

OXFORD

TOP
INCOMES
OVER THE
20TH
CENTURY

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

Edited by A. B. ATKINSON & T. PIKETTY

9

Top Incomes in Germany Throughout the Twentieth Century: 1891–98

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9.1 INTRODUCTION

This chapter aims at providing for the first time homogenous top income shares for Germany over the whole twentieth century. Using income tax data, we are able to trace top income shares back into the past as far off as 1891, when the first modern income tax was put into effect in Prussia. We can thus study top income shares series for a period longer than a century, beginning at a time when Germany was still in a phase of late industrialization.²

Being very similar to France (and indeed all continental European countries documented in this volume), Germany constitutes an appropriate comparison point to deepen our understanding of how top incomes distribution changes. Like France, Germany was deeply shaken by the two World Wars. Like France (and the Netherlands), Germany built a comprehensive Welfare State after the Second World War. Like France, Germany did not experience sharp tax cuts in the 1980s.

Indeed, one (still tentative) explanatory factor of the evolution of top income share is the (progressive) income tax system. As Piketty and Saez (2003) put it, ‘top capital incomes were never able to recover from these [World Wars and Great Depression] shocks probably because of the dynamic effects of progressive taxation on capital accumulation and wealth inequality’. The German experience could thus enlighten us on this issue because of the proximity and similarity between German and French economies, associated with different tax systems.³

¹ PSE, Paris, and DIW, Berlin. I would like to thank my PhD advisor, Thomas Piketty, for helpful discussions and constant support. I also would like to thank Nicole Buschle and Markus Zwick of the German Federal Statistical Office for helping me working with contemporary German income tax micro-data. I am also most grateful to Anthony Atkinson, Stefan Bach, Pierre-Cyrille Hautcoeur, Albrecht Ritschl, and Emmanuel Saez for helpful comments. Previous drafts have been presented at a seminar at Nuffield College in Oxford. (September 2003); at the UCLA (April 2004); and the EEA Conference in Madrid (August 2004); I thank participants for comments.

² The First Industrial Revolution came relatively late in Germany (later than in France and, of course, later than in the UK).

³ The German tax system differs from the French system in various ways but the most striking and constant element is the very low effective rates of inheritance taxes throughout the century, which were already noticed by Schumpeter in the early 1920s.

Nevertheless, Germany is also a country whose path through the twentieth century was strewn with more exogenous shocks than any other industrialized country. Several episodes deserve special attention. First, the First World War years and the subsequent inflation period, which fundamentally transformed the structure of top incomes. Then the Third Reich, when Nazi power led to skyrocketing top income shares in the context of an ever more centrally administered economy. After the Second World War, the second inflationary episode and the monetary reform of 1948 drastically shifted the burden of the defeat off the top of the wealth distribution and onto the lower groups. Lastly, the years since the Reunification saw two radically different income distributions being merged in the course of an outside driven transition process. Our series, beginning very early,⁴ cast light on the 1891–1913 period, usually too remote to be documented, and nevertheless very interesting since it gives insight in how income inequalities might have looked like during the end of the industrialization process.

Among former attempts to estimate income shares (or simply assess income distribution in Germany before the Second World War), one should cite, Geisenberger and Müller (1972) (pre-First World War years) and Procopovitch (1926) (for Prussia) and Sweezy (1939) (for the Third Reich).⁵ These attempts are not as comprehensive as the present work in terms of the range of income shares they estimate as well as in terms of the time periods they study. Moreover, the methodology used is often very elusively described, thus preventing us to assess the reasons of some discrepancies with our results in terms of levels. Geisenberger and Müller (1972) calculate income shares for Prussia (1873–1913), Saxony (1881–1913), Hesse (1886–1913) and Baden (1891–1913). The results for Prussia are very similar to ours (see Figure 9.1).⁶ Procopovitch estimates top income shares for (among others) Prussia for the tax years 1875, 1896, 1913, and 1919 as well as for Saxony for 1912.⁷ Procopovitch pinpoints the decisive importance of urban areas in income

⁴ Equivalent data are only available on a regular basis after 1915 for France; after 1914 for the Netherlands; after 1913 for the US; and after 1908 for the UK.

⁵ Grumbach (1957), quoted by Hoffmann (1965: 510sq.) estimated Pareto coefficients for a very wide time span (1822–1939), for various parts of the German Empire (including Prussia) before 1918. Unfortunately, only one Pareto coefficient was estimated each year for the whole income distribution and no attempt was made at deriving income shares. Moreover, the methodology used is discussed in general and abstract terms preventing the reader from knowing the detail of the estimation methods adopted (in particular, one would like to know how Grumbach bridged the frequent gaps resulting from pre-1891 changes in the ‘income-related-taxes’ of that time).

⁶ Prussia was by far the biggest component of the German Empire. Nonetheless, aggregating Prussian data with data of other German States could render our picture of top income evolution in Germany before the First World War more complete. The fact that the tax unit definition is not homogenous across states (Saxony, for instance, had a income tax based on individuals) is an important obstacle.

⁷ Procopovitch’s figure seem at first sight significantly higher than ours (for instance: top 1% share in 1913: 24.3% whereas we estimate only 17.5%). But Procopovitch’s top income groups are relative to the entire population and not to a total of tax units. In 1913 for instance, his top 1% represent more than 400,000 Prussian tax payers whereas ours represent only 160,000. Adapted to our total of tax units, Procopovitch’s top income shares are similar to ours: for instance, the top 1% in the tax year 1913 is 18.2% and the top 10% is 38.9% (ours is 37.7%).

concentration dynamics. He concludes stating ‘It would be extremely interesting to compare the distribution of incomes at the beginning of the present century with that of a century ago’. Sweezy (1939) uses earlier version of the tabulations which we call ‘synthetic’ (see Statistisches Reichsamtsamt 1939) published in the late 1930s by the German Statistical Office and which merge tax data (at the top) and social insurance data (at the bottom). The conclusion is that ‘the general picture of the distribution of individual income shows that inequality has increased during the Hitler regime’ and also points to a rise in wealth inequality at the same time.

From 1969 to 1998, Becker and Hauser (2003) systematically documented equalized market and disposable income inequality using the German *Income and Consumption Survey* (EVS), but without addressing specifically the issue of top incomes: standard surveys are problematic for estimating top income shares, particularly for smaller percentile groups.

Our main results are the following: top income shares fell in Germany over the twentieth century following the very chaotic period of 1914–45. This decline is mostly due to the fall of the top percentile, and within the top percentile to the fall of the highest group (top 0.01%). Although the First World War and Nazi government of Germany had a very positive impact on top income shares, the pre-First World War levels were never reached again after the Second World War. Nevertheless top income shares grew again in the fifties and sixties, reaching levels largely superior to those which could be observed at the same time in France, the United States or Britain (see Chapters 3, 4, and 5 in this volume). This partial recovery not only happened at the very top of the distribution, but also in the

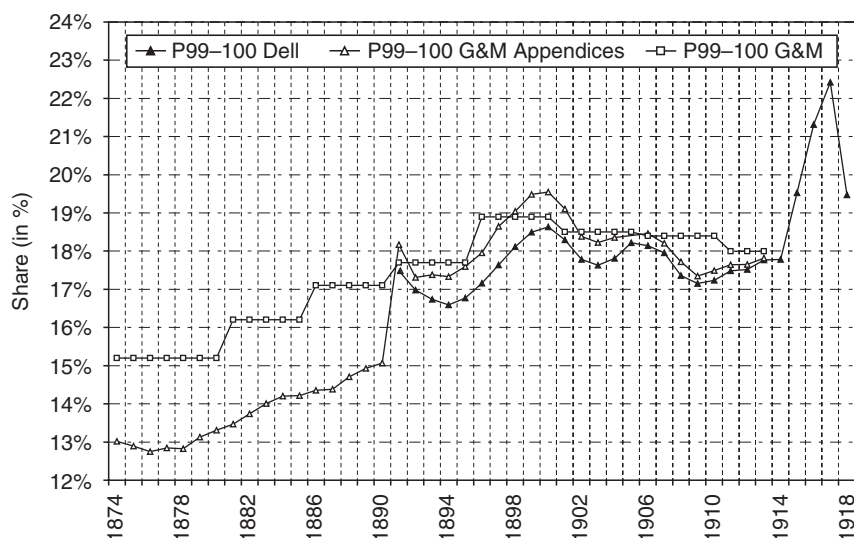


Figure 9.1 Series of Müller and Geisenberger (1972) for Prussia

Source: Author's computation on Prussian income tax data; Mueller and Geisenberger 1972: 44–5, appendix 1: 59–60.

lower groups of the top decile thus leading to a sensible de-concentration of the top decile. However, throughout the second half of the century, the German top decile exhibits an original physiognomy: the gap between the top one percent and the following nine percentiles is much wider than in any other developed country (since the mid-1980s however, Anglo-Saxon countries present a comparable concentration).

The present chapter is organized as follows: Section 9.2 presents our data sources and explains our estimation methods and Section 9.3 presents top income shares series over the century.

9.2 DATA AND METHODOLOGY USED

This section briefly presents the different data we use in this work and the methodology used to estimate top income shares. More details on this topic can be found in appendices 9.A to 9.I.

Our data rely on tax returns statistics compiled by the successive German fiscal administrations over the twentieth century. The raw data we use consist of tables containing, for a large number of income brackets, the number of taxpayers and the amounts declared. Other such tabulations are available (unfortunately only after 1926) to assess composition by income sources.

Unlike other developed countries, the German state did encounter numerous breaks over the twentieth century. So did the data we use. Three major periods have thus to be distinguished: before 1920, the Interwar Years, and the Federal Republic period.

Before 1920, there was no central fiscal administration: in the Wilhelmine Empire, direct tax collection was conducted at the level of the member states of the federation (the most prominent exception to this federalism was the introduction of an imperial inheritance tax in 1906). Direct income taxes did not exist everywhere in the Reich at the end of the nineteenth century. Nevertheless around 1900 all major states (Saxony, Bavaria, Hessen, and most notably Prussia) had brought modern income taxes into operation. The present version of this paper only uses Prussian data to document the pre-1920 period.⁸ Income tax was introduced in Prussia in 1891 and the first data we use relate to the tax year 1891. It should nonetheless be noted that there exists from 1873 onward a Prussian income tax which mixes features of the old *Classensteuer* with features of a properly modern income tax. The *Classensteuer* categorized people according

⁸ It is important to bear in mind that before the First World War, Prussia accounted for two-thirds of the total German population. Moreover, Prussian territory encompassed low density rural areas (e.g., *Ostpreußen*) as well as high density industrial regions (e.g., *Ruhrgebiet*) with numerous cities. The capital of the empire, Berlin, was also part of it. Prussian high incomes are therefore probably a good proxy of German high incomes for the pre-1920 period. Nevertheless, data from other member states such as Saxony and Bavaria are available and are currently exploited in order to complete the Prussian data.

to their status (classes) and not to the extent of their income. Although the status was largely positively correlated with income, the publications before 1891 do not tabulate a distribution of income by size *stricto sensu*. The period 1873–91 can thus be seen as the last transition stage toward modern income tax. For former (and unfortunately undocumented) use of these data, see Geisenberger and Müller (1972);⁹ for more recent use, see Grant (2002) who also gives a good summary of the evolution of Prussian income-related-taxes throughout the nineteenth century.

After the First World War and the German Revolution, the Weimar Republic saw the institution of a federal income tax. Together with the development of a modern and centralized Statistical Office,¹⁰ this new tax system led to the first all-German income tax statistics. However, the coexistence of an *ex-post* declaration-based income tax (*Einkommensteuer*, henceforward *ES*) with a *ex-ante* pay-as-you-earn tax system on wages and salaries (*Lohnsteuer*, henceforward *LS*) led to two series of statistical publications (see Appendix 9.A) which must be dealt with caution in order to reconstruct the top of the income distribution. Moreover, data for the hyperinflation years (1919–24), The Second World War (1939–45) and the Allied Occupation Years (1945–49) were never gathered. Nevertheless, available data give us the opportunity to relate the puzzling evolution of high incomes in the Interwar Period, as well as their composition.

After the Second World War, income tax in the Federal Republic of Germany was organized along the same lines as before the war. Tabulations were published regularly at a three year interval. Although the double taxation system of the Interwar Years continued to apply (it still exists), statistics were unified progressively from 1961 onward. The publications available for the nineties (1992, 1995, and 1998) also account for the ex-Democratic Republic of Germany, known as the *neue Bundesländer*. For the nineties, we have been able to use micro-data from the German Federal Statistical Office to assess the precision of our interpolation method. No data is available after 1998. To summarize, we have data for 1891–1918 (on a yearly basis), 1925–38 (on a yearly basis or every two years) and 1950–98 (every three years).

Incomes considered in the various publications used for this paper are total ‘net incomes (i.e., minus expenses necessarily incurred in obtaining these incomes, the so-called *Werbungskosten*), before social transfers and taxes, but after employers’ payroll taxes and corporate income tax.

⁹ Geisenberger and Müller calculated income shares of the top 5, 1, and .1 percent for the 1873–1913 period. Unfortunately, the precise sources used are not given extensively (as the same years are sometimes documented in different publications, with different level of detail), and the interpolation method as well as the control totals used are not documented either. Moreover, the construction of homogeneous series bridging the 1891 gap obviously entails the use of corrective factors (pre-1891 top incomes were systematically underestimated) which are not documented at all. The appendices are very poor, note for instance the discrepancies between series for P99–100 corrected in the body of the text and still exhibiting a huge blip in 1891 in the appendices. For a comparison of those estimates with our results, see Figure 9.1.

¹⁰ The *Statistisches Reichsamt*, see Tooze (2001) on this issue.

Because our data rely on tax returns, they only provide information on incomes at the tax unit level. We cannot assess intra-tax unit income distribution with our data. The fractiles we estimate are defined relative to the total number of potential tax units derived from population and family census statistics. Following Piketty (2001), we focus on the top decile and on smaller fractiles within it that are of crucial interest to understand with finesse the evolution of top incomes. We thus built series for the top decile (denoted by P90–100), the top 5% (P95–100), the top 1% (P99–100), the top 0.5% (P99.5–100), the top 0.1% (P99.9–100) and the top 0.01% (P99.99–100). As the top tail of income distributions is generally well approximated by Pareto distribution, we use simple parametric methods to estimate thresholds and average income for all of our fractiles (for more details on the Pareto method, see Appendix 5C; see Chapter 2 for discussion of the issue of the precision and reliability of such interpolation methods). In order to control, within the top decile, for the (heavy) effect of the top fractiles, we systematically analyze intermediate fractiles P90–95, P95–99, P99–99.5, P99.5–99.9, and P99.9–99.99.

We then estimate the shares of each fractile in the overall personal income by dividing the amounts accruing to each fractile by a homogeneous total personal income series derived from national accounts (after 1950) and from reliable series built by Hoffman and Müller for the Pre-Second World War years.

9.3 TOP INCOMES IN GERMANY

Trends in Top Income Shares: General Pattern

Series of top incomes shares are presented in Figures 9.2 to 9.8.¹¹ One immediately notices the two basic facts that characterize top income evolution in Germany: a long-run decrease combined with short-term jerky variations.

Figure 9.2 shows the evolution of the income share of the top decile over the century. Before the First World War, the top decile share varied between 38% and 42% of total income. After the Second World War, it has been oscillating between 30% and 35%. The decline thus took place between 1914 and 1945. The top percentile (see Figure 9.4) experienced the same kind of evolution. Before the First World War, its share was about 17–20% of total income. The two World Wars brought this share down under 12% and since the 1970s the share even remained under 11%. In other words, since 1891, the share of the top percentile was divided by two in Germany. If we look at the upper percentile of this top percentile (see Figure 9.6), we see that its share was ranging between 3% and 4% at the beginning of the century and now remains below 2%.

¹¹ These new series may differ slightly from those in Dell (2005) due to refinements in the estimates. Nonetheless, the basic secular pattern is unchanged and the levels compared to other countries still exhibit the differences highlighted.

Top Incomes in Germany

371

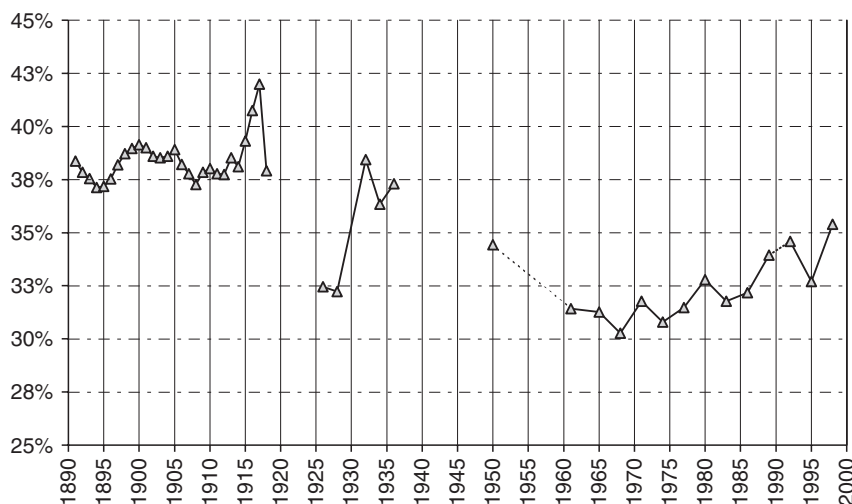


Figure 9.2 Share of the top decile, Germany, 1891–1998

Source: Author's computation on German income tax data; Table 9I.5, this volume.

We can thus say that in the course of the twentieth century, the share of top incomes was dramatically reduced in Germany, and all the more than one looks further right in the tail of the distribution. At the same time one notices two sudden surges in the share of top incomes which took place during the First World War and just before the Second World War, the two moments in the history of twentieth century when Germany saw an authoritarian government take control. Before the First World War and after the Second World War, income shares of the higher groups (top 1% and above) are highly pro-cyclical: boom of the late 1890s when the crisis of the late 1870s comes to an end; downs of 1953–54, 1966–67, 1973–74, 1983 and 1993 can be found in the data.

The evolution of top income shares is driven by the highest income groups. Looking at intermediate fractiles thus enables us to have a more differentiated picture of top incomes evolution. The lower part of the top decile (see Figure 9.3) exhibits a very different pattern: the first half of the top decile (P90–95) saw its share of total income growing over the century. From about 8% at the end of the nineteenth century, it has remained since the late 1970s above 10%. As far as the P95–99 is concerned, one can see that its share actually remained quasi-unchanged in the course of the century.

Pre-First World War Years and the War itself

Once these basic facts set, one can look more precisely at short-term variations. They are of great magnitude, reflecting the chaotic history of Germany over the century. During the Pre-First World War years, top incomes grew to reach their secular maximum (this is even more clear looking at the rough evolution before

1891 documented in Figure 9.1). The years of the war saw a rapid rise of the top incomes but the Revolution of 1918 and the subsequent institutional and economic chaos of the early Weimar Republic constituted a brutal shock from which top incomes never recovered until today.

The growth of top incomes at the beginning of the period studied is easily understandable since it corresponds to the final phase of the late industrialization of the German economy. The pattern of accelerated growth observed during the First World War can be accounted for with two factors. First, the war did not take place on German soil and no physical capital destruction occurred (in contrast to what happened for France). Second, the quick organization of a consensus with the Unions to guaranty a United Front in German society (*Zentrale Arbeitsgemeinschaft*) and the progressive establishment of a military dictatorship closely related to the heavy industrial sector may have been a favorable context for huge profits to be realized at the top of the distribution. Clearly, financing the war led the Kaiser to resort to huge loans, the interests of which were (partly) paid thanks to new taxes on capital. But these were quite modest and the effects of unsustainable deficit spending were to be felt only later on. The war also caused huge disruptions in the productive sector but these were probably offset at the top by the growing demand for military equipment (Germany, contrary to France, was at war on two fronts). Clearly, the war did not mean benefits for all, even in the top decile. The group immediately following the top percentile (P95–99) experienced a steep decline during the war (from 12.6% in 1913 to 10.6% in 1918) symmetrical to the rise of the top percentile, and the second quintile remained unaffected. One tentative explanation of this pattern is that the P95–99 income group may reflect the fate of small businesses which experienced most negatively the reorganizations linked to the war (redirection of labor force and inputs toward defense relevant activities). Further down the distribution, high wages of civil servants and other white collars of the *Wilhelmine Reich* may have remained unaffected by the war. Unfortunately, the absence of composition data before the First World War prevents us from assessing more precisely this explanation.

Once the war was over, the monetary instability it had launched plunged the German economy into chaos until 1924–25.

Interwar Period

The global impact of Hyperinflation Years (1920–24) on top incomes (and on income distribution in general) is a highly disputed issue of German economic history. However, comparing the end of the War (1918) with the first year of economic stability (1925) enables us to draw conclusions on this topic. Once again, dividing the top decile into smaller fractiles proves to be absolutely necessary in order to have a precise picture of what happened. The top percentile's share dropped brutally during these years (from 19% to about 11%) and the share of the top 0.01% was even more negatively affected (falling from more than

3.5% to less than 1.5%). On the other hand, lower fractiles within the top decile (P90–95 and P95–99) experienced a much more enviable fate: the share of the second vintile was in the late 1920s at a very high level (around 10% compared to some 8% before the war) and that of the following 4% seems to have been unaffected by the chaos of 1920–24. Thus, according to our data, the German hyperinflation of the 1920s led to an unprecedented de-concentration of top incomes. This phenomenon is illustrated in Figure 9.7 which graphs the share P99–100 within P90–100. Such a measure only describes the shape of the upper part of the distribution and is thus independent of our income denominator. In 1918 incomes accruing to the upper percentile represented more than the half the total income earned within the top decile. Ten years later, the share had fallen down to less than 35%. These results are perfectly in-line with the diagnostic of Holtfrerich (1980)¹² who sees in the *Mittelstand* the main and only winner of the redistribution process which took place at the time. On the other hand, Peukert (1987) argues in favour of a global stability of top incomes over the hyperinflation years, combined with a complete modification of the structure of the top decile.¹³

One can anyway assert that as the Weimar Republic finally enjoyed a stable economy (and as we at last enjoy tax data), top income shares above the top percentile were substantially under their pre-war levels. As far as the (lower) rest of the top decile is concerned, the pre-war shares had been regained or improved.

The second half of the 1920s and the 1930s were the theatre of the most dramatic variation of top income shares in the twentieth century. The stable years of the Weimar Republic (1925–29) let top income shares unchanged and can thus be described as a short stabilization period before the rapid changes of the 1930s.¹⁴ The Great Depression, indeed, had a sharp and differentiated effect on the top decile. Between 1927 and 1933, the top percentile's share did not decrease much, and remained at its low level at about 11% of total income. At the same time, however, P90–95 and P95–99 experienced a sharp rise: P90–95 even reached its all century maximum at about 12% in 1932. This contrasting situation can be understood as follows: on the one hand, the higher part of the top decile did not significantly suffer of the Depression and of the deflationary measures imposed by the Brüning government at the time, and on the other hand, the lower part of the top decile, being mainly composed of (short-term downward

¹² The position of Holtfrerich is based on the same raw data as those used in the present chapter (p.271sq.) Note however that Holtfrerich draws conclusions on the whole 1913–28 period, without trying to disentangle the effect of the War and that of Hyperinflation, his assumption being that Germany actually experienced one single large inflation period from 1914 to 1924. This perspective is not necessarily accurate to study income distribution as our data show that the two sub-periods (1913–18 and 1919–25) saw completely different evolutions of top incomes.

¹³ Persons of private means were badly hurt whereas businessmen keen on bold investments were largely rewarded. This is not necessarily contradictory with our results: it depends a lot on the limits of the period studied. Data concerning income composition for this period are sorely lacking to assess more in-depth such questions.

¹⁴ The late Weimar Republic is actually subject to very controversial debate (among others about the question of overvalued wages). See Bocharde (1990) and Ritschl (1990) for a recent econometric testing attempt of this assumption.

rigid) wages (see the section on income composition), deflation did not hit them and even made their relative weight grow.

The pattern followed by the top 1% share during the Depression is surprising but casts new light on the way the turmoil of the early 1930s impacted German society. As in any other developed country at the time, the corporate sector in Germany experienced a huge negative shock between 1929 and 1932 (see for instance Sweezy (1940) and Spoerer (1996)). Real levels of income earned in the top groups fell significantly. For instance, an average of 1.38 million 1995 marks accrued to the top 0.01% in 1928, whereas only 926 thousand marks were earned by the same group in 1932.¹⁵ Compared to the dramatic contraction of national income, however, the drop did not lead to a fall of more than 10% in terms of shares (in France for instance the 1928–32 drop of the top 0.01% share is of 34%). This, added to the growing share of the P90–99 group, means that compared to other countries, the bottom of the distribution in Germany might have suffered more under the Depression relative to the top. The skyrocketing German unemployment rates of the time are consistent with this analysis (see Figure 9H.3). In such a context, pretending, with aggressive anticapitalist rhetoric, that they would take care of the ‘small people’, the Nazis were in a good position to win democratic elections in 1932.

When the Nazis came to power in 1933, the top decile had been thoroughly equalized: (P99–100, P95–99, P90–95) had moved from a (18%, 13%, 8%) pattern in 1913 to a (11%, 14%, 11%) pattern in 1934. The effect of Nazi economic administration changed radically this outcome of 20 years of inequality evolution. In a period of time of only five years, the pre-First World War shares were nearly recovered and levels were noticeably improved. From 1933 to 1938, the share of the top percentile grew from 11% to 16%; the share of the top 0.01% grew by more than 100% from less than 1.25% to more than 2.5% thus almost recovering its levels of the end of the nineteenth century. P90–95 and P95–99 went down respectively to 10% and 13%.

This evolution can be easily accounted for by the consequences of the Nazis coming to power. Two distinct periods can be highlighted. The first phase (1933–34), consisting of strengthening their grasp on power (among others by bringing back full employment thanks to civil building works), trickled down to the whole economy. Once the country was brought into line (*Gleichschaltung*), the second phase began after 1934–35, and aimed at preparing the economy to the coming war (*Wehrhaftmachung*). This preparation was institutionalized by the Four Year Plan (from 1936 onward) under which Germany definitely ceased to be a market economy. Domestic consumption was curbed (though maintained at levels guaranteeing social stability) and wages growth was soon stopped (so-called *Lohnstop*). A hidden deficit spending policy was organized using parallel currencies. Since the deficit was meant to finance investment in heavy industries and consumption prices were controlled by law, this expansionist

¹⁵ It means a –49% decrease comparable to the –41% observed in France for the same group between the same dates, see Piketty (2001).

policy remained largely unnoticed (the existence of the most widespread of these currencies, the 'MEFO' bonds, named after the firm which emitted them, were only revealed at the Nuremberg Trial against Schacht, the *Reichsbank* president during the war). Systematically exploiting the accounts of German corporations before the war, Spoerer (1996) shows that virtually all armament related industries saw their profits boom in the late 1930s. Contrary to Sweezy (1940), who uses less comprehensive data, Spoerer (1996) shows that not only big corporations but also smaller one gained from these policies. Both authors agree that final consumption related industries were excluded of the process. Spoerer argues that these profits may have been the price Nazis paid to the corporate sector to have them follow their political and military objectives, a kind of compensation for the loss of autonomy of corporations on the road to war. To what precise extent the Nazi regime helped a new category of 'Nazi entrepreneurs' to thrive is nevertheless hard to assess as well as the question whether these entrepreneurs were junior partners of the Nazis or only opportunistic profiteers. Our data nevertheless clearly show that high income group objectively gained from the new regime. The progressive expropriation of Jewish businesses probably accelerated the quick concentration of top incomes.

Unfortunately, we do not have data on the Second World War and its aftermath. As for the hyperinflation years, we can only compare the situation before 1938 with the outcome in 1950. It is nonetheless important to remember that the allied bombings of Germany were mostly directed at cities and communication infrastructure. Thus the amount of productive capital stock destroyed during the war was relatively small, and the investments realized under the Nazi power were not lost for the German economy of the 1950s.¹⁶

The Years of the Federal Republic

The Federal Republic of Germany, from 1950 to 1998, witnessed an original pattern. The share of the top decile oscillated between 30% and 35% over the whole period. However there seems to be a downward trend in the 1950s and 1960s followed by an upward trend in the 1970s, 1980s, and even 1990s. Once again, one should differentiate the picture at the very top of the distribution from that beneath.

The top percentile exhibits a striking stability throughout the period at about 11%. This level is similar to that observed during the Weimar Republic and much lower than the level of the early twentieth century. The war and the allied occupation thus seems to have undone what the Nazis did at the top of the distribution.¹⁷ Looking further into the top percentile at the top 0.01%, one is

¹⁶ For a detailed assessment of the economic result of the war, see Abelshausen (2004).

¹⁷ It should be recalled here that the data we have do not permit to trace individuals. Top income groups may experience mobility and therefore rich individuals may change as top income groups remain stable.

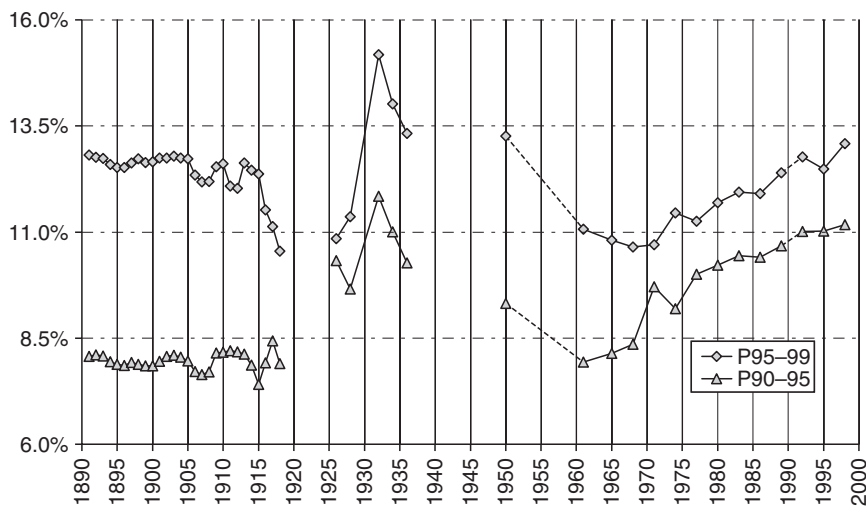


Figure 9.3 Share of P90–95 and P95–99, Germany 1891–1998

Source: Author's computation on German income tax data, Table 9I.5

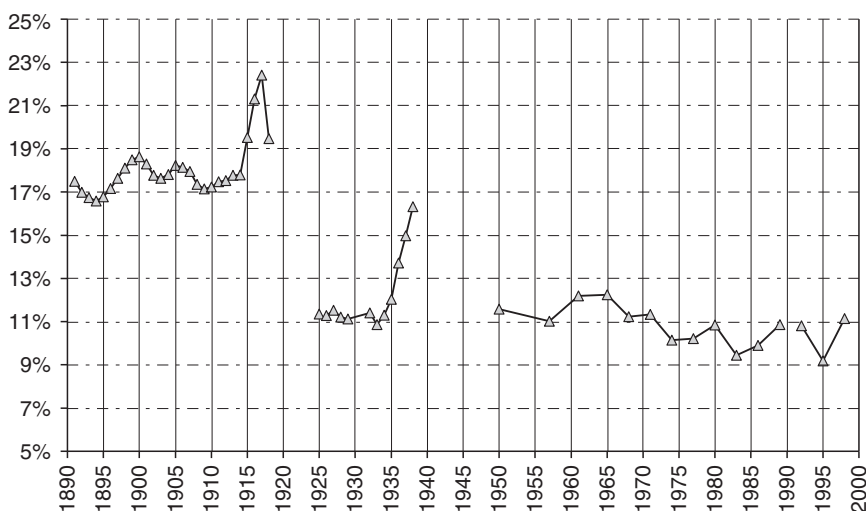


Figure 9.4 Share of the top percentile, Germany 1891–1998

Source: Author's computation on German income tax data, Table 9I.5

nonetheless led to nuance that judgment since the share of very high income groups remained in the years after the war at higher levels than before, notably in the 1960s and in the late 1980s and 1990s. A robust confirmation of this fact is given by shares within shares (see Figure 9.8). The share of the top 0.01% within the top percentile was about 12% before the war, it was in the 1960s and in the late 1980s and 1990s about 15%.

Compared to other developed countries studied in this book like France or the United States, the top 0.01% income share is much higher throughout the post-war period. For instance, the French and American top 0.01% income share remained around 0.5% after the Second World War and until the late 1980s (in the case of France, until today). The German top 0.01% income share is always twice to thrice higher, fluctuating between 1% and 1.5%. Note that this difference is not as striking at the top 1% level. This means that top incomes are structurally more concentrated in Germany than in France or the United States in the immediate after war, and until today in the case of France. Looking once again at shares within shares, one can have a confirmation of this phenomenon, which is robust to differences which could exist between income total denominators. The share of the top 1% within the top 10% (see Figure 9.7) fluctuates in Germany between 30% and 40% with a downward trend since 1961. The same share has been fluctuating (with a downward trend also in France and in the US between 20% and 30% only since the Second World War. In the recent years, however, the US reached German-style levels. The same kind of pattern can be observed when looking at the share of the top 0.01% with the top percentile. Thus the higher concentration of top incomes in Germany is linked to the higher weight of very top income groups: the super-rich German were richer than the super-rich Americans until the late 1980s (see Figures 9.7, 9.9, and 9.10 for illustration of these comparisons).

Note, last, that the pattern followed by the top percentile's share is very pro-cyclical after the war. The recessions of 1966–67, 1973–74, and of the early 1980s are periods of drop in the shares.¹⁸

The bottom part of the top decile does not exhibit the same stability as the upper part (see Figures 9.3 and 9.9). Although it is comparable with levels observed in other developed countries after the war, the point for P90 and P95 for 1950 should be considered with caution (see Appendices for more on this issue) and may be significantly overestimated. From the early 1960s onward, however, the share of the bottom 9% of the top decile has been constantly growing following a trend comparable to that followed by the US (or France in the more recent years, see Figure 9.9). At last, Reunification, does not seem to have impacted significantly top income shares at least at the all-German level.

Evolution of Top Incomes Composition

Information on sources of income enables us to estimate the share of various income sources at different levels of the income distribution, using simple linear interpolation methods. Unfortunately, such information is not available

¹⁸ The drop for 1995 may be related to the aftermath of the 1993 recession but is also at least partly a blip linked to the surge of tax avoidance based on fictional real estate losses which followed the Reunification and the huge real estate investment in the new *Länder*.

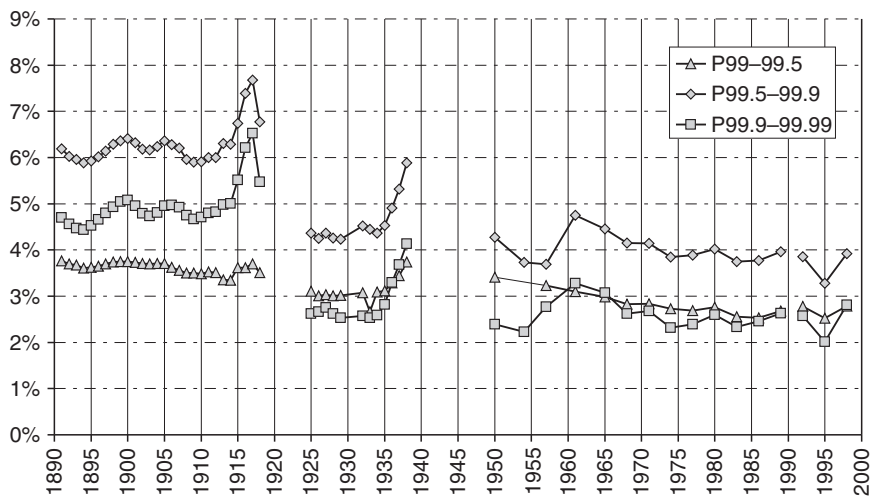


Figure 9.5 Share of P99–99.5, P99.5–99.9, and P99.9–99.9, Germany 1891–1998

Source: Author's computation on German income tax data, Table 9I.5

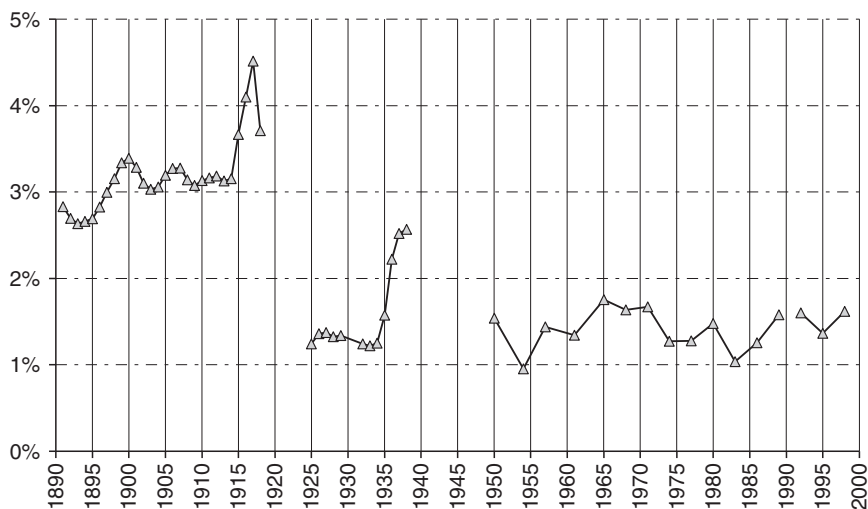


Figure 9.6 Share of the top 0.01%, Germany 1891–1998

Source: Author's computation on German income tax data, Table 9I.5

before 1926. We present here estimates concerning the interwar period (see Figures 9.11–9.13) and the recent years (see Figures 9.14–9.15). The basic fact about the composition of top incomes is, as in France or the US, the share of capital income is growing with income. In 1928 as in 1936, 70–80% of the P90–95

Top Incomes in Germany

379

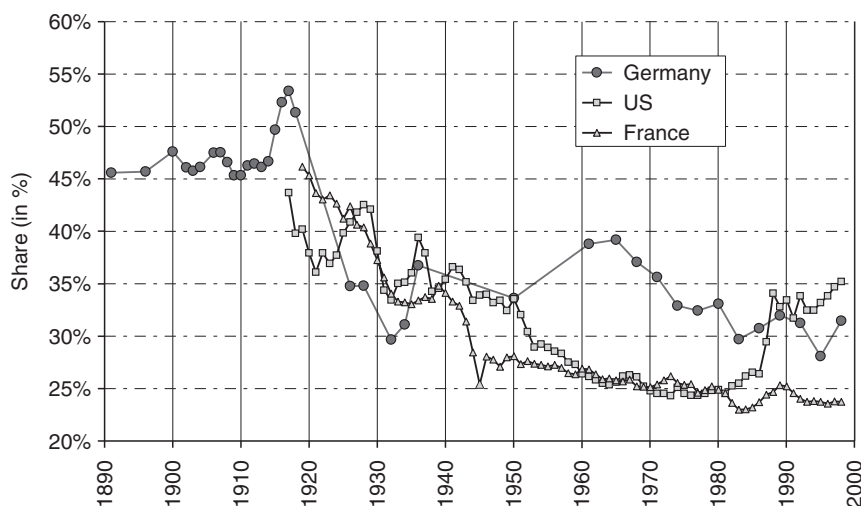


Figure 9.7 Share of the top percentile within the top decile, France, US, and Germany 1891–1998

Source: Author's computations on German income tax data; France—Chapter 3, this volume; US—Chapter 4, this volume.

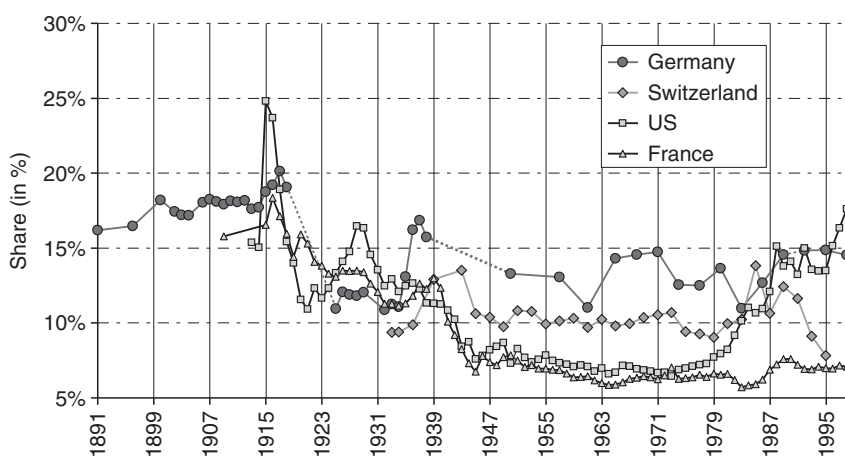


Figure 9.8 Share of P99.99–100 in top percentile, Germany 1891–1998

Source: Author's computations on German income tax data; France—Chapter 3, this volume; US—Chapter 4, this volume.

percentile is made of wages. The rest being capital and business income, and self-employment income. The top 0.1%¹⁹ is on the contrary basically made of capital income and wages only represent a mere 10–20% of this fractile. The same

¹⁹ We do not give estimates for the top 0.01% because it would most of the time entail linear extrapolations, which are obviously not robust.

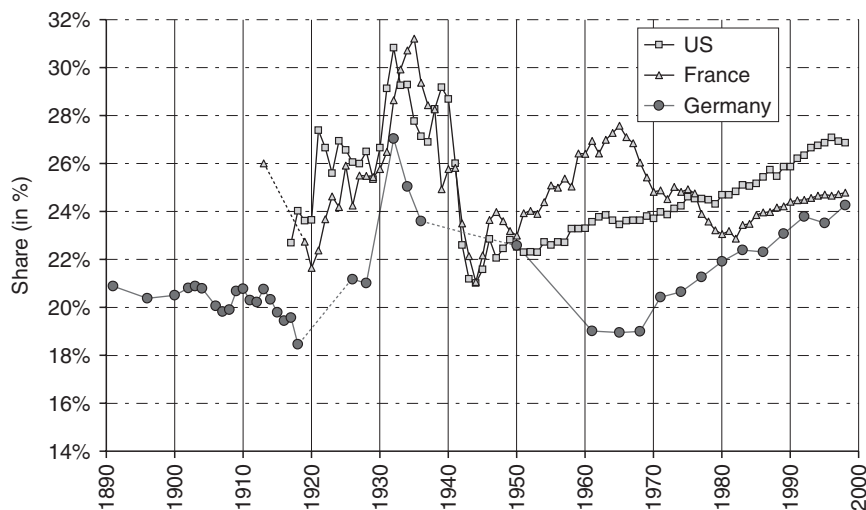


Figure 9.9 Share of the bottom part of the top decile (P90–99), France, US, and Germany 1891–1998

Source: Germany—author’s computations on German income tax data; France—Chapter 3, this volume; US—Chapter 4, this volume.

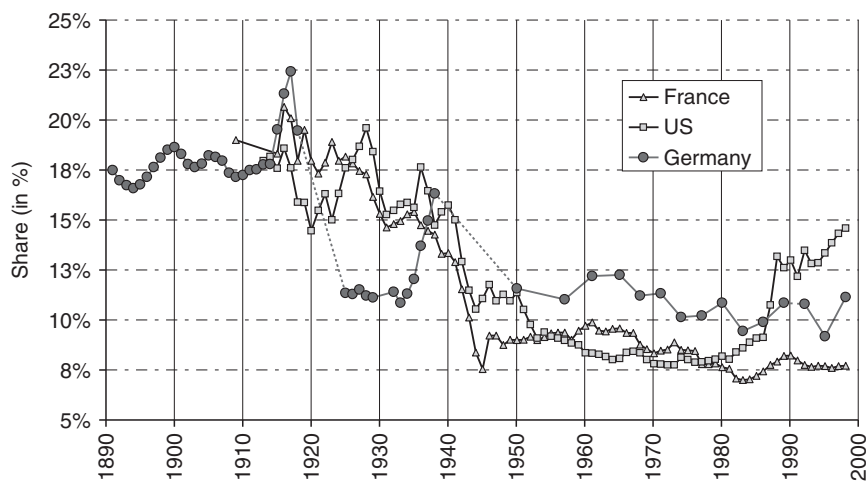


Figure 9.10 Share of the top part of the top decile (P99–100), France, US, and Germany 1891–1998

Source: Germany—author’s computations on German income tax data; France—Chapter 3, this volume; US—Chapter 4, this volume.

pattern can be observed during the last decade of the twentieth century. It should be noted here that German tax law registers as ‘business income’ (*Einkünfte aus dem Gewerbebetrieb*) incomes that would, for example in France, be recorded as capital income. This phenomenon still exists today and is related

Top Incomes in Germany

381

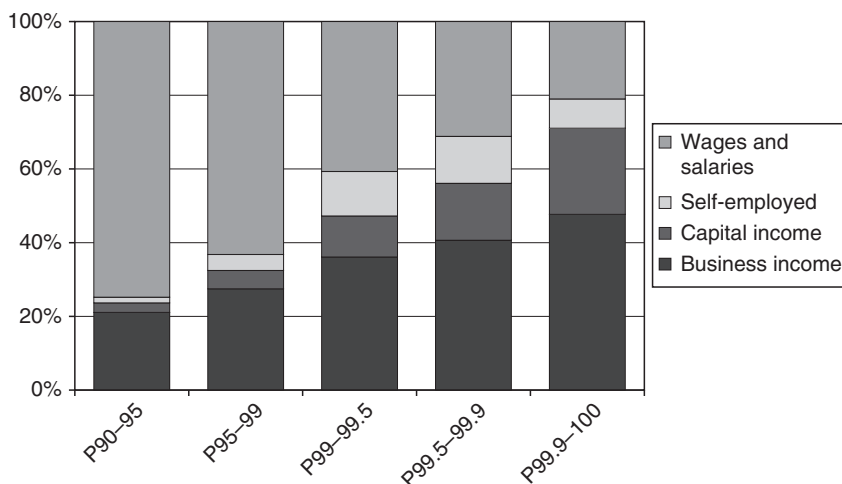


Figure 9.11 Sources of income in top income groups in Germany, 1928

Source: Author's computation on German income tax data, Table 9I.5.

to the fact that public corporations (*Aktiengesellschaften*) which pay dividends which are in turn taxed under the category 'capital income' was until recently quite rare in Germany. Other legal forms for societies (*Kommanditengesellschaft* or *Offene Handelsgesellschaft*) seem to have been much more widespread and even encouraged by corporate and business tax law. The structure of top incomes appears to be very similar to that of other countries (with also a local maximum of self-employment incomes about the P99 threshold). Thus top income shares decline in the first half of the century (with also a capital income phenomenon as well as the striking concentration of top German incomes after the Second World War. Further study of the effective impact of German direct income and wealth taxes on the dynamics of capital accumulation could cast light on these facts.²⁰

Income composition estimates also cast an interesting light on economic shocks such as the Great Depression. Not only did the Great Depression lower all top incomes: as already said, the top decile was fundamentally transformed during the Depression with lower percentiles weighting more whereas the share of the top centile was only slightly negatively affected. Composition estimates for 1932 confirm very clearly our former assumption that this phenomenon was the result of real wages having become relatively more important within the top decile thanks to deflation. In 1932 indeed, wages are more present higher in the distribution: they still represent about 35% of incomes in the top

²⁰ See Dell (2005) for an preliminary attempt at understanding the German originality using German inheritance tax. Top income tax rates in Germany have remained at 40% before the Second World War and fluctuated between 50% and 60% after the War. These rates were thus smaller than those experienced in France until very recently, and in Anglo-saxon countries until the beginning of the 1980s. On the top of that, inheritance tax rates have been significantly lower, and exemption brackets much larger, than in France after 1945.

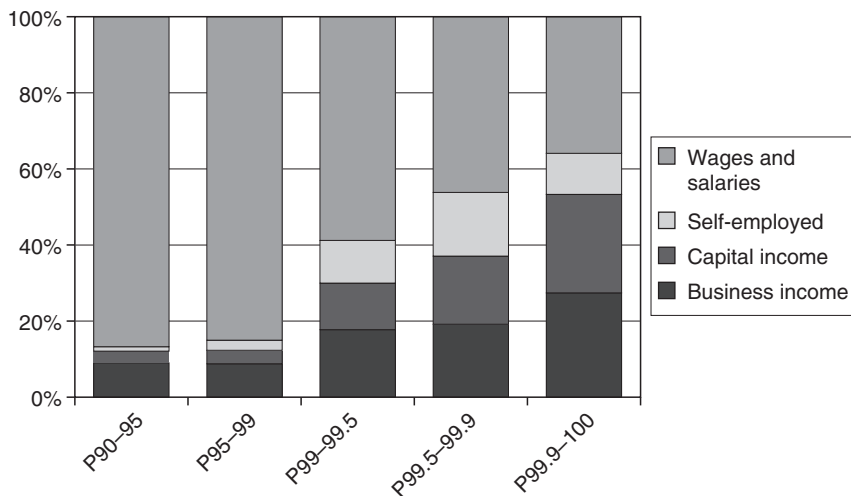


Figure 9.12 Sources of income in top income groups in Germany, 1932

Source: Author's computation on German income tax data, Table 9I.5.

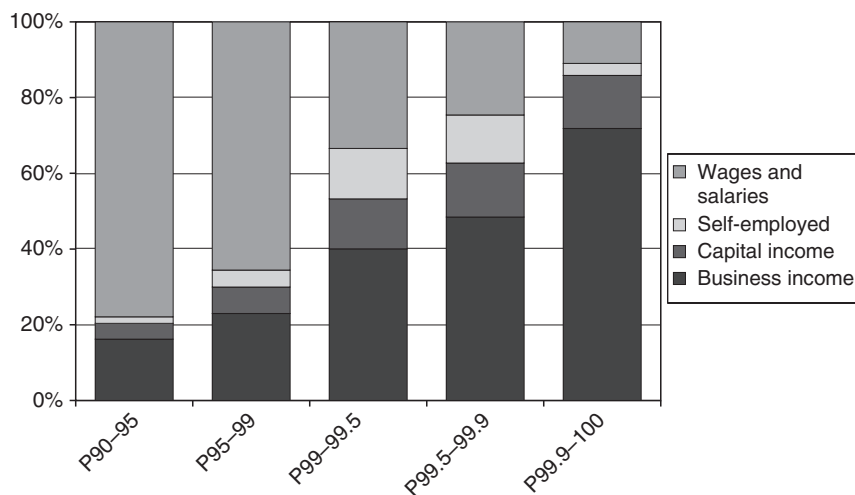


Figure 9.13 Sources of income in top income groups in Germany, 1936

Source: Author's computation on German income tax data, Table 9I.5.

0.1 percentile whereas four years before, as four years later, they represent a maximum of 20%.

9.4 CONCLUSION

In this chapter we display for the first time complete patterns of evolution for top incomes in Germany throughout the twentieth century. We show that top income

Top Incomes in Germany

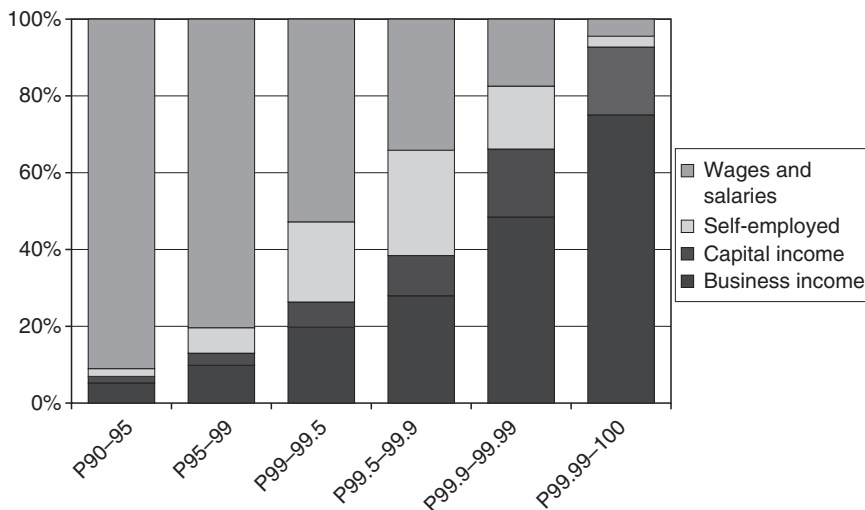


Figure 9.14 Sources of income in top income groups in Germany, 1992

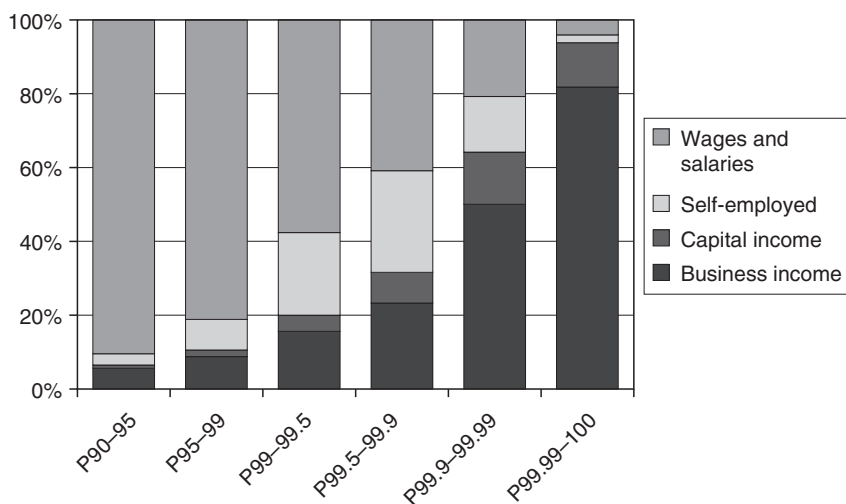


Figure 9.15 Sources of income in top income groups in Germany, 1998

Source: Author's computation on German income tax data, Table 9I.5.

shares decreased over the century largely because of the shocks of the 1914–45 period. We also highlight an original evolution during the interwar years: Nazi power helped top incomes to recover part of their pre-1913 shares. Further, we pinpoint a specific structure of the top decile of the German income distribution after the Second World War, characterized by high stability and high concentration: super-rich Germans were richer than super-rich Americans until the late 1980s.

Using (partial) estimates of income sources we show that these top incomes which were hit hard in the course of the century were basically capital

incomes. Thus understanding the pattern observed should encourage us to look more precisely at wealth distributions and the effect of progressive taxation on wealth accumulation dynamics over the century.

APPENDIX 9A: DATA FOR GERMANY OVER THE TWENTIETH CENTURY

See Table 9A.1 for precise references to the publications used. Sometimes, the same tax year is documented more than once; we only indicate here the most detailed publication used for one given year. The years 1920 and 1949 were not used in this work because their robustness was not assured. Indeed, 1920 and 1949 were years of institutional, fiscal, and monetary turmoil which render the interpretation of the income shares we could estimate quite dubious.

In order to estimate thresholds and average income of top income groups, we assume that the tail of the income distribution is Pareto shaped. The detail of this estimation strategy is given in the next section.

APPENDIX 9B: INTERPOLATION TECHNIQUE USING PARETO'S LAW

With the German data, we have at our disposal tabulations with fiscal income brackets containing amounts and numbers of tax payers. The Pareto method

Table 9A.1 Income tax publications used, Germany

Years	Name of the main publication	Volume
1891–1918	<i>Statistisches Jahrbuch für den preußischen Staat</i>	17(1921)
1920	<i>Statistik des deutschen Reichs</i>	312 (ES)
1925	<i>Statistik des deutschen Reichs</i>	348 (ES)
1926	<i>Statistik des deutschen Reichs</i>	375 (ES) & 359 (LS)
1927	<i>Statistik des deutschen Reichs</i>	375 (ES)
1928	<i>Statistik des deutschen Reichs</i>	391 (ES) & 378 (LS)
1929	<i>Statistik des deutschen Reichs</i>	430 (ES)
1932	<i>Statistik des deutschen Reichs</i>	482 (ES) & 492 (LS)
1933	<i>Statistik des deutschen Reichs</i>	482 (ES)
1934	<i>Statistik des deutschen Reichs</i>	499 (ES) & 492 (LS)
1935	<i>Statistik des deutschen Reichs</i>	534 (ES)
1936	<i>Statistik des deutschen Reichs</i>	534 (ES) & 530 (LS)
1937–1938	<i>Statistik des deutschen Reichs</i>	580
1949	<i>Statistisches Jahrbuch der Bundesrepublik Deutschland</i>	–
1950	<i>Statistik der Bundesrepublik Deutschland</i>	125 (ES) & 107 (LS)
1954	<i>Fachserie L: Finanzen und Steuern</i>	Reihe 6.1 (ES)
1955	<i>Statistik der Bundesrepublik Deutschland</i>	– (LS)
1957	<i>Fachserie L: Finanzen und Steuern</i>	Reihe 6.1 (ES)
1961–1968	<i>Fachserie L: Finanzen und Steuern</i>	Reihe 6.1 (ES)
1971–1998	<i>Fachserie L: Finanzen und Steuern</i>	Reihe 7.1 (ES)

used to interpolate has been described in Appendix 5C. The accuracy of our estimates relies on the assumption that the income distributions observed are indeed Pareto tailed, as well as on the number of top brackets published in tax statistics. The first issue has received various theoretical justifications (Champernowne 1953; Mandelbrot 1960; Gabaix 1999, for instance) and is thus more than as simple empirical regularity. As far as the second issue is concerned, German tax statistics most of the time produced tabulations with very numerous top brackets, and the P99.99 fractile is most of the time larger than the top bracket published (see Appendix 9I where years for which this is not the case are indicated). Nevertheless we checked with micro-data the accuracy of our estimates for the 1990s, for which micro data are available—see Appendix 9C.

APPENDIX 9C: CHECKS OF INTERPOLATION ASSUMPTIONS USING MICRO-DATA IN THE 1990s

We completed the extensive use of tax data tabulations published by the German Statistical Offices by working on income tax micro-data. These were provided by the German Federal Statistical Office, for the first time to a non-German, under strong anonymization conditions. There are available data for the years 1992, 1995, and 1998. Original data-sets contain about 30 million observations. Table 9C.1 summarizes these figures. We worked on a 10% stratified random sampling set with an over-representation (sampling rate of 70%) of the top centile. This enabled us to check the validity of the Pareto assumption made when using tabulations for years before 1990.

Since the micro-data we used rely on a sample, we reproduced the type of tabulation used before 1992 to distinguish sampling error and estimation error. Results are given in Table 9C.2 and show that most of the time, the relative estimation error is smaller than 1%. Higher errors arise in 1995 but remain under 2%.

APPENDIX 9D: TAX UNIT DEFINITION OVER THE TWENTIETH CENTURY

The first German income tax was introduced in Prussia in 1891. Tax units were the married couple plus children if any. In comparison with other European

Table 9C.1 Tax units in the micro-data set for Germany in the 1990s

	1992	1995	1998
TU in the file	29,478,994	29,478,994	28,672,912
Total TU	43,972,179	44,618,987	45,172,545
Share	67.00%	66.50%	63.50%

Note: Tax units (TU) with cut-off age at 20.

Source: Author's computation on micro data provided by the *Statistisches Bundesamt*.

Table 9C.2 The accuracy of quantile estimation for Germany in the 1990s

1992					
	Micro Data	Tabulation	Tabulation	Sampling	Estimation
	Sample	Sample	Total	Error	Error
P90–100	148,992	148,563	148,540	–0.02%	–0.29%
P95–100	203,773	202,759	202,717	–0.02%	–0.50%
P99–100	473,216	469,014	468,763	–0.05%	–0.89%
P99,5–100	708,984	703,592	703,083	–0.07%	–0.76%
P99,9–100	1,894,885	1,881,457	1,878,210	–0.17%	–0.71%
P99,99–100	7,742,969	7,791,919	7,756,572	–0.45%	0.63%
1995					
	Micro Data	Tabulation	Tabulation	Sampling	Estimation
	Sample	Sample	Total	Error	Error
P90–100	152,952	152,249	152,173	–0.05%	–0.46%
P95–100	204,398	202,677	202,494	–0.09%	–0.84%
P99–100	445,741	438,526	437,807	–0.16%	–1.62%
P99,5–100	656,363	648,114	646,656	–0.22%	–1.26%
P99,9–100	1,734,253	1,702,345	1,694,440	–0.46%	–1.84%
P99,99–100	7,430,870	7,424,250	7,379,744	–0.60%	–0.09%
1998					
	Micro Data	Tabulation	Tabulation	Sampling	Estimation
	Sample	Sample	Total	Error	Error
P90–100	174,949	174,644	175,015	0.21%	–0.17%
P95–100	242,577	240,338	240,835	0.21%	–0.92%
P99–100	586,814	585,152	587,232	0.36%	–0.28%
P99,5–100	909,658	907,564	911,298	0.41%	–0.23%
P99,9–100	2,700,748	2,694,098	2,709,431	0.57%	–0.25%
P99,99–100	12,819,136	12,798,031	12,895,617	0.76%	–0.16%

Note: Yearly fiscal income of tax units, in DM.

Source: Author's computation on micro data provided by the *Statistisches Bundesamt*.

countries like France, who introduced income taxes only during or after the First World War, Prussia was thus quite ahead of its time. The broad basis of Prussia's income tax was a mark of modernity: whereas France's first income tax (1914/15) applied to less than 5% of the entire French population, Prussia's income tax basis represented from 20% (1891) to about 50% (1914) of the total tax units (see Figure 9G.1).²¹

After 1920, tax units remained based on couples but the introduction of a pay-as-you-earn tax on wages, relying on individual-based tax units, makes the reconstitution of an homogenous income distribution more complex: the vast majority of tax payers only paid the so-called *Lohnsteuer* (*LS*) and were therefore recorded in specific statistics. Above a given income threshold, one had to file a tax return, and one thus entered the 'classical' income tax (*Einkommensteuer*: *ES*) statistics.²² This fiscal dichotomy still exists today. It entails that one has to merge

²¹ For a precise account of the genesis of Prussia's fiscal modernity at the turn of the century, see Ketterle (1994).

²² The threshold has been existing until 1995. After this date (and notably for 1998), there was no obligation of filing tax returns for wage earners with no other income source. 'Pure' wage earners are nonetheless still present in the statistics via PAYE records.

income tax data coming from two different kinds of tabulations in order to estimate fractiles bigger than the top 1% of the income distribution.²³

This problem is particularly significant for the Interwar period and just after the Second World War. After 1961 (included) indeed, the German Statistical Office published income tabulations which already contained agglomerate data and could therefore be used without further treatment (this is why table sources does not document the specific *Lohnsteuer* publications which continued to be issued by the Federal Statistical Office until 1992). Before 1961, one has to merge the various tabulations on its own. For the years 1925, 1927, 1929, 1933, 1935, and 1937–38, the lack of PAYE statistics made it impossible for us to estimate fractiles P90 and P95. Two kinds of problem arise due to this merging process.

First, the merging of *LS* and *ES* tabulation can lead to double counting. Fortunately, the *LS* statistics only record the PAYE tax payers who do not earn more than the ‘*ES*-threshold’, which suppresses most potential cases of double counting. Nonetheless, for the years 1926, 1928, and 1932, some double counting exists because people with mixed activity may be present in both statistics: small wages lead them to appear in the *LS* statistics (with their wage) and other incomes make them pay the *ES* (on these other incomes). These tax payers are thus split in two. The number of tax units affected by these double counts is modest (in 1928 they were less than 300,000, which is less than 1% of all tax units) and probably lead to a slight underestimation of our top income groups around P90 and P95. Clearly, the problem cannot impact significantly higher income groups because if the wage component exceeds the ‘*ES*-threshold’ then the tax unit disappears from the *LS* statistics. The *ES*-threshold is thus the upper bound of the possible under-estimation.

Second, the heterogeneity of tax units (married couple based at the top, but individual based at the bottom, since PAYE tax was collected on an individual basis) may lead to some bias in the estimates of the fractiles beneath and around the *ES*-threshold. For the years 1950, 1954, and 1957 the merging of the two sets of tabulations rely would rely on too many ad hoc hypotheses and we are thus able to estimate robustly only top groups above P99. We nonetheless produce estimates of P90 and P95 for 1950 using a synthetic tabulation published in Statistisches Bundesamt (1954*b*). This tabulation is comparable to the synthetic tabulations existing for the interwar years Statistisches Reichsamt (1939) and which lead to estimates identical to ours. From 1968 onward, the German Statistical Office issued tabulations matching ‘whenever the necessary information was at hand’ the married individuals taxed separately by the PAYE wage tax. We use these tabulations, but unfortunately the Statistical Office did not document properly the extent to which the matching it implemented did solve the problem.

In conclusion, the reader should keep in mind that the robustness of the P90 and P95 estimates between 1919 and 1968 is not guaranteed. After 1968, one still

²³ The threshold indeed guarantees that higher fractiles (top 1% and higher) are only constituted of ‘*ES* income tax’ payers.

cannot exclude a upward bias for these fractiles. This bias would nevertheless be conservative with regard to our findings, namely that, compared with other developed countries, P90 and P95 are low relative to P99 and the other fractiles further up the distribution.

APPENDIX 9E: FISCAL INCOME DEFINITION: INCOME AND THE GERMAN TAX STATISTICS OVER THE TWENTIETH CENTURY

The Prussian income tax was a ‘modern’ income tax because of its very broad definition of taxable income: wages and salaries, capital income, self-employed incomes were part of the taxable basis. Capital gains were not taxable under the income tax. Apart from an exemption threshold (*Existenzminimum*), every income had to be taxed. Dependent children were taken into account by ‘moving’ tax payers one, two, or three brackets down the tax schedule. Published statistics, however, most of the time record incomes before application of this system (at least as far as the ‘top’ incomes are concerned, i.e., those for which a tax return was effectively filed).²⁴ Prussian income tax statistics can therefore be used without any specific treatment.

After the First World War, however, the simplicity of the Prussian system was lost and the income tabulated in the tax statistics varied over time. As far as *ES* statistics are concerned, the income concept used was slightly more restrictive and law dependant than the one we used before 1920. Incomes (*Einkommen*) are tabulated after deductions of the costs incurred by earning them. These costs are of two kinds: those which can be related to one specific income source (*Werbungskosten*) and those which cannot be related to a specific income source (*Sonderleistungen* before 1934 and *Sonderausgaben* after 1934 and until today). We corrected for the latter but not for the former.²⁵ The correction was realized by adding the minimal lump sum deduction allowed by law. We therefore adopted a conservative correction which cannot be likely to overestimate our top income groups. As far as the *LS* statistics are concerned, the lumpy deductions for wage and salaries (equivalent of *Werbungskosten* and *Sonderleistungen* and *-ausgaben*) were all deduced in the 1920s but not anymore in the 1930s as well as after the Second World War: in the process of merging *ES* and *LS* statistics we

²⁴ Indeed, for smaller incomes, the Prussian income tax relied heavily on estimation of tax payers’ incomes by a local commission. The threshold above which a return had to be filed has remained that of 3000m throughout the period.

²⁵ The latter is often more variable across time and of less economic significance than the former. For instance, when the Nazi came to power, contribution to unions (which were part of the *Sonderleistungen*) stopped to be deductible, and purchases of *Ersatz* became tax deductible. Clearly, we do not want such variation to impact our income definition. As far as *Werbungskosten* are concerned, on the contrary, their deduction seems necessary, at least for the self-employed, and business income. Moreover, the post-WWII incomes are also after deductions of these *Werbungskosten*.

thus had to translate the wage distribution to the right in the 1920s (add the *Sonderleistungen*) and to the left in the 1930s (subtract the *Werbungskosten*).

Note that from the Interwar years onward, capital gains are taxable in Germany (with a specific treatment, however, see Appendix 9F). Pensions are also fully taxable at the time (in the course of the 1950s, most of them became tax exempt) but unemployment benefits are tax exempt. From 1932 onward, most of agricultural income was tax exempt. We did not correct the series for this exemption first because the German economy encountered too heavy a shock between 1929 and 1932 to correct the post-crisis years using pre-crisis year data, and, second, because agricultural income is anyway a very small portion of incomes at the top of the distribution.

The post-1949 German tax law is based on a set decreasing series of income concepts, which was already in part, although unsystematically, used in the 1930s. Each concept is based on the previous one, new deductions being operated. Estimates of top incomes shares in this paper are based on the ‘overall amount of incomes’ (*Gesamtbetrag der Einkünfte*, or *GdE*). This fiscal income is the more upstream concept available, i.e., the one from which fewer law dependant deductions were subtracted (it, however, contains compensations of losses between various sources at the taxpayer’s level). What it measures is thus relatively close to an economically relevant concept of primary income containing all wages and salaries, business, and self-employment income as well as financial capital and real estate incomes. Payroll taxes paid by employees are included but those paid by employers are not. A small part of the pensions (from 1955 onward, the so-called *Ertragsanteil* which varies across individuals but represent about 30% of the pension) is included but unemployment benefits are not. Most importantly, wage and salary incomes are taken into account after deduction of the costs incurred by earning those incomes, which is often a lumpy deduction.²⁶ This makes wages and salaries homogenous to other income sources. No correction is made for these deductions in the series presented here.

Overall, thus, the raw fiscal income which is the material of our series is a fairly wide income notion, which is moreover homogenous over the century (at least for the top income groups we are focusing on).

APPENDIX 9F: CAPITAL GAINS AND THE GERMAN TAX LAW

The Taxation of Capital Gains in the Late 1980s and the Reforms of the 1990s

Capital gains on productive capital (*Betriebsvermögen*) are subject to the income tax in Germany under the category of ‘extraordinary incomes’. They therefore

²⁶ These are the *Werbungskosten* which are deducted of the *Bruttolohn* to produce the *Einkünfte aus unselbständiger Arbeit* which is taken into account in ES tax statistics, in a setting which was already functioning before the war.

enjoy a tax reduction of 50%. Capital gains on personal capital (*Privatvermögen*) are tax exempt if they are not realized within a 'speculation period' of one year. Moreover, part of the capital gains on productive capital enjoy exemption brackets. The determination of the exemption bracket is complex and depends on the absolute level of the capital gain as well as on the age of the tax payer. Moreover, and more importantly, capital gains from financial capital are tax exempt if they represent less than 1% of the firm sold or if the shareholder had no 'significant participation' in the firm during the five years preceding the realization of the gains. 'Significant participation' (*wesentliche Beteiligung*) means holding 25% of the firm.

In 1990, a Tax Reform Act had a huge impact on capital gain realization, although the part of the reform concerning capital gain taxation was ultimately considerably weakened. It originally restricted to the first DM2 million of capital gains the 50% tax reduction. The following DM3 million still enjoyed a 33% tax reduction but capital gains in excess of DM5 million were to be taxed at full rate. This restriction was subject to discussion within the ruling coalition²⁷ and finally in the new income tax law for 1990, the 50% reduction still applied to the first DM30 million (sic). This episode and its impact on income tax statistics is documented in Rosinus (2000: 461, n. 24) and can be seen in Figure 9E.3.

The tax reforms of the late 1990s also changed the conditions under which capital gains are taxed: the 'significant participation' criterion has been tightened up progressively. Thus the 25% of the total firm capital threshold was reduced to 10% after 1998 and to 1% (which led the concept of 'significant participation' to disappear) from 2001 onward. This may have led to lumpy capital gain realizations in 1998 (last years at 25%) and 2000 (last year at 10%).

Capital Gains Taxation

As already mentioned, capital gains were not taxable in Prussia before the First World War. After the First World War, they became taxable under conditions similar to those existing at the end of the century ('significant participation' of 25% and reduced taxation rates).

Assessing the Importance of Capital Gains in the 1990s

The raw micro-data we use include 100% of taxable capital gains. Top incomes shares estimated on raw data are thus based on the capital gains included (CGI) income distribution. Since micro-data enable us to identify capital gains for each tax payer, we can estimate series of capital gain excluded (CGE) top income shares. Last, we can use the fractiles of the CGE distribution to identify to groups for which we calculate total including capital gains.

²⁷ 'Schwarz-Gelbe' Coalition of Christian Democrats and Liberals under H. Kohl.

To stick to the habitual notations, let P^0XX be the threshold of the XX th percentile for the CGI distribution. $P^0XX-100$ is the average CGI income above this threshold and $T^0XX-100$ is the total CGI income above this threshold. Similarly let P^1XX be the threshold of the XX th percentile for the CGE distribution. Then $P^1XX-100$ (resp. $T^1XX-100$) is the average (resp. the total) GCE income above that threshold. Finally we define $P^2XX-100$ (resp. $T^2XX-100$), the average (resp. total) CGI income of individuals above P^1XX .²⁸

Tables 9F.1–9F.3 give these three income series for 1992, 1995, and 1998.

Columns 9 and 10 show that capital gains affect mostly the top of the distribution. Comparing columns 12 and 14 give an idea of the magnitude of the re-ranking which takes place when including capital gains: amounts along the F_0 distributions of CGI incomes are clearly concentrated at the top (showing that to a certain extent, capital gains ‘make’ top income earners). Opposite, capital gains in the F_1 distributions of CGE incomes are much more uniformly distributed. The fact that column 10 may be smaller than one also reflect the consequences of this re-ranking.

When comparing the different years documented, two scenarios can be pointed out, these scenarios can be easily related to the stock market activity in the nineties in Germany (Figures 9F.1 and 9F.2 show the evolution of the German DAX from 1988 to 2002).

The 1992–95 scenario is a scenario of low growth of assets, which corresponds to capital gains of modest magnitude. Looking at column 10 and 13 in Tables 9F.1 and 9F.2, one sees that the capital gain issue become significant (entails variations of more than 1% of the quantities of interest) only above P_{99} .

The 1998 scenarios a scenario of rapid growth of assets with, on the top of it, a tax law reform which may have encouraged lumpy capital gain realization. Capital gains in 1998 are still very concentrated at the top but the order of magnitude of the ‘overestimation’ implied by taking them into account is much greater than in the previous years (they represent more than 50% of total income in $P_{99.99}-100$ whereas only 20% in 1992 and 1995).

These results are consistent with what Piketty and Saez (2003) found for the US: capital gain realization takes place at the very top of the distribution. In Germany, it seems to be a phenomenon of smaller magnitude (e.g., column 10 for $P_{99.99}-100$ is 126% in 1992 and 176% in 1998 in the US against 113% and 164% in Germany) and, most of all, even more concentrated at the top of the GCI-income distribution (e.g., column 10 for $P_{99}-99.5$ is 106% in 1992 and 115% in 1998 in the US against 99.9% and 98.0% in Germany).

Correcting for Capital Gains Before 1990

Two main factors can explain the amount of capital gains realized a given year. The growth of the value of capital in the previous years is the first obvious factor which

²⁸ For the sake of symmetry we could define P^3 resp. T^3 being average resp. total CGE incomes above CGI distribution based thresholds, but this has not much economic significance.

Top Incomes in Germany

Table 9F.2 Capital gains and the various aggregates, Germany 1995

PXX	Capital gains fully included						Capital gains fully excluded						Ratios			
	P ⁰ 0XX 1	T ⁰ 0XX 2	P ⁰ 0XX-XX+1 3	P ⁰ 0XX-100 4	P ⁰ 1XX 5	T ⁰ 1XX 6	P ⁰ 1XX-XX+1 7	P ⁰ 1XX-100 8	1/5 9	3/7 10	4/8 11					
P90	90,340	226,454,996,524	101,506	152,952	90,206	226,028,805,748	101,315	150,245	100.1%	100.2%	101.8%					
P95	116,014	257,117,314,453	144,063	204,398	115,747	255,990,668,168	143,431	199,176	100.2%	100.4%	102.6%					
P99	206,199	52,454,030,913	235,120	445,741	204,377	51,816,345,137	232,261	422,153	100.9%	101.2%	105.6%					
P99.5	278,517	69,050,551,193	386,890	656,363	274,014	67,205,627,306	376,553	612,045	101.6%	102.7%	107.2%					
P99.9	647,793	44,224,817,761	1,101,295	1,734,253	620,765	41,314,129,519	1,028,813	1,554,012	104.4%	107.0%	111.6%					
P99.99	2,815,634	33,155,790,429	7,430,870	7,430,870	2,540,775	28,024,312,771	6,280,804	6,280,804	110.8%	118.3%	118.3%					
Share of CG when ranking takes CG into account												Ratios				
PXX	CinF_0 12	C/T_0 13	CinF_1 14	C/(T_1+C) 15	T_1+C 16	Hybrid series						17/7 19	18/8 20			
						P ⁰ 2XX-XX+1 17	P ⁰ 2XX-100 18									
P90	363,316,725	0.2%	494,997,565	0.2%	226,523,803,313	101,537	151,913	100.20%	101.1%	101.1%						
P95	1,157,095,038	0.5%	1,106,158,220	0.4%	257,096,826,388	144,051	202,290	100.40%	101.6%	101.6%						
P99	647,657,083	1.2%	670,280,759	1.3%	52,486,625,896	235,266	435,243	101.30%	103.1%	103.1%						
P99.5	1,896,794,928	2.7%	1,468,603,096	2.1%	68,674,230,402	384,781	635,221	102.20%	103.8%	103.8%						
P99.9	3,255,794,541	7.4%	1,976,074,562	4.6%	43,290,204,081	1,078,022	1,636,977	104.80%	105.3%	105.3%						
P99.99	6,804,235,939	20.5%	1,725,731,020	5.8%	29,750,043,791	6,667,575	6,667,575	106.20%	106.2%	106.2%						
Totals above P50	15,455,480,235		9,283,422,266													

Note: Yearly fiscal income of tax units, in DM.

Source: Author's computation on micro data provided by the Statistisches Bundesamt.

Top Incomes in Germany

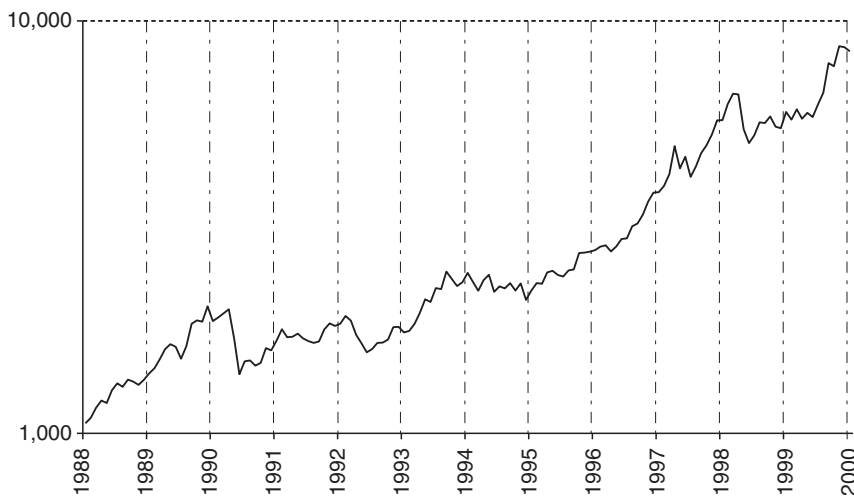


Figure 9F.1 German DAX index, 1988–2000

Source: DAX, log scale.

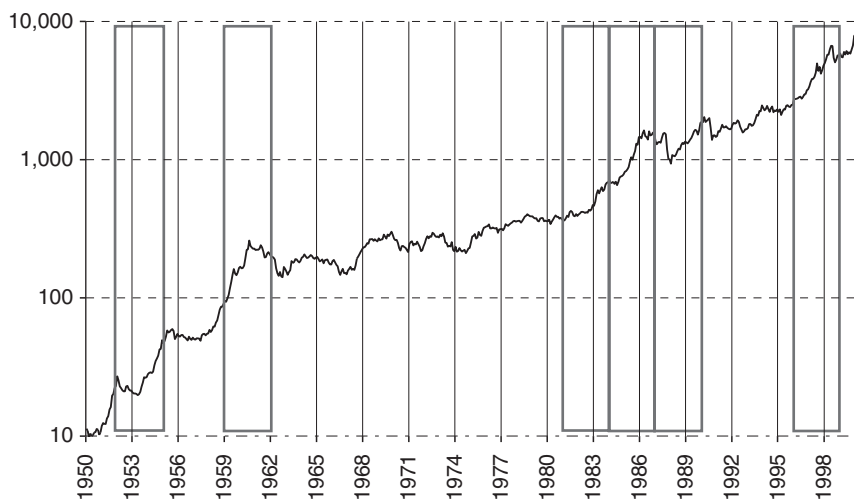


Figure 9F.2 German DAX index, 1950–2002

Note: The 3 year (taxation year + 2 preceding years) periods outlined identify the years when, according to the evolution of the stock market, high capital gain realizations may have been taking place.

Source: The DAX Index is continued from 1987 backward to 1959 with the Index of the *Börsenzeitung* and then retroprojected back to 1948 by Stehle (1999).

drives the size of potential capital gains. The timing of the realization is driven by various factors among which anticipated tax reforms can play an important role. 1989, for instance, is a singular episode illustrating this phenomenon: bullish stock market conjuncture and anticipated tax reform combined and led to obviously huge capital gain realizations (which would probably have spread over time

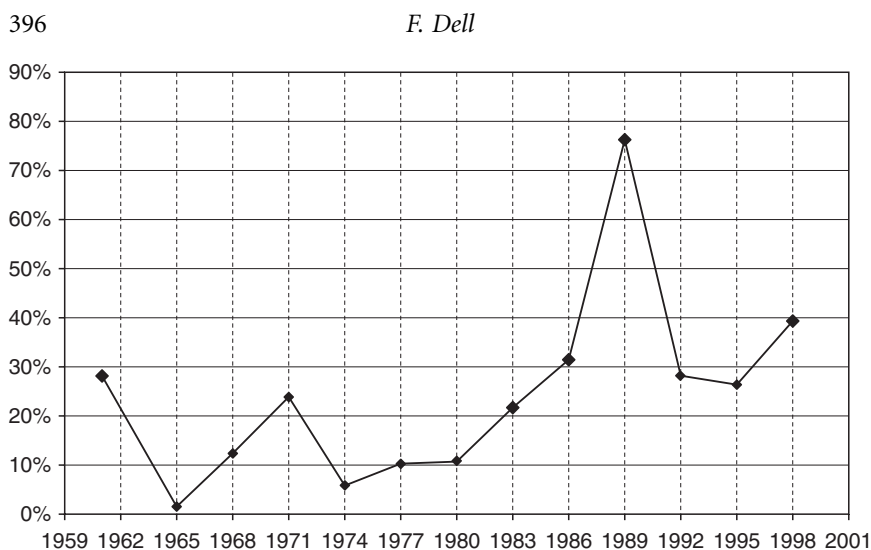


Figure 9F.3 Implicit capital gains in the last bracket, German tax data, 1961–98

Note: Share of implicit capital gains in total taxable income filed in bracket DM10 million +. Big dots are dots for which the 1998 scenario-correction was applied.

Source: German tax data, various years.

otherwise). These two determinants are of totally different nature. If the former is of fundamental economic nature, the latter is pure noise. The P^0 series should ideally be corrected of this second effect whereas they should not be corrected for the first one.

After the Second World War, we focus on the growth of capital value (proxied by the evolution of the stock market) to correct our series for capital gains. We use correction factors of 1992 for all years where the stock market was rather bearish, and correction factors of 1998 for all years where the stock market was bullish (see Figure 9F.2). The years we classify as bullish 1961, 1983, 1986, and 1989. The value for 1989 has nevertheless to be corrected further. Figure 9F.3 gives for years after 1961 the ‘implicit capital gains’ in the top bracket of income tax statistics. Knowing that capital gains are taxed at half the rate of other incomes, the gap between the tax effectively paid by tax payers in the top bracket and the tax they should have paid if their taxable income had been entirely subject to the ‘normal’ tax rates of the schedule give an indication of the size of capital gains declared in the top bracket. This measure is too rough an indication to be used to correct the series for standard years but it clearly shows the specific status of 1989 and confirm that the years 1961, 1983, and 1986 were years of higher capital gain realizations (implicit capital gains above 20%, like in the 1990s).²⁹ We therefore first corrected the data for 1989 in order for them to exhibit potential capital gains of the same magnitude as those observed in 1998.

²⁹ Clearly, according to Figure 9F.3, 1971 could also be a candidate for higher capital gains correction. Nevertheless the German stock market in the first half of the 1970s does not support such correction. Conversely, 1954 may have been a year of heavy capital gain realizations (see Figure 9F.2), but since correcting it according to the 1998 scenario leads to huge blips downward in our series, we preferred not taking the risk to over-correct and we treated it like 1950 and 1957.

During the Interwar years, although capital gains were taxable, we did not correct the series. Indeed, we do not have any indication to assess the importance of capital gains before 1945 (implicit capital gains cannot be calculated because the treatment of capital gains was at the time more complex than after the war) and applying corrections estimated in the 1990s is likely to add more noise than signal to the series. Thus the shares for 1925–28 may be slightly over-estimated (which would be a conservative bias with regard to our findings for these years, namely that top income shares were at the lowest level of the century). For the 1932–38 years, a correction based on stock-market fluctuations does not make much sense since the German economy departed more and more from a free market economy under the Nazi rule, and both the value of the capital stock and the decision to sell assets probably responded more and more to political factors while the stock market was losing a lot of its economic relevance.

APPENDIX 9G: TOTAL TAX UNIT SERIES (CONTROL TOTALS FOR POPULATION)

In order to calculate top income shares, we need to know the total number of tax units in the population. This total number is most of the time considerably higher than the number of actual taxpayers and should not be confused with the total number of households.

In order to build such control totals for the population, we use the simple formula:

$$\text{Tax Units} = \frac{\text{Married couples}}{2} + \text{Bachelors} - \text{Children}$$

The accuracy of this total depends on two questions. First, the definition of children should be chosen in a such way that all children are dependant and all adults are either separate tax units or part of a couple (population cut-off problem). Second, the formula relies on the assumption that all married couple are treated as single tax units by tax law and fiscal statistics.

The first problem is difficult to tackle without very precise information about occupational status in different age groups, and its evolution over time. Such information being not at our disposal, we decided to define children as individuals aged 20 or less from 1925 until 1998.³⁰ For the years before 1918, Prussian data provide us with the exact total number of tax units (broken down in tax paying and tax exempt, see Table 9G.1). (See Table 9G.2 for the same information for Germany, 1891–1998.)

³⁰ Two remarks should be added here. First, under the assumption that the upper tail of the distribution is Pareto, one can estimate the difference in terms of top income shares entailed by the choice of a cut-off at 15 rather than 20. As shown in Chapter 2, this difference is 'rather modest'. Second, the problem of cut-off population is, at least in the German case, linked to the law-dependant tax unit definition problem. Individuals under the cut-off age and nonetheless economically independent can be expected to be most of the time wage-earners. They therefore enter 'tax return' statistics as p-a-y-e contributors, who are anyway treated as individual tax units (see *infra*).

The second question is more complex. As noted in Chapter 2, ‘the impact of moving from household based to individual based tax units depends on the joint distribution of income’. As far as the *ES* is concerned, couples are most of the time treated as a single tax unit.³¹ Conversely, the *LS PAYE* system is based on individual tax units. Thus the use of control totals for population relying on married couples being counted only once could bias our top income fractiles where *LS* data matters, that is around P90 to P95. (See Figures 9G.1, 9G.2, and 9G.3.)

APPENDIX 9H: TOTAL HOUSEHOLD INCOME SERIES (CONTROL TOTALS FOR TOTAL INCOME)

As we have seen in the previous sections, we use an income concept originating from tax system and fiscal law to estimate top income quantiles. Top income shares should therefore be calculated with the total income which would have been reported on tax return statistics, ‘had every single tax unit been required to declare its income’ as Saez and Veall (2005) put it. Various strategies have been adopted by authors who dealt with long series of top income shares (see Chapter 2). Suffice here to say that a ‘bottom-up’ strategy competes with a ‘top-down’ strategy.

The ‘bottom-up’ strategy adds missing income elements to the total fiscal income recorded in tax statistics (income of non filers, exonerated income components). This is the strategy we use to construct our denominator for the pre-First World War years. The ‘top-down’ strategy uses national accounts as a starting point to calculate the total income denominator by subtracting income components in order to stick as much as possible to the income concept on which tax law relies. As argued in Atkinson 2003, this approach guaranties historical continuity as well as a link between countries.³² This is the methodology we use for the rest of our series. Most of the time, one needs at least one reference point to calibrate a ‘(total fiscal income) on (chosen national accounts total income aggregate) ratio’. Unfortunately, we do not have a clear benchmark for Germany since the number of tax filers never exceeded 80% of all tax units in the course of the twentieth century (see Figures 9G.1–3). In the following, we describe how we solved this problem and the potential bias the solutions adopted may entail. Three periods should be addressed independently: before, between and after the two World Wars.

³¹ Tax payers can choose between common declaration (*Zusammenveranlagung*) and separate declaration (*getrennte Veranlagung*). Common taxation most of the time leads to less taxes (specially for high incomes) thanks to the *Splittingstabelle* system. For recent years where we have micro data, the number of married couples choosing a separate taxation is less than 0.5%. Given that there were no additional incentives in the past to choose *getrennte Veranlagung*, we can thus ignore this possibility.

³² The SNA (United Nations System of National Accounts) provides a common framework which makes comparisons easier. Most importantly, the ESA95 (European System of Accounts, base-year 1995), which should be used everywhere in the European Union since 1999, imposes a normalized use of fully equivalent aggregates. Thanks to retropolation works led by the national institutes, we can thus have fully comparable income aggregates inside the Union, from 1980, sometimes 1970, onward.

Table 9G.1 Tax units control total for Prussia, 1891–1918

Tax year	Overall population										Tax Filers										Tax paying		
	Total population	Total tax units	Share of tax units in total population	Population	Tax units	Among which: <i>Freigeste lte</i>	Share of <i>Freigeste lte</i> in Tax-exempt tax units	Share of tax units in population (tax-exempt domain)	Share of tax-exempt total tax units	11	12	13	14	15	16	17	18	19	Share of tax units in population (tax-payers domain)	Share of paying tax units in total tax units			
1891	29,895,224	10,921,508	36.5%	20,952,059	8,544,043	158,996	1.9%	40.8%	78.2%	2,594,854	93.9%	8,943,165	2,435,858	2,435,858	0.0%	27.2%	22.3%						
1892	30,080,017	10,989,017	36.5%	21,055,068	8,590,931	164,659	1.9%	40.8%	78.2%	2,644,437	93.8%	9,024,949	2,479,778	2,479,778	0.0%	27.5%	22.6%						
1893	30,387,331	11,101,287	36.5%	21,239,905	8,677,776	177,532	2.0%	40.9%	78.2%	2,696,540	93.4%	9,147,426	2,519,008	2,519,008	0.0%	27.5%	22.7%						
1894	30,812,583	11,256,643	36.5%	21,143,299	8,653,351	191,769	2.2%	40.9%	76.9%	2,795,061	93.1%	9,669,284	2,603,292	2,603,292	0.0%	26.9%	23.1%						
1895	31,349,283	11,473,418	36.6%	21,066,453	8,819,803	205,809	2.3%	41.9%	76.9%	2,859,424	92.8%	10,282,830	2,653,615	2,653,615	0.0%	25.8%	23.1%						
1896	31,849,116	11,723,457	36.8%	21,204,796	8,958,683	220,156	2.5%	42.2%	76.4%	2,984,960	92.6%	10,644,320	2,764,804	2,763,995	0.0%	26.0%	23.6%						
1897	32,348,765	11,936,695	36.9%	21,215,115	9,028,480	236,850	2.6%	42.6%	75.6%	3,145,065	92.4%	11,133,650	2,908,215	2,907,279	0.0%	26.1%	24.4%						
1898	33,908,839	12,165,125	37.0%	21,160,676	9,072,399	252,570	2.8%	42.9%	74.6%	3,345,296	92.4%	11,748,163	3,092,726	3,092,166	0.0%	26.3%	25.4%						
1899	34,056,414	12,656,746	37.2%	20,890,102	9,070,375	265,254	2.9%	43.4%	72.9%	3,642,812	92.7%	12,579,716	3,377,558	3,377,091	0.0%	26.8%	27.1%						
1900	34,551,274	12,812,985	37.1%	20,613,249	9,052,142	303,391	3.4%	43.9%	70.6%	4,064,234	92.5%	13,938,025	3,760,843	3,759,377	0.0%	27.0%	29.4%						
1901	35,114,667	13,033,565	37.1%	20,686,670	9,136,579	320,344	3.5%	44.2%	70.1%	4,217,330	92.4%	14,427,997	3,896,986	3,895,184	0.0%	27.0%	29.9%						
1902	35,629,139	13,249,695	37.2%	20,540,902	9,117,137	327,833	3.6%	44.4%	68.8%	4,460,391	92.6%	15,088,237	4,132,558	4,130,956	0.0%	27.4%	31.2%						
1903	36,269,439	13,567,150	37.4%	20,483,263	9,174,914	332,699	3.6%	44.8%	67.6%	4,724,935	92.9%	15,786,176	4,392,236	4,390,608	0.0%	27.8%	32.4%						
1904	36,829,724	13,848,209	37.6%	20,297,174	9,175,055	339,789	3.7%	45.2%	66.3%	5,012,943	93.2%	16,532,550	4,673,154	4,672,429	0.0%	28.3%	33.7%						
1905	37,467,246	14,203,497	37.9%	18,842,470	8,817,655	351,178	4.0%	46.8%	62.1%	5,737,020	93.9%	18,624,776	5,385,842	5,384,556	0.0%	28.9%	37.9%						
1906	38,026,556	14,560,767	38.3%	17,957,848	8,682,413	352,061	4.1%	48.3%	59.6%	6,230,415	94.3%	20,068,708	5,878,354	5,876,741	0.0%	29.3%	40.4%						
1907	38,598,423	14,771,359	38.3%	17,676,308	8,670,077	367,810	4.2%	49.0%	58.7%	6,469,092	94.3%	20,922,115	6,101,282	6,099,422	0.0%	29.2%	41.3%						
1908	39,145,535	15,048,290	38.4%	16,768,154	8,805,397	606,216	6.9%	52.5%	58.5%	6,849,109	91.1%	22,377,381	6,242,893	6,241,494	0.0%	27.9%	41.5%						
1909	39,773,029	15,443,627	38.8%	16,382,969	8,887,448	635,741	7.2%	54.2%	57.5%	7,191,920	91.1%	23,390,060	6,556,179	6,551,705	-0.1%	28.0%	42.5%						
1910																							
1911																							

(cont'd.)

Table 9G.1 (Contd.)

Tax year	Overall population					Tax Filers					Tax paying					
	Total population	Total tax units	Share of tax units in total population	Population	Tax units	Among which: <i>Freigeste lte</i>	Share of <i>Freigeste lte</i> in tax units	Share of tax units in population (tax-exempt domain)	Share of tax-exempt total tax units in tax units	Share of tax-payers among tax filers	Population	Tax units	Tax in tabulations	Difference	Share of tax units in population (tax-payers domain)	Share of paying tax units in total
1912	40,236,830	15,700,613	39.0%	16,004,537	8,790,398	631,473	7.2%	54.9%	56.0%	91.6%	24,232,293	6,910,215	6,906,497	-0.1%	28.5%	44.0%
1913	40,751,635	16,017,048	39.3%	15,545,529	8,694,855	608,382	7.0%	55.9%	54.3%	92.3%	25,206,106	7,322,193	7,318,382	-0.1%	29.0%	45.7%
1914	41,228,784	16,254,480	39.4%	15,136,123	8,565,554	578,920	6.8%	56.6%	52.7%	92.9%	26,092,661	7,688,926	7,684,062	-0.1%	29.4%	47.3%
1915	41,036,081	15,832,483	38.6%	15,230,399	8,460,486	591,887	7.0%	55.5%	53.4%	91.7%	25,805,682	7,371,997	7,300,619	-1.0%	28.3%	46.6%
1916	41,052,718	15,914,623	38.8%	15,386,644	8,368,766	521,556	6.2%	54.4%	52.6%	93.1%	25,666,074	7,545,857	7,508,529	-0.5%	29.3%	47.4%
1917	40,682,389	15,855,343	39.0%	16,623,104	8,623,871	365,103	4.2%	51.9%	54.4%	93.9%	24,059,285	7,231,472	7,130,655	-1.4%	29.6%	45.6%
1918	40,115,914	16,097,364	40.1%	16,380,850	8,208,122	243,678	3.0%	50.1%	51.0%	95.6%	23,735,064	7,889,242	7,777,358	-1.4%	32.8%	49.0%
1918	38,073,380	15,463,273	40.6%	15,256,982	7,773,894	221,492	2.8%	51.0%	50.3%	95.8%	22,816,398	7,689,379	7,579,154	-1.4%	33.2%	49.7%
1919	37,806,233	15,815,749	41.8%	11,454,110	6,251,706	164,867	2.6%	54.6%	39.5%	97.4%	26,352,123	9,564,043	9,477,139	-0.9%	36.0%	60.5%

Notes: Second occurrence of 1917; without the *Regierungsbezirke* Posen and Bromberg, which were not recorded in 1918, newline We have 3 + 6 = 14; 4 = 7 + 15; 5 = 4/3; 9 = 8/7; 10 = 7/6; 11 = 7/4; 12 = 8 + 15; 13 = 15/12; 17 = (16-15)/15; 18 = 15/14; 19 = 15/4 thus 19 + 11 = 100%. For the years 1892-94 (*emphasized* values), 4 has been constructed using 3 and assuming that 5 in 1892-94 was equal to its 1895 value. For the years 1892-94 (*emphasized* values), 7 has been constructed the same way, assuming constant (7-8)/6. The (always small) discrepancy between 15 (tax-paying population according to the handbooks) and 16 (tax-paying units effectively recorded in the tabulations) for the years 1914 and 1916-18 remains unaccounted for (described as *Einkommensteuerpflichtige deren Veranlagung ausgesetzt war*).

Source: *Statistisches Jahrbuch für den preussischen Staat* 1921(17): 218.

Top Incomes in Germany

401

Table 9G.2 Tax units (Tu) control total, Germany 1891–1998

Year	TU total	Territorial changes / reference
1891	10,921,508	Prussia
1892	10,989,017	
1893	11,101,287	
1894	11,256,643	
1895	11,473,418	
1896	11,723,457	
1897	11,936,695	
1898	12,165,125	
1899	12,447,933	
1900	12,656,746	
1901	12,812,985	
1902	13,033,565	
1903	13,249,695	
1904	13,567,150	
1905	13,848,209	
1906	14,203,497	
1907	14,560,767	
1908	14,771,359	
1909	15,048,290	
1910	15,443,627	
1911	15,700,613	
1912	16,017,048	
1913	16,254,480	
1914	15,832,483	
1915	15,914,623	
1916	15,855,343	
1917	16,097,364	
1918	15,815,749	– Posen & Bromberg
1925	27,077,500	Republic of Weimar
1926	27,579,348	
1927	28,054,998	
1928	28,525,419	
1929	28,987,601	
1930	29,451,244	
1931	29,916,752	
1932	30,361,630	
1933	30,822,000	
1934	30,713,242	
1935	31,021,052	+ Saarland
1936	30,949,636	
1937	30,875,878	
1938	30,908,380	
1950	21,924,508	Federal Republic of Germany
1951	22,108,509	
1952	22,263,231	
1953	22,539,301	
1954	22,709,548	
1955	22,910,718	
1956	23,112,187	

(contd.)

Table 9G.2 (Contd.)

Year	TU total	Territorial changes / reference
1957	23,360,650	
1958	23,753,607	
1959	25,619,052	
1960	26,053,847	+ West-Berlin and Saarland
1961	26,558,730	
1962	26,773,185	
1963	26,966,456	
1964	27,206,775	
1965	27,438,278	
1966	27,499,648	
1967	27,402,490	
1968	27,467,500	
1969	27,827,930	
1970	27,767,969	
1971	28,024,378	
1972	28,318,630	
1973	28,607,551	
1974	28,711,788	
1975	28,773,815	
1976	28,901,211	
1977	29,080,847	
1978	29,429,724	
1979	29,850,430	
1980	30,322,201	
1981	30,806,346	
1982	31,179,142	
1983	31,512,050	
1984	31,877,877	
1985	32,360,735	
1986	32,923,250	
1987	33,179,362	
1988	33,642,946	
1989	34,376,745	
1990	34,835,678	
1991	43,737,103	Reunification
1992	43,972,179	
1993	44,232,219	
1994	44,404,071	
1995	44,618,987	
1996	44,869,739	
1997	45,039,120	
1998	45,172,545	

Federal Republic Years

As seen in the previous section, even in recent years, the total number of tax returns filed is much lower than the tax unit total. Figure 9G.3 shows the evolution of the total number of filers. Note that the expression 'filers' does not

Top Incomes in Germany

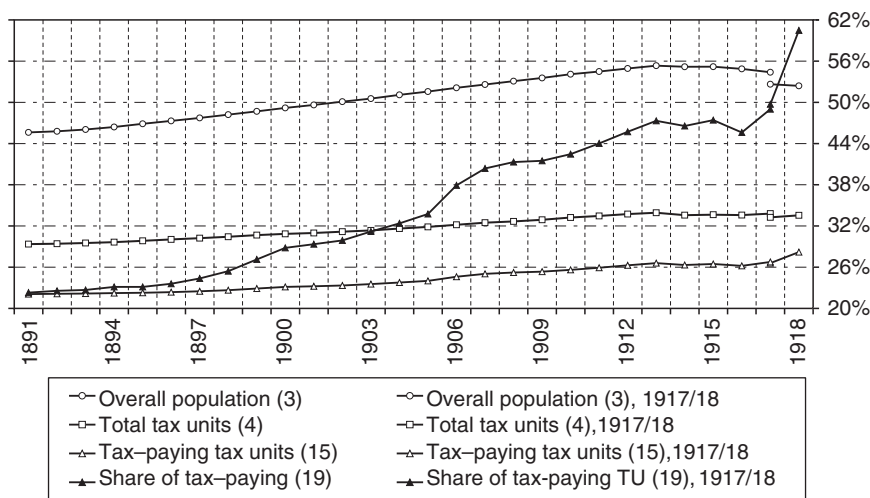


Figure 9G.1 Evolution of the overall Prussian population; evolution of the share of tax units actually filing tax returns, 1891–1918

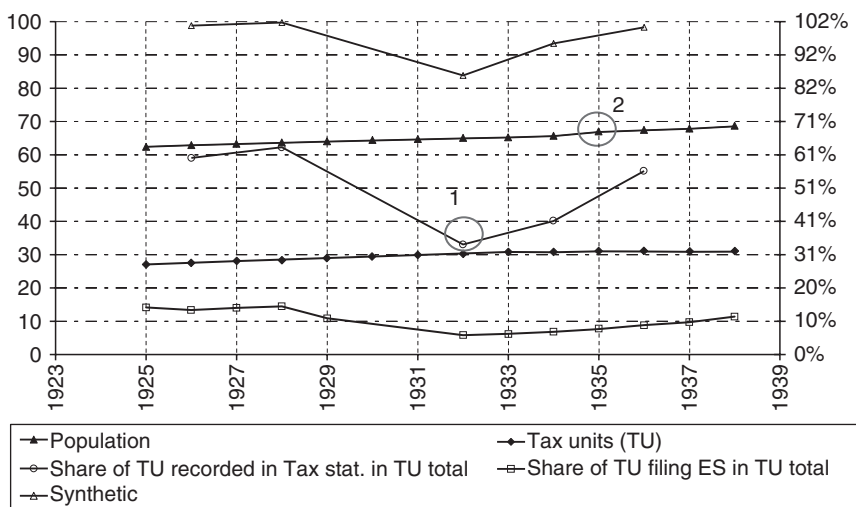


Figure 9G.2 Overall population, tax units, Weimar Republic, and Third Reich, 1925–38

Notes: ‘Synthetic’ series refer to *Statistisches Reichsamt* (1939). The blip (1) is linked to the gigantic rise in unemployment in the Depression (see Figure 94.3). The (very slight) blip (2) is linked to the reintegration of Saarland in the Reich (less than 2% additional population).

Source: German income tax statistics, German statistical handbooks, various years, and *Statistisches Reichsamt*.

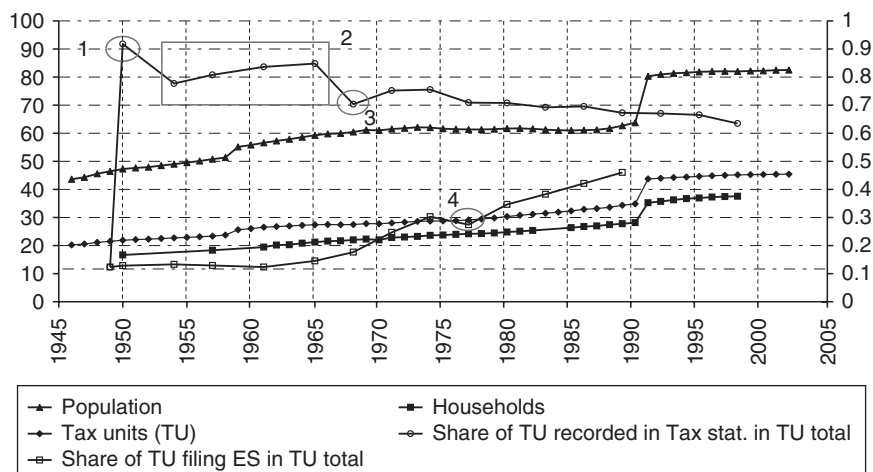


Figure 9G.3 Overall population, households, and tax units, Federal Republic of Germany, 1946–2002

Notes: The full dots read on the left scale (million) and the empty dots on the right scale(%); 1950 relies on rough estimates of the whole distribution by the German Federal Statistical Office (see *Statistisches Bundesamt* (1954a)); 1954–65 rely on attempts to merge ES and LS statistics; 1954 and 1957 are rough units (from CS) and family tax units (from ES) where the two statistics mesh (around DM 25,000); 1968 is the first homogenous estimate of the German Federal Statistical Office, using only family based tax units (even for LS); the 1977 blip for the share of filed returns of the ES is linked to the Tax Reform of 1975, which led to arise of the threshold above which filing an income tax return was required.

Source: German income tax statistics, various years.

precisely fit the German reality (nor the British one for instance) since only a fraction (about 3 million in 1950, about 15 million in the 1990s) of all tax payers do effectively file an income tax return every year. The remaining part of German tax payers never file tax return: they pay the pay-as-you-earn tax.

During the postwar years, the share of tax filers in the tax unit total has then been stable around 70%. Thus, we do not have a precise estimation of the structural gap between national accounts aggregates of personal income and the total fiscal income for recent years (contrary to, for instance, France).

The total income series we computed for 1950–98 is based on the ESA95 concept of Net Primary Income of Private Households.³³ This aggregate is available back to 1980 thanks to retropolations operated on a ESA95 basis by the *Statistisches Bundesamt*, (see *Statistisches Bundesamt* (2005)). This NPIPH aggregate is the sum of gross wages and salaries paid to the households by the firms (including payroll taxes),³⁴ pre-tax net wealth income,³⁵ pre-tax net

³³ Thereafter NPIPH, in German *Nettonationaleinkommen der privaten Haushalte*. Unfortunately, this aggregate is most of the time published for two ‘Institutional Sectors’ together: Households (*private Haushalte*) (S.14) and ‘non-profit oriented private Organizations’ *private Organisationen ohne Erwerbszweck*. The calibration strategy we use should solve this problem, provided that the income share of these organizations has been constant over time. Note that net means that capital depreciation is taken into account. NPIPH remains a pre-tax, pre-transfers income.

³⁴ Code: D1; *Arbeitnehmerentgelt* in German.

³⁵ Code: D4; *Vermögenseinkommen* in German.

profits,³⁶ pre-tax net self-employment income.³⁷ For the years 1950 to 1980 we constructed homogenous series of primary income using retroplated series from 1950 to 1990 published by the German Federal Statistical Office in the 1990s (see Statistisches Bundesamt (1991)): since ‘primary income’ was not a aggregate of the German National Accounts system at the time, we take the *Volkseinkommen* of the private households, which is very close income concept.³⁸ We then adjust this NPIPH series to fiscal income by subtracting payroll taxes paid by employers, which are not part of the taxable income base. The adjusted NPIPH is approximately equal to disposable income of the national accounts throughout the period. Figure 9H.2 graphs the various aggregates of the German National Accounts after 1945 and the adjusted NPIPH we constructed.

The adjusted aggregate is calculated before taxes and social transfers but after deduction of social contributions paid by employers and is thus roughly homogenous to the gross fiscal income (GdE) we use after 1945 to estimate top income groups. Figure 9H.1 shows which share of this aggregate is contained in income tax statistics from 1950 to 1998. The share is stable between 70% and 80% throughout the period. We take 90% of the adjusted NPIPH series for total fiscal income denominator for the whole period 1950–98. This adjusts for the small differences which remain between numerator (GdE) and denominator (adjusted NPIPH) namely (i) the presence of approximately 30% of the pensions in the GdE (so called *Ertragsanteil*, which should lead to an adjustment upward of the denominator);³⁹ and (ii) the absence of the *Werbungskosten* in the GdE (which should lead to an adjustment downward of the denominator).⁴⁰ Finally, our total fiscal income series is about 87% of NPIPH just after the Second World War and decreases until it reaches 78% of NPIPH in the 1980s and remains stable afterward. This trend mainly reflects the continuous increase of employers’ social contributions in Germany from 1950 to 1980. The share is significantly higher than in France (Piketty 2001) because French fiscal income does not include social contributions paid by the employees.⁴¹ The share is comparable to the one found for the US by Piketty and Saez (2003).

The gap between our denominator and the total gross fiscal income registered by the tax administration can either be related to income of non-filers or to the existence of tax exempt capital income, systematic underreporting of business

³⁶ Code: B2n; *Nettobetriebsüberschuss* in German.

³⁷ Code: B3n; *Selbstständigeneinkommen* in German.

³⁸ A little bit tighter though. We thus adjust it upward by 4%. In the 1980s we can compare both aggregates, and the augmented *Volkseinkommen* of the private households is always within 2% of the NPIPH.

³⁹ This correction is negligible. In 1983 for instance, pensions represent less than 1.5% of the total taxable income.

⁴⁰ This is the dominating effect, for instance in 1983, the wage and salaries incomes subject to LS and included in the GdE were reduced by DM 70 billion by *Werbungskosten* and other similar deductions. Correcting would lead to an increase of slightly more than 8% of the GdE.

⁴¹ Part of the gap is filled by the fact that our German series are after deduction of the *Werbungskosten*, whereas the series for France are corrected for the corresponding ‘abattements’ for wage and salary incomes (which are much higher at about 30%).

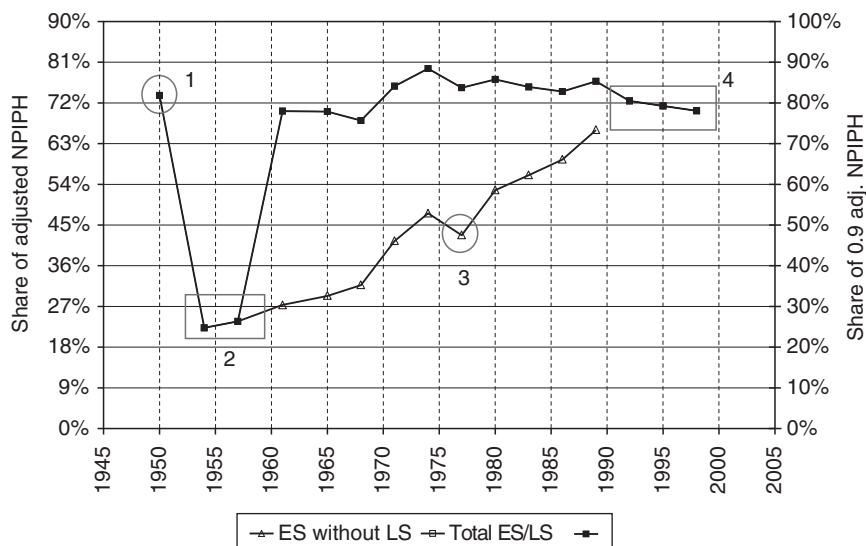


Figure 9H.1 Net personal income of private households and total taxable income Federal Republic of Germany, 1950–98

Notes: 1950 relies on rough estimates of the whole distribution by the German Federal Statistical Office (see *Statistisches Bundesamt 1954a*); for 1954–57 there is no simple way to merge ES and CS statistics. The figures here only refer to the ES Statistics (roughly the top 10% of the distribution); the 1977 blip for the share of filed returns the ES is linked to the Tax Reform of 1975 which led to a rise of the threshold above which filing an income tax return was required; from 1992 on word, the ES and CS statistics are integrated.

Source: German income tax statistics and national accounts (various years).

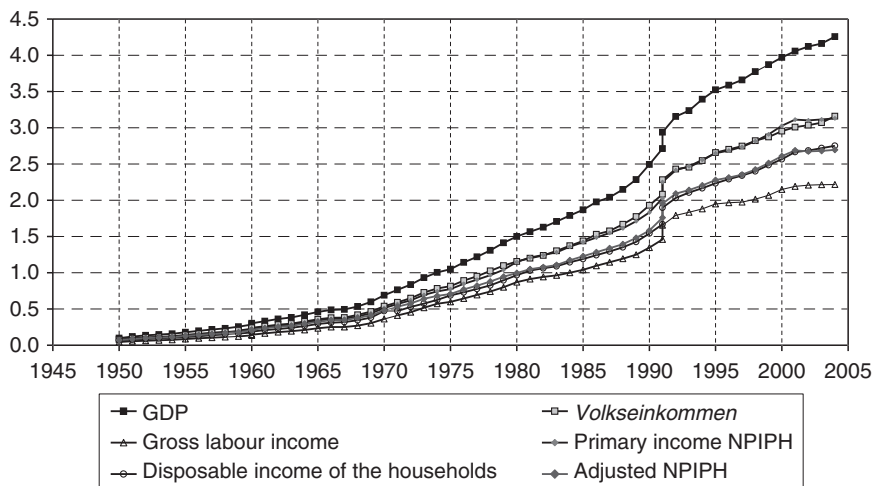


Figure 9H.2 Aggregates of the German national accounts after the Second World War and adjusted net personal income of private households, 1950–2004

Source: German national accounts from *Statistisches Bundesamt 1991 and 2005*.

and agricultural income and systematic tax optimization on incomes from real estate.⁴² We now review the consistency of the denominator with other available sources on incomes of non-filers after the Second World War. Those sources are however too heterogenous to be used as benchmarks, which is why we adopted the ‘top-down’ approach.

A starting point is, for 1950, a rough attempt of the *Statistisches Bundesamt* to estimate the ‘whole fiscal’ income distribution (Statistisches Bundesamt 1954a; and Statistisches Bundesamt 1954c). The middle and the top of the distribution are estimated thanks to income tax data for 1950, and the bottom is unfortunately estimated with unspecified methodology, obviously using social security statistics. Ninety-one percent of our tax units total is present in these tabulations (see Figure 9G.3, point 1).⁴³

The total amount of gross fiscal income recorded in tax returns in Germany in 1950 amounts to some 82% of our income total (see Figure 9H.1, point 1). The gap cannot be explained only by the missing income of the bottom 10%.⁴⁴ However, the numerous tax exemptions (*Sondervergünstigungen*) which were enacted after 1949 by the newly founded Federal Republic, and which stood in stark contrast with the very severe taxation during the allied occupation, as well as a probably high level of tax avoidance and evasion can explain part of the missing share. The rough estimate for 1950 is compatible with our series, although it may hint at a slight over-estimation of our denominator at the beginning of the period. The poor documentation of this estimate and the very low confidence displayed by the statisticians of the time in their own attempt to reconstruct the whole income distribution dissuaded us to use this attempt to correct our series.

For more recent years, the share of tax units recorded is stable at about 70% of all tax units, for an income share of all returns of about 75–80% of NPIPH: around 80–90% of our income total is contained in fiscal statistics.

⁴² Large scale exploitation of the loopholes of the German tax law has been very popular in the late 1970s and early 1980s, as well as in the 1990s. In 1980 for instance, ‘income from real estate’ is negative throughout the distribution and losses offset gains by more than 300% in some brackets. Correcting for this kind of tax avoidance is very tricky and we preferred keeping our series uncorrected. One should therefore keep in mind that some of our estimates may be slightly biased downward in the late 1970s, early 1980s and in the 1990s. If we corrected for this major kind of tax avoidance at the end of the period, our top income shares would be even higher.

⁴³ This does not hint at an overestimation of our tax unit total since pensioners are not included (because tax exempt for most of them) in the reconstitution. We do not try to correct our series using this 1950 estimate. Once again, the methodology on which this estimate relies is unknown, and the statistics of the following years (1954–65) indicate that this estimate does not rely on an homogenous (family based) definition of tax units. We thus prefer to keep a clear cut and robust tax units series which only rely on population statistics.

⁴⁴ The primary income share of the bottom 10% is extremely small. Rough estimates for Germany in 1950 are 1% (see Statistisches Bundesamt 1954b). Piketty and Saez (2003) impute 1% of their income total (1/20 of the average income) to the missing bottom 5% of the distribution after 1945. In any case, 5% is an upper bound to the share of the bottom 10%.

Data sources which document the bottom of the income distribution in Germany in the recent years most of the time rely on measures of the distribution of disposable income of households. They are thus of little use to calibrate our total fiscal income denominator. The two main data sources are the Income and Expenditure Survey (EVS *Einkommens und Verbrauchsstichprobe*)—conducted by the German Federal Statistical Office in 1962, 1969, and from 1973 onward, every five years—and the German Socio-Economic Panel (SOEP) conducted by the German Institute for Economic Research (DIW) on a yearly basis since 1984.

Hauser and Becker (2003) estimate deciles of equivalized disposable income from 1969 to 1998 using the EVS. They find a share of the bottom three deciles at about 17% throughout the period. Disposable income at the bottom of the distribution is significantly higher than fiscal income, all the more when, like in Germany, unemployment benefits and most pensions are tax exempt. This is coherent with our series.

Systematic estimates of bottom shares of disposable equivalized income relying on SOEP data can be used to estimate a bottom 30% income share of a at least 14% in the late 1980s and in the 1990s.⁴⁵

Matching EVS data and data from the National Accounts, the DIW has been estimating disposable income distributions throughout the postwar period.⁴⁶ The quality of these estimates is hard to assess and they contain few details about how they were realized. For 1983, a distribution of gross income has been estimated together with a distribution of disposable income (Bedau 1985). The share of the bottom 30% is of less than 5% for gross income, and of about 19% for disposable income.⁴⁷

Thus, it seems unlikely that the bottom 30% of the income distribution earns the 10–20% missing from our income total. One has to assume that a significant part of the gap between our income denominator and total fiscal income from tax statistics is not due to income of the non-filers but much more to non-taxable or hidden income of the filers. No significant trend being observed in the (implicit) share of these non taxable or hidden incomes, we preferred to keep a clear-cut income denominator. Taking these income components into account (by either shrinking our denominator, or correcting up our top income groups) could only concentrate further the income distribution as long as most of the avoidance/evasion does not take place at the bottom of the distribution, which is very unlikely because this bottom is mostly made of wages and salaries which cannot avoid taxation easily.

⁴⁵ See Wagner and Krause (2001), $P0 - 30 \leq P0 - 20 + P0 - 20 - P0 - 10$. Moreover, comparing equivalized income shares and income shares relying on tax units is not straightforward.

⁴⁶ We are most grateful to A.B. Atkinson for drawing our attention to those series.

⁴⁷ Note that the concept of gross income used by the DIW is very different from what our series contain. Indeed it is the primary income of the households without any adjustment, which is more than 30% higher than our total fiscal aggregate. This difference nonetheless does not impact much the bottom of the distribution.

Interwar Years

The interwar years saw the development of ‘modern’ national accounting in Germany (see Tooze 2001). In their seminal work, Hoffmann and Mueller (1959) provide us with series of personal income (*Einkommen der privaten Haushalte*), which are homogenous to the NPIPH used after the Second World War. We adjust these series downward for social contributions paid by employers and take once again 90% of this adjusted aggregate to build our income denominator. Throughout the interwar years, we have a lower share of tax units present in our sources than after the Second World War. Figure 9G.2 shows that this share is between 55% and 65% at the beginning and at the end of the period, with a huge blip downward in 1932 (35%) and 1934 (42%) due to the Great Depression and the sudden rise of unemployment (see Figure 9H.3) which made millions of tax units exit the income tax statistics. During the same period, the total fiscal income recorded fluctuated between 70% and 80% of our total income denominator (with a low at 62% in 1932), see Figure 9H.4. It means that (excepted for 1932) 20–30% of total primary income was accruing to the bottom 35–45% of the income distribution which is an acceptable assumption consistent with what we assume after the Second World War.

Like for 1950, there were some attempts of the Statistical Office (at that time, *Statistisches Reichsamt*) to build comprehensive income tabulations, using not only fiscal data but also data from social benefits (see *Statistisches Reichsamt* 1939). We thus have ‘reference’ points of the total income (for 1926, 1928, 1932, 1939).

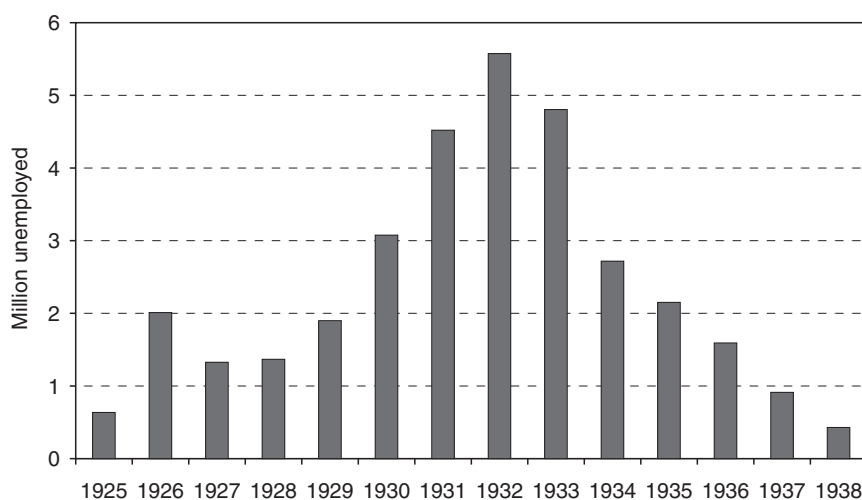


Figure 9H.3 Unemployment in Germany, 1925–38

Source: *German Statistical Handbook* 1939/40.

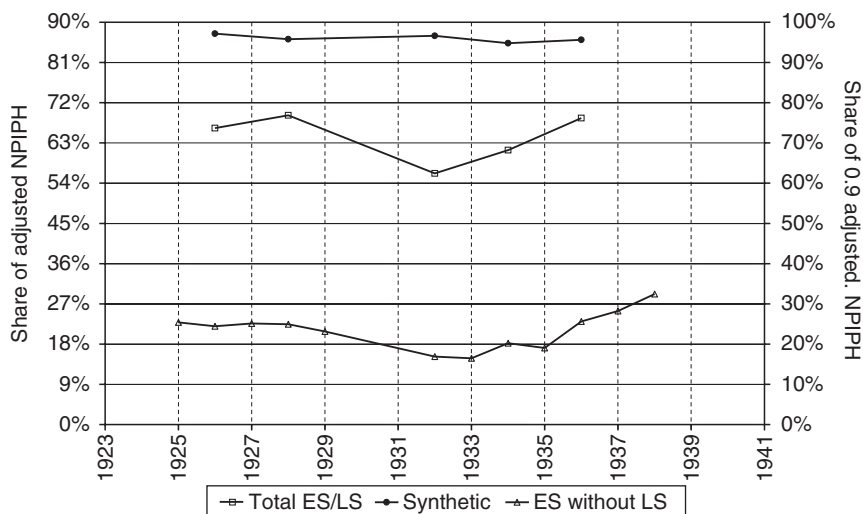


Figure 9H.4 Net personal income of private households and total taxable income, Weimar Republic and Third Reich 1925–38

Note: The ‘synthetic’ series originates from *Statistisches Reichsamt* (1939).

Source: German income tax statistics and National accounts (Various years).

1934, and 1936). The share of these income aggregates is given in Figure 9H.4 (series ‘synthetic’) and amounts to more than 95% of our income total for the whole period. It does not include the unemployed and thus the missing 5% can be interpreted as both the residual incomes of the unemployed and the income evading or avoiding taxation. Once again, these exogenous sources are consistent with our data, but we do not rely on them to calibrate our income control total because of their unspecified methodology.⁴⁸

Pre-First World War period

National accounts in their modern form did not exist at the time of the Wilhelmine Empire. Fortunately, Hoffmann and Mueller (1959) did reconstruct series of personal income for the 1891–1913 period. The series are based on fiscal sources with precise estimation of the part of personal income that do not appear in tax return statistics. We thus have at our disposal series which are intrinsically homogeneous with the fiscal incomes we use to estimate the fractiles. Total fiscal income amount to 85–90% of total personal income over the period 1891–1913.

⁴⁸ Note moreover that these ‘ready to use’ distributions were published for a larger readership than the raw income tax tabulations, and one cannot exclude the possibility that they were manipulated. Inequalities were indeed a very sensitive issue for the Nazi power who meant to be socialist as well as nationalist.

Table 9H.1 Income control total for Prussia, 1891–1918

Income year	Tax filers					Tax free			Overall population			
	Total taxable income Million mark	Exonerated incomes of tax-filers Million mark	Among which 900M of the <i>Freigestellte</i> Million mark	Rest: family deductions above DA 900m Million mark	Share of the rest in total taxable income Million mark	Total income of tax filers Million mark	Share of exonerated incomes in total income Mark	Estimated income Million mark	Mean income Million mark	Wage index	Income total	Income of private household series
1	2	3	4	5	6	7	8	9	10	11	12	13
1891	5,704	297	143	154	2.7%	6,001	4.9%	5,148	634	65	11,149	12,446
1892	5,725	308	148	160	2.8%	6,033	5.1%	5,241	634	65	11,274	12,580
1893	5,785	327	160	167	2.9%	6,112	5.4%	5,315	633	65	11,427	12,756
1894	5,937	347	173	174	2.9%	6,284	5.5%	5,340	631	65	11,624	12,997
1895	6,086	368	185	183	3.0%	6,454	5.7%	5,461	634	65	11,915	13,329
1896	6,375	389	198	191	3.0%	6,764	5.8%	5,558	636	68	12,322	13,811
1897	6,775	417	213	204	3.0%	7,192	5.8%	5,627	640	68	12,819	14,400
1898	7,258	446	227	219	3.0%	7,704	5.8%	5,689	645	71	13,393	15,075
1899	7,841	472	239	233	3.0%	8,313	5.7%	5,732	651	73	14,045	15,854
1900	8,376	507	257	250	3.0%	8,883	5.7%	5,714	655	75	14,597	16,536
1901	8,560	533	273	260	3.0%	9,093	5.9%	5,748	657	74	14,841	16,831
1902	8,709	559	288	271	3.1%	9,268	6.0%	5,801	658	74	15,069	17,092
1903	9,123	578	295	283	3.1%	9,701	6.0%	5,810	661	75	15,511	17,634
1904	9,668	595	299	296	3.1%	10,263	5.8%	5,898	667	77	16,161	18,422
1905	10,332	616	306	310	3.0%	10,948	5.6%	5,964	675	80	16,912	19,321
1906	11,748	731	316	415	3.5%	12,479	5.9%	5,799	685	84	18,278	21,000
1907	12,795	775	317	458	3.6%	13,570	5.7%	5,773	693	89	19,343	22,304
1908	13,219	981	331	650	4.9%	14,200	6.9%	5,795	698	88	19,995	23,095
1909	13,711	1,342	546	796	5.8%	15,053	8.9%	5,756	702	89	20,809	24,097
1910	14,487	1,409	572	837	5.8%	15,896	8.9%	5,842	708	91	21,738	25,064
1911	15,240	1,441	568	873	5.7%	16,681	8.6%	5,842	716	91	22,523	26,190
1912	16,262	1,456	548	908	5.6%	17,718	8.2%	5,870	726	95	23,588	27,519
1913	17,560	1,458	521	937	5.3%	19,018	7.7%	5,870	735	100	24,888	29,173
1914	16,550	1,410	533	877	5.3%	17,959	7.9%	5,870	746	100	23,829	—
1915	18,247	1,436	469	967	5.3%	19,683	7.3%	6,140	782	105	25,823	—
1916	19,165	1,344	329	1,016	5.3%	20,510	6.6%	6,680	809	114	27,190	—
1917	23,484	1,464	219	1,245	5.3%	24,948	5.9%	7,490	940	128	32,438	—
1918	29,524	1,713	148	1,565	5.3%	31,237	5.5%	8,570	1,408	146	39,807	—

Notes: for 1891–1913; 2 = Hoffmann and Mueller 1959; table 34, p.73, col. 3 corrected for 1910; 3 = *id.*, col. 4; 4 = Table 9G.1, col. 8 × 900M; 5 = 3 – 4; 6 = 5/2; 7 = 2 + 3; 8 = 3/7; 9 = Hoffmann and Mueller 1959; tab. 35, p.74, col. 5; 10 = 9 / ((Table 9G.1): 7 + 8); 11 = see Kuczynsky 1960; and Hoffmann and Mueller 1959; 6; 12 = 7 + 9; 13 = Hoffmann and Mueller 1959; table 37, 76–77, col. 5. *Einkommen der Haushalte*; for 1913–18: the missing information (*emphasized values*) is 5 and 9. 5 is completed assuming constant 6 over the period; 9 is completed using 11 (which for the 1914–18 years is a very partial index of *Ruhrgebiet* coal miners, see Bry 1960; table A-2 part II, p.330).

Source: Statistisches Reichsamt 1932: 21–27; Hoffmann and Mueller 1959; tables 34 to 37, p.73–77.

Table 9H.2 Income control total, 1891–1998

Year	Income control	Territorial change/reference
1891	11,149	Prussia
1892	11,274	
1893	11,427	
1894	11,624	
1895	11,915	
1896	12,322	
1897	12,819	
1898	13,393	
1899	14,045	
1900	14,597	
1901	14,841	
1902	15,069	
1903	15,511	
1904	16,161	
1905	16,912	
1906	18,278	
1907	19,343	
1908	19,995	
1909	20,809	
1910	21,738	
1911	22,523	
1912	23,588	
1913	24,888	
1914	23,829	
1915	25,823	
1916	27,190	
1917	32,438	
1918	39,807	–Posen & Bromberg
1925	48,387	Republic of Weimar
1926	49,894	
1927	55,450	
1928	59,719	
1929	59,910	
1930	55,035	
1931	46,193	
1932	36,293	
1933	37,142	
1934	42,075	
1935	46,949	+ Saarland
1936	51,809	
1937	57,902	
1938	64,517	
1950	63,526	Federal Republic of Germany
1951	77,222	
1952	87,680	
1953	93,596	
1954	100,091	
1955	114,263	

(contd.)

Top Incomes in Germany

413

Table 9H.2 (Contd.)

Year	Income control	Territorial change/reference	
1956	126,265		
1957	137,291		
1958	149,320		
1959	161,545		
1960	183,353		
1960	193,741	+ Saarland	West-Berlin
1961	209,899		
1962	228,692		
1963	241,071		
1964	266,231		
1965	291,096		
1966	309,265		
1967	311,878		
1968	339,025		
1969	372,412		
1970	433,689		
1971	478,547		
1972	518,799		
1973	576,623		
1974	613,612		
1975	635,994		
1976	693,273		
1977	739,950		
1978	790,686		
1979	850,010		
1980	895,913		
1981	944,883		
1982	968,277		
1983	994,892		
1984	1,055,955		
1985	1,105,805		
1986	1,154,916		
1987	1,204,203		
1988	1,254,053		
1989	1,333,387		
1990	1,425,378		
1991	1,584,258		
1991	1,757,114	Reunification	
1992	1,881,862		
1993	1,925,657		
1994	1,984,767		
1995	2,050,265		
1996	2,081,598		
1997	2,118,264		
1998	2,181,034		

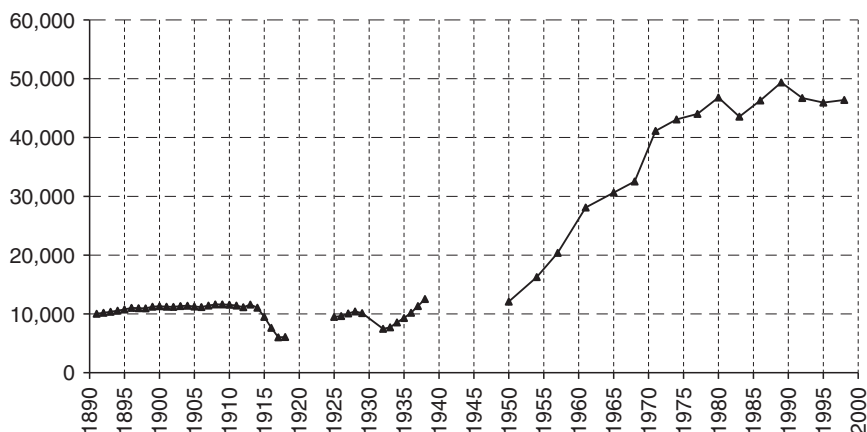


Figure 9H.5 Average tax unit income over the twentieth century in Germany

Note: 1995 Deutsche Mark.

For the 1913–18 years, these series are unfortunately not available. Following the same methodology, we extended the series of Hoffmann and Mueller (1959) to 1918 (see Tables 9H.1 and 9H.2).

Figure 9H.5 graphs the evolution of the real average fiscal income per tax unit over the twentieth century in Germany. The last years of the nineteenth century and the first decade of the twentieth century are years of great stability of this average income in Prussia. The First World War, however, led to a sharp decline. The Weimar Republic witnessed a rapid decline during the Great Depression which was more than offset by the growth which occurred at the beginning of the Third Reich. The average tax unit income was in 1950 back at its 1938 level and rose constantly during the three following decades. The 1980s marked the end of this continuous rise (depression of the early 1980s, compensated by the boom of the late 1980s). The 1990s are years of great stability, at a lower level however, following the Reunification which brought more population that income to the pre-1989 Federal Republic of Germany.

APPENDIX 9I: FRACTILES AND SHARES

This Appendix gives the detailed results in Tables 9I.1–9I.8:

Table 91.1 Nominal thresholds and nominal average income of top income groups, Prussia 1891–1918

	P90	P95	P99	P99.5	P99.9	P99.99	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99	∥
1891	1,326	2,095	6,209	9,745	30,110	126,364	3,896	6,154	17,756	27,869	76,513	287,524	1,638	3,254	7,643	15,708	53,067	∥
1892	1,339	2,105	6,127	9,585	29,369	122,262	3,854	6,058	17,292	27,052	73,877	274,438	1,650	3,250	7,531	15,346	51,593	∥
1893	1,339	2,102	6,103	9,528	29,008	119,391	3,832	6,014	17,079	26,663	72,528	268,828	1,649	3,248	7,494	15,197	50,717	∥
1894	1,332	2,093	6,060	9,485	29,059	121,303	3,834	6,027	17,132	26,814	73,303	274,551	1,641	3,251	7,451	15,192	50,942	∥
1895	1,327	2,092	6,122	9,597	29,674	124,352	3,861	6,084	17,420	27,307	74,982	279,529	1,637	3,250	7,532	15,388	52,254	∥
1896	1,337	2,115	6,228	9,804	30,561	130,974	3,945	6,238	18,031	28,385	78,665	296,883	1,652	3,290	7,678	15,815	54,419	∥
1897	1,376	2,181	6,433	10,167	31,912	138,860	4,101	6,501	18,941	29,936	83,775	322,006	1,702	3,391	7,946	16,476	57,305	∥
1898	1,400	2,229	6,647	10,552	33,261	145,841	4,263	6,790	19,940	31,652	89,034	347,456	1,735	3,503	8,228	17,307	60,321	∥
1899	1,425	2,277	6,819	10,874	34,662	155,782	4,397	7,024	20,867	33,274	94,622	376,365	1,770	3,563	8,459	17,937	63,317	∥
1900	1,457	2,330	6,969	11,132	35,620	159,221	4,513	7,216	21,487	34,321	97,704	390,963	1,810	3,649	8,652	18,475	65,120	∥
1901	1,486	2,366	6,966	11,092	35,058	157,024	4,516	7,190	21,186	33,737	95,511	380,643	1,842	3,691	8,635	18,294	63,829	∥
1902	1,510	2,388	6,929	10,970	34,109	150,924	4,462	7,058	20,558	32,550	91,245	358,588	1,866	3,683	8,566	17,876	61,540	∥
1903	1,535	2,425	7,003	11,070	34,397	149,988	4,509	7,122	20,637	32,624	90,938	355,107	1,896	3,743	8,651	18,046	61,585	∥
1904	1,551	2,456	7,138	11,306	35,394	153,838	4,598	7,279	21,214	33,603	93,671	364,411	1,918	3,795	8,826	18,585	63,589	∥
1905	1,570	2,497	7,307	11,639	37,108	162,254	4,752	7,559	22,253	35,446	99,502	389,803	1,945	3,885	9,060	19,432	67,246	∥
1906	1,600	2,554	7,502	12,008	38,707	172,170	4,916	7,847	23,347	37,371	106,092	421,069	1,986	3,972	9,323	20,191	71,094	∥
1907	1,637	2,612	7,603	12,191	39,403	176,673	5,019	8,007	23,854	38,252	108,860	435,105	2,031	4,045	9,457	20,600	72,610	∥
1908	1,686	2,675	7,642	12,199	39,083	174,913	5,043	8,001	23,496	37,508	106,872	425,352	2,086	4,127	9,485	20,167	71,485	∥
1909	1,830	2,872	7,813	12,436	39,271	174,970	5,232	8,211	23,718	37,753	107,117	425,279	2,253	4,334	9,683	20,412	71,766	∥
1910	1,867	2,932	7,916	12,627	39,940	179,384	5,351	8,402	24,263	38,705	110,315	440,630	2,299	4,436	9,821	20,803	73,614	∥
1911	1,914	2,997	8,148	13,010	41,488	185,320	5,419	8,483	25,080	40,046	114,206	453,550	2,354	4,534	10,114	21,506	76,501	∥
1912	1,958	3,068	8,330	13,319	42,567	190,593	5,557	8,705	25,804	41,260	117,928	469,038	2,409	4,630	10,347	22,094	78,916	∥
1913	2,015	3,181	8,863	16,122	51,338	198,122	5,898	9,309	27,205	44,137	124,153	479,128	2,488	4,834	10,274	24,133	84,711	∥
1914	1,912	3,035	8,539	15,668	50,682	195,890	5,735	9,103	26,765	43,468	122,764	474,491	2,367	4,687	10,063	23,644	83,683	∥
1915	1,923	3,121	9,025	16,998	59,360	237,026	6,379	10,352	31,688	51,638	148,884	594,501	2,406	5,018	11,738	27,326	99,372	∥
1916	2,178	3,509	9,887	19,700	70,871	281,670	6,988	11,261	36,556	60,714	176,855	702,890	2,715	4,938	12,397	31,679	118,407	∥
1917	2,802	3,387	11,317	22,712	86,389	353,335	8,460	13,522	45,175	75,436	222,496	910,024	3,398	5,608	14,915	38,670	146,104	∥
1918	2,832	3,421	11,432	22,891	86,929	357,068	8,543	13,666	45,671	76,224	224,964	924,059	3,421	5,664	15,119	39,039	147,286	∥
1919	3,604	4,067	13,186	25,144	90,955	367,554	9,544	15,113	49,003	80,329	231,140	934,049	3,975	6,640	17,677	42,626	153,039	∥

Notes: Capital gains excluded

Table 9L2 Nominal thresholds and nominal average income of top income groups, Germany 1925–38

	P90	P95	P99	P99.5	P99.9	P99.99	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1925		8,983	13,553	33,714	110,958				20,271	29,429	69,097	222,156				11,114	19,512	52,090
1926	2,907	3,251	8,781	13,340	33,912	118,251	5,871	8,006	20,417	29,965	72,886	246,492		3,736	4,903	10,870	19,234	53,597
1927		10,014	14,924	38,054	132,973				22,779	33,568	81,594	271,115				11,991	21,561	60,536
1928	3,348	3,859	10,557	15,564	38,462	133,740	6,747	9,453	23,490	34,381	82,698	277,476		4,042	5,944	12,599	22,301	61,056
1929		10,454	15,367	36,783	128,058				22,976	33,498	80,044	276,718				12,454	21,862	58,191
1932	2,442	3,379	6,171	9,018	22,035	74,912	4,594	6,355	13,629	19,915	45,563	148,377		2,832	4,537	7,343	13,503	34,139
1933		4,775	8,944	21,864	74,356				13,081	19,751	45,210	147,275				6,411	13,387	33,869
1934	2,591	3,613	7,133	10,538	25,039	84,630	4,977	6,939	15,481	22,488	52,629	171,611		3,016	4,803	8,475	14,952	39,408
1935		7,834	11,807	29,371	103,314				18,216	27,005	66,438	238,321				9,428	17,147	47,340
1936	2,945	4,013	9,095	13,810	36,519	145,267	6,245	9,050	22,946	34,898	92,361	372,072		3,440	5,576	10,995	20,532	61,282
1937		10,576	16,400	45,519	183,335				28,070	43,208	116,325	472,739				12,931	24,929	76,724
1938		12,656	20,190	56,264	223,815				34,077	52,555	139,894	536,046				15,599	30,720	95,877

Notes: Capital gains included; bold values are extrapolated, i.e., the last bracket contains more than the quantile.

Table 9I.3 Nominal thresholds and nominal average income of top income groups, Federal Republic of Germany 1950–98 (1)

	P90	P95	P99	P99.5	P99.9	P99.99	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1950	4422*	6067*	13914*	24,909	49,814	211,142	10039*	14550*	34319*	48,860	120,635	502,891	5397*	9588*	19,744	30,948	78,479
1954			25,846	38,403	105,590	233,607			66,279	62,352	147,458	473,613				41,076	111,219
1957			25,846	38,403	105,590	429,208			66,279	95,608	261,191	954,598			37,949	54,198	184,197
1961	10,723	14,978	39,267	60,627	175,935	762,828	25,427	38,373	105,169	162,375	445,311	1,742,753	12,481	21,674	47,962	91,642	301,150
1965	14,332	19,157	51,568	79,558	213,726	923,293	33,375	49,493	132,979	202,802	541,738	2,098,300	17,257	28,621	63,157	118,068	368,787
1968	19,434	23,466	56,079	88,244	215,087	923,120	37,597	54,590	141,748	213,892	557,496	2,277,192	20,603	32,801	69,603	127,991	366,418
1971	28,906	31,251	78,964	121,306	306,537	1,330,633	54,604	76,059	197,891	299,102	788,460	3,218,338	33,149	45,601	96,681	176,762	518,474
1974	33,596	47,275	95,446	142,249	341,301	1,399,859	66,237	93,206	221,693	326,824	812,483	3,073,013	39,267	61,084	116,563	205,409	561,313
1977	44,101	60,365	113,937	171,817	417,865	1,725,457	80,609	110,336	265,869	395,296	986,278	3,664,635	50,881	71,453	136,442	247,551	688,683
1980	55,401	64,684	135,315	203,315	514,990	2,133,601	97,463	134,574	327,956	492,766	1,275,803	4,936,219	60,352	86,229	163,146	297,006	869,090
1983	58,895	74,043	130,536	197,698	499,155	2,177,607	102,728	139,824	325,409	492,838	1,307,773	5,370,825	65,632	93,428	157,981	289,104	856,323
1986	65,521	85,146	142,711	219,814	569,586	2,620,037	115,576	158,532	378,729	583,344	1,625,245	7,226,706	72,619	103,483	174,113	322,869	1,002,860
1989	73,024	91,103	166,351	258,878	642,178	3,589,998	134,809	187,206	459,588	715,220	2,074,823	10,063,533	82,412	119,110	203,957	375,319	1,187,188
1992	83,731	107,994	202,904	287,839	716,457	3,235,910	148,992	203,773	473,216	708,984	1,894,885	7,742,969	94,211	136,412	237,448	412,508	1,245,098
1995	90,340	116,014	206,199	278,517	647,793	2,815,634	152,952	204,398	445,741	656,363	1,734,253	7,430,870	101,506	144,063	235,120	386,890	1,101,295
1998	94,624	123,876	228,674	318,469	827,490	4,716,607	174,949	242,577	586,814	909,658	2,700,748	12,819,136	107,322	156,518	263,970	461,886	1,576,483

Notes: Capital gains included; bold values are extrapolated, i.e., the last bracket contains more than the quantile; <*> means that the value has been estimated on the basis of 'synthetic' tabulations constructed with tax statistics but with unspecified methodology as far as the merging of ES and LS statistics are concerned.

Table 9I.4 Nominal thresholds and nominal average income of top income groups, Federal Republic of Germany 1950–98 (2)

	P90	P95	P99	P99.5	P99.9	P99.99	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1950	4,416*	6,053*	13,772*	24,455	47,471	185,789	9,976*	14,411*	33,540*	47,358	113,704	445,544	5,402*	9,605*	19,770*	30,947	77,037
1954				27,240	69,312	205,556				60,436	138,986	419,604				41,074	109,176
1957			25,582	37,703	100,624	377,669			64,775	92,669	246,184	845,741			38,000	54,195	180,814
1961	10,684	14,896	38,373	57,792	151,134	492,092	24,833	36,994	96,347	143,840	352,432	1,061,641	12,544	21,869	48,943	93,829	287,929
1965	14,312	19,114	51,043	78,109	203,674	812,427	33,165	49,020	129,962	196,568	510,611	1,859,020	17,270	28,674	63,241	118,061	362,014
1968	19,407	23,413	55,508	86,637	204,971	812,274	37,360	54,069	138,531	207,318	525,463	2,017,512	20,619	32,862	69,695	127,985	359,689
1971	28,866	31,181	78,160	119,097	292,120	1,170,853	54,261	75,333	193,400	289,908	743,157	2,851,335	33,175	45,686	96,809	176,753	508,952
1974	33,549	47,169	94,474	139,659	325,249	1,231,767	65,820	92,316	216,662	316,778	765,799	2,722,582	39,297	61,198	116,718	205,398	551,004
1977	44,041	60,230	112,777	168,688	398,212	1,518,268	80,102	109,283	259,836	383,145	929,608	3,246,738	50,921	71,585	136,624	247,538	676,035
1980	55,325	64,539	133,937	199,612	490,769	1,877,404	96,850	133,289	320,514	477,619	1,202,497	4,373,317	60,398	86,389	163,363	296,990	853,129
1983	58,684	73,638	127,562	188,454	428,791	1,404,749	100,326	134,797	298,114	436,579	1,035,010	3,271,772	65,962	94,266	161,211	296,004	818,727
1986	65,286	84,680	139,461	209,536	489,293	1,690,155	112,874	152,833	346,961	516,753	1,286,266	4,402,329	72,985	104,412	177,673	330,575	958,830
1989	72,761	90,605	162,561	246,773	551,652	2,315,866	131,657	180,476	421,038	633,575	1,642,075	6,130,453	82,826	120,179	208,127	384,276	1,135,065
1992	83,616	107,752	200,838	282,597	682,761	2,847,350	148,055	201,827	462,477	687,191	1,786,008	6,859,999	94,283	136,665	237,764	412,487	1,222,232
1995	90,206	115,747	204,377	274,014	620,765	2,540,775	150,245	199,176	422,153	612,045	1,554,012	6,280,804	101,315	143,431	232,261	376,553	1,028,813
1998	94,284	123,198	223,465	303,578	710,841	3,042,628	170,859	233,857	537,592	805,817	2,137,451	7,809,097	107,861	157,923	269,367	472,909	1,507,268

Notes: Capital gains excluded; **bold** values are extrapolated, i.e., the last bracket contains more than the quantile; <> means that the value has been estimated on the basis of 'synthetic' tabulations constructed with tax statistics but with unspecified methodology as far as the merging of ES and IS statistics are concerned.

Table 9I.5 Nominal thresholds and nominal average income of top income groups, Federal Republic of Germany 1950–98 (3)

	P90	P95	P99	P99.5	P99.9	P99.99	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1950	4,416*	6,053*	13,772*	24,455	47,471	185,789	9,898*	14,268*	33,141*	46,865	114,429	481,274	5,384*	9,527*	19,447*	30,049	74,033
1954				27,240	69,312	205,556				59,807	139,872	453,254				39,882	104,919
1957			25,582	37,703	100,624	377,669			64,004	91,705	247,754	913,564		37,379		52,623	173,763
1961	10,684	14,896	38,373	57,792	151,134	492,092	24,355	36,171	94,434	142,904	380,660	1,547,709	12,388	21,334	45,848	83,439	251,995
1965	14,312	19,114	51,043	78,109	203,674	812,427	32,905	48,534	128,415	194,523	513,869	2,008,102	17,214	28,439	62,207	114,637	347,897
1968	19,407	23,413	55,508	86,637	204,971	812,274	37,068	53,533	136,882	205,161	528,815	2,179,303	20,551	32,592	68,556	124,273	345,663
1971	28,866	31,181	78,160	119,097	292,120	1,170,853	53,836	74,585	191,099	286,891	747,898	3,079,994	33,066	45,311	95,227	171,626	489,105
1974	33,549	47,169	94,474	139,659	325,249	1,231,767	65,305	91,400	214,084	313,482	770,685	2,940,915	39,169	60,696	114,810	199,441	529,517
1977	44,041	60,230	112,777	168,688	398,212	1,518,268	79,475	108,198	256,744	379,159	935,539	3,507,105	50,754	70,998	134,391	240,359	649,673
1980	55,325	64,539	133,937	199,612	490,769	1,877,404	96,092	131,967	316,699	472,650	1,210,169	4,724,028	60,200	85,680	160,693	288,377	819,861
1983	58,684	73,638	127,562	188,454	428,791	1,404,749	98,395	131,800	292,195	433,738	1,117,908	4,769,739	65,142	91,961	151,017	263,226	716,550
1986	65,286	84,680	139,461	209,536	489,293	1,690,155	110,701	149,435	340,072	513,391	1,389,288	6,417,916	72,078	101,859	166,438	293,969	839,168
1989	72,761	90,605	162,561	246,773	551,652	2,315,866	129,123	176,463	412,678	629,452	1,773,596	8,937,255	81,797	117,241	194,967	341,724	993,409
1992	83,616	107,752	200,838	282,597	682,761	2,847,350	150,168	205,815	478,915	716,438	1,882,872	7,168,132	94,520	137,540	241,393	424,829	1,295,621
1995	90,206	115,747	204,377	274,014	620,765	2,540,775	151,913	202,290	435,243	635,221	1,636,977	6,667,575	101,537	144,051	235,266	384,781	1,078,022
1998	94,284	123,198	223,465	303,578	710,841	3,042,628	178,383	248,093	598,702	915,616	2,500,475	8,793,204	108,672	160,441	281,788	519,401	1,801,283

Notes: Capital gains included but ranking according to distribution of incomes excluding capital gains excluded; bold values are extrapolated i.e. the last bracket contains more than the quantile; <*> means that the value has been estimated on the basis of 'synthetic' tabulations constructed with tax statistics but with unspecified methodology as far as the merging of ES and LS statistics are concerned.

1925	11.3%	8.2%	3.9%	1.2%	10.3%	3.1%	4.4%	2.6%	21.2%	34.8%	11.0%
1926	11.3%	8.3%	4.0%	1.4%	10.3%	3.0%	4.3%	2.7%	21.2%	34.8%	12.1%
1927	11.5%	8.5%	4.1%	1.4%	9.7%	3.0%	4.4%	2.8%	21.0%	34.8%	11.9%
1928	11.2%	8.2%	4.0%	1.3%	11.4%	3.0%	4.3%	2.6%	21.0%	34.8%	11.8%
1929	11.1%	8.1%	3.9%	1.3%	11.8%	3.0%	4.2%	2.5%	27.0%	29.7%	12.0%
1932	38.4%	8.3%	3.8%	1.2%	15.2%	3.1%	4.5%	2.6%	27.0%	29.7%	10.9%
1933	10.9%	8.2%	3.8%	1.2%	11.0%	2.7%	4.4%	2.5%	25.0%	31.1%	11.3%
1934	36.3%	8.2%	3.8%	1.3%	14.0%	3.1%	4.4%	2.6%	25.0%	31.1%	11.1%
1935	12.0%	8.9%	4.4%	1.6%	10.3%	3.1%	4.5%	2.8%	23.6%	36.7%	13.1%
1936	37.3%	10.4%	5.5%	2.2%	13.3%	3.3%	4.9%	3.3%	23.6%	36.7%	16.2%
1937	15.0%	11.5%	6.2%	2.5%	9.3%	3.4%	5.3%	3.7%	22.6%	33.6%	16.8%
1938	16.3%	12.6%	6.7%	2.6%	13.3%	3.7%	5.9%	4.1%	22.6%	33.6%	15.7%
1950	11.6%	8.2%	3.9%	1.5%	9.3%	3.4%	4.3%	2.4%	22.6%	33.6%	13.3%
1954	11.0%	6.9%	3.2%	1.0%	7.9%	3.2%	3.7%	2.2%	19.0%	38.8%	13.1%
1957	11.0%	7.9%	4.2%	1.4%	11.1%	3.1%	3.7%	2.8%	19.0%	38.8%	11.0%
1961	31.4%	9.1%	4.5%	1.3%	8.1%	3.1%	4.7%	3.3%	19.0%	39.2%	14.3%
1965	31.3%	9.3%	4.8%	1.8%	10.8%	3.0%	4.5%	3.1%	19.0%	37.1%	14.6%
1968	30.3%	8.4%	4.3%	1.6%	10.6%	2.8%	4.1%	2.6%	20.4%	35.6%	14.7%
1971	31.8%	8.5%	4.4%	1.7%	10.7%	2.8%	4.1%	2.7%	20.6%	32.9%	12.6%
1974	30.8%	7.4%	3.6%	1.3%	11.5%	2.7%	3.8%	2.3%	21.3%	32.4%	12.5%
1977	31.5%	7.5%	3.7%	1.3%	11.3%	2.7%	3.9%	2.4%	21.9%	33.1%	13.6%
1980	32.8%	8.1%	4.1%	1.5%	10.2%	2.8%	4.0%	2.6%	22.4%	29.7%	11.0%
1983	31.8%	6.9%	3.3%	1.0%	11.9%	2.6%	3.8%	2.3%	22.4%	30.7%	12.7%
1986	32.2%	7.4%	3.7%	1.3%	11.9%	2.5%	3.8%	2.5%	23.1%	32.0%	14.6%
1989	33.9%	8.2%	4.2%	1.6%	12.4%	2.7%	4.0%	2.6%	23.8%	31.2%	14.8%
1992	34.6%	8.0%	4.2%	1.6%	12.8%	2.8%	3.9%	2.6%	23.5%	28.1%	14.9%
1995	32.7%	6.7%	3.4%	1.4%	12.5%	2.5%	3.3%	2.0%	24.3%	31.5%	14.5%
1998	35.4%	8.3%	4.4%	1.6%	13.1%	2.8%	3.9%	2.8%	24.3%	31.5%	14.5%

Note: Excluding capital gains excepted for 1925-38.

Table 9I.7 Top income share, Germany 1950–98 (2)

	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1950	34.6%	25.1%	11.8%	8.4%	4.2%	1.7%	9.3%	13.2%	3.4%	4.3%	2.4%
1954				7.1%	3.3%	1.1%				3.7%	2.3%
1957			11.3%	8.1%	4.4%	1.6%			3.2%	3.7%	2.8%
1961	32.2%	24.3%	13.3%	10.3%	5.6%	2.2%	7.9%	11.0%	3.0%	4.6%	3.4%
1965	31.5%	23.3%	12.5%	9.6%	5.1%	2.0%	8.1%	10.8%	3.0%	4.5%	3.1%
1968	30.5%	22.1%	11.5%	8.7%	4.5%	1.8%	8.3%	10.6%	2.8%	4.1%	2.7%
1971	32.0%	22.3%	11.6%	8.8%	4.6%	1.9%	9.7%	10.7%	2.8%	4.1%	2.7%
1974	31.0%	21.8%	10.4%	7.6%	3.8%	1.4%	9.2%	11.4%	2.7%	3.8%	2.4%
1977	31.7%	21.7%	10.4%	7.8%	3.9%	1.4%	10.0%	11.2%	2.7%	3.9%	2.4%
1980	33.0%	22.8%	11.1%	8.3%	4.3%	1.7%	10.2%	11.7%	2.8%	4.0%	2.6%
1983	32.5%	22.1%	10.3%	7.8%	4.1%	1.7%	10.4%	11.8%	2.5%	3.7%	2.4%
1986	32.9%	22.6%	10.8%	8.3%	4.6%	2.1%	10.4%	11.8%	2.5%	3.7%	2.6%
1989	34.8%	24.1%	11.8%	9.2%	5.3%	2.6%	10.6%	12.3%	2.6%	3.9%	2.8%
1992	34.8%	23.8%	11.1%	8.3%	4.4%	1.8%	11.0%	12.7%	2.8%	3.9%	2.6%
1995	33.3%	22.2%	9.7%	7.1%	3.8%	1.6%	11.0%	12.5%	2.6%	3.4%	2.2%
1998	36.2%	25.1%	12.2%	9.4%	5.6%	2.7%	11.1%	13.0%	2.7%	3.8%	2.9%

Note: Including capital gains.

Table 9I.8 Top income shares, Germany 1950–98 (3)

	P90–100	P95–100	P99–100	P99.5–100	P99.9–100	P99.99–100	P90–95	P95–99	P99–99.5	P99.5–99.9	P99.9–99.99
1950	34.2%	24.6%	11.4%	8.1%	3.9%	1.7%	9.3%	13.2%	3.4%	4.1%	2.3%
1954				6.8%	3.2%	1.0%				3.6%	2.1%
1957			10.9%	7.8%	4.2%	1.6%			3.2%	3.6%	2.7%
1961	30.8%	22.9%	11.9%	9.0%	4.8%	2.0%	7.8%	10.8%	2.9%	4.2%	2.9%
1965	31.0%	22.9%	12.1%	9.2%	4.8%	1.9%	8.1%	10.7%	2.9%	4.3%	3.0%
1968	30.0%	21.7%	11.1%	8.3%	4.3%	1.8%	8.3%	10.6%	2.8%	4.0%	2.5%
1971	31.5%	21.8%	11.2%	8.4%	4.4%	1.8%	9.7%	10.6%	2.8%	4.0%	2.6%
1974	30.6%	21.4%	10.0%	7.3%	3.6%	1.4%	9.2%	11.4%	2.7%	3.7%	2.2%
1977	31.2%	21.3%	10.1%	7.5%	3.7%	1.4%	10.0%	11.2%	2.6%	3.8%	2.3%
1980	32.5%	22.3%	10.7%	8.0%	4.1%	1.6%	10.2%	11.6%	2.7%	3.9%	2.5%
1983	31.2%	20.9%	9.3%	6.9%	3.5%	1.5%	10.3%	11.7%	2.4%	3.3%	2.0%
1986	31.6%	21.3%	9.7%	7.3%	4.0%	1.8%	10.3%	11.6%	2.4%	3.4%	2.2%
1989	33.3%	22.7%	10.6%	8.1%	4.6%	2.3%	10.5%	12.1%	2.5%	3.5%	2.3%
1992	35.1%	24.0%	11.2%	8.4%	4.4%	1.7%	11.0%	12.9%	2.8%	4.0%	2.7%
1995	33.1%	22.0%	9.5%	6.9%	3.6%	1.5%	11.0%	12.5%	2.6%	3.3%	2.1%
1998	36.9%	25.7%	12.4%	9.5%	5.2%	1.8%	11.3%	13.3%	2.9%	4.3%	3.4%

REFERENCES

- Abelshauer, W. (2004). *Deutsche Wirtschaftsgeschichte seit 1945*. Bonn: C.H. Beck.
- Atkinson, A. B. (2005). 'Top incomes in the UK over the 20th century', *Journal of the Royal Statistical Society*, 168(2): 325–43.
- Becker, I. and Hauser, R. (2003). *Anatomie der Einkommensverteilung*. Berlin: Sigma Editions.
- Bedau, K-D. (1985). 'Das Einkommen sozialer Haushaltsgruppen in der Bundesrepublik Deutschland im Jahr 1983', *DIW Wochenbericht*, 14: 177–87.
- Borchardt, K. (1990). *Economic Crisis and Political Collapse. The Weimarer Republic 1924–1933*. Oxford: Berg.
- Bry, G. (1960). *Wages in Germany 1871–1945*. Princeton: Princeton University Press.
- Champernowne, D. G. (1953). 'A model of income distribution', *Economic Journal*, 63: 318–51.
- Dell, F. (2005). 'Top Incomes in Germany and Switzerland over the Twentieth Century', *Journal of the European Economic Association*, 3: 412–21.
- Gabaix, X. (1999). 'Zipf's law for cities: an explanation', *Quarterly Journal of Economics*, 114: 739–67.
- Geisenberger, S. and Müller, J. H. (1972). *Die Einkommenstruktur in verschiedenen deutschen Länder, 1874–1914*. Berlin: Duncker & Humblot.
- Grant, O. W. (2002). 'Does industrialization push up inequality? New evidence on the Kuznets curve from nineteenth century Prussian tax statistics'. Discussion Papers in Economic and Social History, University of Oxford.
- Grumbach, F. (1957). 'Statistische untersuchungen über die entwicklung der einkommenverteilung in deutschland'. Unpublished PhD thesis, University of Münster.
- Hoffmann, W. G. (1965). *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*. Berlin: Jahrhundert.
- Müller, J. H. (1959). *Das deutsche Volkseinkommen 1851–1957*. Tübingen: Mohr Verlag.
- Holtfrerich, C. L. (1980). *Die deutsche Inflation*. Berlin: de Gruyter Verlag.
- Ketterle, J. (1994). *Die Einkommensteuer in Deutschland, Modernisierung und Anpassung einer direkten Steuer von 1890–91 bis 1920*. Köln: Botermann & Botermann Verlag.
- Kuczinsky, J. (1960–72). *Die Geschichte der Lage der Arbeiter unter dem Kapitalismus*. Berlin: AkademiVerlag.
- Mandelbrot, B. (1960). 'The pareto-levy law and the distribution of income', *International Economic Review*, 1: 79–106.
- Peukert, D. (1987). *Die Weimarer Republik: Krisenjahre der klassischen Moderne*. Frankfurt: Suhrkamp.
- Piketty, T. (2001). *Les hauts revenus en France au 20^{ème} siècle*. Paris: Grasset.
- Saez, E. (2003). 'Income Inequality in the United States, 1913–1998', *Quarterly Journal of Economics*, 118: 1–39.
- Procopovitch, S. N. (1926). 'The distribution of national income', *Economic Journal*, 26: 69–82.
- Ritschl, A. (1990). 'Zu hohe Löhne in der Weimarer Republik? Eine Auseinandersetzung mit Holtfrerichs Berechnungen zur Lohnposition der Arbeiterschaft 1925–1932', *Geschichte und Gesellschaft*, pp. 375–402.

- Rosinus, W. (2000). 'Die steuerliche Einkommensverteilung', *Wirtschaft und Statistik*, (6): 456–63.
- Saez, E. and Veall, M. (2005). 'The evolution of high incomes in Northern America: Lessons from Canadian evidence', *American Economic Review*, 95: 831–49.
- Spoerer, M. (1996). *Von Scheingewinnen zum Rüstungsboom, Eigenkapitalrentabilität der deutschen Industrieaktiengesellschaften, 1925–1941*. Stuttgart: Steiner Verlag.
- Statistische Reichsamt (1932). 'Das deutsche Volkseinkommen vor und nach dem Kriege', *Einzelschriften zur Statistik des deutschen Reichs*, vol. 24. Berlin: Reimar Hobbing.
- (1939). 'Die Einkommenschichtung im Deutschen Reich', *Wirtschaft und Statistik*, 660sq. Berlin: Reimar Hobbing.
- (1954). 'Zur Frage der Einkommenschichtung', *Wirtschaft und Statistik*, (6), 265–73.
- (1954a). 'Nochmals Zur Frage der Einkommenschichtung', *Wirtschaft und Statistik*, (10): 457–60.
- (1954b). 'Versuch eines Vergleiches der Einkommensteuerschichtung in der Bundesrepublik Deutschland 1950 und im Deutschen Reich 1936', *Wirtschaft und Statistik*, (10): 460–4.
- (1991). 'Volkswirtschaftliche Gesamtrechnungen, Revidierte Ergebnisse, 1950 bis 1990', Fachserie 18, vol. S. 15.
- (2005). 'Volkswirtschaftliche Gesamtrechnungen, Revidierte Ergebnisse, 1970 bis 2004', Fachserie 18, vol. S. 21.
- Stehle, R. (1999). 'Renditenvergleich von Aktien und festverzinslichen Wertpapiere auf Basis des DAX and des REXP'. Mimeo, Humboldt-Universität zu Berlin.
- Sweezy, M. Y. (1939). 'Distribution of wealth and income under the Nazis', *Review of Economic Statistics*, 21: 178–84.
- (1940). 'German corporate profits: 1926–1938', *Quarterly Journal of Economics*, 54: 384–98.
- Tooze, A. (2001). *Statistics and the German State, 1900–1945*. Cambridge: Cambridge University Press.
- Wagner, G. and Krause, P. (2001). *Lebenslagen in Deutschland: Forschungsprojekt Einkommensverteilung und Einkommensmobilität*. Technical report, Bundesministerium für Arbeit und Sozialordnung.