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# Progressivity of Income Taxation: Comparison between Quebec and Ontario

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## PRÉCIS

L'étude compare la progressivité des impôts sur le revenu du Québec et de l'Ontario. Après avoir constaté l'importance de l'imposition du revenu au Québec et en Ontario, par des comparaisons internationales et interprovinciales et avoir illustré la présence de progressivité dans les deux cas, nous présentons des indicateurs de progressivité. À l'aide de ces indicateurs, nous avons mesuré la progressivité des régimes d'imposition québécois et ontarien pour quatre situations familiales différentes et pour six niveaux de revenus. Les résultats montrent que dans certaines situations, la progressivité est plus grande au Québec alors que dans d'autres cas, la progressivité est supérieure en Ontario. Plus précisément, la progressivité est plus grande au Québec pour les variations de revenus au bas de l'échelle des revenus tandis qu'elle est en général plus élevée en Ontario pour les revenus supérieurs. Ces résultats confirment la plus grande concentration de l'impôt ontarien sur le revenu auprès des contribuables à revenu élevé que nous avons précédemment illustrée dans l'étude.

## ABSTRACT

This study compares the progressivity of the income tax of Quebec and Ontario. After observing the predominance of income taxation in Quebec and Ontario, by way of international and interprovincial comparisons and illustrating the presence of progressivity in both provinces, progressivity indicators are described. Using these indicators, we measured the progressivity of the Quebec and Ontario tax systems for four different family situations and six levels of income. The results show that in certain situations, Quebec's tax system is more progressive while in others, the reverse is true. More specifically, Quebec's tax system is more progressive for changes in income at the lower end of the income scale while in general Ontario's system is more progressive for higher incomes. These results confirm the greater concentration of Ontario's income tax on high-income taxpayers that we have previously illustrated in the study.

**Keywords:** Quebec, Ontario, progressivity, income tax, tax policy, indicator

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## Introduction

This study compares the progressivity of the income taxes levied by Quebec and Ontario. There are many reasons for a comparison between Quebec and Ontario. First, these provinces are frequently compared. Also, since Ontario is the most populous and wealthiest province in Canada, how it taxes income cannot be ignored. Furthermore, the economic structures of Quebec and Ontario are comparable, trade between the two provinces is substantial,<sup>1</sup> and large population pools live close to the borders.

The study is divided into two parts. The first analyzes the tax burden specific to personal income tax in Quebec and in Ontario by comparing it with the G7 countries and with the other provinces of Canada. Part two considers ways to illustrate and measure progressivity. After settling on the progressivity indicators, this part of the study compares the progressivity of income tax in Quebec and in Ontario in 2002 for four different family situations and six income levels.

## Part one: the Quebec and Ontario tax systems

Before comparing the progressivity of personal income tax in Quebec and Ontario, the first part of the study analyzes the tax burden specific to personal income tax.

### 1.1 The tax structure in effect in Quebec and in Ontario: the income tax burden

**Table 1** identifies the sources of tax revenue and their relative size in Quebec and in Ontario. In 2002-2003, personal income tax was the largest source of tax revenue for both provinces. However, at 44% of all tax revenues, its relative importance is greater in Quebec than in Ontario where it accounted for less than 37% of all tax revenues. **Table 1** also provides a comparison of the composition of the tax structure by tax source for the years 1993-1994 and 2002-2003. In 1993-1994, the relative share of personal income tax was comparable in Ontario and in Quebec.

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<sup>1</sup> To illustrate the volume of trade between Quebec and Ontario, 58% of Quebec's exports to the rest of Canada are shipped to Ontario while 40% of Ontario's exports to the rest of the country are sent to Quebec. Statistics Canada, Interprovincial Trade and International Trade in Canada, 1992-1998, n° 15546-XIE.

That was no longer the case in 2002-2003. While the table shows that the relative importance of personal income tax declined in Quebec and in Ontario, the drop was much more pronounced in Ontario (8.4 percentage points) than in Quebec (2.5 percentage points).

By means of an international comparison, **Table 2** confirms the predominant use, in Quebec and in Ontario, of income tax as a percentage of tax revenues. In 2002, this source of revenue as a percentage of GDP in Canada, in Quebec, in Ontario and in the United States, exceeded the average of the G7 countries. This table shows that personal income taxation is used to a greater extent in North America than in Europe. Still, the relative burden of income tax in total tax revenues is highest in Quebec, at 44.0%. Again using an international comparison, **Table 3** shows the personal income tax burden as a percentage of GDP. This ratio is higher in Quebec and in Ontario, but once again the share of federal and provincial income tax is highest in Quebec, with more than 14% of GDP.

**Table 4** spotlights provincial income tax by means of an interprovincial comparison. In 2002, Quebec was the province where the burden of its income tax as a percentage of GDP was the highest in Canada, while in Ontario this proportion was lower than the Canadian average. However, while Quebec is the province with the heaviest personal income tax burden, **Table 5** shows, by comparing 2002 with 1992, that Quebec's differential in relation to the average of the provinces remained unchanged at 1.4%. Nonetheless, in 1992, Quebec was the only province whose personal income tax burden exceeded the average of the provinces. In 2002, the income tax burden of four provinces exceeded the average of the provinces. During the same period, among the provinces whose personal income tax burden was below the Canadian average, Alberta was the only province to widen its differential. Accordingly, although Ontario substantially reduced its tax rates during the period, the difference between Ontario's income tax burden and the Canadian average still shrunk.

**Table 1<sup>2</sup>****Comparison of the tax structure – as a % of tax revenues**

<b>Breakdown of tax revenues/Québec</b>	<b>1993-1994</b>	<b>2001-2002</b>	<b>Difference</b>
Personal income tax	46.5	44.0	- 2.5
Consumption taxes	26.8	29.9	+ 3.1
Corporate taxes	8.2	10.1	+ 1.9
Payroll taxes	10.5	12.1	+ 1.6
Other tax revenues	7.9	3.9	- 4.0
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	
<b>Breakdown of tax revenues/Ontario</b>	<b>1993-1994</b>	<b>2001-2002</b>	<b>Difference</b>
Personal income tax	45.1	36.7	-8.4
Consumption taxes	34.3	37.0	+ 2.7
Corporate taxes	10.6	15.1	+ 4.5
Payroll taxes	8.2	7.2	-1.0
Other tax revenues	1.9	3.9	+ 2.0
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	

Sources: QUÉBEC, ministère des Finances (MFQ), *Consolidated Financial Statements of the Gouvernement du Québec, Public Accounts 2002-2003 – volume 1*, 2004a; Institut de la Statistique du Québec (ISQ), *Comptes économiques des revenus et des dépenses du Québec – édition 2003*, 2004; ONTARIO, Ministry of Finance of Ontario, *Public Accounts 2002-2003*, 2003, ONTARIO, Ministry of Finance of Ontario, *Public Accounts 1994-1995*, 1995, <http://www.gov.on.ca.fin>.

**Table 2<sup>3, 4</sup>****International comparison of income taxation – as a % of tax revenues (2002)**

<b>Country or province</b>	<b>Income tax / Tax revenues</b>
Quebec	44.0%
United States	42.3%
Canada	37.1%
Ontario	36.7%
<b>Average –G7 countries</b>	<b>29.6%</b>

Sources: QUÉBEC (2004a); ONTARIO (2003); Organization for Economic Cooperation and Development (OECD), *Revenue Statistics – 1965-2002*, 2003a; CANADA, Canada Customs and Revenue Agency (CCRA), *Tax Statistics on Individuals – Taxation Year 2002*, 2004.

**Table 3<sup>5</sup>****International comparison of personal income taxation – as a % of GDP (2002)**

<b>Country or province</b>	<b>Income tax / GDP</b>
Quebec (federal and provincial tax)	14.2%
United States	12.2%
Ontario (federal and provincial tax)	11.7%
Rest of Canada (without Quebec and Ontario)	10.1%
<b>Average –G7 countries</b>	<b>9.6%</b>

Sources: OECD (2003a), ISQ (2004), CCRA (2004), Statistics Canada, Provincial economic accounts.

<sup>2</sup> In Quebec, income tax revenues include the tax points specific that the federal government has transferred to it.

<sup>3</sup> Ibid.

<sup>4</sup> Data for Quebec and Ontario are those of 2002-2003 (ending March 31).

<sup>5</sup> Ibid.

**Table 4<sup>6</sup>****Interprovincial comparison of the burden of provincial personal income taxes – as a % of GDP (2002)**

Province	Income tax / GDP
Quebec	6.0%
Nova Scotia	5.1%
Manitoba	4.8%
Saskatchewan	4.8%
New Brunswick	4.4%
Newfoundland	4.4%
Ontario	4.3%
Prince Edward Island	4.2%
British Columbia	4.1%
Alberta	2.8%
<b>Provincial average</b>	<b>4.6%</b>

Source: Statistics Canada, Provincial economic accounts.

**Table 5<sup>7</sup>****Change in differences from the average for the provinces of the burden of provincial personal income tax (as a % of GDP) – 1992 and 2002**

Differences from the average for the provinces	2002	1992	Change in differences
Quebec	1.4%	1.4%	0.0%
Nova Scotia	0.4%	-0.1%	0.5%
Manitoba	0.1%	-0.4%	0.5%
Saskatchewan	0.1%	-0.4%	0.5%
New Brunswick	-0.2%	-0.5%	0.3%
Newfoundland	-0.2%	-0.6%	0.4%
Ontario	-0.3%	-0.7%	0.4%
Prince Edward Island	-0.4%	-1.0%	0.6%
British Columbia	-0.5%	-0.6%	0.1%
Alberta	-1.9%	-1.3%	-0.6%

Source: Statistics Canada, Provincial economic accounts.

**1.2 Breakdown of tax paid by income bracket**

The breakdown of income and of tax payable, in relation to the number of taxpayers by certain taxable income brackets shows the concentration of income and of the tax burden within the society arising from the tax system. Using tax statistics for taxation year 2001, we can compare the concentration of income and of taxes in Québec and in Ontario.

<sup>6</sup> To make Québec's personal income tax comparable with that of the other provinces, we have removed the Québec abatement of 16.5% to reflect the transfer of tax points specific to Québec.

<sup>7</sup> Ibid.

Beginning with the concentration of income, **Table 6** shows that income is more concentrated in Ontario than in Quebec. The 15% of taxpayers with the highest incomes account for 46% of total income in Ontario compared with 42% in Quebec.

Turning to the concentration of taxes, **Table 6** clearly shows that the share of tax payable rises faster than income under both the Quebec and the Ontario tax system. Both tax systems are genuinely progressive. When comparing taxpayers with the lowest incomes, who account for 50% of the total, taxes paid amount to only 3% of total taxes in Quebec and 5% in Ontario. Nonetheless, by comparison with Ontario's income tax, Quebec's income tax is less concentrated on high-income taxpayers since the 15% of taxpayers with the highest incomes paid 62% of total income tax compared with 69% in Ontario. On the other hand, Quebec's income tax is more concentrated than Ontario's on middle-income taxpayers. By comparing the breakdown of income tax payable by group of taxpayers, **Table 6** shows that Quebec middle-income taxpayers pay 35% of taxes compared with 26% in Ontario.

**Table 6**

**Concentration of income and taxes in Quebec and Ontario (2001)**

	Breakdown of taxpayers by income group – Quebec (%)		
	low	middle	high
Number	50%	35%	15%
Income	18%	40%	42%
Tax	3%	35%	62%
	Breakdown of taxpayers by income group – Ontario (%)		
	low	middle	high
Number	50%	35%	15%
Income	16%	38%	46%
Tax	5%	26%	69%
Quebec / Ontario difference			
Tax	-2%	+9%	-7%

Source: Québec, ministère des Finances, *Tax Statistics on Individuals – Taxation Year 2001*, Québec, 2003b; CCRA (2003). Notes: earned income is not the same in Ontario and Quebec. To make the statistical data comparable, the comparison is carried out by isolating the same percentage of taxpayers and comparing the share of earned income and the share of tax paid by the latter over all earned income and all tax paid. Results have been rounded off. In Quebec, the “low” category ends at roughly \$20 000 and the “high” category begins at close to \$50 000. In Ontario, the “low” category ends at roughly \$25 000 and the “high” category begins at close to \$60 000.

Part one of this study has shown the greater importance of income tax in the total tax revenue of both Quebec and Ontario than in the other G7 countries. However, this relative importance is

greater in Quebec. The interprovincial comparison shows an above-average relative income tax burden in Quebec and a below-average relative burden in Ontario. Lastly, the Quebec-Ontario comparison of the breakdown of tax paid by income bracket shows that Quebec's middle class bears a higher relative tax burden Ontario's middle class.

## Part two: measuring progressivity

In the second part of the study, we compare certain illustrations of progressivity in Quebec and Ontario and then go on to describe indicators of the measures retained.

### 2.1 Illustrations of the progressivity of income tax

The *grand dictionnaire terminologique* of the Office québécois de la langue française<sup>8</sup> defines progressivity as follows: *Feature of income tax whereby the tax rate rises with income. System in which the rate rises as the quantity of the taxable item held by the taxpayer rises.* [TRANSLATION] Although the principle is relatively simple, it is not so simple to measure the degree of progressivity or regressivity. However, it is possible to illustrate progressivity in various ways.

#### 2.1.1 Through tax system mechanisms

The simplest method of illustrating the progressivity of a tax system is based on the table of nominal tax rates. **Table 7** shows that the tax rate rises with income. However, the Ontario income taxation table shown in **Table 7** is incomplete because that province's tax system includes two surtaxes that alter the progression for higher incomes. **Table 8** shows the Ontario income taxation table including these surtaxes. It can be seen that the maximum rate rises from 11.16% to 17.41%.

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<sup>8</sup> [http://w3.granddictionnaire.com/btml/fra/r\\_motclef/index800\\_1.asp](http://w3.granddictionnaire.com/btml/fra/r_motclef/index800_1.asp).



Contrary to **Tables 7 and 8**, **Table 9** incorporates in the illustration of progressivity of taxation the use of all the preferential tax measures whose effect is to reduce the actual tax payable by taxpayers. Accordingly, as a result of tax measures, the tax actually paid by a taxpayer according to his income is lower than indicated by the nominal tax table. Despite that, the system remains progressive since the average tax rate still rises with income.

**Table 7****Nominal progressivity of the income tax table (2003)**

Québec scale			Ontario scale		
Rate	Taxable income		Rate	Taxable income	
0%	to	\$11 275	0%	to	\$7 817
16%	to	\$27 095	6.05%	to	\$32 435
20%	to	\$54 195	9.15%	to	\$64 871
24%	on the excess		11.16%	on the excess	

**Table 8****Nominal progressivity of the Ontario income tax table including surtaxes (2003)**

Rate		Taxable income
0%	to	\$7 817
6.05%	to	\$32 435
9.15%	to	\$57 108
10.98%	to	\$64 871
13.39%	to	\$65 824
17.41%	on the excess	

**Table 9****Effective progressivity of the income tax table – Certain brackets of total income (2001)**

Total income bracket (\$)	Average rate in Québec	Average rate in Ontario
20 000 – 25 000	7.1%	2.3%
40 000 – 45 000	12.5%	4.5%
50 000 – 60 000	14.0%	5.3%
70 000 – 100 000	15.9%	7.2%

Sources: Québec (2003b); CCRA (2003).

### *2.1.2 Through an international comparison of tax system mechanisms*

It is always difficult to compare tax systems. Various factors account for the pitfalls concerning international comparisons of personal income taxation. First, the personal situation of taxpayers can vary enormously from one country to another. In addition, the level of income can also vary among the countries compared. The determination of a representative taxpayer with a universally

comparable income that can be used to compare the tax burden should minimize such difficulties. Furthermore, it goes without saying that differences in purchasing power and exchange rates affect the determination of the table of tax rates of each country. Accordingly, to arrive at acceptable tax burden comparisons, the cost of living in the countries being analyzed must necessarily be taken into account. It is easy to see that a taxpayer earning \$100 000 in Quebec is relatively wealthier, if his annual housing cost is \$20 000, than a taxpayer earning \$110 000 in Ontario, but whose annual housing cost is \$35 000. Clearly, a comparison of tax burdens must take the relative wealth of taxpayers into account. To carry out international comparisons of income taxes, the OECD uses a specific methodology based on the average worker's wage of each country.<sup>9</sup> Our international comparisons used to illustrate progressivity are based on the OECD methodology.<sup>10</sup>

**Table 10** shows the progressivity of tax systems by comparing the coverage of essential needs recognized by the determination of the liability-for-tax threshold as a percentage of the average worker's wage. On average in the G7 countries, a single person begins to pay tax at 32% of the average worker's wage. In Quebec, the rate is equal to the average of the G7 countries. In Ontario, this rate is lower than average (18%).

**Table 11** illustrates progressivity by means of a comparison of income thresholds needed for the application of the maximum tax rate for a single person earning the average worker's wage. According to the average of the G7 countries, a single person reaches the maximum tax rate at close to four times the average wage. In the United States, a single person must reach close to ten times the average worker's wage, i.e. over US\$300 000, before he is taxed at the highest tax rate. However, in some tax systems, the maximum tax rate is reached very quickly. Maximum tax rates are reached most quickly in Quebec and Ontario. As soon as a taxpayer earns a little more than one and one half times the average worker's wage, his excess income is subject to the

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<sup>9</sup> OECD, *Taxing Wages. Special Feature: Taxing Families. 2001-2002*, part 3, 2003b, p. 115. The average worker's wage represents the "annual income from employment is equal to a given fraction of the average gross wage earnings of adult, full-time production workers in the manufacturing sector of each OECD economy".

<sup>10</sup> In addition to the notion of the average worker's wage, the OECD methodology lists a series of postulates. Thus, the determination of tax payable excludes benefits in kind offered by the employer, includes income taxes collected by sub-central levels of government, includes tax relief applicable to wages but excludes all non-lump sum tax relief, such as the retirement savings deduction (OECD 2003b).

maximum tax rate. Beyond this threshold, the progressivity of the Quebec and Ontario tax tables ceases to rise. In this case, progressivity is real but abrupt since its full effect is reached more quickly than elsewhere.

**Table 12** compares, among the G7 countries, the change in the effective average tax rate applicable to a single person for incomes representing 67%, 100% and 167% of the average worker's wage. The analysis shows that for each country the average tax rate rises with the increase in income, confirming the progressivity of the tax. However, the average tax rates in Quebec and Ontario exceed those of all the G7 countries for each of the three levels of income. When a taxpayer's income rises from 67% to 167% of the average worker's wage, the difference is greater in Quebec (13.1%) than in Ontario (10.5%) or in the G7 countries on average (9.1%).

**Table 13** shows the difference in the average tax rate applicable for an income level always equal to 100% of the average worker's wage, but with different family situations, in the G7 countries, Quebec and Ontario. By changing the family situation from a single person to family with two children and only one spouse working, we see that to reflect this change, the average tax rate falls in each case. However, the difference between average tax rates is greater in Quebec than in the G7 countries on average. This difference shows that the tax system in Quebec goes further to take into account changes in the coverage of essential needs. On the other hand, the difference is smallest in Ontario.

**Table 10**

**International comparison of the income tax liability threshold for a single person earning the average worker's wage (2002)**

Country or province	Tax liability threshold/ average worker's wage
Quebec	32%
United States	24%
Canada	20%
Ontario	18%
<b>Average –G7 countries</b>	<b>32%</b>

Sources: OECD, *Taxing wages. Special feature: taxing families. 2001-2002, 2003b*. Statistics Canada, CANSIM tables 281-0030 and 281-033.

**Table 11**

**International comparison of the application threshold of the maximum rate of the income tax table for a single person earning the average worker's wage (2002)**

Country or province	Number
United States	9.7
Canada	2.7
Ontario	1.5
Quebec	1.5
<b>Average – G7 countries</b>	<b>3.8</b>

Sources: OECD (2003b); Statistics Canada, CANSIM tables 281-0030 and 281-0033.

**Table 12**

**International comparison of the difference from the average income tax rate for a single person (2002)**

	67% of the AWW	100% of the AWW	167% of the AWW	Differences
Quebec (federal and provincial tax)	15.7%	21.8%	28.8%	13.1%
Ontario (federal and provincial tax)	14.8%	19.2%	25.3%	10.5%
Canada (all provinces)	15.3%	19.2%	24.8%	9.5%
United States	14.1%	16.6%	22.6%	8.5%
<b>Average – G7 countries</b>	<b>11.8%</b>	<b>15.8%</b>	<b>20.9%</b>	<b>9.1%</b>

Sources: OECD (2003b); Statistics Canada, CANSIM, tables 281-0030 and 281-0033.

**Table 13**

**International comparison of the difference from the average income tax rate in the case of a change in family situation (2002)**

Country or province	Differences
Quebec (federal and provincial tax)	14.1%
United States	12.9%
Canada (all provinces)	4.0%
Ontario (federal and provincial tax)	3.3%
<b>Average – G7 countries</b>	<b>9.0%</b>

Sources: OECD (2003b); Statistics Canada CANSIM tables 281-0030 and 281-0033.

## 2.2 Indicators of income tax progressivity

While it is easy to illustrate situations in which progressivity applies, based on the increase in tax payable rising faster than the increase in income, it is still difficult to measure the degree of progressivity, since there is no universally applied approach. An analysis of government budget documents showed us that the examples illustrating the effects on progressivity of changes to income tax vary from year to year, depending on the underlying objectives.

An example illustrated in **Table 14** shows the difficulties in evaluating the notion of progressivity. Let us assume that the 2002 rate scale of Quebec's personal income tax system is replaced by a single tax rate of 16% applicable to income in excess of \$9 000. In this example, a taxpayer earning \$10 000 pays \$160 in tax while a taxpayer earning \$1 million pays almost \$159 000. Based on their different allegiances, certain groups could point to the progressive nature of the new tax system while others could argue that progressivity is reduced. One group might say that the system is clearly progressive since the taxpayer earning \$1million has an income one hundred times higher than the low-income taxpayer but pays almost one thousand times more tax. On the other hand, another group could argue that the tax savings are not fairly distributed because they amount to only \$228 for the taxpayer earning \$10 000 but exceed \$77 000 for the taxpayer earning \$1 million. A third group could make the point that progressivity has been reduced because the disposable income of the low-income taxpayer has risen by only 2.3% while the taxpayer earning \$1 million enjoys a gain in disposable income of 7.7%. Lastly, a fourth group could maintain that progressivity is greater since the ratio of tax payable by the taxpayer earning \$1 million to the tax payable by the low-income taxpayer has risen from 607 times before to 991 times after the change to the tax system. These four illustrations show very different results of the evaluation of progressivity.

**Table 14<sup>11</sup>****Example of changes to income tax and their effects on the measure of progressivity (2002)**

Income	Tax payable		Tax savings (3) = (1)-(2)	Increase in disposable income
	Starting tax system (1)	Tax system after changes (2)		
\$10 000 (a)	\$388	\$160	\$228	2.3%
\$1 000 000 (b)	\$235 584	\$158 560	\$77 024	7.7%
Ratio (b)/(a)	607 times	991 times		

The economic literature provides many indicators of progressivity that have been developed over the years. However, since Musgrave and Thin presented their indicators in 1948, the others that have been proposed are variations based on their work.<sup>12</sup> They make it possible to measure the

<sup>11</sup> This Table was inspired by: KESSELMAN, J., «Flat Taxes, Dual Taxes, Smart Taxes : Making the Best Choices», in *Policy Matters*, Institute for Research on Public Policy, vol. 1, no. 7, 2000, pp. 22-26.

<sup>12</sup> Richard A. Musgrave and Tun Thin, "Income Tax Progression: 1929-1948" in *Journal of Political Economy*, volume 56, 1948, pp. 498-514.

effects of the fiscal parameters of an income tax according to different income situations. The three indicators of progressivity described below make it possible to evaluate progressivity. They are the most widely known and used.<sup>13</sup> They can be conceptualized using the following formulae:

- through the variation in the average tax rate:  $[(T_1/Y_1 - T_0/Y_0)/(Y_1 - Y_0)] > 0$  if tax progressive;
- through the variation in tax payable:  $[(T_1 - T_0)/T_0] / [(Y_1 - Y_0)/Y_0] > 1$  if tax progressive;
- through the variation in disposable income:  $[(Y_1 - T_1) - (Y_0 - T_0)] / (Y_0 - T_0) / [(Y_1 - Y_0) / Y_0] < 1$  if tax progressive;

where

- $Y_0$  and  $Y_1$  = two levels of income;
- $T_0$  and  $T_1$  = corresponding tax payable.

### 2.3 Application of progressivity indicators to Quebec and Ontario income tax

Using progressivity indicators and the change in a comparable income (here the average worker's wage), a tax system can be compared over time or with the tax system of another jurisdiction. We applied the progressivity indicators developed by Musgrave and Thin, as explained in the preceding point, to income tax paid in Quebec and in Ontario. In addition, to permit comparisons between various tax systems, we have applied the methodology used by the OECD on the basis of average worker's wage (AWW).<sup>14</sup> The application of progressivity indicators coupled with the change in the average worker's wage makes a tax system comparable over time and space.

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<sup>13</sup> Richard A. Musgrave and Peggy B. Musgrave, *Public Finance in Theory and Practice*, New York, Fifth edition, McGraw-Hill, 1989, pp. 358-361.

<sup>14</sup> AWW = Average worker's wage. Concept previously used in this study and taken from OECD documentation. For more details, see the explanations in footnote 9.

The assumptions used to establish the progressivity indicators of Quebec and Ontario income tax are given below along with information on how we proceeded:

- the AWW for Quebec and Ontario were determined the same way as the AWW for Canada used in the OECD studies;<sup>15</sup>
- the tax payable for each situation was calculated using Taxprep 2003 software;
- tax payable includes provincial and federal income taxes;
- the simulations for a double income couple assume that one spouse earns the AWW for a single person while the other spouse earns 66.6% of this income. Family Income is accordingly split 60-40 between the spouses;
- the simulations assume that taxpayers earn only one employment income and that CPP/QPP and employment contributions are paid in full;
- when children are considered in the simulations, they are deemed to be under 5 years old;
- the family situations are: single person; double income childless couple; double income couple with two children;<sup>16</sup> single-parent family with one child.<sup>17</sup>

The **tables in Appendix 1** show all the results of the application of the income tax progressivity indicators in each of the family situations and assuming six different income levels, for both Quebec and Ontario. To interpret the results of the progressivity indicator calculations, the rule indicating progressivity is shown in the lower right corner of the tables.

The first thing to note from the analysis of the tables in **Appendix 1** is that the three indicators used confirm that the income tax systems of Quebec and Ontario are progressive regardless of family situation and earned income. While each indicator shows that the tax system is progressive, the degree of progressivity measured varies from one indicator to another.

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<sup>15</sup> The Canadian AWW represents the average hourly remuneration of employees paid on an hourly basis for the manufacturing industry multiplied by the average weekly hours of employees paid on an hourly basis in that sector, multiplied by 52 weeks. The data used to determine the AWW are for 2002 from Cansim tables 281-0033 and 281-0030 of Statistics Canada.

<sup>16</sup> Statistics Canada, the 2001 census shows that both in Québec and Ontario, a family with two spouses and two children is the dominant family type (42% of couples with children have two children in Québec and 44% in Ontario).

<sup>17</sup> Statistics Canada, the 2001 census shows that both in Québec and Ontario, most single-parent families have one child (64% of single-parent families in Québec and 60% in Ontario).

The progressivity indicator based on the average tax rate shows that as income rises, the progressivity coefficient obtained falls. Accordingly, as income rises, the change in the average rate tends to more closely resemble the change in income. In addition, while progressivity remains, its relative importance varies inversely with the increase in income. This relation between the level of income and the progressivity coefficient is valid for each family situation, though to varying degrees.

The progressivity indicator based on tax payable also shows that for each family situation the progressivity coefficient falls as income rises.

Lastly, the progressivity indicator based on disposable income also exhibits an inverse relation between the progressivity coefficient and the increase in income.

Generally speaking, progressivity indicators tend to fall when income rises. The negative correlation, for each progressivity indicator, between the decline in the progressivity coefficient and the increase in income arises, at least in part, from the speed at which the maximum rate of the tax table begins to apply.

To ensure that the progressivity indicators are comparable, it is also crucial to specify which indicator is used for comparison purposes. While all three indicators measure the change in tax compared to the change in income, some are more appropriate than others depending on the type of comparison sought. For intergovernmental comparison, the progressivity indicator based on the average tax rate is not appropriate, in view of the calculation of the denominator in the formula.<sup>18</sup> Thus, for the interprovincial comparison of progressivity, only two indicators can be used.

Using the results obtained in the tables in **Appendix 1**, we can determine the differences in progressivity between Quebec and Ontario. A positive difference indicates a higher degree of progressivity in Quebec and a negative difference, a higher degree of progressivity in Ontario.

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<sup>18</sup> This is the income gap. However, in our Québec-Ontario comparison, equivalent incomes (for example 100% of the AWW) are not equal, so that the calculated indicators are not comparable.



**Tables 15 to 18** show that progressivity is not symmetrically distributed between tax payable by Quebecers and Ontarians (federal and provincial taxes). Some situations give rise to greater progressivity in Quebec while in other cases, progressivity is greater in Ontario. In addition, the results show that for each family situation, the differences between progressivity indicators of tax paid by Quebecers and that paid by Ontarians always favour Quebec when the income considered is below the average worker's wage.

However, for incomes at over twice the average worker's wage, all the differences obtained for single persons, childless couples, couples with two children and single parent family with one child indicate that progressivity indicators are identical greater for taxes paid by Ontarians than for those paid by Quebecers. These results confirm that Ontario's tax is more highly concentrated on incomes of high-income taxpayers, as shown in **Table 6**.

**Table 15**

**Differences of progressivity indicators – Quebec/Ontario – single person (2003)**

Change in income <i>% of AWW between</i>	Quebec/Ontario differences in progressivity indicators	
	<i>by tax payable</i>	<i>by disposable income</i>
67% and 100%	0,30	0,07
100% and 200%	(0,09)	0,02
200% and 300%	(0,13)	(0,02)
300% and 400%	(0,03)	0,00
400% and 500%	(0,02)	0,00

**Table 16**

**Differences of progressivity indicators – Quebec/Ontario – childless couple (2003)**

Change in income <i>% of AWW between</i>	Quebec/Ontario differences in progressivity indicators	
	<i>by tax payable</i>	<i>by disposable income</i>
67% et 100%	0,22	0,05
100% et 200%	(0,01)	0,03
200% et 300%	(0,16)	(0,02)
300% et 400%	(0,06)	(0,01)
400% et 500%	(0,04)	(0,01)

**Tableau 17**

**Differences of progressivity indicators – Quebec/Ontario – couple with two children (2003)**

Change in income <i>% of AWW between</i>	Quebec/Ontario differences in progressivity indicators	
	<i>by tax payable</i>	<i>by disposable income</i>
67% et 100%	1,59	0,09
100% et 200%	0,34	0,07
200% et 300%	(0,11)	(0,01)
300% et 400%	(0,04)	0,00
400% et 500%	(0,03)	0,00

**Tableau 18**

**Differences of progressivity indicators – Quebec/Ontario – single-parent family with one child (2003)**

Change in income <i>% of AWW between</i>	Quebec/Ontario differences in progressivity indicators	
	<i>by tax payable</i>	<i>by disposable income</i>
67% et 100%	4,57	0,11
100% et 200%	0,53	0,08
200% et 300%	(0,15)	(0,02)
300% et 400%	(0,03)	0,00
400% et 500%	(0,03)	0,00

## Conclusion

The first part of the study compared the income tax burden in Quebec and Ontario with that of the other provinces of Canada and the G7 countries. It showed that Quebecers and Ontarians bear a heavier income tax burden. Lastly, a comparison of the concentration of income tax in Quebec compared to Ontario indicated that the income tax burden is heavier on high-income taxpayers in Ontario than in Quebec.

The second part of the study considered the notion of progressivity and examined various ways of measuring it. After illustrating progressivity in various ways, on the basis of the tax table, coverage of essential needs, tax payable and income, we determined a number of progressivity indicators. To compare the income taxes of Quebec and Ontario, we used the methodology developed by the OECD on the basis of average workers' wage (AWW).<sup>19</sup> The determination of progressivity indicators, using six levels of income and four different family situations, confirms that these two taxes are progressive regardless of family situation and earned income. The comparison of progressivity indicators of Quebec and Ontario for the same family and income parameters showed that certain situations give rise to greater progressivity in Ontario while in other cases, progressivity is greater in Quebec. The results indicate that for each family situation, the differences between the progressivity indicators of tax paid by Quebecers and that paid by Ontarians always favour Quebec when the income considered is less than the average worker's wage. However, for income of more than twice the average worker's wage, all the differences obtained for single persons, childless couples couples with two children and single parent family with one child show that progressivity indicators are greater for tax paid by Ontarians than for tax paid by Quebecers.

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<sup>19</sup>The concept of average worker's wage is used in the documentation of the OECD. For more details, see note 9.

## Appendix 1: Application of progressivity indicators to income tax paid by Quebecers and Ontarians

Tables A1-1 to A1-8 show the results of applying the progressivity indicators to 2003 federal and provincial income taxes according to four family situations and for different levels of income, for Quebec and Ontario.

The three indicators used confirm that income taxes paid by Quebec and Ontario taxpayers are progressive regardless of family situation and level of earned income.

**Table A1-1**

### Progressivity indicators – federal and Quebec income tax – single person (2003)

Income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	23 790	3 726	15.7%	0.53	2.21	0.78
100%	35 507	7 776	21.9%	0.27	1.86	0.76
200%	71 014	22 256	31.3%	0.14	1.46	0.79
300%	106 521	38 534	36.2%	0.08	1.33	0.81
400%	142 028	55 653	39.2%	0.05	1.23	0.85
500%	177 535	72 773	41.0%	>0	>1	<1

**Tableau A1-2****Progressivity indicators – federal and Quebec income tax – childless couple (2003)**

Income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	39 648	5 633	14.2%	0.28	2.18	0.80
100%	59 177	11 686	19.7%	0.16	1.96	0.76
200%	118 353	34 533	29.2%	0.09	1.52	0.79
300%	177 530	60 788	34.2%	0.05	1.38	0.80
400%	236 706	88 726	37.5%	0.03	1.28	0.84
500%	295 883	117 009	39,5%	>0	>1	<1

**Tableau A1-3****Progressivity indicators – federal and Quebec income tax – couple with two children (2003)**

Taxable income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	39 648	3 468	8.7%	0.43	3.89	0.72
100%	59 177	10 106	17.1%	0.19	2.31	0.73
200%	118 353	33 491	28.3%	0.09	1.57	0.78
300%	177 530	59 746	33.7%	0.06	1.40	0.80
400%	236 706	87 684	37.0%	0.04	1.29	0.83
500%	295 883	115 967	39.2%	>0	>1	<1

**Tableau A1-4****Progressivity indicators – federal and Quebec income tax – single-parent family with one child (2003)**

Income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	23 790	1 108	4.7%	0.90	7.89	0.66
100%	35 507	5 412	15.2%	0.40	2.85	0.67
200%	71 014	20 834	29.3%	0.15	1.56	0.77
300%	106 521	37 112	34.8%	0.09	1.38	0.79
400%	142 028	54 231	38.2%	0.06	1.26	0.84
500%	177 535	71 351	40.2%	>0	>1	<1

**Tableau A1-5****Progressivity indicators – federal and Ontario income tax – single person (2003)**

Income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	29 390	4 348	14.8%	0.31	1.91	0.84
100%	43 865	8 435	19.2%	0.21	1.95	0.77
200%	87 730	24 878	28.4%	0.13	1.60	0.76
300%	131 595	44 728	34.0%	0.07	1.37	0.81
400%	175 460	65 086	37.1%	0.04	1.25	0.85
500%	219 325	85 443	39.0%	>0	>1	<1

**Tableau A1-6**
**Progressivity indicators – federal and Ontario income tax – childless couple (2003)**

Income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	49 980	6 687	13.4%	0.18	1.96	0.85
100%	73 105	12 752	17.4%	-	-	-
200%	146 210	37 865	25.9%	0.12	1.97	0.80
300%	219 315	69 602	31.7%	-	-	-
400%	292 420	103 022	35.2%	0.08	1.68	0.76
500%	365 525	136 950	37.5%	-	-	-
				0.05	1.44	0.80
				-	-	-
				0.03	1.32	0.83
				>0	>1	<1

**Tableau A1-7**
**Progressivity indicators – federal and Ontario income tax – couple with two children (2003)**

Taxable income		Income tax		Progressivity indicators		
% of AWW	(\$)	tax payable (\$)	average tax rate	by average rate	by tax payable	by disposable income
67%	49 980	6 179	12.4%	0.22	2.30	0.82
100%	73 105	12 752	17.4%	0.12	1.97	0.80
200%	146 210	37 865	25.9%	0.08	1.68	0.76
300%	219 315	69 602	31.7%	0.05	1.44	0.80
400%	292 420	103 022	35.2%	0.03	1.32	0.83
500%	365 525	136 950	37.5%	>0	>1	<1

**Tableau A1-8**

**Progressivity indicators – federal and Ontario income tax – single-parent family with one child (2003)**

Income		Income tax		Progressivity indicators		
<i>% of AWW</i>	<i>(\$)</i>	<i>tax payable (\$)</i>	<i>average tax rate</i>	<i>by average rate</i>	<i>by tax payable</i>	<i>by disposable income</i>
67%	29 390	2 651	9.0%	0.48	3.31	0.77
100%	43 865	6 980	15.9%	0.24	2.32	0.75
200%	87 730	23 198	26.4%	0.14	1.71	0.74
300%	131 595	43 048	32.7%	0.08	1.42	0.80
400%	175 460	63 406	36.1%	0.05	1.28	0.84
500%	219 325	83 763	38.2%	>0	>1	<1