

# *Real Effective Corporate Tax Rates in Canada and the United States After Tax Reform*

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## PRÉCIS

Le Canada et les États-Unis viennent d'entreprendre une réforme de grande envergure de leurs régimes fiscaux. En ce qui concerne l'impôt sur les sociétés, la réforme fiscale a eu pour effet de réduire les taux d'imposition, d'élargir l'assiette de leur impôt et de réduire ou éliminer certaines mesures incitatives telles que le crédit d'impôt à l'investissement.

L'article examine l'importance pour le Canada des réformes de l'impôt sur les sociétés dans les deux pays. En recourant au concept du taux réel effectif d'imposition marginal sur les nouveaux investissements, l'auteur analyse l'effet des changements sur la taille et la distribution du fardeau de l'impôt sur les sociétés dans chaque pays, en assumant diverses hypothèses quant au taux de l'inflation et la mesure dans laquelle l'investissement est financé par l'emprunt.

La concurrence entre le Canada et les États-Unis est la plus intense dans le secteur de la fabrication, et c'est là que les taux réels effectifs de l'impôt sur les sociétés possèdent probablement le plus grand potentiel d'influencer l'emplacement des investissements et de l'emploi. Avant la réforme fiscale, le taux réel effectif de l'impôt sur les investissements en machines et en équipement pour la fabrication était considérablement moindre au Canada qu'aux États-Unis. Après la réforme toutefois l'avantage du Canada se trouve réduit considérablement, et il diminue à mesure qu'augmente le financement par emprunt. En fait, sans les stimulants fiscaux pour les investissements introduits par l'Ontario et le Québec en 1988, la position fiscale favorable du Canada dans le secteur crucial des investissements en machines et en équipement pour la fabrication aurait pu être entièrement annihilée.

La réforme fiscale a par contre augmenté de façon significative le taux réel effectif de l'impôt sur les investissements financés par actions dans le secteur de la construction non résidentielle aux États-Unis, mais non au Canada. Dans ce secteur la réforme fiscale a transformé ce qui

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était un avantage fiscal pour les États-Unis en un avantage pour le Canada.

En tenant compte des taux réels effectifs de l'impôt, pondérés adéquatement, à la fois pour les investissements en machines et en équipement et pour les investissements dans la construction non résidentielle, l'effet global de la réforme fiscale dans les deux pays a été de réduire légèrement l'avantage fiscal du Canada dans le secteur de la fabrication. Cet avantage demeure cependant substantiel. L'analyse soulève deux questions importantes. Tout d'abord, quelles sont les conséquences du fait que les efforts du gouvernement fédéral pour réduire les mesures incitatives en faveur des investissements en machines et équipement pour la fabrication ont par la suite été entravés par des provinces désireuses de restaurer leur position préférentielle dans le secteur de la fabrication? Deuxièmement, étant donné que l'un des principaux arguments à la base de l'ensemble de la réforme fiscale au Canada était de réduire la distorsion dans la répartition des ressources provoquée par l'impôt en réduisant ou en éliminant des stimulants fiscaux spéciaux, pourquoi la réforme a-t-elle en fait augmenté la valeur relative du crédit d'impôt à l'investissement dans la région Atlantique?

#### ABSTRACT

Both Canada and the United States have recently undertaken comprehensive reforms of their tax systems. In the case of the corporate tax, the main thrust of the reforms has been to lower tax rates, broaden the tax base, and curtail or eliminate incentives such as investment tax credits.

This article examines the significance for Canada of the corporate tax reforms in both countries. It uses the concept of the marginal real effective tax rate on new investment to analyze the impact of the corporate tax changes on the size and distribution of the corporate tax burden in each country, given various assumptions about the rate of inflation and the extent to which investment is debt financed.

It is in the manufacturing sector that competition between Canada and the United States is most intense and that real effective corporate tax rates probably have their greatest potential impact on the location of investment and employment. Before tax reform, the real effective tax rate on manufacturing investment in machinery and equipment in Canada was considerably lower than the rate in the United States. Under the post-reform regime, however, Canada's advantage is significantly smaller and decreases as the degree of debt financing increases. Indeed, in the absence of the investment incentives introduced by Ontario and Quebec in 1988, Canada's favourable tax position in the critical area of manufacturing investment in machinery and equipment would be lost altogether.

In contrast, tax reform has significantly increased the real effective tax rate on equity-financed investment in non-residential construction in

the United States, but not the rate in Canada. In this case, tax reform has transformed what was a tax advantage for the United States into an advantage for Canada.

The overall effect of tax reform in the two countries, given the real effective tax rates, appropriately weighted, for both investment in machinery and equipment and investment in non-residential construction, has been to slightly reduce Canada's tax advantage in the manufacturing sector. This advantage is still a substantial one, however. Two important questions emerge from the analysis. First, what are the implications of the fact that federal efforts to reduce tax incentives for manufacturing investment in machinery and equipment have been offset by subsequent provincial efforts to restore the preferential position of their manufacturing sectors? Second, given that one of the main rationales for the Canadian tax reform package was that it would reduce tax-induced distortion of resource allocation by reducing or eliminating special tax incentives, why has reform actually increased the relative value of the tax credit for investment in the Atlantic region?

## INTRODUCTION

The Canadian government has just undertaken its most comprehensive reform of the tax system since 1972. This tax reform initiative, which the government introduced in a white paper in June 1987,<sup>1</sup> came on the heels of a US tax reform package passed by Congress in the fall of 1986.<sup>2</sup> For the Canadian corporate tax system, the 1987 tax reform was the second stage of a process proposed in a May 1985 budget discussion paper and begun in the February 1986 budget.<sup>3</sup> The main thrust of corporate tax reform is to lower tax rates, to broaden the tax base, and to curtail or eliminate incentives such as investment tax credits.

This article considers how the recent corporate tax changes will affect the size of the corporate tax burden and its distribution among broad sectors and regions in Canada.<sup>4</sup> In particular, it considers changes in the distribution of corporate taxes between the manufacturing and non-manufacturing sectors, between large and small business, and between the Atlantic region and the rest of the country. The article also compares the impact of the corporate tax changes in Canada with the impact of the changes in the United States. The analysis uses the concept of the

<sup>1</sup> Canada, Department of Finance, *The White Paper: Tax Reform 1987* (Ottawa: the department, June 18, 1987), referred to herein as "the white paper."

<sup>2</sup> Tax Reform Act of 1986, Pub. L. no 99-514 100 stat. 2058 (1986).

<sup>3</sup> Canada, Department of Finance, Budget Papers, *The Corporate Income Tax System: A Direction for Change*, May 1985.

<sup>4</sup> The present article updates and refines the analysis of proposed corporate tax changes presented in an earlier article. See Patrick Grady, "The Recent Corporate Income Tax Reform Proposals in Canada and the United States" (January-February 1986), 34 *Canadian Tax Journal* 111-28.

**Table 1 Provincial Tax Rates Used in Calculating Weighted Corporate Tax Rates**

Province	Large non-manufacturing	Large manufacturing	Small non-manufacturing	Small manufacturing
	<i>percent</i>			
Atlantic region . . . . .	15.6	15.6	9.7	9.6
Newfoundland . . . . .	16.0	16.0	10.0	10.0
Prince Edward Island . . . . .	15.0	15.0	10.0	10.0
Nova Scotia . . . . .	15.0	15.0	10.0	10.0
New Brunswick . . . . .	16.0	16.0	9.0	9.0
Non-Atlantic region . . . . .	13.4	11.8	7.0	7.3
Quebec . . . . .	5.9	5.9	3.2	3.2
Ontario . . . . .	15.5	14.5	10.0	10.0
Manitoba . . . . .	17.0	17.0	10.0	10.0
Saskatchewan . . . . .	15.0	15.0	10.0	10.0
Alberta . . . . .	15.0	9.0	5.0	0.0
British Columbia . . . . .	15.0	15.0	9.0	9.0

Note: Atlantic and non-Atlantic-region tax rates are weighted averages of the provincial rates. The weights are based on the ratios of non-manufacturing income and manufacturing income to total income for both large and small corporations.

marginal real effective tax rate on investment. This rate is a measure of the disincentive that corporate taxes pose for investment; it takes into account the offsetting effects of statutory tax rates on the one hand and fast write-offs and tax credits on the other. I conduct the analysis under a variety of assumptions about the rate of inflation and the extent to which the investment is debt-financed. The analysis raises some important issues that I discuss briefly in the concluding section of the article.

#### THE CANADIAN CORPORATE TAX REFORM AND REAL EFFECTIVE TAX RATES

Tax reform has reduced the federal corporate tax rate from 36 to 28 percent, the small business rate from 15 to 12 percent, and the rate for manufacturing and processing from 30 to 23 percent; it has also increased the rate for small manufacturing corporations from 10 to 12 percent. The overall corporate tax rate is the sum of the federal rate and the provincial rate. Table 1 shows the provincial tax rates that I have used in calculating marginal real effective tax rates on investment; they are the provincial rates that were in effect after the 1988 round of provincial budgets. The structure of provincial corporate tax rates exhibits the following noteworthy features:

- In all provinces, the rate is higher for large corporations than it is for small ones.
- The rates for manufacturing are relatively low for large corporations in Ontario and for both large and small corporations in Alberta.

- In Quebec, all of the rates are very low.
- The weighted average rate is higher in the Atlantic provinces than it is in the other provinces. This state of affairs is largely attributable to the low rates in Quebec and Alberta, which pull down the non-Atlantic-region average.

The decrease in federal revenues that results from the reduction in the corporate tax rate is more than offset by the elimination or modification of many tax deductions and credits. Corporate tax changes are expected to increase corporate tax revenues by about \$500 to \$600 million in fiscal years 1988-89 and 1989-90, and by about \$1.5 billion by 1991-92.<sup>5</sup>

The analysis in this article considers two broad corporate tax reform measures: (1) the reduction in the three-year write-off for class 29 manufacturing and processing assets to 25 percent on a declining balance basis and (2) the elimination of investment tax credits apart from regional credits and credits for scientific research expenditures. The article does not consider various more specific measures that affect financial institutions, life insurance companies, the real estate industry, and the resource sector.

Table 2 sets out the pre-reform and post-reform corporate tax rates, investment tax credit rates, and capital cost allowance rates for representative industry groups and broad categories of investment. These rates provide the basis for the calculations of real effective tax rates presented below.

Some of the benefits of the corporate tax changes are set out in the white paper. By offering broader tax incentives, the reforms will reduce the degree of tax-induced distortion in investment decision making and lead to a pattern of economic activity that is more conducive to economic growth and employment creation. Investment should increase in sectors such as utilities, transport, wholesale trade, retail trade, and services. Since these sectors tend to be more labour-intensive than manufacturing, a shift in investment in their favour should lead to increased employment. Another impact of the reforms will be to decrease differences among the marginal tax rates on investments made in buildings, land, and machinery. The shift in the pattern of incentives away from machinery and toward structures will increase demand in construction-related industries—which, like the other non-manufacturing industries mentioned above, tend to be labour-intensive.

Another likely benefit of corporate tax reform is that the reduction in statutory corporate tax rates will make equity financing more attractive relative to debt financing and thus help to improve the balance sheets of corporations. Finally, the curtailment of many deductions and investment tax credits will stop the substantial buildup of unused tax deductions and credits on corporate books. This buildup has been the source of much

<sup>5</sup>Canada, Department of Finance, *Tax Reform 1987: Economic and Fiscal Outlook* (Ottawa: the department, June 18, 1987).

**Table 2 Tax Parameters Used in Calculating Real Effective Tax Rates  
for Various Industry Groups and Categories of Investment,  
Pre-Reform and Post-Reform**

	Pre-reform			Post-reform		
	Corporate tax rate	Inventory tax credit	Capital cost allowance	Corporate tax rate	Inventory tax credit	Capital cost allowance
	<i>percent</i>					
Large, non-Atlantic region, non-manufacturing						
Machinery and equipment .....	49.4	7	20	41.4	0	20
Non-residential construction .....	49.4	7	5	41.4	0	5
Large, Atlantic region, non-manufacturing						
Machinery and equipment .....	51.6	20	20	43.6	15	20
Non-residential construction .....	51.6	20	5	43.6	15	5
Large, non-Atlantic region, manufacturing						
Machinery and equipment .....	41.8	7	50	34.8	0	25
Non-residential construction .....	41.8	7	5	34.8	0	5
Large, Atlantic region, manufacturing						
Machinery and equipment .....	45.6	20	50	38.6	15	25
Non-residential construction .....	45.6	20	5	38.6	15	5
Small, non-Atlantic region, non-manufacturing						
Machinery and equipment .....	22.0	7	20	19.0	0	20
Non-residential construction .....	22.0	7	5	19.0	0	5
Small, Atlantic region, non-manufacturing						
Machinery and equipment .....	24.7	20	20	21.7	15	20
Non-residential construction .....	24.7	20	5	21.7	15	5
Small, non-Atlantic region, manufacturing						
Machinery and equipment .....	17.3	7	50	19.3	0	25
Non-residential construction .....	17.3	7	5	19.3	0	5

(Table 2 is concluded on the next page.)

Table 2 Concluded

	Pre-reform			Post-reform		
	Corporate tax rate	Inventory tax credit	Capital cost allowance	Corporate tax rate	Inventory tax credit	Capital cost allowance
	<i>percent</i>					
Small, Atlantic region, manufacturing						
Machinery and equipment . . . . .	19.6	20	50	21.6	15	25
Non-residential construction . . . . .	19.6	20	5	21.6	15	5

Note: Only half of capital cost allowance can be claimed in the first year.

trouble for tax administrators, since it has prompted corporations to seek to transfer their unused tax write-offs. It has also made corporate tax revenues difficult to predict and thereby interfered with fiscal planning.

### Real Effective Tax Rates

The white paper contains much excellent analysis of the impact of corporate tax reform. My purpose here is not to comment on this analysis in its entirety, but rather to consider the impact of tax reform on the incentive to invest across broad sectors. As I noted earlier, the means that I shall use to this end is the concept of the marginal real effective tax rate on illustrative investment projects. The virtue of this concept is that it captures in one number the combined tax effect on new investment of changes in corporate tax rates, capital cost allowances, and investment tax credits.

The real effective tax rate is calculated by dividing the present value of real (inflation-adjusted) tax payments by real income. Real income is computed by deflating by the price level the income that remains from the investment once indexed capital consumption allowances and real interest payments on any debt incurred to finance the investment have been subtracted. The analysis uses real rather than nominal taxes and income because in the absence of money illusion it is real rather than nominal magnitudes that influence business decisions. The real discount rate that I use in the calculations is 10 percent. This rate is the same as the assumed before-tax rate of return and cost of debt financing. The calculations assume rates of economic depreciation of 14.94 percent for machinery and equipment and 3.47 percent for non-residential construction.<sup>6</sup>

<sup>6</sup>These depreciation rates are averages of those estimated by Hulten and Wykoff and also used by the Department of Finance. See Charles R. Hulten and Frank C. Wykoff, "The Measurement of Economic Depreciation," in Charles R. Hulten, ed., *Depreciation, Inflation, and the Taxation of Income from Capital* (Washington, DC: Urban Institute Press, 1981), 81-125. For a more detailed discussion of the calculation of the real effective tax rate, see supra footnote 3, at 127-28.

The calculations of real effective tax rates presented here have several limitations as indicators of the combined effects of corporate tax changes. First, they are, obviously, highly simplified and do not capture all aspects of the corporate tax system. Second, they measure not the overall impact of corporate taxation on corporations but only its impact on illustrative new investment projects. Third, they assume that corporations subject to tax are able to take full advantage of all write-offs and credits—an assumption that is not strictly valid in the case of the roughly two-thirds of all companies that are only sometimes taxable. Since losses can be carried backward three years and forward seven years, the tax benefits that flow from write-offs and credits are not necessarily lost by firms in a non-taxpaying position, but their value may be substantially reduced. The reader should bear these limitations in mind in interpreting the analysis.

Table 3 presents the real effective tax rates by industry groups and by type of investment under both the pre- and post-reform corporate tax regimes. The calculations assume a continuation of inflation at its average level in recent years of 4 percent. The real effective tax rates for large corporations outside the Atlantic region reflect a weighted average provincial corporate tax rate of 11.8 percent for manufacturing and 13.4 percent for non-manufacturing. These averages are pulled down by a 5.9 percent provincial rate in Quebec and a 9 percent rate for manufacturing in Alberta. The provincial rates in the other non-Atlantic provinces range from 15 to 17 percent for non-manufacturing and from 14.5 to 17 percent for manufacturing. Consequently, the real effective tax rates in these provinces, if they were calculated separately, would be several percentage points higher than the non-Atlantic-region average.

Under the pre-reform system, as table 3 shows, real effective tax rates are in all cases substantially lower than statutory rates. In the case of investment in machinery and equipment, real effective tax rates are actually negative (indicating a subsidy) for large Atlantic-region manufacturing corporations, small manufacturing corporations, and small Atlantic-region non-manufacturing corporations. The largest negative rate is for small Atlantic-region manufacturing corporations, a circumstance that reflects the generosity of the three-year write-off for manufacturing and processing and the high level of the investment tax credit, particularly in the Atlantic region. The post-reform system will bring real effective tax rates on the return to new investment in manufacturing machinery and equipment more in line with statutory rates, although the effective rates will still be significantly below the statutory rates. The result will be a significant increase in real effective tax rates on new investment in the manufacturing sector. On the other hand, because the post-reform regime will retain the regional investment tax credit, the rate for investment by large non-manufacturing corporations in the Atlantic region will actually decline and the rate for investment in machinery and equipment by small Atlantic-region corporations will continue to be negative. Thus, although the disparity between real effective tax rates in

**Table 3 Real Effective Tax Rates on Investment by Industry Group in Canada Under 4 Percent Inflation, Pre-Reform and Post-Reform**

	Pre-reform	Post-reform
	<i>percent</i>	
Large, non-Atlantic region, non-manufacturing		
Machinery and equipment .....	42.4	44.7
Non-residential construction .....	42.4	41.8
Large, Atlantic region, non-manufacturing		
Machinery and equipment .....	25.0	22.3
Non-residential construction .....	31.1	27.8
Large, non-Atlantic region, manufacturing		
Machinery and equipment .....	10.9	33.1/29.4 <sup>a</sup>
Non-residential construction .....	34.6	35.1
Large, Atlantic region, manufacturing		
Machinery and equipment .....	-4.3	11.6
Non-residential construction .....	24.6	22.5
Small, non-Atlantic region, non-manufacturing		
Machinery and equipment .....	10.1	20.5
Non-residential construction .....	14.1	19.2
Small, Atlantic region, non-manufacturing		
Machinery and equipment .....	-11.7	-6.0
Non-residential construction .....	2.1	4.6
Small, non-Atlantic region, manufacturing		
Machinery and equipment .....	-4.8	18.4/16.0 <sup>a</sup>
Non-residential construction .....	9.3	19.5
Small, Atlantic region, manufacturing		
Machinery and equipment .....	-27.7	-8.5
Non-residential construction .....	-3.4	4.5

<sup>a</sup>Two figures are given for non-Atlantic-region manufacturing investment in machinery and equipment to show the impact of provincial tax incentives for manufacturing introduced in Ontario and Quebec in 1988.

the manufacturing sector and rates in the non-manufacturing sector will decline under tax reform, the disparity between rates in the Atlantic region and rates in the rest of the country will increase.

The Department of Finance has published calculations of the effects of tax reform on new investment in the manufacturing sector that differ sharply from the results shown in table 3.<sup>7</sup> Instead of a significant increase in real effective tax rates on new investment in manufacturing, the department foresees a slight reduction in the corporate tax rate on

<sup>7</sup>Canada, Department of Finance, *Tax Reform 1987: Income Tax Reform* (Ottawa: the department, June 18, 1987), 45-47.

new investment—from 26.2 percent before tax reform to 26.1 percent after tax reform.

There are three main reasons why the results differ:

1) The Department of Finance calculations consider a wider range of capital assets, including land and inventories, than I consider here. The real effective tax rates on new investment in land and inventories, unlike the rates on investment in machinery and equipment, will not be affected by the curtailment under tax reform of the three-year write-off.<sup>8</sup> I emphasize investment in machinery and equipment because investment of this kind is critical to the maintenance and improvement of the competitive position of the Canadian economy.

2) The department discounts the value of capital consumption allowances in the first year, whereas my analysis does not.

3) The department uses a discount factor that is higher than the 10 percent real discount rate used here.<sup>9</sup>

### Provincial Incentives

The preceding analysis was based on the corporate tax system set out in the white paper, which does not take into account important new provincial tax incentives for manufacturing and processing that the governments of Ontario and Quebec introduced in their 1988 budgets. These incentives restore some of the preferential treatment that the manufacturing sector lost as a result of tax reform. The Ontario incentive is a current cost adjustment based on the cost of new manufacturing and processing investment used in Ontario.<sup>10</sup> This adjustment, which will be equal to 10 percent of the investment cost in 1988 and 15 percent after 1989, will be a direct deduction from income otherwise subject to Ontario tax. At 15 percent, it is equivalent to an investment tax credit of 2.2 percent for investment in machinery and equipment by large manufacturing corporations and 1.5 percent for investment by small corporations. The Quebec incentive is a 100 percent capital cost allowance for capital goods used in manufacturing and processing.<sup>11</sup> It is equivalent to an investment tax credit of 1.9 percent for investment in machinery and equipment by large manufacturing corporations and 1 percent for investment by small corporations.

<sup>8</sup>Ibid., at 153-55.

<sup>9</sup>Although there is much room for disagreement about the most appropriate assumptions to make in calculating effective tax rates, the assumptions I have used here would seem to be the most plausible. If a firm is in a taxpaying position, it can always alter its instalment payments so that it need not wait a year in order to take advantage of any capital cost allowances generated by investment. Thus it is not appropriate to start discounting capital consumption allowances in the first year. The 10 percent real discount factor used here already allows for a significant risk premium relative to the current real yield on bonds and equities. It would be hard to justify using an even higher rate given that the real cost of capital to a firm should be a weighted sum of the real cost of equity and debt.

<sup>10</sup>Ontario, Ministry of Treasury and Economics, 1988 Ontario Budget, April 20, 1988.

<sup>11</sup>Quebec, Ministry of Finance, 1988-89 Budget, May 12, 1988.

**Table 4 The Impact of Inflation and Debt Financing on Canadian Real Effective Tax Rates for Large Non-Atlantic-Region Corporations, Pre-Reform and Post-Reform**

	Pre-reform, 1% debt-financed			Post-reform, 22% debt-financed		
	0	25	50	0	25	50
	<i>percent</i>					
Non-manufacturing						
Machinery and equipment						
4% inflation .....	42.4	32.8	13.6	44.7	39.8	29.8
10% inflation .....	51.2	33.6	-1.4	52.6	41.2	18.3
Non-residential construction						
4% inflation .....	42.4	32.9	13.7	41.8	35.8	23.9
10% inflation .....	46.0	26.8	-11.7	45.0	31.1	3.1
Manufacturing						
Machinery and equipment before Ontario and Quebec incentives						
4% inflation .....	10.9	-5.5	-38.3	33.1	27.4	16.1
10% inflation .....	14.8	-9.5	-58.1	39.4	28.2	5.7
Machinery and equipment after Ontario and Quebec incentives						
4% inflation .....	10.9	-5.5	-38.3	29.4	22.5	8.6
10% inflation .....	14.8	-9.5	-58.1	35.7	23.2	-1.8
Non-residential construction						
4% inflation .....	34.6	26.1	9.0	35.1	30.1	20.1
10% inflation .....	37.6	20.9	-12.5	37.8	26.1	2.6

As table 3 shows, the Ontario and Quebec incentives will significantly reduce the post-reform increase in the average real effective tax rate on investment in machinery and equipment by manufacturing corporations outside the Atlantic region. For large corporations, the provincial incentives will reduce the real effective tax rate by almost 4 percentage points, to 29.4 percent; for small corporations, the incentives will reduce the rate by almost 2.5 percentage points, to 16 percent.

### Inflation and Debt Financing

Since neither the pre-reform corporate tax regime nor the post-reform regime is indexed, real effective tax rates under either regime are influenced by the rate of inflation. Inflation affects real effective tax rates in two ways. First, it erodes the real value of capital cost allowances and thus tends to increase real effective tax rates. Second, it increases the inflation premium in the nominal interest rate and hence the value of nominal interest payments. Since interest payments are deductible, the effect of inflation in this case is to lower real effective tax rates.<sup>12</sup>

Table 4 shows the effects of inflation alone and of debt financing in the context of inflation on pre- and post-reform real effective tax rates for

<sup>12</sup>For a detailed discussion of the issues associated with indexation and the impact of inflation on the taxation of business and investment income, see Patrick Grady, *Indexation and the Taxation of Business and Investment Income*, Discussion Paper no. 283 (Ottawa: Economic Council of Canada, 1984).

large non-Atlantic-region corporations both before and after the introduction of the new provincial manufacturing and processing incentives.<sup>13</sup> The table clearly reveals the tendency of inflation to raise real effective tax rates in the absence of debt financing. This tendency is slightly less pronounced after tax reform than it is before reform, except in the case of manufacturing investment in machinery and equipment. The reduction in statutory tax rates under tax reform reduces the erosion by inflation of the real value of capital cost allowances. In the case of manufacturing machinery and equipment, however, the lengthening of the write-off period under tax reform more than offsets the impact of reduced statutory rates; the result is that the inflation-induced increase in effective tax rates is greater after tax reform than it is before reform, even if one takes the new provincial investment incentives into account.

If investment involves a significant level of debt financing, inflation will lower real effective tax rates. The greater is the reliance on debt financing, the larger is the reduction. The reduction in effective tax rates that arises from the interaction of inflation and debt financing is much less after tax reform, however, than it is before reform. Under the pre-reform system, given 10 percent inflation, the effective tax rate translates into significant subsidies at the margin for both manufacturing and non-manufacturing investment in both machinery and equipment and non-residential construction. Under the reformed system, subsidies result at 10 percent inflation only if one takes the new provincial tax incentives into account. Thus the proposed incentives will mitigate to some extent the adverse impact of inflation on the dispersion in effective marginal corporate tax rates. This mitigation will, however, stop far short of the relief that would result from a comprehensive indexation of the corporate income tax.

### THE US CORPORATE TAX REFORM AND REAL EFFECTIVE TAX RATES

Table 5 shows how the Tax Reform Act of 1986 has changed the federal corporate tax rate structure in the United States. The most striking change in the rate schedule is the reduction in the top rates from 46 to 34 percent. If one takes into account the average (deductible) state tax rate of 7.5 percent,<sup>14</sup> the total marginal corporate tax rate for large companies in the United States has declined under tax reform from 50 to 39 percent.

Under the post-reform regime, the benefits of the graduated rate structure will be phased out as taxable income increases from \$100,000 to \$335,000; an effective marginal tax rate of 39 percent will apply to income in this range.

<sup>13</sup>The table shows the real effective tax rates for illustrative cases where the proportion of the investment assumed to be financed by debt is zero, 25 percent, and 50 percent. The average proportion of investment that is debt-financed is around one-third.

<sup>14</sup>The assumption of 7.5 percent for the average US state tax rate was taken from *Income Tax Reform*, supra footnote 7, at 12.

**Table 5 Federal Statutory Corporate Income Tax Rates in the United States, Pre-Reform and Post-Reform**

Taxable income, \$	Pre-reform	Post-reform
	<i>percent</i>	
0-25,000 .....	15	15
25,000-50,000 .....	18	15
50,000-75,000 .....	30	25
75,000-100,000 .....	40	34
Over 100,000 .....	46	34

The reform legislation also repealed the investment tax credit. Under the pre-reform system, the investment tax credit rate was generally 10 percent except in the case of three-year property, where the applicable rate was generally 6 percent. These figures exaggerate the benefit from the credit, however, since taxpayers were required to elect either a reduction in the basis of depreciable property by 50 percent of the credit amount or a two percentage point reduction in the value of the credit.

Finally, tax reform modified the treatment of capital cost under the accelerated cost recovery system (ACRS) for property put in service after 1986. It created two new ACRS classes and reclassified depreciable property on the basis of the pre-1981 asset depreciation range (ADR) system. The recovery method under the post-reform regime is double declining balance, with a switch to straightline accounting for most machinery and equipment and straightline for most structures.

Table 6 compares the pre- and post-reform depreciation allowances for two classes of assets that include most manufacturing machinery and equipment and non-residential construction. I have singled out these two classes of assets because they are the classes most relevant to the question of how tax reform in the United States will affect the competitive position of Canadian industry relative to US industry. Two points emerge from the table:

- Tax reform has retained but reduced the front-end-loaded nature of accelerated depreciation allowances for manufacturing machinery and equipment.
- The change to straightline accounting has significantly lengthened the recovery period for non-residential construction.

In the course of tax reform debate in the United States, the administration proposed an almost comprehensive indexation of the corporate income tax (indexation would have applied to depreciation allowances and inventories but not to interest income and expense). Had this proposal been implemented, Canada would have had either to follow suit or to accept a substantial degree of disharmony between the US and Canadian corporate tax systems. The US decision not to proceed with indexation made it easier not to index the corporate income tax in Canada.

**Table 6 Depreciation Allowances for Manufacturing in the United States, Pre-Reform and Post-Reform**

Year	Machinery and equipment		Non-residential construction	
	Pre-reform	Post-reform	Pre-reform	Post-reform
	<i>percent</i>			
1 .....	15.0	14.3	4.6	1.6
2 .....	25.5	24.5	8.8	3.2
3 .....	20.0	17.5	8.0	3.2
4 .....	20.0	12.5	7.2	3.2
5 .....	19.5	8.9	6.6	3.2
6 .....	0.0	8.9	6.0	3.2
7 .....	0.0	8.9	5.4	3.2
8 .....	0.0	4.5	5.3	3.2
9 .....	0.0	0.0	5.3	3.2
10 .....	0.0	0.0	5.3	3.2
11 .....	0.0	0.0	5.3	3.2
12 .....	0.0	0.0	5.3	3.2
13 .....	0.0	0.0	5.3	3.2
14 .....	0.0	0.0	5.3	3.2
15 .....	0.0	0.0	5.3	3.2
16 .....	0.0	0.0	5.3	3.2
17 .....	0.0	0.0	5.3	3.2
18 .....	0.0	0.0	0.4	3.2
19-32 .....	0.0	0.0	0.0	3.2
33 .....	0.0	0.0	0.0	2.4

Note: Depreciation is computed for an asset placed in service by a calendar-year taxpayer on July 1 of year 1.

Table 7 shows the marginal real effective corporate tax rates in the United States on the returns to most new investment in machinery and equipment and non-residential construction, given an inflation rate of 4 percent (I have used the same methodology in determining these rates as I used earlier to determine the equivalent rates in Canada). Real effective tax rates are higher now than they were before tax reform—the predictable outcome of a reform initiative designed to move the tax system away from accelerated write-offs and investment tax credits and toward a lower general tax rate. Tax reform has not, however, significantly altered the system's bias in favour of shorter-lived assets. The effective rate on investment in machinery and equipment is still substantially below the rate on investment in structures.

Table 8 shows the effects of inflation and of debt financing in the context of inflation on pre- and post-reform real effective corporate tax rates in the United States. If depreciation allowances are not indexed, inflation increases effective tax rates for equity-financed investments under both the pre- and post-reform systems. The post-reform system, however, exhibits less of a tendency than its predecessor does to generate inflation-induced reductions in real tax rates as the degree of debt financ-

**Table 7 Real Effective Tax Rates on Investment in Manufacturing in the United States Under 4 Percent Inflation, Pre-Reform and Post-Reform**

	Pre-reform	Post-reform
	<i>percent</i>	
Machinery and equipment .....	18.7	32.8
Non-residential construction .....	29.1	41.3

**Table 8 The Impact of Inflation and Debt Financing on Real Effective Tax Rates for Manufacturing in the United States, Pre-Reform and Post-Reform**

	Pre-reform, % debt-financed			Post-reform, % debt-financed		
	0	25	50	0	25	50
	<i>percent</i>					
Machinery and equipment						
4% inflation .....	18.7	1.0	-34.6	32.8	25.0	9.4
10% inflation .....	26.5	0.3	-52.1	39.6	25.5	-2.7
Non-residential construction						
4% inflation .....	29.1	14.8	-13.8	41.3	36.4	26.5
10% inflation .....	34.5	11.0	-36.0	44.5	32.1	7.2

ing increases. This result is attributable to the reduction under tax reform in the marginal corporate tax rate.

#### A COMPARISON OF PRE- AND POST-REFORM EFFECTIVE TAX RATES IN CANADA AND THE UNITED STATES

I shall limit my comparison of Canadian and US marginal real effective tax rates to the rates for large corporations in the manufacturing sector, since it is in this sector that competition between Canada and the United States is most intense and that corporate tax rates probably have their greatest potential impact on the location of investment and employment. It is important to note, however, that manufacturing is the only sector in which a comparison of Canadian and US effective corporate tax rates is favourable to Canada. Moreover, outside the Atlantic region, the Canadian rates for manufacturing are lower than the US rates only because the Canadian tax system incorporates various provincial incentives to manufacturing that the US system does not offer.

Table 9 compares Canadian and US real effective tax rates for the manufacturing sector both before and after the tax reforms in the two countries. Since by far the largest part of the Canadian manufacturing sector is outside the Atlantic region and therefore does not qualify for the higher investment tax credit available in that region, the Canadian rates in the table are for non-Atlantic Canada only.

Before the reforms, as table 9 shows, the real effective tax rate on investment in machinery and equipment in manufacturing was considera-

**Table 9 A Comparison of Real Effective Tax Rates for Investment in Manufacturing in Canada and the United States Under Various Assumptions About Inflation and Debt Financing—Pre-Reform and Post-Reform, Including the 1988 Ontario and Quebec Manufacturing Incentives**

	Pre-reform, % debt-financed			Post-reform, % debt-financed		
	0	25	50	0	25	50
	<i>percent</i>					
<b>Machinery and equipment</b>						
4% inflation						
Canada .....	10.9	-5.5	-38.3	29.4	22.5	8.6
United States .....	18.7	1.0	-34.6	32.8	25.0	9.4
Difference .....	-7.8	-6.5	-3.7	-3.4	-2.5	-0.8
10% inflation						
Canada .....	14.8	-9.5	-58.1	35.7	23.2	-1.8
United States .....	26.5	0.3	-52.1	39.6	25.5	-2.7
Difference .....	-11.7	-9.8	-6.0	-3.9	-2.3	0.9
<b>Non-residential construction</b>						
4% inflation						
Canada .....	34.6	26.1	9.0	35.1	30.1	20.1
United States .....	29.1	14.8	-13.8	41.3	36.4	26.5
Difference .....	5.5	11.3	22.8	-6.2	-6.3	-6.4
10% inflation						
Canada .....	37.6	20.9	-12.5	37.8	26.1	2.6
United States .....	34.5	11.0	-36.0	44.5	32.1	7.2
Difference .....	3.1	9.9	23.5	-6.7	-6.0	-4.6
<b>Total fixed investment</b>						
4% inflation						
Canada .....	14.6	-0.5	-30.9	30.3	23.7	10.4
United States .....	20.3	3.2	-31.3	34.1	26.8	12.1
Difference .....	-5.7	-3.7	0.5	-3.8	-3.1	-1.7
10% inflation						
Canada .....	18.4	-4.7	-51.0	36.0	23.7	-1.1
United States .....	27.8	2.0	-49.6	40.4	26.5	-1.1
Difference .....	-9.4	-6.7	-1.4	-4.3	-2.9	0.0

Note: Weights of 84.33 percent for machinery and equipment and 15.67 percent for non-residential construction were used in calculating real effective tax rates for total fixed investment.

bly lower in Canada than in the United States if the investment was equity-financed or only 25 percent debt-financed. On the other hand, the real effective tax rate on investment in non-residential construction was considerably higher in Canada. The advantage associated with debt financing as inflation increased was smaller in Canada than it was in the United States.

Under the post-reform tax regimes, real effective tax rates on equity-financed investment in machinery and equipment continue to be lower in Canada than they are in the United States, but the Canadian advantage is smaller than it was and diminishes as the degree of debt financing increases. The gap in favour of Canada is now less than one percentage

**Table 10 A Comparison of the Present Values, at Different Rates of Inflation, of Capital Cost Allowances for Manufacturing in Canada and the United States, Pre- and Post-Reform**

	Pre-reform rate of inflation			Post-reform rate of inflation		
	0%	4%	10%	0%	4%	10%
<i>Cents per dollar of investment</i>						
Machinery and equipment						
Canada .....	91.1	87.8	83.4	75.0	68.0	60.1
United States .....	83.1	77.3	70.1	79.4	72.9	65.2
Non-residential construction						
Canada .....	35.0	27.6	21.2	35.0	27.6	21.2
United States .....	54.4	44.7	35.4	31.9	23.5	16.8

point for investment in machinery and equipment that is 50 percent debt-financed. In contrast, the real effective tax rate on equity-financed investment in non-residential construction has increased significantly in the United States but not in Canada. In this case, tax reform has transformed a gap in favour of the United States into a gap in favour of Canada.

In order to measure the gap between the overall Canadian and US real effective tax rates, it is necessary to assign weights to each of the two basic categories of investment in proportion to each category's share of total investment. Given that 84 percent of investment in Canada is in machinery and equipment and 16 percent is in non-residential construction, and given 4 percent inflation, the gap between the weighted Canadian and US marginal real effective tax rates on equity-financed investment was 5.7 percentage points in Canada's favour before tax reform and is now 3.8 percentage points. Thus, although tax reform has slightly reduced Canada's tax advantage in the manufacturing sector, this advantage is still significant in the case of equity-financed investment. As table 9 shows, the advantage lies with Canada in the case of debt-financed investment as well.

The fact that the increase in real effective tax rates on manufacturing investment in machinery and equipment is slightly greater in Canada than it is in the United States is the result of offsetting factors. On the one hand, the applicable statutory rate is lower in Canada than it is in the United States (34.8 percent in Canada, including an average provincial tax of 11.8 percent, and 39 percent in the United States, including an average state tax of 7.5 percent). On the other hand, Canada's replacement of the three-year write-off for manufacturing investment in machinery and equipment with a 25 percent capital cost allowance rate has increased effective tax rates by far more than has the United States' replacement of the five-year 150 percent declining balance write-off with a seven-year double declining balance write-off. The fact that under the reformed US system taxpayers have the option of switching to straightline inventory accounting further increases the attractiveness of US capital

cost allowances for machinery and equipment relative to Canadian allowances.

Table 10 shows how tax reform has changed the present value of depreciation allowances in Canada and the United States, given different assumed rates of inflation. Before tax reform, the present value of capital cost allowances for manufacturing machinery and equipment was greater in Canada than it was in the United States. Tax reform has produced a substantial reduction in the present value of the Canadian allowances but only a slight reduction in the present value of the US allowances. In the case of non-residential construction, the present value of capital cost allowances before tax reform was lower in Canada than it was in the United States. Tax reform has reversed this situation.

The new incentives for manufacturing investment in Ontario and Quebec have moderated the increase in real effective tax rates on manufacturing investment in Canada. Indeed, in the absence of these incentives, tax reform in Canada and the United States would have largely eliminated Canada's advantage in the matter of real effective tax rates on investment in manufacturing.

## CONCLUSIONS

The foregoing analysis of the impact of tax reform on real effective tax rates sheds light on two important issues: the international competitiveness of Canada's corporate tax system and the system's structure of regional incentives.

As I noted above, only the investment incentives introduced by Ontario and Québec in 1988 have prevented Canada from losing most of its advantage relative to the United States in terms of the taxation of manufacturing investment in machinery and equipment. It would seem that provincial governments put more weight on maintaining the competitiveness of Canada's corporate tax system than does the federal government. The provincial incentives are probably a useful development, given the importance of Canada's maintaining its competitiveness if the country is to take advantage of the opportunities created by free trade with the United States. The incentives also underline the fact that the federal government can no longer dictate corporate tax policy now that Ontario, Quebec, and Alberta have their own corporate tax systems. On the other hand, the introduction of further provincial investment incentives could lead to a further deterioration of our national corporate tax system and to mutually destructive competition for corporate investment among the provinces.

The second issue is the structure of regional incentives under the reformed corporate tax system. The divergence between real effective tax rates in the Atlantic region and rates in the rest of the country is greater now than it was before tax reform. Real effective tax rates on non-manufacturing investment in machinery and equipment have increased everywhere in non-Atlantic Canada, but decreased in the Atlantic region.

Increases in the rates for manufacturing investment in machinery and equipment are much smaller in the Atlantic region, particularly for small corporations, than they are outside the region. The cause of the divergences is the retention of investment tax credits in the Atlantic region (though at a reduced rate consistent with the reduction in the corporate tax rate) in spite of their elimination in the rest of the country. One of the main rationales for tax reform was that it would reduce tax-induced distortions in business decision making and improve the allocation of investment resources. The treatment of regional investment tax credits under tax reform runs counter to this philosophy and actually increases distortions. Given the lack of any convincing evidence of the desirability or effectiveness of regional investment tax incentives, why has the relative value of these incentives been increased?

An issue that this article has addressed only indirectly is indexation. As long as inflation remains near 4 percent, the beneficial effects on resource allocation that would presumably flow from an indexed tax system are probably outweighed by the disadvantages associated with the increased complexity that indexing would introduce into the tax system. If inflation were to return to double-digit levels, however, the arguments in favour of indexing would become more telling. Nevertheless, at least for the present, it was probably appropriate that tax reform did not include the introduction of comprehensive indexation.