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Federal Personal Income Tax: Slicing the Pie

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Federal Personal Income Tax: Slicing the Pie

Patrice Martineau
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Summary

The personal income tax system is the largest source of revenue for the federal government. It is also the most important tool when it comes to maintaining a taxation system that's fair to everyone.

Canada currently has a progressive income tax system. This means that those who earn more should be taxed at higher rates. In other words, the high-income taxpayers should be paying a greater proportion of their income in taxes than the ones with lower incomes.

That's the principle. But just how does it work out in reality? How has the tax pie been sliced among high- and low-income earners during the past few years?

This study examines the evolution of income, federal tax on personal income and the effective tax rate between 1990 and 2002.

For the purposes of this study, taxfilers were divided into three groups: the 10% with the highest incomes; the one-half with the lowest incomes; and a group representing the remaining 40% of taxfilers who are called intermediate-income earners.

The results were conclusive. The one-tenth of taxfilers who were in the highest earnings bracket provided more than one-half of the revenue from federal income tax in 2002. And, their share of the tax pie has been increasing. In 1990, this 10% of taxfilers accounted for 46.0% of total federal income tax; by 2002, this group accounted for 52.6%. This increase reflects faster income growth and a smaller reduction in effective tax rates for this group relative to others.

At the other end of the scale, the one-half of taxfilers with the lowest incomes saw their share of the tax pie decline during the same period. In 1990, this group accounted for 6.7% of total federal income tax paid; in 2002, this proportion had declined to 4.4%. In fact, this group paid less federal income tax in 2002 than in 1990, in spite of higher incomes.

Intermediate-income earners were the biggest winners in terms of effective tax rate. For this group, the rate went from \$11.75 in federal tax paid for each \$100 of income to \$10.14, a decline of \$1.61.

Between 1990 and 2002, Canadians saw their total income grow more rapidly than the federal tax paid on personal income. Revenue from federal income tax increased 49.4%, while total income rose 63.8%.

Thus, the average effective income tax rate, that is, the amount of federal tax paid for each \$100 of income, fell by \$1.07 during this period, from \$12.25 to \$11.18.

Incomes grew more rapidly than income tax

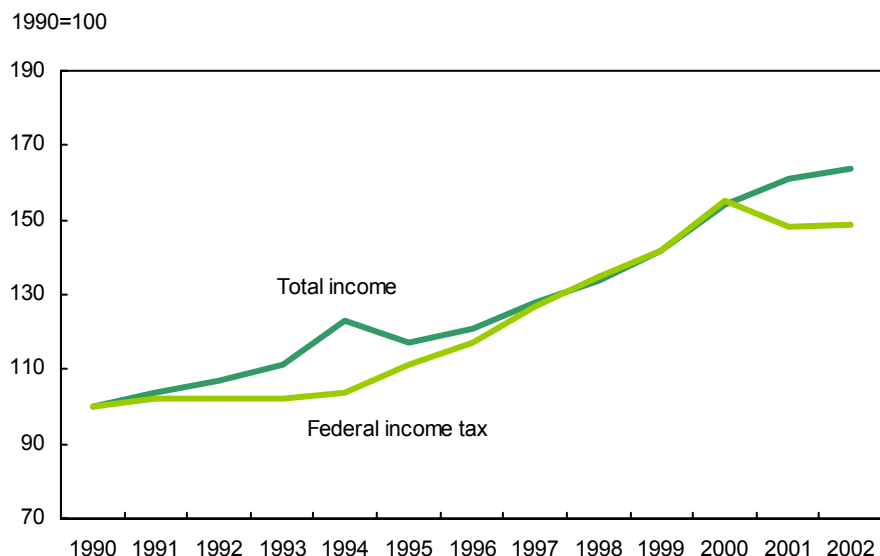
Between 1990 and 2002, Canadians saw their total income¹ grow more rapidly than their federal personal income tax bill. While federal tax increased 49.4%, total income went up 63.8%. (For purposes of brevity, the term “federal tax” will be used here to refer to “federal tax on personal income.”)

However, this gap was entirely attributable to developments in just two years: 2001 and 2002. During this time, total income continued to rise, while revenue from federal tax declined slightly.

This decrease in federal tax paid between 2000 and 2002 was due notably to a decline in marginal tax rates. The federal government lowered tax rates applicable to Canadians’ incomes in 2001.

Capital losses registered as a result of the stock market decline of the early 2000s also contributed to the decline in federal tax revenues.

Canadian taxfilers’ total income rose faster than federal income tax paid, from 1990 to 2002



Source: Longitudinal Administrative Databank, Statistics Canada.

Thus, Canadians saw the effective federal tax rate, that is, the federal tax paid for each \$100 of income, decline during this 12-year period.

In 1990, Canadians on average paid \$12.25 of federal tax for each \$100 of income. By 2002, the corresponding amount had declined to \$11.18, a difference of \$1.07.

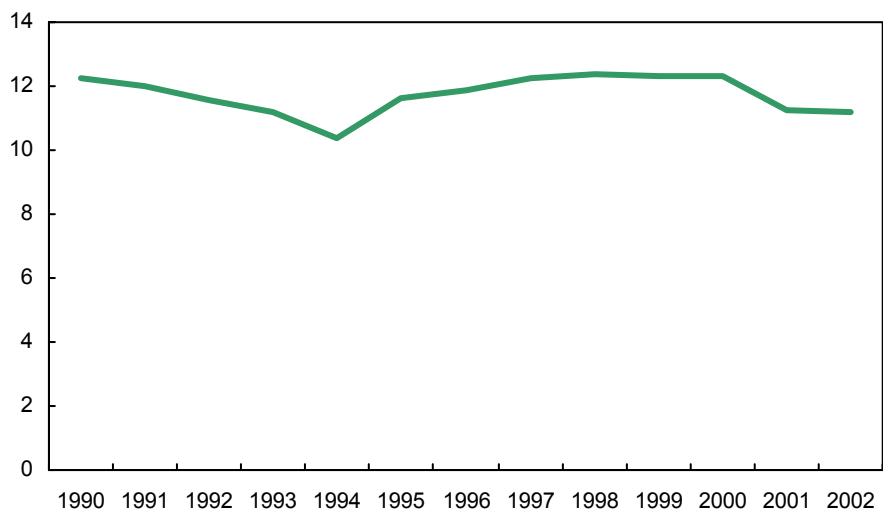
1. We are speaking here about total income and not average income. Thus, a portion of the increase is attributable to the growth of the population observed. The average income of Canadian tax filers rose 31.3% during the observation period.

Overall, during this period the effective federal tax rate ranged between \$11.00 and \$12.50 for each \$100 of income. However, there was one exception. In 1994, the effective federal tax rate was \$10.37 for each \$100 of income.

This result for 1994 was due to a change made to the federal income tax, more specifically the elimination of the \$100,000 capital gains exemption. This change prompted many taxfilers to realize capital gains accumulated over previous years. This had a major impact on total income without, however, significantly affecting the total federal tax paid.

The effective tax rate declined for Canadian taxfilers between 2000 and 2002

dollars paid as federal tax for each \$100 of income



Source: Longitudinal Administrative Databank, Statistics Canada.

The 10% with the highest incomes paid more than one-half of federal income tax

The group comprising the 10% of taxfilers with the highest income—more than \$64,500 in 2002—provided more than 50% of the federal personal income tax revenue in 2002. Between 1990 and 2002, the share of federal tax paid by this group went from 46.0% to 52.6%.

This increase was attributable to two factors: a smaller drop in the effective tax rate than that of the other two groups of taxfilers, combined with an increase in their share of total income.

This group had the highest effective tax rate in 2002, even though the rate dropped during the 12-year period.

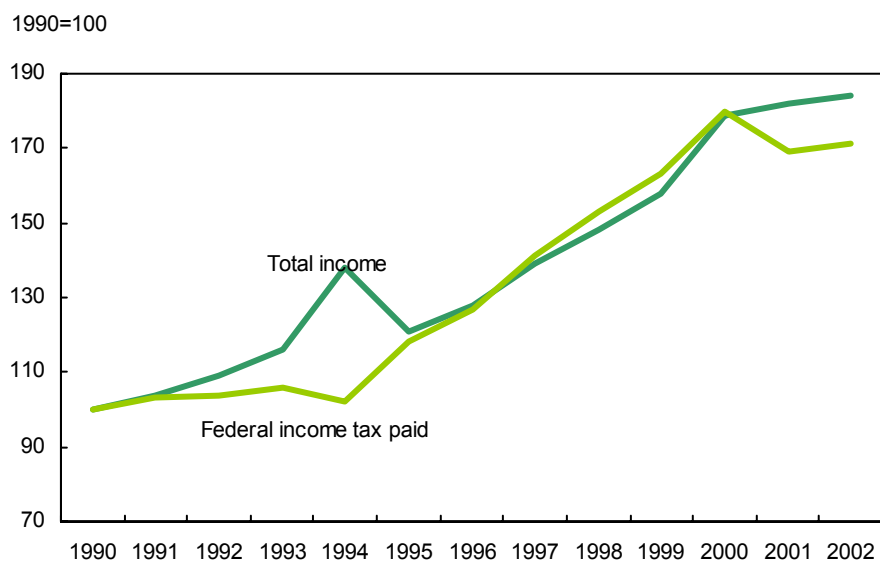
In 1990, these individuals paid \$17.79 in federal tax for each \$100 of income. By 2002, this rate had declined to \$16.47. This decline of \$1.32 was the smallest of the three groups of taxfilers in this study.

On the other hand, this 10% of taxfilers was the only group whose share of total income increased during the 12-year period. In 1990, these individuals accounted for 31.7% of all income; by 2002, their share had risen to 35.7%.

Among the three groups of taxfilers, only those with the highest incomes contributed a share of federal income tax greater than their share of total income.

In 2002, their share of federal income tax was 52.6%, well above their 35.7% share of income. In addition, this was the only group in which the gap between the share of income tax and share of income actually widened.

The 10% of taxfilers with the highest incomes paid less federal income tax in 2002 than in 2000 but much more than in 1990



Source: Longitudinal Administrative Databank, Statistics Canada.

The one-half of taxfilers with the lowest incomes paid less income tax

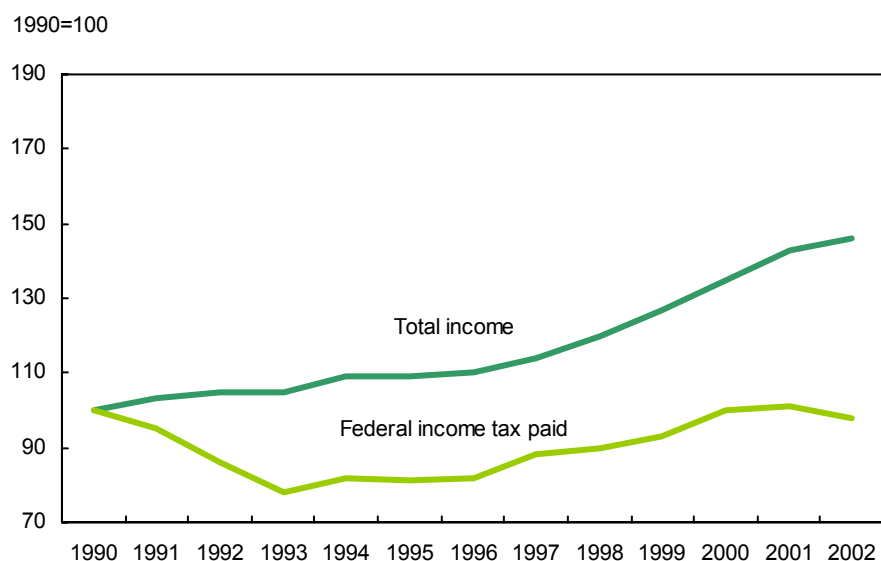
The effective tax position of the 50% of taxfilers with the lowest incomes—\$23,000 or less in 2002—improved considerably between 1990 and 2002. During this period, the federal tax paid by this group fell 2.0%, while their total income increased 45.8%.

As a result, their effective tax rate fell from \$4.30 for every \$100 of income in 1990 to \$2.89 in 2002, a sizeable decline of \$1.41. At the same time, their share of total federal tax declined from 6.7% to only 4.4%.

During the same period, this group of taxfilers also saw its share of total income decline. This occurred because the rate of increase of 45.8% in their total income was much slower than the 63.8% average increase nationally.

Consequently, their share of total income fell from 19.0% in 1990 to 16.9% in 2002.

The 50% of taxfilers with the lowest incomes paid less federal income tax in 2002 than in 1990, in spite of increases in total income



Source: Longitudinal Administrative Databank, Statistics Canada.

Intermediate-income taxfilers the big winners

As a group, intermediate-income taxfilers—the 40% of taxfilers between the half with the lowest incomes and the 10% with the highest incomes—saw their effective federal tax rate decline the most between 1990 and 2002.

For this group, the rate went from \$11.75 in federal tax paid for each \$100 of income to \$10.14, a decline of \$1.61. This decrease was due to the fact that the total income of this group of taxfilers rose more rapidly than their federal tax paid.

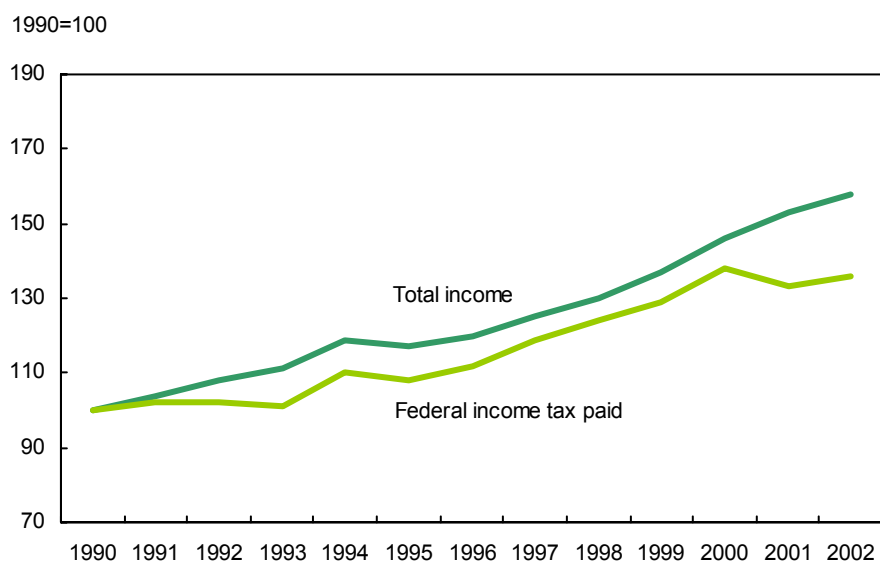
During the 12-year period, their total income rose 57.5% while their federal tax load rose 35.9%.

Like the lowest-income taxfilers, this group of taxpayers also saw a decline in its share of federal tax paid. In 2002, it accounted for 43.0% of federal tax paid, down from 47.3% in 1990.

Intermediate-income taxfilers also registered a slight drop in their share of total income during the period. In 2002, that share stood at 47.4%, compared with 49.3% in 1990.

During this period, their share of total income remained slightly higher than their share of federal tax paid, except in 1994 when the opposite was true.

Intermediate-income taxfilers' incomes increased relatively more than federal income tax paid between 1990 and 2002



Source: Longitudinal Administrative Databank, Statistics Canada.

A more progressive tax system

For a given taxfiler, federal tax payable tends to increase more rapidly than income, meaning that effective tax rates increase with income. Thus, the federal tax system is considered progressive.

In 2002, the 10% of taxpayers with the highest incomes paid an average of \$16.47 for each \$100 of income. On the other hand the one-half of taxpayers with the lowest incomes paid \$2.89, a difference of \$13.58.

The group of intermediate-income earners fell between these two groups, paying on average \$10.14 dollars for each \$100 of income.

The gap between the higher- and lower-income groups of taxfilers went from \$13.49 in 1990 to \$13.58 in 2002. Based on this measure, the tax system became effectively more progressive during the 12-year period.

The observable gaps between the effective tax rates of the different groups are attributable to two main factors: the structure of the federal tax calculation and the different treatment that it gives to the various income sources.

Thus, the federal income tax is structured so as to tax the highest-income taxfilers more, while reducing the tax burden on those with lower incomes. This is done notably through the basic personal credit and marginal tax rates that rise with taxable income.

Also, some forms of income, such as social assistance benefits and net payment of federal supplements, are not taxable. This also tends to reduce the effective tax rate of the lowest-income taxfilers, since it is mainly within this group that this type of income is encountered.

In contrast, some income sources such as dividends and capital gains, which are generally more substantial among wealthier persons, are not taxed at their full value. This tends to reduce the effective tax rate for these individuals.

Summary tables

Effective federal income tax rates by the different groups observed, Canada, 1990 and 2002

Income group	1990	2002	Absolute change
	\$ paid per \$100 of income		
Half of taxfilers with lowest incomes	4.30	2.89	-1.41
Intermediate-income taxfilers	11.75	10.14	-1.61
10% of taxfilers with highest incomes	17.79	16.47	-1.32
All Canadian taxfilers	12.25	11.18	-1.07 ¹

1. This decline is smaller than those of the three observed taxfiler groups. This unusual statistical phenomenon, known as the Simpson Paradox, is due to a major shift in total income distribution among the three groups.

Source: Longitudinal Administrative Databank, Statistics Canada.

Share of federal tax paid by the different groups observed, Canada, 1990 and 2002

Income group	1990	2002	Absolute change
	%		
Half of taxfilers with lowest incomes	6.7	4.4	- 2.3
Intermediate-income taxfilers	47.3	43.0	- 4.3
10% of taxfilers with highest incomes	46.0	52.6	6.6
All Canadian taxfilers	100.0	100.0	0.0

Source: Longitudinal Administrative Databank, Statistics Canada.

Share of total income of the different groups observed, Canada, 1990 and 2002

Income group	1990	2002	Absolute change
	%		
Half of taxfilers with lowest incomes	19.0	16.9	- 2.1
Intermediate-income taxfilers	49.3	47.4	- 1.9
10% of taxfilers with highest incomes	31.7	35.7	4.0
All Canadian taxfilers	100.0	100.0	0.0

Source: Longitudinal Administrative Databank, Statistics Canada.

Data sources and methodology

Data sources

The data used in this article come from the Longitudinal Administrative Databank (LAD), which is unique to Statistics Canada. LAD is a representative annual sample of Canadian taxfilers. It includes 20% of taxfilers and data from each individual's T1 income tax returns.

The data observed refer to taxation years 1990 to 2002. This period was selected because of the availability and comparability of the data, since the introduction in 1990 of the refundable Goods and Services Tax credit had caused a sizable increase in the number of Canadian taxfilers.

Groups observed

For each year, Canadian taxfilers were ranked in descending order according to their total income. The population was then divided into 10 deciles, each consisting of 10% of the population observed. This means that a given taxfiler could change decile from year to year.

To facilitate the analysis and presentation of the data, some deciles were grouped so as to form three groups of taxfilers:

- The half of taxfilers with the lowest incomes: Taxfilers making up deciles 1 to 5.
- Intermediate-income taxfilers: Taxfilers making up deciles 6 to 9.
- 10% of taxfilers with the highest incomes: Taxfilers making up the tenth decile.

This grouping of deciles was done to bring out the general trends of the data. The first group represents the deciles for which the share of tax paid is substantially lower than the weight of the populations that it represents. Thus, deciles 1 to 5 each account for less than 4% of tax paid, whereas each represents 10% of taxfilers. At the other extreme, the third group represents only 10% of taxfilers but more than 50% of tax paid.

Income ranges defining taxfiler groups

Year	The half of taxfilers with the lowest incomes	Intermediate-income taxfilers	The 10 % of taxfilers with the highest incomes
1990	\$19,000 or less	from \$19,001 to \$48,700	more than \$48,700
1991	\$19,100 or less	from \$19,101 to \$50,000	more than \$50,000
1992	\$19,100 or less	from \$19,101 to \$51,000	more than \$51,000
1993	\$18,800 or less	from \$18,801 to \$51,500	more than \$51,500
1994	\$19,400 or less	from \$19,401 to \$56,600	more than \$56,600
1995	\$19,000 or less	from \$19,001 to \$52,700	more than \$52,700
1996	\$19,100 or less	from \$19,101 to \$53,800	more than \$53,800
1997	\$19,500 or less	from \$19,501 to \$55,400	more than \$55,400
1998	\$20,100 or less	from \$20,101 to \$56,700	more than \$56,700
1999	\$20,900 or less	from \$20,901 to \$58,400	more than \$58,400
2000	\$21,900 or less	from \$21,901 to \$61,900	more than \$61,900
2001	\$22,700 or less	from \$22,701 to \$62,800	more than \$62,800
2002	\$23,000 or less	from \$23,001 to \$64,500	more than \$64,500

Source: Longitudinal Administrative Databank, Statistics Canada.

Reliability of results

For 2002, we estimated the income, taxes and other results for each portion representing 10% of the population (decile) based on a sample of approximately 462,000 taxfilers. Thus, the results for an entire year come from a sample of more than 4.5 million taxfilers.

For results involving a percentage, this sample size allows us to estimate the margin of sampling error at no more than 0.07%, 19 times out of 20. In these conditions, any difference greater than 0.2% between two proportions may be declared significant without using more sophisticated tests.

Variables used

Total income

Total income includes all items included on line 150 (except support payments) on form T1 General, namely employment income, income from commissions, old age security pension, Canada Pension Plan (CPP) and Quebec Pension Plan (QPP) benefits, employment insurance benefits, dividends of Canadian corporations, interest and other investment income, capital gains, net partnership income, rental income, Registered Retirement Savings Plan (RRSP) income, self-employment income, workers' compensation benefits, social assistance payments, and net federal supplements.

Also included are family allowances, child tax benefits and refundable tax credits. Note that for capital gains and dividends, the income included is the income actually recorded and not taxable income.

Tax paid

The amount used is from line 420 of each tax filer's form T1 General, namely net federal tax.

Note that all figures are in current dollars.

Selected major legislative tax changes: 1990 to 2002

1994 taxation year—Elimination of the \$100,000 capital gains exemption

The year 1994 was the last year for which Canadian taxfilers could dispose of the unused portion of their \$100,000 capital gains exemption. This change caused many taxfilers to realize capital gains accumulated on various types of property during that tax year. This had a major impact on the total income of Canadian taxfilers in 1994, without, however, affecting significantly total federal personal income tax paid.

2000 taxation year—Reduction of the rate of inclusion of capital gains in taxable income

In 2000, the rate of inclusion of capital gains in taxable income was reduced twice. It went from 75% to 66.7%, then ended the year at 50%. These reductions resulted in a decrease in federal personal income tax paid on this type of income.