

# *R & D Tax Incentive Comparisons: Canadian and US Large Manufacturing Industries*

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## **PRÉCIS**

En recourant à un modèle des flux de l'encaisse, l'étude analyse les avantages fiscaux pour la recherche et le développement (R et D) qui sont accordés aux industries de la pétrochimie, des télécommunications, de l'acier et du papier journal dans des juridictions choisies du Canada et des États-Unis. Les résultats démontrent que dans le domaine de la recherche et du développement, les industries canadiennes obtiennent des avantages fiscaux supérieurs à ceux de leurs contreparties aux États-Unis, quoique, dans l'ensemble, le fardeau fiscal est plus lourd pour les compagnies canadiennes. Ces avantages sont particulièrement marqués au Québec et en Ontario à cause d'un dégrèvement applicable à l'impôt sur les traitements et salaires au Québec et d'une superallocation en Ontario.

## **ABSTRACT**

The study analyzes the tax-related benefits of research and development (R & D) for the petrochemical, telecommunications, steel, and newsprint industries in selected Canadian and US jurisdictions using a cash flow model. The findings show that Canadian R & D performers generally receive greater tax benefits than their counterparts in the United States, although the overall corporate tax burden is marginally higher in Canada. Such benefits are especially pronounced for Quebec and Ontario owing to the provision of a wage tax credit in Quebec and a superallowance in Ontario.

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## **INTRODUCTION**

A variety of government instruments, including grants and tax incentives, are used to promote research and development (R & D). While grants can

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play an important strategic role, an income tax based system is generally considered more efficient and equitable in delivering R & D assistance to a broad range of businesses. It may also be more effective in encouraging long-term research; for example, firms may be more confident in undertaking multiyear projects if eligibility criteria for receiving R & D benefits are based on legislated tax incentives. Funding for grant programs, on the other hand, often depends on the year-to-year budget provision of the granting authority.<sup>1</sup> Canada, along with many other industrialized countries, therefore uses its income tax system to promote business R & D activities.

This article focuses on the R & D tax incentives applied to selected large manufacturing and processing industries in Canada and the United States.<sup>2</sup> The objective of the study is to determine, under the current federal, provincial, and state corporate tax systems, including R & D tax benefits, how various Canadian provinces rank against US jurisdictions.

The first section of the article examines the R & D tax incentives in Canada and the United States in a historical and comparative framework. The methodology for the analysis is described in the second section. Simulation results, based on a cash flow model of four large manufacturing and processing industries in the selected jurisdictions, are presented in the third section. The final section summarizes the findings of the study.

## **R & D TAX INCENTIVES IN CANADA AND THE UNITED STATES**

### **Background**

Before 1983, the Canadian federal tax regime provided a 10 percent tax credit for general R & D, an allowance of 50 percent for incremental R & D, and a deduction for eligible R & D expenditures. The April 1983 budget<sup>3</sup> reformed the R & D tax package and brought it closer to the current system by eliminating the annual limits on the investment tax credit and allowing limited refunds for unused investment tax credit. The carryforward period was extended to seven years, and a three-year carryback provision for an investment tax credit was introduced.

In subsequent years, especially in the May 1985 budget,<sup>4</sup> additional measures to increase the tax benefit to R & D performers in Canada were announced. To reflect the fact that most industrial R & D in Canada relates

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<sup>1</sup> For further reading on the merits of alternative mechanisms for R & D support, see W. Steven Clark, Gerry Goodchild, Bob Hamilton, and Bill Toms, "Canada's R & D Tax Incentives: Recent Developments," in *Report of Proceedings of the Forty-Fourth Tax Conference*, 1992 Conference Report (Toronto: Canadian Tax Foundation, 1993), 32:1-29.

<sup>2</sup> In this study, a business entity with assets in excess of \$10 million is considered a large company.

<sup>3</sup> Canada, Department of Finance, 1983 Budget, Supplementary Information and Notices of Ways and Means Motions on the Budget, April 19, 1983.

<sup>4</sup> Canada, Department of Finance, 1985 Budget, Supplementary Information and Notices of Ways and Means Motions on the Budget, May 23, 1985.

to *experimental development* and *scientific research*, the definition of R & D was expanded (SR & ED) to clarify that such activities were eligible for tax benefits.<sup>5</sup> The investment tax credit rate was raised to 20 percent for large companies and 35 percent for small Canadian-controlled private corporations (CCPCs). A 100 percent refund for current R & D expenditures and a 40 percent refund for capital R & D expenditures were extended to CCPCs, with some qualifications. In addition, the \$1 million cap on accumulated income eligible for the small business investment tax credit rate was eliminated. In the June 1987 tax reform, the carryforward period for the investment tax credit was extended from 7 to 10 years for all companies. A "fast-track" mechanism to improve the turnaround time for SR & ED refund claims was announced in April 1988.<sup>6</sup> Legislative proposals released in December 1992 included further measures that made R & D expenditures more attractive. These include a new and simpler method of determining tax credits for overhead expenditures, expanded eligibility for capital expenditures, and suggested measures to improve the administration of SR & ED programs.<sup>7</sup>

In the United States, the option to expense rather than to capitalize R & D spending was the principal tax incentive available to R & D performers before 1980. In 1981, as part of the Economic Recovery Tax Act,<sup>8</sup> firms were allowed, for the first time, to claim a 25 percent tax credit for R & D spending in excess of a base amount. In addition, capital equipment used in R & D became subject to different depreciation rules from those applied to equipment used in other production activities.<sup>9</sup> The Tax Reform Act of 1986<sup>10</sup> reduced the incremental R & D tax credit to 20 percent and treated as taxable income 50 percent of the R & D tax credit. The 1989 Act<sup>11</sup> further limited the benefits of the incremental R & D tax credit by treating 100 percent of the credit as taxable income. The definition of base level was also made more restrictive.<sup>12</sup> The R & D tax credit has not yet become a permanent feature of the tax system in the United States, although the Clinton administration has promised to make it permanent.<sup>13</sup>

<sup>5</sup> The terms "research and development" (R & D), "research and experimentation" (R & E), and "scientific research and experimental development" (SR & ED) are used interchangeably in this article.

<sup>6</sup> For a detailed historical review of the Canadian R & D tax system, see Clark et al., *supra* footnote 1.

<sup>7</sup> Canada, Department of Finance, "Background Information on Proposed Changes to SR & ED Tax Incentives," *Release*, no. 92-088, December 2, 1992.

<sup>8</sup> Pub. L. no. 97-34, enacted on August 13, 1981.

<sup>9</sup> Joseph J. Cordes, "Tax Incentives and R & D Spending: A Review of the Evidence" (June 1989), 18 *Research Policy* 119-33.

<sup>10</sup> Pub. L. no. 99-514, enacted on October 22, 1986.

<sup>11</sup> Omnibus Budget Reconciliation Act of 1989, Pub. L. no. 101-239, enacted on December 19, 1989.

<sup>12</sup> Gary Clyde Hufbauer, *U.S. Taxation of International Income: Blueprint for Reform* (Washington, DC: Institute for International Economics, October 1992), 140.

<sup>13</sup> The Omnibus Budget Reconciliation Act of 1993, Pub. L. no. 103-66, enacted on August 10, 1993, extends the credit to June 30, 1995 only.

## A Comparison

SR & ED expenditures that qualify for deduction from taxable income in Canada and the United States are similar in eligibility, but the method of application is different.<sup>14</sup> In Canada, a taxpayer may immediately write off current and capital SR & ED expenditures made in Canada. The taxpayer may also choose to claim such expenditures currently or to defer them to future years. In addition, current SR & ED expenses incurred outside Canada can be written off immediately.

In the United States, on the other hand, there are no specific carryforward provisions for SR & ED expenses. Eligible expenses must be written off in the year in which they are incurred or, alternatively, must be amortized over a period of not less than five years beginning at the time the research project translates into the actual product. Further, whereas Canada permits tax credits for capital expenditures (all, substantially all, and some shared use), the US tax regime provides credits for current expenditures only.

There is no difference in the *nominal* rate of the federal tax credit for qualified R & D activities of large companies in the two countries. The *nominal* tax credit rate is 20 percent and is non-refundable. In Canada, however, this 20 percent is applied to the total amount of current R & D expenditures after the deduction of government grants and assistance. In the United States, the credit is applied to the incremental R & D amount only. The incremental value is determined by the excess of current expenditure over the base-period expenditure, which cannot be less than 50 percent of current R & D outlay. As a result, the average *effective* tax credit rate in the United States is equivalent to 10 percent.<sup>15</sup> The average *effective marginal* tax credit rate is even lower.<sup>16</sup>

Moreover, tax incentives for R & D provided by the provinces of Ontario, Quebec, and Nova Scotia are much more generous than those provided by US states. State-sponsored R & D tax incentives are limited to a few jurisdictions only, most notably New York and California. (See table 1 for an illustration of the workings of R & D tax mechanics in Canada and the United States for large and small manufacturing and processing companies.)

## METHODOLOGY

The relative position of R & D tax incentives applied to the large manufacturing industries in Canada and the United States is calculated by

<sup>14</sup> See Deloitte & Touche, *A Comparison of Tax Incentives for Performing Research and Development in Canada and the United States* (Ottawa: Deloitte & Touche, May 1990).

<sup>15</sup> *Ibid.*, at 19.

<sup>16</sup> Bronwyn H. Hall, *R & D Tax Policy During the Eighties: Success or Failure*, Working Paper no. 4240 (Cambridge, Mass.: National Bureau of Economic Research, 1992), 9. Using Standard & Poor's data on US manufacturing firms from 1980 to 1991, Hall estimated an average *effective marginal* tax credit of 4 to 5 percent on R & E, though the statutory rate was 20 percent.

**Table 1 After-Tax R & D Cost Comparison of Large and Small Canadian and US Manufacturing and Processing Companies, January 1, 1994**

	Large			Small		
	Ontario	Quebec	United States	Ontario (CCPC)	United States	United States
a) Current year R & D .....	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
b) R & D for tax purposes <sup>1</sup> .....	900	900	500	900	500	500
c) Quebec wage tax credit <sup>2</sup> .....	na	(108) [b*60%*20%]	na	na	na	na
d) Federal tax credit (FTC) .....	(180) [b*20%]	(158.4) [(b-c)*20%]	(100) [b*20%]	(315) [b*35%]	(100) [b*20%]	(100) [b*20%]
e) Quebec federal tax saving <sup>3</sup> ..	na	(80.1) [b*8.9%]	na	na	na	na
f) Ontario superallowance saving <sup>4</sup> .....	(24.3) [(b-d)*25%*13.5%] (3.6)	na	na	(19.5) [(b-d)*35%*9.5%] (2.9)	na	na
g) Tax saving from deduction <sup>5</sup> .	[30%*(b-d)*12.5%*13.5%] (255.6)	(139.4)	(280) [(800-d)*40%] <sup>6</sup>	[30%*(b-d)*17.5%*9.5%] (130.5)	(259) [(800-d)*37%] <sup>6</sup>	(259) [(800-d)*37%] <sup>6</sup>
h) Fed. tax on FTC <sup>7</sup> .....	35.8 [d*21.84%*0.91]	31.5 [d*21.84%*0.91]	na	36.8 [d*12.84%*0.91]	na	na
i) Ont. tax on FTC .....	22.1 [d*13.5%*0.91]	na	na	27.2 [d*9.5%*0.91]	na	na
j) Total credit and tax saving ..	(405.6) [d+f+g-h-i]	(454.4) [c+d+e+g-h]	(380) [d+g]	(403.9) [d+f+g-h-i]	(359) [d+g]	(359) [d+g]
k) After-tax cost of R & D .....	594.4 [a-j]	545.6 [a-j]	620 [a-j]	596.1 [a-j]	641 [a-j]	641 [a-j]

(Table 1 is concluded on the next page.)

**Table 1 Concluded**

<sup>1</sup> Net R & D is \$900 in Canada; not infrequently, a portion of R & D (government grants and subsidies, assumed 10%) is not eligible for tax credit. For the United States, it is incremental R & D, which is the difference between the current year's and the base period R & D. The base is deemed to be at least 50% of the current year's R & D. <sup>2</sup> Assumed 60% wage. <sup>3</sup> 8.9% is the sum of Quebec's income tax of 6.9% and 2% surtax. <sup>4</sup> Ontario's R & D superallowance has two components: bonus and incremental. For large companies, a bonus deduction of 25% is allowed on current qualified R & D. An incremental deduction of 12.5% is allowed on the current year's qualified R & D over the average of the prior three years' qualified R & D. It is assumed that the current year's R & D is 30% above the previous year's average R & D. For small companies, the bonus superallowance is 35% and the incremental allowance is 17.5%. Ontario's income tax is 13.5% for large and 9.5% for small companies. <sup>5</sup> For large manufacturing and processing industry, 35.5% (22% + 13.5%) is the combined Canadian federal and provincial (Ontario) income tax, and 40% is the combined federal and state income tax in the United States. For small manufacturing and processing industry, it is 22.3% (12.84% + 9.5%) in Ontario and 37% in the United States. <sup>6</sup> Because of limited applicability of the deduction on qualified R & D in the United States as compared with Canada, the US R & D deduction is assumed to be 20% less than the actual R & D (see text). <sup>7</sup> Applied federal tax and Ontario tax on the previous year's federal tax credit. Assumed 10% discount rate.

Source: Prepared from examples provided by Deloitte & Touche and Ernst & Young.

creating a tax comparison index, which is based on a ratio of tax to net cash flow before tax (NCFBT). The ratio is estimated by using the Conference Board's after-tax cash flow model for a typical plant in an industry. A typical plant in each industry represents the average observations of participating companies. These include the financial, market, and technological characteristics, such as costs of raw materials, labour, and other production and administration requirements.<sup>17</sup> Data were supplied by industry associates of the Conference Board of Canada.

Except for the corporate tax system, including the treatment of R & D expenditures, the economic factors related to each geographical location are assumed to be the same. This approach is necessary in order to isolate the impact of the differences in corporate tax and R & D tax incentives in the comparative ranking of jurisdictions.

The capital structure of the typical business is assumed to be 50 percent debt and 50 percent equity.<sup>18</sup> It is also assumed to be a "flowthrough" arrangement, under which the business simulated by the model is assumed to be fully integrated into a larger organization. This provides a more complete evaluation of the tax system of the industrial sector examined.

The study compares federal and provincial/state corporate income taxes; sales tax on material components of capital expenditures; large corporations, capital, or franchise tax; payroll tax;<sup>19</sup> depreciation or capital cost allowances; and any tax incentives applicable to the large manufacturing and processing industries.<sup>20</sup>

The study analyzes four large manufacturing and processing industries: petrochemicals, telecommunications, steel, and newsprint. Each industry is analyzed for four regions, two for Canada and two for the United States. Ontario is common to all four cases. Alberta, Louisiana, and Texas are included in the analysis of the petrochemical industry; Quebec, Illinois, and North Carolina in the telecommunications industry; Quebec, Ohio, and Pennsylvania in the steel industry; and British Columbia, Oregon, and Washington in the newsprint industry.

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<sup>17</sup> For more details on the methodology and tax regulations, see Mahmood Iqbal, *A Tax Comparison of Large Manufacturing Industries in Canada, the United States and Mexico*, Report no. 116-94 (Ottawa: Conference Board of Canada, Business Centre for Tax Research, April 1994).

<sup>18</sup> Simulations based on 100 percent debt and 100 percent equity also were performed. The overall results remain unaffected with a change in the debt-equity ratio. This was primarily because the borrowing rate (like all other economic factors) was assumed to be the same for all jurisdictions.

<sup>19</sup> Payroll tax includes only that portion of health benefits, unemployment insurance, pension plans, etc., that is collected from employers. These are legitimate business expenses and affect the level of R & D related tax benefits—for example, Quebec's wage tax credit.

<sup>20</sup> Property tax is not included in this study. It would not affect the overall findings since R & D tax advantages are independent of the level of property tax burden. Property tax is excluded because it is very complex to estimate, owing to differences in assessment value, mill rate, and the availability of tax relief among municipalities. For more detail, see Harry M. Kitchen, *Property Taxation in Canada*, Canadian Tax Paper no. 92 (Toronto: Canadian Tax Foundation, 1992).

The choice of jurisdictions and industries was based on the concentration of the industry in the given area and its economic contribution. Together these industries provide jobs to 4.1 million people and contribute \$1,041.5 billion to the manufacturing output. As a percentage of total manufacturing activity in Canada and the United States, these estimates account for 22.2 percent of the total manufacturing employment and 26.8 percent of the total manufacturing output.<sup>21</sup>

In this study, R & D expenditure represents in-house research undertaken by the particular industry.<sup>22</sup> R & D is taken as a proportion of total sales, estimated by industry sources. As a proportion of total sales, R & D is estimated at 1 percent for petrochemicals, 0.85 percent for telecommunications,<sup>23</sup> 0.45 percent for steel, and 0.35 percent for the newsprint industry in Canada and the United States.<sup>24</sup>

### SIMULATION RESULTS

In order to isolate the impact of differences in R & D tax incentives among jurisdictions, simulations with the cash flow model are performed by using two approaches. In the first approach, the comparative position of a jurisdiction is analyzed on the basis of all corporate income, sales, large corporations, capital/franchise, and payroll taxes, but R & D tax incentives are *excluded*. In the second approach, the comparative position is analyzed with the *inclusion* of R & D tax incentives, and all other taxes remain unchanged from the first estimation.<sup>25</sup>

The comparative position of each jurisdiction is measured by the ratio of tax to NCFBT, converted into an index where Ontario is the base. The lower the index value, the better is the comparative R & D tax position of the jurisdiction in the group under examination. The R & D tax benefits are estimated from the difference of the ratios of tax to NCFBT *with* and *without* R & D expenditure and again presented in an index form. In this

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<sup>21</sup> These estimates are based on broad industry classification for the year 1990. Sources are Statistics Canada, *Manufacturing Industries of Canada: National and Provincial Areas 1992*, catalogue no. 31-203; and United States, Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States 1993*, 113th ed. (Washington, DC: US Government Printing Office, 1993).

<sup>22</sup> As opposed to in-house research, there is contract-out research, which qualifies for only 65 percent of tax credit benefits in the United States. In Canada, in-house and contract-out research qualify for the same benefit.

<sup>23</sup> Although the telecommunications industry is very R & D intensive, polyolefin insulated cable (the product used in this study) is a technologically mature product and is now under challenge from new technologies such as fiber optics. As a result, cable companies do not spend much on R & D for this product.

<sup>24</sup> In order for the impact of differences in the R & D related tax benefits among jurisdictions to be estimated by the methodology used in this article, the R & D expenditure-to-sale ratio must be the same in the two countries for an industry.

<sup>25</sup> For the purpose of this simulation, it is assumed that the life of the operation is 20 years and the discount rate is 10 percent. Simulation results show that the comparative ranking of jurisdictions is indifferent to the discount rate used. For more detail, see Iqbal, *supra* footnote 17.

case, the higher the index value, the greater is the R & D tax incentive advantage of the jurisdiction.

### **Tax Comparison**

When the total tax burden in Canada is compared with the tax burden in the United States *without* R & D tax benefits, all provinces except Quebec lag behind their US counterparts, although not significantly (see figures 1, 3, 5, and 7). Ontario lags behind mainly because of its high provincial income tax, capital tax, and sales tax. British Columbia is the least competitive jurisdiction in the newsprint industry because of its high provincial income tax and capital tax. Alberta lies in the middle of the stack since sales and capital taxes are not applicable to manufacturing operations in that province. However, Alberta's provincial income tax is at the same level as Ontario's. Quebec is the most competitive jurisdiction, largely because of its generous provincial depreciation allowance on capital expenditure; it allows a 100 percent writeoff of class 10 and class 43 capital assets in the year of acquisition. In addition, Quebec's income tax, including surtax, is low.

US jurisdictions have a better ranking in terms of their total tax burden, mainly because of low or no state capital tax. The level of state income tax is low as well and is deductible from the federal income tax base. US companies also receive foreign sales corporation benefits on their exports.

The capital depreciation allowance in the steel and newsprint industries in the United States is not as lucrative as in Canada. Most of the capital assets receive, on double declining balance, a 7-year writeoff compared with a 30 percent allowance on declining balance in Canada. In the petrochemical and telecommunications industries, the depreciation allowance is quite competitive in the United States since most of the assets receive a 5-year writeoff. However, a good portion of capital, such as building and pipeline employed in the petrochemical industry, is subject to a 39-year depreciation rule. As a result, in the petrochemical industry, Louisiana shows a significantly poor ranking. Texas, on the other hand, is able to rank first, largely because of its very low state income tax.

Compared with Canada, US jurisdictions have a relatively high payroll tax in the form of unemployment insurance, social security, medicare, and worker compensation.<sup>26</sup>

### **R & D Tax Advantage**

The inclusion of R & D expenditures in the cash flow model simulation does not change the overall ranking of jurisdictions since R & D is a very small proportion of the total investment of the industries examined. The

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<sup>26</sup> Other payroll-related costs, such as dental insurance, retirement plans, and life insurance offered by firms to their employees through third-party insurers, also are believed to be higher in the United States than in Canada. However, owing to variations in practice and the absence of reliable data, they are not included in the simulation results.

petrochemical and telecommunications industries are relatively more R & D intensive, but R & D expenditures as a percentage of total sales revenue still account for not more than 1 percent.

R & D related tax advantages are estimated from the difference of two tax burden ratios, *with* and *without* R & D expenditure, and presented in figures 2, 4, 6, and 8 in the form of indexes in order to magnify results. In general, the gap in the R & D related tax advantages among jurisdictions results from the differences in their statutory rates of R & D tax credits and savings and the intensity of R & D expenditures in an industry. Jurisdictions enjoying higher rates of R & D related tax incentives and performing in more R & D intensive sectors, such as Quebec in the telecommunications industry, have higher levels of R & D tax benefits than their counterparts in the United States, such as Ohio in the steel industry.

Since overall R & D related tax credits and savings are higher in Canada than in the United States (see table 1), the gap between the two countries narrows when R & D expenditures are *included* in the total corporate tax burden calculation. This is especially true for Ontario in the petrochemical industry, which moves from the lowest place in the absence of R & D expenditures to second place with R & D expenditures. Ontario provides its own R & D superallowance in addition to the standard federal R & D tax credits and savings. Quebec is another prime example where R & D performers enjoy highly liberalized R & D wage credits and other incentives. Although the ranking of Canadian jurisdictions remains largely the same, their position generally improves with the inclusion of R & D expenditures in the analysis.

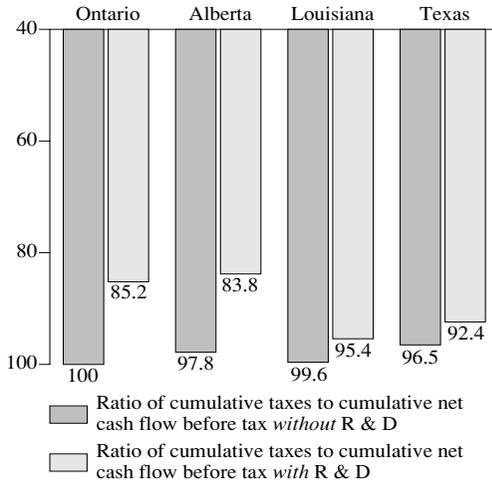
## CONCLUSION

The overall level of corporate tax burden is higher in Canada than in the United States, although not significantly. This is largely due to high provincial income tax and capital tax. The better tax incentives available to R & D performers in Canada narrow the tax burden gap between the competing jurisdictions of the two countries, but only marginally. R & D tax benefits are especially pronounced for Quebec and Ontario, owing to the provision of the wage tax credit in Quebec and the R & D superallowance in Ontario. In general, the main reasons for the more advantageous tax treatment in Canadian jurisdictions are the availability of more flexible terms for amortization of capital expenditure, higher levels of R & D tax credits, and liberalized refunds of qualified tax credits.<sup>27</sup>

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<sup>27</sup> The critical question for future research is, did lucrative R & D tax incentives in Canada lead to a higher investment in technology-intensive industries? The decision on the location of an investment is based on a host of factors, such as cost of raw materials, fuel, capital, supply of skilled labour, market size, market accessibility, infrastructure facilities, state and provincial regulations affecting various aspects of investment, and the level of corporate tax burden. The R & D tax incentive is just one component of the total corporate tax burden. If there is a substantial difference between the two countries in the major determinants on which investment decisions are based, it is unlikely that a lucrative R & D tax incentive alone would be sufficient to attract more investment in Canada, unless the level of the incentive were so high that it exceeded the sum of all negative effects.

**Figure 1 Petrochemical Industry: Tax Comparison With and Without R & D, Index<sup>a</sup>**

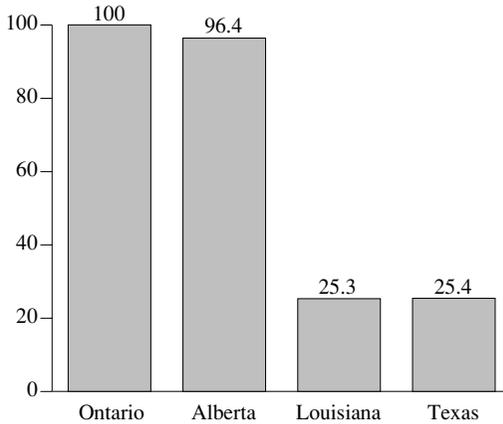


<sup>a</sup> Base = 100, Ontario at 10% discount.

Note: The lower the value, the better the comparative position of the jurisdiction.

Source: Conference Board of Canada, 1994.

**Figure 2 Petrochemical Industry: R & D Tax Advantage, Index<sup>a</sup>**

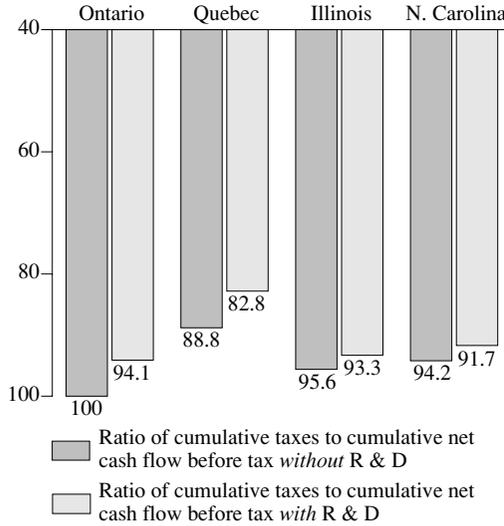


<sup>a</sup> Estimated from difference between tax ratios with and without R & D in figure 1, Ontario = 100.

Note: The higher the value, the better the comparative position of the jurisdiction.

Source: Conference Board of Canada, 1994.

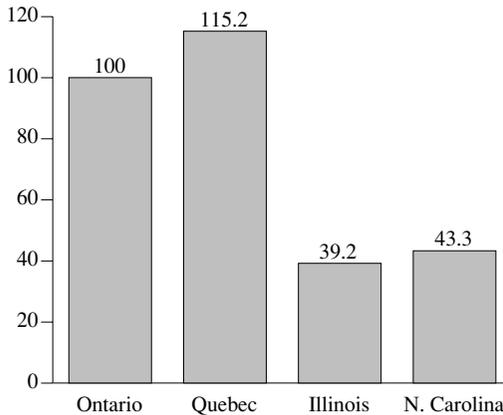
**Figure 3 Telecommunications Industry: Tax Comparison With and Without R & D, Index<sup>a</sup>**



<sup>a</sup> Base = 100, Ontario at 10% discount.

Note: The lower the value, the better the comparative position of the jurisdiction.  
 Source: Conference Board of Canada, 1994.

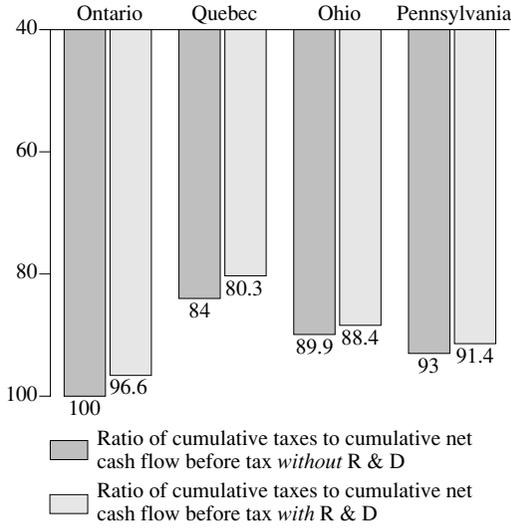
**Figure 4 Telecommunications Industry: R & D Tax Advantage, Index<sup>a</sup>**



<sup>a</sup> Estimated from difference between tax ratios with and without R & D in figure 3, Ontario = 100.

Note: The higher the value, the better the comparative position of the jurisdiction.  
 Source: Conference Board of Canada, 1994.

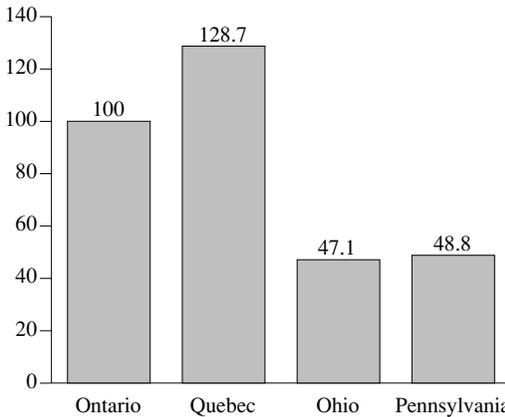
**Figure 5 Steel Industry: Tax Comparison With and Without R & D, Index<sup>a</sup>**



<sup>a</sup> Base = 100, Ontario at 10% discount.

Note: The lower the value, the better the comparative position of the jurisdiction.  
 Source: Conference Board of Canada, 1994.

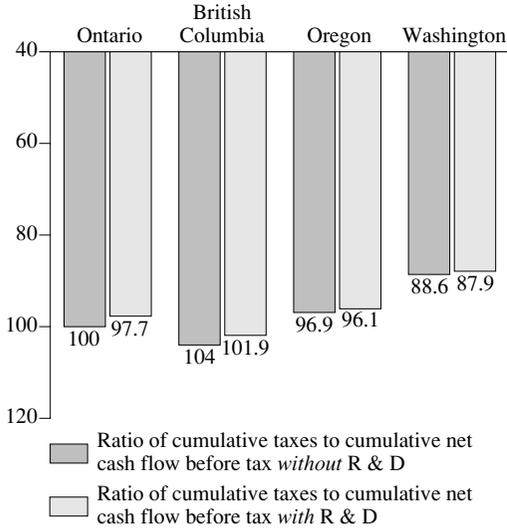
**Figure 6 Steel Industry: R & D Tax Advantage, Index<sup>a</sup>**



<sup>a</sup> Estimated from difference between tax ratios with and without R & D in figure 5, Ontario = 100.

Note: The higher the value, the better the comparative position of the jurisdiction.  
 Source: Conference Board of Canada, 1994.

**Figure 7 Newspaper Industry: Tax Comparison With and Without R & D, Index<sup>a</sup>**

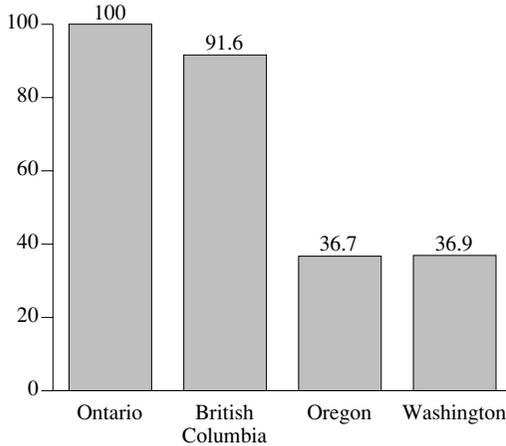


<sup>a</sup> Base = 100, Ontario at 10% discount.

Note: The lower the value, the better the comparative position of the jurisdiction.

Source: Conference Board of Canada, 1994.

**Figure 8 Newspaper Industry: R & D Tax Advantage, Index<sup>a</sup>**



<sup>a</sup> Estimated from difference between tax ratios with and without R & D in figure 7, Ontario = 100.

Note: The higher the value, the better the comparative position of the jurisdiction.

Source: Conference Board of Canada, 1994.