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Income Inequality in the United States, 1913-1998

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Abstract : This paper presents new homogeneous series on top shares of income and wages from 1913 to 1998 in the US using individual tax returns data. Top income and wages shares display a U-shaped pattern over the century. Our series suggest that the “technical change” view of inequality dynamics cannot fully account for the observed facts. The large shocks that capital owners experienced during the Great Depression and World War II seem to have had a permanent effect: top capital incomes are still lower in the late 1990s than before World War I. A plausible explanation is that steep progressive taxation, by reducing drastically the rate of wealth accumulation at the top of the distribution, has prevented large fortunes to recover fully yet from these shocks. The evidence on wage inequality shows that top wage shares were flat before WWII and dropped precipitously during the war. Top wage shares have started recovering from this shock since the 1960s-1970s and are now higher than before WWII. We emphasize the role of social norms as a potential explanation for the pattern of wage shares.

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1. Introduction

According to Kuznets' influential hypothesis, income inequality should follow an inverse-U shape along the development process, first rising with industrialization and then declining, as more and more workers join the high-productivity sectors of the economy (Kuznets (1955)). Today, the Kuznets curve is widely held to have doubled back on itself, especially in the United States, with the period of falling inequality observed during the first half of the 20th century being succeeded by a very sharp reversal of the trend since the 1970s. This does not imply however that Kuznets' hypothesis is no longer of interest. One could indeed argue that what has been happening since the 1970s is just a remake of the previous inverse-U curve: a new industrial revolution has taken place, thereby leading to increasing inequality, and inequality will decline again at some point, as more and more workers benefit from the new innovations.

In order to cast light on this central issue, we build in this paper new homogeneous series on top shares of pre-tax income and wages in the United States covering the 1913-1998 period. These new series are based primarily on tax returns data published by the Internal Revenue Service (IRS) since the income tax was instituted in 1913, as well as on the large micro-files of tax returns released by the IRS since 1960. First, we have constructed annual 1913-1998 series of shares of total income accruing to various upper income groups fractiles within the top decile of the income distribution. For each of these fractiles, we also present the shares of each source of income such as wages, business income, and capital income. Kuznets (1953) did produce in the 1950s a number of top income shares series covering the 1913-1948 period. However, these series are not fully satisfactory from a technical viewpoint (Kuznets tends to underestimate top income shares), and they do not allow the analysis of very high incomes as the top group analyzed by Kuznets is the top percentile.¹ Most importantly, nobody has attempted since the time of Kuznets to estimate homogeneous series covering the entire century, and our series are unique in

this respect.² Second, we have constructed annual 1927-1998 series of top shares of salaries for the top fractiles of the salary distribution, based on tax returns tabulations by size of salaries compiled by the IRS since 1927, and which have apparently never been used before.³ To our knowledge, this is the first time that a homogeneous annual series of top wage shares for the US is produced starting before the 1950s.⁴ Finally, in order to complete our analysis of top capital income earners, we have also used tax returns tabulations by size of dividends to construct annual 1927-1995 series of top dividends and estate tax returns tabulations to construct quasi-annual 1916-1997 series of top estates.

Our estimated series show that the “technical change” view of inequality dynamics described above is not the whole story: politics seems to matter much more than what the mechanical theory tends to suggest. More specifically, we show that top capital incomes were severely hit by major shocks during the 1914-1945 period. The large depressions on the first part of the century destroyed many businesses and thus reduced significantly top capital incomes. The wars generated large fiscal shocks, especially in the corporate sector, which mechanically reduced distributions to stock owners. We argue that top capital incomes were never able to fully recover from these shocks, probably because of the dynamic effects of progressive taxation on capital accumulation and wealth inequality. We also show that top wage shares were flat before WWII and dropped precipitously during the war. This evidence suggests that, contrarily to a widely held view, no “spontaneous” decline of wage inequality was taking place in the U.S. during the first half of the 20th century. Top wage shares have started recovering from the WWII shock since the 1960s and 1970s, and they are now higher than before WWII. We argue that both the downturn and the upturn of top

¹ Analyzing smaller fractiles within the top percentile is critical because capital income is extremely concentrated.

² Feenberg and Poterba (1993, 2000) have constructed top income share series covering the 1951-1995 period, but their series are not homogeneous with those of Kuznets. Moreover, they provide income shares series only for the top 0.5%, and not for other fractiles.

³ Kuznets and subsequent researchers have focused on tabulations by size of total income.

⁴ Previous studies on wage inequality before 1945 in the U.S. rely for the most part on occupational pay ratios (see Williamson and Lindert (1980), Goldin and Margo (1992), and Goldin and Katz (1999)).

wage shares seem too sudden to be accounted for by technical change alone, and we emphasize the role of changing social norms as a potential explanation for the observed patterns.

Although our proposed interpretation for the observed trends seems plausible to us, we stress that we cannot prove that progressive taxation and social norms have indeed played the role we attribute to them. In our view, the primary contribution of this paper is to provide new series on income and wage inequality. Hopefully, other researchers will use our series and complement them with new empirical sources in order to formulate their own hypotheses and explanations.

One additional motivation for constructing long series is to be able to tell apart the trends in inequality that are the consequence of “real” economic change from those that are due to fiscal manipulation. The issue of fiscal manipulation has recently received a lot of attention. For instance, a number of studies analyzing the effects of the Tax Reform Act of 1986 (TRA86) have emphasized that a large part of the response observable in tax returns was due to income shifting between the corporate sector and the individual sector (Slemrod (1996), Gordon and Slemrod (2000)). We do not deny that fiscal manipulation can have substantial short-run effects (especially in 1986-1988), but we argue that most long-run inequality trends are the consequence of “real” economic change, and that a short-run perspective might lead to attribute improperly some of these trends to fiscal manipulation. For instance, the decline of top capital incomes is a phenomenon which dates back to the interwar period, and that, as we will see, can be evidenced from various independent tax return sources. This is certainly evidence of “real” changes in the distribution of incomes and cannot be accounted only with fiscal manipulation explanations.

The paper is organized as follows. Section 2 describes our data sources and outlines our estimation methods. In Section 3, we present and analyze the trends in top income shares, with particular attention to the issue of top capital incomes. Section 4 focuses on trends in top wages shares. Section 5 compares our US findings to other countries experiences, and especially to the French and

U.K. series recently constructed by Piketty (2001a, 2001b) and Atkinson (2001). Section 6 offers concluding comments. All series and complete technical details about our methodology are gathered in appendices of the working paper version of the paper (Piketty and Saez (2001)).

2. Data and Methodology

In this section, we describe briefly the data we use and the broad steps of our estimation methodology. Readers interested in the complete details of our estimations are referred to the extensive appendices of Piketty and Saez (2001).

Our estimations rely on tax returns statistics compiled annually by the Internal Revenue Service since the beginning of the modern US income tax in 1913.⁵ Before 1944, because of large exemptions levels, only a small fraction of households had to file tax returns and therefore, by necessity, we must restrict our analysis to the top decile of the income distribution.⁶ As the tax statistics we use are based on tax returns, they never provide information of the distribution of individual incomes within a tax unit. As a result, all our series are based on tax units and not on individuals.⁷ A tax unit is defined as a married couple living together (with dependents) or a single adult (with dependents), as in the current tax law. The average number of individuals per tax unit has decreased over the century but, fortunately, this decrease has been roughly uniform across income groups. Therefore, assuming that income is evenly allocated to individuals within tax units,⁸ patterns of top shares based on individuals instead of tax units, if they could be estimated, would probably be very similar. Tax units within the top

⁵ In 1913, a constitutional amendment allowed the US government to raise revenue with an individual income tax.

⁶ From 1913 to 1916, because of higher exemption levels, we can only provide estimates within the top percentile.

⁷ Kuznets (1953) decided nevertheless to estimate series based on individuals and not tax units. We explain in appendix of Piketty and Saez (2001) why his method produced a downward bias in the levels (but fortunately not in the pattern) of top shares.

⁸ Obviously, income is not earned evenly across individuals within tax units, and, because of increasing female labor force participation, the share of income earned by the primary earner has certainly declined over the century. Therefore, inequality series based on income earned at the

decile form a very heterogeneous group, from the solid middle class families deriving most of their income from wages, and up to the super-rich living off very large fortunes. More precisely, we will see that the composition of income varies substantially by income level within the top decile. Therefore, it is critical to divide the top decile into finer fractiles. Following Piketty (2001a, 2001b), in addition to the top decile (denoted by P90-100), we have constructed series for a number of higher fractiles within the top decile: 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). This also allows us to analyze the five intermediate fractiles within the top decile: P90-95, P95-99, P99-99.5, P99.5-99.9, P99.9-99.99. Each fractile is defined relative to the total number of tax units in the US population had everybody been required to file a tax return. This number is computed using population and family census statistics and should not be confused with the actual number of tax returns filed. For example, as there are about 130 million tax units in the US population in 1998,⁹ the top decile is defined as the top 13 million tax returns, and the top percentile as the top 1.3 million tax returns, etc. In order to get a more concrete sense of size of income by fractiles, Table 1 displays the thresholds P90, P95,... the average income level in each fractile P90-95,..., along with the number of tax units in each fractile for year 1998.

Insert Table 1: Top Fractiles in 1998

The income definition we use is a gross income definition including all the income items reported on tax returns and before all deductions: salaries and wages, small business and farm income, partnership and fiduciary income, dividends, interest, rents, royalties, and other small items reported as other income. Realized capital gains are not an annual flow of income (in general, capital gains are realized by individuals in a lumpy way only once in a while) and form a very volatile component of income with large aggregate variations from year to year

individual level would be different. Our tax returns statistics are mute on this issue. We come back to that point when we present our wage estimates.

depending on stock price variations. Therefore, we focus mainly on series excluding completely capital gains.¹⁰ It is important to note that our income definition is computed before individual income taxes and individual payroll taxes but after employers' payroll taxes and corporate income taxes.¹¹

Our raw data consists in tables displaying the number of tax returns, the amounts reported, and the income composition, for a large number of income brackets. As the top tail of the income distribution is very well approximated by Pareto distributions, we can use simple parametric interpolation methods to estimate the thresholds and average income levels for each of our fractiles. We then estimate shares of income by dividing the income amounts accruing to each fractiles by total personal income computed from National Accounts.¹² Using the published information on composition of income by brackets and a simple linear interpolation method, we decompose the amount of income for each fractile into five components: salaries and wages, dividends, interest income, rents and royalties, and business income.

We use the same methodology to compute top wage shares using published tables classifying tax returns by size of salaries and wages. In this case, fractiles are defined relative to the total number of tax units with positive wages and salaries (which is also computed from census population and work force statistics).

⁹ The number of returns actually filed is smaller, around 125 million.

¹⁰ In order to assess the sensitivity of our results with the treatment of capital gains, we present two additional sets of series corresponding to two additional ways of treating capital gains. In the first alternative, we rank tax units by income excluding capital gains but we add back average capital gains for each fractile when computing income levels and shares. In the second alternative, we fully include capital gains in income (both for the ranking and the levels and shares computations). Details on the methodology and complete series are presented in appendix of Piketty and Saez (2001).

¹¹ We discuss later how computing pre-corporate income tax series by inflating dividends to account for reduced distributions due to corporate income taxes would affect our results. Computing series after individual income taxes is beyond the scope of the present paper but is certainly worth being investigated to analyze the redistributive power of the income tax over time, as well as behavioral responses to individual income taxation.

¹² This methodology using tax returns to compute the level of top incomes, and using national accounts to compute the total income denominator is standard in historical studies of income inequality. Kuznets (1953), for instance, adopted this method.

There are variations in the presentation of published data from year to year and a number of changes in tax law over the period 1913-1998.¹³ Therefore, in order to construct homogeneous series, we are lead to make a number of adjustments and corrections. The micro-files available from 1960 to 1995 allow us to do exact computations of all our statistics for that period and are a precious source to check the validity of our adjustments for the other periods. Kuznets (1953) did not have the possibility to use micro-files to assess the extent of the biases in his estimates due to his methodological assumptions.¹⁴ Relying on micro-files to test our methods allows us to obtain far more complete statistical series than Kuznets. First, we analyze much finer top fractiles than Kuznets who did not go above the top percentile. Second, we derive full composition series and obtain series for specific sources of income such as salaries and dividends. Finally, we are able to give an extensive treatment of capital gains which were completely ignored by Kuznets.

Our method also differs from the recent important studies by Feenberg and Poterba (1993, 2000) who derive series of the income share of the top 0.5%¹⁵ for the period 1951 to 1995. They simply use total income reported on tax returns as their denominator and the total adult population as their base to obtain the number of tax units corresponding to the top fractiles.¹⁶ Their method is obviously far simpler than ours but cannot be used for years before 1945 when only a small fraction of the population was filing tax returns.

3. Top Capital Incomes: The Role of Shocks and Progressive Taxation

3.1. Trends in Top Income Shares

¹³ The most important example is the treatment of capital gains and the percentage of these gains that are included in the statistics tables.

¹⁴ The two main sources of (downward) bias in Kuznets series come from his choice to estimate shares based on individuals instead of tax units and from his treatment of capital gains.

¹⁵ They also present incomplete series for the top 1%.

¹⁶ This method is not fully satisfying for a long-run study as the average number of adults per tax unit has decreased significantly since WWII.

We start by presenting our basic top income shares series estimated from individual tax return data from 1913 to 1998. Most of the series presented in the text exclude capital gains from the definition of personal income (complete series including capital gains are presented in appendix of Piketty and Saez (2001)).

We present on Figure 1 the income share of the top decile of tax units from 1917 to 1998. The overall pattern of the top decile share over the century is U-shaped. The share of the top decile fluctuates around 40-45% during the interwar period. It declines substantially to just above 30% in four years during WWII. It stays flat at 31-32% until the 1970s when it starts increasing again. In the mid-1990s, the share has crossed the 40% level and is now at a level close to the before WWII level, although still a bit lower. Therefore, the evidence suggests that the decline in inequality took place in a very specific and short period of time. Such an abrupt decline cannot easily be reconciled with a Kuznets type process. The smooth increase in inequality in the last three decades is more consistent with slow underlying changes in the demand and supply of factors, even though it should be noted that a significant part of the gain is concentrated in two years, 1987 and 1988 just after the Tax Reform Act of 1986 which cut dramatically the top marginal income tax rates (we will come back on this issue later on).

Looking at the bottom fractiles within the top decile (P90-95 and P95-99) on Figure 2 displays interesting new evidence. One can see that these fractiles account for a relatively small fraction of the total fluctuations of the top decile income share. First, the drop in the shares of fractiles P90-95 and P95-99 during WWII is far less dramatic than for the top decile as a whole. Second, they start recovering from the WWII shock right after the war. Third, the shares for these groups do not increase much during the 1980s-1990s: the P90-95 share was fairly stable, and the P95-99 share increased by about 2 percentage points while the top decile share increased by about 10 percentage points. Finally, it is interesting to note that the groups P90-95 and P95-99 did relatively better during the post WWI depression and the great depression, and relatively worse during the WWI boom and the late 1920s boom. This can easily be accounted for by

the fact that income in these fractiles is predominantly wage income, and that wages are to a large extent nominally rigid in the short run. In particular, high middle-class wage earners are the big winners of the deflationary years of the great depression.

In contrast to the fractiles P90-95 and P95-99, the top percentile (depicted on Figure 3) has gone through enormous fluctuations along the course of the 20th century, with a drop by more than 50% from 1913 to the 1950s: the share of total income received by the top 1% was about 18% before WWI, and it was only about 8% during the 1960s-1970s. Figure 3 shows clearly that the top percentile share declined during WWI, recovered during the 1920s boom, and declined again during the great depression and WWII. This very specific timing, together with the fact that very high incomes account for a disproportionate share of the total decline in inequality, strongly suggests that the shocks incurred by capital owners during 1914 to 1945 (depression and wars) have played a key role. The depressions of the inter-war period were far more profound than the post-WWII recessions. They destroyed many businesses and had a stronger impact on capital income than labor income. As a result, it is not surprising that the fluctuations in top shares are far wider during the inter-war period than in the decades after the war.¹⁷ It is interesting to note that the pattern of shares for P90-95 and P95-99 is exactly symmetrical to the pattern for P99-100 from 1917 to 1939 (in comparison and as a result, the pattern for the full top decile is flatter). This is explained by the fact that, as we will see, P90-99 is mostly composed of wage income while P99-100 is mostly composed of capital income. During the large downturns of the inter-war period in the U.S. (1921, and 1930-1933, 1938-1939), capital income drops dramatically while wages (and especially high wages) are rigid nominally and thus the position of the upper middle class groups P90-99 improves relative to the top percentile. On the other hand, during the booms (1923-1929) and the recovery (1934-1937), capital income increases

¹⁷ The fact that top shares are very smooth after 1945 and bumpy before is therefore not an artifact of an increase in the accuracy of the data (in fact, the data is more detailed before WWII than after), but reflects real changes in the economic conditions.

quickly, inflation increases and high wages loose in relative terms.¹⁸ The negative effect of the wars on top incomes can be explained in part by the large tax increases enacted to finance the wars. During both wars, the corporate income tax (as well as the individual income tax) was drastically increased and this reduced mechanically the distributions to stockholders (see our discussion below).¹⁹

The decline in top incomes during the first part of the century is even more pronounced for higher fractiles within the top percentile, i.e. for fractiles which one expects to rely more heavily on capital income. As depicted on Figure 4, the income share of the top 0.01% has gone through enormous fluctuations during the 20th century. In 1915, the top 0.01% earned incomes 400 times larger than the average income; in 1970, their incomes were “only” 50 times larger than average. They have not yet fully recovered today, as they earned in 1998 about 250 times the average income.

Insert Figure 1: The top decile income share in the U.S., 1917-1998

Insert Figure 2: The income share of fractiles P90-95 and P95-99 in the U.S., 1917-1998

Insert Figure 3: The top percentile income share in the U.S., 1913-1998

Insert Figure 4: The top 0.01% income share in the U.S., 1913-1998

Insert Table 2: Top income shares in the U.S., 1913-1998

Our long-term series allow us to analyze the TRA 1986 episode from a new perspective. Feenberg and Poterba (1993, 2000) looking at the top 0.5% income shares series ending in 1992 (and 1995 respectively) argue that the surge after TRA86 looks permanent. However, completing the series up to 1998 shows very clearly that top shares can increase even in the absence of tax

¹⁸ Piketty (2001a, 2001b) shows that exactly the same phenomenon is taking place in France at the same period.

¹⁹ During WWI, top income tax rates reached “modern” levels above 60% in less than two years. As was forcefully argued at that time by Mellon (1924), it is conceivable that large incomes found temporary ways to avoid taxation at a time where the administration of the Internal Revenue Service was still in its infancy.

cuts.²⁰ From that perspective, looking at Figures 3 and 4, the average increase in top shares from 1985 to 1994 is not significantly higher than the increase from 1994 to 1998 or from 1978 to 1984. This transitory effect of TRA 1986 is even more striking when looking at series including capital gains as in Figure 4B.²¹ The series with full capital gains included both in the ranking of tax units and when computing shares shows indeed a much smaller increase in the top percentile share from 1985 to 1994 than from 1994 to 1998 or from 1978 to 1984. As a result, it is possible to argue that TRA86 produced no permanent surge in top income shares, but only a transitory blip. The analysis of top wage shares in Section 4 will reinforce this interpretation. Figure 4B also shows that including capital gains does not modify our main conclusion that very top income shares dropped enormously during the 1914-1945 period before increasing steadily in the last three decades.²²

Insert Figure 4B: the top percentile with and without capital gains, 1913-1998.

3.2. The secular decline of top capital incomes

In order to confirm our intuition on the decline of top capital incomes over the century, it is useful to look at the composition of income within the top fractiles. Figure 5 displays the composition of income for each fractile in 1929. As expected, one can see that the share of wage income is a declining function of income and that the share of capital income (dividends, interest, rents and royalties) is an increasing function of income. The share of entrepreneurial income (business, farm and partnerships) is fairly flat. High middle-class fractiles (P90-95 and P95-99) rely mostly on labor income: wage and entrepreneurial

²⁰ Slemrod and Bakija (2000) pointed out that top incomes have surged in recent years. They note that tax payments by taxpayers with AGI above \$200,000 increased significantly from 1995 to 1997.

²¹ See footnote 10 for a precise definition of the two alternative series with capital gains.

²² It is interesting to note, however, that during the 1960s, when dividends were strongly tax disadvantaged relative to capital gains, capital gains do seem to represent a larger share in top incomes than during other periods such as the 1920s or late 1990s that also witnessed large increases in stock prices.

income make about 80% of their resources, and capital income brings a 20% income supplement. The pattern is basically reversed for very top fractiles: more than 70% of the resources of fractile P99.99-100 are made of capital income, and wage and entrepreneurial income brings a bare 30% income supplement. Note also that the sharply increasing pattern of capital income is entirely due to dividends: the share of interest, rents and royalties is fairly flat, while the share of dividends in total income goes from about 5% at the level of fractile P90-95 to more than 55% at the level of fractile P99.99-100. These numbers confirm that the very large decline of top incomes observed during the 1914-1945 period is to a large extent a capital income phenomenon: wages make a small fraction of very top incomes, and trends in wage inequality can only explain a small fraction of the trends in very top income shares.²³

Insert Figure 5: The income composition of the top decile in the U.S. in 1929

Insert Figure 6: The income composition of the top decile in the U.S. in 1998

One might also be tempted to interpret the large upturn in top income shares observed since the 1970s as a revival of very high capital incomes. The interesting point, however, is that it is not so. In fact, as shown in Figure 6, the income composition pattern has changed considerably between 1929 and 1998. In 1998, salary income and business income form the vast majority of the largest incomes. Wage and entrepreneurial income make about 80% of the resources of fractile P99.99-100, and capital income brings a mere 20% income supplement. Therefore, highest incomes at the end of the 20th century are very different from the highest incomes in the early part of the century. Before WWII, the highest incomes were overwhelmingly composed of rentiers deriving most of their incomes from their wealth holdings (mainly in the form of dividends). Today, the “working rich” celebrated by Forbes magazine seem to have overtaken the “coupon-clippers”.

²³ We will come back on this issue later on when we look at wage inequality series.

The IRS published in *Statistics of Income* for the year 1916, statistics classifying tax returns into 36 different occupations by brackets of income. We have combined these 36 occupations into four groups: salaried professions; independent professions; business owners; and capitalists and rentiers. The salaried professions are those who receive salaries such as teachers, civil servants, engineers, corporation managers and officials. These individuals presumably derive an important part of their income in the form of wages and salaries. Independent professions are self-employed individuals or individuals working in partnerships such as lawyers, doctors, etc. Business owners are merchants, hotel proprietors, manufacturers, etc. These two groups presumably derive most of their incomes in the form of business income. Finally capitalists and rentiers are bankers, brokers, and those who classify themselves as “capitalists: investors and speculators”,²⁴ and presumably derive most of their income in the form of capital income. It is possible, especially at the very top, for some individuals to be classified in more than one group. We present in Table 23 the distribution of these four occupation groups by fractiles within the top percentile.²⁵ This table confirms our previous results: the share of the salaried occupation declines steadily within the top percentile from 28% to less than 10% at the very top. The share of independent professions also declines from 20% to 5%. The share of business owners is first increasing (from 30% to 40%) and declining slightly at the very top. The share of capitalists increases sharply especially at the very top where 95% of the top 400 taxpayers fall into this category. This table shows clearly that top corporate executives at the beginning of the century were only a tiny minority within the top taxpayers. In contrast, in 1998, more than half of the very top taxpayers derive a substantial fraction of their income in the form of salary.

Insert Table 3: Occupations by income level within the top percentile, 1916.

²⁴ At the very top, “capitalists: investors and speculators” form the overwhelming majority of our capitalists and rentiers group.

²⁵ We have added a fractile for the top 0.001% (top 400 taxpayers in 1916) to emphasize how the very top is composed overwhelmingly of “capitalists”.

The dramatic evolution of the composition of top incomes seems extremely robust. First, it is totally independent from the erratic evolution of capital gains, which were excluded from Figures 5 and 6, as well as from the income shares series depicted on Figures 1 to 4. As a matter of fact, both 1929 and 1998 were excellent years for the stock market and the share of capital gains in the top fractiles is very large and strikingly close in both years (see Table X).

Next, it is important to note that the decline of the capital income share is a very long-term phenomenon and is not limited to a few years and a few thousands tax units. Figure 7 shows a gradual secular decline of the share of capital income (excluding again capital gains realizations) in the top 0.5% fractile from the 1920s to the 1990s: capital income made about 55% of total income in the 1920s, 35% in the 1950s-1960s, and 15% in the 1990s. Unsurprisingly, drastic declines occurred during WWI, the great depression, and WWII. But the point is that the share of capital income recovered only partially for these shocks in the late 1940s and started a steady decline in the mid-1960s. Note also that this secular decline is entirely due to dividends: the share of interest, rent and royalties has been roughly flat for the top 0.5% incomes in the long run (note however the upsurge of interest income around 1980 due to high nominal interest rates), while the dividend share has dropped from about 40% in the 1920s to about 25% in the 1950s-1960s and less than 10% in the 1990s.

Insert Figure 7: The capital income share within the top 0.5% in the U.S., 1916-1998

Insert Table 4: Income composition by fractiles in the U.S., 1916-1998.

We have also used the tabulations by size of dividends produced by the IRS from 1927 on in order to make sure that the amount of dividends reported by the top dividend earners is indeed characterized by a secular decline. Figure 8 displays the levels of dividends (expressed in 1998 dollars) reported by the top

0.1% tax units (including tax units with no dividends) ranked by size of reported dividends. While average incomes have been multiplied by a factor 3 from 1927 to 1995, the top 0.1% dividends earners reported on average about \$500,000 in 1927-1929 but less than \$240,000 in 1995. The figure shows clearly that top dividend levels were very sensitive to the business cycle, with a sharp decline during the great depression and a quick but short-lived recovery before WWII. But the key point is that high dividend earners never recovered from the shocks of the first half of the century and that their secular decline (relative to average income) became even larger during the second half of the century.

Insert Figure 8: Average real dividends of top 0.1% dividend earners in the U.S., 1927-1995 (in 1998 dollars)

Next, and most importantly, the secular decline of top capital incomes is the consequence of a decreased concentration of capital income and not of a decline in the share of capital income in the economy as a whole. The national accounts series show that the aggregate capital income share has not declined over the century. First, it is well known that factor shares in the corporate sector are fairly flat in the long-run: the labor share has always been around 70-75%, and the capital share has always been around 25-30% (see Figure 9). Next, the share of capital income in aggregate personal income is about 20% both in the 1920s and in the 1990s (see Figure 10). The aggregate capital income share was substantially lower during the 1950s-1960s (about 10-15%), which can be explained by the following two factors. First, retained earnings were particularly low during the late 1920s and even more so during the Great Depression, and they became very important during WWII, before gradually returning to “normal” levels. Second, corporate income tax rates were significantly increased during WWI and WWII, which mechanically reduced distributions to stockholders and thus amplified the “retained earnings” effect. This explains why capital income

dropped so sharply during WWI and WWII (see figure 10B).²⁶ Corporate taxation also explains why the dividend share in aggregate personal income is still a bit lower in the late 1990s (about 5%) than what it used to be in the late 1920s (about 6-7%), although factor shares in corporate value-added and retained earnings are approximately the same. In any case, the key point is that these aggregate fluctuations (6-7% in the late 1920s, 5% in the late 1990s) are very small as compared to the enormous decline of top capital incomes. Contrarily to a widely held view, dividends as a whole are still well and alive.²⁷

It should be noted, however, that the ratio of total dividends reported on individual tax returns to personal dividends in National Accounts has declined continuously over the period 1927 to 1995, starting from a level close to 90% in 1927, declining slowly to 60% in 1988, and dropping precipitously to less than 40% in 1995. But the point is that this decline is due mostly to the growth of funded pension plans and retirement saving accounts through which individuals receive dividends that are never reported as dividends on income tax returns. For the highest income earners, this additional source of dividends is likely to be very small relative to dividends directly reported on tax returns. When shares are held “directly” (i.e. not through pensions plans or retirement savings accounts), it seems fairly difficult not to report the corresponding dividends on tax returns.²⁸

Insert Figure 9: Factor shares in the U.S. corporate sector, 1929-1999

Insert Figure 10: The capital income share in U.S. personal income, 1929-1998

²⁶ One can see on figure 10B that the rise of corporate taxation accounts for about 80% of the fall in the dividend share during WWII, while retained earnings account for about 20% of the fall: real corporate profits increased by about 100 billions (in 1998 dollars) between 1940 and 1944 (from 120 billions to 220 billions), real corporate tax liability increased by about 80 billions 1998 \$ (from less than 40 billions to almost 120 billions), real retained earnings increased by about 20 billions 1998 \$ (from 40 billions to 60 billions) and real dividends did not increase at all (around 40 billions 1998 \$ both in 1940 and in 1944). Goldsmith et al. (1954) and Brittain (1966) have already pointed out the important role played by retained earnings and corporate taxation during this period. We have also attempted to construct pre-corporate tax top income shares series, and these series do confirm that the rise of corporate taxation does explain a significant part of the WWII decline in top income shares (see appendix of Piketty and Saez (2001)).

²⁷ As documented by Fama and French (2000), a growing fraction of firms never pay dividends (especially in the new technology industries, where firms often make no profit at all), but the point is that total dividend payments continue to grow at the same rate as aggregate corporate profits.

Insert Figure 10B: Dividends, retained earnings and corporate tax in the U.S., 1929-1998

Estate tax return statistics are an alternative precious source of data to analyze whether there has been a secular decline of large fortunes. The US started imposing an estate tax in 1916. Estate tax returns have been analyzed previously to construct top wealth holding shares (Lampman (1962)). Here, we look only at the real average levels of gross estates by fractiles of decedents aged 25 or above in the U.S. population (ranked by size of estate). We can construct these series for all the years for which the IRS has produced statistics on Estate tax returns by size of estates.²⁹ This allows us to construct an almost continuous annual series from 1916 to 1997, the latest year available. Figure 11 displays the average level (in 1998 dollars) of gross estates for the top 0.01% of decedents from 1916 to 1997. This represents the largest 225 estates in 1997. Strikingly, the real value of the top estates in the pre-great depression period was similar to the level of the 1990s, namely around \$70 million. As a first approximation, it is reasonable to assume that average wealth of decedents has grown at a comparable pace as GDP per capita which has been multiplied by 3.5 between 1916 and 1997.³⁰ Therefore, the biggest fortunes have in fact substantially declined in relative terms.³¹ To emphasize this point, Figure 12 displays the evolution of average estates in lower fractiles. The average estate in P98-99 has grown continuously and has been multiplied by about 3 between 1916 and 1997. Similarly the average estate in P99-99.5 has been multiplied by about 2.5. Series for other fractiles provided in Table X show that the higher the fractiles, the smaller the growth between 1916 and 1997. This evidence is

²⁸ In particular, note that the “personal holding company surtax”, which has been in place since the 1930s, basically forces personal holding companies to distribute their dividends.

²⁹ Lampman (1962) constructed top 1% wealth shares only for a few years between 1922 and 1956 because estimating wealth shares from estate data requires age distributions of wealth decedents that have been tabulated only for a few years by the IRS.

³⁰ Changes in life expectancy, retirement behavior, etc. could have modified life-cycle savings patterns over the century.

³¹ It is important to keep in mind that estate data reflects the wealth distribution of decedents and thus introduces probably a long lag relative to the current wealth distribution.

consistent with our previous results, and strongly suggests that there has been a strong trend of deconcentration of wealth over the 20th century.

Insert Figure 11: Average Estate for top 0.01% decedents: 1916-1997

Insert Figure 12: Average Estate P98-99 and P99-99.5, 1916-1997

The estate tax returns evidence truly reflects a decrease in the concentration of large fortunes only if gross estates accurately reflect the wealth levels of the richest individuals in the economy. Fortunately, the definition of gross estates has changed very little from 1916 to today (see appendix of Piketty and Saez (2001) for the details). Another potential source of bias is tax evasion. Whether or not estate tax evasion is as large as what a number of popular accounts tend to suggest is still a controversial issue.³² In any case, even a substantial level of tax evasion does not necessarily invalidate our findings. Our results would be biased only if the extent of tax evasion had increased drastically over time. There is no a-priori reason to think that tax evasion has increased overtime. First, the levels of estate tax rates, presumably strongly correlated with tax evasion,³³ have been continuously high since 1932 and have in fact been decreasing since the 1940s. Second, many provisions of the estate tax reform of 1976, such as taxation of generation skipping trusts, were devised to close loopholes in the tax law.

3.3 Proposed interpretation: the role of progressive taxation

How can we explain the steep secular decline in capital income concentration? It is easy to understand how the macro-economic shocks of the great depression and the temporary fiscal shocks of WWI and WWII have had a

³² Wolff (1996) and Poterba (2000) have estimated the extent of estate tax avoidance by comparing the estate tax base to an estimate of what the base should be using the survey of wealth from the 1992 Survey of Consumer Finances. Wolff estimates that the extent of tax avoidance is very large while Poterba finds a small level of tax avoidance. Eller et al. (2001) show that this type of computations is very sensitive to mortality rates assumptions and bequest behavior between spouses.

negative impact on capital concentration. The difficult question is to explain why large fortunes have not recovered from these shocks. The most natural and realistic candidate for an explanation seems to be the creation and the development of the progressive income tax (and of the progressive estate tax and corporate income tax). The very large fortunes that generate the top 0.01% incomes observed at the beginning of the 20th century were accumulated during the 19th century, at a time where progressive taxes hardly existed and capitalists could dispose of almost 100% of their income to consume and to accumulate.³⁴ The conditions faced by 20th century capitalists to recover from the shocks incurred during the 1914-1945 period were substantially different. Top tax rates have been very high from the end of WWI to the early 1920s but were decreased to mild levels from 1924 to 1932. However, starting in 1933, and continuously until the 1980s, top rates have been set at very high levels. Moreover, starting in 1916, the U.S. has imposed a substantial estate tax. These very high marginal rates applied only to a very small fraction of taxpayers, but the point is that they were to a large extent designed to hit the incomes of the top 0.1% and 0.01% of the income distribution, i.e. the incomes that depend primarily on capital income and capital accumulation. In contrast to progressive labor income taxation which simply produces a level effect on earnings through labor supply responses, it is important to note that progressive capital income taxation has cumulative or dynamic effects because it reduces the net-return on wealth which generates tomorrow's wealth.

It is obviously very difficult to prove in a rigorous way that the dynamic effects of progressive taxation on capital accumulation and pre-tax income inequality have the "right" quantitative magnitude and account for the observed facts. One would need to know more about the savings rates of capitalists, how their accumulation strategies have changed since 1945, etc. Note however that the orders of magnitude do not seem unrealistic, especially if one assumes that the owners of large fortunes, whose pre-tax incomes and lifestyles were already

³³ See the recent study of Slemrod and Kopczuk (2000).

severely hit by the 1914-1945 shocks, were not willing to reduce their consumption down to very low levels. Standard models of capital accumulation indeed predict that capital income taxation has a negative impact on wealth concentration. In the presence of progressive capital income taxation, individuals with large wealth levels need to increase their savings rates much more than lower wealth holders to maintain their relative wealth position. Moreover, savings rates for high wealth holders are likely to decrease due to a reduced after-tax rate of return. This behavioral response will exacerbate the decrease in wealth inequality. Piketty (2001a, 2001b) provides simple numerical simulations showing that for fixed saving rates, introducing substantial capital income taxation has a tremendous effect on the time needed to reconstitute large wealth holdings after negative shocks (the effect would still be very large even if the capitalists increase their savings rates somewhat). Piketty (2001b) shows that in the classic dynastic model with infinite horizon, any positive capital income tax rate above a given high threshold of wealth will eventually eliminate all large wealth holdings without affecting, however, the total capital stock in the economy.

Note also that we are not the first to propose progressive taxation as an explanation for the decrease in top shares of income and wealth. Lampman (1962) also favored progressive taxation as one important factor explaining the reduction in top wealth shares. Kuznets (1955) himself explicitly mentioned this mechanism (together with the shocks incurred by capital owners during the 1913-1948 period) before presenting the theory of the Kuznets' curve (based on the idea of a spontaneous downturn in inequality).

Our results suggest that the shocks of the inter-war period and of the wars are the main causes of the reduction in capital income concentration. Large fortunes have not been able to recover yet from these shocks probably because of the high levels of taxation. Obviously, explanations based on technical changes that point out that periods of industrial revolutions such as the end of the 19th century or the end of the 20th century are more favorable to the making of

³⁴ During the 19th century, the only progressive tax was the property tax, but its level was low (see Brownlee (2000) for a detailed description).

fortunes than other periods, might also be relevant.³⁵ Unfortunately, there are not yet rigorous studies trying to quantify the relative contribution of the technological effect versus the fiscal effect on the pattern of top incomes in the US.

We have shown that the share of labor income in the top fractiles has grown continuously over the century. Next section will look specifically at wage income inequality and show that wage inequality has increased substantially in the last three decades and is today as high as in the inter-war period. This suggests that with the decline in tax progressivity since the early 1980s, and furthermore if the estate tax is repealed, the US might experience again in a few decades levels of wealth concentration similar to those of the beginning of the century.

4. Top Wages: The Role of Social Norms

We present in Figures 13 to 16 the wage shares for various fractiles of the wage distribution from 1927 to 1998 that we constructed using IRS tabulations by size of wages. There are two caveats to note about these long-term wage inequality series. First, self-employment income is not included in wages and therefore our series focus only on wage income inequality which is not necessarily equivalent to total labor income inequality. As self-employment income has been a decreasing share of labor income over the century, it is conceivable that the pool of wage and salary earners has substantially evolved overtime. Similarly, large changes in the wage force due to the business cycle or wars might affect our series through compositional effects.³⁶ We discuss in appendix of Piketty and Saez (2001) under what conditions these entry effects do or do not affect top shares and we show why the major entry effect of military personnel during WWII does not affect our results. Second, our wage income

³⁵ DeLong (1998) also points out the potential role of anti-trust law (according to DeLong, anti-trust law was enforced more loosely before 1929 and since 1980 than during the 1929-1980, which might contribute to explain why the U.S. economy was generating fewer billionaires during the 1929-1980 period than before 1929 and since 1980).

³⁶ We explain in appendix of Piketty and Saez (2001) why the major entry effect of military personnel during WWII, in fact does not affect our results.

series are based on the tax unit and not the individual. As a result, an increase in the correlation of earnings across spouses, as documented in Karoly (1993), with no change in individual wage inequality, would generate an increase in tax unit wage inequality.³⁷

Similarly to the figures for overall income, the pattern of top wage shares over the century is also U-shaped. There are, however, important differences that we describe below. It is useful to divide the period 1927-1998 into three sub-periods: the pre-WWII period (1927-1940), the war and post-war period (1941-1969), and the last three decades (1970-1998). We analyse each of these periods in turn.

Insert Figure 13: share of top 10% wage earners.

Insert Figure 14: share of P90-95, P95-99 wage earners

Insert Figure 15: share of top 1% wage earners

Insert Figure 16: shares of P99-99.5, P99.5-99.9, P99.9-100 wage earners

Insert Table 5: Top wage income shares in the U.S., 1927-1998

4.1 Wage inequality stability before World War II

Top wage shares show a striking stability in the pre-WWII period. In contrast to capital income, the great depression has not produced a contraction in top wage shares. On the contrary, the high middle class fractiles have benefited in relative terms from the Great Depression. Unfortunately, the IRS has not published tables on wage income over the period 1913 to 1926. However, we can use an indirect source of evidence to document trends in top wage shares in that earlier period. Corporation tax returns require each corporation to report separately the sum of salaries paid to its officers. This statistic, compensation of officers, is reported annually in IRS publications starting in 1917. We report on

³⁷ This point can be analyzed using the Current Population Surveys available since 1961 which allows to compute wage inequality series both at the individual and tax unit level. A systematic analysis of this issue is left for future research.

Figure 17, the total compensation of officers reported divided by the total wage bill in the economy from 1916 to 1960 along with the share of the top 0.5% and P99-99.9 wage earners which are close in level to the share of officer compensation. From 1927 to 1960, officer compensation share and the top 0.5%, and P99-99.9 track each other relatively closely. Therefore, the share of officer compensation from 1917 to 1927 might be a good proxy as well for these top wage shares. This indirect evidence suggests that the top share of wages was also roughly constant, or even slightly increasing from WWI to 1926.

Insert Figure 17: share of officer compensation in total wages and share P99.5-100 or P99-99.9, 1916-1960.

Previous studies have suggested that wage inequality has been gradually decreasing during the first half of the 20th century (and in particular during the inter-war period) using series of wage ratios between skilled and unskilled occupations (see e.g., Keat (1960), Williamson and Lindert (1980)). However, it is important to recognize that a decrease in the ratio of skilled over unskilled wages does not necessarily imply an overall compression of wage income inequality, let alone a reduction in the very top wage shares. Given the continuous rise in the numerical importance of high-skill jobs, it is natural to expect ratios such as (high-skill wages)/(low-skill wages) to decline continuously over time, even if wage inequality (measured in terms of fractiles of the whole distribution) does not change.³⁸ It seems to us that, to cast light on potential compositional biases in occupational ratios, it would be useful to supplement any occupational ratio series with series on the number of workers in the corresponding occupations. From occupational ratios series and number of workers series, it might be possible to construct proxies for P90/P10 type ratios

³⁸ For instance, Piketty (2001a, 2001b) reports a long-run compression from 1950 to 1990 of the ratio of the average wage of managers over the average wage of production workers in France even though wage inequality (measured both in terms of top fractiles wage shares and in terms of P90/P10-type ratios) was constant over that period. On the other hand, the time-series evidence presented by Katz and Autor (1999) on college premium in the U.S. since 1950 appears to be consistent with the pattern of U.S. top wage shares decade by decade.

that would be unbiased even in the long-run. With this important caveat in mind, we note however that Goldin and Katz (1999) present new series of white-collar to blue-collar earnings ratios from the beginning of the 20th century to 1960 and find that the decrease in pay ratio is concentrated only in the short periods of the two world wars. Their results on occupational pay ratios are thus fully consistent with our top share results.

4.2 Sharp drop in inequality during World War II with no recovery

All wage shares figures display a sharp drop during the four years of WWII from 1941 to 1945.³⁹ The drop is sharpest, the higher the fractile. The share of P90-95 declines by 16% between 1940 and 1945, but the share of the top 1% declines by more than 30%, and the top 0.1% by almost 35% during the same period. This sharp compression of high wages can fairly easily be explained by the wage controls of the war economy. The National War Labor Board, established in January 1942 and dissolved in 1945, was responsible for approving all wage changes and made any wage increase illegal without its approval. Exceptions to controls were more frequently granted to employees receiving low wages.⁴⁰ Lewellen (1968) has studied the evolution of executive compensation from 1940 to 1963 and his results show strikingly that executive salaries were frozen in nominal terms from 1941 to 1945 consistent with the sharp drop in top wage shares that we find.

The surprising fact, however, is that top wage shares did not recover after the war. A partial and short-lived recovery can be seen for all groups, except the very top. But the shares never recover more than one third of the loss incurred during WWII. Moreover, after a short period of stability in the late 1940s, a second phase of compression takes place in the top percentile. It is important to note that this compression phase is longer and most pronounced the higher the fractile. While the fractiles P90-95 and P95-99 hardly suffer from a second

³⁹ Note that for fractiles below the top percentile, the drop starts from 1940 to 1941.

⁴⁰ See Goldin and Margo (1992) for a more detailed description.

compression phase and start recovering just after the war, the top groups shares experience a substantial loss from 1950 to the mid-1960s. The top 0.1% share for example declines from 1.6% in 1950 to 1.1% in 1964. Unfortunately, our tax return evidence, does not allow us to study top wage shares during the inflationary episode of WWI.⁴¹

Note also that the overall drop in top wage shares, although very substantial, is significantly lower than the overall drop in top income shares. The top 1% income share dropped from about 18-19% before WWI and in the late 1920s to about 8% in the late 1950s (see Figure 3), while the top 1% wage share dropped from about 8% in the 1920s to about 5% in the late 1950s (see Figure 15). This confirms that capital income has played a key role in the decline of top income shares during the first half of the 20th century.

4.3 The increase in top shares since the 1970s

Many studies have documented the increase in inequality in the US since the 1970s (see e.g., Katz and Murphy (1992)). Our evidence on top shares is consistent with this evidence. After the WWII compression, the high middle class fractiles below the top percentile recovered slowly and continuously from the 1950s to the 1990s. They reached the pre-WWII level in the beginning of the 1980s. As described above, the recovery process for the top groups did not begin until the 1970s and was much faster than for lower fractiles. In accordance with results obtained from the March Current Population Surveys (see e.g. Katz and Murphy (1992), Katz and Autor (1999)), we find that wage inequality starts to increase in the early 1970s. This is in contrast with results from the May Current Population Surveys (see DiNardo et al. (1996)) suggesting that the surge in wage inequality is limited to the 1980s.

⁴¹ Occupational ratios evidence presented by Goldin and Katz (1999) suggests that this was also a period of sharp wage compression but that most of that compression was reversed after a few years. From this evidence alone, as discussed above, it is difficult to assess whether top wage shares were higher in the first decade of the 20th century than during the inter-war period.

From 1970 to 1984 the share of the top 0.1% doubled from 1% to 2%. From 1986 to 1988, the top shares of wage earners increased sharply, especially at the very top. This sharp increase has been documented by Feenberg and Poterba (1993) and is certainly attributable at least in part to fiscal manipulation following the large top marginal tax rate cuts of the Tax Reform Act of 1986 (see the discussion in Section 3 above). However, from 1988 to 1994, top wage shares stay on average constant,⁴² but increase very sharply from 1994 to 1998.⁴³ While everybody acknowledges that tax reforms can have large short-term effects on reported incomes due to retiming, there is a controversial debate on whether changing tax rates can have permanent effects on the level of reported incomes. As discussed in Section 3 above, Poterba and Feenberg (1993, 2000) looking at top income shares series ending in 1995 argue that the surge after TRA of 1986 looks permanent. However, completing the series up to 1998 casts doubts on the interpretation that tax cuts can have lasting effects on reported wages.⁴⁴

Insert Figure 18: top 100 CEOs' average pay versus average wage from 1970 to 1999.

To cast additional light on this issue, we look at CEO compensation from 1970 to 1999 using tables published by Forbes magazine since 1971 and providing compensation levels and composition for CEOs in the 800 largest publicly traded US corporations. Figure 18 displays the average real compensation level (including stock-option exercised) for the top 100 CEOs from the Forbes list, along with the compensation of the 50th and 100th ranked CEO,

⁴² One can note the surge in high wages in 1992 and the dip in 1993 and 1994 due to retiming of labor compensation in order to escape the higher rates enacted in 1993 (see Goolsbee (2000)).

⁴³ Part of the recent increase in top wages is due to the development of stock-options that are often exercised in a lumpy way. This phenomenon introduces some upward bias in our annual shares at the very top (top 0.1% and above).

⁴⁴ A rigorous proof of our short-term effect interpretation would require a panel to top wage earners to analyse whether the surge in wages from 1986 to 1988 was mainly the consequence of retiming by a fraction of individuals.

and the salary plus bonus level of the top 10th salary and bonus earner among the top 100 CEOs. As a comparison, we also report the average wage of a full-time worker in the economy. This figure provides two interesting results. First and consistent with the evolution of top wage shares, average CEO compensation has increased faster than average wage since the early 1970s. This suggests that the increase in pay gap between top executives and the average worker cannot be attributed only to the tax episodes of the 1980s. Second, the timing of the increase in CEO pay is different from the evidence from tax returns. Contrary to tax return evidence, CEO pay does not seem to increase sharply between 1986 and 1988. Large increases took place in the early 1980s and later in the 1990s.

By the end of the 20th century, top wage shares are higher than in the inter-war period. These results confirm our previous findings on overall income. Labor income inequality after a period of compression from 1940 to 1960 has recovered the pre-war level in the 1980s. The current top wage earners should be able to accumulate amounts of wealth much larger than in the earlier decades. If progressive taxation of income and estates does not counteract this new phenomenon, inequality in wealth and capital income should also start to increase sharply during the next few decades.

4.4. Proposed interpretation: the role of social norms

The pattern of top shares over the century is striking: most of the decline from 1927 to 1960 took place during the four years of World War II. The extent of that decline is large, especially for very high wages. More surprisingly, there is no recovery after the war. We are of course not the first ones to document compression in wages during the 1940s. The social security administration in the *Handbook of Old-age and Survivors Insurance statistics* (1949) has shown that the Lorenz curve of wages in 1949 displays much more equality than the 1938 Lorenz curve. In a widely cited paper, Goldin and Margo (1992), using Census micro data for 1939 and 1949, have also noted that the ratios P90/P10 and

P50/P10 have declined sharply during that decade. However, our annual series allow us to conclude that most of the decline took place during the key years of the war with no previous decline in inequality before and no recovery afterwards.⁴⁵

This evidence cannot be immediately reconciled with explanations of the reduction of inequality based on technical change (Williamson and Lindert (1980)) or changes in the relative supply of educated workers put forward by Goldin and Margo (1992) and Goldin and Katz (1999).⁴⁶ The compression of wages during the war can be explained by the wage controls of the war economy, but how can we explain the fact that high wage earners did not recover after the wage controls were removed? We think that this pattern of evolution of inequality is indirect evidence that non-market mechanisms such as social norms regarding inequality play an important role in the setting of the level of the high salaries. The Great depression and the war have without doubt had a profound effect on social norms regarding inequality. Starting in 1932, during the worst part of the Great depression, the Roosevelt administration decided to increase substantially the top rates of the income tax from 20% to 55%, and then to 75% in 1936. During the war, top rates were increased again to 82% in 1942, and 91% in 1944. During the same period, large redistributive programs such as Social Security, and Aid for Families with Dependent Children were initiated. These strongly redistributive policy reforms show that American society's views on income inequality and redistribution had changed dramatically from 1930 to 1945. It is also important to note that unionisation increased substantially from 1929 to 1950 and that unions have been traditionally in favor of wage compression. In that context, it is perhaps not surprising that the high wages earners which were the most severely hit by the war wage controls were simply

⁴⁵ As discussed above, our evidence is consistent with the new occupational ratios series constructed by Goldin and Katz (1999).

⁴⁶ Goldin and Margo (1992) and Goldin and Katz (1999) also note that WWII had a very strong wage equalization effect. Goldin and Margo (1992) conclude however that much of the compression is due to an increased demand for unskilled labor when educated labor was greatly expanding rather than the direct effects of WWII labor regulations. Goldin and Katz (1999) put more emphasis of the two World War episodes and conclude that most of the narrowing of the wage structure in the first part the century occurred in WWI and WWII.

not able, because of social and union pressure, to increase their salaries back to the pre-war levels in relative terms.^{47 48} Similarly, the huge increase in top wage shares since the 1970s is hard to interpret as the consequence of technical change. First, the increase is very large, and concentrated among the highest income earners. The fractiles P90-95 and P95-99 experienced a much smaller increase than the very top shares since the 1970s. Second, such a large change in the very top wage earners has not taken place in most European countries which experienced the same technical change as the US. For example, Piketty (2001a, 2001b) documents no change in top wage shares in the last decades in France.⁴⁹

There is a large literature on the determinants of executive and CEO compensation (see Murphy (1999) for a survey). In the standard neo-classical model, executive pay should be determined by marginal productivity. It is obviously very difficult, if not impossible, to measure executive productivity. Therefore, most of the literature focuses not on explaining the absolute levels of executive pay but rather how executive pay varies with observable firm and individual characteristics and outcomes. A recent study by Bertrand and Mullainathan (2000) has shown that CEOs' pay reacts to shocks outside of CEOs control, such as oil price shocks, which suggests that the standard model where compensation equals marginal productivity is excessively naïve. Many studies have pointed out the role of social norms in wage determination (see e.g. Brown (1977)). Recently, Rotemberg (1996) and Atkinson (1999) have proposed models where individual productivity is imperfectly observed which generate a positive

⁴⁷ Emphasizing the role of social norms and unionization is of course not new and has been pointed out as important elements explaining the wage compression of the 1940s and 1950s by several studies (see Goldin and Margo (1992) and Goldin and Katz (1999)).

⁴⁸ Moreover, as emphasized by Goldin and Margo (1992) and Goldin and Katz (1999), it is possible that the large increase in the supply of college graduates contributed to make the drop in top wage shares persistent.

⁴⁹ DiNardo et al. (1996) argue that changes in institutions such as the minimum wage and unionization account for a large part of the increase in wage inequality in the U.S. from 1973 to 1992. As emphasized by Acemoglu et al. (2001), it is possible that these changes in institutions have been triggered by previous technological changes which made it impossible to sustain previous labor market arrangements.

connection between employees' perception of fairness or firms' horizon and income equality.

If social norms play indeed a key role in the determination of top salaries, this suggests that the top wage shares evolution cannot be easily predictable and might experience new large fluctuations in the future. Even though top salary shares may have reached today levels higher than ever before in the American history, a public outcry against these high inequality levels does not seem perceptible for the time being.

5. Comparison with Other Countries

To what extent is the U.S. experience representative of other developed countries' long run inequality dynamics? Existing inequality series are unfortunately very scarce and incomplete for most countries, and it is therefore very difficult to provide a fully satisfactory answer to this question. In this section, we concentrate for the most part on the France, U.S, and U.K. comparison, using the French and U.K. inequality series recently constructed by Piketty (2001a, 2001b) and Atkinson (2001). Available evidence suggests that the French experience is fairly representative of other continental European countries.⁵⁰

Insert Figure 19: Top decile in France and the US, 1913-1998

Insert Figure 20: Top percentile in France and the US, 1913-1998

Insert Figure 21: Top 0.1% in France, the U.K. and the US, 1913-1998

There are important similarities between the French, the British, and the American experience displayed on Figures 19, 20, and 21.⁵¹ In all three

⁵⁰ One important exception is worth mentioning: the very quick recovery of wage inequality observed in France during the 1950s-1960s seems to be a French specificity (this apparently did not happen in Germany and in Scandinavian countries).

⁵¹ The UK super-tax was characterized by very large exemption levels prior to WWII, and the number of super-tax taxpayers was extremely small. This explains why Atkinson (2001) was not able to construct top decile and top percentile series covering the entire century (only the top 0.1% and higher fractiles series covers the entire century). Consequently, the UK only appears on

countries, top capital incomes fell considerably during the 1914-1945 period, and they were never able to come back to the very high levels observed at the eve of WWI or during the 1920s. The timing of the fall, together with the fact that the very top incomes account in all countries for a disproportionate share of the total decline in inequality, suggest that the same basic mechanism has been at work. In France, the U.K., and in the U.S., and probably in other developed countries as well, top capital incomes have been hit by very strong shocks during the 1914-1945 period (depression, wars, inflation), and the dynamic effects of progressive taxation on capital accumulation and wealth concentration probably explain to a large extent why large fortunes never recovered from these shocks.

The French experience also shows in a very clear way that there was no spontaneous decline of wage inequality during the first half of the 20th century. In France, wage inequality declined during WWI, but it quickly recovered during the 1920s and was pretty stable until WWII. Our U.S. wage inequality series, though starting later than the French wage inequality series constructed by Piketty,⁵² are consistent with these findings.⁵³

Some important differences between the three countries need however to be emphasized. First, the shocks incurred by top capital incomes during the 1914-1945 period were more pronounced in the U.K. and especially in France than in the United States. This explains why the top percentile income shares dropped from about 20% in 1913 to 7.5% in 1945 in France and from about 18% in 1913 to 11% in 1945 in the United States. This is consistent with the fact that capital owners suffered from physical capital loss during the war in France (and to a lesser extent in the U.K.), while there was no destruction on U.S. soil.⁵⁴

figure 21 (Atkinson's top 0.1% series ends in 1994, and the 1998 value was extrapolated using Atkinson's top 1% and 0.5% series).

⁵² Another advantage of the French wage data is that it is always based upon individual wages (rather than total tax unit wages): the data comes from employers' wage tax returns (rather than employees' income tax returns), and the wage tax was a separate tax computed at the level of individual wages.

⁵³ Atkinson did not attempt to compute comparable wage series for the UK.

⁵⁴ Note however that the Great Depression was more severe in the US (the WWII fiscal shock was also more severe in the US).

Next, the WWII wage compression was very short-lived in France, while it had long lasting effects in the United States. This explains why the top decile income share was larger in France than in the U.S. during the 1950s-1960s (cf. Figure 19). In France, wage inequality, measured both in terms of top decile wage share, top percentile wage share, etc., and in terms of interdecile ratios P90/P10, P90/P50, P50/P10, etc., appears to have been extremely stable over the course of the twentieth century: the WWI and WWII compressions were very short-lived, and the “over-shooting” widening of the 1950s-1960s was counterbalanced by the minimum-wage-driven compression that took place between 1968 and 1982-1983 (since 1983, wage inequality is pretty stable). The U.S. history of wage inequality looks very different: the WWII compression had long-lasting effects, and then wage inequality increased considerably during the 1980s-1990s, which explains the U.S. upturn of top income shares since the 1970s.⁵⁵ The fact that France and the U.S. display such diverging trends seems consistent with the social norms explanation. Note also these diverging trends of the past 30 years explain why the income composition patterns of the rich look so different in France and in the U.S. at the beginning of the 21st century. In France, income composition patterns still look very much like what they did during the interwar period: although wealth concentration is much lower than what it was one century ago, very top incomes are mostly made of dividends. In the US, due to the very large rise of top wages since the 1970s, the coupon-clippers have been overtaken by the CEOs.⁵⁶ Such a pattern might not last for very long, however.

6. Concluding Comments

⁵⁵ The recent U.K. inequality pattern appears to be increasing and intermediate between the U.S. and France.

⁵⁶ Unfortunately, Atkinson (2001) does not provide estimates of the composition of income by fractiles in the U.K. However, it is likely that the composition of top incomes before WWII was also similar to France or the U.S., and that the recent increase in top shares in the U.K. is a wage income phenomenon as in the U.S. These points clearly deserve to be analyzed using the British tax statistics.

This paper has presented new homogeneous series on top shares of income and wages from 1913 to 1998. Perhaps surprisingly, nobody had tried to extend the pioneering work of Kuznets (1953) to more recent years. Moreover, important wage income statistics from tax returns had never been exploited before. The large shocks that capital owners experienced during the Great Depression and World War II seem to have had a permanent effect: top capital incomes are still lower in the late 1990s than before World War I. We have tentatively suggested that steep progressive taxation, by reducing the rate of wealth accumulation, has prevented the large fortunes to recover fully yet from these shocks. The evidence for wage series shows that top wage shares were flat before WWII and dropped precipitously during the war. Top wage shares have started recovering from this shock since the 1960s-1970s and are now higher than before WWII. We have emphasized the role of social norms to explain the pattern of wage shares.

International comparisons show that, although there exists some important cross-country variations (in particular, the sharp inequality upturn observed in the U.S. since the 1970s did not occur in Continental Europe), a number of key conclusions regarding long-run inequality dynamics do hold for all developed countries. In particular, the evidence presented in this paper, together with the evidence on France by Piketty (2001a, 2001b) and the U.K. by Atkinson (2001), strongly suggest that there was no such thing as a “spontaneous”, Kuznets-like decline of inequality in developed countries during the first half of the 20th century. The inequality decline was to a large extent accidental (depression, inflation, wars) and amplified by political factors (progressive taxation). This does not mean that the current rise of inequality will not be followed by a mechanical downturn during the first few decades of the 21st century: this is simply saying that such a mechanical downturn apparently never occurred in the past. Our proposed interpretation also suggests that the decline of progressive taxation observed since the early 1980s (especially in the U.S. and in the U.K.) could very well spur a revival of high wealth concentration and top capital incomes during the next few decades.

Finally, we stress that more research is needed to provide a fully rigorous account of long-run inequality dynamics. We hope that our attempt to construct homogeneous long time series will help researchers to formulate other hypotheses or explanations. We also think that there are still important sources of empirical evidence that could fruitfully be used to cast light on the evolution of income and wage inequality in the United States and other developed countries.

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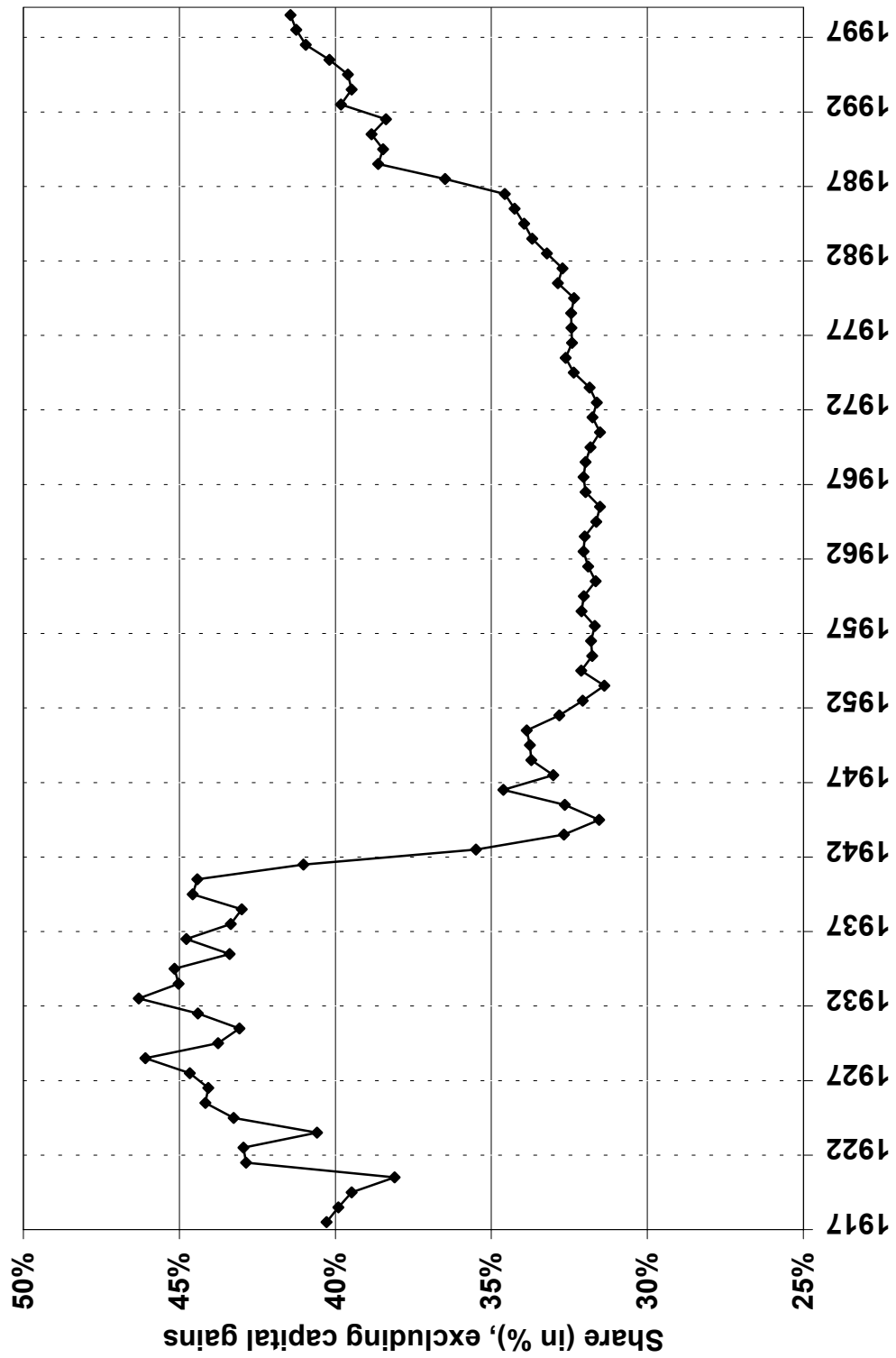
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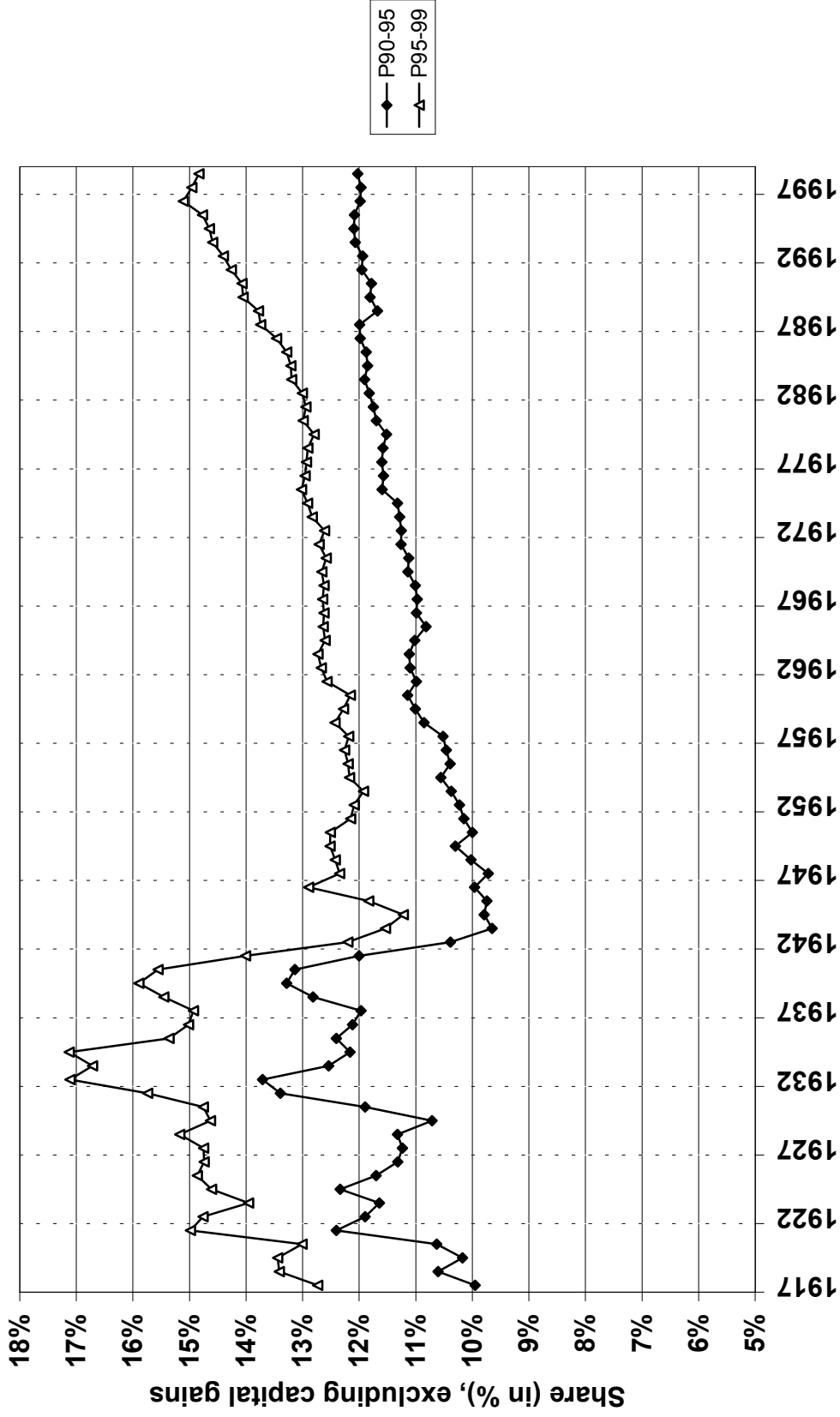
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Figure 1: The top decile income share in the U.S., 1917-1998



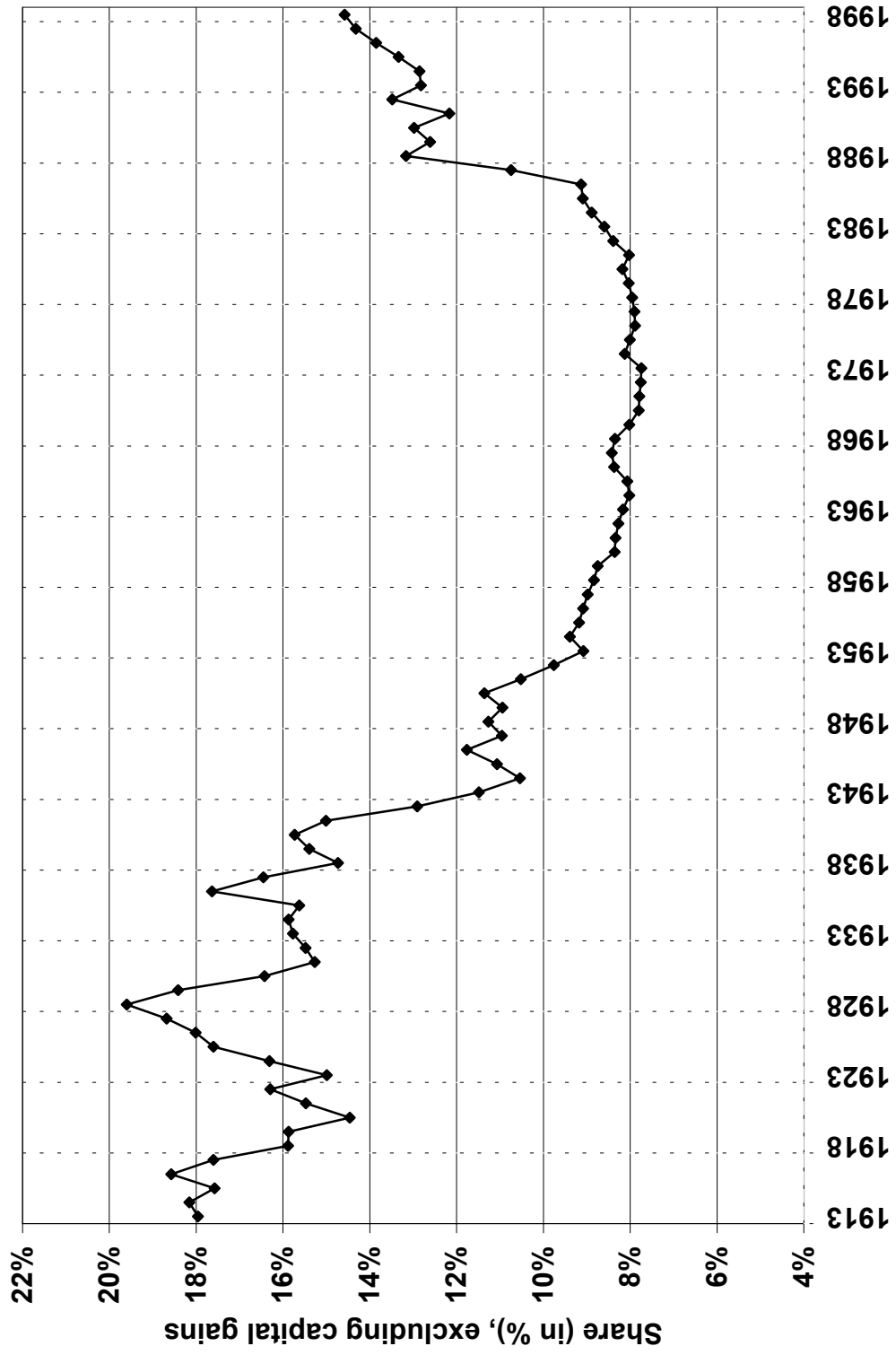
Source: Authors' computations based on income tax returns (table A1, col. P90-100)

Figure 2: The income shares of fractiles P90-95 and P95-99 in the U.S., 1917-1998



Source: Authors' computations based on income tax returns (table A1, col. P90-95, P95-99)

Figure 3: The top centile income share in the U.S., 1913-1998



Source: Authors' computations based on income tax returns, table A1, col. P99-100)

Figure 4: The top 0.01% income share in the U.S., 1913-1998

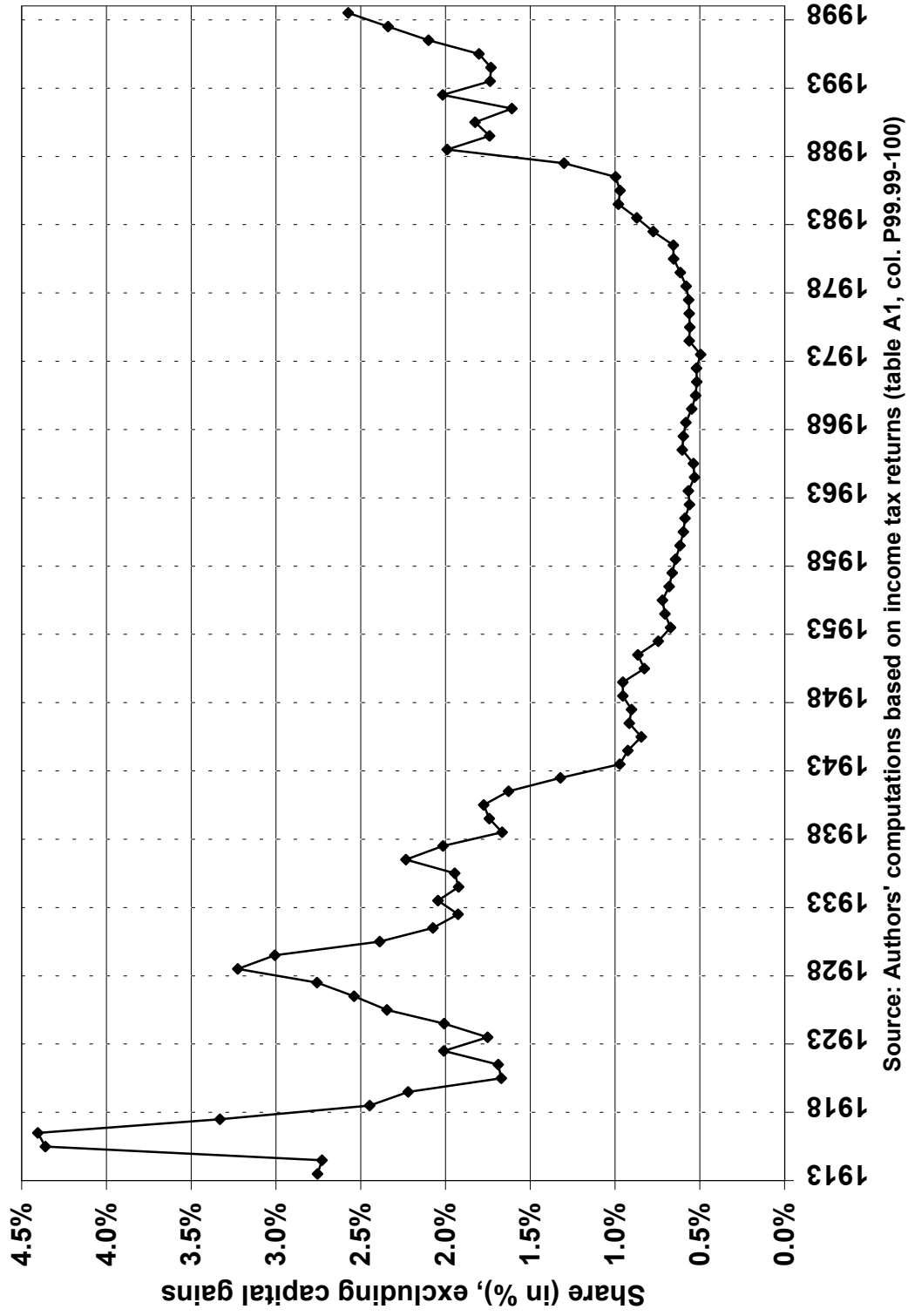
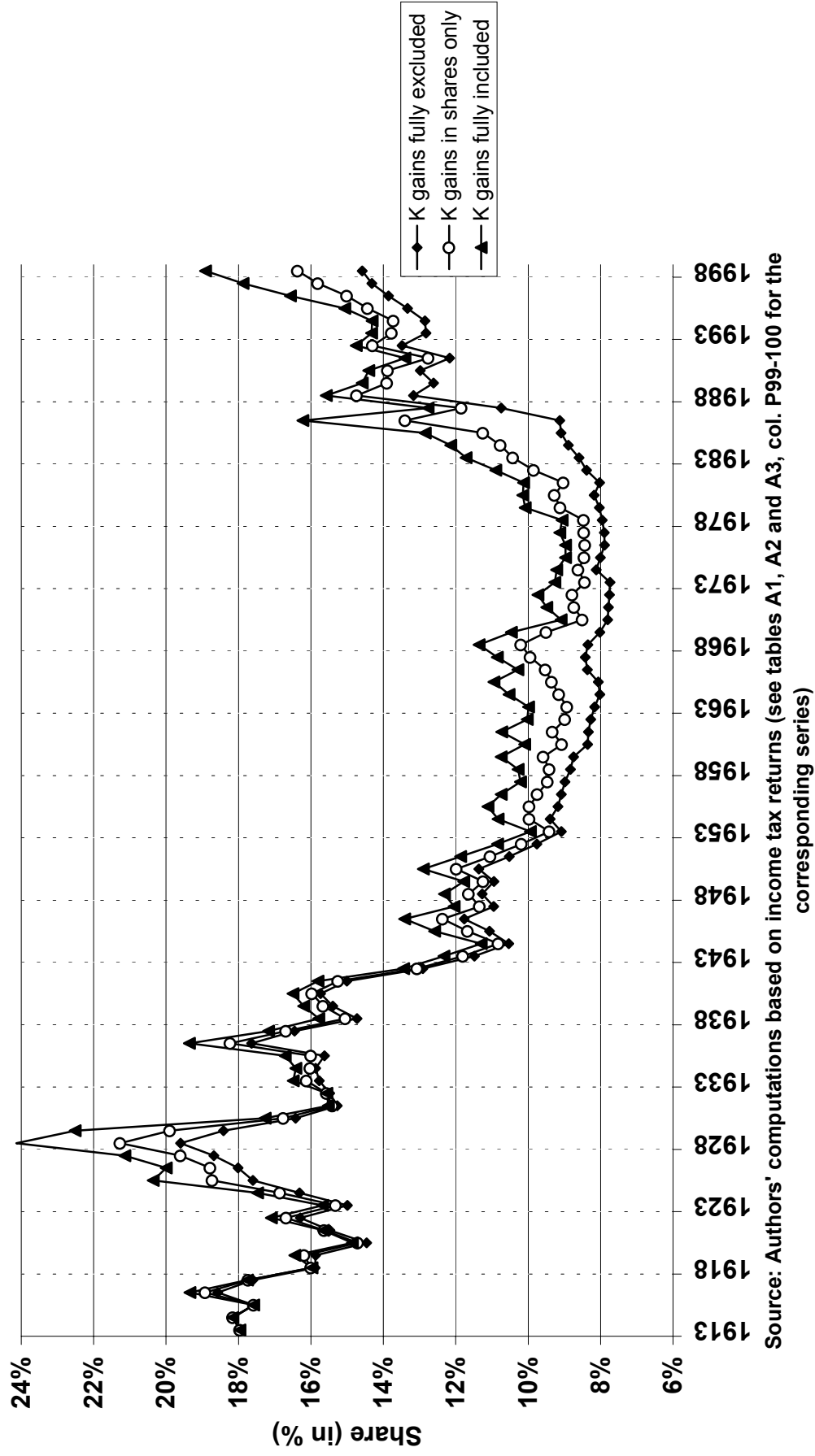


Figure 4B: The top percentile income share in the U.S., 1913-1998



Source: Authors' computations based on income tax returns (see tables A1, A2 and A3, col. P99-100 for the corresponding series)

Figure 5: The income composition of the top fractiles in the U.S. in 1929

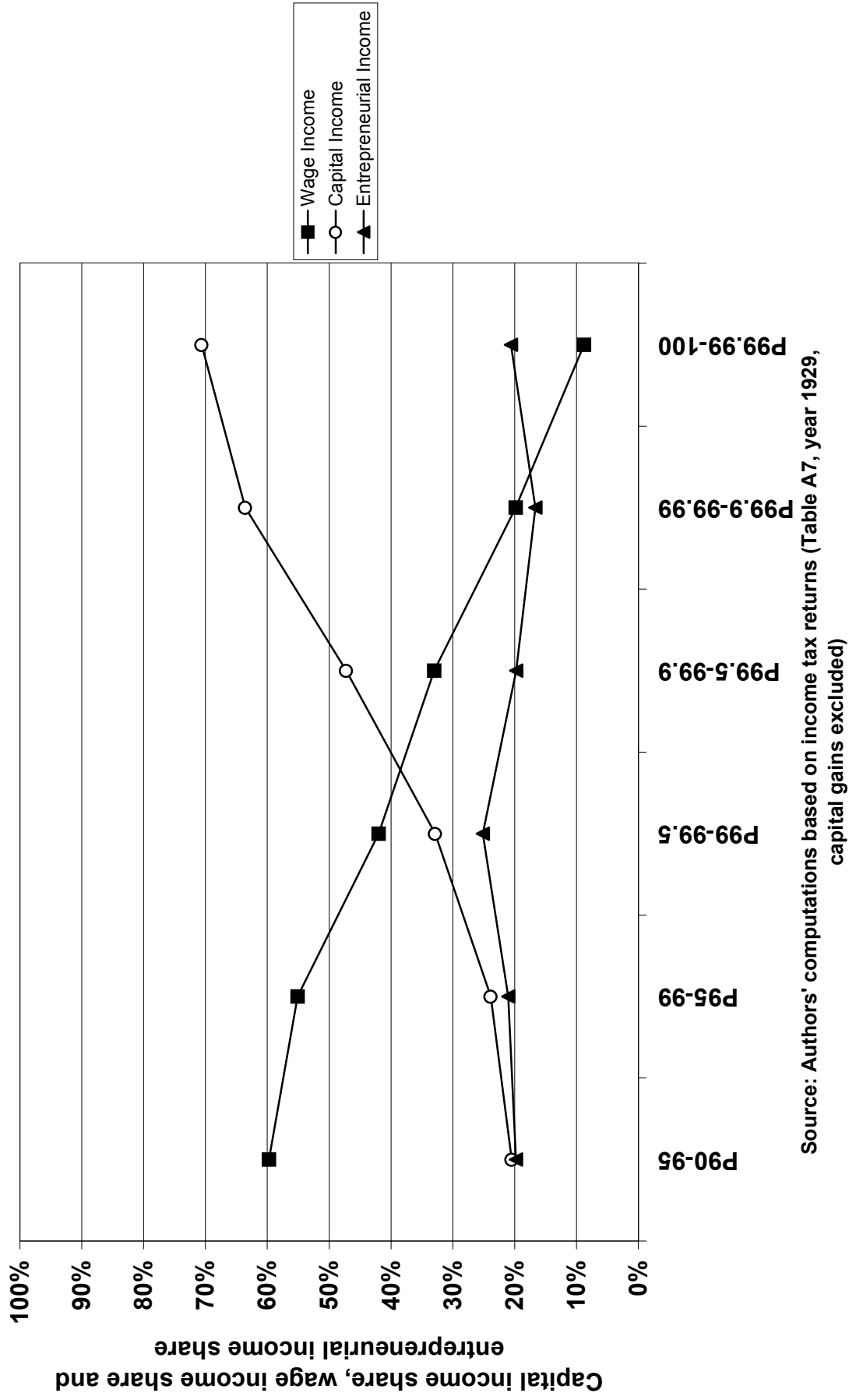
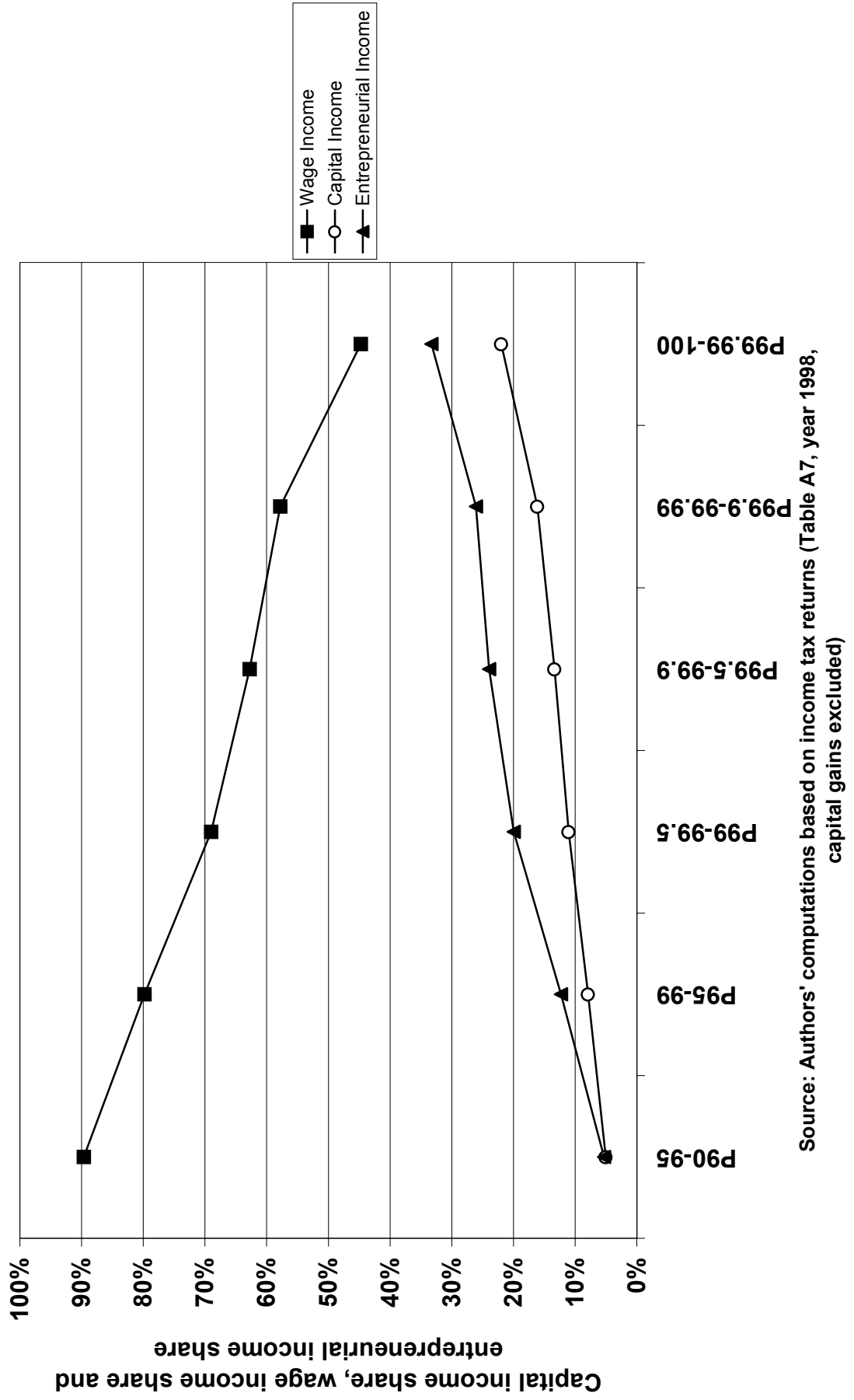
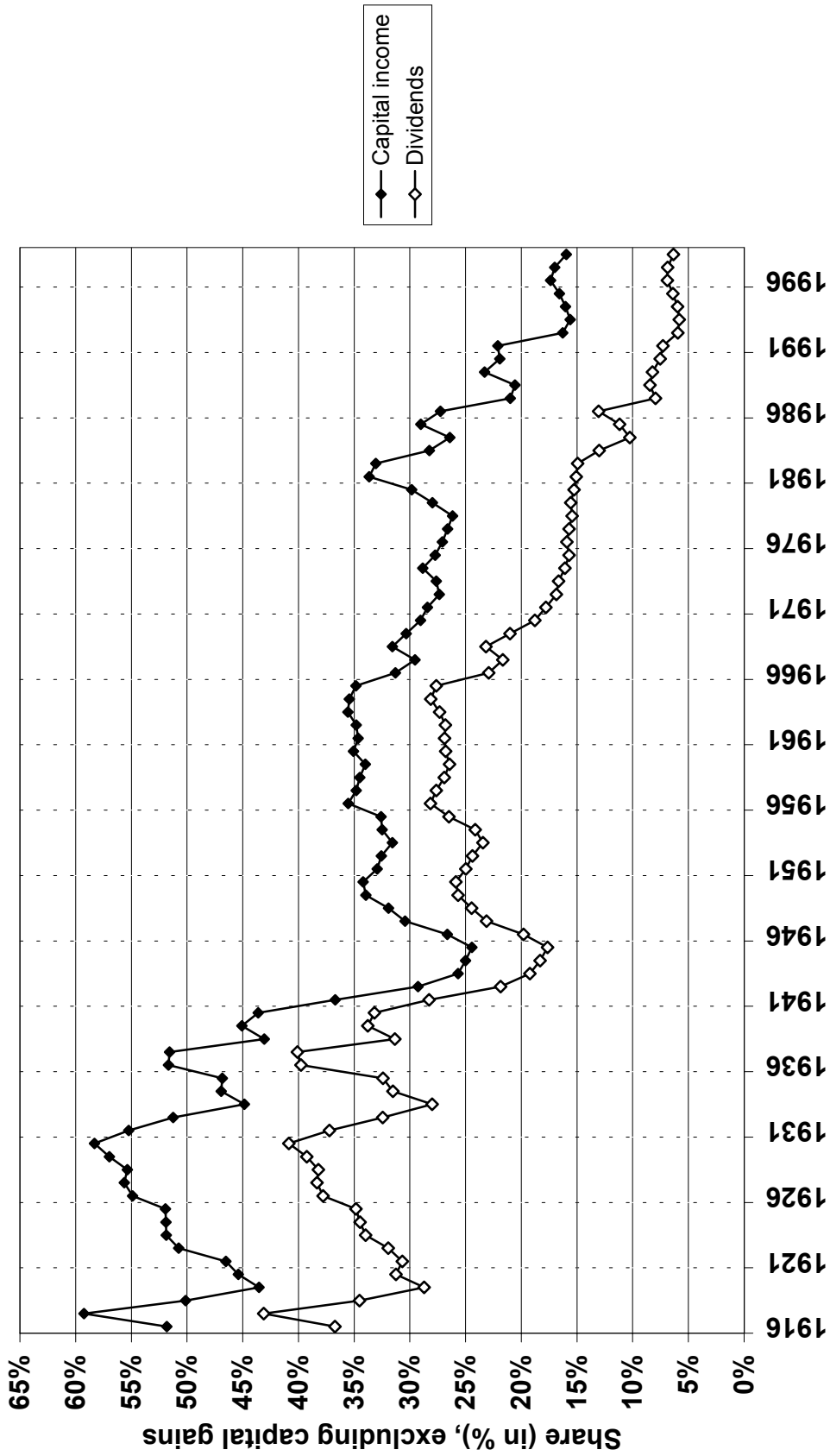


Figure 6 : The income composition of the top decile in the U.S. in 1998



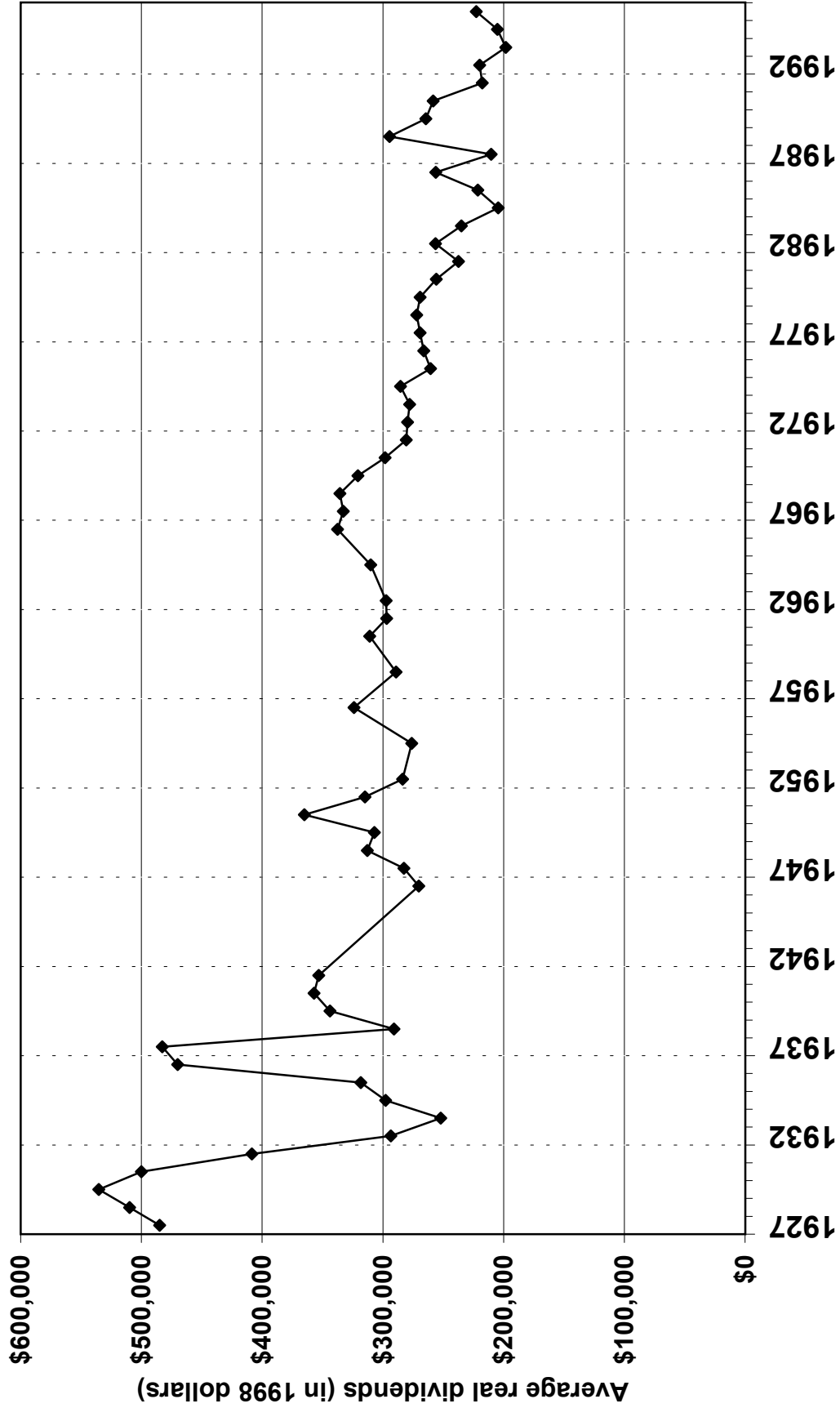
Source: Authors' computations based on income tax returns (Table A7, year 1998, capital gains excluded)

Figure 7: The capital income share in the top 0.5% in the U.S., 1916-1998



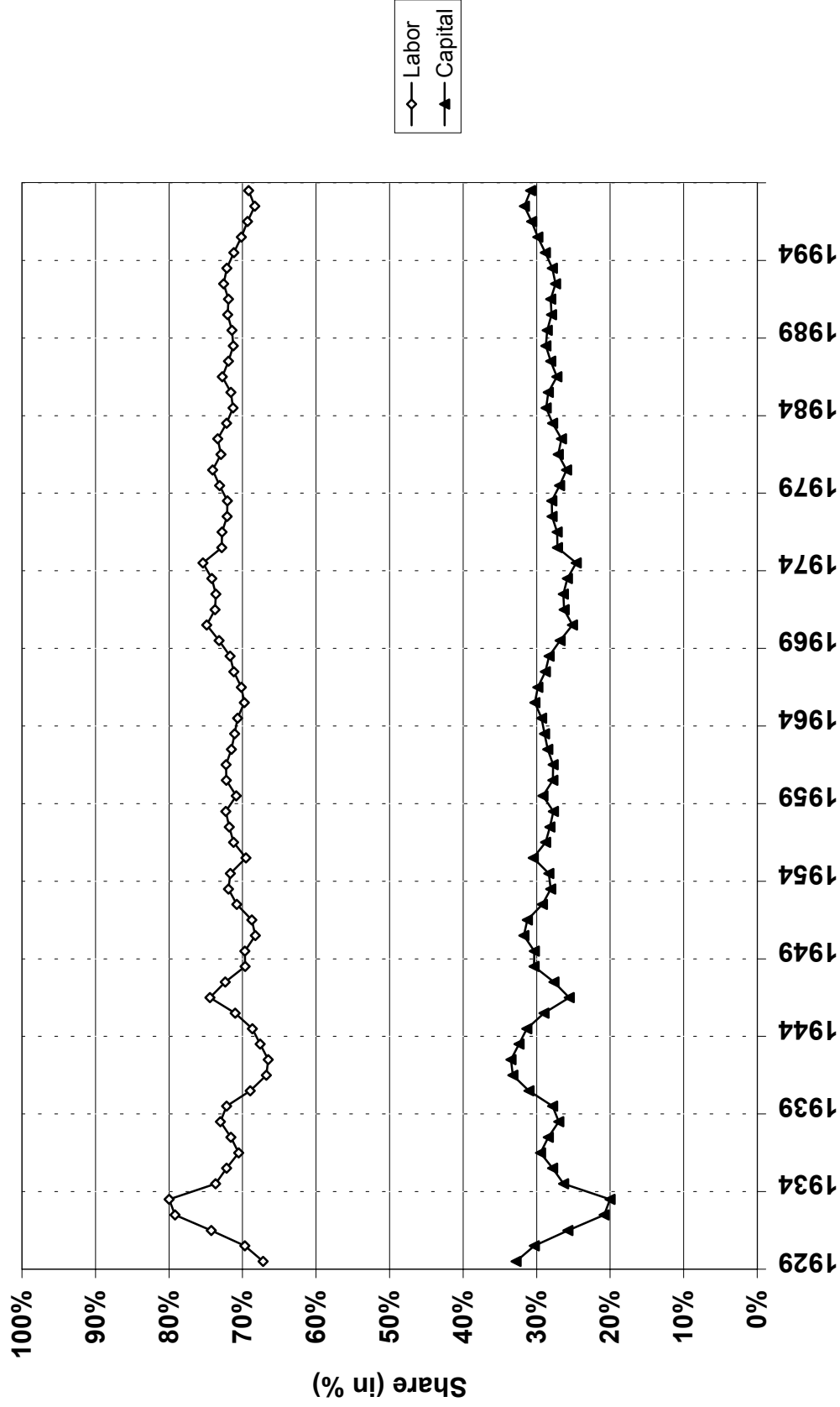
Source: Authors' computations based on income tax returns (Table A4, col. P99.5-100)

Figure 8: Average real dividends of top 0.1% dividend earners, 1927-1995



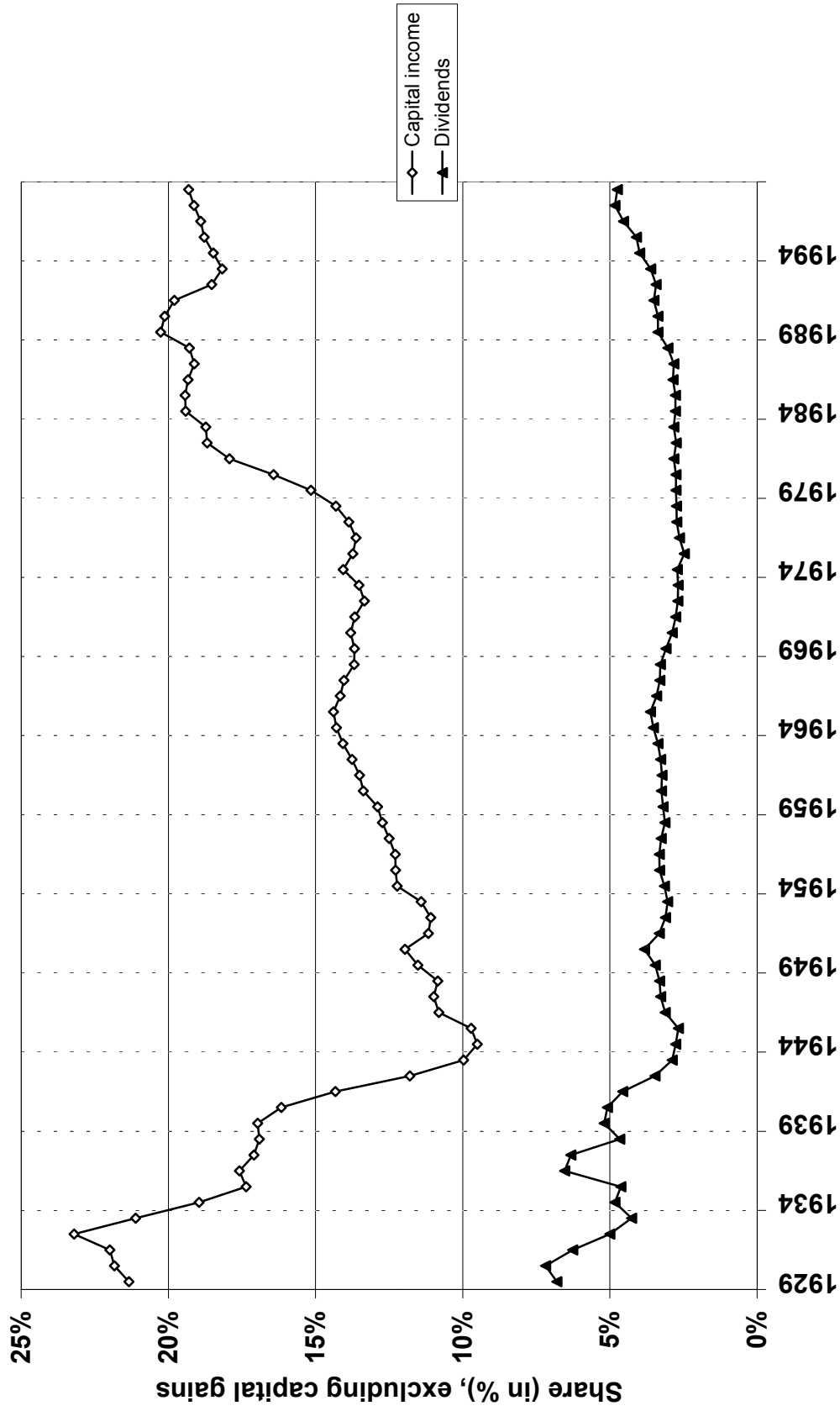
Source: Authors' computations based on income tax returns (Table C1, col. P99.9-100)

Figure 9: Factor shares in the U.S. corporate sector, 1929-1999



Source: Authors' computations based on National Accounts (NIPA Table 1,16; CFC and net interest have been included in the capital share)

Figure 10: The capital income share in the U.S. personal income, 1929-1998



Source: Authors' computations based on National Accounts (NIPA table 2.1; capital income includes dividends, interest and rents)

Figure 10B: Dividends, retained earnings and corporate tax in the U.S., 1929-1950

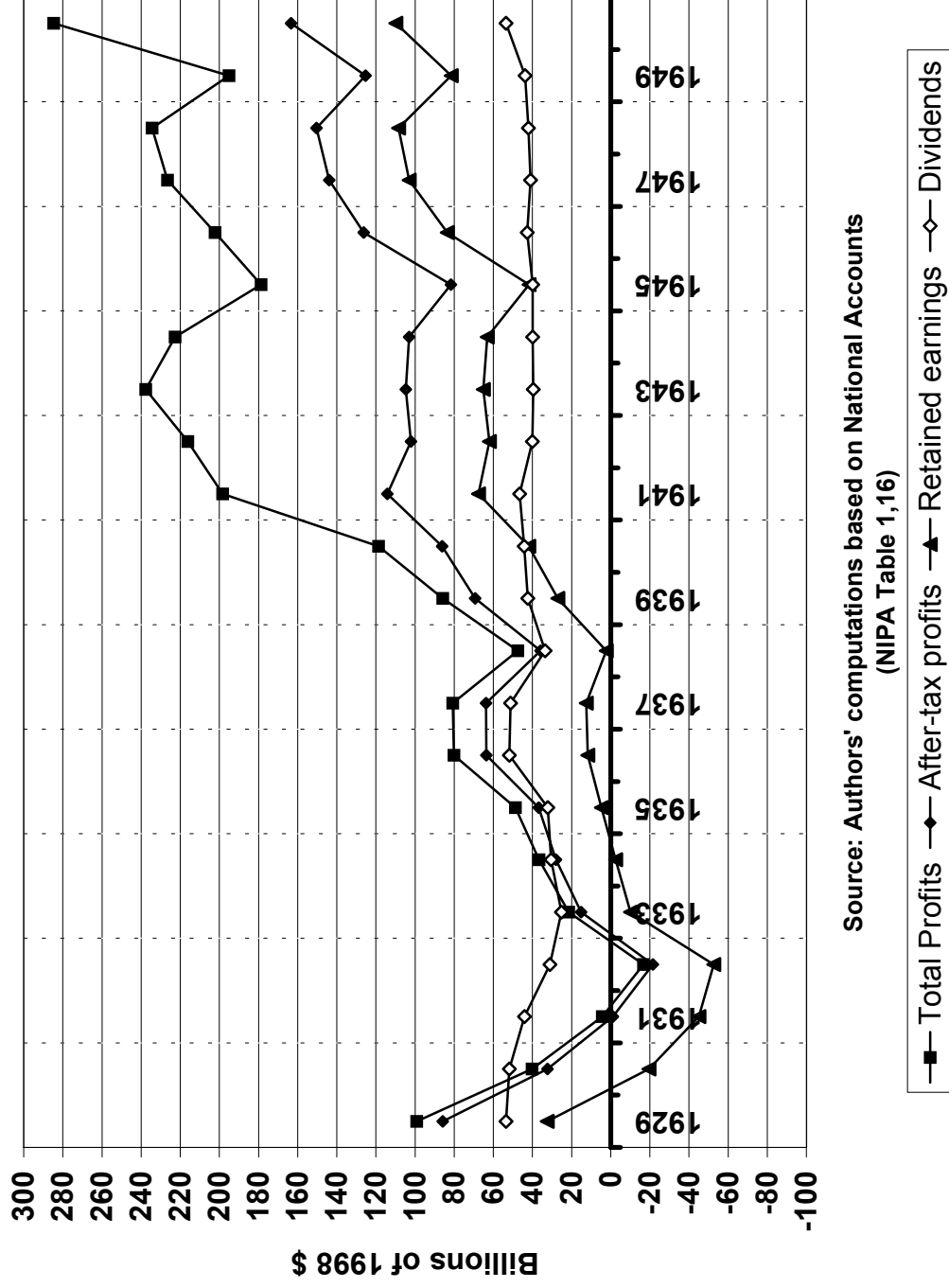
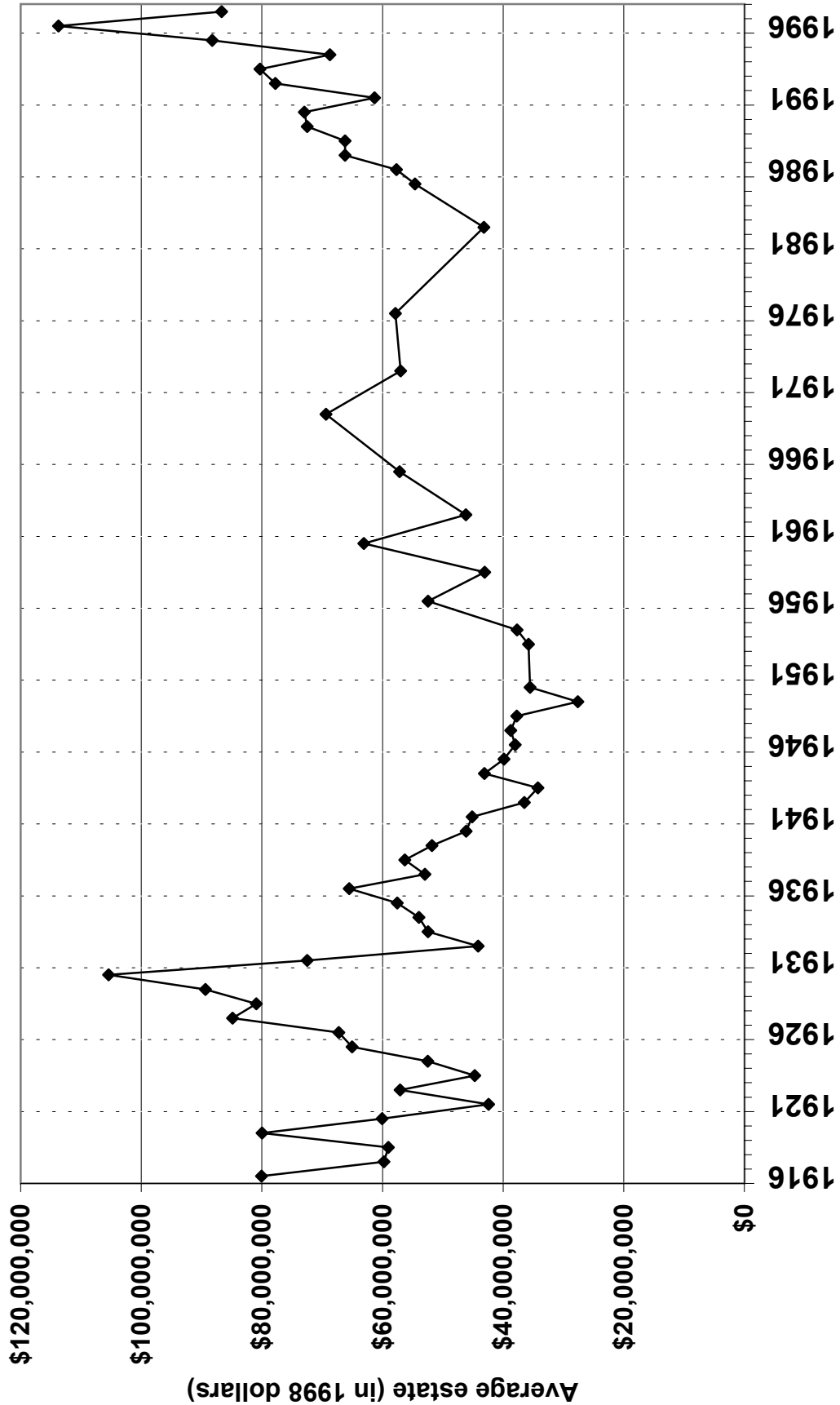
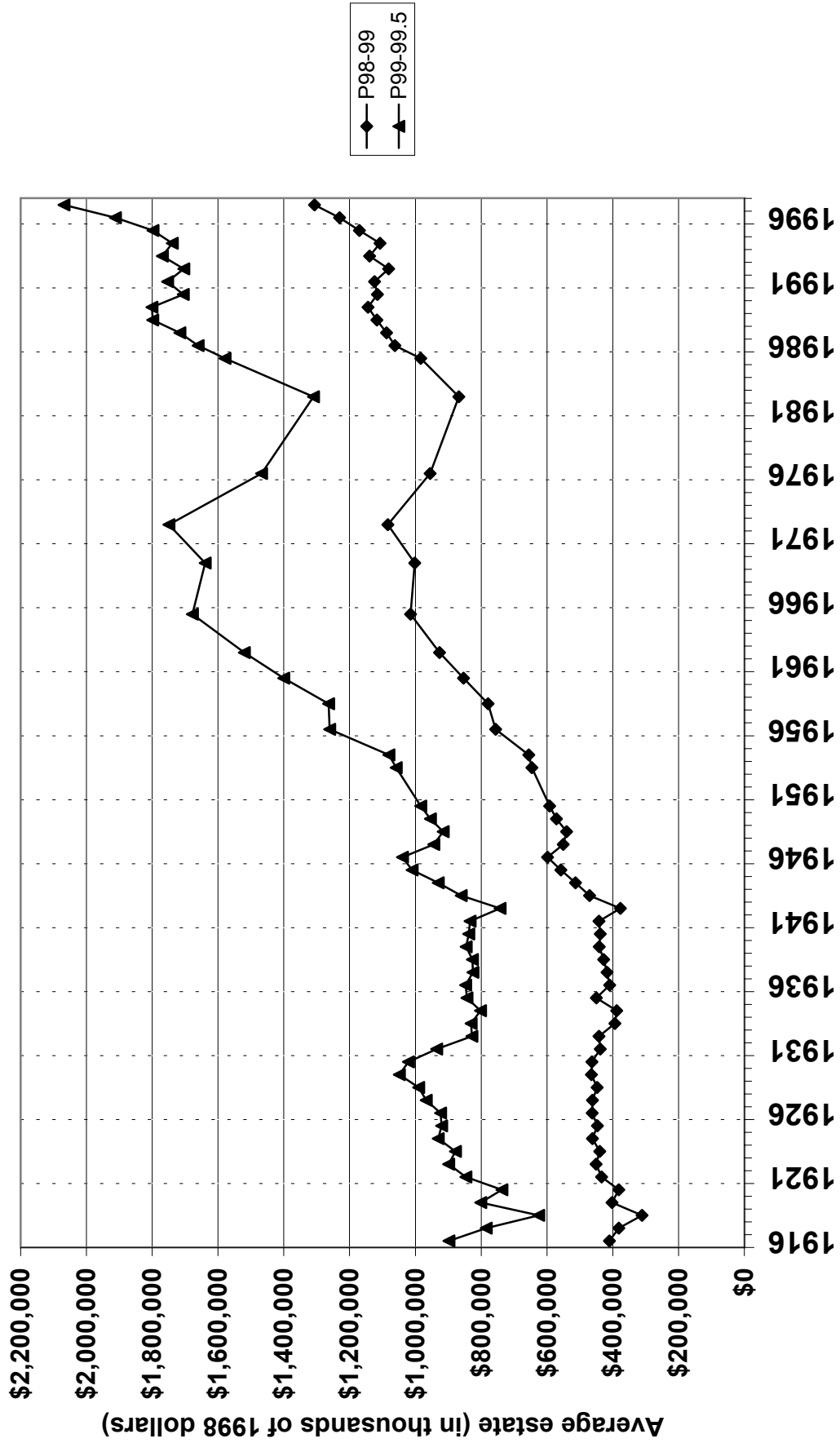


Figure 11: Average estate of top 0.01% decedents, 1916-1997



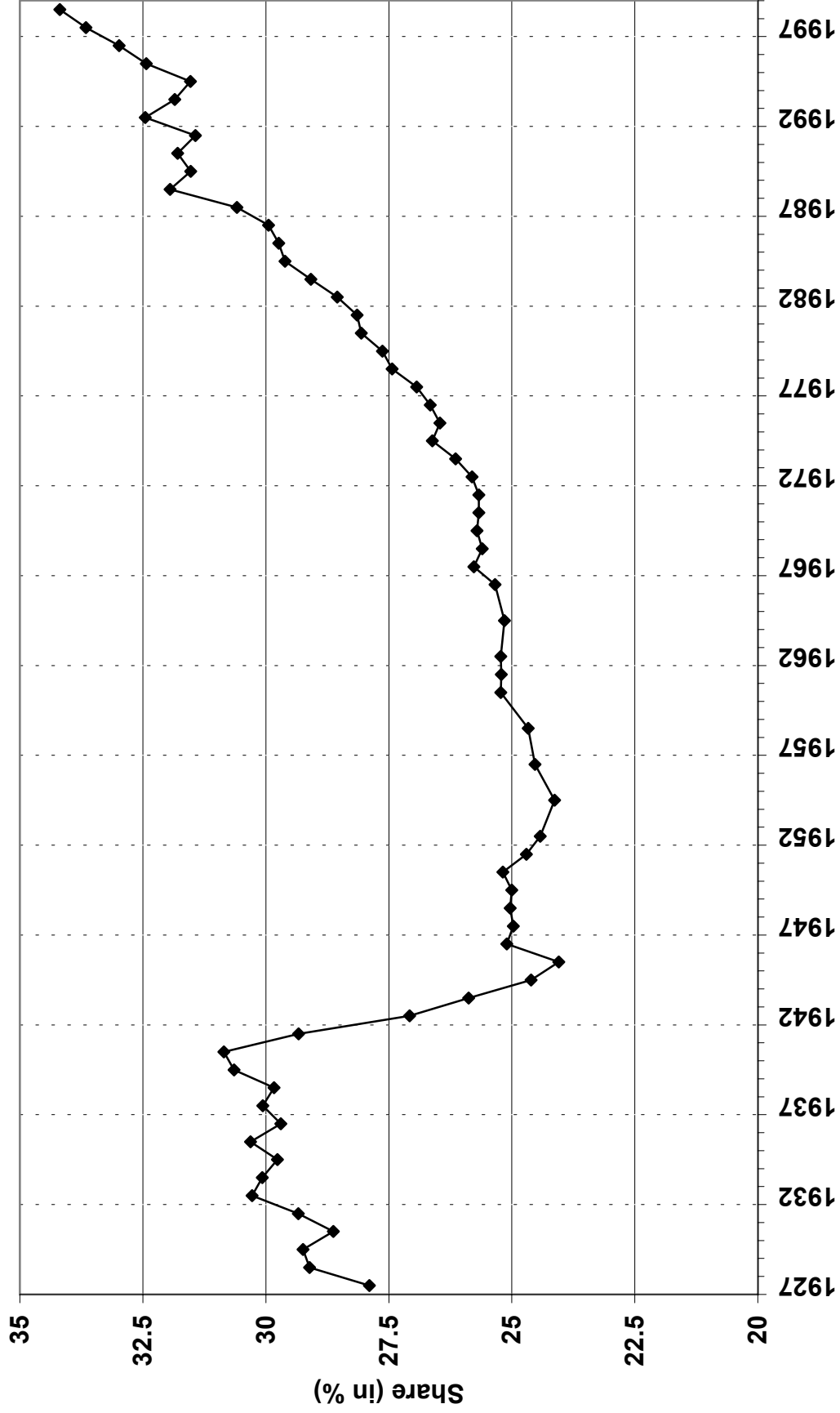
Source: Authors' computations based on income tax returns (Table C3, col. P99.99-100)

Figure 12: Average estate of P98-99, and P99-99.5 decedents, 1916-1997



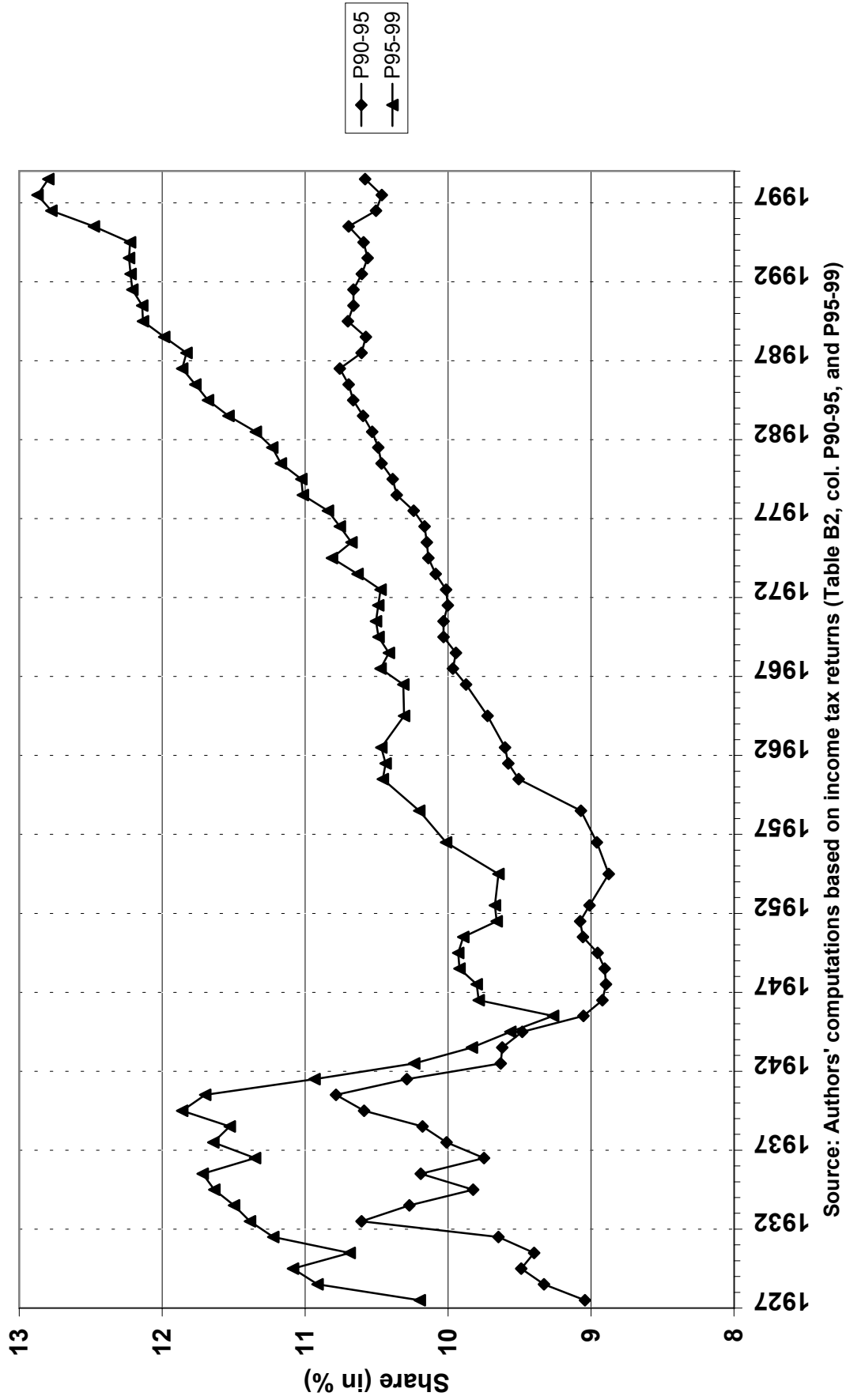
Source: Authors' computations based on income tax returns (Table C3, col. P98-99, and P99-99.5)

Figure 13: Share of top 10% salary earners, 1927 to 1998



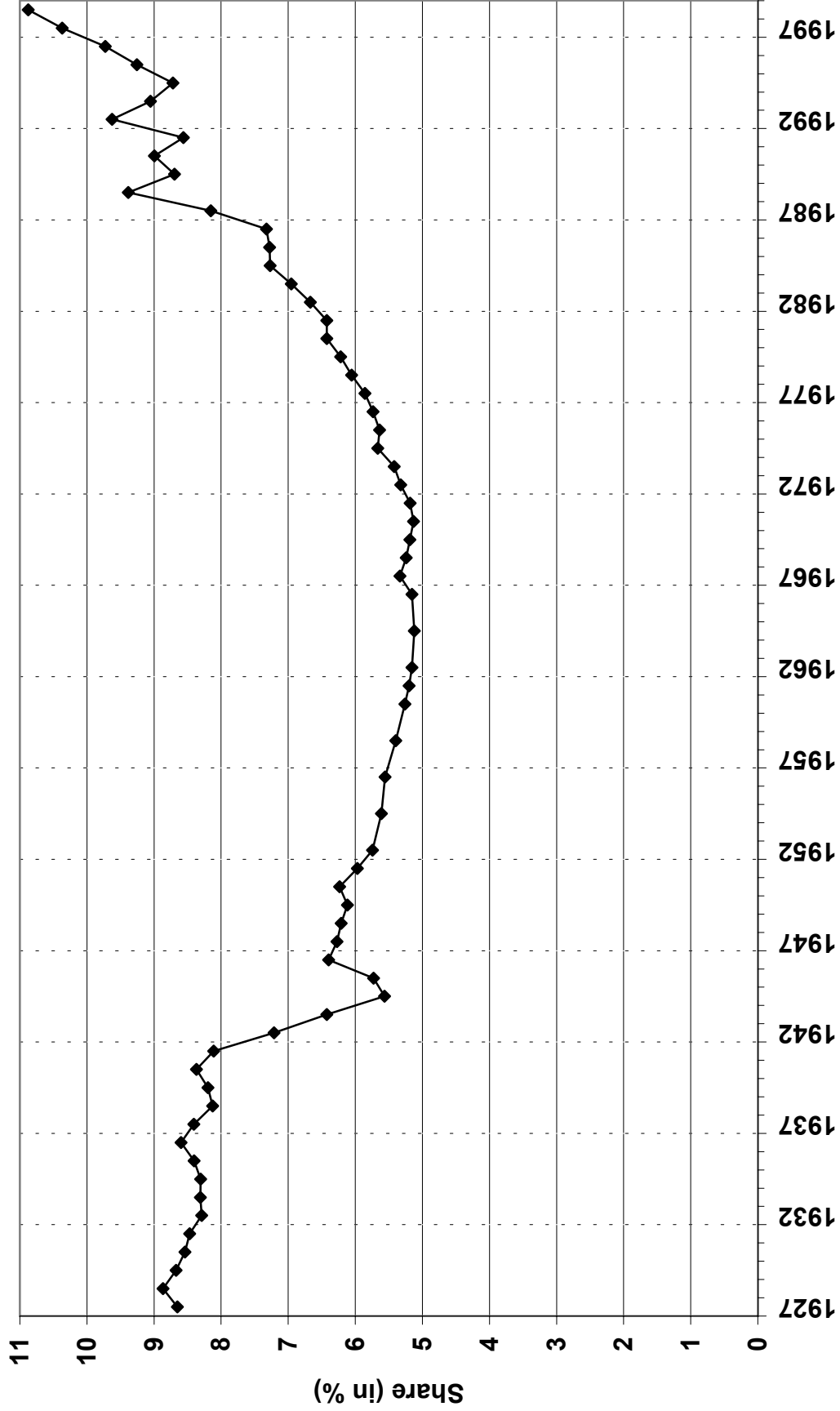
Source: Authors' computations based on income tax returns (Table B2, col. P90-100)

Figure 14: Shares of P90-95 and P95-99 salary earners, 1927 to 1998



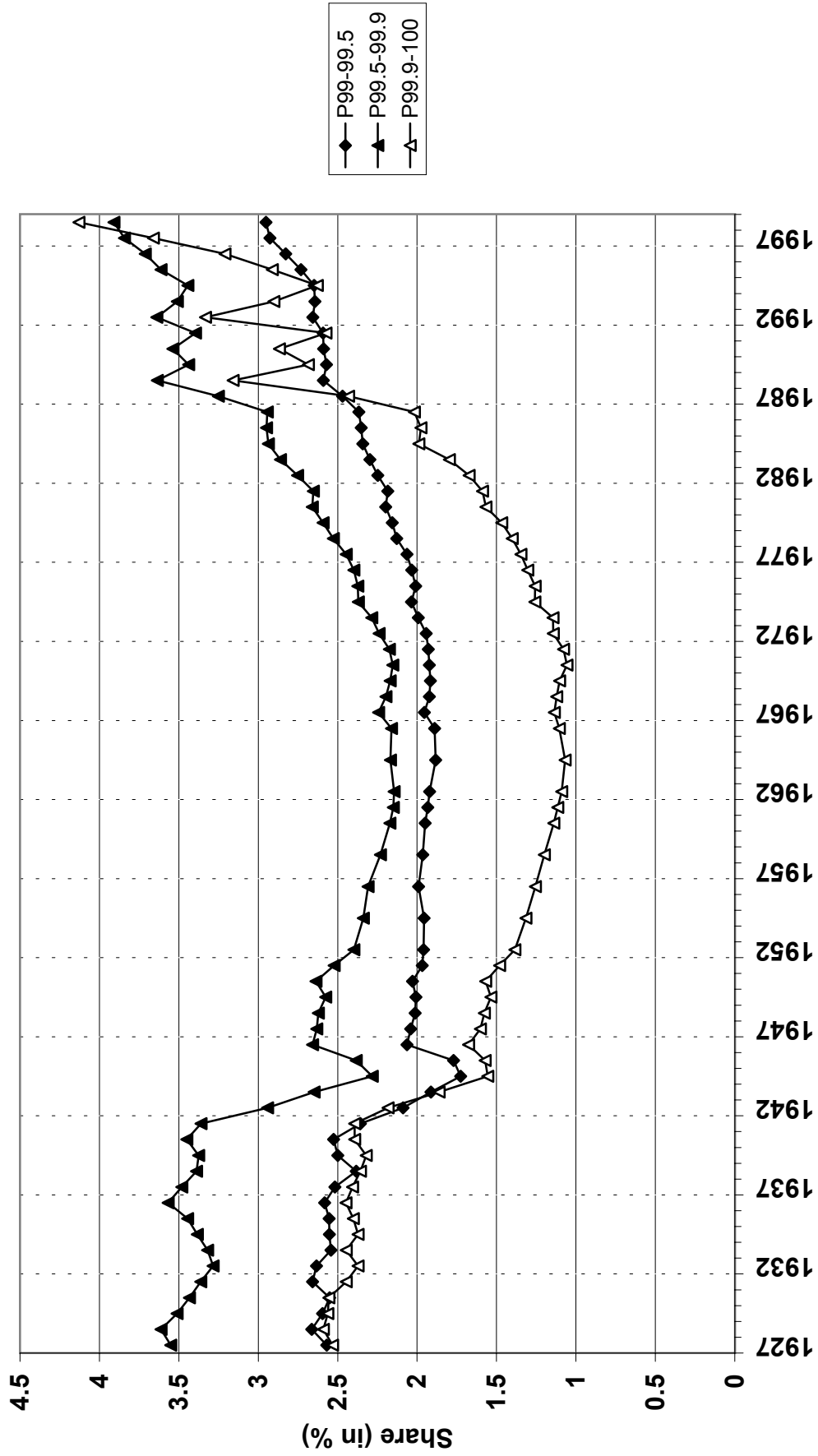
Source: Authors' computations based on income tax returns (Table B2, col. P90-95, and P95-99)

Figure 15: Share of top 1% salary earners, 1927 to 1998



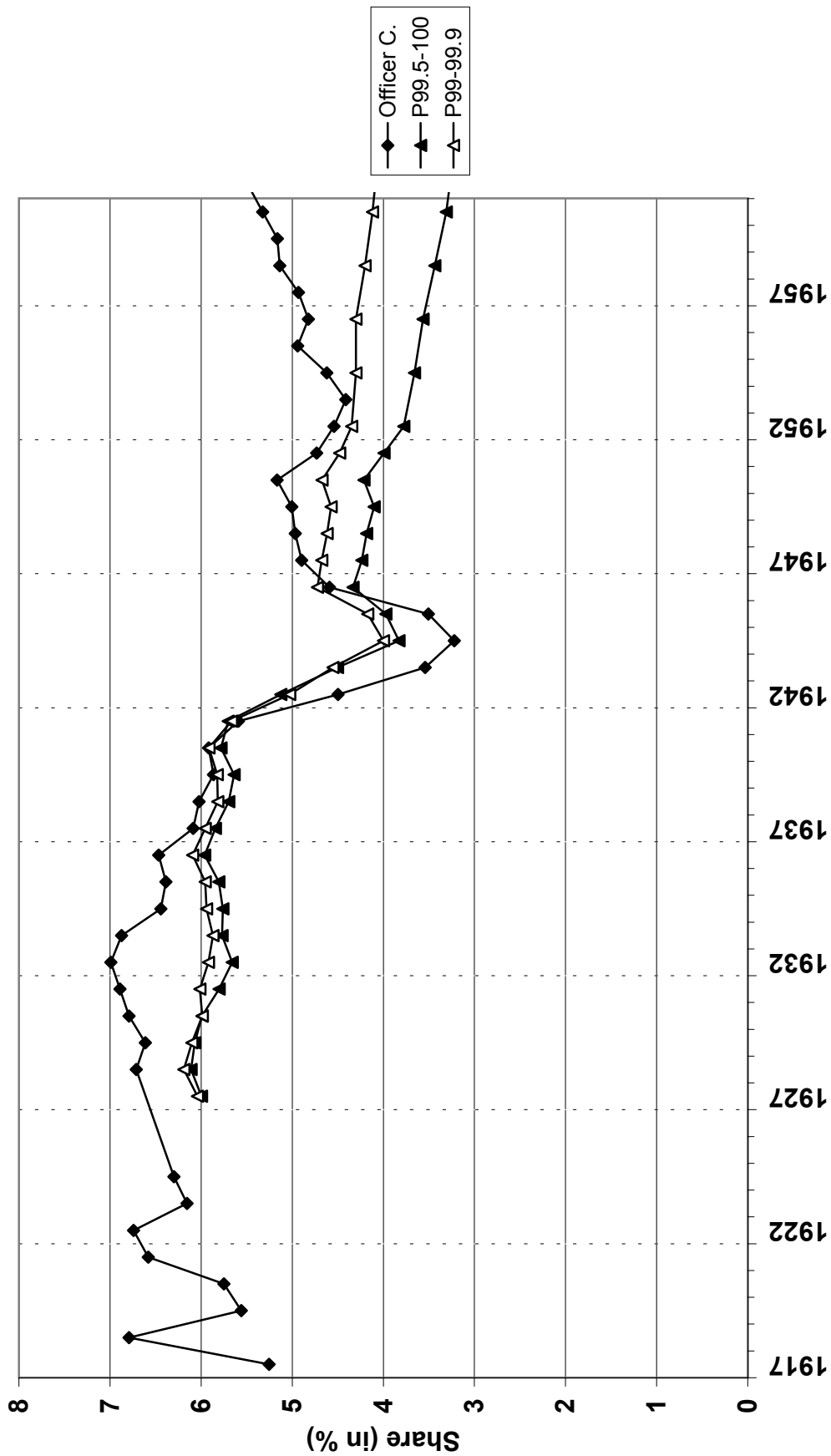
Source: Authors' computations based on income tax returns (table B2, col. P99-100)

Figure 16: Shares of P99-99.5, P99.5-99.9, and P99.9-100 salary earners, 1927 to 1998



Source: Authors' computations based on income tax returns (table B2, col. , P99-99.5, P99.5-99.9, and P99.9-100)

Figure 17: Shares of Officer Compensation, P99.5-100 and P99-99.9 salary earners, 1917-1960



Source: Authors' computations based on income tax returns (table B1, col. Officer comp., and Table B2, col. P99.5-100, and P99-99.5+P99.5-99.9)

Figure 18: CEOs Pay versus Average Salary, 1970–1999

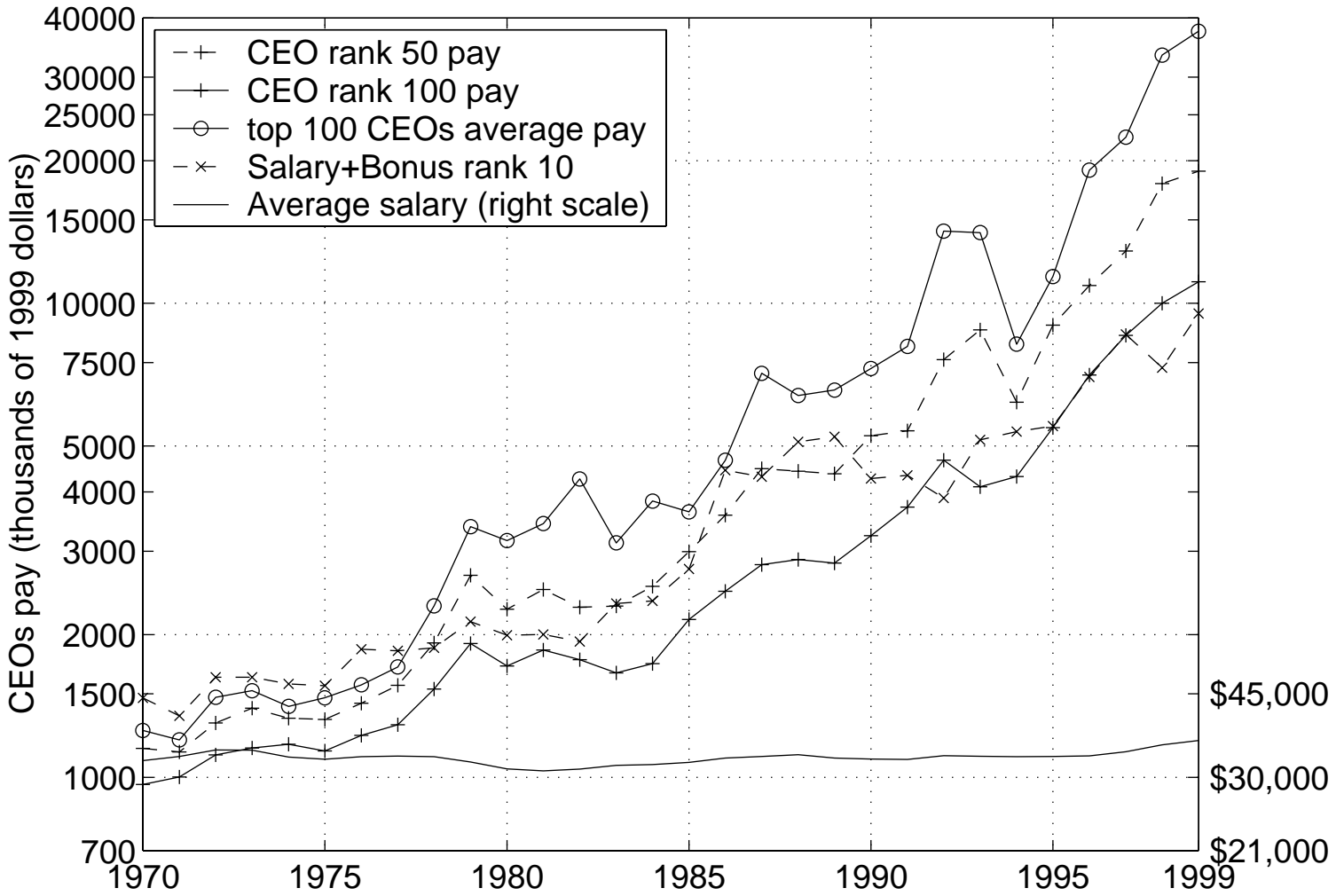
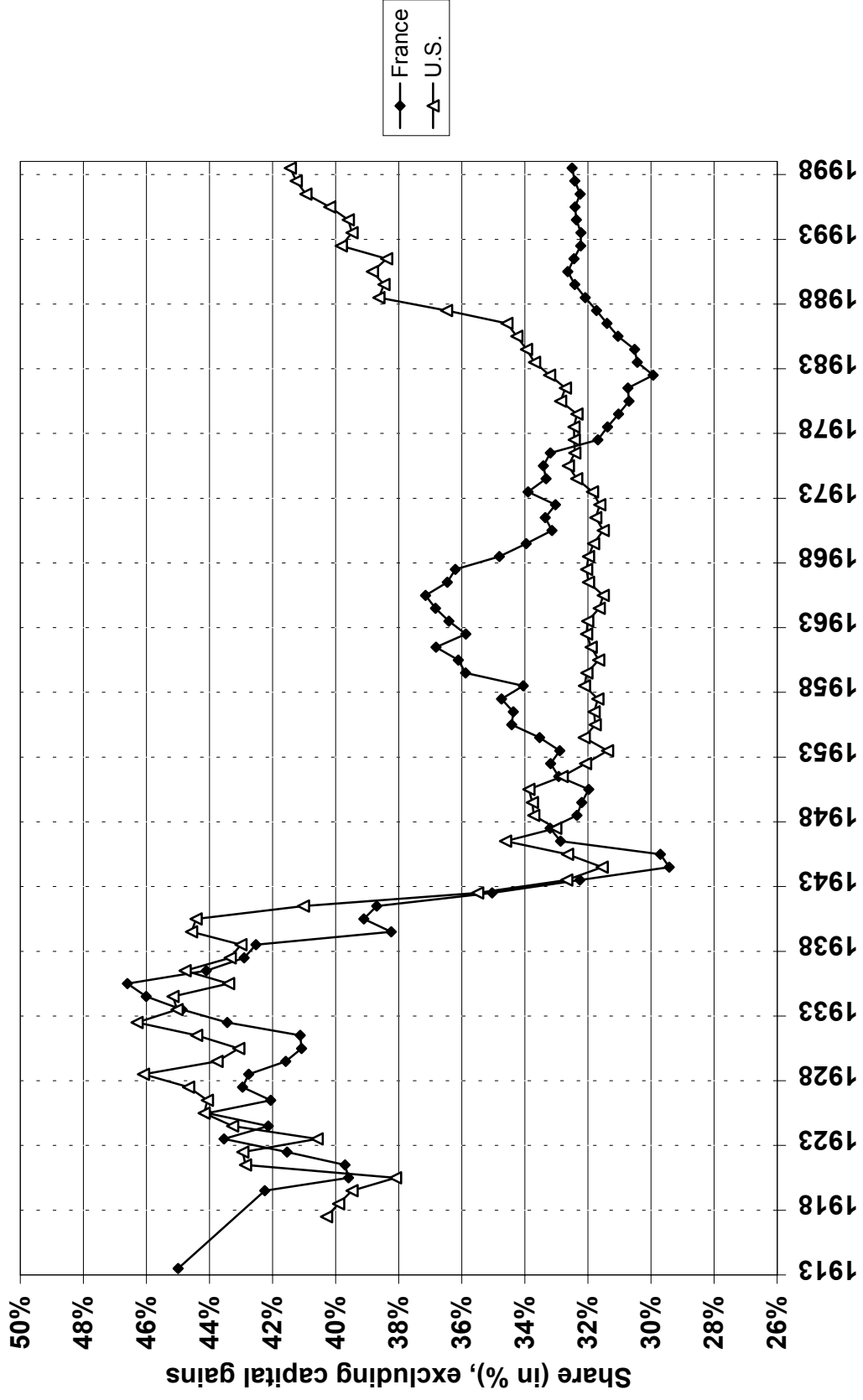
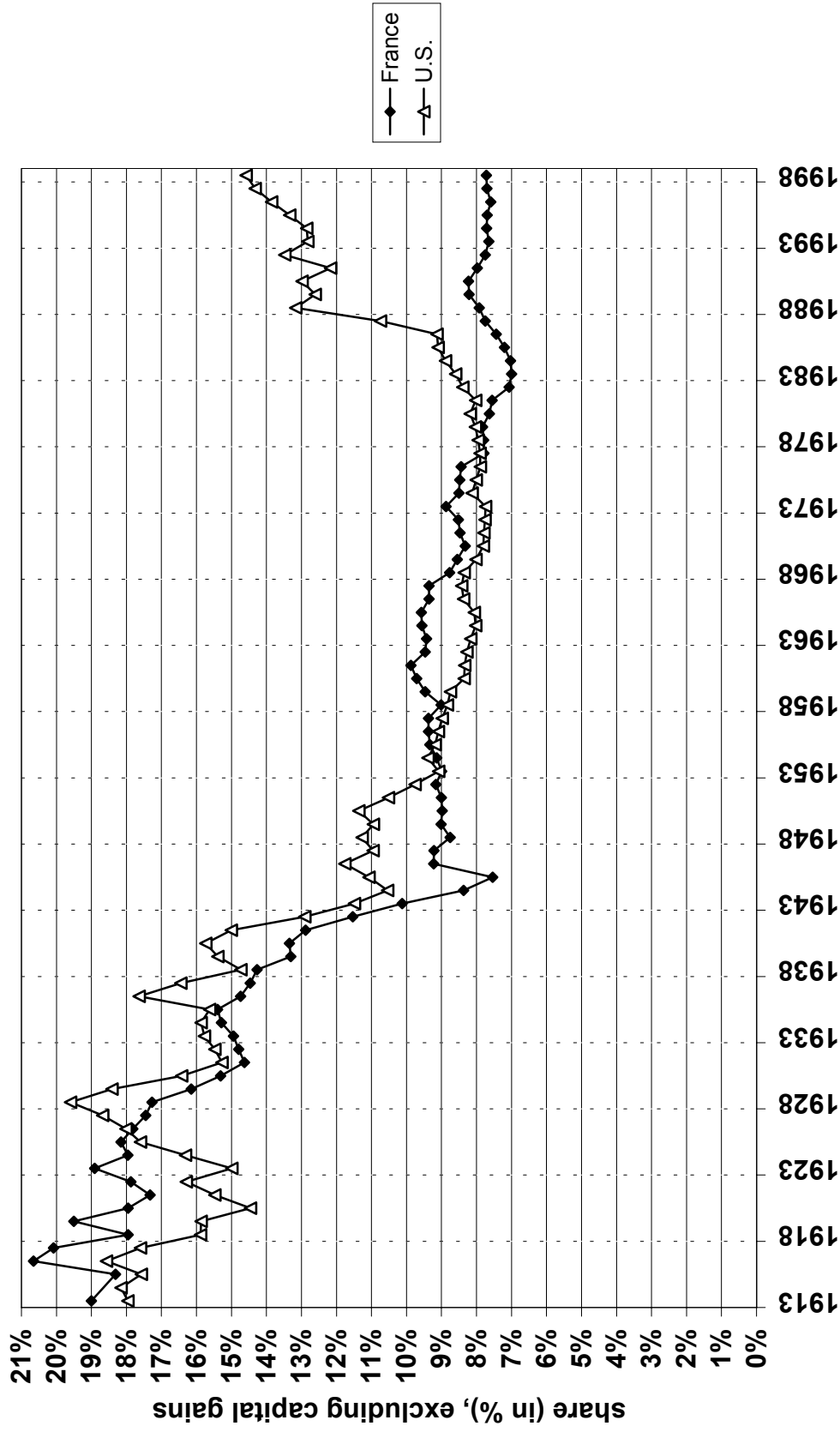


Figure 19: The top decile income share in France and in the U.S., 1913-1998



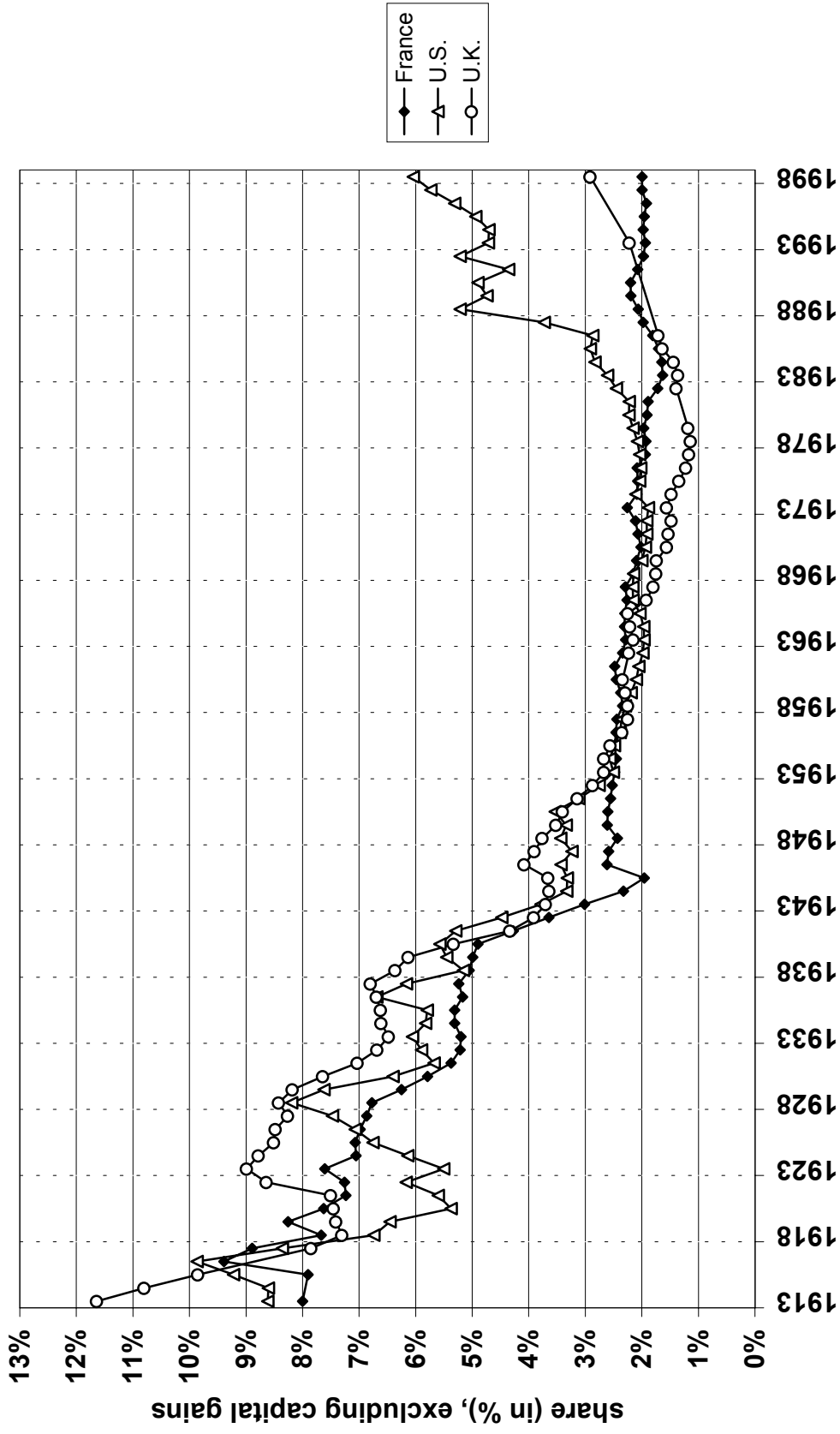
Source: Authors' computations based on income tax returns (France: see Piketty (2001b, table A1, col. P90-100); U.S.: see this paper, table A1, col. P90-100)

Figure 20: The top 1% income share in France and in the U.S., 1913-1998



Source: Authors' computations based on income tax returns (France: see Piketty (2001b, table A1, col. P99-100); U.S.: see this paper, table A1, col. P99-100).

Figure 21: The top 0.1% income share in France, the U.S. and the U.K., 1913-1998



Source: Authors' computations based on income tax returns (France: see Piketty (2001b, table A1, col. P99-100); U.S.: see this paper, table A1, col. P99-100); U.K. See Atkinson (2001).

Table 1: Thresholds and average incomes by fractiles in 1998

Thresholds	Income level	Fractiles	Number of tax units	Average Income
(1)	(2)	(3)	(4)	(5)
		Full Population	130,945,000	\$38,740
P90	\$81,700	P90-95	6,550,000	\$94,000
P95	\$107,400	P95-99	5,240,000	\$143,000
P99	\$230,200	P99-99.5	655,000	\$267,000
P99.5	\$316,100	P99.5-99.9	524,000	\$494,000
P99.9	\$790,400	P99.9-99.99	117,900	\$1,490,000
P99.99	\$3,620,500	P99.99-100	13,100	\$9,970,000

Source: Table A0 and Table A4, row 1998 in Piketty and Saez (2001). Amounts expressed in 1998 dollars.

Table 2: Top Income Shares, 1913-1998

Year	Inflation CPI (p(1998)/p(n)) (0)	N. tax units (thousands) (1)	Average income (1998 \$) (2)	Top Shares (excluding capital gains)										Capital gains included	
				P90-100 (3)	P90-95 (4)	P95-99 (5)	P99-100 (6)	P99.5-100 (7)	P99.9-100 (8)	P99.99-100 (9)	share only				
											P99-100 (10)	P99-100 (11)			
1913	16.4776	37,701	12,076				17.96	14.73	8.62	2.76	17.96	17.96			
1914	16.2662	38,513	11,804				18.16	15.08	8.60	2.73	18.16	18.16			
1915	16.1051	39,154	11,918				17.58	14.58	9.22	4.36	17.58	17.58			
1916	14.9676	39,790	12,961				18.57	15.60	9.87	4.40	18.92	19.34			
1917	12.7492	40,387	13,204	9.95	12.74		17.60	14.23	8.36	3.33	17.73	17.75			
1918	10.8596	40,451	12,502	10.61	13.41		15.88	12.39	6.74	2.45	16.00	15.97			
1919	9.4514	41,052	12,240	10.17	13.44		15.87	12.23	6.45	2.22	16.19	16.44			
1920	8.1618	41,909	10,918	10.63	13.01		14.46	10.95	5.37	1.67	14.71	14.86			
1921	9.1398	42,835	9,636	12.40	14.98		15.47	11.60	5.60	1.69	15.63	15.65			
1922	9.7543	43,543	10,875	11.90	14.76		16.29	12.38	6.17	2.01	16.68	17.09			
1923	9.5818	44,409	12,096	11.64	13.96		14.99	11.32	5.50	1.75	15.32	15.68			
1924	9.5627	45,384	11,951	12.34	14.61		16.32	12.42	6.14	2.01	16.85	17.47			
1925	9.3295	46,190	12,073	11.70	14.86		17.60	13.41	6.75	2.35	18.72	20.36			
1926	9.2371	46,940	12,199	11.32	14.74		18.01	13.75	7.07	2.54	18.78	20.00			
1927	9.4160	47,723	12,291	11.23	14.75		18.68	14.33	7.47	2.76	19.60	21.14			
1928	9.5400	48,445	12,542	11.32	15.17		19.60	15.17	8.19	3.23	21.27	24.14			
1929	9.5400	49,085	13,076	10.71	14.63		18.42	14.21	7.62	3.01	19.90	22.51			
1930	9.7846	49,750	11,848	11.89	14.76		16.42	12.42	6.40	2.39	16.76	17.27			
1931	10.7288	50,462	10,750	13.39	15.74		15.27	11.32	5.68	2.07	15.41	15.52			
1932	11.9607	51,117	9,041	13.71	17.11		15.48	11.55	5.90	1.93	15.57	15.56			
1933	12.6035	51,757	8,805	12.54	16.72		15.77	11.78	6.05	2.04	16.12	16.49			
1934	12.1891	52,430	9,671	12.16	17.13		15.87	11.80	5.82	1.92	16.02	16.41			
1935	11.8918	53,147	10,472	12.40	15.36		15.63	11.67	5.80	1.95	16.00	16.71			
1936	11.7740	53,844	11,493	12.12	15.02		17.64	13.37	6.69	2.23	18.23	19.36			
1937	11.3649	54,539	12,053	11.97	14.93		16.45	12.42	6.16	2.02	16.69	17.17			
1938	11.5850	55,342	11,086	12.82	15.45		14.73	10.82	5.16	1.67	15.05	15.78			
1939	11.7495	56,181	11,812	13.28	15.89		15.39	11.37	5.45	1.74	15.66	16.20			
1940	11.6332	57,115	12,367	13.14	15.55		15.73	11.66	5.57	1.77	15.97	16.50			
1941	11.0792	57,392	14,455	12.00	14.01		15.01	11.15	5.29	1.63	15.25	15.81			
1942	10.0083	57,736	16,794	10.39	12.20		12.91	9.60	4.48	1.32	13.07	13.44			
1943	9.4329	58,250	19,420	9.65	11.54		11.48	8.43	3.78	0.97	11.80	12.33			
1944	9.2752	58,656	20,568	9.79	11.22		10.54	7.60	3.33	0.92	10.82	11.30			
1945	9.0667	58,997	20,102	9.74	11.83		11.07	7.87	3.32	0.84	11.67	12.58			
1946	8.3564	59,297	19,025	9.96	12.90		11.76	8.28	3.43	0.92	12.36	13.41			
1947	7.3045	60,118	18,257	9.72	12.35		10.95	7.71	3.24	0.90	11.34	12.05			
1948	6.7760	60,825	18,579	10.02	12.43		11.27	8.03	3.44	0.95	11.64	12.31			
1949	6.8445	61,537	18,353	10.30	12.52		10.95	7.77	3.34	0.95	11.24	11.78			
1950	6.7767	62,446	19,809	10.00	12.51		11.36	8.14	3.53	0.83	11.98	12.89			
1951	6.2805	63,060	20,410	10.15	12.15		10.52	7.41	3.12	0.87	11.05	11.86			
1952	6.1453	63,684	21,059	10.23	12.09		9.76	6.81	2.76	0.75	10.19	10.85			
1953	6.0966	64,273	21,987	10.37	11.93		9.08	6.26	2.51	0.67	9.41	9.94			
1954	6.0662	64,928	21,720	10.56	12.17		9.39	6.47	2.57	0.71	9.97	10.83			
1955	6.0906	65,589	23,219	10.39	12.20		9.18	6.28	2.49	0.72	9.97	11.11			
1956	6.0006	66,257	24,425	10.46	12.26		9.09	6.14	2.38	0.68	9.75	10.74			

1957	5.7921	66,947	24,528	31.69	10.52	12.19	8.98	6.08	2.36	0.66	9.47	10.21
1958	5.6398	67,546	23,783	32.11	10.85	12.43	8.83	5.94	2.29	0.64	9.42	10.28
1959	5.5950	68,144	25,186	32.03	11.01	12.28	8.75	5.90	2.19	0.62	9.58	10.74
1960	5.5069	68,681	25,500	31.66	11.15	12.15	8.36	5.52	2.10	0.60	9.07	10.10
1961	5.4524	69,997	25,802	31.90	10.99	12.57	8.34	5.41	2.05	0.59	9.32	10.73
1962	5.3931	71,254	26,679	32.04	11.10	12.67	8.27	5.40	1.98	0.56	8.98	10.02
1963	5.3291	72,464	27,369	32.01	11.11	12.73	8.16	5.33	1.96	0.57	8.93	9.99
1964	5.2607	73,660	28,680	31.64	11.02	12.60	8.02	5.33	1.97	0.53	9.15	10.53
1965	5.1728	74,772	29,828	31.52	10.82	12.63	8.07	5.42	2.04	0.54	9.35	10.95
1966	5.0270	75,831	31,136	31.98	10.99	12.62	8.37	5.59	2.15	0.60	9.52	10.28
1967	4.8853	76,856	31,954	32.05	10.97	12.65	8.43	5.63	2.16	0.60	9.94	10.85
1968	4.6884	77,826	33,002	31.98	11.01	12.62	8.35	5.58	2.15	0.58	10.20	11.36
1969	4.4482	78,793	33,506	31.82	11.14	12.66	8.02	5.30	2.00	0.55	9.50	10.46
1970	4.2004	79,924	33,637	31.51	11.13	12.58	7.80	5.16	1.94	0.53	8.50	9.09
1971	4.0234	81,849	33,543	31.75	11.26	12.71	7.79	5.12	1.91	0.52	8.73	9.48
1972	3.8986	83,670	34,941	31.62	11.25	12.62	7.75	5.10	1.92	0.52	8.78	9.73
1973	3.6710	85,442	35,679	31.85	11.28	12.83	7.74	5.07	1.89	0.50	8.44	9.27
1974	3.3072	87,228	34,623	32.36	11.32	12.91	8.12	5.41	2.11	0.56	8.61	9.21
1975	3.0314	89,127	32,807	32.62	11.60	13.02	8.01	5.31	2.04	0.56	8.45	8.97
1976	2.8652	91,048	33,587	32.42	11.57	12.96	7.89	5.23	2.02	0.56	8.43	8.97
1977	2.6903	93,076	33,924	32.43	11.60	12.93	7.90	5.25	2.04	0.57	8.46	9.12
1978	2.5003	95,213	34,560	32.44	11.58	12.91	7.95	5.30	2.08	0.58	8.47	9.06
1979	2.2464	97,457	34,018	32.35	11.52	12.80	8.03	5.38	2.16	0.62	9.11	10.08
1980	1.9792	99,625	32,428	32.87	11.70	12.99	8.18	5.51	2.23	0.65	9.27	10.15
1981	1.7944	101,432	31,763	32.72	11.75	12.94	8.03	5.42	2.23	0.66	9.03	10.12
1982	1.6897	103,250	31,310	33.22	11.82	13.01	8.39	5.73	2.45	0.77	9.85	10.89
1983	1.6373	105,067	31,318	33.69	11.91	13.19	8.59	5.94	2.61	0.87	10.42	11.71
1984	1.5698	106,871	32,401	33.95	11.85	13.21	8.89	6.22	2.83	0.98	10.76	12.14
1985	1.5152	108,736	32,938	34.25	11.87	13.28	9.09	6.39	2.91	0.97	11.24	12.84
1986	1.4870	110,684	33,362	34.57	11.98	13.46	9.13	6.38	2.87	1.00	13.40	16.22
1987	1.4353	112,640	34,328	36.48	11.99	13.74	10.75	7.76	3.73	1.30	11.84	12.76
1988	1.3788	114,656	35,862	38.63	11.68	13.78	13.17	9.96	5.21	1.99	14.73	15.58
1989	1.3156	116,759	35,607	38.47	11.81	14.05	12.61	9.37	4.74	1.74	13.90	14.58
1990	1.2482	119,055	35,174	38.84	11.78	14.07	12.98	9.71	4.90	1.83	13.88	14.40
1991	1.1979	120,453	34,137	38.38	11.95	14.26	12.17	8.90	4.36	1.61	12.76	13.40
1992	1.1630	121,944	34,345	39.82	11.94	14.40	13.48	10.11	5.21	2.02	14.30	14.74
1993	1.1291	123,378	33,633	39.48	12.07	14.59	12.82	9.45	4.72	1.74	13.77	14.33
1994	1.1005	124,716	34,107	39.60	12.09	14.65	12.85	9.45	4.70	1.73	13.72	14.31
1995	1.0705	126,023	34,971	40.19	12.08	14.77	13.33	9.87	4.94	1.80	14.43	15.06
1996	1.0394	127,625	35,682	40.95	11.98	15.11	13.85	10.18	5.31	2.10	15.01	16.57
1997	1.0160	129,301	37,046	41.25	11.97	14.96	14.32	10.79	5.73	2.34	15.80	17.87
1998	1.0000	130,945	38,739	41.44	12.02	14.83	14.58	11.14	6.04	2.57	16.37	18.91

Notes: Full details in appendix of Piketty and Saez (2001). Tax units estimated from Census data. Average income is estimated from National Accounts. Top shares obtained from Tax returns tables and Pareto interpolation. Shares in columns (3) to (9) are based on individual gross income excluding capital gains. Column (10) displays top percentile (based on income excluding capital gains) share where capital gains are added back in the share computation. Column (11) displays top percentile (based on income including capital gains) share where capital gains are added back in the share computation.

Table 3: Shares of each occupation within the top 1% in 1916

Fractiles	Number of tax	Salaried	Independent	Business	Capitalists
(1)	units	Professions	Professions	Owners	and Rentiers
	(2)	(3)	(4)	(5)	(6)
P99-99.5	198,950	30.5%	19.0%	30.3%	20.2%
P99.5-99.9	159,160	22.1%	14.0%	35.8%	27.9%
P99.9-99.99	35,811	16.2%	8.0%	39.7%	45.2%
P99.99-99.999	3,581	12.0%	5.1%	42.6%	65.4%
P99.999-100	398	8.0%	3.1%	33.2%	94.6%

Notes: Computations based on interpolations from Statistics of Income, 1916, Table 6c, pp. 126-137.

Salaried Professions defined as accounting profession (accountants, statisticians, actuaries, etc.), engineers, clergymen, public service: civil and military, teachers, corporation officials, and all other employees.

Independent professions defined as architects, artists, authors, clergymen, lawyers and judges, medical profession, theatrical profession, all other professions, profession not stated, commercial travelers, and sportsmen.

Business owners defined as farmers, hotel proprietors and restaurateurs, insurance agents, labor skilled and unskilled, lumbermen, manufacturers, merchants and dealers, mine owners and operators, saloon keepers, theatrical business owners, all other business, and business not stated.

Capitalists and Rentiers defined as bankers, real-estate brokers, stock and bond brokers, insurance brokers, all other brokers, and capitalists: investors and speculators.

1957	88.8	8.2	3.0	1.0	70.0	20.7	9.2	2.8	47.4	38.3	14.3	2.4	41.2	34.2	24.6	5.8	33.0	24.0	43.0	12.5	17.6	7.3	75.0	15.5
1958	89.3	8.1	2.6	0.8	70.8	19.8	9.3	3.4	48.0	38.5	13.5	3.2	41.5	34.1	24.5	7.3	34.2	23.0	42.8	14.3	18.1	7.5	74.4	17.9
1959	89.5	7.4	3.1	0.3	69.4	20.6	10.0	5.3	48.2	38.2	13.6	4.8	40.9	34.6	24.5	10.0	33.1	24.0	42.9	19.7	17.8	8.6	73.5	23.6
1960	90.3	6.8	2.9	0.9	70.3	19.4	10.3	4.2	50.5	36.1	13.4	3.9	42.6	32.4	25.0	8.7	34.9	21.2	43.8	17.6	18.1	5.4	76.4	23.9
1961	88.5	7.6	3.9	2.1	73.6	17.7	8.8	4.5	50.3	35.7	14.0	4.4	42.3	32.6	25.1	12.4	34.5	22.7	42.8	23.6	17.0	7.8	75.2	31.3
1962	88.9	7.3	3.8	1.2	73.1	17.9	9.0	2.9	50.5	36.2	13.2	2.7	42.7	32.3	25.0	8.5	34.0	22.1	43.9	19.2	17.4	5.4	77.2	25.7
1963	88.1	7.4	4.5	1.6	73.6	17.1	9.2	3.1	51.6	34.7	13.7	4.4	42.8	31.7	25.5	9.4	33.5	21.9	44.6	19.4	16.6	4.9	78.4	24.9
1964	86.2	8.6	5.2	2.7	71.6	19.1	9.3	4.9	52.6	31.4	16.1	12.1	42.4	31.8	25.8	12.0	34.2	23.0	42.8	19.9	12.6	3.2	84.2	32.6
1965	83.9	10.7	5.4	4.8	72.0	19.3	8.6	5.0	52.0	31.2	16.8	15.2	42.3	32.5	25.2	12.9	34.0	23.2	42.8	20.4	13.1	5.7	81.2	37.5
1966	88.3	7.4	4.3	1.8	72.7	17.9	9.4	4.4	48.2	34.6	17.3	9.2	41.6	36.5	21.9	11.8	34.5	27.5	38.1	22.4	15.9	11.3	72.8	30.7
1967	88.2	7.3	4.6	3.0	73.3	17.4	9.3	6.6	49.1	34.3	16.6	12.1	42.4	37.0	20.6	16.5	34.5	28.3	37.3	27.2	17.8	13.6	68.6	32.6
1968	88.6	7.0	4.3	3.7	73.7	17.2	9.1	7.4	51.1	32.3	16.6	14.4	41.9	36.6	21.5	20.2	32.7	24.9	42.5	31.1	18.2	11.3	70.5	37.4
1969	88.6	6.8	4.6	2.1	75.3	16.1	8.6	4.9	51.3	33.7	15.0	9.7	44.3	34.3	21.4	16.2	36.3	25.8	37.9	27.8	18.4	8.3	73.3	39.9
1970	89.2	6.0	4.7	1.1	77.1	14.1	8.7	2.4	54.5	30.2	15.3	5.8	46.0	34.0	20.1	8.5	36.8	27.1	36.0	15.3	18.1	10.6	71.2	23.2
1971	90.1	5.6	4.3	1.8	77.6	13.4	9.0	3.9	57.2	28.1	14.7	8.1	47.2	32.6	20.2	11.3	38.9	25.9	35.3	20.2	19.0	13.6	67.4	28.0
1972	89.6	5.9	4.6	2.6	76.4	14.6	9.0	5.0	54.9	28.7	16.4	9.6	51.1	29.1	19.8	13.0	41.5	24.7	33.8	20.4	24.5	12.3	63.1	30.6
1973	88.8	6.4	4.9	1.9	74.2	16.0	9.8	4.3	55.5	28.2	16.2	6.8	50.5	29.3	20.2	9.9	41.2	25.0	33.8	15.9	23.3	12.8	63.9	20.5
1974	86.9	6.6	6.5	1.4	74.3	15.5	10.3	2.6	56.7	27.3	16.0	5.1	51.2	27.4	21.4	7.0	40.8	24.0	35.2	10.2	22.9	18.3	58.8	14.2
1975	88.7	5.6	5.7	1.4	77.4	13.3	9.3	2.4	59.0	25.0	16.0	4.9	55.1	24.0	21.0	6.1	45.9	21.6	32.5	9.5	25.8	16.7	57.4	15.4
1976	88.4	5.8	5.8	1.9	77.9	12.7	9.4	3.1	60.0	24.0	16.1	5.7	57.2	22.4	20.4	7.6	48.9	19.3	31.7	11.6	27.9	16.4	55.7	16.6
1977	88.7	5.4	5.9	1.9	78.1	12.4	9.5	3.3	61.5	22.8	15.7	6.4	58.1	21.7	20.3	8.0	51.1	18.2	30.7	12.1	29.2	15.6	55.1	15.6
1978	88.4	5.8	5.7	2.0	78.0	12.6	9.4	3.2	64.2	21.0	14.7	5.8	60.7	20.1	19.3	7.7	51.4	17.1	31.4	11.2	30.7	16.3	53.0	13.5
1979	89.1	5.2	5.7	2.3	78.4	11.5	10.1	4.5	64.4	19.6	16.0	8.4	62.5	16.7	20.9	12.0	52.3	14.4	33.3	20.3	31.3	13.7	55.0	34.7
1980	88.6	4.5	6.9	2.2	79.7	8.5	11.9	4.0	66.3	15.0	18.7	8.4	63.2	13.9	22.9	12.9	54.9	10.3	34.8	20.4	33.7	10.7	55.6	28.4
1981	88.1	3.7	8.2	2.1	80.6	6.1	13.2	3.7	68.6	10.4	21.0	8.1	65.7	7.9	26.4	12.3	56.5	5.0	38.5	19.3	35.4	3.5	61.1	26.8
1982	89.2	2.5	8.3	1.8	81.2	5.4	13.5	4.3	69.6	9.5	20.9	8.9	67.7	7.3	25.0	14.8	54.7	6.3	39.0	25.4	30.3	12.1	57.7	34.6
1983	89.5	3.4	7.1	2.7	83.4	5.7	10.9	5.6	73.7	9.5	16.8	13.0	70.4	8.4	21.2	18.9	57.6	7.8	34.6	28.8	34.0	21.4	44.6	34.0
1984	89.9	3.2	6.8	3.0	81.8	6.3	11.9	5.9	71.9	9.6	18.5	11.6	71.2	8.4	20.4	18.7	64.1	4.4	31.5	29.9	32.6	28.2	39.2	33.3
1985	89.9	3.2	6.8	3.9	82.9	6.6	10.5	7.4	73.9	9.4	16.7	13.8	69.8	8.7	21.6	20.8	51.2	10.6	38.2	31.7	34.5	26.5	39.0	36.3
1986	90.1	3.8	6.0	6.0	83.3	7.3	9.4	12.0	75.1	10.9	14.0	23.2	70.6	8.8	20.7	39.2	53.9	10.4	35.8	44.2	38.8	24.1	37.1	54.6
1987	90.1	4.3	5.6	2.8	81.8	8.9	9.3	5.4	70.4	15.9	13.7	8.9	68.8	14.1	17.0	12.6	59.9	17.7	22.4	15.8	36.2	31.3	32.5	17.7
1988	89.4	4.9	5.8	2.4	80.3	10.4	9.3	4.8	68.3	17.2	14.5	9.3	65.6	18.1	16.2	13.2	53.9	24.8	21.4	17.5	38.7	30.3	31.0	20.8
1989	88.6	4.9	6.5	2.3	79.3	10.3	10.3	4.0	67.4	18.2	14.4	8.3	62.0	19.1	18.8	10.8	50.1	25.1	24.8	15.0	30.8	35.3	33.9	20.7
1990	88.7	4.7	6.6	1.5	80.5	9.8	9.7	2.8	68.8	17.4	13.8	5.7	62.1	20.7	17.2	8.0	52.1	24.3	23.6	10.5	34.3	33.1	32.7	15.2
1991	89.4	4.7	5.9	1.6	80.8	10.2	9.0	2.8	68.9	18.0	13.2	4.9	62.1	20.8	17.1	6.3	50.3	25.4	24.2	9.5	29.9	36.4	33.7	9.0
1992	90.9	4.3	4.8	1.6	82.6	10.5	6.9	2.7	70.4	19.1	10.6	5.3	64.2	22.6	13.2	7.2	57.4	24.8	17.9	10.7	46.1	32.3	21.6	11.1
1993	90.9	5.0	4.2	1.7	83.2	10.7	6.1	3.3	71.3	18.7	10.0	5.5	65.9	21.8	12.3	8.4	56.5	26.4	17.2	13.1	41.0	36.2	22.8	15.0
1994	91.1	5.0	3.9	1.9	82.9	10.8	6.3	3.0	71.1	20.0	8.8	5.4	64.3	23.1	12.6	8.3	50.7	31.9	17.4	11.5	32.7	43.6	23.7	13.5
1995	90.4	4.9	4.6	2.0	82.1	10.6	7.3	3.7	70.6	19.2	10.2	7.3	64.1	23.1	12.8	9.9	52.2	29.6	18.2	13.9	35.8	38.8	25.4	13.5
1996	90.3	4.5	5.2	2.5	81.6	10.9	7.6	2.9	70.9	18.7	10.4	5.6	61.8	24.2	14.0	11.1	52.4	29.1	18.4	16.6	37.9	37.5	24.6	16.7
1997	89.8	4.9	5.2	2.4	80.3	11.3	8.3	5.3	69.5	18.8	11.6	9.6	62.2	23.7	14.0	13.5	54.8	27.9	17.3	19.6	40.1	35.8	24.1	18.8
1998	89.6	5.3	5.1	1.9	79.8	12.3	7.9	6.3	69.0	20.0	11.0	12.3	62.7	23.9	13.3	15.5	57.8	26.1	16.1	22.1	44.8	33.3	22.0	20.9

Notes: Fractiles defined by size of total income (excluding capital gains). For each fractile, the first three columns (summing to 100%) give the percentage of wage income, entrepreneurial income, and capital income (dividends, interest, and rents) in total income (excluding capital gains). The fourth column displays the extra percentage of income (defined excluding capital gains) obtained by each of these fractiles (defined again by total income excluding capital gains) from capital gains. Details on methodology are presented in Appendix of Piketty and Saez (2001).

Table 5: Top Wage Income Shares, 1927-1998

	N. tax units with wages (thousands)	Average wage income (1998 \$)	Top wage income shares					
			P90-100	P90-95	P95-99	P99-100	P99.5-100	P99.9-100
			(3)	(4)	(5)	(6)	(7)	(8)
1927	33,953	12,225	27.89	9.04	10.20	8.65	6.08	2.53
1928	34,197	12,506	29.11	9.33	10.91	8.87	6.20	2.59
1929	35,425	12,769	29.24	9.49	11.09	8.67	6.08	2.56
1930	33,266	12,705	28.63	9.40	10.69	8.54	5.99	2.56
1931	30,386	12,838	29.34	9.65	11.22	8.47	5.81	2.45
1932	27,117	12,395	30.28	10.61	11.39	8.29	5.66	2.37
1933	28,491	11,824	30.08	10.27	11.50	8.31	5.77	2.45
1934	31,565	12,010	29.77	9.83	11.64	8.31	5.76	2.37
1935	32,790	12,274	30.31	10.19	11.72	8.40	5.85	2.40
1936	35,608	12,797	29.70	9.75	11.35	8.60	6.02	2.45
1937	36,654	13,208	30.06	10.01	11.64	8.41	5.89	2.41
1938	35,205	13,003	29.83	10.18	11.53	8.13	5.74	2.36
1939	36,413	13,633	30.65	10.59	11.86	8.20	5.70	2.32
1940	38,087	13,998	30.85	10.78	11.70	8.37	5.84	2.39
1941	41,889	15,024	29.33	10.29	10.94	8.11	5.75	2.39
1942	45,891	16,362	27.08	9.63	10.24	7.21	5.12	2.18
1943	51,108	17,821	25.88	9.62	9.83	6.42	4.51	1.86
1944	51,928	18,924	24.61	9.48	9.56	5.56	3.84	1.56
1945	50,210	19,178	24.05	9.05	9.27	5.73	3.96	1.57
1946	44,370	18,854	25.10	8.92	9.79	6.40	4.33	1.68
1947	44,582	18,006	24.97	8.90	9.80	6.27	4.23	1.60
1948	45,275	17,891	25.03	8.90	9.92	6.21	4.20	1.58
1949	44,088	18,310	25.00	8.95	9.93	6.12	4.11	1.54
1950	45,592	19,033	25.18	9.06	9.89	6.24	4.21	1.57
1951	48,858	19,103	24.71	9.08	9.66	5.97	4.00	1.48
1952	49,963	19,769	24.43	9.01	9.67	5.74	3.78	1.39
1954	49,144	20,850	24.13	8.88	9.65	5.61	3.65	1.32
1956	51,632	22,584	24.53	8.96	10.02	5.56	3.57	1.26
1958	50,153	22,741	24.67	9.07	10.20	5.40	3.43	1.20
1960	52,554	23,970	25.23	9.51	10.46	5.26	3.31	1.14
1961	51,946	24,321	25.21	9.58	10.44	5.20	3.26	1.11
1962	53,338	24,999	25.22	9.60	10.47	5.16	3.24	1.09
1964	55,216	26,411	25.15	9.72	10.31	5.12	3.24	1.07
1966	60,358	27,370	25.34	9.87	10.31	5.16	3.27	1.11
1967	61,571	27,777	25.77	9.97	10.47	5.34	3.38	1.14
1968	62,836	28,511	25.60	9.95	10.42	5.24	3.32	1.12
1969	64,371	28,871	25.71	10.03	10.49	5.19	3.27	1.10
1970	63,778	29,046	25.67	10.03	10.51	5.13	3.21	1.06
1971	63,194	29,558	25.67	10.00	10.49	5.18	3.25	1.08
1972	64,750	30,520	25.81	10.02	10.47	5.32	3.38	1.14
1973	67,614	30,532	26.14	10.09	10.63	5.42	3.43	1.14
1974	68,518	29,497	26.61	10.14	10.81	5.66	3.63	1.26
1975	66,671	29,039	26.46	10.15	10.68	5.64	3.63	1.26
1976	68,459	29,490	26.66	10.16	10.76	5.74	3.70	1.30
1977	70,898	29,574	26.94	10.24	10.84	5.86	3.79	1.35
1978	74,503	29,571	27.43	10.36	11.02	6.06	3.93	1.40
1979	77,038	28,774	27.63	10.39	11.03	6.22	4.06	1.47
1980	76,913	27,712	28.06	10.47	11.17	6.43	4.23	1.57
1981	77,439	27,436	28.14	10.49	11.23	6.43	4.24	1.59
1982	75,771	27,539	28.55	10.53	11.35	6.67	4.42	1.67
1983	76,260	27,988	29.09	10.59	11.54	6.96	4.66	1.80
1984	80,008	28,235	29.61	10.66	11.68	7.27	4.93	1.99
1985	81,936	28,573	29.74	10.70	11.77	7.28	4.92	1.98
1986	83,340	29,183	29.94	10.76	11.86	7.33	4.96	2.02
1987	85,618	29,423	30.59	10.61	11.83	8.15	5.68	2.43
1988	88,121	29,691	31.95	10.58	11.99	9.39	6.79	3.16
1989	90,145	29,293	31.53	10.70	12.13	8.69	6.12	2.69
1990	91,348	29,107	31.79	10.66	12.14	8.99	6.41	2.87
1991	89,813	29,008	31.43	10.66	12.21	8.56	5.97	2.57
1992	89,883	29,463	32.45	10.60	12.22	9.63	6.97	3.33
1993	91,279	29,387	31.85	10.56	12.23	9.05	6.41	2.90
1994	93,270	29,427	31.54	10.59	12.22	8.72	6.07	2.63
1995	95,388	29,558	32.43	10.70	12.48	9.25	6.52	2.91
1996	97,338	29,707	32.98	10.51	12.78	9.73	6.90	3.21
1997	100,161	30,343	33.65	10.46	12.87	10.37	7.45	3.66
1998	103,053	31,422	34.19	10.58	12.80	10.88	7.95	4.13

Notes: Full details in appendix of Piketty and Saez (2001). Number of tax units with wages estimated from Census data. Average wage income is estimated from National Accounts. Top shares obtained from tax returns tables by size of wages and Pareto interpolation. Full details on methodology in Appendix of Piketty and Saez (2001).