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The Evolution of High Incomes in Canada, 1920-2000

Emmanuel Saez
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SEDAP Research Paper No. 99

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Shorter Paper version

The Evolution of High Incomes in Canada, 1920-2000

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Abstract :

This paper presents new homogeneous series on top shares of income from 1920 to 2000 in Canada using personal income tax return data. Top income shares display a U-shaped pattern over the century, with a precipitous drop during World War II, followed by a slower decline until 1970. Since the late 1970s, top income shares have been increasing steadily and the very top shares are now as high as in the pre-war era. As in the United States, the recent increase in top income shares is the consequence of a surge in top wages and salaries. The parallel evolution of top income shares in Canada and the United States, associated with much more modest marginal tax rate cuts in Canada, suggests that the upward trend in top shares in Canada since the late 1970s cannot be explained by tax cuts. Further evidence suggests that the upward trend in Canada derives from the United States, perhaps because many Canadians have an emigration option.

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1. Introduction

The evolution of inequality during the process of development has attracted enormous attention in the economics literature. Many authors have tried to analyze whether changes in inequality are mostly due to changes in technical progress. The Kuznets curve theory is perhaps the most famous example of such an analysis. Kuznets (1955) proposed that income inequality should follow an inverse-U shape, first rising with industrialization and then declining, as more and more workers join the high-productivity sectors of the economy. As alternatives to this technological explanation of inequality patterns, many studies have analyzed whether macro-economic business cycles, government interventions such as tax policy and redistributive programs, or more generally labor market institutions (such as unions) and regulations can have a sustained impact on inequality or explain the time or cross-country patterns in inequality. Understanding better the forces driving inequality is of critical importance to assess the role of government in regulating or shaping the distribution of income and welfare but requires analyzing long-term series of inequality. This study proposes to cast light on this issue by constructing and analyzing income inequality series for Canada over the 20th century.

In many instances, income tax statistics are the only source on income distribution available on a regular annual basis for extended periods of time before micro-economic surveys on incomes became available in the 1950s or 1960s, and remain the best source to study upper income groups. However, income tax statistics cover only taxpayers and thus for some earlier years only the top of the income distribution can be analyzed using tax return data, for example the share of total income accruing to the top decile or top percentile.

Recent studies have used income tax statistics to construct inequality time series for various countries over the course of the 20th century (Piketty 2001a, b for France, Piketty and Saez, 2003 for the United States, and Atkinson, 2001 for the United Kingdom). All these studies have found dramatic declines in the top income shares in the first part of the century but the pattern has been different in

the last two or three decades: an almost complete recovery in the United States, some recovery in the United Kingdom and no recovery in France. The timing of the downturns and upturns suggests that pure technological explanations cannot account for the facts, although other explanations are still tentative.

An important question that arises is whether the level of top income shares is mainly driven by changes in the tax system. The Canadian situation might cast interesting new light on these issues because of the proximity and similarity of the Canadian and American economies associated with a divergent tax experience in these countries over the last three decades. Therefore, analyzing the Canadian case may offer an opportunity to assess whether fiscal developments are the main factor driving the pattern of top income shares.

This study uses Canadian income tax statistics from 1920 (the first year such statistics were produced) to estimate homogeneous series of income shares for various upper income groups within the top decile. As personal income taxes in Canada are based on individual income (not family income), our series measure inequality among individuals rather than families. In order to understand the evolution of these top income shares, we analyze changes in their composition, primarily from 1946 (the first year details on composition of incomes by income bracket became available). Finally because the evolution of top incomes over the last 20 years is driven mostly by changes in labor income, we also construct employment income shares accruing to top wage earners since 1972, primarily using a large microdata set of tax returns that is only available for more recent years.

Our estimated top shares series show that, similar to the French, British, and American experiences, top income shares in Canada experienced a dramatic drop during World War II with no recovery during the next three decades. However, in contrast to the U.S. experience, top income shares in Canada were not negatively affected by the downturns of the inter-war period. Over the last 20 years, top income shares in Canada have increased dramatically, almost as much as in the United States. However, this drastic change has remained largely unnoticed because it is concentrated within the top

percentile of the Canadian income distribution and thus can only be detected with tax return data covering very high incomes. As in the United States, the increase is largely due to a surge in top wages and salaries. As a result, the composition of income in the top income groups has also shifted dramatically in Canada since World War II: many more high income individuals derive their principal income from employment instead of as a return to capital.

Many authors have argued (see e.g., Slemrod (1996, 1998) and Gordon and Slemrod (2000)) that the surge in top incomes in the United States may not reflect real changes in inequality but rather changes in the way incomes are reported for tax purposes induced by reductions in marginal tax rates. The Canadian experience casts doubt on this view in part because Canada experienced a more modest reduction in tax rates than the United States and yet experienced a similar surge in top incomes. We present further evidence suggesting that the surge in top incomes in Canada might have derived from the United States as many Canadians have an option to leave Canada to work in the United States. If this brain drain threat explanation is correct, this would imply that the surge in top incomes in the United States has been real as well because it could not have impacted top incomes in Canada otherwise.[1]

To the best of our knowledge, this is the first time that the full set of Canadian income tax statistics has been exploited to construct long-term series on inequality in Canada.[2] Blackburn and Bloom (1993) summarize a number of studies that examine both individual and family income inequality in Canada in the post-war period. The view that emerges from their summary is that from the late 1940s to the 1980s, there were alternating small increases and decreases in income inequality with not much overall change. None of these studies examines

[1] The question of whether the surge in top U.S. incomes is due to supply side effects following the tax cuts (Feldstein, 1995) or to non-tax related effects (Slemrod and Bakija, 2001, Piketty and Saez, 2003) is still debated. The Canadian evidence could be consistent with either explanation.

[2] Professor A.B. Atkinson has recently and independently produced preliminary distributional series within the top decile of the Canadian income distribution since World War II using Income Tax Statistics. Atkinson's series focus on inequality within the top decile (such as the share of the top decile income accruing to the top percentile) and not on top income shares relative to the average in the population as we do here. Buse (1982) also used Canadian tax statistics from 1947 to 1978. However, his analysis focused on the effects of the business cycle and employment levels on the Gini coefficient and various decile shares, and not on top incomes.

high incomes or the war/pre-war period because they use survey data. Heisz, Jackson and Picot (2001) summarize more recent Canadian inequality research, including the well-known contribution by Beach and Slotsve (1996). They find that there is some evidence of growing male and family earnings inequality but also emphasize the findings of Wolfson and Murphy (2000) that with respect to income after tax and transfers, the inequality "gap" between Canada and the United States grew between 1974 and 1997.

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 and the evolution of the composition of these top incomes. To cast further light on the recent period, Section 4 presents series of top wages shares since 1972. Section 5 discusses to what extent income tax changes can explain the patterns we obtain and compares these results with the American experience. Finally, Section 6 offers a brief conclusion. All series and complete technical details about our methodology are gathered in appendices of the working paper version of the paper (Saez and Veall, 2003).

2. Data and Methodology

In this section, we describe briefly the data we use and the broad steps of our estimation methodology. Our estimates are from personal income tax return statistics compiled annually by the Canadian federal taxation authorities since 1920.[3] Before World War II, because of high exemptions, only about 2 to 8 percent of individuals had to file tax returns and therefore, by necessity, we must restrict our analysis to the top 5% of the income distribution.[4] Beginning with World War II we can extend our analysis to the top decile, which we divide into finer fractiles. Following Piketty (2001a, 2001b) and Piketty and Saez (2003), in

[3] Personal income taxation started in 1917 in Canada. However, the fiscal administration did not produce distribution statistics for the first three years 1917 to 1919. Canadian personal income tax statistics have been published in The Canada Yearbook in the pre-war period and in Taxation Statistics afterwards.

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. (See Table 1 for data on these fractiles as well as the average income level in each group and the number of tax units in each group all for 2000, the latest year available.) Each fractile is defined relative to the total number of adult individuals (aged 20 and above) in the Canadian population. This number is computed using population census statistics and should not be confused with the actual number of tax returns filed. Column (1) in Table 2 reports the number of adult individuals in Canada from 1920 to 2000. The adult population has increased from about 5 million in 1920 to almost 23 million in 2000.

The income definition we use is a gross income definition before all deductions and including all the income items reported on personal tax returns: salaries and wages, self-employment and small business net income, partnership and fiduciary income, dividends, interest, other investment income, as well as other smaller income items. Realized capital gains are not an annual flow of income (in general, capital gains are realized infrequently in a lumpy way) and form a very volatile component of income with large aggregate variations from year to year depending on stock price variations. Moreover before 1972, capital gains were not taxable and hence not reported on tax returns. Therefore, we focus mainly on series excluding capital gains.[5] Our income definition is computed before personal income taxes and personal payroll taxes but after employers' payroll taxes and corporate income taxes.

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[4] We can provide estimates for the top 5% for all years because it is always the case that more than 5% of singles file a return, as opposed to married individuals, for whom the exemption threshold was higher. (See appendix section B in Saez and Veall (2003) for details.)

[5] In Saez and Veall (2003), in order to assess the sensitivity of our results to the treatment of capital gains, for the period 1972 to 2000, we compute for each fractile (defined by ranking incomes excluding capital gains) the percentage of additional income reported in the form of realized capital gains. We also recompute our top income shares including realized capital gains in income (both for the ranking and the levels and shares computations). For the period 1972-2000, series with and without capital gains are quite similar and display the same general pattern.

Our principal data consist of tables of the number of tax returns, the amounts reported, and the income composition (since 1946), 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 fractile.

We then estimate shares of income by dividing the income amounts accruing to each fractile by total Personal Income computed from the National Accounts.[6] Our income denominator is taken as 80% of Personal Income not including transfers from the National Accounts.[7] The average income (per adult) series is reported on Column (2) of Table 2. This series is reported in real (2000) Canadian dollars. Our CPI deflator used to convert current incomes to real incomes is reported in Column (3). Average real income per adult has increased fivefold from 1920 to 2000. The Great Depression decreased real income by about one third. World War II was a period of high income growth. Average income grew steadily from 1950 to 1976. Since then, average real income has increased very little with downturns from 1981 to 1983 and from 1990 to 1993.

After we have analyzed the top share data, we will also analyze the composition of income, concentrating on the period since 1946 when composition data were first published. Using this published information and a simple linear interpolation method, we decompose the amount of income for each fractile into employment income, entrepreneurial income (self-employment and small business income), and capital income (excluding capital gains).

Large microfiles of tax returns (covering 20% of the total population) are available beginning in 1982. These microfiles allow us to produce top wage shares series for the period 1972 to 2000.[8] In this case, fractiles are defined

[6] 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. For example, Kuznets (1953) adopted this method in his famous study on American inequality. All the National Accounts series we use in this study are from CANSIM (2003).

[7] Personal Income is higher than total income from tax returns because it includes non-taxable items such as imputed rent, imputed interest, etc. In the recent years in which virtually all adults with income file tax returns, total income from tax returns has always been very close to 80% of Personal Income net of transfers.

[8] Top wage shares for 1972 to 1981 are estimated using the number of tax returns reporting wages and the amount of wages reported by income brackets (see Saez and Veall, 2003).

relative to the total number of individuals with positive wages and salaries. Wages and salaries include exercised stock options. Estimating the pattern of top wage shares is critical to understanding the pattern of top income shares over the last two decades in Canada.

3. Top Income Shares

3.1. Trends

The basic series of top income shares are presented in Table 2. Figure 1 displays the income share of the top 5% (P95-100) from 1920 to 2000. The top 5% share displays sharp fluctuations up to the end of World War II (between 30 and 40% of total income) and is much more stable afterwards (around 25%). Before WWII, the fluctuations are strikingly counter-cyclical. The top share increases sharply during each downturn episode of the inter-war period: the sharp depression of 1920-1921, the Great Depression from 1930-1933, and the pre-WWII downturn of 1937-1938. The top 5% share tends to decrease during the recoveries from the downturns (1921-1923, 1933-1935, and WWII), although the pattern is less pronounced than for the downturns. The top 5% share declines drastically during the WWII years from almost 40% in 1938 to less than 25% in 1945.[9] This drastic reduction implies that the average income in the top 5% dropped from 8 times the average income before WWII to just 5 times the average income in 1945. After WWII, the top 5% share declines very slowly (with very small fluctuations) from 25% to 22% by the mid 1980s. However, in the last 20 years, the top 5% share has gone up substantially to about 29% in 2000, but is still substantially below its level just before WWII.

Therefore, the Canadian evidence suggests that the twentieth century decline in inequality took place in a very specific and brief time interval, namely the World War II years. This evidence is very much in line with the French

[9] As we will see in Section 5, in the United States, the fall in top income shares does not start before 1941, providing further evidence that the fall is closely related to the war.

(Piketty, 2001a,b), American (Piketty and Saez, 2003), and British (Atkinson, 2001) findings. Moreover, the pattern of the sharp upturns and downturns in the pre-war period suggests that the business cycle was the main driving factor in these fluctuations. In any case, the traditional Kuznets inverted U-curve theory of inequality does not fit well with the Canadian experience.

In order to understand the overall pattern of top income shares, it is useful to decompose the top decile into three groups, P90-95, P95-99, and the top percentile P99-100. The share of income accruing to these three groups is depicted in Figure 2. Three important facts should be noted. First, the counter-cyclical pattern before World War II appears to be stronger for P95-99 than for the top percentile. Second, the drop during WWII is larger for the top percentile (from 18% in 1939 to 10% in 1945) than for P90-95 and P95-99. Third, the upturn during the last two decades is concentrated in the top percentile (which increased from about 7.5% in the late 1970s to 13.5% in 2000). The P90-95 share did not increase at all from the late 1970s and even the P95-99 share increased by less than one percentage point during the same period.

Examination of the very top groups (P99.9-100 and P99.99-100) in Figure 3 reinforces these three empirical findings. The higher the group, the sharper is the decline during World War II, and the sharper the recovery since the late 1970s. The very top group shares experience a drop of more than 50% from 1938 to 1945. Moreover, and in contrast to lower groups, the drop continues after World War II until the mid-1970s. As a result, the average individual in the top 0.01% had an income more than 200 times the average income in the adult population in 1920. In 1972, that individual had an income only 40 times higher than average. However, since the late 1970s, the very top groups have almost recovered their pre-World War II levels so that by 2000, average income in the top 0.01% is about 190 times the average income.

The concentration of the rise in top shares in the very top groups explains why it appears to have gone unnoticed in the literature. Tax returns are the only data that allow the analysis of groups within the top percentile. The concentrated surge as opposed to a pattern of gains spread more evenly across skilled

workers casts doubt on the skill-biased technology explanation (see Acemoglu, 2000). We will return to this issue in our analysis of top employment income shares in the last three decades. We also note that there is a short-term spike in top shares in 1989, and that this spike is bigger for the very top groups. We believe that this is evidence of a (transitory) response to the marginal tax rate flattening consistent with the findings of Sillamaa and Veall (2001). We will discuss the important issue of the effects of taxation on reported top incomes in Section 5. Finally, the very top groups do not display the same counter-cyclical behavior as other high income groups. The top 0.01% share declined during the 1920-1921 downturn and did not increase during the Great Depression.

The remainder of the paper will be aimed at understanding the three key facts: the counter-cyclical pattern of top shares (except the very top share) in the pre-war period, the sharp fall of top shares during World War II (with the most dramatic decline at the very top) with no recovery after the war, and the surge in top income shares over the last 20 years (characterized by an extreme concentration at the top). In order to progress in our understanding, we now turn to the analysis of the composition of incomes reported by the top groups.

3.2. The Composition of Top Incomes

For Canada from 1920 to 1945, detailed composition of income is not available in personal income tax data and only tables showing the distribution of taxpayer occupations (defined by principal source of income) are available. This evidence is summarized in Saez and Veall (2003). It shows that between two thirds and four fifths of taxpayers were classified as employees during the inter-war period, a time when less than 5% of adults filed tax returns. This suggests that well compensated employees formed a very important fraction of the top 5% of income earners, and probably the overwhelming majority of the upper middle class group P95-99. This is the pattern that arose in the analysis of France (Piketty 2001a,b) and the United States (Piketty and Saez, 2003) and will be confirmed in our analysis on income composition after World War II. This can

explain why the P95-99 share is so clearly counter-cyclical in the pre-war period. The sharp downturns of the pre-war period were associated with sharp deflations (see column (3) in Table 2). Assuming wages are in general nominally rigid in the short-run, those who are able to keep their jobs during the recession experience a relative gain. This might explain why the P95-99 share increases so much during the downturns (and goes down during the recoveries). The top 1% of the income distribution contains many more entrepreneurs and capital income earners[10] (as confirmed by occupation tables by income bracket that were published for 1942) and hence their share is less counter-cyclical.[11]

Our Canadian top share series display a sharp drop during World War II, and that drop is larger for the very top groups. This fall can be in part explained by the fiscal shock in the corporate sector. As part of financing the war, Canada increased substantially taxes on corporations.[12] Moreover, corporations reduced their payout ratios during the war because of the high demand for investment, and perhaps also to avoid the personal income tax which imposed extremely high marginal tax rates (in excess of 90%) on the highest incomes. This is illustrated in Figure 4. Panel A displays the real aggregate value of profits before and after taxes, along with dividend distributions of Canadian corporations from the National Accounts for the period 1926 (the first year the data are available) to 1955. The figure shows that, in spite of a two-fold increase in profits from 1938 to 1945, real dividend payments actually decreased slightly. This explains why top income rentiers experienced a sharp drop relative to the fast growing average adult income during the World War II episode (see column (2) in Table 2). Panel

[10] The occupation tables from the pre-war period indicate that a substantial fraction of very top income earners in Canada were receiving most of their incomes through personal corporations. A personal corporation, first developed in 1925, was a corporation that was controlled by a single person or family and that derived at least one quarter of its profits from passive investments. It was taxed only at the personal level (similarly to an S-corporation in the United States today).

[11] Even then almost half of the top 0.1% were employees explaining why the top share was not procyclical in Canada, in contrast to the case in the United States (Piketty and Saez, 2003) and France (Piketty, 2001). Also as Figure 4 will show, unlike their U.S. counterparts, Canadian corporations tended to maintain dividend payments during the Great Depression which also limited the downturn in income accruing to the top percentile.

[12] While during the war the corporation income tax itself increased modestly from 15% to 18%, an additional tax was introduced of the greater of 22% of total profits and 100% (part refundable after the war) of profit increases.

B in Figure 4 displays the share of total capital income (excluding capital gains), and the share of dividends from Canadian corporations in total personal income in the Canadian economy from 1926 to 2000. Consistent with the evidence in Panel A, the share of domestic dividends in personal income falls by more than 60% from 1938 to 1945. Moreover, the share of total capital income (including interest income and distributions from Canadian-owned foreign stock) falls from over 12% in 1938 to about 6-7% at the end of the war. These figures show clearly that capital income accruing to individuals was sharply reduced during the war and this might explain why top incomes fell so much in relative terms.

However, the shares of income groups P90-95 and P95-99 also fell during World War II. The evidence from occupational tables in the pre-war period and from 1946 on (see below) shows that these groups are composed largely of employees. Therefore, it seems salaries of highly compensated employees must have fallen relative to average earnings in the economy. Indirect evidence confirms those results. Since 1915 for the Canadian manufacturing sector, data are available on the number and total employment income of salary earners (supervisory and office employees with a compensation contract determined at the annual level) and non-salaried employees (workers with a compensation contract determined either at the hourly, daily, or weekly level). Saez and Veall (2003) show that salary earners gained significantly relative to non-salaried employees in terms of employment and compensation during the downturns of 1920-21 and the Great Depression but lost significantly during World War II. These results are consistent with our other findings for this period and particularly support the hypothesis that a compression in wage income inequality took place in Canada during the war years.[13]

From 1946 on, detailed tables on the composition of income were published annually. Therefore, for each fractile within the top decile, we were

[13] The most direct explanation (The Canada Yearbook, 1948) was that war labor regulations set strict bounds on the raises that corporations were able to give to their high-salary employees. For example, raises for employees with salaries above $7,500 (corresponding roughly to percentile P99.5) required direct approval of the Minister. Similar evidence of wage compression has been found for the United States (Goldin and Margo, 1992, Goldin and Katz, 1999, and Piketty and Saez, 2003).

able to construct series on the composition of incomes. These series are presented in Table 3. Figure 5 shows the composition of income for each fractile in 1946 (Panel A) and 2000 (Panel B). As expected, Panel A shows the share of wage income is a declining function of income and that the share of capital income (dividends, interest, and other investment income) is an increasing function of income. The share of entrepreneurial income (professional and business income) presents an inverted U-shape, and peaks for fractile P99.5-99.9. Thus, individuals in fractiles P90-95 and P95-99 rely mostly on labor income (capital income is less than 25 percent for these groups) while individuals in the top percentile derive most of their income in the form of passive capital income (mostly dividend and estate income). However, as was found in the occupation tables for 1942, even within the very top groups, wage and salary income remains important. In France and the United States at that time, the share of wages and salaries was much lower at the top than in Canada.

Panel B shows that the income composition pattern has changed significantly from 1946 to 2000. In 2000, the share of wage income has increased for all groups, and this increase is larger at the very top. Entrepreneurial income (professional and business income) has fallen sharply, especially at the top. The share of capital income (dividends, interest, and other capital income, excluding capital gains) has slightly increased below the top 0.5% and fallen significantly for the very top groups. Therefore, both the self-employed or small business owners in the bottom of the top percentile, and the capital income earners in the very top, have been in large part replaced by highly compensated employees.

Finally, two facts show that the decline of the share of capital income for the top 0.5% reflects a fall in large capital holdings (relative to the average) rather than a decline in the aggregate capital income in the economy. First, the share of capital income actually increases for the groups P90-95, P95-99, and P99-99.5, showing that top capital income earners have indeed lost relative to the other groups. Second, Panel B of Figure 4 shows clearly that the share of capital

income and dividends in personal income from the National Accounts is not lower in 2000 than it was in the pre-war period. We will come back to this in Section 5.

We saw in Section 3.1 that top income shares have increased dramatically over the last 20 years in Canada, and that this increase was concentrated within the top 1%. At the same time, we have shown that the share of wages has also increased dramatically for groups within the top 1%. Therefore, there is a strong presumption that the recent upturn in top shares is the consequence of an unprecedented surge in the pay of the top compensated employees. In order to cast direct light on this issue, we analyze in the following section the top of the wage income distribution since 1972.

4. Wage Income Inequality Since 1972

4.1. The Canada/United States Comparison

To examine recent trends in the distribution of wage income (defined as the employment earnings of any type of employee), we use microfiles of tax returns, available from 1982, supplemented with extrapolations based on composition tables published for the years 1972 to 1981. Our top groups are now defined relative to the total number of individual taxfilers who report positive wage income. Table 4 reports the total number of wage income earners (column 1), and the average real annual wage income per wage earner (column 2), as well as the top wage income shares for the period 1972 to 2000.

Figure 6 displays the share of wages accruing to the top decile of the wage distribution. The top 10% wage share has increased steadily over the period from about 25% in the 1970s to 33% in 2000. This increase parallels closely the increase of about 6-7 percentage points in the top 10% of the total income distribution that we analyzed in Section 3.1.[14] Figure 7 decomposes the

[14] The level of the top 10% wage share is significantly lower than the level of the top 10% income share. This is due to the fact that non-wage income is more unequally distributed than wage income and that the top 10% income share is computed based on all adult individuals, a

top decile into three groups (P90-95, P95-99, and P99-100). It shows that, exactly as with the total income shares, the increase is concentrated within the top percentile. The shares of P90-95 and P95-99 are almost flat and increase by less than one percentage point while the top 1% share doubles from around 5% in the late 1970s to over 10% in 2000.

Panels A and B of Figure 8 illustrate the extreme concentration of this top wage surge. The top 0.1% wage share (Panel A) increased more than four fold from about 1% to 4.3% over the period and the top 0.01% wage share (Panel B) increased even more dramatically from 0.2% to 1.5%.[15] Therefore the top 0.01% of wage earners in 2000 (comprising about 1,400 individuals) earned about 150 times the average wage; the comparable ratio in 1972 was 20. This dramatic change follows closely the evolution of top income shares that we documented in Section 3.1. Therefore, this evidence shows that the surge in top wages led to a drastic shift in the composition of top incomes away from capital income and toward labor income, as well as to a dramatic increase in top income shares.

The United States experienced a similar surge in top wage incomes (Piketty and Saez, 2003).[16] One possible explanation might be that the two economies have experienced very similar technological change and thus distributions of earnings in both countries follow a similar path. A second possible explanation for the parallel pattern at the top might be competition for highly skilled executives driven by the U.S. market. Canadian executives and other professionals can relatively easily move and find jobs in the United States as part

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significant fraction of which have no incomes (for example non-working spouses), while the top 10% wage share is based on employed individuals only.

[15] Saez and Veall (2003) report calculations at the family level (which are possible with the microdata) that show that the increase in inequality in family wage income is slightly greater.

[16] The surge in top wage shares in the United States started earlier (in the early 1970s) and was not as concentrated as in Canada so that it was significant for the upper middle class P95-99 group. As a result, in contrast to the Canadian case, studies using survey data such as the Current Population Survey were largely able to document the surge in high wages (see Katz and Autor, 1999 and Acemoglu, 2002 for recent surveys of these U.S. studies).

Another very important difference between the United States and Canada is the pattern of inequality at the bottom. Low income earners have lost dramatically in the United States relative to Canada, explaining why overall inequality measures such as the Gini coefficient have increased much more in the United States than in Canada (see Blackburn and Bloom, 1993, and Wolfson and Murphy, 2000).

of what is sometimes called the brain drain. Therefore, the only way for Canadian firms to retain their best paid employees might be to increase their salaries.

The brain drain threat explanation seems more convincing to us than the technology explanation for a number of reasons. First, there is a problem in determining exactly what might be meant by technological change. But suppose the underlying notion is a broad economy-wide change such as improvements in information technology. As we have mentioned this would seem to suggest that gains would be distributed more broadly across Canadian highly-skilled workers, rather than be so concentrated at the very top. Second, European countries experienced the same change in technology as did Canada and the United States. However, Piketty (2001a, b) has demonstrated that France has not had an increase in inequality at the top of the wage distribution.[17] Third, if the migration threat explanation is true, then groups with higher mobility costs (or smaller benefits from moving) should experience a smaller rise in their compensation. Three pieces of evidence suggest that this is the case.

First, the surge in inequality at the top is more concentrated in Canada than in the United States. The benefits from moving are clearly higher for the very top wage earners (who experienced the greatest increase in compensation in the United States, both in absolute and relative terms). Therefore, a model with fixed costs of moving would suggest that those at the very top in Canada are more likely to move than those in the upper middle class (below the top percentile). As a result, U.S. driven competition should be stronger at the top, producing a more concentrated rise in inequality in Canada than in the United States, as we observed in the data. Finnie (2002) finds that international migration is in fact much more likely among those with high incomes.[18]

[17] British top income shares have increased significantly as well since 1980 although less than in the United States or Canada (see Atkinson, 2001). Consistent with the migration threat explanation, we expect higher mobility between the United Kingdom and the United States than between continental Europe and the United States.

[18] This is in contrast to the small and mixed income effects he finds for interprovincial migration (Finnie, forthcoming) and consistent with the bivariate comparisons in Graph 7 of Finnie (2001) where he reports that for 1996, 0.89% of Canadians with incomes in excess of $150,000 migrated internationally, compared to an average for all incomes of 0.12%.

Second, the surge in top income shares started earlier in the United States than in Canada. Figure 9 displays the top 0.5% wage share for the United States and Canada since 1972. The top wage shares were very similar in the United States and Canada in the early 1970s but the U.S. top share started increasing almost 10 years earlier, remaining somewhat higher in 2000. Iqbal (1999) documents the brain drain and notes that emigration of high-income Canadian workers to the United States increased during the 1980s and especially after 1995 when the North American Free Trade Agreement allowed high skilled workers to receive temporary work visa permits much more easily. The brain drain pressures from the United States therefore correspond closely to the increase in top wage shares in Canada, suggesting that the latter might well have been driven by the former.

Third, the French speaking community in Quebec may be more reluctant to move to the United States because of language and other cultural differences. Finnie (2002) finds that Quebec francophones are much less likely to migrate internationally than residents of other provinces and than Quebec anglophones. This is consistent with research (Finnie, forthcoming), which finds a similar pattern in interprovincial migration. As a result, we would expect brain-drain pressures to be weaker for Quebec francophones than for others in Canada. Figure 10 displays the top 1% wage share for francophones in Quebec and for Canadians in all other provinces from 1982 to 2000.[19] Figure 10 shows indeed that the rise in the top 1% share has been much more modest for francophones in Quebec (from about 4.5% to 6.5%) than for the rest of the provinces (from less than 6% to more than 11%).[20] Moreover, anglophones in Quebec as a group experience a surge in top wage shares as in the rest of the provinces.[21] This evidence is consistent with the brain drain threat explanation and is more difficult

[19] Francophones are defined as those who complete their income tax returns in French.
[20] Complete series for each group within the top decile (reported in Saez and Veall, 2003) display similar patterns. Very top incomes have also increased significantly for francophones (although much less than for non-Quebec residents). A model where francophones have a higher fixed cost of moving than anglophones on average would produce such results if the fixed cost (measured in dollars) is independent of income.
[21] Within Quebec anglophones, the top 1% share increases from less than 7% in 1982 to over 14% in 2000.

to reconcile with the pure technological change explanation: we would expect technological change to spread very quickly across Canadian provinces.

4.2. Stock Options

The surge in top executive compensation in the United States is due in large part to the development of stock options. In Canada, the development of stock options has been slower because they do not receive as favored overall tax treatment (Klassen and Mawani, 2000).[22] In contrast to the United States, profits from stock-option exercises can be separated out from wages and salaries on Canadian income tax returns. In spite of the unfavorable tax treatment, Saez and Veall (2003) document that stock options exercises, which represented less than 0.1% of total employment income before 1990, represent about 1.5% of employment income in Canada in 2000. They show that stock options are extremely concentrated toward the top end of the wage income distribution. Stock options, however, like realized capital gains, are not an annual flow of income. As a result, top wage income shares produced, as we did, by ranking taxpayers including stock options might be upward biased as those with stock options have incomes that are unusually high in that particular year. Saez and Veall (2003) show, however, that even excluding stock options from wage income, top wage income shares would still have increased dramatically since the 1970s. Since 1978, the top 0.1% share would have increased by a factor of 3.5 if stock options were completely excluded instead of by a factor of 4.3 with stock options fully included. Therefore, the development of stock options can only

[22]In the United States, profits from stock-option exercise are deductible from profits for the corporation and taxed like wage income for the individual. In Canada, stock options profits are not deductible for corporations and are in effect taxed very similarly to capital gains for most individuals upon exercise (but are fully reported and included in wages and salaries in the income tax statistics we have used). In effect, 75% of stock-option exercise gains are taxable from 1990 to 1999 (50% before 1988, and 66.6% in 1988 and 1989). Over the course of 2000, the share of taxable stock-option gains was reduced to 50%.

explain a small fraction of the rise in top wage shares over the last 25 years although it can explain a larger fraction of the surge since 1995.[23]

5. The Role of Taxation and Comparison with the United States

The empirical literature on behavioral responses to taxation has shown that taxes can have a substantial impact on income reported for tax purposes, the variable which is the focus of this study. Therefore, it is important to consider changes in the income tax system in parallel to the evolution of top income shares. Figure 11 presents for 1920 to 2000 the marginal personal income tax rate applicable at various percentiles of the income distribution, along with the top marginal tax rate.[24]

Before World War II, Figure 11 shows that taxation changes do not appear to have been that substantial, except for the very top rate, which applied to extremely few individuals.[25] The figure also shows how sharply tax rates jumped during World War II and we have emphasized the effect that this change may have had, in conjunction with war-time wage controls, in initially depressing top income shares as in Figure 2. However it is much harder to discern the impact of marginal tax rate changes since WWII. For someone at the P90 or P99 thresholds, Figure 11 shows that tax rates climbed very substantially (25 to 35 percentage points) between 1950 and 1980 and then leveled off, with a drop in 1988 at the P99 threshold and a fairly substantial decline from 1995 to 2000 for those at the P90 threshold. But from Figure 2 it can be seen that for the top share groups up to the P99 threshold, there appears to have been almost no change in income share over the entire 1950 to 2000 period.

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[23] More generally, Baker and Solon (1999) and Beach, Finnie and Gray (2003) have used tax-based data to conclude that the overall increase in annual earnings inequality in Canada was not due to increased earnings variability. In future research we intend to determine whether this finding applies to the sample restricted to top earners.

[24] In Canada, provincial income taxes represent a very significant portion of total income taxes. Therefore, Figure 11 displays marginal tax rates including both the federal and provincial income taxes (see appendix section E in Saez and Veall (2003) for details).

[25] For example, in the early 1920s, the top marginal tax rate was in excess of 70% but the taxpayer at percentile P99.99 (approximately the 500th highest income in Canada at that time) faced a much more modest marginal rate of about 25%.

Have marginal tax rate changes had more effect on the top percentile since World War II? For the United States, Feenberg and Poterba (1993, 2000) and Feldstein (1995) argue that large decreases in the marginal tax rates for top groups have given rise to the surge in top incomes depicted in Figure 12. Also for the United States, various studies have pointed out that the dramatic surge in top incomes in the 1980s might not reflect actual income changes but rather changes in the way incomes are reported (see e.g. Slemrod, 1998 and Gordon and Slemrod, 2000). For example, Slemrod (1996) shows that about one third of the jump in the top income shares in the United States from 1986 to 1988 is due to shifts from the corporate sector to the personal sector (as the top personal tax rate became lower than the corporate tax rate after 1987). The Canadian experience casts new light on these issues.

One central difference between the Canadian and U.S. experience is that Canadian marginal tax rate cuts have been much smaller. From the early 1960s to 2000, as Figure 11 shows, an individual at the P99.9 threshold received no marginal tax rate cut and an individual at the P99.99 threshold received a cut of just 8 percentage points. We have calculated the comparable cuts in the United States as over 30 percentage points at the P99.9 threshold and over 40 percentage points at the P99.99 threshold.

Figure 12 does show that the U.S. top income surge has so far been larger. There is perhaps also some indication that Canadian top shares started to increase during the 1980s at the time of some significant Canadian marginal tax rate cuts, although some of the effect seems to have been temporary (see below). But it is striking that between 1990 and 2000, top shares surged very similarly in both countries, particularly after 1995. This occurred even though there was very little further change in Canadian marginal tax rates facing these top income individuals (compare the larger marginal tax rate reduction at the P90 level where there was no surge) and even though there was a substantial increase in the relevant U.S. marginal personal income tax rates in 1993 (as emphasized by Slemrod and Bakija, 2001, and Piketty and Saez, 2003). Therefore, the dramatic climb in Canadian top reported incomes is unlikely to

have been induced by changes in Canadian tax legislation alone[26] and particularly unlikely to be only the consequence of changes in tax reporting behavior.[27] If, as tentatively argued in the previous section, some of the surge in Canadian top incomes is due to brain drain threats, it must be the case that the surge in top U.S. wage incomes is real and not entirely due to changes in the way incomes are reported for tax purposes. Otherwise, those changes in the United States could not have increased incentives for Canadian top earners to move to the United States.

There are other things to learn from the Canada/United States comparison in Figure 12. First, as noted, there is clear evidence in Canada, as in the United States, of a short-term response to cuts in marginal tax rates. For example Figure 11 shows that there was a substantial tax cut in Canada in 1988 and Figure 12 shows a sharp increase in the 0.5% share between 1987 and 1989, which is partially reversed by 1990. The top wage series display the same spike in 1989 (Figure 8) suggesting that this short-term response was in large part a wage income phenomenon, with highly compensated employees shifting some of their compensation into the lower tax rate years. Goolsbee (2000) has documented similar effects for the U.S. tax increase of 1993. Sillamaa and Veall (2001) analyzed the Canadian tax cut of 1988 by comparing incomes in years 1986 and 1989. Consistent with our results, they found significant and large elasticities for high-income groups. However, our top share series shows that their elasticity estimates capture the short-term spike response but that this likely overstates the long-run response to the tax change. [28]

[26] The corporate income tax rate remained relatively stable from the 1950s to 1987, slightly above 50%. The corporate income tax rate was decreased from 1987 to 1990 to about 45%, and has remained stable until 2000. If anything, this small decrease should have induced a shifting out of the personal sector toward the corporate sector.

[27] In contrast to the United States, the share of business income reported on high income tax returns has been relatively stable and very low, between 1 and 3% of total income over the last 20 years in Canada (see Table C3 in Saez and Veall, 2003). This shows that shifts between the corporate and non-corporate sector cannot explain the surge in top incomes in Canada. It is also important to note that, in Canada and in contrast to the United States, there was a dividend tax credit system throughout this period which reduced double taxation of dividends.

[28] Sillamaa and Veall (2001) use four years of the same microdata set used as part of this study. They find much lower tax responsiveness for low-income groups, consistent with the U.S. findings of Feldstein (1995) and Gruber and Saez (2002). Gagné, Nadeau and Vaillancourt (2000) use

Second, in Sections 3 and 4 we argued that the drop in top income shares during World War II was a combination of a reduction in wage income inequality (probably due to WWII wage controls) and a reduction in distributed dividends because of the fiscal shock in the corporate sector during the war. Figure 12 shows that the same drop in top shares took place in the United States and it is plausible that the same mechanisms were at play in both countries.[29] The absence of recovery after WWII suggests that the top capital income earners were never able to reconstitute fortunes as large (relative to the average income) as in the pre-war period. As argued in Piketty and Saez (2003) in the case of the United States, the most natural and realistic explanation seems to be progressive taxes. The wealth that contributed to the top 0.01% of incomes observed in the inter-war period was accumulated during a time when progressive taxes hardly existed. The fiscal situation faced by wealth-holders during and after WWII in Canada has been substantially less favorable. As shown in Figure 11, groups within the top 0.1% consistently faced personal income tax rates between 50 and 60% after the war. In addition, the corporate tax rate was low before the war (around 10 to 15%) and was consistently around 40-50% after the war. Furthermore, there were progressive estate taxes in Canada with top rates as high as 50% in 1941 until these were eliminated over the 1970s.

Since the 1970s, the burden of taxation on large capital incomes has been reduced with the repeal of the estate tax and the extension of the dividend tax credit (which reduces substantially the burden of corporate taxation on distributed profits), and the reduction of the top income tax rates. However, it is important to recall that the recent surge in top income shares is mostly a wage income phenomenon and top capital incomes have not yet recovered to their pre-war levels. Nevertheless, the dramatic surge in top wage shares, together with a

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provincial level aggregate data over 1972-1996 and find a large tax responsiveness for high-income individuals, but only for the 1988-1996 period.

[29] Moreover in the pre-war era, as discussed in Section 3, the top share in the United States declines during the Great Depression while it increases in Canada. This is explained by the larger share of wage income in top shares in Canada and the fact that there was less change in aggregate dividends in Canada than in the United States. Note also that the World War II effect starts earlier in Canada than the United States as Canada enters World War II in 1939, two years before the United States.

more favorable fiscal environment for the rich, may allow the working rich to accumulate large fortunes. As a result, we may very well observe a revival of top capital incomes in Canada within the next few decades.

6. Conclusion

This paper has used personal income tax data to construct homogeneous series of top income shares in Canada over the course of the 20th century. A number of important findings have emerged. First and most striking are the close parallels between the patterns and composition of top incomes in Canada and the United States. Both countries experienced a sharp drop in top shares during World War II with no recovery before the 1970s. However, during the last two decades, the top groups have recovered their pre-war levels. Moreover both countries have experienced the same shift in the composition of top incomes (although this change is less dramatic in Canada than in the United States): until the 1960s, the very top incomes in both countries were mostly composed of passive capital income. However, the dramatic increase in top income shares over the last 20 years is due to a surge in the top wages and salaries. As a result, today earners of employment income have, to a large extent, replaced rentiers at the top of the income distribution.

The Canadian experience casts interesting light on the role of taxation in explaining the pattern of top income shares. Although the drop in marginal tax rates since the 1970s has been much more modest in Canada than in the United States, the surge in top incomes has been almost as large in Canada as in the United States. The analysis of top Canadian incomes is more transparent because it is not plagued with shifts between the personal and corporate sectors, which have made the U.S. results more difficult to interpret. Moreover, the concentration of the surge in the last decade and among only the very top income shares suggests that tax changes in Canada cannot explain the facts. While clear evidence of short-term responses to taxation can be found in Canada, it would be very misleading to equate such responses to the permanent long-run effects of tax changes.

The surge in top wage shares in the last two decades took place in both the United States and Canada but not in other modern economies such as France (Piketty, 2001a,b) or Japan.[30] Therefore, simple skilled-bias technological explanations cannot account fully for these facts. The surge in top wages in Canada is more concentrated within very top groups than in the United States and was much less pronounced for francophones in Quebec. This suggests that the threat of migration to the United States by highly skilled Canadian executives or professionals may have driven the surge in top wage shares in Canada (while not affecting other countries such as France or Japan). If the migration threat explanation is valid, then this implies that the surge in top reported incomes in the United States since the 1970s must be real to a large extent and cannot be the consequence of changes in the way incomes are reported for tax purposes. The puzzle that still remains to be explained is why such a surge took place in the United States in the first place.

The overall picture that emerges is that no deep technological forces underlying the process of development seem to be driving changes in inequality in Canada, as the famous Kuznets hypothesis suggested. On the contrary, World War II, the development of progressive taxation and changes in top income shares in the United States seem to be the most important factors that account for long term trends in Canadian top income shares.

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[30] Preliminary investigation of Japanese tax statistics on employment income suggests that top wage shares have not increased at all over the last two decades and have stayed at a low level (compared to the United States).

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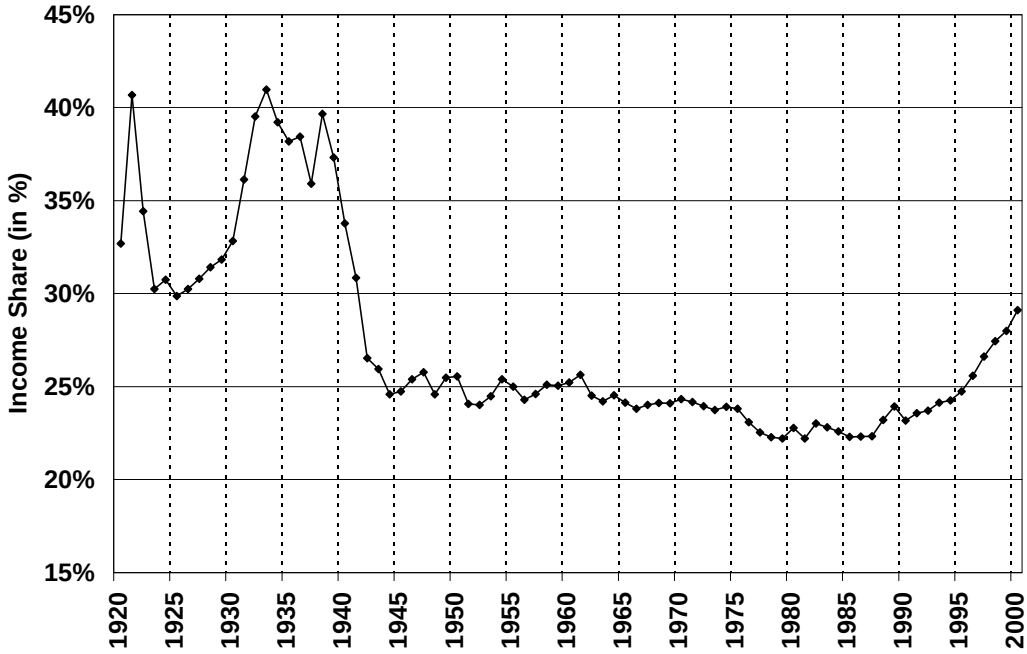

FIGURE 1

The Top 5% Income Share (P95-100) in Canada, 1920-2000

Source: Table 2, column P95-100.

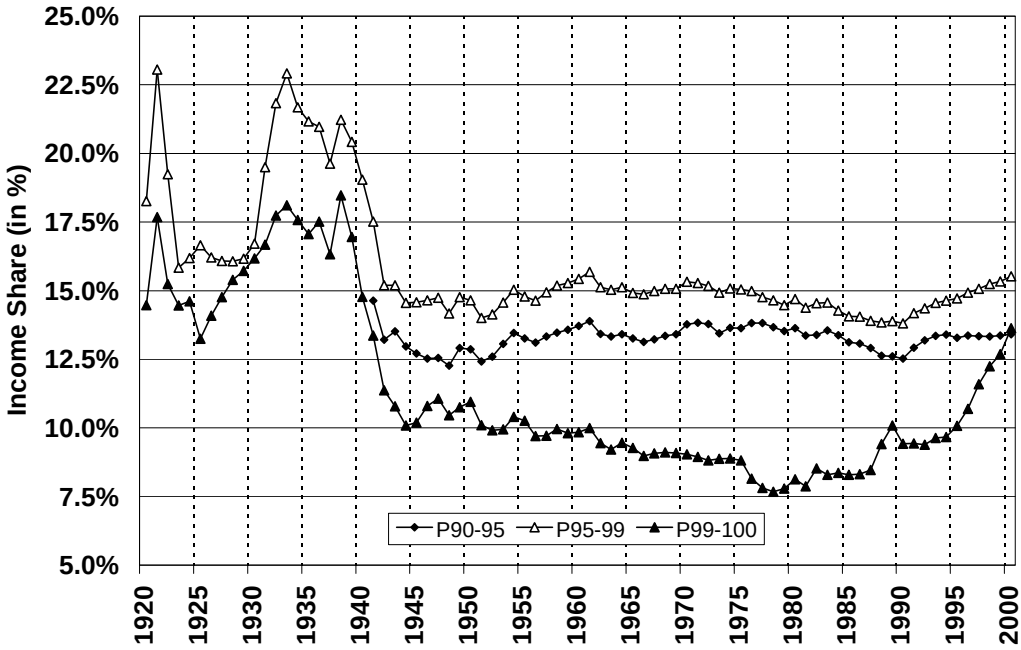

FIGURE 2

The Income Shares of P90-95, P95-99, and P99-100 in Canada, 1920-2000

Source: Table 2, columns P90-95, P95-99, and P99-100.
Estimates for P90-95 are only available from 1941 (because of high exemption levels in the pre-war period).

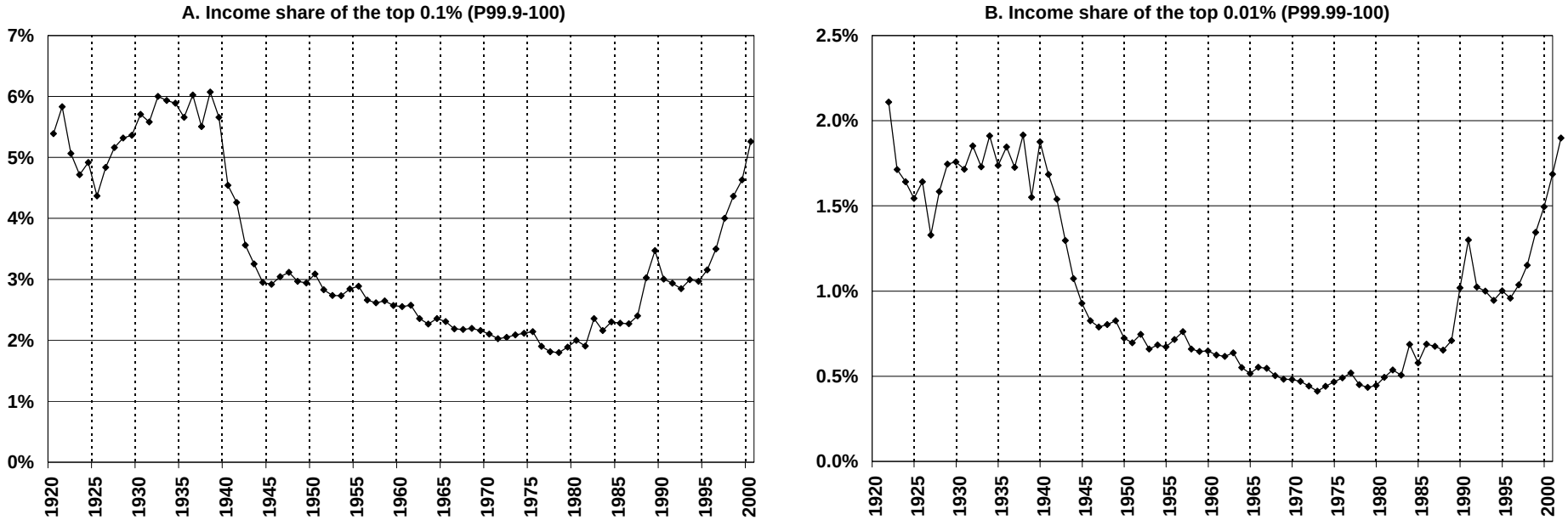

FIGURE 3

The Income Shares of the Top Income Groups in Canada, 1920-2000

Source: Table 2, columns P99.9-100, and P99.99-100.

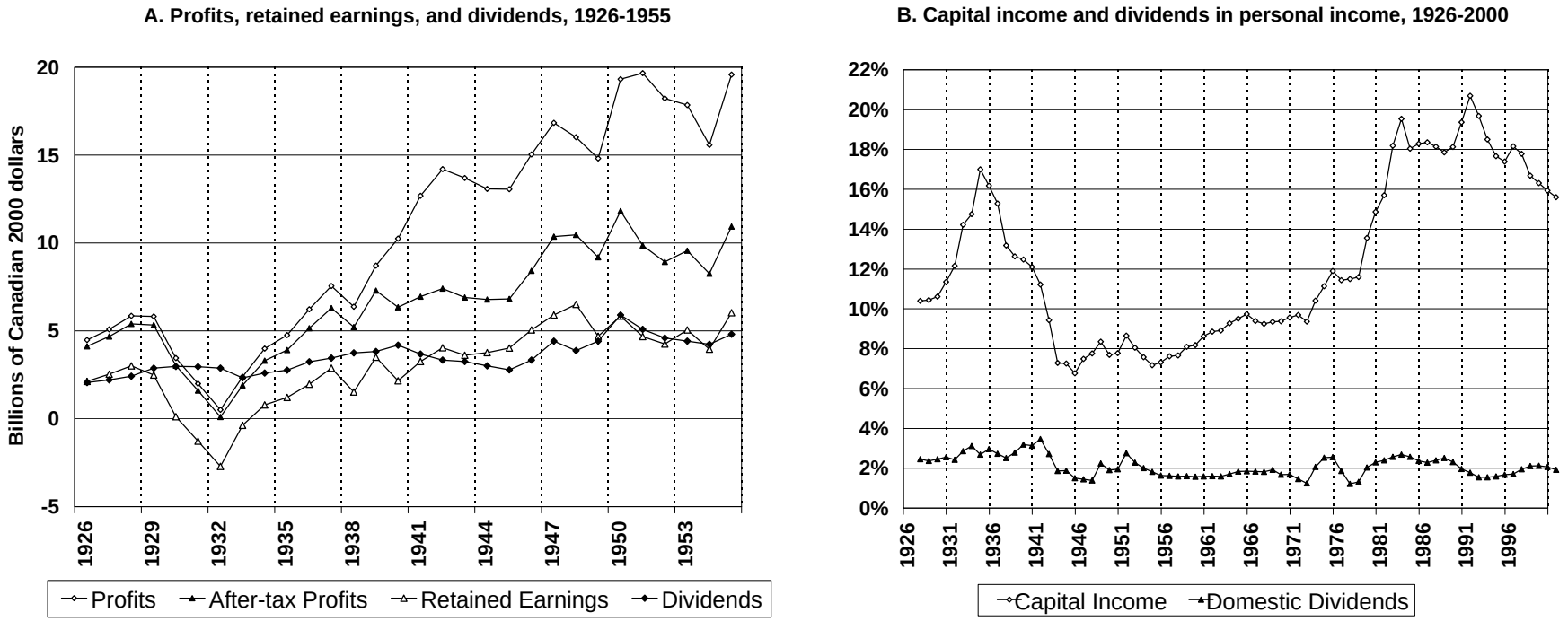

FIGURE 4

Capital Income in the Corporate and the Personal Sector in Canada

Source: Authors' computations based on National Income and Expenditure Accounts, data from CANSIM (2003) with additional data provided by Statistics Canada.

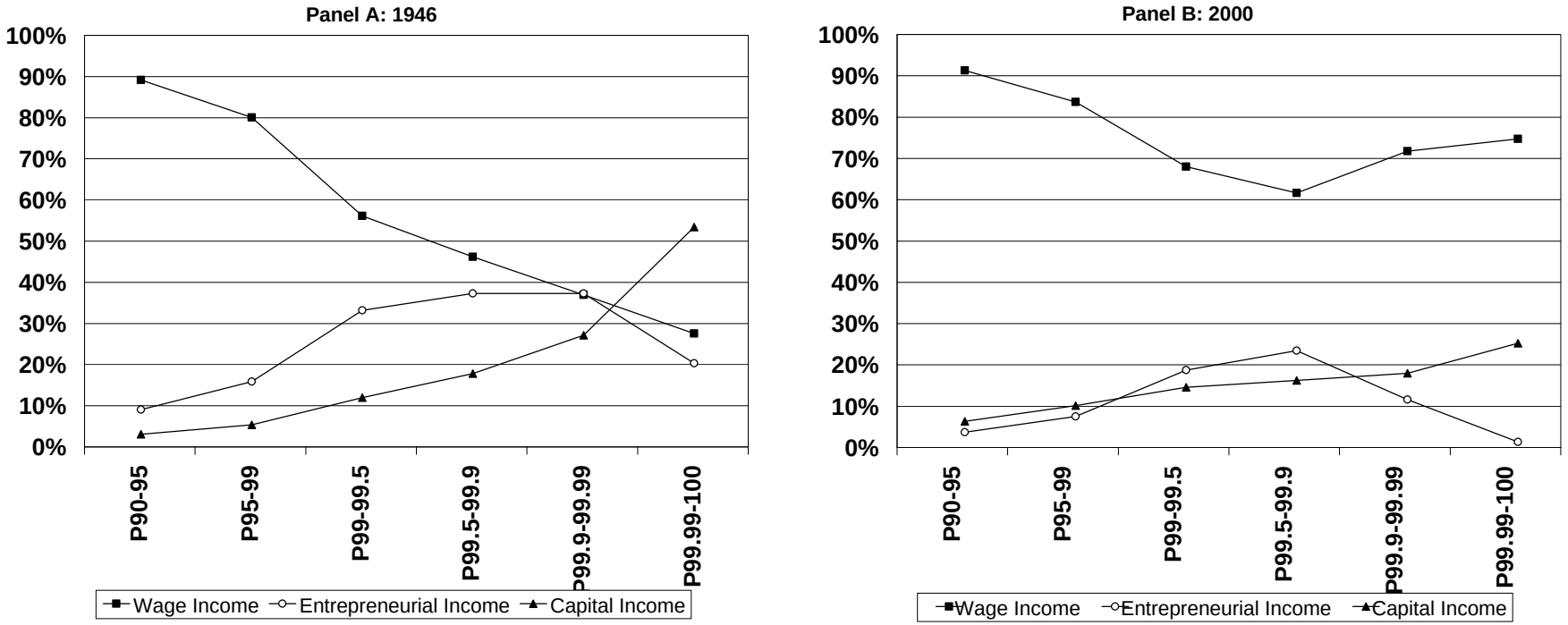

FIGURE 5

Income Composition of Top Groups within the Top Decile in 1946 and 2000

Capital income does not include capital gains.
Source: Table 3, rows 1946 and 2000.

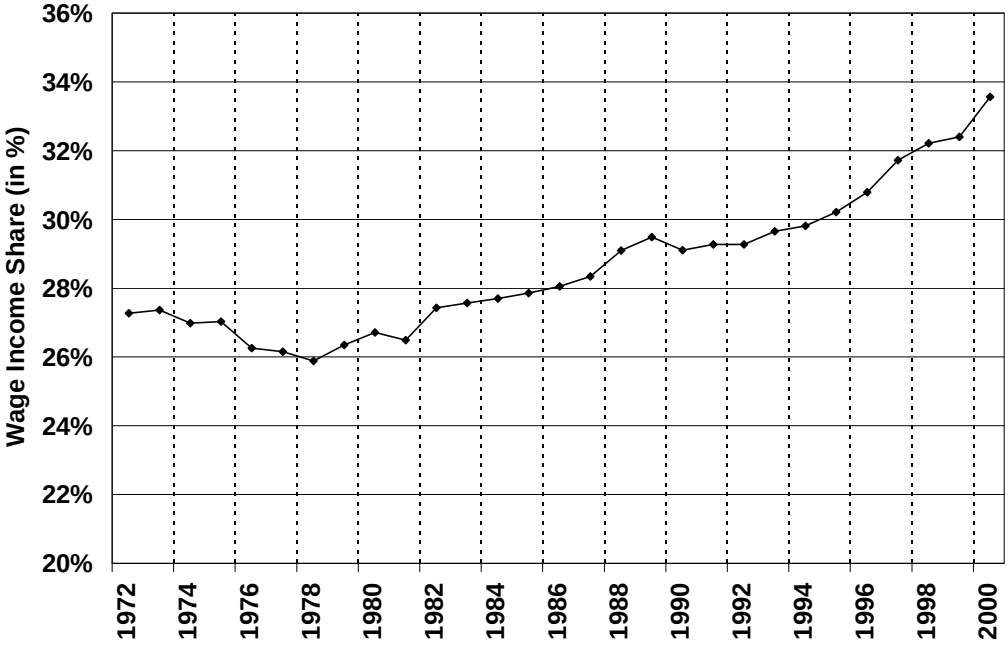

FIGURE 6

The Top 10% Wage Income Share (P90-100) in Canada, 1972-2000

Source: Table 4, column P90-100.

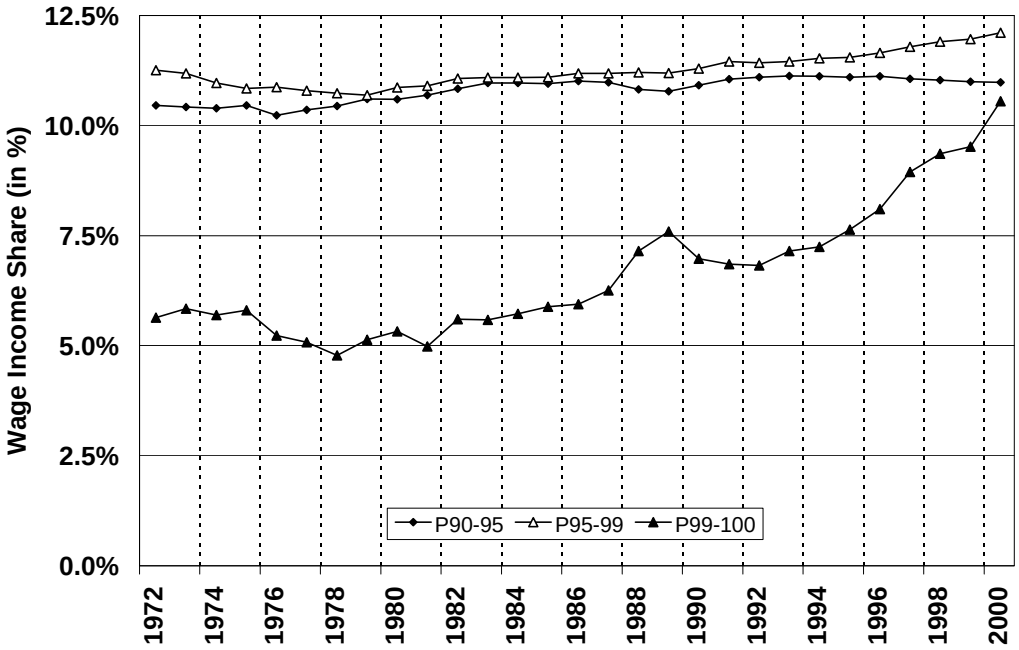

FIGURE 7

The Wage Income Shares of P90-95, P95-99, and P99-100 in Canada, 1972-2000

Source: Table 4, columns P90-95, P95-99, and P99-100.

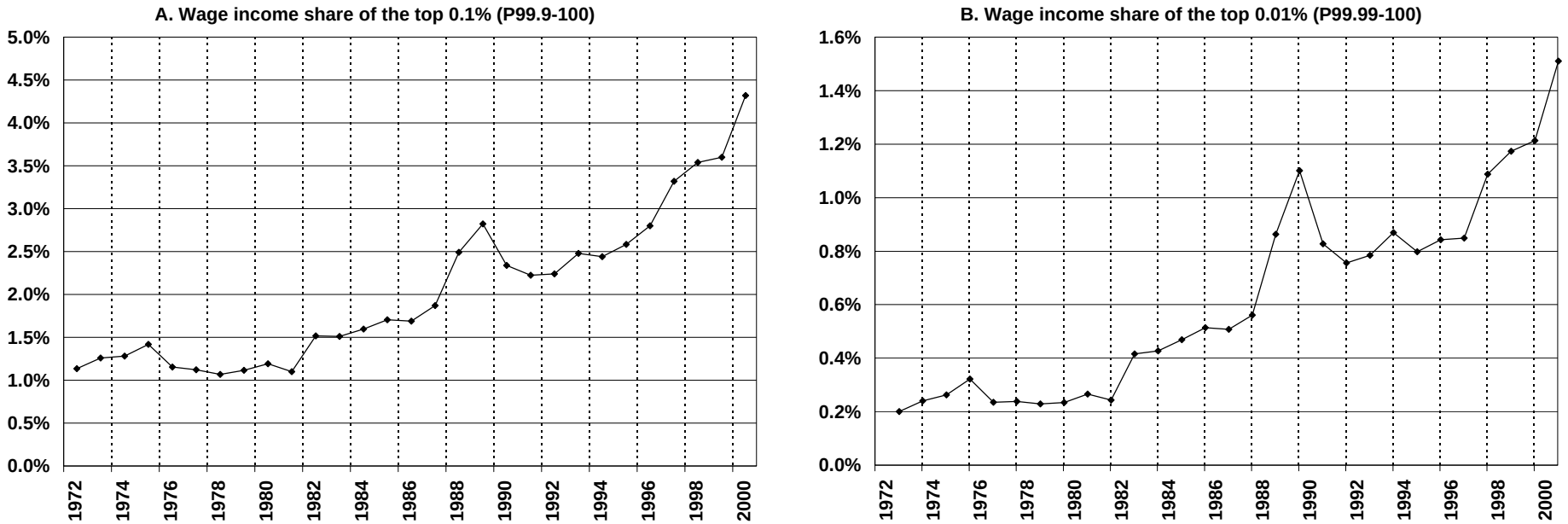

FIGURE 8

The Top Wage Income Shares in Canada, 1972-2000

Source: Table 4, columns P99.9-100, and P99.99-100.

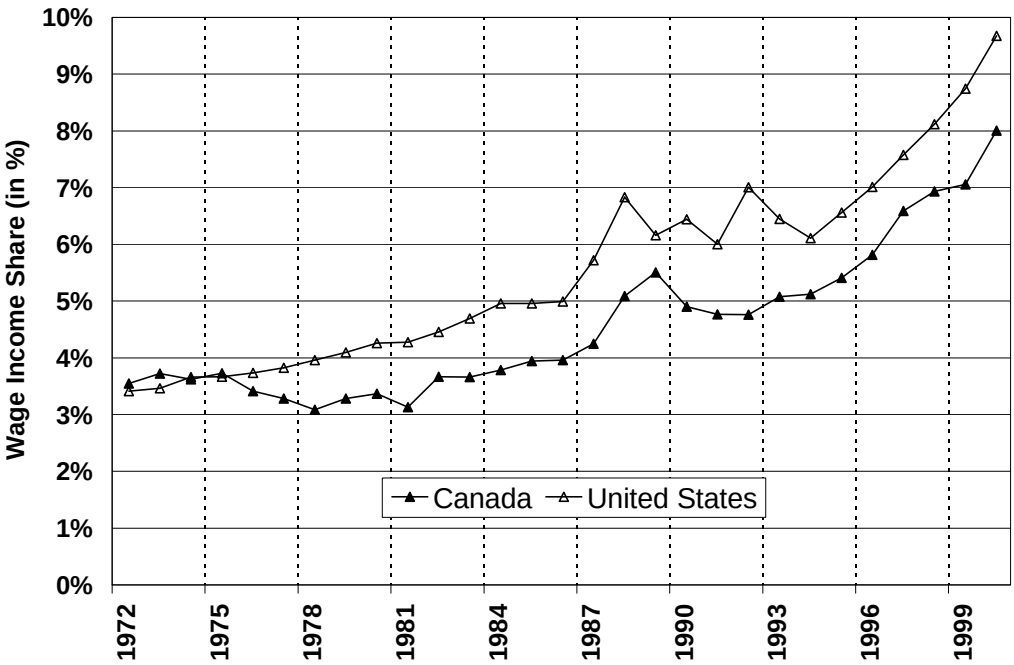

FIGURE 9

The Top 0.5% Wage Income Share in Canada and United States, 1972-2000

Source: Canada Table 4, column P99.5-100
United States, Piketty and Saez (2003), Table IV, col. P99.5-100, updated to 2000
United States series are based on family earnings while Canadian series are based on individual earnings

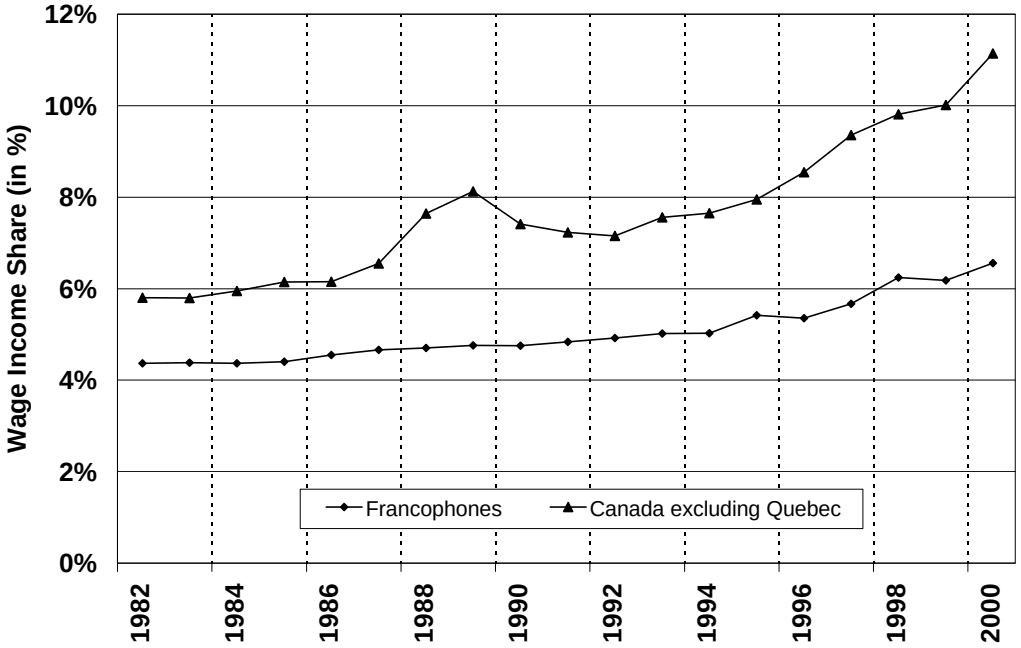

FIGURE 10
The Top 1% Wage Income Share of Quebec Francophones Versus All Filers from the Rest of Canada, 1982-2000

Source: Table D4, Panel A and B, column P99-100 in Saez and Veall (2003)

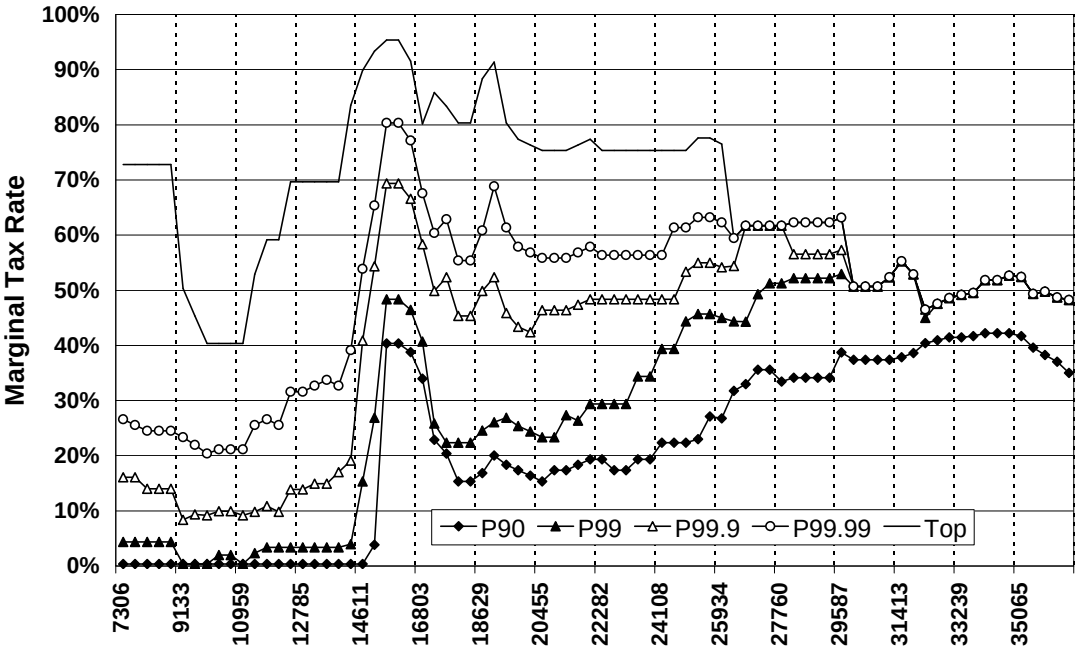

FIGURE 11

Marginal Income Tax Rates in Canada for Various Percentiles, 1920-2000

Source: Table E1, columns P90, P99, P99.9, P99.99, and Top, in Saez and Veall (2003).
Notes: Marginal tax rates include both federal and provincial taxes, as well as applicable surtaxes and credits
Year 1942 excluded because rates were reduced due to transition to a pay-as-you earn system
Estimation details are provided in Appendix Section E of Saez and Veall (2003)

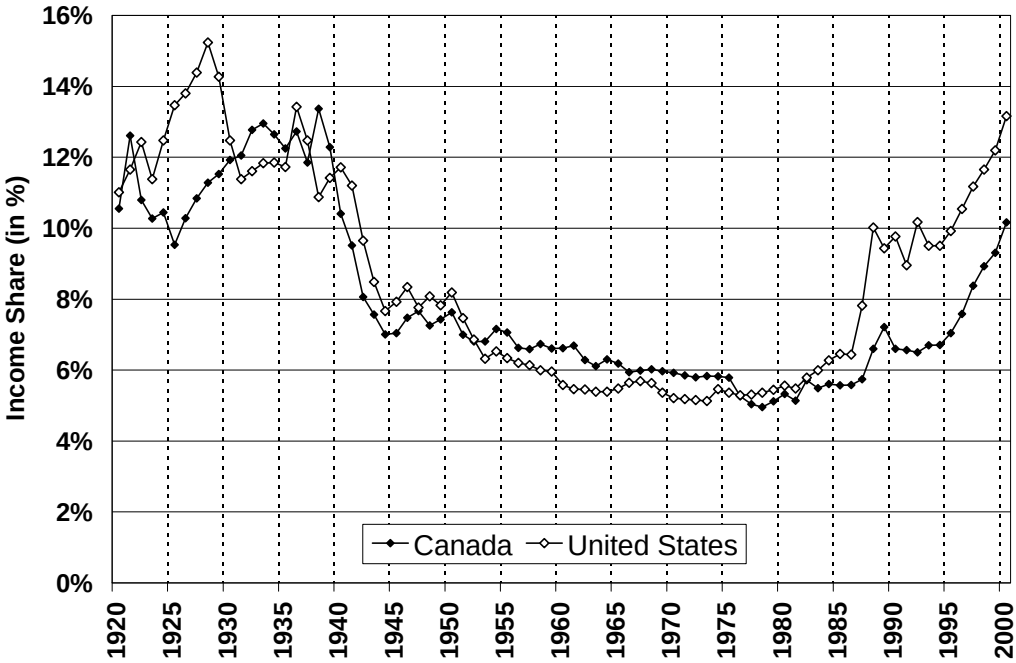

FIGURE 12

The Top 0.5% Income Share in Canada and the United States, 1920-2000

Source: Canada, Table 2, column P99.5-100
United States, Piketty and Saez (2003), Table II, col. P99.5-100, updated to 2000
United States series are based on family income while Canadian series are based on individual income

Table 1:
Thresholds and Average Incomes in Top Groups in Canada, 2000

Thresholds (1)	Income level (2)	Fractiles (3)	Number of tax units (4)	Average income (5)
		Full Population	22,807,585	$24,859
P90	$59,232	P90-95	1,140,379	$66,310
P95	$75,670	P95-99	912,303	$95,982
P99	$145,774	P99-99.5	114,038	$171,728
P99.5	$210,150	P99.5-99.9	91,230	$303,035
P99.9	$530,311	P99.9-99.99	20,527	$923,385
P99.99	$2,396,050	P99.99-100	2,281	$4,695,923

Notes: Computations based on income tax return statistics (see Saez and Veall, 2003, Appendix Section B)

Income is defined as annual gross income excluding capital gains and before individual taxes.

Amounts are expressed in 2000 Canadian dollars. 1 US dollar = 1.5 Canadian dollar.

Source: Table A and Table B3, row 2000 in Saez and Veall (2003).

Table 2: Top Income Shares in Canada, 1920-2000

	Population (aged 20+) ('000s)	Average Income (2000 $)	Inflation CPI (2000 base)	Top Income Shares							
				P90-100	P95-100	P99-100	P99.5-100	P99.9-100	P99.99-100	P90-95	P95-99
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1920	4,990	4,980	11.894		32.60	14.40	10.49	5.36	2.10		18.19
1921	5,072	4,474	10.485		40.58	17.60	12.55	5.81	1.70		22.98
1922	5,163	4,987	9.604		34.34	15.17	10.74	5.04	1.63		19.17
1923	5,228	5,300	9.604		30.15	14.38	10.22	4.69	1.53		15.77
1924	5,321	5,242	9.427		30.65	14.53	10.39	4.89	1.63		16.11
1925	5,426	5,600	9.604		29.76	13.18	9.48	4.34	1.32		16.59
1926	5,528	5,944	9.604		30.15	14.01	10.22	4.81	1.57		16.14
1927	5,668	6,179	9.515		30.70	14.69	10.78	5.13	1.74		16.01
1928	5,810	6,474	9.515		31.31	15.32	11.23	5.29	1.75		16.00
1929	5,947	6,293	9.692		31.73	15.64	11.47	5.34	1.71		16.09
1930	6,074	5,831	9.604		32.74	16.10	11.86	5.68	1.84		16.63
1931	6,192	5,250	8.634		36.03	16.60	12.00	5.55	1.72		19.42
1932	6,317	4,674	7.841		39.42	17.67	12.72	5.98	1.90		21.75
1933	6,445	4,397	7.489		40.88	18.03	12.89	5.91	1.73		22.84
1934	6,564	4,755	7.577		39.11	17.50	12.59	5.86	1.84		21.61
1935	6,681	4,963	7.665		38.09	16.99	12.19	5.63	1.72		21.10
1936	6,786	5,132	7.753		38.35	17.45	12.67	6.00	1.91		20.90
1937	6,890	5,544	8.018		35.81	16.26	11.79	5.48	1.54		19.55
1938	6,999	5,494	8.106		39.55	18.41	13.31	6.05	1.87		21.15
1939	7,114	5,708	8.106		37.23	16.88	12.23	5.63	1.67		20.34
1940	7,229	6,278	8.370		33.68	14.71	10.35	4.52	1.53		18.97
1941	7,350	6,991	8.899	45.31	30.74	13.30	9.46	4.24	1.29	14.56	17.45
1942	7,492	8,383	9.251	39.56	26.42	11.30	8.01	3.53	1.06	13.14	15.13
1943	7,614	8,835	9.427	39.29	25.84	10.72	7.51	3.23	0.92	13.45	15.12
1944	7,730	9,473	9.515	37.38	24.49	10.01	6.95	2.92	0.82	12.89	14.48
1945	7,822	9,304	9.604	37.27	24.63	10.12	6.99	2.89	0.78	12.64	14.51
1946	7,971	9,037	9.868	37.75	25.30	10.72	7.42	3.02	0.79	12.45	14.57
1947	8,122	9,291	10.837	38.14	25.66	10.99	7.61	3.09	0.82	12.47	14.67
1948	8,266	9,314	12.335	36.68	24.49	10.39	7.20	2.94	0.71	12.19	14.10
1949	8,613	9,162	12.775	38.22	25.37	10.69	7.38	2.91	0.69	12.84	14.69
1950	8,758	9,328	13.128	38.24	25.45	10.88	7.58	3.06	0.74	12.79	14.57
1951	8,896	9,917	14.449	36.31	23.96	10.03	6.94	2.80	0.65	12.35	13.93
1952	9,129	10,285	14.890	36.44	23.91	9.85	6.75	2.71	0.67	12.52	14.07
1953	9,329	10,681	14.714	37.36	24.37	9.88	6.75	2.70	0.66	12.98	14.50
1954	9,548	10,378	14.802	38.68	25.29	10.33	7.10	2.82	0.71	13.39	14.96
1955	9,734	10,998	14.802	38.08	24.90	10.19	7.00	2.86	0.75	13.18	14.71
1956	9,911	11,806	15.066	37.22	24.19	9.63	6.57	2.63	0.65	13.04	14.56
1957	10,159	11,894	15.507	37.76	24.50	9.64	6.54	2.59	0.64	13.26	14.86
1958	10,352	11,920	15.859	38.39	25.00	9.89	6.68	2.62	0.64	13.39	15.11
1959	10,537	12,163	16.123	38.44	24.94	9.74	6.55	2.54	0.61	13.50	15.21
1960	10,700	12,406	16.300	38.78	25.13	9.77	6.56	2.52	0.61	13.65	15.36
1961	10,851	12,531	16.476	39.35	25.53	9.93	6.63	2.55	0.63	13.82	15.61
1962	11,001	13,337	16.652	37.77	24.42	9.37	6.23	2.33	0.54	13.36	15.05
1963	11,158	13,816	16.916	37.37	24.11	9.14	6.06	2.24	0.51	13.26	14.96
1964	11,354	14,330	17.269	37.77	24.43	9.38	6.24	2.33	0.54	13.34	15.05
1965	11,575	15,232	17.621	37.23	24.04	9.20	6.12	2.28	0.54	13.19	14.84
1966	11,845	16,106	18.326	36.76	23.70	8.91	5.88	2.16	0.49	13.06	14.80
1967	12,150	16,512	18.943	37.06	23.91	9.00	5.93	2.15	0.47	13.15	14.91
1968	12,451	16,909	19.736	37.31	24.02	9.04	5.96	2.17	0.47	13.28	14.99
1969	12,756	17,510	20.617	37.34	24.01	9.01	5.91	2.13	0.46	13.33	15.00
1970	13,064	17,760	21.322	37.92	24.22	8.97	5.87	2.07	0.43	13.69	15.25
1971	13,365	18,481	21.938	37.83	24.08	8.87	5.79	2.00	0.40	13.76	15.21
1972	13,659	19,488	22.996	37.55	23.84	8.75	5.74	2.02	0.43	13.71	15.09
1973	13,983	20,715	24.758	37.02	23.65	8.80	5.78	2.06	0.46	13.37	14.85
1974	14,353	21,611	27.401	37.38	23.82	8.81	5.76	2.09	0.48	13.57	15.01
1975	14,737	21,996	30.396	37.28	23.71	8.74	5.73	2.11	0.51	13.56	14.97
1976	15,101	22,781	32.687	36.74	22.99	8.08	5.21	1.88	0.44	13.75	14.91
1977	15,454	22,757	35.242	36.18	22.43	7.74	4.98	1.79	0.43	13.75	14.69
1978	15,787	22,786	38.414	35.77	22.17	7.60	4.90	1.77	0.44	13.60	14.57
1979	16,129	23,123	41.938	35.57	22.11	7.72	5.06	1.86	0.48	13.46	14.40
1980	16,524	23,202	46.167	36.23	22.68	8.06	5.27	1.97	0.53	13.56	14.62
1981	16,919	23,829	51.894	35.39	22.10	7.80	5.08	1.88	0.50	13.29	14.30
1982	17,299	22,875	57.533	36.24	22.92	8.46	5.66	2.33	0.68	13.32	14.47
1983	17,654	22,045	60.881	36.19	22.71	8.21	5.44	2.13	0.57	13.48	14.49
1984	17,998	22,480	63.524	35.78	22.48	8.29	5.55	2.28	0.68	13.30	14.20
1985	18,321	23,007	66.079	35.25	22.20	8.21	5.51	2.26	0.67	13.04	13.99
1986	18,628	23,243	68.811	35.22	22.22	8.24	5.52	2.24	0.64	13.00	13.97
1987	18,966	23,518	71.806	35.05	22.22	8.40	5.69	2.38	0.70	12.83	13.82
1988	19,278	24,507	74.714	35.66	23.11	9.34	6.54	3.00	1.01	12.55	13.77
1989	19,690	24,875	78.414	36.36	23.83	10.01	7.15	3.44	1.29	12.53	13.82
1990	20,030	24,877	82.203	35.54	23.08	9.35	6.55	2.98	1.01	12.46	13.73
1991	20,313	23,578	86.784	36.31	23.47	9.37	6.51	2.91	0.99	12.84	14.11
1992	20,579	23,195	88.106	36.72	23.60	9.31	6.44	2.82	0.94	13.12	14.29
1993	20,843	22,804	89.692	37.31	24.03	9.56	6.64	2.97	0.99	13.28	14.48
1994	21,115	22,989	89.868	37.49	24.16	9.59	6.65	2.94	0.95	13.33	14.57
1995	21,394	23,252	91.806	37.85	24.65	10.00	6.99	3.13	1.03	13.21	14.64
1996	21,667	23,171	93.304	38.77	25.48	10.62	7.53	3.47	1.14	13.29	14.85
1997	21,971	23,455	94.802	39.78	26.51	11.52	8.32	3.97	1.33	13.26	14.99
1998	22,241	23,955	95.683	40.61	27.35	12.18	8.87	4.34	1.48	13.26	15.17
1999	22,517	24,312	97.357	41.17	27.89	12.62	9.25	4.61	1.68	13.29	15.27
2000	22,808	24,859	100.000	42.34	29.01	13.56	10.11	5.23	1.89	13.34	15.44

Notes: See Appendix Sections A and B in Saez and Veall (2003) for details. Average income is estimated from National Income and Product Accounts.
Income is defined as income reported on personal income tax returns before all deductions and excluding realized capital gains.
Top income shares are estimated from on income tax return statistics and Pareto interpolations.
Series for P90-95 are estimated only for the 1941-2000 period because the tax return population does not cover that group in the pre-war period.
Source: Tables A and B1 in Saez and Veall (2003)

Table 3: Income Composition in Top Income Groups, 1946-2000

	P90-95			P95-99			P99-99.5			P99.5-99.9			P99.9-99.99			P99.99-100		
	Wage	Entrep.	Capital	Wage	Entrep.	Capital	Wage	Entrep.	Capital	Wage	Entrep.	Capital	Wage	Entrep.	Capital	Wage	Entrep.	Capital
1946	88.7	8.6	2.7	79.6	15.5	4.9	55.7	32.8	11.5	45.8	36.9	17.4	36.5	36.8	26.7	27.2	19.9	53.0
1947	89.7	8.2	2.2	76.7	18.2	5.0	54.4	34.6	11.0	43.2	41.3	15.5	35.3	40.5	24.3	25.1	24.8	50.2
1948	90.0	8.0	2.0	76.7	18.4	4.9	52.5	36.2	11.3	44.1	40.1	15.9	36.7	37.3	26.1	28.2	27.2	44.6
1949	89.3	8.6	2.1	76.5	18.8	4.7	53.1	36.3	10.5	44.4	39.4	16.2	35.6	38.3	26.1	28.8	25.0	46.3
1950	89.5	8.4	2.1	77.2	17.6	5.2	53.2	35.5	11.3	44.1	38.7	17.1	34.5	38.9	26.6	32.3	25.1	42.6
1951	90.0	8.1	1.9	77.5	17.6	4.9	54.2	33.9	11.9	46.4	37.5	16.1	38.3	34.3	27.4	26.7	30.8	42.5
1952	90.3	7.6	2.1	78.9	16.6	4.5	53.9	34.6	11.6	46.0	37.8	16.2	38.6	33.1	28.3	28.0	23.4	48.7
1953	90.2	7.5	2.3	79.6	15.7	4.7	54.1	33.8	12.1	47.4	36.6	16.0	38.7	32.3	29.0	33.4	20.6	45.9
1954	91.6	6.3	2.2	81.8	13.3	4.8	58.0	29.9	12.1	49.4	33.6	17.0	39.8	29.2	31.1	30.3	25.2	44.5
1955	91.6	6.1	2.3	81.6	13.3	5.0	56.5	30.8	12.7	48.1	34.7	17.1	36.3	32.1	31.6	25.9	27.4	46.7
1956	91.4	6.4	2.2	81.6	13.6	4.7	55.9	32.2	11.9	47.7	35.5	16.9	39.7	32.4	27.9	26.2	29.9	43.9
1957	91.7	5.9	2.4	82.9	12.4	4.7	61.4	27.3	11.3	50.8	32.5	16.7	42.5	29.7	27.8	29.4	23.1	47.4
1958	90.9	6.6	2.5	80.4	14.1	5.5	60.7	27.5	11.9	49.8	33.0	17.2	43.2	29.0	27.8	30.0	19.2	50.8
1959	91.1	6.2	2.7	81.6	12.7	5.7	63.1	25.1	11.8	49.5	32.5	18.0	44.0	27.9	28.1	32.0	17.4	50.6
1960	91.1	6.0	2.9	81.6	12.4	6.0	65.7	22.3	12.0	50.1	31.2	18.7	43.5	27.7	28.8	31.0	15.8	53.2
1961	91.0	6.2	2.9	81.5	12.0	6.5	66.1	21.8	12.0	50.5	30.6	19.0	42.9	27.9	29.1	28.4	16.1	55.4
1962	91.1	6.0	2.9	81.6	12.0	6.5	66.1	21.6	12.3	50.4	30.4	19.2	43.3	27.9	28.8	30.3	17.1	52.7
1963	91.0	6.2	2.8	81.3	12.1	6.6	67.0	21.1	12.0	50.7	31.1	18.2	43.6	29.7	26.7	35.4	17.4	47.3
1964	90.7	6.3	3.1	80.3	12.9	6.8	64.0	23.1	12.9	50.2	31.2	18.5	43.5	29.7	26.8	32.5	17.5	50.1
1965	90.6	6.4	3.0	80.8	12.8	6.4	63.4	24.1	12.5	49.2	32.9	17.9	43.8	30.0	26.2	32.0	19.7	48.3
1966	90.5	6.4	3.1	81.0	12.6	6.4	64.1	23.5	12.4	50.5	32.2	17.4	45.2	29.8	25.0	31.8	17.3	50.9
1967	90.6	6.3	3.1	81.5	12.0	6.4	66.1	22.1	11.9	51.1	32.4	16.5	45.5	30.9	23.6	34.0	16.3	49.7
1968	91.0	5.4	3.7	82.7	10.4	6.9	68.5	19.3	12.3	51.8	31.8	16.4	45.2	31.4	23.4	35.0	18.2	46.9
1969	91.6	4.6	3.9	84.1	8.9	7.0	68.1	19.5	12.5	53.2	30.6	16.2	44.3	32.0	23.7	35.7	19.1	45.3
1970	91.7	4.1	4.2	85.2	7.8	7.0	67.5	19.3	13.1	53.6	29.9	16.5	41.4	35.0	23.6	33.0	19.8	47.2
1971	91.9	4.0	4.1	85.7	7.5	6.8	66.5	20.9	12.7	54.4	30.7	14.9	39.8	40.5	19.7	31.9	26.5	41.6
1972	91.7	4.3	4.0	84.8	8.3	6.9	68.4	19.6	12.0	50.9	33.6	15.5	42.4	36.9	20.7	40.5	19.3	40.2
1973	90.3	5.4	4.4	82.0	11.0	7.0	62.3	25.5	12.2	47.3	37.0	15.7	45.1	33.7	21.2	45.1	18.2	36.8
1974	89.5	5.3	5.2	79.4	12.1	8.5	59.0	27.1	13.9	44.5	38.0	17.6	45.0	31.5	23.5	45.4	15.1	39.5
1975	89.5	5.3	5.1	80.0	11.5	8.5	60.1	26.1	13.8	45.2	37.6	17.3	48.8	27.4	23.8	58.3	11.6	30.1
1976	89.8	4.7	5.5	82.7	9.0	8.3	62.6	23.2	14.2	46.0	35.3	18.6	47.4	27.1	25.5	49.5	15.3	35.2
1977	90.5	3.9	5.5	84.0	7.7	8.3	63.6	21.3	15.1	49.2	32.5	18.3	48.7	24.2	27.2	53.6	9.9	36.6
1978	89.5	4.1	6.4	81.0	8.4	10.6	57.9	21.7	20.3	49.5	27.1	23.4	46.4	18.9	34.7	49.7	8.2	42.1
1979	89.0	4.1	7.0	79.5	8.7	11.8	51.6	24.5	23.8	50.6	23.3	26.1	47.6	14.8	37.7	49.0	4.8	46.3
1980	87.8	3.7	8.5	77.9	8.4	13.7	57.9	19.0	23.2	53.1	19.1	27.8	48.2	11.6	40.2	50.0	4.5	45.6
1981	87.1	3.3	9.6	76.7	7.7	15.6	54.8	19.1	26.1	44.6	22.0	33.4	43.7	11.1	45.2	44.7	5.7	49.6
1982	87.4	2.8	9.8	79.2	6.1	14.7	61.6	16.2	22.2	49.1	23.4	27.5	50.7	11.9	37.4	47.1	2.4	50.6
1983	89.5	2.6	8.0	82.8	5.6	11.6	66.0	16.4	17.7	52.2	26.7	21.1	52.0	18.8	29.3	63.7	2.6	33.7
1984	90.2	2.7	7.1	84.3	5.5	10.2	67.5	16.8	15.7	52.9	28.7	18.5	54.4	20.6	25.0	59.8	1.1	39.2
1985	90.1	2.5	7.4	83.9	5.4	10.7	67.7	15.5	16.8	55.2	25.5	19.2	59.4	15.3	25.3	64.3	-1.2	37.0
1986	90.3	2.7	7.0	84.1	5.7	10.2	68.1	16.4	15.5	56.5	25.0	18.6	59.2	15.3	25.5	65.9	0.4	33.7
1987	90.7	2.9	6.5	84.2	5.8	10.0	66.7	16.6	16.7	57.5	24.3	18.3	63.4	13.9	22.7	68.9	0.8	30.4
1988	90.1	3.0	6.9	83.4	5.9	10.8	65.5	17.5	17.1	56.6	24.9	18.6	66.1	12.2	21.6	75.7	3.8	20.5
1989	89.4	3.0	7.6	81.9	6.2	11.9	62.3	18.7	19.0	52.6	26.0	21.4	62.6	12.3	25.1	72.5	4.6	22.8
1990	89.4	2.8	7.9	81.8	6.0	12.2	62.0	17.6	20.4	52.0	25.4	22.6	57.3	14.4	28.2	66.7	4.9	28.4
1991	90.5	2.4	7.2	83.2	5.5	11.3	63.4	17.1	19.5	52.3	26.4	21.3	57.8	15.8	26.4	63.6	3.9	32.5
1992	91.9	2.3	5.8	85.4	5.3	9.3	65.7	17.4	16.9	53.0	28.6	18.5	58.4	17.9	23.6	72.0	5.0	23.0
1993	92.1	2.5	5.5	85.5	5.4	9.0	66.1	17.3	16.6	53.9	29.0	17.1	63.2	16.3	20.5	79.6	2.3	18.1
1994	92.0	2.6	5.4	85.4	5.7	8.8	67.0	17.4	15.6	55.9	28.0	16.1	65.6	15.5	18.9	74.0	4.0	22.1
1995	91.1	2.9	6.0	83.8	6.2	10.1	65.5	17.3	17.2	55.9	27.5	16.6	65.7	14.4	19.9	74.1	3.7	22.2
1996	90.7	3.0	6.3	82.9	6.5	10.6	64.8	18.3	16.9	56.6	27.0	16.4	67.9	13.9	18.2	67.5	5.2	27.3
1997	91.0	3.2	5.8	83.5	6.9	9.6	65.5	19.3	15.2	57.6	26.8	15.7	70.1	13.3	16.6	72.6	3.0	24.4
1998	91.3	3.2	5.5	83.8	6.8	9.5	66.2	18.9	14.9	59.0	24.9	16.2	69.4	11.5	19.1	72.0	1.2	26.8
1999	90.9	3.3	5.8	83.7	7.0	9.3	66.8	18.6	14.5	59.8	24.6	15.6	68.7	12.9	18.4	67.0	2.5	30.5
2000	90.9	3.3	5.9	83.2	7.1	9.7	67.6	18.3	14.2	61.2	23.0	15.8	71.3	11.2	17.5	74.3	0.9	24.8

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 (wages and salaries, stock options exercises, pensions, other employment income), entrepreneurial income (self-employment income, farm income, and small business income), and capital income (dividends, interest, rents, foreign and other investment income) in total income (excluding capital gains). Capital income does not include realized capital gains. Details on methodology are presented in Appendix Section C of Saez and Veall (2003).
Source: Computations based on tax return statistics reported in Table C3 in Saez and Veall (2003).

Table 4: Top Wage Income Shares in Canada, 1972-2000

	Wage income earners ('000s)	Average wage income (2000 $)	Top Wage Income Shares							
			P90-100	P95-100	P99-100	P99.5-100	P99.9-100	P99.99-100	P90-95	P95-99
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1972	8,541	27,255	27.22	16.80	5.59	3.51	1.12	0.19	10.41	11.21
1973	8,955	27,933	27.31	16.93	5.79	3.69	1.24	0.23	10.38	11.14
1974	9,419	28,480	26.92	16.57	5.65	3.59	1.26	0.26	10.35	10.92
1975	9,648	29,135	26.97	16.56	5.76	3.70	1.40	0.32	10.41	10.80
1976	9,869	30,768	26.20	16.02	5.19	3.38	1.13	0.23	10.19	10.83
1977	10,014	30,945	26.10	15.79	5.04	3.25	1.10	0.23	10.31	10.75
1978	10,328	30,021	25.82	15.42	4.74	3.05	1.05	0.22	10.40	10.69
1979	10,772	29,625	26.30	15.74	5.09	3.25	1.10	0.23	10.56	10.65
1980	11,069	29,694	26.65	16.10	5.28	3.34	1.17	0.26	10.55	10.82
1981	11,420	29,232	26.44	15.79	4.94	3.10	1.08	0.24	10.65	10.85
1982	11,256	28,507	27.37	16.57	5.55	3.63	1.50	0.41	10.79	11.02
1983	11,185	28,160	27.52	16.59	5.54	3.63	1.49	0.42	10.92	11.05
1984	11,402	28,357	27.65	16.72	5.68	3.75	1.58	0.46	10.92	11.05
1985	11,582	28,549	27.80	16.89	5.84	3.91	1.68	0.51	10.91	11.05
1986	12,079	28,413	28.00	17.04	5.89	3.92	1.67	0.50	10.96	11.14
1987	12,312	28,547	28.28	17.35	6.21	4.21	1.85	0.55	10.94	11.14
1988	12,623	29,461	29.04	18.27	7.11	5.05	2.47	0.86	10.77	11.16
1989	12,962	29,836	29.43	18.70	7.55	5.47	2.80	1.10	10.73	11.15
1990	13,073	29,427	29.05	18.18	6.93	4.87	2.32	0.82	10.87	11.25
1991	12,916	28,683	29.22	18.21	6.80	4.73	2.20	0.75	11.01	11.41
1992	12,869	29,117	29.21	18.16	6.78	4.73	2.22	0.78	11.06	11.38
1993	12,903	29,011	29.59	18.51	7.11	5.04	2.46	0.86	11.08	11.41
1994	13,021	29,402	29.75	18.68	7.20	5.09	2.42	0.79	11.08	11.48
1995	13,195	29,443	30.15	19.10	7.59	5.38	2.57	0.84	11.06	11.51
1996	13,297	29,445	30.73	19.66	8.06	5.78	2.78	0.84	11.07	11.61
1997	13,615	29,932	31.66	20.64	8.90	6.56	3.30	1.08	11.02	11.74
1998	13,844	30,768	32.16	21.17	9.31	6.90	3.52	1.17	10.99	11.86
1999	14,233	31,183	32.35	21.40	9.48	7.02	3.58	1.21	10.95	11.92
2000	14,688	31,729	33.50	22.57	10.51	7.97	4.30	1.50	10.93	12.06

Notes: See Appendix Section D in Saez and Veall (2003) for details. Wage income earners is the number of individuals reporting positive wage income for personal income tax purposes. Wage income includes wages and salaries, stock option exercises, and other employment income.
Top wage income shares are estimated from income tax return statistics and Pareto interpolations.
Source: Tables D1 and D2 in Saez and Veall (2003)

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