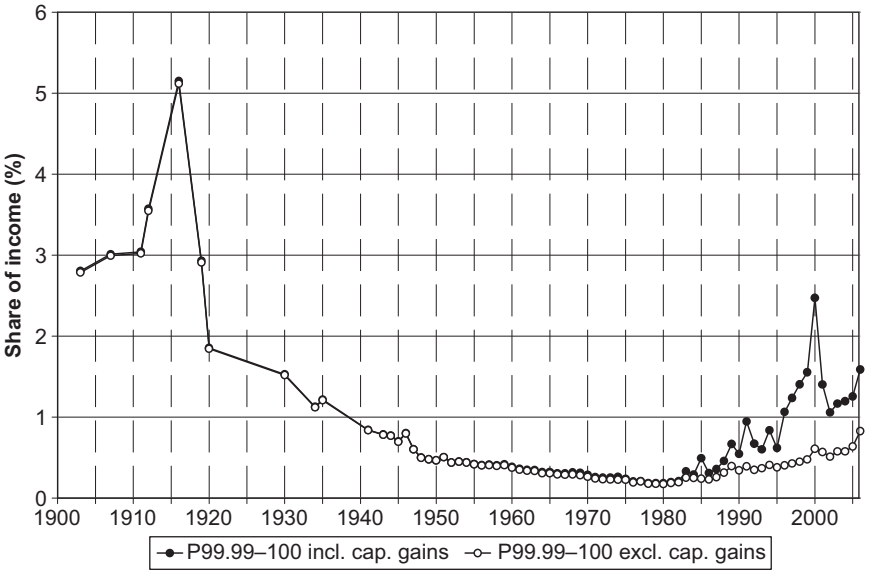

Figure 7.3 The top 0.01% income share in Sweden (with and without capital gains), 1903–2006

Source: Column 7 in Appendix Tables 7A.2 and 7A.3, respectively.

magnitude, which again highlights the impact of capital gains in Swedish top incomes. Expressing the incomes of the top 0.01 per cent group in multiples of average income, our data suggest that over the twentieth century their income has gone from being around 300 times the average income in the early 1900s, falling down to around 25 times average income in the 70s, and then rising to more than 100 times average income in the late 1990s (again when including capital gains).[18]

Composition of Top Incomes

Examining the composition of top incomes offers important hints to the understanding of the development of top income shares. For example, shocks to capital income during the First and Second World Wars explain much of the decline in French top incomes (Piketty 2003) while large increases in wage and salaries at the top has been the primary factor behind the increased income inequality in the USA during the 1980s and 1990s (Piketty and Saez 2003). The composition of

[18] It is worth pointing out that some internationally very visible super-rich Swedes are not driving these results. Incomes of individuals such as IKEA's owner Ingvar Kamprad, and the Rausing family, founders of Tetra Pak, all high up on the *Forbes* list of the world's wealthiest individuals, are not in our data as they do not reside in Sweden.

Table 7.3 Decomposition of changes in top income shares in Sweden into wage-, capital-, and other incomes over three sub-periods between 1912 and 1980

		Percentage change in			
			With contribution by		
		Total income shares	Wages	Capital income	Business income
1912–1935	P90–95	6.1	8.8	−1.2	−1.4
	P95–99	−9.4	−1.8	−6.3	−1.4
	P99–100	−41.1	−9.1	−23.8	−8.2
	P99.9–100	−53.0	−7.2	−35.2	−10.6
1935–1951	P90–95	0.3	−2.6	−4.6	7.5
	P95–99	−10.0	−9.9	−7.6	7.4
	P99–100	−38.6	−16.7	−19.4	−2.5
	P99.9–100	−56.2	−21.8	−27.0	−7.3
1951–1980	P90–95	−2.5	11.9	0.7	−15.1
	P95–99	−11.7	11.6	−1.5	−21.8
	P99–100	−36.1	−6.6	−4.9	−24.6
	P99.9–100	−49.5	−19.8	−5.0	−24.7

Note: Calculations are based on tax returns data from 1945 onwards and Census data from 1920, 1930, 1935, and 1945, including estimates of returns to wealth. Business income is calculated as a residual prior to 1951.

Swedish top incomes also changes significantly during the twentieth century, and these changes hold important clues for explaining the general patterns.

Swedish tax laws distinguish four sources of income: labour (wages and salaries), capital (mainly interest earnings and dividends), business, and realized capital gains.[19] In Table 7.3, we decompose the decline in total top income shares (excluding capital gains) for various fractiles during three periods between 1912 and 1980.[20] In the period 1912–35, almost the entire decrease in total income shares is due to falls in capital income which explain about two-thirds of the drop of the top percentile. An interesting exception is the drop in 1916–20, which is mainly due to large earnings increases of the rest of the population (P0–90).[21]

[19] As described in Appendix 7A–C Swedish income statistics reported six different sources of incomes until 1990 and only three thereafter. Using available data we are however able to construct consistent and continuous series of the four above-mentioned sources for the entire post-war period. For the earlier periods we rely on data from the censuses (1920, 1930, 1935, and 1945) and estimates of returns to wealth to calculate approximate shares.

[20] These periods were chosen based on availability of data and to get one period pre-Second World War (1912–35), one period focusing on changes around the Second World War (1935–51), and one period stretching from the start of the expansion of the welfare state to the year when Swedish income equality peaked (1951–80). One could be concerned that increases in the capital income shares would mainly reflect compensation for high inflation. However, the level of inflation has been sufficiently constant over the century to rule out that adjustments for differences in inflation would significantly change our results.

[21] It is generally interesting to examine to what extent changes in top shares are driven mainly by relatively larger increases (or decreases) in the top fraction or in the denominator. It turns out that the 1910s is the only period where it is clearly one or the other that drives the change in the resulting top share, with the peak in 1916 being a consequence of much larger increases for the top fractiles, while the massive decline thereafter is due to an equally disproportionate increase for the P0–90 group.

During the period 1935–51, total income shares fall roughly as much as in 1912–35 (–9.4% compared to −12.9% for P95–9, −39.3% compared to −41.1% for P99–100), but this time about half of the decrease is attributed to a decreased wage share for top income earners. During 1950–80, total income shares continue to fall, but not because of falling capital or wage shares but falling top business income shares. Over this period business income goes from constituting approximately 20 per cent of total incomes in the top decile to being only a couple of per cent in 1980.[22]

To further illustrate the large differences both within the top decile as well as over time Figure 7.4 shows the income composition for different fractiles in the years 1945, 1978, and 2004 (where CG denotes a series including capital gains). The general pattern that capital income is more important higher up in the distribution is true for all of these years. However, between 1945 and 1978 the wage share at all levels of top incomes became more important, while the share of business income decreased at all levels. 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. In fact, at the very top of the income distribution, the share of capital income when including capital gains is larger today than it is was in 1945.

The distribution of capital incomes and its development over the period 1912–2004 is illustrated in Figure 7.5. The upper panel shows the capital share of total income for fractiles in the top decile when excluding capital gains, while the lower panel includes realized capital gains.[23] Both figures show a similar pattern. Capital incomes become less important for all top groups over the first half of the century. Starting in the 1970s, however the role of capital income for the top percentile becomes more important again and for the very top group the shares are even higher today than they were in the beginning of the period. When including realized capital income the recent increase is even more marked.[24]

The particular role of capital gains in the Swedish top income context, especially after 1980, is interesting. Capital gains are often excluded from studies of income inequality due to lack of data or due to their potentially problematic character (even though they constitute an undisputable part of income according to the classical Haig–Simons definition).[25] Ideally we would, of course, like to include *all* capital gains, but according to Swedish tax law only *realized* gains

[22] The drop in self-employment income should not be taken as evidence of decreased small-business activity, per se, as self-employed individuals may choose to start a firm from which they pay themselves regular wages, etc.

[23] Observations pre-Second World War shares are based on an assumed 4% rate of return of the net wealth of each top income fractile (which is available in the tax statistics) while the post-Second World War shares are directly observed in the income statistics.

[24] One should note, however, that it is likely that our estimates of realized capital gains in the first half of the century are underestimated, and consequently the shares including realized capital gains are likely to be higher before the Second World War.

[25] For example, the influential Luxemburg Income Study (LIS) does not contain capital gains at all. According to the Haig–Simons definition income should ideally be measure as the value of consumption plus any increase in real net wealth, that is, it should include all capital gains.

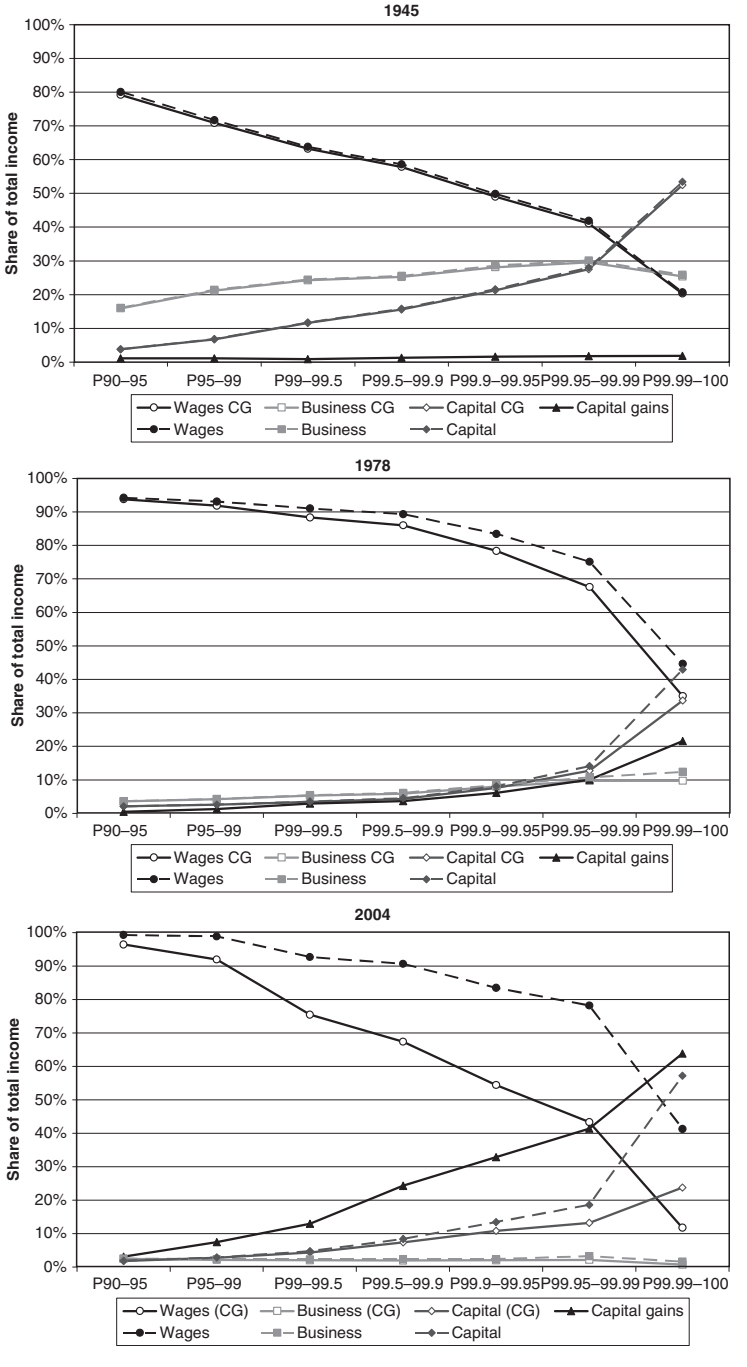

Figure 7.4 Income composition within the top decile in Sweden 1945, 1978, and 2004

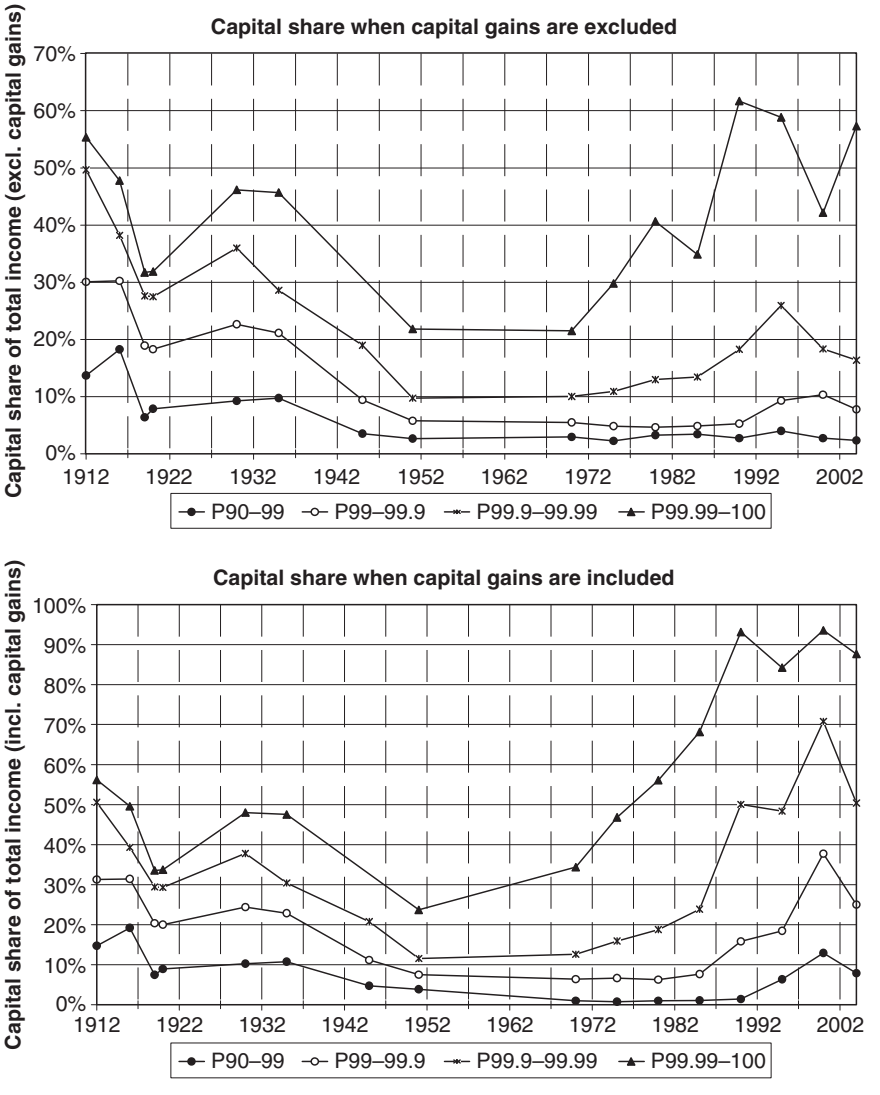

Figure 7.5 The evolution of capital income shares in Sweden (excluding and in-cluding capital gains) within the top decile, 1912–2004

constitute a taxable income and consequently this is what we can get information on. The main concern when realized capital gains are used in place of actual capital gains is the possibility that the realized gains actually represent increases over a longer period of time. This is problematic both in that such capital gains should be smoothed out over the years when they were made (but not realized) as

well as in that it potentially introduces individuals in the top who are only there at the time of the sale of their asset. Furthermore it is, of course, somewhat arbitrary whether a real capital gain is realized at all. With respect to the first problem there is no doubt that we observe instances where, for example, changes in legislation made it more attractive to realize accumulated capital gains leading to likely overestimations of the top income shares for these years (the spikes in the series in 1991 and 1994 are traceable to sales being relatively attractive due to tax reasons). It is not likely, however, that the series including capital gains introduce 'new' individuals each year. Instead, it seems to be the case that the majority of capital gains are made by those with the highest earnings who year after year get additional income from capital gains (we come back to this in section 7.4 below).

Whether real capital gains that have not been realized would affect our shares depends on the distribution of such real gains. One may speculate that some assets are likely to be traded more frequently (such as financial assets) and therefore less likely to constitute large gains which have never appeared in tax records (not even in the form of realized gains possibly accumulated over several years) while others (such as housing) are more likely to fall into this category. If we think that real capital gains made by the top income groups are more likely to appear in the tax records (which could well be the case) we would risk overestimating their income share including capital gains when using realized capital gains. However, as Figure 7.5 above indicates, assets yielding interest and dividend are important in the top income groups (and have become increasingly so over the past decades) and given the very large increases in Swedish stock values (compared to housing, for example) we think that we would be making a more serious underestimation of the top income shares if we were to exclude capital gains altogether.

Tax Avoidance and Evasion

Problems with tax avoidance and evasion are present in all studies of income inequality based on data from personal tax returns.[26] In particular, if such activities change in systematic ways over time without being accounted for, changes in top income shares may just as well reflect changes in reported income as changes in actual income. Unfortunately there is only scattered evidence on the importance of tax avoidance and evasion in Sweden (see Appendix 7A–C for more details). The earliest official comment on the problem of tax evasion refers to 1919 when a special inquiry into the extent of evasion in the past five years was carried out (Statistics Sweden 1923: 13*). Information about how this special inquiry was conducted is sketchy and it is therefore difficult to say what conclusions can be drawn about evasion activities. According to the available information

[26] We will not emphasize the distinction between legal tax avoidance and illegal tax evasion as we are interested in all missing income. Based on the saying that the main difference between the two is a good tax lawyer we will call the activities in the top of the distribution tax avoidance without necessarily implying that all activities we discuss would be judged as being in accordance with the law.

it seems that evasion was concentrated in the top of the distribution but relatively small in relation to total income, but we do not know to what extent the top was targeted, nor the extent of the efforts to find evasion activities. Bentzel (1953) makes a more thorough calculation for the period 1930–48 suggesting that between 2 and 7 per cent of personal income may be missing due to under-reporting. Later studies such as Apel (1994), Löfqvist (2001), and Malmer and Persson (1994), variously using consumption equivalence scales and discrepancies in National Accounts arrive at similar estimates—between 4 and 6 per cent of all incomes—for years in the 1980s and 1990s.[27] Overall, these estimates suggest 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 under-report have increased as tax rates have gone up over time the administrative control over tax compliance has also been improved. However, none of these studies focus on avoidance in the top of the distribution. As it is well known that the possibilities for high-income earners to avoid taxation on any wage income are small, the best source for attempting to study this is arguably the estimates of 'capital flight' since the early 1980s using unexplained residual capital flows ('net errors and omissions') published in official balance of payments statistics. In a recent survey of the Swedish household wealth concentration, Roine and Waldenström (2009) show that significant shares of wealth owned by the richest Swedes may be placed in offshore locations. 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 our top income shares, we add all of the returns from this capital (the lower and upper bound estimates, respectively) first to the incomes of the top decile and then to the top percentile. The main results of this exercise are the following.[28] 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, these incomes become sizeable. When adding all of them to the top decile, its income shares during 1995–2004 increase moderately (by approximately 3 per cent). When instead adding everything to the incomes of the top percentile, the income shares increase by about 25 per cent which is equivalent to an increased share from about 5.7 to 7.0 per cent. While this is a notable change, it does not raise Swedish top income shares over those in France (about 7.7 per cent in 1998), the UK (12.5 per cent in 1998), or the USA (15.3 per cent in 1998).

Overall, potential changes in under-reporting over the twentieth century probably play a marginal role in explaining the evolution of Swedish top income share series with the possible exception of the past decades. However, for the

[27] Apel (1994) mainly captures under-reporting among the self-employed, the study by Löfqvist (1991) estimates avoidance in the economy as a whole, while Malmer and Persson (1994) study the effects of the tax reform in 1991 on tax compliance.

[28] Details on the calculations are available from the authors upon request.

income shares to change much we must make the rather extreme assumption of attributing all of the missing capital income in recent years to the top percentile, and when doing so this only amplifies what we find without this adjustment.[29]

Total Income Shares vs. Market Income Shares—Excluding Taxable Transfers

In 1974 a number of work-related transfer programmes, such as unemployment insurance, sickness payments, and parental leave payments, became taxable. As such programmes have grown in importance over time it could be argued that our series of total gross (pre-tax) income shares have gone from being shares of market income (or even factor income) in the earlier parts of the century to being shares of a pre-tax income concept which includes substantial de facto transfers. To address the impact of these transfers on our income shares we have calculated series in which we exclude the most important transfer payments.[30] In our basic series above we added the total government outlays for the transfers that were made taxable in 1974 to the reference total for income for the period before 1974. Under the assumption that these transfers made up a negligible share of top incomes before 1974, this adjustment suffices to make the series conform to the current definition of gross pre-tax income. To exclude the transfers we basically do the opposite. Before 1974 we do not make any additions to the reference total for income, while we thereafter deduct total transfers from the reference total. However, we must now also take care of the fact that transfer incomes, while being small shares of top incomes, are not zero for everyone in the top decile. To correct our shares we rely on exact data on the size of these transfers by income class for the years 1974–7 and from 1991 and onwards, and estimations for the period in between.

Figure 7.6 displays the changes in the series for the top percentile when including these transfers in the income concept (*total income*, which is the same as our main series) and when excluding them (*market income*). The basic trend is that market income shares go from being relatively equal to total income shares in the 1950s, start to grow in the 1970s, and are about 20 per cent higher in the beginning of the twenty-first century. The marked recent increase is likely to be an effect of large increases in sickness payments. Overall the difference between total income and market income shares is insignificant and has no effect on the trend.

[29] Roine and Waldenström (2009) contains calculations of how this possibly missing wealth would affect wealth concentration.

[30] The most important transfers are unemployment insurance, sickness payments, and parental leave payments. Transfers which are not taxed (such as child benefits, housing benefits, study grants, etc.) never enter our series. See Appendices 7A–C for details.

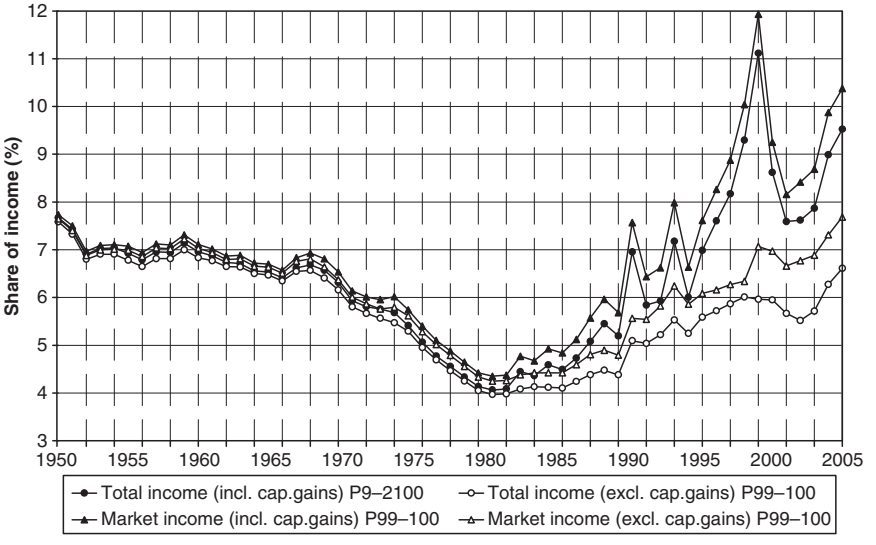

Figure 7.6 Total income shares vs. market income shares in Sweden of P99–100, 1950–2006

7.4 EXPLANATIONS OF THE EVOLUTION OF SWEDISH TOP INCOME SHARES

What accounts for the large declines of top income shares in the first half of the twentieth century, the steady decline during the expansion of the welfare state, the relatively sharp drops over the 1970s, and the increase in the recent decades (which is augmented when including capital gains)? This section discusses factors that can contribute to our understanding of the evolution of the top income shares presented above. First, we examine the roles of factor shares and wealth distribution, and their respective changes over time. In particular, the Swedish tax system before 1948 provides us with data on wealth by income class. Second, we study the evolution of the Swedish progressive income tax system and its effects on top income shares, and third, we account for the recent dramatic changes in asset prices, arguing that these are fundamental for understanding the particular Swedish experience with very large differences in top shares depending on whether capital gains are included or not.

The Roles of Factor Shares and the Wealth Distribution

According to David Ricardo, 'the principal problem of Political Economy... is to determine how... the produce of the earth... is divided between... the

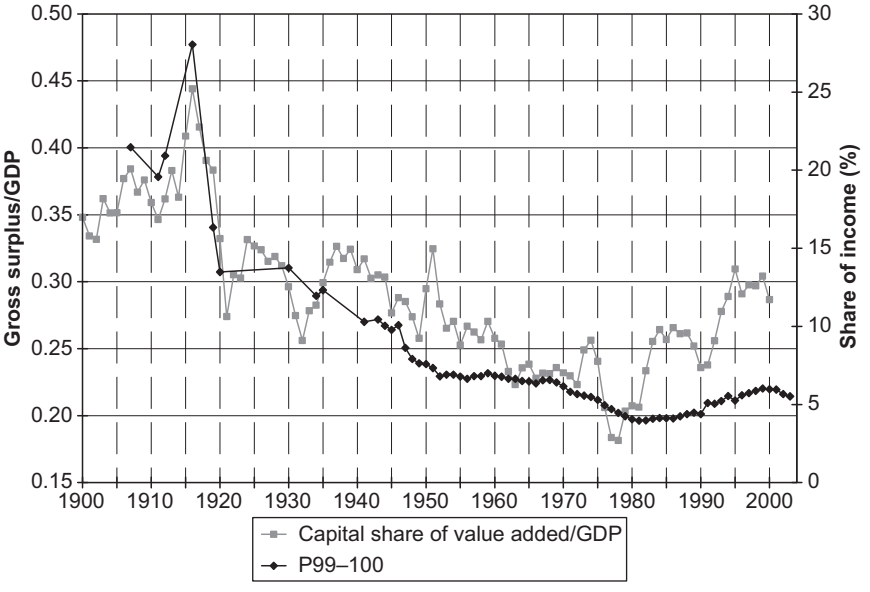

Figure 7.7 The capital share of value added as a share of GDP and the top 1% in-come share in Sweden, 1903–2003

Sources: Data on the capital share of value added and GDP by activity come from Edvinsson (2005). Top income percentile shares come from Appendix Table 7A.2, column 1.

proprietor of the land, the owner of the stock of capital needed for its cultivation, and the labourers by whose industry it is cultivated'.[31] If we were to assume that the very top of the income distribution consists mainly of wealth holders, while the rest of the population consists mainly of wage-earning workers, fluctuations in factor shares should also explain fluctuations in income shares. (We return to the question of how good an approximation this is below.) Figure 7.7 shows the changes in the capital share of value added (defined as GDP by activity, minus wages and salaries, minus imputed labour income of self-employed) as a share of GDP, and the evolution of the top 1 per cent income share.

The series are strongly correlated over the whole period (0.86) 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. The figure also shows a downward trend in the capital share of value added over the first eighty years and a conservative reading would suggest a drop in this share from around 0.35 in the first decade, to approximately 0.25 in the

[31] Quoted in Atkinson (1975: 161).

1970s and 1980s.[32] If we take this share as a proxy for the share of GDP derived as a return to property it would translate directly to an equally large drop in the income share of property holders who, in turn, are found mainly among the top income earners. Of course, no income class consists of only wage earners or only property holders, and furthermore a number of institutions (such as firms and the government sector) stand between the productive sector and the personal sector whose income distribution we are concerned with. Nevertheless, such approximations give a sense of the magnitude by which the respective factors could have changed the income shares.[33]

To estimate the impact of returns to property on the top income shares we also need data on the property holdings of the top income groups. Typically such data are not available and as a substitute many studies have used wealth distribution estimates, assuming that the distributions of wealth and income overlap sufficiently. In the case of Sweden, however, there exist unusual data on individual wealth holdings by precisely those groups for which we also have income data. The reason is that between the years 1911 and 1948 Sweden had a peculiar form of joint income and wealth taxation in which taxes were levied on what was called the *taxable amount*, consisting of all income *plus* a share of net wealth holdings. For selected years, tabulations of incomes decomposed into actual income and wealth shares by income class are available.[34] Similar information is also available in the 1950 Census (for the year 1951) and for the years 1991–3. This allows us to calculate the *wealth shares held by top income groups*. Figure 7.8 shows changes in wealth shares by income class, together with our calculations of wealth shares (by wealth class) and income shares (by income class) for P99–100 and P90–9 of the respective distributions.[35] Not surprisingly, wealth shares by income class follow the fluctuations of income shares more closely than do wealth shares, but the

[32] The question of factor shares, to what extent they are relatively stable over time, and how 'relatively stable' should be interpreted, is of course a much debated question. See Atkinson (1975: chapter 9), for a good overview and a historical perspective, where it is also noted that the labour share seems to have been increasing at least since the 1930s up to the 1970s in a number of Western economies.

[33] Among the interesting details found by studying the development of the capital share of value added as share of GDP is that it is likely to explain the peak in the top income share in 1916. The first years of the First World War were a period during which industrial companies made huge profits while the majority of the population experienced substantial falls in real wages and trade restrictions that led to a food shortage (see Edvinsson 2005: 242), and references given there). The year 1916, which is the only year for which we have data during this period, was most probably the most extreme year. The average wage rate fell by 10% and the ratio between gross surplus and labour income jumped from about 50% in 1914–15, to around 70% in 1916–17 (after which it fell back down to 50% in 1918–19), indicating that 1916 was a year when the income share of capital owners was very high compared to the years immediately before and after.

[34] The taxable amount was equal to all income plus one-sixtieth of taxable wealth between 1910 and 1938 and there after all income plus one-hundredth of taxable wealth until 1948.

[35] Our series for wealth distribution are based tax return data and are for the years 1920–75 similar to Spånt (1979) and for the years 1978–2002 to series calculated by Statistics Sweden (2002), rather than more recent estimates based on household panel data (such as Klevmarken 2004). In the present context these figures are most relevant as we are trying to estimate the impact of wealth concentration on income concentration rather than some measure of living standards.

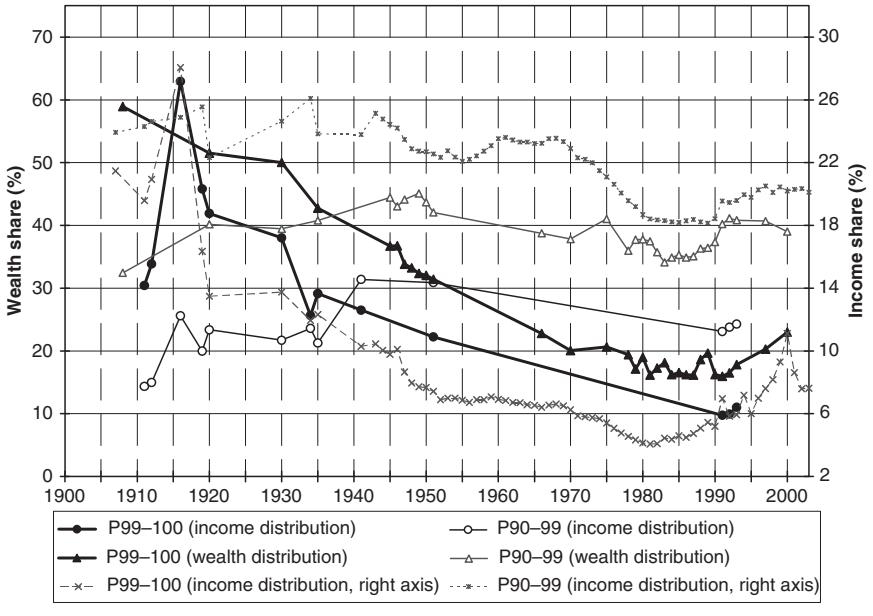

Figure 7.8 Wealth in top income and wealth fractiles in Sweden, 1908–2004

Source: Authors' own calculations.

Note: the circles relate to wealth shares (left-hand scale) of units ranked by income.

trends seem to be the same.[36] The wealth share of the top per cent among the income earners, as well as among wealth holders, decreases quite dramatically over the century with slight recoveries over the past decades.[37] The wealth shares for the P90–9 group, both in the income and in the wealth distribution, are instead increasing until around 1950. After that they fall slightly, to recover again after the mid 1980s. Once again this highlights the importance of distinguishing between different groups at the top to understand the trends.

What would be the joint impact of the changes in wealth concentration and the changes in factor shares on the income distribution? Following Meade (1964), we can make a simple approximation to get a sense of the magnitude of the effect. Let a and b be the share of all earnings and all returns to property, respectively, received by a certain income group. Then the total income share of this group is given by

[36] The exception is the first observations in the series. There could, however, be a problem in the data as the sources for 1911 and 1912 for wealth by income class are tax return data for the first two years when the wealth tax was implemented, which could underestimate the wealth in the top shares. The 1908 wealth data, on the other hand, are based on estates. By 1920 the system of joint income and wealth taxation was well established and wealth data were also collected for the Census, which leads us to think that these series are relatively reliable at least from that point on.

[37] The top per cent wealth share in the wealth distribution has increased over the past decades and assuming that the wealth of the top income earners has followed this is true for them as well. However, we only have data on the years between 1991 and 1993.

Table 7.4 Contribution of changes in the top income earners' wealth shares on their income shares in Sweden, 1911–1991

Period	Change in P99 income share[a] (percentage points)	Change resulting from changes in wealth (assuming factor share 0.3, percentage points)	Change resulting from changes in wealth (calculated factor shares, percentage points)
1911–12	1.36	0.52	0.92
1912–16	7.12	4.36	7.76
1916–19	−11.70	−2.57	−5.14
1919–20	−2.85	−0.59	−1.79
1920–30	0.26	−0.58	−1.29
1930–34	−1.80	−1.86	−2.01
1934–35	0.37	0.52	0.76
1935–41	−2.03	−0.39	−0.17
1941–51	−3.21	−0.64	−0.60
1951–91	−1.26	−1.87	−2.44

[a] Changes based on the series including capital gains. The calculated change in the P99–100 income share between 1951 and 1991 is based on an average of the share in 1990–2 as 1991 is an outlier in the series including capital gains (as discussed in section 7.3) due to the tax reform.

Sources: Own calculations based on income and wealth shares reported above.

$$a \cdot (\text{factor share of earnings}) \; + \; b \cdot (\text{factor share of property}).$$

Setting the factor share of property to 0.3 or alternatively letting the factor share fluctuate and take on the yearly value displayed in Figure 7.7 above we can get a sense of the magnitude of the impact that changes in wealth concentration at the top of the income distribution has had between 1911 and 1991. Table 7.4 gives an example of such calculations for P99–100.

Table 7.4 suggests that the direction of change is correct for all intervals except for the period 1920–30 when the income share increases slightly for the top per cent of income earners but their wealth share drops. Between 1911 and 1920, however, the magnitudes are not right. The income share increases slightly more 1911–16 and, in particular, drops much more 1916–20 than can be explained by changes in wealth shares. However, this is exactly what we would expect given that most of the change in 1916–19/20 is due to increases in the incomes of the lower 90 per cent of the population.

Overall, the above suggests that an important reason for the substantial drop in the top 1 per cent income share—which is driving the decreased income share of the top 10 per cent—especially before 1950, is the decreased wealth share of the top income earners, which in turn decreased their share of returns to property. However, the question of why the top wealth share decreased so substantially has no obvious answer. Sweden did not take part in the world wars, and even though the country's economy was of course not unaffected by these wars, they did not cause the same direct destruction of capital in Sweden as they did in many other countries. If single events are to be pointed out, the effects of the Great Depression,

which hit Sweden in 1931, and in particular the dramatic collapse of the industrial empire controlled by the Swedish industrialist Ivar Kreuger (the 'Kreuger-crash') in 1932, are probably most important.[38] Between 1930 and 1935 we observe a drop from 50 per cent to 43 per cent in the top per cent wealth share but an even larger drop in the wealth of the top 1 per cent of income earners, from 38 per cent in 1930 to 26 per cent in 1934 (see Figure 7.7 above). The Second World War, however, does not seem to have been a major shock to wealth holdings in Sweden. The top 1 per cent share does drop from 43 to 37 per cent between 1935 and 1945, but the drop just after the war is just as sharp continuing down to 32 per cent in 1950 (see section 7.5 for more on this point in international perspective).

By 1950 progressive taxation has started to play a major part and the most likely explanation for the continued decreasing top wealth share is that a larger share of new wealth was accumulated in the corporate and government sector and among the rest of the population, rather than in the wealthiest per cent. However, over the past decades wealth concentration has increased, and compared to many other countries Sweden today does have a surprisingly skewed wealth distribution.[39] A possible explanation for this is that the extensive welfare state takes away some of the typical reasons for, in particular, the middle class to accumulate capital (such as saving for (children's) higher education, healthcare, pension, etc.) since these things are provided by the state.[40] This in turn means that income from capital is likely to be skewed and, in particular at times when returns to capital increase, the gains will be concentrated at the top of the distribution (we will discuss this in more detail in section 4.3). As shown in Figure 7.5 above, the increasingly important role of capital for the very highest income earners seems consistent with such an explanation.

The Role of Taxation

Many previous studies have shown that top incomes are sensitive to changes in top marginal income tax rates, either through their direct effect on work incentives or through more subtle processes of tax arbitrage (see Saez 2004 for an overview of this literature). For example, Saez and Veall (2005) showed that Canadian top income shares were negatively correlated with Canadian marginal income tax rates, with elasticities of income with respect to the net-of-tax rates for the top percentile being about unity.

[38] In Sweden, the economic crisis in the early 1920s was in many ways more severe than the one ten years later which coincided with the 'Great Depression' in America.

[39] Much of the high wealth Gini figures in Sweden is due to a large part of the population having negative net wealth (rather than high concentration at the top) but also in terms of the wealth share held by the top per cent Sweden is second only to the USA in high wealth concentration according to the first comparable estimates in the LWS (Luxembourg Wealth Study) project (Sierminska, Brandolini, and Smeeding 2006).

[40] Domeij and Klein (2002) study to what extent the public pension system in Sweden can account for the high wealth inequality in data.

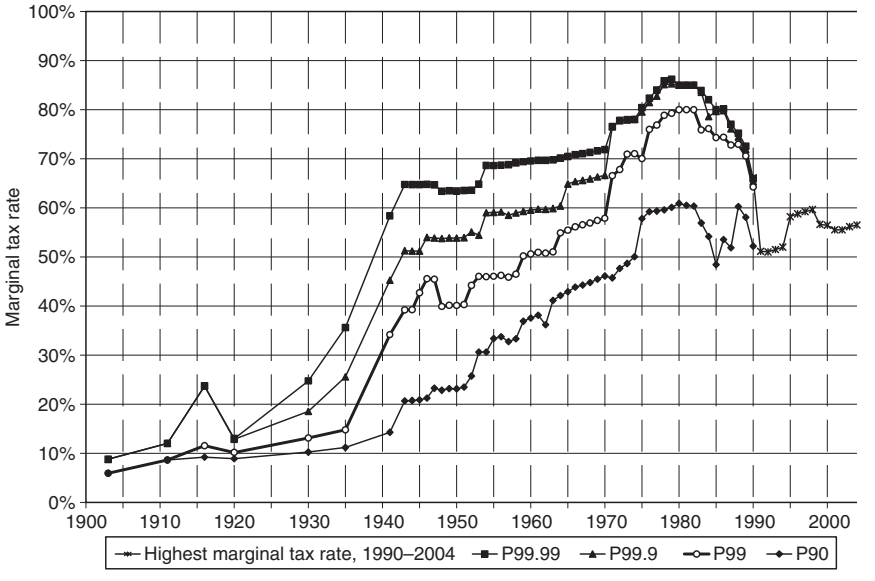

Figure 7.9 Top marginal tax rates in Sweden, 1903–2004

Source: Tax rates are computed for each top income level in Table 7A.4 using tax tables in Söder-berg (1996) until 1990. After 1990, we show the 'highest marginal tax rate' (Swedish National Tax Board 2004), applying only to labour income (wages + business income).

In the case of Sweden, Figure 7.9 depicts the statutory marginal tax rates on incomes at the 90th, 99th, 99.9th, and 99.99th percentiles over the past century.[41] These rates more than doubled between the mid 1930s up to 1950, and then continued to rise until 1980 when they peaked. Thereafter the top marginal taxes were lowered, particularly in relation to the tax reform of 1990–1 which introduced separate taxation of capital incomes at a lower, flat rate.

To get a better picture of the role of taxation for Swedish top income shares, we estimate tax elasticities in several top income levels for the post-war period (1943–90).[42] In particular, we relate the incomes of the tax units exactly at the 90th, 99th, 99.9th, and 99.99th income percentiles to the marginal tax rates paid by precisely these tax units respectively. Although we employ a fairly standard approach towards estimating these tax responses (following Saez 2004), it should be noted that we only observe the product of the amount of hours worked and the per hour wage, at each income level, and any differential variation in these two as

[41] The presented marginal tax rates are the sum of the respective rates at the local (*kommunalskatt*) and state (*statlig skatt*) levels, calculated using tables in Söderberg (1996).

[42] Before 1943, there are no annual data and after the tax reform of 1990–1, wages and capital income are taxed at separate rates.

a response to changes in the marginal tax level is thereby missed.[43] However, since we confine the study to top and extreme top income earners, these variations may not be of first-order importance. Then log-linear regressions are estimated for each percentile separately:

$$\ln(S_P)_t = \beta_0 + \beta_1 \left(\ln(1-MTR_P)_t\right) + \beta_2 t + \beta_3 t^2 + u_t, \quad (1)$$

where S_P denotes income share for percentile P = P90, P99, P99.9, P99.99, $(1–MTR_P)$ the corresponding net-of-tax rate (one minus the marginal tax rate), t a linear time trend, and u_t a random error.[44] Since inflation may push incomes up in higher tax brackets ('bracket creep'), we may have a downward bias in the estimated tax elasticity ($\hat{\beta}_1$). To control for this eventuality, we fit both OLS and two-stage least squares (2SLS) regressions using the log of one minus the highest statutory marginal tax rate as instrument. The results in Table 7.5 show that tax elasticities range from about 0.3 in the 90th (in the 2SLS case) and 99th percentiles, to 0.5–0.6 in the 99.9th percentile and 0.8–0.9 in the 99.99th percentile. The influence of bracket creep seems to be of minor importance as hinted by the similarity of the OLS and 2SLS results. Altogether, these results are well in line with previous findings from the estimated tax responses of US top income earners (Saez 2004). Progressive taxation hence seems to have been a major contributing factor in explaining the evolution of Swedish top incomes in the post-war 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. To the extent that new fortunes were created they most probably remained outside the personal sector.[45]

The Role of Asset Prices

One aspect which stands out in our series over the past decades is the large difference in top income shares when realized capital gains are included or not. Whether capital gains should be included in the income concept is debatable and ultimately depends on the questions at hand.[46] When it comes to studying

[43] For example, if workers' bargaining strength *vis-à-vis* their employers increases with wages, a tax increase may imply that lower-wage workers have to accept constant pre-tax wages, and hence a real wage cut, whereas higher-wage workers may be able to threaten with reduced labour supply and thereby get a wage increase.

[44] Equation (1) uses Newey–West standard errors and is inspired by Saez (2004), but unlike him we use threshold incomes and corresponding marginal tax rates instead of average incomes in a group of income earners, say P99–100, and the corresponding weighted average marginal income tax for all the various income levels contained in the top percentile group.

[45] The particular structure of ownership via various tax exempt institutions for tax reasons is documented in Henrekson and Jakobsson (2005).

[46] In the case of Sweden the choice lies between excluding capital gains completely or using realized capital gains since data does not allow us to measure all capital gains. See for example Atkinson (1975: chapter 3), for a general discussion, and, in particular, Björklund, Palme, and Svensson (1995) for an estimation of real capital income using assumed real rates of return on net wealth.

Table 7.5 Marginal tax effects on top incomes in Sweden, 1943–1990

		Coefficient estimates					
Fractile	Model	Constant ($\hat{\beta}_0$)	Elasticity ($\hat{\beta}_1$)	Trend ($\hat{\beta}_2$)	Trend² ($\hat{\beta}_3$)	R^2	Pr.>χ^2
P90	OLS	3.51***	0.07	−0.01	−0.00	0.79	
		(0.06)	(0.13)	(0.01)	(0.00)		
	2SLS	3.53***	0.30***	−0.00	−0.00	0.77	0.00
		(0.04)	(0.11)	(0.00)	(0.00)		
P99	OLS	2.39***	0.27***	−0.02**	0.00**	0.88	
		(0.08)	(0.10)	(0.01)	(0.00)		
	2SLS	2.41***	0.32***	−0.02***	0.00***	0.88	0.98
		(0.05)	(0.06)	(0.00)	(0.00)		
P99.9	OLS	1.43***	0.53***	−0.04***	0.00***	0.92	
		(0.09)	(0.08)	(0.01)	(0.00)		
	2SLS	1.45***	0.58***	−0.04***	0.00***	0.92	0.87
		(0.07)	(0.07)	(0.00)	(0.00)		
P99.99	OLS	0.64***	0.81***	−0.07***	0.00***	0.91	
		(0.10)	(0.09)	(0.00)	(0.00)		
	2SLS	0.71***	0.89***	−0.06***	0.00***	0.91	0.19
		(0.13)	(0.13)	(0.00)	(0.00)		

Notes: OLS regressions use Newey-West standard errors (with 6 lags). The 2SLS instrument the net-of-tax rate with the ln(1—Statutory top marginal tax rate). Tax rates are calculated using laws listed in Söderberg (1996). Pr.>χ^2 shows p-values from Hausman tests of a difference between OLS and 2SLS. All regressions have 48 observations. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

Swedish income inequality, and in particular the absolute top over recent decades, we argue that capital gains incomes are too important to be ignored. The main reason for this is the development of Swedish stock prices, which in comparison with many other Western countries is remarkable.[47] Figure 7.10 shows the evolution of the composite stock price index, in real terms, at the Stockholm Stock Exchange and the amount of capital gains earned by three top income fractiles since 1967 (which is the first year with separate capital gains figures for different total income classes). The realized capital gains and stock prices are significantly correlated over time (>0.9 in all cases), which suggests that the capital gains appearing in top incomes to a large extent stem from increased values of financial portfolios.[48]

One of the major concerns with including capital gains in the analysed total income concept is the possibility that some taxpayers in the top income fractiles

[47] Over the period 1980–2000, the real stock price index at the Stockholm Stock Exchange increased twenty times compared to four to six times in New York, London, and Paris.

[48] Compared to real estate prices, which have also increased substantially over the past decades (starting at 100 in 1981, the housing price index was 360 while the consumer price index was 250, in 2003) the gains from equities are much larger and also much more concentrated. However, it is likely that the increase in wealth holdings for the top 10% (even when excluding the top per cent) is largely due to the increases in owner-occupied housing prices.

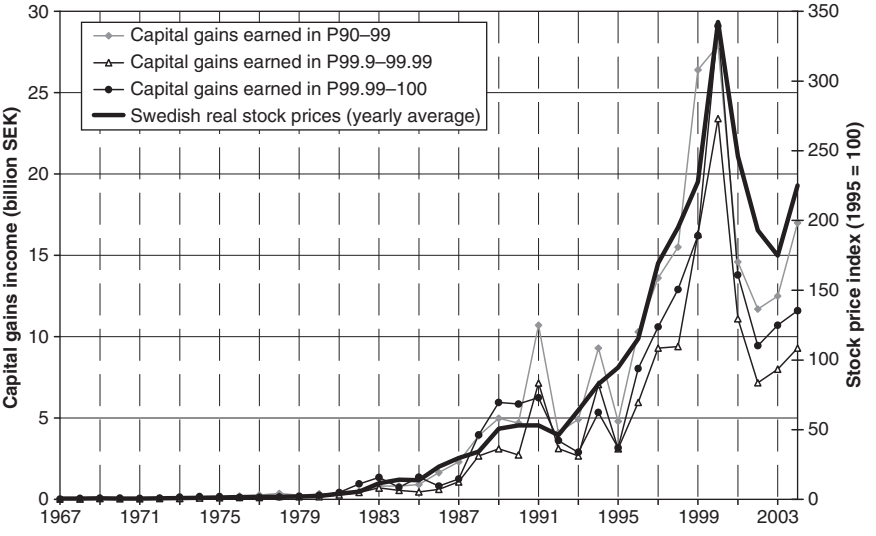

Figure 7.10 Capital gains in some top income fractiles and real stock prices in Sweden, 1967–2004

Note: Stock prices are yearly averages of end-of-month prices up to 1979 and daily closing prices thereafter of *Affärsvärldens Generalindex* (http://www.affarsvarlden.se), deflated with monthly CPI (monthly averages).

are there only because of recent realizations of gains that have been accumulated over a longer period of time. However, using tabulated income data listing capital gains in classes of labour income (which excludes capital gains), we can after 1990 confirm that this is not the case for the most part of our analysed capital gains incomes.[49] Furthermore, Magnusson (2004) uses panel data for the period 1991–2002 and shows that the top of the income distribution is not primarily represented by low-income earners with large one-time capital gains.[50] Altogether, our data suggest that the substantial increases in capital gains that drive much of the observed rise in top income shares in Sweden over the past decades are largely due to increased Swedish stock prices.

[49] Looking at the average realized capital gains over labour income classes, the overwhelmingly largest average capital gains in the entire period 1991–2004 accrue to those who already are positioned in the top of the income distribution.

[50] She studies two sub-periods, 1991–7 and 1996–2002, and shows that about one-fifth (19.1 and 19.2%, respectively) of those in the top 0.1 percentile in 1997 and 2002 when including capital gains belonged to the P0–90 group six years earlier. The same shares when excluding capital gains were about one-tenth (8.4 and 12.8%), which suggests that about one-tenth of top income earners were a relatively mobile group, and possibly low-wage earners with high one-time capital gains.

7.5 INTERNATIONAL COMPARISONS

In Figure 7.11 the long-run development of top percentile income shares in a number of Western countries is shown alongside that of Sweden.[51] Looking at the figure, three broad facts stand out. First, all countries experience a similar development with large decreases in top income shares between the beginning of the 1900s and the mid 1970s. The drop in Swedish top incomes over this period is the largest among all these countries, both in absolute and relative terms, but interestingly, much of the difference between Sweden and the other countries is established already by 1950. Second, the effect of the Second World War, which for all countries directly engaged in warfare turned out to be devastating for top incomes (see, e.g., Atkinson and Leigh 2005; Piketty and Saez 2006), is practically non-existent in Sweden. Table 7.6 shows this fact in more detail. During the war, the top income share for P99–100 decreased by between 13

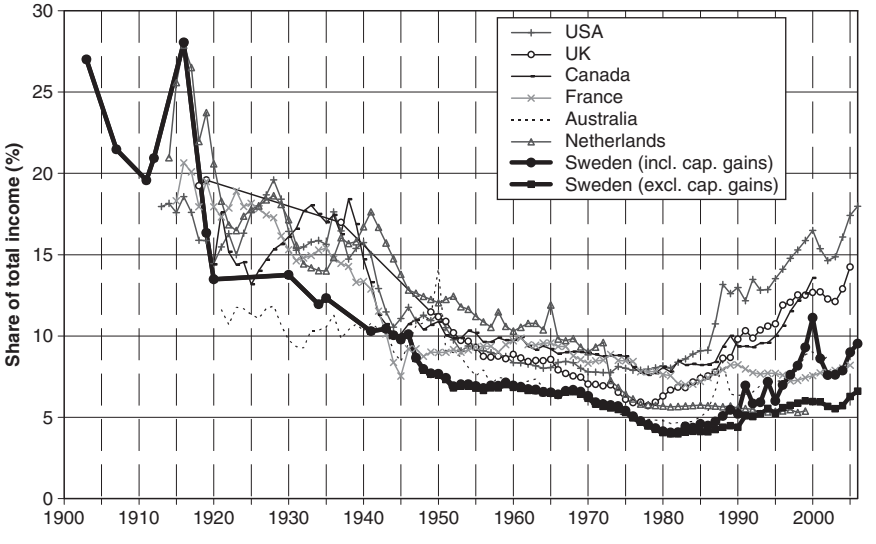

Figure 7.11 Income shares of the top percentile in Western countries, 1903–2006
Source: Atkinson and Piketty, this volume.

[51] The country-specific developments would be very similar for P90–100 and for P99.9–100. As always, the developments should be compared with some caution. Even if the series have been constructed using basically the same methodology there are still some differences such as the difference in the construction of reference totals which may understate the figures for the UK and the Netherlands compared to those for the USA and France. See Atkinson (2005b) for details.

Table 7.6 Percentage change in top percentile income shares in Sweden during the Second World War

	Percentage change in the top percentile income share in						
Period:	Sweden	Australia	Canada	France	The Netherlands	UK	USA
1939–1945	−4.6	−24.0	−40.1	−43.3	−12.7	−22.7	−25.5
1946–1951	−27.2	11.4	−0.9	19.4	−11.2	−15.2	−5.3

Note: For Sweden, we use 1941–5 since no data exist for 1939.

and 40 per cent in countries directly involved in warfare, but by less than 5 per cent in Sweden. By contrast, right after, the Swedish top shares dropped by one-quarter but elsewhere they decreased by much less or even increased.

The third fact that stands out in Figure 7.11 is the divergence after 1980 between one group of countries with significantly increasing top shares; Australia, Canada, UK, and the USA, and another group; France, the Netherlands, and Spain, where the top shares remain virtually constant.[52] This division between the 'Anglo-Saxon' and 'continental European' experience has received a lot of attention in the recent literature.[53] As can be seen in the figure, Sweden does not belong entirely to either one of these groups. More precisely, if capital gains are included Swedish top incomes shares have increased so much that the Swedish development resembles that of the Anglo-Saxon group. However, when capital gains are excluded, Sweden looks more like belonging to the continental European group. This difference in the series is unique to Sweden among the countries for which it has been possible to make this distinction.[54] Whether capital gains are included or not makes very little difference to the pattern of development in the USA, Canada, as well as Spain.[55]

The distinction between series including and excluding capital gains holds an important key to understanding the Swedish development in international comparison. Previous work on top incomes has pointed out that the main change over the twentieth century in Anglo-Saxon countries, and in particular in the USA, has been the replacement of the rentiers by the working rich in the top of the income distribution (see, e.g., Piketty and Saez 2006). To what extent this in turn depends on increased returns to education and skill-biased technological change is a much debated issue; however, the fact that so much of the increase in the top happens in the very top (top 1 per cent) has made many sceptical of a

[52] This division has previously been discussed in Saez (2004) and Atkinson and Leigh (2005), who also show that this division remains true when including New Zealand to the 'Anglo-Saxon' group.

[53] See e.g. Piketty and Saez (2006).

[54] Besides Sweden, the construction of separate series including and excluding capital gains has been possible for the USA, Canada (after 1971), and Spain (Chapter 10).

[55] In the case of France this distinction is not very important, according to Piketty (2001b: 20 n.), as the capital gains share is very small even for the top income earners. The same relationship seems true for Germany (Dell 2005: 414 n. 2).

return-to-education story.[56] Our data for Sweden also seems to indicate that a skill-biased technological change story is not the most likely explanation for the observed changes. First, as was discussed above the movements for the lower part of the top decile P90–5 account for very little of the top decile income share. This is true both when including and excluding capital gains and, hence, suggests that to the extent that we think that high-skilled workers make up most of this group, their income share has not increased substantially over the past decades. Second, and more important, is the large difference in the development in the top depending on how capital gains are treated. The economic interpretation of this development rests on a distinction which we cannot entirely make based on our data. If we believe that much of the observed capital gains, in fact, stem from compensation for work made by, e.g., chief executives and other high-income individuals, then the Swedish development should be seen as resembling the Anglo-Saxon one, with working rich receiving an increasing share of all incomes over the past decades. What makes this interpretation plausible is the observed correlation between capital gains and wage incomes discussed in section 7.4, as well as the fact that Sweden has a dual tax system where capital incomes are taxed at lower rates than wage incomes. If, however, these capital gains do not stem directly from work but just from making investments with unusually large pay-offs over the past decades, then our data suggest that the key to becoming rich in Sweden over the past decades has been to invest wisely rather than to work hard.

7.5 SUMMARY AND CONCLUSIONS

In this chapter, we have studied the evolution of income concentration in Sweden over the twentieth century. We have presented new series on top income shares, their composition, as well as new data relevant for understanding their development. We have also tried to put our results into international perspective. Our findings suggest that top income shares in Sweden, as in many other Western countries, decreased significantly over the first eighty years of the century. They did so from levels indicating that Sweden was not more equal than other Western countries at the beginning of the twentieth century. Most of this decrease happened before 1950, that is, before the expansion of the Swedish welfare state. As in many other countries, most of the fall was due to decreasing shares in the very top of the distribution (the top 1 percent), while the income share of the lower half of the top decile (P90–P95) has been extraordinarily stable. Most of the fall is explained by decreased income from capital; however, it does not seem likely that this development in the case of Sweden is due only to shocks to capital holdings (which have been the suggested explanation in some other countries).

[56] Piketty and Saez (2003) are, for example, sceptical of the skill-biased technological change explanation for the USA. See also Dew-Becker and Gordon (2005).

Even though especially the financial crises in the early 1930s caused drops in both the wealth holdings and the income shares at the top of the income distribution, such shocks do not fully explain the decrease. In particular, we note that the major drop just after the First World War was mainly due to increased wages below the top decile. We also note that the Second World War had no obvious impact on Swedish top income shares. Instead a very significant drop takes place just after the war, at a time when marginal taxes for the top groups had just risen sharply. A closer look at the composition of the decrease in top income shares also suggests that wage compression was as important as decreased capital incomes between 1935 and 1951.

Even if the evolution of top income shares in Sweden in many ways resembles that in other Western countries over the first eighty years, there are some important differences. By 1950 top income shares had already dropped more in Sweden than in any other country (for which comparable data exist), and the further increases in marginal taxes as well as 'solidarity wage policies' caused them to drop even further in the 1970s. However, the most remarkably different aspect in the Swedish data appears over the past decades. During this period, when top income shares increased significantly in Anglo-Saxon countries, mainly due to wage increases, but remained virtually unchanged in continental Europe, the Swedish development depends largely on how realized capital gains are treated. If we include realized capital gains, Swedish top income shares look like the Anglo-Saxon ones; if we do not include them top shares have increased slightly but still resemble the continental European experience. Despite the potential problems with including realized capital gains in a study such as this, we believe there are good reasons to think that our data do capture a real development in terms of top incomes.

The picture of the Swedish income distribution that emerges from this study is in some ways quite different from that which is typically found in the literature. In some respects this is due to a different focus. Most previous studies have examined how the tax and transfer systems have achieved equalization of disposable income in relatively recent times, often focusing on the lower end of the distribution. We have instead been concerned mainly with gross income and its long-run concentration in the top of the distribution. This means that many of our findings, such as the large drop in income inequality before 1950, and the extent to which this is driven by the top percentile, are new findings complementing—rather than conflicting with—the previously emphasized achievements of the welfare state during the 1960s and 1970s. But when it comes to the development since 1980 our series do indicate that a revision of the standard view may be needed. Even though previous studies have pointed out that inequality has increased over the past decades, the important role that capital incomes have played for the top of the distribution has not been fully appreciated and, in particular, most studies have not included the further increase in inequality from including capital gains. Furthermore, as the focus has previously been on

broader inequality measures it has not been noted how many of the recent developments are driven by the very top of the distribution. As such points may change not only our factual understanding about what has happened, but also our theories about the causes, further research is necessary to get a more complete view of income inequality in Sweden.

APPENDIX 7A: TABLES OF SOURCES AND KEY RESULTS

The sources for total incomes and income composition, 1903–2003, are listed in Table 7A.1.

The key results on income shares are shown in Tables A7.2 (excluding capital gains) and A7.3 (including capital gains).

Table 7A.1 List of sources for total incomes and income composition in Sweden, 1903–2006

Year	Main source a, b	Tables	Pages	Series[c]
1903	Flodström (1906)		1, 3	
1907	Flodström (1909)		XI–XII	FU
1911	Flodström (1914)		11	FU
1912	Flodström (1915)		13*	FU
1916	Statistics Sweden (1921)	C, E	21*–27*	SOS
1919	Statistics Sweden (1923)	C	21*	SOS
1920	Statistics Sweden (1927)	21	558–9	SOS
1930	Statistics Sweden (1937)	11	268–9	SOS
1934	SOU 1936:18	10	47	SOS
1935	Statistics Sweden (1940)	21	88–9	
1941	Quensel (1944)	VIII, IX	22–3, 28	
1943	Skattetaxeringarna (1) … taxeringsåret 1944	L	31*	SOS
1944	Skattetaxeringarna (1) … taxeringsåret 1945	Q	43*	SOS
1945	Skattetaxeringarna (1) … taxeringsåret 1946	P	42*	SOS
	Statistics Sweden (1951), *Census of 1945*	4	2–3	SOS
1946	Skattetaxeringarna (1) … taxeringsåret 1947	R	47*	SOS
1947	Skattetaxeringarna (1) … taxeringsåret 1948	V	51*	SOS
1948	Skattetaxeringarna (1) … taxeringsåret 1949	Q	48*	SOS
1949	Skattetaxeringarna (2) … taxeringsåret 1950	R	48*	SOS
1950	Skattetaxeringarna (2) … taxeringsåret 1951	S	51*	SOS
1951	Skattetaxeringarna (2) … taxeringsåret 1952	Å, 8	63*, 26–7	SOS
	Statistics Sweden (1956), *Census of 1950*	7	20–21	SOS
1952	Skattetaxeringarna (2) … taxeringsåret 1953	Z, 8	53°, 26–7	SOS
1953	Skattetaxeringarna (2) … taxeringsåret 1954	Z, 8	49°, 26–7	SOS
1954	Skattetaxeringarna (2) … taxeringsåret 1955	Z, 8	47°, 26–7	SOS
1955	Skattetaxeringarna (2) … taxeringsåret 1956	Z, 8	46°, 28–9	SOS
1956	Skattetaxeringarna (2) … taxeringsåret 1957	Z, 8	47°, 28–9	SOS
1957	Skattetaxeringarna (2) … taxeringsåret 1958	Y, 8	47°, 28–9	SOS
1958	Skattetaxeringarna (2) … taxeringsåret 1959	Å, 8	50°, 34–5	SOS
1959	Skattetaxeringarna (2) … taxeringsåret 1960	J, 8	28°, 32–3	SOS
1960	Skattetaxeringarna (2) … taxeringsåret 1961	I, 10	28°, 32–3	SOS
1961	Skattetaxeringarna (3) … taxeringsåret 1962	I, 10	28°, 34–5	SOS
1962	Skattetaxeringarna (3) … taxeringsåret 1963	J, 10	29°, 34–5	SOS
1963	Skattetaxeringarna (3) … taxeringsåret 1964	J, 10	43°, 36–7	SOS

(*continued*)

Table 7A.1 Continued

Year	Main source a, b	Tables	Pages	Series[c]
1964	Skattetaxeringarna (3) . . . taxeringsåret 1965	K, 10	44°, 36–37	SOS
1965	Skattetaxeringarna (3) . . . taxeringsåret 1966	J, 10	43°, 116–17	SOS
1966	Skattetaxeringarna (3) . . . taxeringsåret 1967	L, 9	43°, 118–19	SOS
1967	Inkomst och förmögenhet 1967	2, 7	44–5, 58–61	SOS
1968	Inkomst och förmögenhet 1968	2, 7	50–1, 64–7	SOS
1969	Inkomst och förmögenhet 1969	2, 7	50–1, 64–7	SOS
1970	Inkomst och förmögenhet 1970	2, 7	48–9, 62–5	SOS
1971	Inkomst och förmögenhet 1971	3, 12	68–9, 90–3	SOS
1972	Inkomst och förmögenhet 1972	1, 3, 14	54–5, 70–1, 102–5	SOS
	Inkomst- och förmögenhetsfördelningen 1972	7	19	SM N 1973:94
1973	Inkomst och förmögenhet 1973	3, 14	68–9, 100–3	SOS
1974	Inkomst- och förmögenhetsfördelningen 1974	1, 7	11, 33	SM N 1976:4
1975	Inkomst- och förmögenhetsfördelningen 1975	1, 7	13, 35	SM N 1976:23
1976	Inkomst- och förmögenhetsfördelningen 1976	1, 7	18, 41, 43	SM N 1977:24
1977	Inkomst- och förmögenhetsfördelningen 1977	1, 7	22, 46–7	SM N 1978:22
1978	Inkomst- och förmögenhetsfördelningen 1978	1, 4.1, 4.2	29, 38, 41	SM N 1980:9
1979	Inkomst- och förmögenhetsfördelningen 1979	1, 4.1, 4.2	20, 27, 30	SM N 1981:9.1
1980	Inkomst- och förmögenhetsfördelningen 1980	1, 4.1, 4.2	7, 14, 17	SM N 1976:4
1981	Inkomst- och förmögenhetsfördelningen 1981	1, 4.1, 4.2	7, 14, 17	SM N 1976:4
1982	Inkomst- och förmögenhetsfördelningen 1982	1, 4.1, 4.2	14, 21, 24	SM Be 1984:6.1
1983	Inkomst- och förmögenhetsfördelningen 1983	1, 4.1, 4.2	14, 21, 24	Be 20 SM 8501
1984	Inkomst- och förmögenhetsfördelningen 1984	1, 3.1, 3.2	15, 19, 22	Be 20 SM 8601
1985	Inkomst- och förmögenhetsfördelningen 1985	1, 2.1, 2.2	15, 18, 21	Be 20 SM 8701
1986	Inkomst- och förmögenhetsfördelningen 1986	1, 2.1, 2.2	17, 20, 23	Be 20 SM 8801
1987	Inkomst- och förmögenhetsfördelningen 1987	1, 2.1, 2.2	17, 20, 23	Be 20 SM 8901
1988	Inkomst- och skattestatistik 1988	1, 2.1, 2.2	16, 19, 22	Be 20 SM 9001
1989	Inkomst- och skattestatistik 1989	1, 2.1, 2.2	16, 20, 23	Be 20 SM 9101
1990	Inkomst- och skattestatistik 1990	1, 2.1, 2.2	15, 20, 23	Be 20 SM 9201
1991–2006	Tables with grouped income distributions acquired directly from Statistics Sweden			

[a] Some publications titles are abbreviated. Skattetaxeringarna (1) = *Skattetaxeringarna samt inkomstfördelningen inom yrkesgrupper*; Skattetaxeringarna (2) = *Skattetaxeringarna samt fördelningen av inkomst och förmögenhet inom yrkesgrupper*; Skattetaxeringarna (3) = *Skattetaxeringarna samt fördelningen av inkomst och förmögenhet taxeringsåret*.

[b] The publications since 1982 also have the subtitle *Totalräknad statistik*.

[c] 'FU' denotes *Finansstatistiska utredningar* (Fiscal Surveys) and 'SOS' *Sveriges officiella statistik* (Swedish Official Statistics).

Table 7A.2 Total income shares (excluding capital gains) in Sweden, 1903–2006

	Shares (excl. capital gains income)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1903	46.79	35.33	26.99	19.16	8.66	6.15	2.79
1904							
1905							
1906							
1907	45.42	36.33	21.46	16.57	8.72	6.47	2.99
1908							
1909							
1910							
1911	43.90	34.11	19.57	15.21	8.11	6.08	3.02
1912	45.59	35.75	20.92	16.29	8.99	6.84	3.55
1913							
1914							
1915							
1916	52.97	43.53	28.04	22.93	13.70	10.60	5.12
1917							
1918							
1919	41.91	31.23	16.33	11.70	7.33	5.55	2.91
1920	35.83	26.13	13.48	10.16	5.23	3.86	1.84
1921							
1922							
1923							
1924							
1925							
1926							
1927							
1928							
1929							
1930	38.41	27.87	13.74	10.15	4.82	3.45	1.52
1931							
1932							
1933							
1934	38.06	26.73	11.95	8.54	3.83	2.68	1.12
1935	36.18	25.74	12.32	8.98	4.22	2.99	1.21
1936							
1937							
1938							
1939							
1940							
1941	34.09	23.67	10.29	7.15	3.01	2.06	0.84
1942							
1943	35.61	24.48	10.44	7.19	2.99	2.01	0.78
1944	34.84	23.82	10.04	6.89	2.85	1.92	0.77
1945	34.23	23.36	9.77	6.69	2.72	1.82	0.70
1946	34.29	23.52	10.07	6.99	2.91	2.00	0.80
1947	32.09	21.43	8.62	5.85	2.35	1.59	0.60
1948	30.77	20.28	7.90	5.31	2.06	1.32	0.50
1949	30.35	19.89	7.64	5.09	1.96	1.29	0.48

(*continued*)

Table 7A.2 Continued

	Shares (excl. capital gains income)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1950	30.25	19.80	7.59	5.06	1.94	1.28	0.47
1951	29.84	19.41	7.33	4.91	1.94	1.30	0.51
1952	29.08	18.60	6.80	4.49	1.73	1.15	0.44
1953	29.60	19.01	6.90	4.55	1.75	1.16	0.45
1954	29.21	18.71	6.90	4.57	1.75	1.15	0.44
1955	28.82	18.39	6.78	4.48	1.69	1.11	0.41
1956	28.83	18.20	6.65	4.38	1.64	1.07	0.40
1957	29.21	18.59	6.81	4.47	1.67	1.09	0.40
1958	29.52	18.75	6.81	4.45	1.65	1.07	0.40
1959	30.06	19.18	7.00	4.57	1.69	1.10	0.40
1960	30.35	19.34	6.83	4.41	1.60	1.03	0.37
1961	30.36	19.27	6.77	4.35	1.55	0.99	0.35
1962	30.08	19.03	6.65	4.25	1.50	0.96	0.34
1963	29.95	18.95	6.64	4.25	1.50	0.95	0.33
1964	29.80	18.77	6.50	4.14	1.43	0.90	0.31
1965	29.69	18.67	6.47	4.11	1.42	0.90	0.31
1966	29.58	18.50	6.35	4.02	1.37	0.86	0.29
1967	30.33	19.17	6.55	4.10	1.38	0.86	0.29
1968	30.39	19.21	6.57	4.11	1.39	0.87	0.29
1969	30.02	18.88	6.41	4.01	1.34	0.84	0.28
1970	29.36	18.34	6.16	3.83	1.28	0.79	0.26
1971	28.36	17.59	5.80	3.60	1.19	0.74	0.24
1972	27.89	17.27	5.67	3.51	1.15	0.71	0.23
1973	27.56	17.00	5.57	3.44	1.13	0.70	0.23
1974	27.07	16.58	5.47	3.39	1.12	0.69	0.23
1975	26.38	16.14	5.29	3.28	1.07	0.67	0.23
1976	25.55	15.48	4.95	3.04	0.96	0.59	0.19
1977	24.72	14.91	4.69	2.86	0.83	0.54	0.21
1978	23.99	14.38	4.47	2.70	0.83	0.50	0.18
1979	23.47	13.97	4.25	2.56	0.77	0.49	0.18
1980	22.73	13.44	4.05	2.42	0.74	0.47	0.17
1981	22.40	13.19	3.97	2.38	0.76	0.48	0.19
1982	22.33	13.18	3.98	2.40	0.77	0.49	0.19
1983	22.42	13.29	4.08	2.47	0.81	0.54	0.25
1984	22.30	13.31	4.13	2.52	0.82	0.57	0.25
1985	22.33	13.35	4.12	2.49	0.80	0.56	0.24
1986	22.35	13.39	4.11	2.47	0.77	0.54	0.23
1987	22.54	13.59	4.24	2.55	0.86	0.60	0.26
1988	22.53	13.62	4.38	2.72	0.99	0.70	0.31
1989	22.55	13.68	4.48	2.81	1.07	0.79	0.40
1990	22.75	13.73	4.38	2.72	1.02	0.73	0.34
1991	24.33	15.04	5.10	3.27	1.30	0.89	0.39
1992	24.33	15.04	5.04	3.19	1.22	0.82	0.35
1993	24.63	15.31	5.22	3.33	1.30	0.88	0.37
1994	25.23	15.85	5.53	3.61	1.45	1.00	0.41
1995	24.93	15.54	5.25	3.35	1.31	0.88	0.38
1996	25.56	16.05	5.59	3.69	1.41	0.98	0.40

1997	25.82	16.23	5.72	3.80	1.47	1.03	0.43
1998	25.91	16.35	5.87	3.91	1.57	1.09	0.45
1999	26.12	16.52	6.01	4.00	1.62	1.13	0.48
2000	26.72	17.12	5.97	4.43	1.93	1.37	0.61
2001	26.76	17.10	5.95	4.33	1.86	1.32	0.57
2002	26.43	16.77	5.67	4.07	1.69	1.18	0.51
2003	26.12	16.54	5.52	4.02	1.70	1.20	0.58
2004	26.34	16.71	5.72	4.09	1.73	1.22	0.58
2005	26.96	17.33	6.28	4.40	1.91	1.35	0.64
2006	27.30	17.73	6.61	4.73	2.21	1.63	0.83
1903	11.58	8.41	7.90	10.64	2.55	3.43	
1904							
1905							
1906							
1907	9.19	15.03	4.92	7.94	2.29	3.54	
1908							
1909							
1910							
1911	9.90	14.70	4.38	7.19	2.06	3.11	
1912	9.95	14.99	4.66	7.39	2.18	3.36	
1913							
1914							
1915							
1916	9.54	15.66	5.13	9.33	3.15	5.58	
1917							
1918							
1919	10.81	15.06	4.67	4.42	1.81	2.68	
1920	9.81	12.79	3.35	4.99	1.39	2.05	
1921							
1922							
1923							
1924							
1925							
1926							
1927							
1928							
1929							
1930	10.66	14.28	3.62	5.40	1.40	1.96	
1931							
1932							
1933							
1934	11.46	14.95	3.43	4.78	1.16	1.59	
1935	10.56	13.58	3.36	4.82	1.25	1.81	
1936							
1937							
1938							
1939							
1940							
1941	10.54	13.54	3.17	4.19	0.97	1.24	
1942							
1943	11.25	14.20	3.28	4.26	0.99	1.25	
1944	11.15	13.94	3.17	4.09	0.94	1.18	
1945	10.99	13.75	3.11	4.02	0.92	1.14	
1946	10.89	13.59	3.12	4.13	0.93	1.22	

(*continued*)

Table 7A.2 Continued

	Shares (excl. capital gains income)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1947	10.76	12.94	2.81	3.56	0.77	1.00	
1948	10.58	12.49	2.65	3.30	0.75	0.83	
1949	10.54	12.35	2.61	3.18	0.68	0.82	
1950	10.52	12.31	2.59	3.17	0.67	0.82	
1951	10.49	12.17	2.50	3.01	0.65	0.79	
1952	10.54	11.89	2.37	2.80	0.59	0.71	
1953	10.65	12.19	2.42	2.84	0.59	0.72	
1954	10.56	11.89	2.40	2.86	0.60	0.72	
1955	10.48	11.69	2.35	2.83	0.59	0.70	
1956	10.68	11.63	2.32	2.77	0.57	0.68	
1957	10.68	11.85	2.39	2.84	0.59	0.69	
1958	10.82	12.01	2.41	2.84	0.58	0.69	
1959	10.92	12.26	2.47	2.92	0.60	0.71	
1960	11.05	12.59	2.46	2.84	0.58	0.67	
1961	11.13	12.58	2.46	2.84	0.56	0.65	
1962	11.09	12.45	2.43	2.78	0.55	0.63	
1963	11.04	12.38	2.42	2.78	0.55	0.63	
1964	11.08	12.33	2.39	2.74	0.54	0.61	
1965	11.05	12.26	2.38	2.72	0.53	0.60	
1966	11.11	12.22	2.35	2.67	0.52	0.58	
1967	11.16	12.63	2.45	2.72	0.52	0.57	
1968	11.19	12.64	2.45	2.73	0.52	0.58	
1969	11.14	12.47	2.40	2.66	0.50	0.56	
1970	11.02	12.18	2.32	2.56	0.48	0.53	
1971	10.78	11.78	2.21	2.41	0.45	0.49	
1972	10.63	11.60	2.16	2.36	0.44	0.48	
1973	10.56	11.43	2.12	2.31	0.43	0.47	
1974	10.49	11.11	2.08	2.27	0.42	0.46	
1975	10.23	10.85	2.01	2.21	0.40	0.45	
1976	10.06	10.53	1.92	2.07	0.37	0.40	
1977	9.82	10.21	1.84	2.03	0.28	0.34	
1978	9.61	9.92	1.77	1.87	0.32	0.33	
1979	9.51	9.72	1.69	1.79	0.28	0.31	
1980	9.29	9.38	1.63	1.68	0.27	0.29	
1981	9.21	9.22	1.59	1.63	0.28	0.29	
1982	9.14	9.20	1.58	1.63	0.28	0.29	
1983	9.13	9.21	1.61	1.67	0.27	0.29	
1984	8.99	9.18	1.61	1.69	0.25	0.33	
1985	8.98	9.23	1.63	1.70	0.24	0.32	
1986	8.97	9.28	1.64	1.70	0.24	0.31	
1987	8.95	9.35	1.69	1.68	0.26	0.34	
1988	8.91	9.24	1.66	1.73	0.29	0.39	
1989	8.87	9.21	1.66	1.75	0.28	0.40	
1990	9.01	9.35	1.66	1.70	0.29	0.39	
1991	9.29	9.95	1.82	1.97	0.41	0.50	
1992	9.29	10.00	1.85	1.97	0.40	0.47	
1993	9.33	10.08	1.90	2.03	0.42	0.51	

1994	9.38	10.32	1.92	2.16	0.45	0.59
1995	9.39	10.29	1.90	2.05	0.42	0.51
1996	9.51	10.46	1.90	2.28	0.43	0.57
1997	9.59	10.51	1.92	2.33	0.43	0.61
1998	9.56	10.48	1.96	2.33	0.48	0.64
1999	9.60	10.51	2.02	2.37	0.50	0.65
2000	9.60	11.16	1.54	2.50	0.56	0.76
2001	9.65	11.15	1.62	2.48	0.54	0.75
2002	9.65	11.11	1.59	2.38	0.51	0.67
2003	9.58	11.02	1.50	2.32	0.50	0.63
2004	9.63	10.99	1.63	2.36	0.51	0.65
2005	9.64	11.05	1.87	2.50	0.56	0.71
2006	9.57	11.12	1.88	2.52	0.58	0.80

Notes: The shares 1903–66 are adjusted downwards by estimated capital gains shares.
In 1982, the gross total income (SRI) minus deficits at source (UF) and minus capital gains (CG) is negative, and therefore set to 0.

Table 7A.3 Total income shares (including capital gains) in Sweden, 1903–2006

	Shares (incl. social benefits, incl. capital gains)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1903	46.76	35.32	27.01	19.21	8.71	6.19	2.81
1904							
1905							
1906							
1907	45.40	36.32	21.48	16.62	8.77	6.51	3.01
1908							
1909							
1910							
1911	43.88	34.10	19.58	15.25	8.15	6.12	3.04
1912	45.57	35.74	20.94	16.34	9.04	6.89	3.57
1913							
1914							
1915							
1916	52.94	43.52	28.06	22.99	13.78	10.67	5.15
1917							
1918							
1919	41.89	31.22	16.35	11.73	7.37	5.58	2.93
1920	35.81	26.12	13.49	10.19	5.25	3.88	1.85
1921							
1922							
1923							
1924							
1925							
1926							
1927							
1928							
1929							
1930	38.39	27.86	13.75	10.18	4.85	3.47	1.53

(*continued*)

Table 7A.3 Continued

	Shares (incl. social benefits, incl. capital gains)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1931							
1932							
1933							
1934	38.04	26.72	11.95	8.56	3.85	2.70	1.13
1935	36.16	25.73	12.32	9.01	4.24	3.00	1.22
1936							
1937							
1938							
1939							
1940							
1941	34.08	23.67	10.30	7.16	3.02	2.07	0.84
1942							
1943	35.59	24.47	10.45	7.21	3.00	2.02	0.79
1944	34.83	23.81	10.05	6.91	2.87	1.94	0.77
1945	34.22	23.36	9.78	6.70	2.74	1.83	0.70
1946	34.31	23.54	10.10	7.01	2.93	2.01	0.80
1947	32.13	21.48	8.66	5.88	2.36	1.59	0.60
1948	30.84	20.34	7.96	5.33	2.06	1.32	0.50
1949	30.44	19.98	7.71	5.12	1.96	1.29	0.48
1950	30.37	19.91	7.67	5.10	1.94	1.28	0.47
1951	29.99	19.55	7.43	4.94	1.95	1.30	0.51
1952	29.22	18.73	6.89	4.53	1.74	1.15	0.44
1953	29.74	19.13	6.99	4.58	1.76	1.17	0.45
1954	29.34	18.83	6.99	4.61	1.76	1.16	0.44
1955	28.94	18.50	6.86	4.52	1.70	1.12	0.42
1956	28.94	18.31	6.73	4.42	1.66	1.09	0.41
1957	29.32	18.69	6.89	4.52	1.68	1.10	0.41
1958	29.62	18.85	6.89	4.50	1.67	1.09	0.40
1959	30.16	19.28	7.08	4.62	1.71	1.12	0.41
1960	30.45	19.44	6.91	4.46	1.63	1.05	0.38
1961	30.45	19.37	6.85	4.40	1.57	1.01	0.36
1962	30.16	19.12	6.72	4.30	1.53	0.98	0.35
1963	30.03	19.03	6.71	4.30	1.53	0.98	0.35
1964	29.88	18.84	6.57	4.19	1.46	0.93	0.32
1965	29.75	18.75	6.54	4.16	1.45	0.92	0.32
1966	29.64	18.58	6.41	4.07	1.41	0.89	0.31
1967	30.40	19.25	6.62	4.16	1.42	0.89	0.30
1968	30.49	19.32	6.69	4.22	1.46	0.92	0.32
1969	30.16	19.05	6.57	4.15	1.43	0.91	0.31
1970	29.47	18.49	6.32	3.97	1.35	0.85	0.29
1971	28.48	17.72	5.93	3.70	1.24	0.78	0.26
1972	28.03	17.43	5.81	3.62	1.21	0.76	0.25
1973	27.75	17.21	5.76	3.60	1.21	0.76	0.25
1974	27.17	16.80	5.68	3.58	1.23	0.77	0.26
1975	26.51	16.28	5.41	3.38	1.13	0.71	0.24
1976	25.69	15.63	5.07	3.13	1.02	0.63	0.21
1977	24.85	15.03	4.77	2.92	0.85	0.56	0.21
1978	24.13	14.53	4.56	2.76	0.87	0.53	0.19

1979	23.53	14.07	4.33	2.61	0.80	0.51	0.19
1980	22.82	13.55	4.13	2.50	0.79	0.50	0.19
1981	22.48	13.32	4.07	2.47	0.81	0.51	0.20
1982	22.44	13.32	4.08	2.49	0.83	0.53	0.21
1983	22.76	13.71	4.45	2.81	1.06	0.71	0.33
1984	22.59	13.59	4.36	2.72	0.96	0.67	0.29
1985	22.78	13.84	4.59	2.94	1.16	0.90	0.49
1986	22.79	13.84	4.49	2.83	1.04	0.72	0.31
1987	23.11	14.15	4.73	2.99	1.19	0.83	0.36
1988	23.30	14.42	5.08	3.34	1.44	1.02	0.46
1989	23.59	14.76	5.45	3.72	1.81	1.34	0.67
1990	23.62	14.63	5.20	3.47	1.62	1.17	0.55
1991	26.51	17.25	6.95	4.99	2.47	1.87	0.95
1992	25.30	16.02	5.84	4.02	1.79	1.33	0.67
1993	25.51	16.17	5.93	4.04	1.75	1.27	0.60
1994	27.14	17.77	7.18	4.99	2.43	1.78	0.84
1995	25.79	16.39	6.00	3.80	1.80	1.30	0.62
1996	27.26	17.71	6.99	4.76	2.50	1.93	1.06
1997	28.13	18.58	7.61	5.51	2.95	2.29	1.24
1998	28.27	18.78	8.17	5.69	3.15	2.48	1.41
1999	29.75	20.20	9.30	6.77	3.70	2.87	1.56
2000	31.31	21.93	11.12	8.54	5.21	4.20	2.47
2001	28.91	19.35	8.62	6.15	3.36	2.61	1.40
2002	27.94	18.32	7.59	5.20	2.62	2.00	1.06
2003	27.73	18.23	7.62	5.26	2.71	2.09	1.17
2004	28.21	18.34	7.87	5.52	2.80	2.15	1.20
2005	29.77	20.02	8.99	6.56	3.33	2.49	1.26
2006	30.72	21.07	9.53	6.92	3.77	2.91	1.59
1903	11.44	8.31	7.80	10.50	2.51	3.39	
1904							
1905							
1906							
1907	9.08	14.85	4.86	7.85	2.26	3.50	
1908							
1909							
1910							
1911	9.78	14.52	4.33	7.10	2.03	3.08	
1912	9.83	14.80	4.60	7.30	2.15	3.31	
1913							
1914							
1915							
1916	9.42	15.46	5.07	9.22	3.11	5.52	
1917							
1918							
1919	10.67	14.87	4.61	4.37	1.79	2.65	
1920	9.69	12.63	3.31	4.93	1.37	2.02	
1921							
1922							
1923							
1924							
1925							
1926							
1927							
1928							

(*continued*)

Table 7A.3 Continued

	Shares (incl. social benefits, incl. capital gains)						
Year	P90–100 (1)	P95–100 (2)	P99–100 (3)	P99.5–100 (4)	P99.9–100 (5)	P99.95–100 (6)	P99.99–100 (7)
1929							
1930	10.53	14.11	3.57	5.33	1.38	1.94	
1931							
1932							
1933							
1934	11.32	14.77	3.39	4.72	1.15	1.57	
1935	10.43	13.41	3.32	4.76	1.24	1.79	
1936							
1937							
1938							
1939							
1940							
1941	10.41	13.37	3.13	4.14	0.95	1.22	
1942							
1943	11.12	14.03	3.24	4.20	0.98	1.23	
1944	11.02	13.77	3.13	4.04	0.93	1.16	
1945	10.86	13.58	3.08	3.97	0.91	1.13	
1946	10.77	13.44	3.09	4.08	0.92	1.21	
1947	10.65	12.82	2.78	3.52	0.76	0.99	
1948	10.50	12.38	2.63	3.27	0.74	0.82	
1949	10.47	12.27	2.59	3.16	0.67	0.81	
1950	10.46	12.24	2.57	3.15	0.67	0.81	
1951	10.44	12.12	2.48	3.00	0.65	0.79	
1952	10.50	11.84	2.36	2.79	0.59	0.71	
1953	10.61	12.14	2.41	2.82	0.59	0.72	
1954	10.51	11.84	2.39	2.85	0.60	0.72	
1955	10.44	11.64	2.34	2.82	0.59	0.70	
1956	10.63	11.58	2.31	2.76	0.57	0.68	
1957	10.63	11.80	2.38	2.83	0.58	0.69	
1958	10.77	11.96	2.40	2.83	0.58	0.68	
1959	10.87	12.21	2.46	2.91	0.60	0.70	
1960	11.00	12.53	2.45	2.83	0.57	0.67	
1961	11.08	12.52	2.45	2.82	0.56	0.65	
1962	11.05	12.40	2.42	2.77	0.55	0.63	
1963	10.99	12.33	2.41	2.77	0.55	0.63	
1964	11.03	12.27	2.38	2.73	0.53	0.60	
1965	11.01	12.21	2.37	2.71	0.53	0.60	
1966	11.07	12.17	2.34	2.66	0.52	0.58	
1967	11.15	12.63	2.46	2.74	0.53	0.59	
1968	11.17	12.64	2.46	2.76	0.54	0.60	
1969	11.11	12.48	2.42	2.72	0.53	0.59	
1970	10.98	12.18	2.34	2.62	0.50	0.56	
1971	10.76	11.79	2.23	2.46	0.47	0.52	
1972	10.61	11.62	2.19	2.41	0.46	0.50	
1973	10.55	11.45	2.16	2.39	0.45	0.50	
1974	10.37	11.12	2.10	2.35	0.45	0.51	
1975	10.22	10.87	2.03	2.25	0.43	0.47	
1976	10.06	10.57	1.94	2.11	0.39	0.43	

1977	9.81	10.26	1.86	2.06	0.29	0.35
1978	9.60	9.97	1.79	1.89	0.34	0.34
1979	9.47	9.73	1.72	1.81	0.29	0.32
1980	9.27	9.41	1.64	1.71	0.29	0.32
1981	9.16	9.26	1.60	1.66	0.29	0.31
1982	9.12	9.24	1.60	1.66	0.30	0.32
1983	9.05	9.26	1.64	1.75	0.35	0.38
1984	9.00	9.23	1.64	1.76	0.29	0.38
1985	8.94	9.25	1.65	1.78	0.27	0.41
1986	8.95	9.34	1.67	1.79	0.32	0.41
1987	8.96	9.42	1.74	1.80	0.36	0.47
1988	8.88	9.34	1.74	1.90	0.42	0.56
1989	8.84	9.31	1.73	1.92	0.47	0.67
1990	8.99	9.44	1.72	1.85	0.45	0.62
1991	9.26	10.30	1.96	2.52	0.60	0.93
1992	9.28	10.18	1.83	2.22	0.46	0.66
1993	9.34	10.24	1.89	2.29	0.48	0.67
1994	9.37	10.59	2.19	2.56	0.65	0.94
1995	9.40	10.39	2.20	2.01	0.50	0.68
1996	9.55	10.72	2.22	2.26	0.57	0.87
1997	9.55	10.97	2.09	2.56	0.67	1.05
1998	9.50	10.60	2.48	2.54	0.67	1.07
1999	9.55	10.91	2.53	3.06	0.83	1.32
2000	9.39	10.81	2.58	3.33	1.01	1.73
2001	9.56	10.73	2.47	2.79	0.74	1.21
2002	9.62	10.73	2.39	2.58	0.63	0.94
2003	9.51	10.61	2.36	2.55	0.61	0.93
2004	9.87	10.47	2.35	2.72	0.65	0.95
2005	9.74	11.03	2.43	3.23	0.84	1.24
2006	9.65	11.54	2.61	3.15	0.85	1.33

APPENDIX 7B: DETAILS OF THE SWEDISH INCOME DATA

The Swedish income tax system contains several different concepts of income and deductions, and their basic relationships are shown in Table 7B.1. It should be noted that there are some particularities added to this scheme over the centuries, as will be described in the following. In short, the most completely reported total incomes are those in 1971–2006, followed by those in 1943–70 when the tax authorities subtracted deficits in sources (mainly interest payments). Between 1903 and 1942, the incomes reported in the sources are incomes assessed for state taxation, meaning total net income *minus* municipal taxes paid and (from 1911) *plus* a share of taxable personal wealth. We have therefore deducted the wealth shares in all years when these are included and for the years after 1921 when municipal taxes were also progressive (flat rate taxes do not affect the top income shares and are therefore ignored), these are added to the incomes.

Concepts of Income in the Data, 1903–1942

In the years 1903 and 1907, the incomes reported in the tabulate tax returns data are incomes assessed to the progressive state income tax of 1902 (*till statlig inkomst- och förmögenhetsskatt taxerad inkomst*). This implies all income from labour and capital, and fixed rates of return from agricultural and other real estates, in order to capture the otherwise non-reported in-kind revenues from farming (see, e.g., Flodström 1909: p. viii). Deductions for deficits in sources of income (e.g. interest payments) were allowed, and thereby this income concept is a 'total net income'.[57]

In the years 1911, 1912, and 1916, the incomes reported in the statistical sources are amounts assessed for the state income and wealth tax, which means in practice 'total net income' plus a share, one-sixtieth in 1911–37 and one-hundredth in 1938–47, of taxable personal wealth. This income concept, 'total net income' plus a wealth share, was called 'centrally assessed amount' (*taxerat belopp*). We remove the wealth shares in the years 1911, 1912, and 1916, using data on the amount of wealth shares in each income class in the year 1912 (Flodström 1915: 47*–48*).

For 1919, the reported incomes are again assessed amounts, but this time we use the wealth shares in 1920 (Statistics Sweden 1929: 286–7) to remove the shares in 1919.

For 1920, we use another source of data: census material (reported in Statistics Sweden 1929). It reports incomes in the form of centrally assessed incomes, i.e. total net incomes not including wealth shares. However, the incomes used when reporting the taxes paid are based on the tax statistics and then using incomes in the form of 'assessed amounts', i.e. including the wealth shares. We use wealth share information from 1920 to remove the shares.

[57] In *Nordisk familjebok* (1910: 667) under the entry 'income tax' (*Inkomstskatt*) says that deductions are allowed for all costs that arise when earning the income and for interest payments.

For 1930, we use the census material in Statistics Sweden (1937), in which the income concept is the centrally assessed income. Although this implies that we do not need to remove any wealth shares, local taxes paid were from 1921 made deductible from the total net income before arriving at the centrally assessed income. This means that we have to add local taxes to the assessed income in order to arrive at a comparable income concept with earlier (and later) years. Since most local taxes are proportional and hence hit all types of income earners similarly, their effect on top income shares is limited. However, between 1921 and 1937 there were two *progressive* local taxes in place, called 'local progressive tax' (*kommunal progressivskatt*) and 'equalization tax' (*utjämningsskatt*). These must be added to the centrally assessed income for comparability reasons. For 1930, we add the progressive local taxes as they are described in Söderberg (1996: 76–7).

For 1934, the data come from a special inquiry made by the Ministry of Finance, based on a total collection of all tax filers reporting assessed amounts on SEK 8,000 income or above. For income earners with lower incomes, statistical calculations and spurious evidence were used (SOU 1936: 34 ff.). The income concept reported is hence centrally assessed amount, and we remove the wealth shares using information on wealth shares across income classes from the census of 1935/6 (Statistics Sweden 1940: 88–9). Furthermore, we add the progressive local taxes that are listed for each income class.

For 1935, the material is the taken from the census of 1935/6 (Statistics Sweden 1940) and based on a 20 per cent individual-based sample of the population. The incomes collected are centrally assessed incomes, i.e. without including wealth shares. We add progressive local taxes based on their amounts listed for the income year of 1934 (see above).

For 1941, we use data from yet another special inquiry made by the Ministry of Finance based on all tax returns amounting to an assessed amount of SEK 8,000 or above (Quensel 1944: 28). Quensel makes corrections to make the incomes equivalent to centrally assessed incomes (called *korrigerat belopp*), i.e. including local taxes and without wealth shares.

Concepts of Income in the Data, 1943–2006

In the period 1943–70, Statistics Sweden introduced a new system for reporting the Swedish tax-based income distribution. Unlike the previous tabulations, however, a new official main concept of income was introduced: 'total net income' (*sammanräknad nettoinkomst*), defined as total income less deductions of deficit in any income source.

In 1971–90, Statistics Sweden changed main income concept to 'total income' (*sammanräknad inkomst*), which is defined as above but without deducting deficits in sources. A fairly important change in terms of the reported income statistics occurred in 1974, when the government decided to make all social benefits (e.g. unemployment insurance, social security transfers, state pensions) liable to taxation. This implied that incomes filed on tax returns, and hence also the official incomes used in the income statistics, now started to include social security transfers. Since our main focus is on the incomes at the top, where these benefits are relatively small and even insignificant, this rules-based change has limited bearing on this study. Therefore, we only make an adjustment on the reference total income by adding sums of social security transfers on the national level (published in the Statistical Yearbooks of Statistics Sweden) for all years before 1974 whenever such data were found (starting in the 1940s).

In 1991–2006, Statistics Sweden once again changed their main concept of income when producing their income statistics, now to *total earned income* (*sammanräknad förvärvsinkomst*), defined as the sum of labour and business income. Hence, capital income and

capital gains were excluded. Fortunately, Statistics Sweden continued publishing a few summary tables in which they used total income (*summa förvärvs- och kapitalinkomst*) as concept of income, and these are series used by us.

Definitions of Sources of Income

As already mentioned above, the Swedish tax laws and income statistics define the sources of income that are to be specified on the tax returns. These definitions have been remarkably stable and the only major change came with the tax reform of 1991. Unfortunately, the published income statistics have not always reported compositional data across different income levels. In particular, before 1967, when such reports were made each year, these data are available only in two censuses: 1945 (Statistics Sweden 1951) and 1950 (Statistics Sweden 1956).

The sources of income used before 1991 were the following six:[58] labour income (*inkomst av tjänst*), mainly wages and salaries; capital income (*inkomst av kapital*), mainly interest earnings and dividends; entrepreneurial income (*inkomst av rörelse*), mainly firm profits and royalties; farm income (*inkomst av jordbruksfastighet*), mainly of sales of agricultural and forestry products and leases; real estate income (*inkomst av annan fastighet*), mainly rents and in-kind payments; and capital gains (*inkomst av tillfällig förvärvsverksamhet*) from sales of real estate and securities.[59]

After 1991, the number of income sources was reduced to three: labour (*inkomst av tjänst*), business (*inkomst av näringsverksamhet*), and capital (*inkomst av kapital* (*överskott*)). Compared with the earlier period, labour income was defined in basically the same way. Business income, however, included not only the previous entrepreneurial income, but also all of farm incomes and a small part of real estate income emanating from rental apartments. In the new concept of capital income, the previous capital income was included but also most of former real estate income coming from private rental and, notably, all forms of capital gains.

For analyses spanning the whole period, we use four main income sources primarily following the definitions of the post-1991 period (for computational reasons): wages, capital, business, and capital gains, defined in Table 7B.2.

Estimating the Share of Capital Income in Top Incomes, 1912–2006

Thanks to early wealth data in the tax statistics for income earners in different classes of total income, we are able to construct shares of capital income of total income as far back as 1912 and for some more years until the post-war period when we use the compositional sources described previously.

Specifically, the shares before 1945 are computed by assuming that capital income is a fixed rate of return flowing from the individuals' net wealth. Information about net wealth in different classes of income is available from the tax-based income statistics due to the fact that one-sixtieth of that wealth was to be added as taxable income until 1938 when the share was reduced to one-hundredth and 1943 when it was removed altogether (recall

[58] In the late 1960s, there was also a specific entry for income from partnerships (*inkomst av delägarskap i vanligt handelsbolag etc*), but this was included in entrepreneurial income from the 1970s onwards and we do this also for these years when it was reported separately.

[59] Detailed descriptions of the income sources are found in, e.g., Statistics Sweden (1945: 50–67) and Statistics Sweden (1975: 25–6).

Table 7.1). The approach was previously used by, e.g., Flodström (1915: 46–7) and Statistics Sweden (1927). Capital income is then computed as the annual rate of return from this wealth. We assume that the yield is flat and the same for all income earners disregarding the (unlikely) possibility of systematic differences in portfolios across income levels. The yields used are 5 per cent for the years 1912, 1916, and 1919, 5.5 per cent in 1920, 4.5 per cent in 1930, and 3 per cent in 1935. These are the same rates that Flodström and Statistics Sweden use (except for 1920 when they use 5 per cent).[60] Unlike them, however, we can also motivate our choice of these rates by referring to three other reference interest rates from the same particular years. Specifically, the yearly averages of the minimum lending rate (*diskontot*) set by the Swedish central bank, the average deposit rate at Swedish savings banks, and the effective Swedish government bond yield were in 1912: 4.81, 4.35, and 4.80; in 1916: 5.23, 4.76, and 5.09; in 1919: 6.38, 5.08, and 5.71; in 1920: 6.92, 5.16, and 7.00; in 1930: 3.71, 5.22, and 4.18; and in 1935: 2.50, 3.59 (in 1933), and 3.30 (*Svensk Sparbankstidskrift* 1934: 825). However, Östlind (1945: 261) shows numbers of effective yields of stock exchange-listed stocks during the First World War being somewhat lower that what we use (4.0 per cent for 1916). At the same time, Beije (1946: 64–87) shows the market yields of new corporate bond issues during 1912–20 more in line with the ones we use. Finally, the share of capital income of total income across the various top fractiles is computed using Pareto interpolation in the same way as in the rest of the compositional analysis.

Realized Capital Gains and the Identity of Top Income Earners, 1991–2006

One problem with using aggregate income statistics ordered in classes of total income is that we have problems assessing the true distributional effects of capital gains income. In short, we do not wish to have our top total income earners being populated by low-wage income earners selling their house or some old bonds and thereby jumping from the 50th to the 99th percentile.[61]

A simple way to at least rule out some of the ambiguity is to use the tabulations by Statistics Sweden of average gross capital gains income (i.e. before deductions against interest payments or capital losses) in classes of earned income, from 1991 onwards. Since the compositional analysis above showed that business income is only a minimal part of earned income during this period even for top total income earners, earned income in practice means wages and salaries. The results of this exercise are shown in Figure 7B.1, where the distributions of realized capital gains are plotted across classes of labour income for each year in 1991–2006. Apparently average capital gains are highest for those who also earn the most, i.e., at least for this late sub-period of the study we find no support for the hypothesis that realizations of capital gains create a large turnover of people in our income distribution and that a constantly significant share of top income earners is low-wage income earners.

Concepts of Tax Units

The Swedish income statistics have used two main definitions of tax units over the twentieth century. Before 1951, the tax unit is the *family*, meaning married couples or

[60] Unfortunately, no income data were collected in the census of 1940, so we have no information about wealth shares in different classes of income.

[61] This has previously been shown by Saez and Veall (2005) not to be the case among top income earners in Canada.

single households, both with any under-age resident children. After 1951, the tax unit is the *individual*. On top of these main types, there were some minor changes mainly during the latter period which are discussed in this section. Income earners (tax units), 1903–50: Income earners in the Swedish income statistics refer to physical persons who lived in Sweden during the income year and who also filed a personal tax return.[62] The Swedish income statistics were family based until 1950, which meant that families with at least one income earner earning more than the lowest taxable income threshold should file one tax return. Married couples filed a joint tax return.

Income earners (tax units), 1951–2006: For the period 1951–2006, the Swedish income statistics changed to being individual based, meaning that individual tax returns form the basis for the income distribution data that we have used in this study. It should be noted that the definition of income earners according to published income statistics is typically, but not always, identical with the contemporaneous tax legislation. In particular, although the *income statistics* switched from using households to individuals in 1951, the Swedish *tax system* continued taxing families until 1971. But the transition was gradual between 1954 and 1971. Before 1954 the wife's income was automatically assessed as a part of her husband's income. Between 1954 and 1965 spouses filed separate tax returns after which their incomes were lumped together and taxed as one tax unit according to a specific rate of 'joint taxation' (*sambeskattning*). Between 1966 and 1970, the system was further adjusted so that married couples could choose whether to have their income taxed separately or as one couple according to a specific scale. Finally, in 1971 the Swedish tax system changed to being fully individual based and married couples were thereafter treated as two income earners.

In the period 1943–50 the income statistics followed the tax system by being household based, using the total number of filed tax returns as primary material. Due to processing constraints, however, only a few variables could be collected for each tax unit and therefore it was decided to switch to a sample-based system that allowed more background information to be collected and analysed. Because of this, Statistics Sweden decided to start using a nationally representative 10 per cent sample of the tax population as basis for its income statistics from the year 1951 onwards. This basically meant that the income statistics became individual based despite still having a family-based tax system since all persons with positive income had to file an individual tax return regardless of whether they were eventually taxed jointly with their spouses or parents.[63] The 10 per cent sample was drawn from the population of all adults aged 16 years or above and born on either the 5th, 15th, or 25th in each month.[64] To avoid sampling too few high-income earners, these groups were fully sampled.[65] This is, of course, important in the context of studying top incomes as it means that we do not have to worry about missing top income earners due to sampling in this period. The sample-based income statistics lasted until 1967 when

[62] Formally, unfinished death estates and family foundations are also counted as income earners, but they only represent about 1% of the total number of income earners.

[63] The switch to using a population sample followed the instructions of a governmental statute (*kungörelse den 21 december 1951*, No. 832).

[64] Having in fact 365.25 days calendar year, the chosen sample was actually smaller than 10% of the population and instead of multiplying each income earner by 10 (for those jointly assessed 5) it should have been 10.146 (and 5.340). As noted by Statistics Sweden in *Inkomst och förmögenhet 1968*, p. 26 (see appendix sources), this could have some minor effects on the comparability of the data before and after 1967.

[65] The definition of high income was SEK 30,000 or above during 1951–9 and with income above and SEK 50,000 or above in 1960–6.

Statistics Sweden returned to basing the income statistics on the complete tax population with the help of new data-processing techniques.

Apart from these major changes in the income earner definitions, there have been several smaller adjustments and related changes that have affected the income earner concept. For example, in income years 1972 and 1973 all retirees receiving public pension only (*folkpensionärer*) were granted extra deductions so as to avoid paying taxes.[66] Another change happened in 1978 when both employers and employees were required to report all incomes paid and received, which in itself increased the tax-liable population by a couple of hundred thousand income earners who were most likely previously avoiding taxes altogether.

The main impact that these changes of tax units have in our study is on the choice of reference population and how to homogenize this over time. Details of how we do this are presented below.

Lowest Taxable Income Threshold

Sweden is an outlier internationally in terms of the large share of income earners that have been obliged to file taxes over the twentieth century. Figure 7B.2 shows the lowest income level that obliging a tax return (in Swedish *deklarationspliktgräns* or '*skattestreck*'), which is negatively correlated with the number of people included in the tax population. During the first decade 1903–10, the level was relatively high, SEK 1,000, representing between one and two times the overall average income (reference total income divided by reference total population). Over time, the level was increased nominally, shown in the right scale in the figure. Already in 1920, only if one earned a fifth of the average income had one to file a personal tax return and since the 1950s the level has been lowered even further in relative terms.

It should be noted that although the fairly drastic discrete changes in the threshold in, e.g., 1911, 1919, 1952, 1962, and 1971 changed the number of tax filers by several percentage points, this does not affect our analysis since we always observe the absolute top income earners as well as the reference total population.[67]

[66] See, e.g., Statistics Sweden(1973: 15).

[67] The doubling of the threshold in 1962 was estimated to decrease the number of income earners by about 125,000, representing about 3% (Statistics Sweden, 1964: 21).

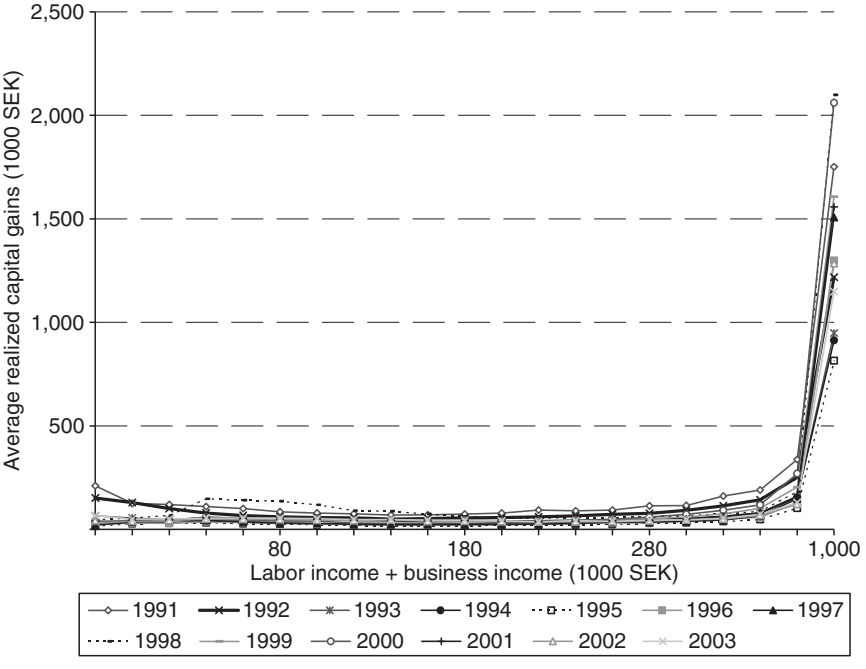

Figure 7B.1 Average gross capital gains income in classes of earned income in Sweden, 1991–2003

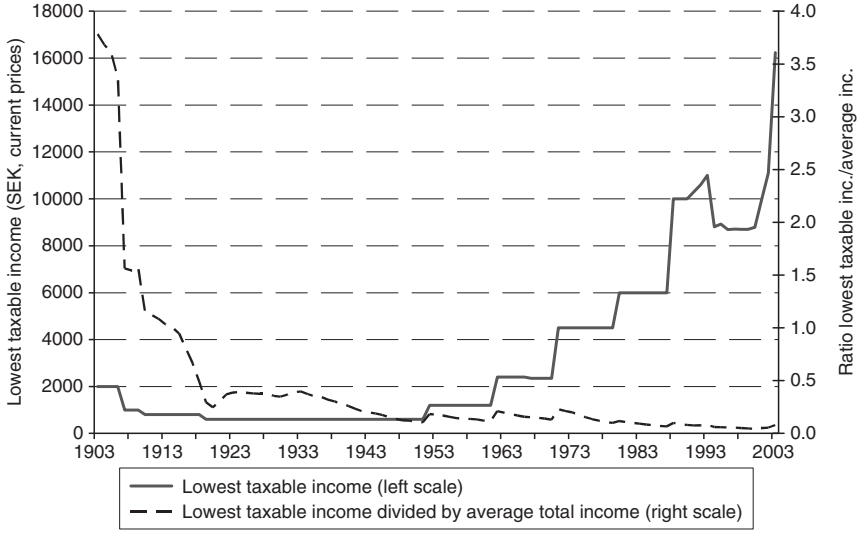

Figure 7B.2 Lowest taxable income and its share of average total income on Sweden, 1903–2003

Table 7B.1 Income concepts, deductions, and taxes and their interrelationships

Concept	Description and relationship with other concepts
SRI	*Total income* (Swedish term: *Sammanräknad inkomst*) from labour, capital, business, capital gains
– UF	*Deficit in source of income* (*Underskott i förvärvskälla*), e.g., interest rate payments.
= SRNI	SRNI = SRI—UF: *Total net income* (*Sammanräknad nettoinkomst*). Main income concept in the Swedish income of Statistics Sweden during 1943–70. In this study used for the whole period.
—EA	*Basic deductions* for, e.g., state pension contributions (*folkpensionsavgift*, 1921–35), social security fees (*sjukförsäkringsavgift*, 1955–74), security charges (*egenavgifter*, 1993–).
= KTI	KTI = SRNI—EA: *Locally assessed income* (*Kommunalt taxerad inkomst*).
—KGA	*Local free allowance* (*Kommunala grundavdrag*). Since 1903, originally a regional adjustment for differences in cost of living (*kommunalt dyrortsavdrag*).
= KBI	KBI = KTI—KOA: *Locally taxable income* (*Kommunalt beskattningsbar inkomst*).
LTAX	LTAX = KBI∗(Local tax rate): *Local taxes paid* (*kommunala skatter*). These are mainly proportional, but during 1921–37 there were two local progressive taxes, municipal progressive tax (*Kommunal progressivskatt*) and equalization tax (*Utjämningsskatt*), which are added to the other taxes.
—AA	*Deduction for losses* (*Allmänna avdrag*): After 1920, this was mainly local taxes (LTAX). Other losses were state pension fees (*Folkpensionsavgifter*) and sick leave insurance fees (*Sjukförsäkringsavgifter*).
—LTAX	
= STI	STI = KTI—AA—LTAX: *Centrally assessed income* (*Statligt taxerad inkomst*). This is what we use in our series, but between 1911 and 1942 (except for the census material of 1920, 1930, and 1935), the tax laws defined STI as STB (see below).
or STB	STB = STI + 'Share of personal taxable wealth': *Centrally assessed amount* (*Statligt taxerat belopp*). During 1911–47. The wealth share added to STI was 1911–37 1/60 of taxable wealth and 1938–47 1/100. Note that the official income statistics used total net income as main concept from 1943, why STB did not appear in the data after 1942.
—SGA	*Central free allowance* (*Statligt grundavdrag*). Introduced in 1911 to mitigate effect from living in high-cost of living areas (*statligt dyrortsavdrag*, 1911–62), but also including deductions for wife (*hustruavdrag*, 1919–48) and children (*barnavdrag*, 1911–48). Moreover, additional allowances were possible in case of accident or long-term illness (*avdrag för särskilda förhållanden*),
= SBI	*Centrally taxable income* (*Statligt beskattningsbar inkomst*).
STAX	STAX = SBI∗(State income tax rate): *State income taxes paid* (*Statlig inkomstskatt*). There were several different kinds of central government income taxes.

Table 7B.2 The four income sources used in the compositional analysis in Sweden, 1912–2006

Income source	Description
Wages	Includes wages and salaries and is basically defined in the same way both before and after 1991.
Capital income	Includes interest earnings, dividends and real estate income. In the period before 1991, we add 'capital income' (interests and dividends) and 'real estate income' together.[a] After 1991, estimate capital income from the 'new capital income', which includes both the old concept and capital gains. Hence, we break out interest earnings and dividends (called *inkomst av ränta* in the income statistics), private rental income (*inkomst av uthyrning av privatbostad*), and special rental income (*inkomst av positiv räntefördelning*).
Business income	Includes mainly income from privately held firms. Before 1991, we add together 'entrepreneurial income' and 'farm income'. After 1991, we use 'business income'.
Capital gains	Includes net gains from sales of real estate and other assets.

[a] Formally, one part of the real estate income was also included in business income after 1991, namely income from public rental buildings. However, this only concerned so-called 'physical persons' (private individuals) and not 'judicial persons' (public and private companies) which instead had to report all of their income (including that from real estate) as entrepreneurial income and which was the largest part of the two incomes. Leif Johansson at Statistics Sweden (from a discussion on 25 June 2005) also would believe that the absolute majority of the real estate income before 1991 should refer to what would after 1991 have been included in capital income. For these reasons, we place all of real estate income in the capital income in our long-run series.

APPENDIX 7C: CONSTRUCTION OF REFERENCE TOTAL

Here we explain in greater detail exactly how our reference totals have been constructed. The different reference totals are used to test the robustness of our series to the choice of reference total. The reference totals for tax units and income, 1903–2006, are shown in Table 7C.1.

Reference Total Population

As described above, there has been one major change in Swedish tax legislation in the twentieth century which has fundamentally changed the concept of tax unit, namely the 1970 tax reform shift from a family-based tax unit to an individually based concept. In terms of *tax statistics*, however, this change occurred (at least to some extent) already in 1951. Before this tax statistics were based on the entire tax population and figures referred to 'tax units', i.e. individuals as well as married couples counted as one income earner.[68] Before 1951 the obvious reference population is therefore the adult population (which we take to be everybody aged 16 or above) less married women (since a married woman formed one tax unit together with her husband). After 1951, however, statistics changed to being based on a representative sample (10 per cent) of the population with married couples, where both had income, now treated as two income earners in the statistics even though they were still *taxed* as one unit. The problem is that in cases where the woman did not work, or had low income, she was not necessarily counted. This means that income statistics between 1951 and 1971 when the individually based system was fully introduced (for labour income, tax on capital income remained family based) are a mix between a family-based system and an individually based system including some women (those with substantial income) but not all. Starting 1971, the reference total is again relatively unambiguous, now obviously being the adult population.

Apart from the quantitatively more substantial decisions discussed above there are a number of smaller adjustments which can be considered. Over the course of a year individuals move in and out of the country, some die, some turn 16 after the population count but before taxes are filed, etc. Based on recent years when we believe that the coverage in the tax statistics is close to complete we have concluded that correcting for deaths is most important. The tax statistics before 1951 contain tax returns for those who died during the previous year (the income year), in the period 1951–73 these are not present in our data, but from 1974 and onwards they are again part of the statistics. We

[68] Note that this is the case for *tax statistics* before 1951 but not income figures in the census (*Folkräkningen*).

have therefore added deaths to our reference total for the population before 1951 and after 1973.[69] For these periods we therefore add the number of deaths during the year when calculating the reference total population.

In terms of choosing the appropriate reference population the period 1903–2006 can, hence, be divided into the following three periods: (1) 1903–50, the total population aged 16 or above minus married women, (2) 1951–70, the total population aged 16 or above minus women likely to be excluded in the statistics, (3) 1971–2006, the total population aged 16 or above.

For the period 1903–50 the reference total population is:

The population aged 16–	(from Statistics Sweden, Population statistics, *SCB Programmet för befolkningsstatistik*)
– married women	(from Statistics Sweden, Statistical Yearbook of Sweden, *Statistisk Årsbok*, various years)
+ deaths during the year	(from Statistics Sweden, Statistical Yearbook of Sweden, *Statistisk Årsbok*, various years)

For the period 1951–71 our preferred reference total population is:

The population aged 16–	(from Statistics Sweden, Population statistics, *SCB Programmet för befolkningsstatistik*)
– married women (no/low income)	Edvinsson (2005: 140) reports data on men and women in paid work and labels married women not in paid work 'housewives'. Part of this group does have income anyway so we subtract a declining share of 'housewives' in the period 1951–67 (based on smoothing shifts in the ratio between the number of tax returns and the reference population, as well as the income shares.[70] In 1967 (when individual taxation became voluntary) the deducted share shifts more drastically (as does the number of income earners in the statistics) and in the period 1967 to 1970 the remaining share of 'housewives' are subtracted.

For the period 1972–2006 the preferred reference total population is:

The population aged 16–	(from Statistics Sweden, Population statistics, *SCB Programmet för befolkningsstatistik*)

[69] To be precise, deaths are not in the statistics 1951–66 (though they are taxed) while they are separately accounted for in the period 1967–73 and hence we can exclude them from our tables. References for the treatment of deaths are e.g.: for the period before 1951, Statistics Sweden, *Inkomst och förmögenhet 1969*, p. 11, for the period 1951–66, Statistics Sweden, *Skattetaxeringarna . . . 1966*, p. 32, for the period 1967–73 Statistics Sweden, *Inkomst och förmögenhet 1969*, pp. 13–15, 20–1, and after 1974 *Statistics Sweden*, SCB SM N 1976:4 (p. 2) and SCB OE 21 SM 0501.

[70] We start by subtracting 60% of married women (which is about 75% of the housewives) and then decrease this share with about 2 percentage points per year until 1967 (as this is about the rate at which the ratio of housewives to married women changes over this period) and then allow for a larger shift between 1966 and 1967 when (judging from the upward jump in the number of tax returns) the number of women with own reported income increased more.

+ deaths during the year	(added after 1973 since they reappear in the statistics in 1974, from Statistics Sweden, Statistical Yearbook of Sweden, *Statistisk Årsbok,* various years)

To check the robustness of our results we have calculated a number of alternatives which differ mainly in the period 1951–71. These are sometimes not 'alternatives' in the sense that we may know that they are clear over- or underestimations, but rather they serve the purpose of giving bounds to our estimates.[71] Figure 7C.1 shows the population aged 16 and above, the number of tax returns, and the different alternative specifications. The alternative specifications are the following:

Preferred series =	(Pop 16−) − Married W + deaths for 1903–50, (Pop 16−) − (Decreasing share of women 1951–71), and from 1967 − Pop 16 − , subtracting declining share of housewives 1967–71 and adding deaths after 73 (1974−).
Tax units alt 1 =	(Pop 16−) − Married W for 1903–50, and (Pop 16 −) from 1951.
Tax units alt 2 =	(Pop 16−) − Married W for 1903–50, (Pop 16−) − Housewives for 1951–66, and (Pop 16 −) from 1967.
Tax units alt 3 =	(Pop 16−) − Married W + Deaths for 1903–50, (Pop 16−) − Housewives for 1951–66, (Pop 16−) − Declining share of housewives for 1967–73, (Pop 16−) + Deaths for 1974 onwards.

Looking at the behaviour of the ratio between the number of tax returns and our reference series, especially around the critical years when there are changes in the definition of tax unit, i.e. 1951, 1967, and 1971, indicates which series seem best. Put simply, we do not want there to be any sudden jumps in the ratio unless there are underlying real changes in the tax base. To exemplify, in 1919 the tax threshold was dropped from SEK 800 to SEK 600 leading to a real major expansion of the tax base. Here we expect the ratio to go up sharply. In 1951, however, the change was only in the type of statistics, not in the actual underlying number of tax-eligible individuals (units), so here we should not expect a break in the ratio. To the extent that the number of returns increase this should be compensated by an increase in the reference total. At the same time, we do not, of course, wish to make ad hoc adjustments to keep the ratio fixed, since there are also real changes in the number of tax filers. Figure 7C.2 shows the ratio between the number of tax returns and our preferred series with indications of critical breaks.

Reference Total Income

In constructing our reference total income we have used three basic approaches. The first two are based on that we can arrive at the 'Preferred Total Income Definition' either by (1) starting with 'Total Personal Sector Income' and deducting items not included in our preferred definition, or (2) starting from the 'Tax Statistics Income' and adding items not included in the tax base and income estimates for individuals not included in the tax statistics. The third—which is mainly included as a point of reference—is based on the assumption that our preferred income total can be approximated as a fixed share of GDP.

[71] Only Tax units 3 is really an alternative. Here we subtract all housewives in the period 1951–67.

Starting with the first approach, we need homogeneous estimates of 'Total Personal Sector Income' from which we want to deduct items not included in our preferred definition of total income. The best homogeneous National Accounts series which span the whole period which we study are those by Edvinsson (2005). These, however, contain only aggregate series for *Wages and salaries of employees* (*including social benefits*) and *Imputed labour income of self-employed* (*including social benefits*). To these we have added aggregate *capital income* and *property income* reported in the tax statistics giving us an estimate of 'Personal sector total income'.[72] This, hence, becomes:

Wages and salaries of employees (including social benefits) (from Edvinsson 2005)
+ Imputed labour income of self-employed (incl. social benefits) (from Edvinsson 2005)
+ individual capital income (from *Taxeringarna* . . . , 1922–88, and corresponding sources thereafter, and estimated before 1922).
+ individual property income(same as for capital income above)
= Estimated 'Personal sector total income'

This estimate fluctuates around 0.7 times GDP (calculated from the expenditure side, reported in Edvinsson 2005) with a standard deviation of 0.03.

Starting from the tax statistics income we use the following method to get at our preferred reference total for income:

Tax statistics income (the aggregates from the same sources as the income statistics described above, sometimes corrected for wealth shares)
+ items not included in the tax base (we make the assumption that all important sources of income including certain social security benefits are included in the tax base after 1974 (hence abstracting from child allowances, *allmänt barnbidrag*, and study grants, *studiebidrag*, which are tax free) and add aggregate government expenditures for unemployment benefits (*arbetslöshetsersättning*), payments for sick leave (*sjukpenning*), and payments for mothers (*moderskapsförsäkring*, which in 1974 was replaced by 'parenthood insurance', *föräldrarförsäkring*, which was taxed) based on figures in the Statistical Yearbook of Sweden 1948– (before they are not listed but can be assumed to be a small share).
+ estimated income for 'non-filers' (in our preferred specification we take (reference population—tax filers) × (0.8 times the tax threshold). As an alternative specifications we use 0.25 times the average income of tax filers).
= 'Preferred reference total' (starting from the tax statistics income)

Figure 7C.3 shows the alternative specifications over the whole period as shares of GDP, as well as in relation to 0.63 times GDP. What we can say with some certainty is that the estimate of 'Personal sector total income' is an overestimate of our preferred reference total. We can also say with some certainty that at least since 1974 the tax statistics income is relatively close to our preferred reference total since most people file taxes and everything we wish to include as income is included in the tax base. We can also note that in the period 1930–90 our 'Preferred reference total' calculated starting with the tax statistics income follows the estimated 'personal sector' total income very closely. In fact, taking 0.89 times the latter, yields numbers which follow the former with very small deviations.[73] We

[72] These are available from the aggregate taxation statistics *Taxering till inkomst- och förmögenhet* 1922–88, for the years before we add shares based on the observations 1922, and after 1988 we add the corresponding figures in the new tax statistics.

[73] The standard deviation is 0.02 and the maximum deviation is 0.05.

also note that for the early years (1903–20) imputing 0.8 times the threshold (or 0.25 times average income) clearly yields overestimates of reference income. This is to be expected since when most individuals are below the threshold small changes in assumptions about their average income make a big difference and at this point in time the average income amongst taxpayers was certainly much higher than later, implying that imputing similar shares to non-filers as later means overestimating their income a lot.

Given the behaviour of these series we have chosen to use 0.89 times our estimated 'personal sector total income' as our reference total for the period 1903–42 and then (as tax statistics become yearly) our calculated reference total income starting with tax statistics income. As with the reference total population we have calculated top income shares using a number of alternatives as well.

Sensitivity of Using Different Reference Totals

Using different reference totals can potentially have an important impact on the income shares. For some single years, such as the spike in top income shares in 1916, the difference can be up to five percentage points between the alternative that gives the lowest and highest estimate respectively. For some periods, such as in the 1950s when the treatment of women in the statistics is unclear, the variation can be up to 3 percentage points over some periods. Overall, however, the main trends in the results are robust to which alternative is chosen. Figure 7C.4 shows the variation in the P90–5 and P99–100 shares including alternatives which are likely to give upper and lower bounds for the series. The three first alternatives keep our preferred population total and varies the income total, while the following four alternatives change the population total but keep our preferred income total. As the figure shows, the beginning of the century, especially the peak in 1916, and the period 1951–71 when the treatment of working women is unclear in the statistics, are the periods with the broadest bands. Overall, however, the main trends in the results are robust to which alternative is chosen.

Sensitivity of Using Individuals or Households as Tax Units

Our income series are computed from the tax returns-based income statistics for most years, and as we described above this implies that we use two different concepts of income earners over the twentieth century. Before 1951, the income earner in our data is the *household* (or family), i.e., married couples with, or without, children, single men 16 years and older, and single women 16 years or older. From 1951 onwards, our income earner is the *individual*, meaning all men and women 16 years or older. Hence, while we in the first period count married couples as one income earner, they are counted as two income earners in the latter period.

This section offers some partial explorations of how this switch of income earner concept may influence the overall results of our study. As our historical data were chosen largely due to availability constraints, we cannot make a fully-fledged comparison as there are simply no parallel datasets based on tax data available. What we can do, however, is to compare our family-based series with the series in which individuals are the basis. This can be done from the years from which we use the *Census material* (the years 1920, 1930, 1935 (partial census), 1945 (partial census), and 1950) when the primary material is individual based but adjusted by us and others (especially Bentzel 1953) to be consistent with

the family-based series from the years before 1920 and in between the other years (1934 and 1937).

Figure 7C.5 shows the income shares of the top fractiles (from top 10 per cent to the top 0.05 percent). Solid lines represent our main family-based income series used in our analysis (called 'Family') whereas the broken lines are the unadjusted, individual-based census series (called 'Individual'). Note that since we use different concepts of income earners in the two cases, we must also use two different reference total populations to calculate the correct population shares. In our family-based series, we use the adult population 16 years and above minus married women, and in the individual-based series the adult population 16 years and above is used. For this reason, the level of the shares may not fully correspond to each other although as Figure 7C.5 shows they do, as a matter of fact, to quite some extent. As for the changes in shares over the period, they pretty much coincide in all cases for all fractiles, and importantly there is no systematic tendency in some direction of either series. For example, whereas the individual-based series produce slightly larger declines between 1935 and 1950 for the top 10 per cent to top 0.5 per cent income earners, the family-based series do it for the top 0.1 to top 0.05 per cent fractiles. Altogether, we feel confident with our choice of income earner concepts and have not found any systematic biases when contrasting them with alternative definitions.

Age Adjustments and Effects of Censoring the Youngest Income Earners

Similar to previous studies of top incomes, we impose a lower age bound on the analysed tax population in order to ensure that we do not include under-age children in the analysis and that the series are conceptually consistent over the years. Specifically, we impose an age cut-off at 16 years, which means that we include all income earners aged 16 and above. We choose this age as it has long marked the beginning of a person's period in life after completing the compulsory Swedish secondary education. Furthermore, the 16-year-olds were the youngest ones sampled by Statistics Sweden in the income statistics during 1951–66, and ever since the late 1970s it has also been the lowest reported age in the published income statistics. For robustness purposes, however, we have also run our entire analysis using income earners aged 20 and older, but the results are qualitatively the same.[74] The finding that the exact choice of age cut-off is not important for the estimated trends in top income shares has also been found by Atkinson and Leigh (2007b).

In practice, our age cut-off means that we subtract the number of income earners aged 15 or less from our reference total population and from the main top income series but not from the reference income total. The reason is that we lack specific data on their incomes. However, it turns out that their incomes are quite marginal and leaving them in the reference income does not influence the results of our study.

In Figure 7C.6, we reinforce the aforementioned result that removing children between 0 and 15 years old from our analysed tax population makes no difference. In fact, the tax

[74] For some post-war years, Statistics Sweden used a different lowest age cut-off in its reported age-income distributions than 16. During 1957–66 it was 17 and during 1971–7 it was 18. We interpolate the shares of our (unobserved) 0–15 group based on the continuously observed 0–19 group. This bridging of the series appears to be of minor importance.

reform implemented changes which made almost all children with some bank holdings part of the tax population, so if we had made any such age adjustments we would have run into great difficulties. The figure shows that throughout the post-war period these youngsters had quite marginal incomes relative to the rest of the population, being about 0.1 per cent. Their share of the number of tax units in the tax population increased disproportionately, however, in 1978 and 1992. In 1978, new tax collection routines required employers to submit income statements (*kontrolluppgifter*) for all employees, which implied that a number of children working extra a few weeks during the summer holidays were included in the tax population. More importantly, after the tax reform in 1991 there was a drastic increase in the share of young income earners. This was directly related to new rules in the reform which stated that capital income over SEK 100 was made taxable. As a consequence, almost one million children, roughly one-ninth of the entire Swedish population, became tax units overnight.[75] In other words, by excluding the youngest income earners we avoid some unwarranted heterogeneity in the income earner shares caused by the tax reform of 1990–1.

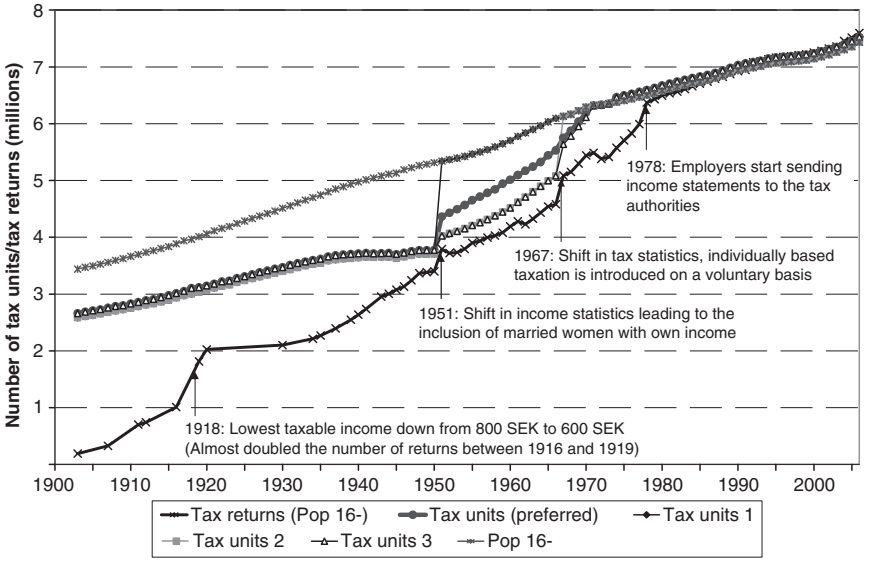

Figure 7C.1 Tax returns and alternative population totals in Sweden, 1903–2006

[75] Formally, the new rules were in practice already in 1991 but in that year's income statistics Statistics Sweden made an adjustment to exclude the new bulk of very young income earners. They excluded all income earners below 18 years of age with labour income less than SEK 12,000 (Statistics Sweden, *Inkomst- och skattestatistik 1991*, Be 20 SM 9301, p. 9).

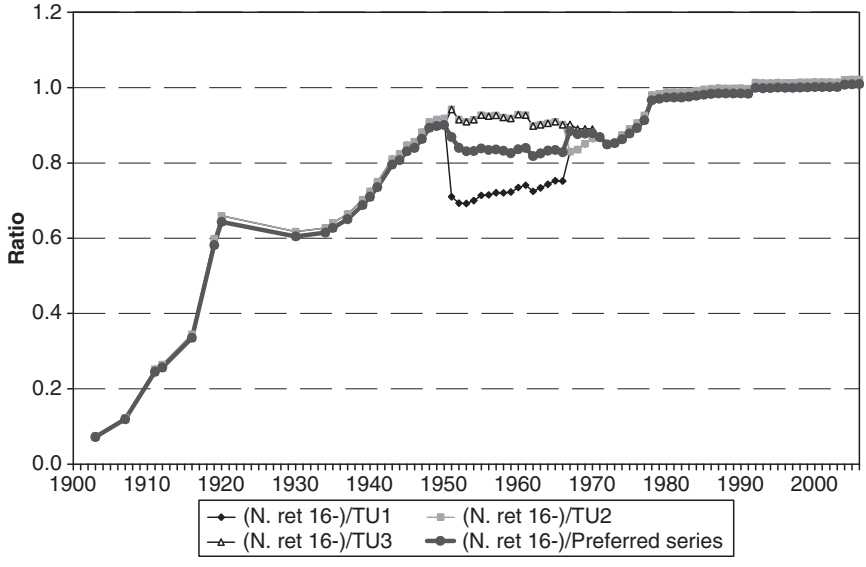

Figure 7C.2 Ratios between tax returns and alternative reference populations in Sweden, 1903–2006

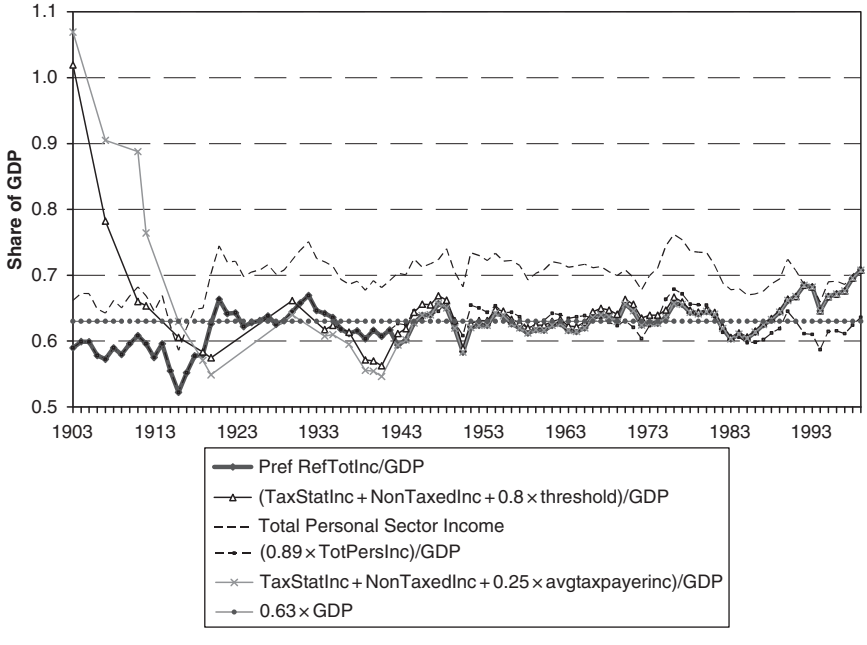

Figure 7C.3 Different reference totals for income as shares of GDP in Sweden, 1903–2004

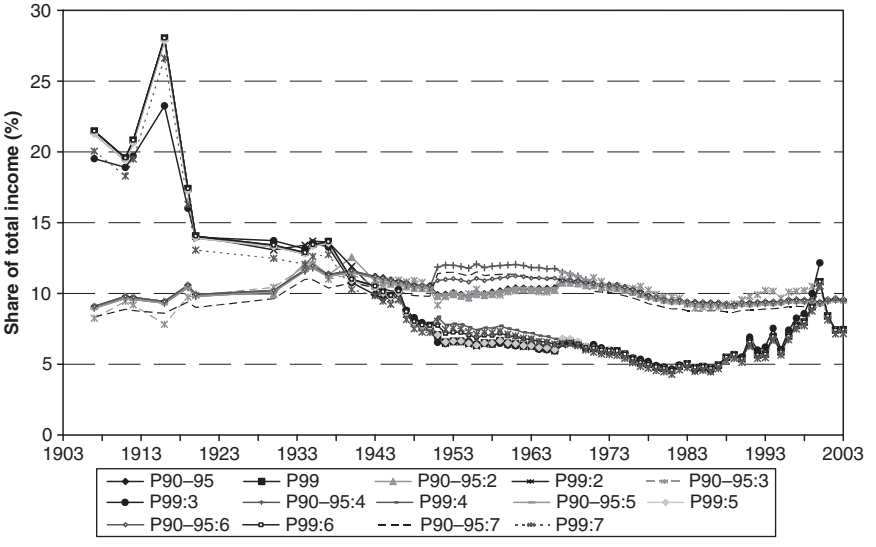

Figure 7C.4 P90–95 and P99 series in Sweden using different reference totals

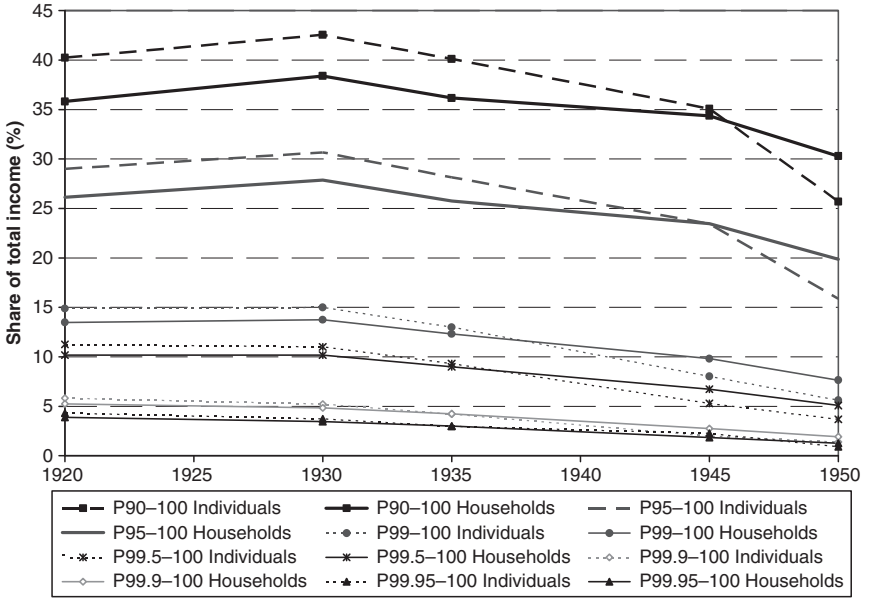

Figure 7C.5 Sensitivity of census-based top income shares in Sweden when switching tax unit definitions between individual and household

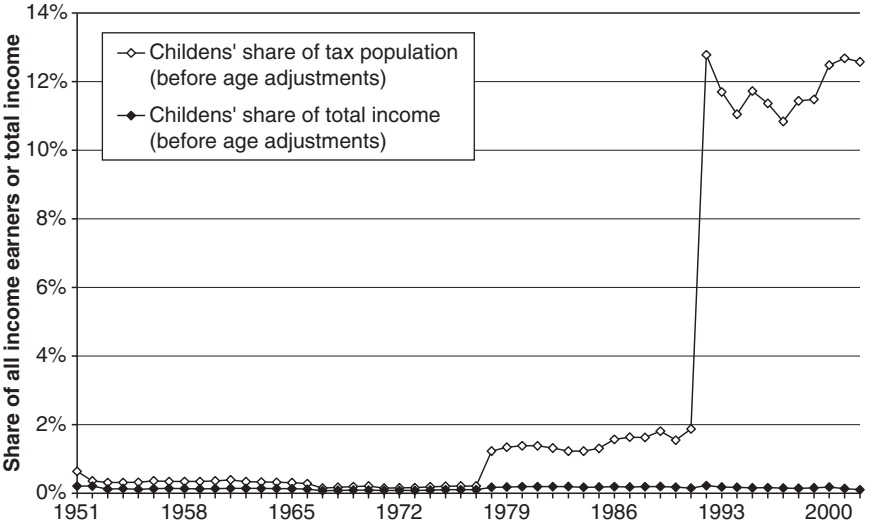

Figure 7C.6 Shares of population and total income of children under 16 years old in Sweden, 1951–2003

Table 7C.1 Reference totals for tax units and income in Sweden, 1903–2006

				Income excl. capital gains		Income incl. capital gains	
				Total income		Total income	
	Total tax units	Tax returns	Share (col. 2/1)	Sum	Ave.	Sum	Ave.
	N	N	%	(TSEK)	(col. 4/1)	(TSEK)	(col. 8/1)
Year	(1)	(2)	(3)	(4)	(5)	(8)	(9)
1903	2,659,911	191,515	7.2	1,389,293	522	1,406,589	529
1904	2,687,207			1,441,809	537	1,459,759	543
1905	2,706,379			1,483,502	548	1,501,971	555
1906	2,727,842			1,601,276	587	1,621,211	594
1907	2,756,634	328,992	11.9	1,743,376	632	1,765,080	640
1908	2,784,634			1,782,905	640	1,805,101	648
1909	2,799,518			1,755,932	627	1,777,792	635
1910	2,830,113			1,943,329	687	1,967,523	695
1911	2,856,711	700,954	24.5	2,013,619	705	2,038,688	714
1912	2,888,302	741,919	25.7	2,100,446	727	2,126,596	736
1913	2,908,770			2,222,844	764	2,250,518	774
1914	2,941,668			2,310,515	785	2,339,280	795
1915	2,976,466			2,482,713	834	2,513,622	844
1916	3,011,266	1,010,963	33.6	2,940,643	977	2,977,253	989
1917	3,051,956			3,623,331	1,187	3,668,441	1,202
1918	3,104,099			5,044,212	1,625	5,107,011	1,645
1919	3,117,303	1,813,876	58.2	6,298,162	2,020	6,376,572	2,046
1920	3,146,313	2,024,462	64.3	7,547,072	2,399	7,641,031	2,429
1921	3,178,804			6,159,471	1,938	6,236,155	1,962
1922	3,217,520			5,177,282	1,609	5,241,738	1,629
1923	3,233,086			4,953,887	1,532	5,015,562	1,551
1924	3,277,477			4,958,474	1,513	5,020,205	1,532
1925	3,310,033			5,101,173	1,541	5,164,681	1,560

(*continued*)

Table 7C.1 Continued

Year	Total tax units N (1)	Tax returns N (2)	Share (col. 2/1) % (3)	Income excl. capital gains: Total income Sum (TSEK) (4)	Income excl. capital gains: Total income Ave. (col. 4/1) (5)	Income incl. capital gains: Total income Sum (TSEK) (8)	Income incl. capital gains: Total income Ave. (col. 8/1) (9)
1926	3,344,617			5,237,633	1,566	5,302,840	1,585
1927	3,382,095			5,345,823	1,581	5,412,377	1,600
1928	3,411,417			5,420,466	1,589	5,487,949	1,609
1929	3,443,967			5,737,820	1,666	5,809,254	1,687
1930	3,471,440	2,100,000	60.5	5,900,304	1,700	5,973,761	1,721
1931	3,509,250			5,667,049	1,615	5,737,602	1,635
1932	3,540,812			5,395,869	1,524	5,463,046	1,543
1933	3,569,615			5,328,643	1,493	5,394,983	1,511
1934	3,596,654	2,213,000	61.5	5,725,887	1,592	5,797,172	1,612
1935	3,616,987	2,269,000	62.7	6,105,505	1,688	6,181,516	1,709
1936	3,659,455			6,327,644	1,729	6,406,421	1,751
1937	3,679,432	2,394,000	65.1	6,855,515	1,863	6,940,864	1,886
1938	3,691,394			7,255,456	1,966	7,345,784	1,990
1939	3,701,699	2,547,000	68.8	7,809,324	2,110	7,906,548	2,136
1940	3,712,732	2,637,000	71.0	8,512,235	2,293	8,618,210	2,321
1941	3,721,269	2,737,000	73.6	9,422,040	2,532	9,539,342	2,563
1942	3,713,351			10,520,534	2,833	10,651,511	2,868
1943	3,715,298	2,955,890	79.6	11,065,749	2,978	11,202,683	3,015
1944	3,720,658	3,003,973	80.7	11,709,195	3,147	11,854,193	3,186
1945	3,701,136	3,074,993	83.1	12,602,660	3,405	12,758,863	3,447
1946	3,727,199	3,131,168	84.0	14,591,812	3,915	14,753,058	3,958
1947	3,751,937	3,240,670	86.4	16,166,881	4,309	16,323,556	4,351
1948	3,770,950	3,367,806	89.3	18,014,723	4,777	18,165,108	4,817
1949	3,769,391	3,384,834	89.8	18,645,789	4,947	18,775,907	4,981
1950	3,777,033	3,401,393	90.1	19,563,440	5,180	19,673,224	5,209
1951	4,363,129	3,791,083	86.9	22,885,687	5,245	22,982,724	5,267
1952	4,413,809	3,721,611	84.3	26,577,977	6,022	26,690,383	6,047

1953	4,458,901	3,732,619	83.7	27,467,838	6,160	27,583,831	6,186
1954	4,514,116	3,795,327	84.1	29,242,354	6,478	29,365,586	6,505
1955	4,582,359	3,899,843	85.1	32,291,992	7,047	32,428,330	7,077
1956	4,644,564	3,934,072	84.7	34,888,533	7,512	35,035,633	7,543
1957	4,712,198	3,995,344	84.8	36,502,787	7,746	36,656,476	7,779
1958	4,789,073	4,029,342	84.1	38,167,789	7,970	38,328,210	8,003
1959	4,872,546	4,081,406	83.8	40,123,929	8,235	40,292,302	8,269
1960	4,959,080	4,190,155	84.5	44,245,603	8,922	44,430,805	8,959
1961	5,059,839	4,277,753	84.5	48,185,654	9,523	48,386,952	9,563
1962	5,152,249	4,229,111	82.1	53,165,500	10,319	53,387,066	10,362
1963	5,243,201	4,326,942	82.5	57,858,292	11,035	58,099,461	11,081
1964	5,341,505	4,431,848	83.0	63,604,263	11,908	63,868,889	11,957
1965	5,440,809	4,541,358	83.5	69,980,068	12,862	70,270,741	12,915
1966	5,529,968	4,579,902	82.8	76,798,500	13,888	77,117,129	13,945
1967	5,750,422	5,086,784	88.5	85,122,755	14,803	85,460,455	14,862
1968	5,876,561	5,148,562	87.6	90,676,471	15,430	91,003,771	15,486
1969	6,036,078	5,299,008	87.8	97,923,883	16,223	98,345,983	16,293
1970	6,194,967	5,441,976	87.8	108,654,568	17,539	109,060,268	17,605
1971	6,320,018	5,487,290	86.8	118,419,028	18,737	118,727,677	18,786
1972	6,333,098	5,377,931	84.9	128,282,502	20,256	128,660,770	20,316
1973	6,350,879	5,412,041	85.2	137,286,578	21,617	137,786,877	21,696
1974	6,464,266	5,574,282	86.2	157,524,389	24,368	158,216,541	24,476
1975	6,496,063	5,705,452	87.8	183,188,876	28,200	184,073,602	28,336
1976	6,526,143	5,826,869	89.3	207,853,848	31,849	208,966,808	32,020
1977	6,559,497	5,990,972	91.3	232,215,863	35,401	233,385,873	35,580
1978	6,592,278	6,372,054	96.7	259,385,859	39,347	260,946,683	39,584
1979	6,629,136	6,431,194	97.0	284,682,262	42,944	286,079,081	43,155
1980	6,670,790	6,494,749	97.4	318,496,317	47,745	319,844,679	47,947
1981	6,705,740	6,531,845	97.4	348,888,051	52,028	350,612,945	52,285
1982	6,740,072	6,565,341	97.4	377,085,887	55,947	379,852,901	56,357
1983	6,773,449	6,609,388	97.6	407,703,146	60,191	412,040,798	60,832
1984	6,803,684	6,657,145	97.8	445,966,952	65,548	449,501,558	66,067
1985	6,830,258	6,701,312	98.1	488,718,732	71,552	492,943,601	72,171
1986	6,856,978	6,742,286	98.3	529,142,905	77,169	534,778,674	77,990
1987	6,893,476	6,787,936	98.5	579,733,510	84,099	587,878,378	85,280
1988	6,936,033	6,826,256	98.4	630,089,899	90,843	647,227,486	93,314

(*continued*)

Table 7C.1 Continued

				Income excl. capital gains		Income incl. capital gains	
				Total income		Total income	
Year	Total tax units N (1)	Tax returns N (2)	Share (col. 2/1) % (3)	Sum (TSEK) (4)	Ave. (col. 4/1) (5)	Sum (TSEK) (8)	Ave. (col. 8/1) (9)
1989	6,984,652	6,874,984	98.4	700,291,628	100,261	722,610,112	103,457
1990	7,030,954	6,923,689	98.5	784,428,517	111,568	805,695,957	114,593
1991	7,060,631	7,087,528	100.4	856,232,513	121,269	893,271,977	126,514
1992	7,081,441	7,107,925	100.4	880,700,744	124,367	895,409,092	126,444
1993	7,109,685	7,139,138	100.4	912,094,785	128,289	926,303,618	130,288
1994	7,144,570	7,178,295	100.5	951,108,791	133,123	983,645,820	137,677
1995	7,163,497	7,201,488	100.5	990,246,452	138,235	1,006,748,895	140,539
1996	7,177,410	7,217,214	100.6	1,034,366,816	144,114	1,071,513,690	149,290
1997	7,187,081	7,232,695	100.6	1,076,806,119	149,825	1,130,844,902	157,344
1998	7,200,331	7,248,321	100.7	1,126,508,147	156,452	1,186,654,380	164,806
1999	7,215,231	7,262,257	100.7	1,188,708,879	164,750	1,286,073,700	178,244
2000	7,239,597	7,287,016	100.7	1,253,659,417	173,167	1,378,939,984	190,472
2001	7,273,123	7,321,060	100.7	1,312,767,595	180,496	1,371,991,000	188,638
2002	7,311,797	7,362,419	100.7	1,362,756,329	186,378	1,403,278,014	191,920
2003	7,350,260	7,405,489	100.8	1,414,031,516	192,378	1,459,078,346	198,507
2004	7,395,545	7,454,633	100.8	1,458,857,002	197,262	1,517,305,205	205,165
2005	7,448,581	7,513,754	100.9	1,515,189,510	203,420	1,606,753,012	215,713
2006	7,525,396	7,595,286	100.9	1,588,210,209	211,047	1,714,402,902	227,816

Total income has been adjusted so that it includes social benefits (unemployment insurance, sick-leave pay, etc which are taxable incomes after 1974) for the whole period.
Tax returns as share of total tax units exceed 100% after 1990 since that year's tax reform led to non-resident Swedes filing taxes in case they had some capital income. Setting a cap at 100% has a negligible effect on the reported shares (about 0.4%).

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