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Productivity, Prosperity, and Business Taxes

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Executive summary

Growth in labour productivity in Canada has declined substantially since 1998. Internationally, Canada's average growth in labour productivity (measured as the change in the average amount of output produced per hour worked) over the past 10 years (1.5%) ranks eighteenth among 24 industrialized countries. Furthermore, the productivity of Canada's workforce has fallen from 89.9% of that in the United States in 1985 to 82.8% in 2004.

Growth in productivity, the increased efficiency with which an economy transforms its inputs into outputs, has a significant impact on future living standards. First, more productive workers are able to demand higher wages. Increased productivity also makes Canadian companies more profitable and competitive. Lastly, a more productive economy provides greater economic output from which governments are able to extract revenue.

As a result of Canada's disappointing productivity performance, Canadian incomes have stagnated and average incomes have decreased dramatically relative to those in the United States. For instance, gross domestic product (GDP) per person, the most commonly used measure of economic living standards, has declined from 87.9% of that in the United States in 1985 to 84.7% in 2004.

Two more narrowly defined measures of income, personal income (wages, salaries, interest income, dividends, government transfers, etc.) and after-tax personal income show an even more pronounced downward trend. Average personal income per person in Canada relative to the United States has decreased from 87.3% in 1985 to 77.4% in 2004 whereas average after-tax income per person has decreased from 80.4% of that in the United States in 1985 to 66.9% in 2004.

One of the primary reasons for Canada's poor productivity growth and hence the growing gap in living standards is an economic environment that penalizes, rather than promotes, capital investment. Increasing the amount of capital that workers have at their disposal is one of the principal drivers of productivity and increased living standards. In addition, technological advances are often embodied in new investments in machinery and equipment.

A review of the academic research indicates that business taxes significantly influence the incentives for capital investment. Jurisdictions with high business taxes reduce the after-tax rate of return on investment. Lower returns reduce the incentives for investment and leave firms with less money to reinvest in new machinery, equipment, and technology.

Unfortunately, Canada has one of the highest tax rates on incremental capital investment in the world: the marginal effective tax rate (METR) on capital is the second highest among 36 leading countries. The METR is the tax rate that firms pay on an additional dollar of return generated from a capital investment. Indeed, METRs are the best indicator of the competitiveness of business taxes in that they are a comprehensive measure that includes income taxes, capital taxes, depreciation and inventory cost deductions, and sales taxes imposed on business inputs.

The most effective means of increasing productivity in Canada lies in creating an environment that is conducive to the accumulation of capital. To that end, Canada should

make its business taxes more competitive. We propose an ambitious plan to reduce corporate income tax rates significantly and to eliminate Canada's most damaging tax, the corporate capital tax, in all Canadian jurisdictions. Our proposed five-year federal-provincial initiative to reduce business taxes amounts to an estimated $59.1 billion dollars. Specifically, the federal general corporate income-tax rate should be reduced from 21.0% to 12.0% over the next five fiscal years (2006/2007–2010/2011). Further, all provincial general corporate income-tax rates should be decreased by 30% (see ExSum table 1). Federal and provincial governments are also encouraged to eliminate corporate capital taxes (CCT) completely over the five-year period.

In addition to these specific tax changes, we also recommend that Canadian governments adjust depreciation rates (capital cost allowances) to reflect more accurately the true costs of replacing assets, exempt business inputs from sales taxes in those provinces that continue to impose such taxes, and bring businesses property tax rates in line with those imposed on residential property.

While our five-year federal-provincial initiative to reduce business taxes represents a significant reduction in revenue, the net impacts of these tax changes will, in all likelihood, be much lower than is currently estimated. The current estimate of revenue loss is static and does not include the effect of improved incentives, which will lead to increased investment and productivity and, ultimately, have a positive impact on tax revenues. Further, we provide numerous options for offsetting revenue losses.

For example, many jurisdictions would benefit from broadening their tax bases by eliminating or curtailing tax incentives that favour one type of investment over another. We estimate that the federal government alone could save an estimated $17.3 billion over five years by eliminating these incentives. Doing so will reduce the cost of the proposed federal tax cut from $28.8 billion (ExSum table 1) to $11.5 billion. Most Canadian governments would also benefit from limiting future increases in spending by holding spending increases to inflation plus population growth. In fact, had Canadian governments increased program spending at the same rate as inflation and population growth over the past five years, an estimated $42.8 billion of tax revenues could have been used for business tax relief.

In conclusion, the multi-year initiative to reduce business taxes proposed in this paper will make Canadian tax policy much more conducive to capital investment, improve Canada's productivity performance vastly, and lead to a higher standard of living for Canadians.

Exsum table 1: Proposed federal-provincial initiative to reduce business taxes, 2006/2007 to 2010/2011

	Statutory general corporate income-tax rate		Estimated cost of reducing corporate income taxes ($millions)	Estimated cost of eliminating corporate capital taxes ($millions)	Estimated total cost of proposed reduction in business taxes ($millions)
	2005/2006	2010/2011	2006/2007–2010/2011		
Federal	21.0	12.0	28,833	0 [1]	28,833
British Columbia	12.0	8.0	2,671	315	2,986
Alberta	11.5	8.0	2,404	0	2,404
Saskatchewan	17.0	12.0	300	1,200	1,500
Manitoba	15.0	10.0	806	533	1,339
Ontario	14.0	10.0	9,551	4,973	14,524
Quebec	8.9	6.0	1,786	4,585	6,371
New Brunswick	13.0	9.0	172	132	304
Nova Scotia	16.0	11.0	354	271	625
Prince Edward Island	16.0	11.0	28	10	37
Newfoundland	14.0	10.0	182	26	207
Total			47,086	12,044	59,130

Sources: Statistics Canada, Public Institutions Division, 2005; provincial and federal government budgets for 2005; Treff and Perry, 2005; calculations by the authors.

Note 1: Our proposal calls for the federal government to eliminate the capital tax on financial institutions. Unfortunately, the federal government does not provide revenue estimates for capital taxes. The Canadian Bankers Association (2005) estimates that the six big Canadian banks paid $22 million in capital taxes in 2004. Thus, the federal government should not experience a significant revenue loss from the elimination of the capital tax.

Note 2: The current estimate of revenue loss is a worst-case scenario as estimates are static and do not include any positive effects from improved incentives. In other words, the supply-side impacts of the reductions in corporate income taxes and the elimination of the corporate capital tax have not been taken into consideration. Mankiw and Weinzierl (2004) provide evidence of the extent to which tax cuts are self financing: they estimate the effects of changes in taxes on capital and labour income and find that approximately 50% of a capital tax cut pays for itself.

Introduction

Productivity growth in Canada is falling behind that of other industrialized nations and our relative standard of living is also falling as a result. Worse still, the policies enacted to increase productivity over the last number of years have been misguided or have simply not gone far enough. The purpose of this study is to highlight the impending productivity crisis in Canada and to offer recommendations that will place Canada on the path to greater productivity.

Organization

The first section shows the importance of productivity growth with particular emphasis on improving Canada's standard of living. Canada's productivity is reviewed in both a North American and a broader international context. The first section concludes with a discussion of the main determinants of productivity and prosperity.

Section 2 examines the impact that business taxes have on capital formation and gives a review of independent research into the impact of business taxes on capital formation and the effects of taxes on business activity, business location, and foreign direct investment. Finally, this section summarizes studies investigating the economic costs of different types of taxes.

Section 3 discusses the international competitiveness of Canada's business tax system.

Section 4 presents a proposal for reducing business taxes that is aimed at improving productivity growth by altering the incentives for investment in Canada.

1 Productivity and why it matters

Productivity is a measure of the efficiency with which an economy transforms its inputs such as labour, capital, and raw materials into outputs. The most common and widely understood measure of productivity is labour productivity, the average value of output produced per hour worked. Productivity growth is a critically important determinant of increased living standards. A more productive economy is able to produce more goods and services with a given amount of inputs. Workers who produce more for each hour they work are able to demand higher wages. A recent study by the Organisation for Economic Co-operation and Development (OECD) investigates ways to improve Canadian living standards and concludes that "labour productivity increases, the ultimate driver of real income growth, requires producing incrementally larger amounts of output for each hour worked" (OECD, 2004:88). In other words, without sustained increases in labour productivity, Canada will be hard pressed to increase average incomes significantly. Further, a new study published by Statistics Canada finds that "[p]roductivity matters for living standards. Real gross domestic product (GDP) per person in 2004 was over 2.9 times higher than in 1961. Productivity growth accounted for 80% of that increase" (Harchaoui and Tarkhani, 2005: 5).

Increased productivity also makes Canadian companies more profitable and competitive. A more productive workforce coupled with increased profitability increases the attractiveness of Canada as a destination for new investment. As businesses invest in new machines, equipment, and technology, the productivity of workers rises further. Indeed, a virtuous circle develops.

Lastly, a more productive economy provides a larger economic base from which governments are able to extract revenues. Highly productive economies are able to generate more revenue per capita at lower tax rates than less productive economies with higher tax rates. As Canada's population ages, the increased fiscal burden of Canada's health-care system, public pensions, and other social programs will be placed on fewer workers. Increases in labour productivity will become ever more important to Canada's ability to fund these government programs.

1 Labour productivity in Canada

The following section gives an empirical analysis of the growth of Canada's labour productivity over time and compares it with that of other industrialized countries. Particular attention is paid to Canada's productivity relative to that of the United States. While other productivity indices are available, we focus on labour productivity, the principal determinant of increased incomes for Canadian workers. [1] Labour productivity is measured by dividing gross domestic product (GDP), an estimate of the total value of the goods and services produced in a jurisdiction, by the total number of hours worked by all employees and self-employed individuals. [2]

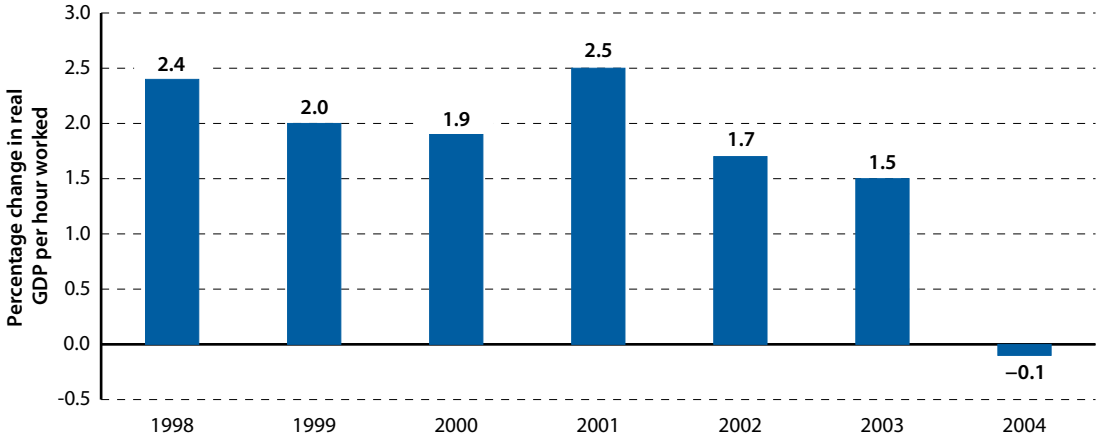
Over the past 20 years, Canada's labour productivity has increased an average of 1.3% per year. In 1985, Canadian workers produced an average of $36.23 in goods and services (GDP) per hour worked, in inflation-adjusted terms. By 2004, this number had increased to an average of $46.01 in goods and services (GDP) per hour worked. While the year-over-year growth in labour productivity has varied a great deal over the past 20 years, Canadians have seen their productivity growth decrease dramatically since 1998 (figure 1). [3]

More important than the absolute decrease in productivity growth is Canada's inability to increase labour productivity relative to that of other countries. Increased productivity improves the attractiveness of Canada as a destination for new investment. Given Canada's proximity to the United States, it is especially important to compare the productivity of these two countries, as they compete for physical and human capital. Figure 2 displays labour productivity in Canada relative to the United States over the past 20 years. In 1985, Canada's GDP per hour worked was 89.9% of that in the United States. Unfortunately, the gap has increased substantially: by 2004, Canada's labour productivity as measured by GDP per hour worked had fallen to 82.8% of that in the United States. [4] More worrying, however, is the dramatic widening of the gap in the past four years. From 2001 to 2004, Canada's labour productivity relative to that of the United States decreased by 5.7 percentage points.

The growth of labour productivity in Canada is equally disappointing when compared to that of other countries. Figure 3 presents the average year-over-year change in GDP per hour worked from 1995 to 2004 in 24 industrialized countries. Canada had an average growth rate of 1.5% in labour productivity over the past ten years, ranking it eighteenth of 24 industrialized countries. Ireland, which ranked first, had an average rate of growth in labour productivity that was more than three times that of Canada (4.7%). In addition, the OECD's recent economic survey of Canada found that the country's increase in GDP per hour worked was one of the smallest in the OECD between 1970 and 1995 (OECD, 2004).

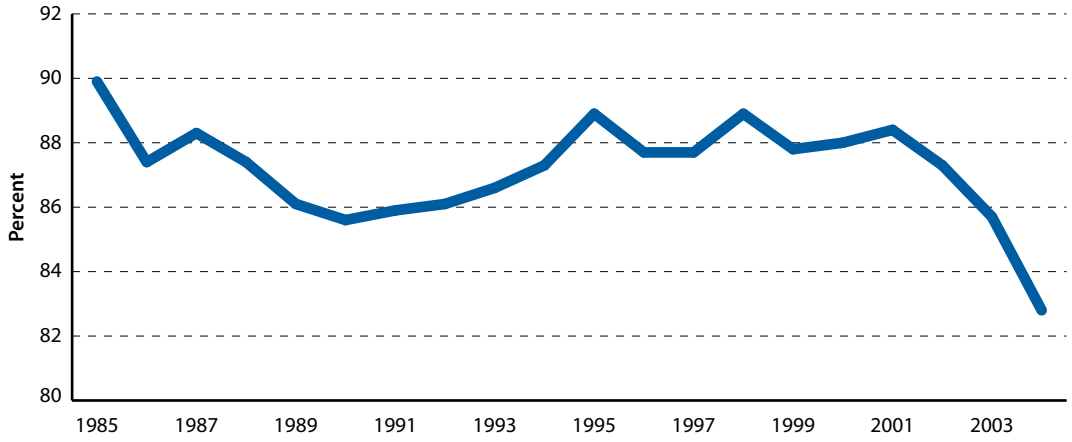
Clearly, labour productivity in Canada needs to be improved. In absolute terms, rates of growth in labour productivity are declining. In addition, Canada's productivity gap with the United States has grown substantially. Finally, in a broader international context, Canada ranks near the bottom in average growth in labour productivity.

Figure 1: Growth in labour productivity in Canada, 1998–2004



Source: Statistics Canada, 2005a, 2005b; calculations by the authors.

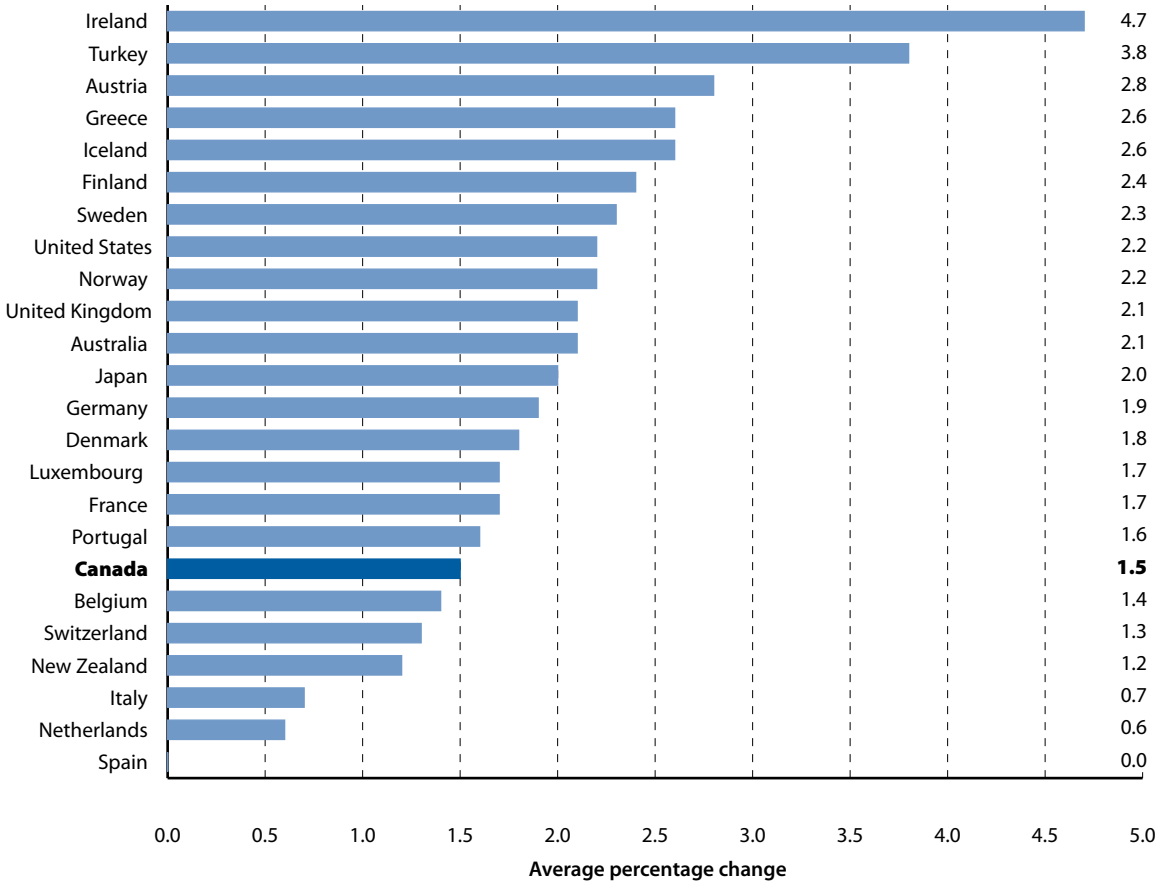
Figure 2: Labour productivity in Canada relative to that in the United States, 1985–2004



Note: Productivity is measured as gross domestic product (GDP) per hour worked. Purchasing power parity exchange rates are used to convert US figures into Canadian dollars.

Sources: Statistics Canada, 2005a, 2005b; US Department of Commerce, Bureau of Economic Analysis, 2005; calculations by the authors.

Figure 3: Average growth in labour productivity, 1995–2004



Note: Labour productivity is measured as gross domestic product per hour worked. Purchasing power parity exchange rates are used to convert figures into US dollars.

Sources: Groningen Growth and Development Centre and The Conference Board, 2005; calculations by the authors.

2 Standard of living in Canada

Productivity growth is essential for sustained increases in living standards. Gross domestic product (GDP) per capita, the total value of the goods and services produced in Canada per person, is the most commonly used measure of economic living standards. Increases in GDP per capita can be attributed to changes in labour productivity (GDP per hour worked), the number of hours worked per worker, or the employment rate (employment to population). [5] Given the preferences of Canadian workers and the approaching retirement of the "baby boomers," it is unlikely that the latter two will contribute significantly to increased living standards. Accordingly, the Federal Government's proposal, *A Plan for Growth and Prosperity*, proclaims, "Given that we are currently at a record-high rate of employment and Canada's population will increasingly age in coming years, growth in employment will have a diminishing impact. Any significant future increase in the Canadian standard of living will come either from an increase in the average number hours worked or in the output of our work effort. We have a choice between working harder or working smarter" (Canada, Department of Finance, 2005c: 24). Indeed, going forward, productivity will be a critical determinant of increased GDP per capita.

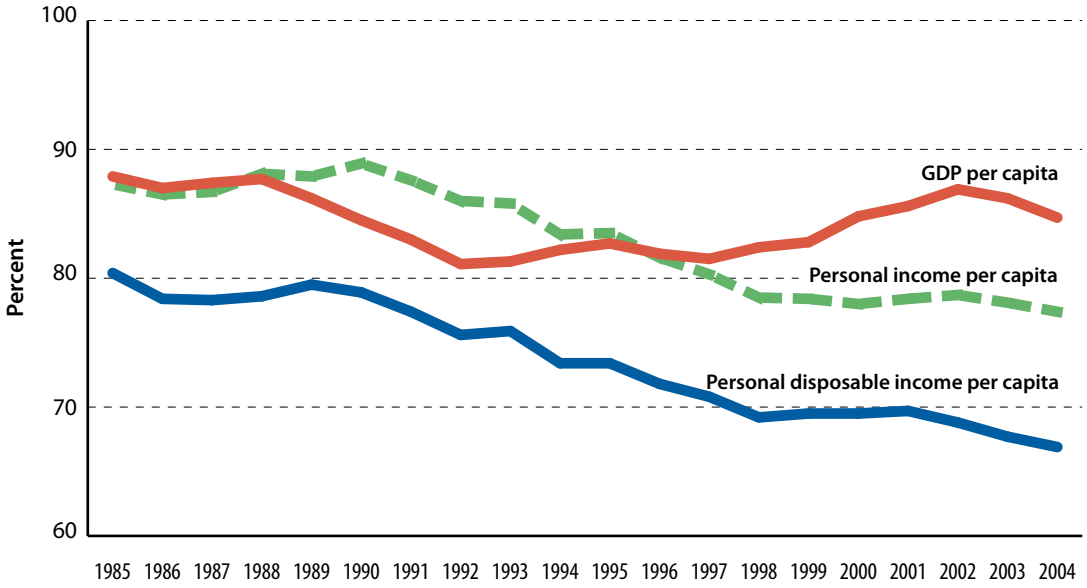
At first glance, the average growth in the standard of living in Canada as measured by GDP per capita appears relatively robust. Over the past ten years, Canada's GDP per capita adjusted for inflation has grown an average of 2.4% a year, increasing from $32,666 in 1995 to $40,484 in 2004. Over a 20-year period (1985–2004), Canada's inflation-adjusted GDP per capita has increased at a somewhat slower average rate of 1.7% a year. However, two more narrowly defined measures of income, personal income and personal disposable income, reveal less robust increases in living standards. Personal income per capita measures the sum of all sources of income received per person (including wages, salaries, interest income, dividends, government transfers, etc.). Personal disposable income measures the amount left over from personal income after the payment of direct personal taxes such as income taxes and contributions to social insurance plans.

Personal income per person adjusted for inflation has increased at an average rate of 1.1% from 1995 to 2004. Over a 20-year period, average personal incomes have grown by an average of just 0.9% a year. Further, after-tax incomes per person have experienced the lowest rates of growth, an average of 1.0% a year from 1995 to 2004 and 0.6% from 1985 to 2004.

It is even more troubling that average incomes in Canada have decreased substantially relative to incomes in the United States. Gross domestic product per person in Canada relative to GDP in the United States declined from 87.9% in 1985 to a low of 81.1% in 1992 (figure 4). Over the next ten years, 1993 to 2002, GDP per capita increased from 81.1% of that in the United States to 86.9%. Unfortunately, Canada's average GDP per capita has again decreased relative to that of the United States in the past two years, from 86.9% in 2002 to 84.7% in 2004.

Personal income and personal disposable income per capita in Canada relative to the United States show an even more pronounced downward trend. Personal income per person in Canada relative to that in the United States has decreased steadily from 87.3% in 1985 to 77.4% in 2004. Personal disposable income per person has decreased from 80.4% of

Figure 4: Standard of living in Canada relative to that in the United States, 1985–2004



Note: Purchasing power parity exchange rates are used to convert US figures into Canadian dollars.

Source: Statistics Canada, 2005a, 2005b; US Department of Commerce, Bureau of Economic Analysis, 2005; calculations by the authors.

that in the United States in 1985 to 66.9% in 2004. In fact, the gap in personal disposable income per capita between Canada and the United States has widened almost every year during the past 20 years.

Other studies reinforce the dismal income growth experienced in Canada. For instance, a recent study published by TD Economics found that average after-tax income per worker had increased only 3.6% in total over the past 15 years (TD Economics, 2005). In addition, a recent survey of Canada by the OECD listed raising living standards as a key challenge for Canada (OECD, 2004).

Canada has been unable to increase its living standards significantly in the past 20 years. In addition, the economic well-being of Canadians has decreased substantially relative to that of Americans. With the ratio of employment to population set to decline given the onset of retiring "baby boomers," increased productivity will be critical to future increases in living standards.

3 Determinants of growth in labour productivity

There is a plethora of empirical research investigating the determinants of labour productivity. While there is no widespread, definitive agreement on all determinants, most economists would agree that investments in physical and human capital and technological progress are principal drivers of growth in labour productivity. [6]

Increased capital accumulation increases the amount of capital workers have at their disposal and, if used effectively, makes them more productive. In addition, technological

advances are often embodied in new investments in machinery and equipment. Unfortunately, Canadian investment in machinery and equipment is significantly lower than that of other industrialized countries (Mintz and Chen, 2005). Further, Goldfarb and Robson (2005) have found that new investments in plants and equipment per worker in Canada have declined relative to the rest of the OECD countries on average and have fallen significantly behind the United States. Indeed, the federal government's own analysis points to the significant gap between Canada's investment in machinery and equipment and that of other countries: "Canadian firms invest less than their peers in the major countries, a pattern that has persisted for at least three decades" (Canada, Department of Finance, 2005c: 93).

Productivity can also be enhanced through a more educated and skilled workforce. Investments in human capital are also an important source of new ideas and innovation. Fortunately, Canada does very well in accumulating human capital: among countries of the OECD, Canada has the highest proportion of the population aged 24 to 64 with post-secondary education (OECD, 2004; Canada, Department of Finance, 2005c).

Investments in physical and human capital also raise productivity levels indirectly through increased innovation, finding better ways of producing existing goods and services, and developing new technologies through research and development.

Conclusion

Productivity growth in Canada has decreased in both absolute and relative terms. As a result, Canadian incomes have stagnated and our standard of living has decreased dramatically relative to the United States. One of the primary reasons for Canada's slow growth in productivity is the lack of capital investment. Indeed, improvements in Canada's future productivity will largely depend on Canada's ability to increase business investment in new machinery, equipment, and technology that make workers more productive.

2 The effect of taxes on capital investment

There are many determinants of a jurisdiction's ability to simulate business investment: openness to international trade, the skill level of the labour force, protection of property rights, the number and complexity of regulations and so on. One of the most important, however, is the level and structure of taxation imposed by governments. Jurisdictions with high levels of taxation on businesses effectively reduce the after-tax rate of return on capital investment and thus reduce the incentive for businesses to invest in capital. In other words, business taxes reduce the amount of money that firms will reinvest in new machinery, equipment, and new technology that make workers more productive. [7]

1 Research on taxes and capital formation

This section summarizes academic research into the impact of business taxes on investment or capital formation. Since business taxes reduce the after-tax rate of return on capital investments and change the incentives for businesses to invest in capital, they are often referred to as "capital taxes." [8]

Business taxes and investment

One of the most influential studies on the relationship between business-tax policy and investment expenditures was written by Robert Hall and Dale W. Jorgenson (1967) and published in the *American Economic Review*. The authors calculate the effects of changes in tax policy on investment behaviour for three major tax revisions [9] in the postwar period in the United States. They find that tax policy is highly effective in changing the level and timing of investment expenditures. In addition, tax policy has had important effects on the composition of investment. [10]

Steven R. Fazzari, Glenn Hubbard, and Bruce Petersen (1988) analyze the effects of taxes on capital spending. The authors investigate whether marginal or average tax rates have an impact on capital investment made by firms. They find that, for firms facing financing constraints, the marginal tax rate may have a weaker effect than average tax rates since lower average tax rates increase the amount of earnings firms have to reinvestment in capital spending. The authors argue that eliminating corporate income taxes would increase investment by firms facing financing constraints.

A series of more recent papers by Jason Cummins, Kevin Hasset, and Glenn Hubbard provide empirical evidence on the influence of business taxes on capital investment. Their first study (Cummins et al., 1994) uses US tax reforms as natural experiments to estimate the responsiveness of fixed investments. The authors conclude that the cross-sectional pattern of investment changed significantly and in a manner consistent with the tax changes subsequent to every major business tax reform since 1962. Further, investment spending was most responsive in firms facing the greatest change in tax incentives.

A subsequent paper (Cummins et al., 1996) investigated the impact of tax reforms on investment using a cross-country comparison. Specifically, firm-level panel data on tax reforms in 14 OECD countries, including Canada, were used to study the investment decisions of over 3,000 firms from 1981 to 1992. Using tax reforms to isolate changes in the marginal incentives to invest in capital, Cummins and his colleagues show that changes in tax policy have statistically significant impacts on investment behaviour in 12 countries, including Canada.

In a working paper published by the National Bureau of Economic Research (NBER), Cummins (1998) investigated how a jurisdiction's policy on capital income tax affects investment by the parent and affiliates of multinational corporations. He finds that reductions in the after-tax price of capital result in robust investment and that this translates directly into productivity gains. Given the connection between capital income tax and the after-tax price of capital, Cummins suggests that tax incentives for capital will increase productivity and growth. [11]

User cost of capital

Many studies analyze the impact of taxes on the user cost of capital, the per-unit cost for the use of a capital asset for a given period. Taxes have a significant impact on the user cost of capital and thus the response of business capital formation to the user cost is critical to evaluating tax reform.

Peter Clark (1993) investigated investment in business equipment in the United States from 1953 to 1992. He estimates that the long-run elasticity of equipment investment with respect to the tax portion of the cost of capital is −0.4, meaning that a 1% increase in taxes would decrease capital formation by 0.40%.

Robert Chirinko and Andrew Meyer (1997) quantify the sensitivity of investment spending to the user cost of capital. They estimate that user cost elasticities range from −1.66 to −0.05, thus varying widely across the 11 sectors studied in the paper. [12] In other words, a 1% increase in the user cost of capital resulting from an increase in business taxes would decrease capital investment by 0.05% to 1.7%.

A more recent paper by Robert Chirinko and colleagues (1999) investigates the responsiveness of business-capital formation to user cost. The authors find that higher user costs do indeed reduce capital formation. Specifically, they estimate a user-cost elasticity of approximately −0.25, meaning a 1% increase in the user cost of capital would decrease capital formation by 0.25%. In addition, they conclude that reducing the tax rate on capital gains, increasing the investment tax credit, and replacing the current tax system with a flat tax, would all affect the long-run capital stock positively.

Canadian economists Kenneth Mackenzie and Aileen Thompson analyzed the impact of changes in the relative cost of capital on relative investment levels in Canada and the United States for the Technical Committee on Business Taxation (1997). The authors find that the user cost of capital has generally been higher in Canada than in the United States throughout the period from 1971 to 1996. While higher real interest rates in Canada were found to be the primary reason for the higher cost of capital, the authors also concluded that the tax system contributed to Canada's higher cost of capital. Secondly, the authors find that changes in the relative cost of capital had a small, but statistically significant, impact on

relative levels of investment in equipment in the two countries. Specifically, a 1% increase in the Canadian cost of capital leads to a 0.03% decrease in the Canadian capital stock, holding constant the capital stock and cost of capital in the United States.

2 Research on business taxes, business activity, and location of investment

Leslie Papke (1987), writing in the *National Tax Journal*, used the after-tax rate of return on a marginal investment, which at the time was a new measure of relative business tax burden, to study the effect of interstate tax differentials on the location of capital investment. Papke finds differentials in the tax burden to be statistically significant and negatively related to the size and location of a capital investment. In addition, the study suggests that state and local business-tax policies designed to increase the return on new capital investment in a particular industry can be expected to generate new investment.

James Hines (1996) examined the effect of subnational taxation on business location using the top statutory rate on taxable corporate income in the state and correcting for depreciation rules and federal deductibility. Hines finds that high tax rates have a significant negative effect on investment in a jurisdiction and that tax policy affects the volume of local business capital by influencing the number of local firms and the average capitalization of local firms. Hines also finds that, "even small variations in local tax rates may have important effects on capital flows and, by implication, on the economy as a whole" (1996: 1092)

Bartik (1991) examined a host of studies that estimated elasticities for American business activity with respect to state and local taxes. He concludes that the elasticity estimates ranged from between −0.10 and −0.60 for studies examining interstate activity. These findings imply that a 1% increase in business taxes reduces business activity by between 0.10% and 0.60%.

More recently, Eugene Beaulieu and his colleagues (2004) at the University of Calgary investigated the effect of tax rates on manufacturing activity. They calculated effective marginal tax rates on marginal costs to estimate the real tax effect on marginal activities within the manufacturing sector. They conclude that a 1% increase in the effective marginal tax rates on marginal costs (EMTRMC) would result in a loss of manufacturing activity of −0.33%. In other words, a 1% increase in the EMTRMC would result in the loss of 115 manufacturing establishments in Canada.

3 Research on taxes and foreign direct investment

Empirical evidence also supports the notion that business taxes influence the location of foreign direct investment. Ruud De Mooij and Sjef Ederveen (2003) provide a comprehensive review of academic literature on the impact of business taxes on the allocation of foreign direct investment. Comparing 25 empirical studies, the authors find that the median value of the tax-rate elasticity in the literature is approximately −3.3: a reduction of one percentage point in the host country's tax rate increases foreign direct investment in that country by 3.3%. [13] Further, data on merger and acquisitions report lower elasticities while those

using data on new plants and plant expansions yield higher elasticities (and therefore a larger impact on investment from tax changes). This is an important insight, given the positive effect of investments in machinery and equipment on productivity.

James Hines (1999) also reviewed the empirical evidence of the effect of taxation on the volume and location of foreign direct investment (FDI), corporate borrowing, transfer pricing, dividend and royalty payments, R&D performance, and tax avoidance. In his comprehensive review of the existing literature, Hines finds "extensive quantitative evidence that international taxation influences the volume and location of foreign direct investment" (1999: 318). [14] Given the international evidence, it follows that governments seeking a combination of adequate tax revenue and efficient economic performance are well advised to impose low taxes on mobile factors such as foreign direct investment. Hines applies the international evidence to domestic tax policy in the United States and finds that demand for R&D, plant and equipment, and other productive factors is considerably more responsive to taxation than previously suspected. Among the many implications of this evidence is the high likelihood that American states offering attractive tax climates will be able to draw business activity away from other parts of the United States.

In an interesting study, Harry Grubert and John Mutti (2000) investigated whether taxes influence where American corporations invest. Grubert and Mutti analyzed tax returns of more than 500 American multinational corporations to identify the role of the host country's tax rates in determining the amount of capital invested in 60 potential locations worldwide. Their findings show that average effective tax rates have a significant effect on the choice of a location and the amount of capital invested there. Specifically, a lower tax rate that increases the after-tax return to capital by 1% is associated with approximately 3% more real capital investment.

Conclusion

The evidence from economic research indicates that business taxes do indeed influence the incentive for businesses to invest in capital. In addition, high business-tax rates have a significant impact on foreign direct investment. Perhaps the most important insight is that jurisdictions should have competitive business-tax regimes to enhance investment.

4 Research on the economic costs of taxation

Economic research has consistently found that business taxes impose significantly higher economic costs than sales taxes, payroll taxes, and personal income taxes. Taxes impose economic costs because they distort the behaviour of individuals and businesses. For instance, taxes on investment income (interest, dividends, and capital gains) decrease the after-tax rate of return, which ultimately leads to a lower savings and investment than would be the case in the absence of taxes. Likewise, as discussed above, taxes on capital lower the rate of capital accumulation. Sales taxes distort consumption decisions while taxes on labour incomes decrease after-tax wages and affect the total number of hours worked and the overall effort of workers.

Marginal efficiency cost

A number of studies have attempted to quantify the costs of various types of taxes by estimating what is known as the marginal efficiency cost (MEC) of taxes, the cost to the economy of raising an additional dollar of revenue from a particular tax. Among the most widely cited calculations of marginal efficiency costs are those estimated by Harvard professor Dale Jorgensen and his colleague Kun-Young Yun (1991). [15] Jorgensen and Yun's estimates of the MEC of select US taxes (table 1) indicate significant variation in the economic costs of different taxes. [16] Specifically, capital-based taxes (MEC = $0.92) and corporate income taxes (MEC = $0.84) were shown to impose much higher costs than other, more efficient, types of taxes such as sales tax (MEC = $0.26). In other words, it costs the economy $0.26 to raise an additional dollar of revenue using consumption taxes and $0.92 to raise an additional dollar of tax revenue using capital-based income taxes.

Estimates of the MEC for Canadian taxes have been calculated by the Organisation for Economic Co-operation and Development (table 2). [17] and corporate income taxes (MEC = $1.55) were shown to impose much higher costs than other, more efficient, types of taxes such as sales (MEC = $0.17) and payroll (MEC = $0.27) taxes.

Estimates of the MECs of both American and Canadian taxes, then, show that consumption and payroll (wage and salary) taxes are much more efficient (less costly) than capital-based taxes. As a result, there are large economic gains available to Canadians from simply shifting their tax mix from capital-based taxes to more efficient taxes such as those based on consumption and payrolls.

Canada's federal Department of Finance (2004) recently undertook a study to evaluate the benefits to Canadian society from reducing different taxes. To do so, it calculated

Table 1: Estimates of Marginal Efficiency Costs (MECs) for select US taxes

	MEC ($CDN)
Capital Income Taxes (Individual & Corporate)	$0.92
Corporate Income Tax	$0.84
Individual Income Tax	$0.60
Payroll Tax	$0.48
Sales Tax	$0.26

Source: Jorgenson and Yun, 1991.

Table 2: Estimates of marginal efficiency costs (MECs) for select Canadian taxes

	MEC ($CDN)
Corporate Income Tax	$1.55
Personal Income Tax	$0.56
Payroll Tax	$0.27
Sales Tax	$0.17

Source: OECD, 1997.

the long-term economic costs imposed by the main taxes used in Canada. Benefits of different types of tax cuts were calculated by assuming that any revenue loss was offset by a non-distortionary "lump-sum" tax increase. [18] Table 3 shows the welfare gains calculated by the Department of Finance for reductions in different taxes. The welfare gains are calculated as the gain in economic well-being per dollar of tax reduction. For example, decreasing personal income taxes on capital (dividends, capital gains, and interest income) by $1 and increasing lump-sum tax revenues by $1 would result in an increase in society's well-being of $1.30. At the other end of the scale, the smallest benefit ($0.10) is received from a reduction in consumption taxes.

The results of this study corroborate the findings reported above. Welfare gains from reducing capital-based taxes—by changes to the capital cost allowance (CCA), by excluding capital goods from retail sales taxes, and by reducing personal taxes on savings, corporate capital taxes, and corporate income taxes—significantly outweigh the benefits from other methods of reducing taxes.

Canada's tax mix

Data from the OECD indicates that Canada, when compared to other nations, is among the most reliant on economically damaging types of taxes. Table 4 presents the numerical breakdown of how much revenue, as a percentage of the total, is collected from five different groups of taxes: income and profit taxes; social security taxes; payroll taxes; property taxes; goods-and-services taxes; and other taxes. [19] The comparison reveals that Canada is one of the highest users of the most damaging taxes, income-and-profit taxes, ranking twenty-eighth among 31 nations. Governments in Canada collected 46.0% of their total revenue in income and profit taxes in 2003 compared to an average of 34.4% among the 31 OECD countries.

The data presented in table 4 along with the empirical studies that find that taxing income and capital is the most damaging type of taxation provide Canada with clear lesson on how to improve its economic performance and productivity. Moving away from the most

Table 3: Welfare gains from tax reductions [1]

Capital Cost Allowance	$1.40 [2]
Sales Tax on Capital Goods	$1.30
Personal Capital Income Tax	$1.30
Capital Tax	$0.90
Corporate Income Tax	$0.40
Average Personal Income Tax	$0.30
Wage Tax	$0.20
Consumption Tax	$0.10

Source: Canada, Department of Finance, 2004.

Note 1: Revenue loss is assumed to be recovered through "lump-sum" taxation. Welfare gains are calculated as the gain in economic well-being per dollar of tax reduction.

Note 2: The estimate for an increase in capital cost allowances (CCA) is for new capital only. Increasing CCA is not a tax reduction per se but rather an increase in a deduction against corporate income taxes.

damaging types of taxes will result in higher rates of economic and productivity growth. It is telling that a recent survey of Canada by the OECD recommends just this: "switching more of the [tax] burden onto consumption taxes could yield better economic outcomes [for Canada]" (2004: 113). Further a recent report published by the federal government recommends that "tax rates should be as low as possible" and "that the mix of taxes should be economically efficient" (Canada, Department of Finance, 2005c: 123).

Table 4: Revenue, as a percentage of the total, collected from different taxes (2003)

	Income and profit	Social security	Payroll	Property	Goods and services	Other
Poland	18.2	41.4	0.6	4.0	35.8	—
Slovak Republic	22.3	39.6	—	1.8	36.2	0.0
France	23.2	37.7	2.5	7.3	25.5	3.6
Greece	23.3	36.1	—	4.5	35.8	0.0
Turkey	23.7	20.8	—	3.2	49.5	2.9
Portugal	24.5	31.7	—	4.1	36.7	2.8
Hungary	24.8	30.5	2.5	2.2	39.4	0.7
Czech Republic	25.3	43.6	—	1.4	29.7	0.0
Netherlands	25.5	36.3	—	5.2	31.8	0.5
Mexico	26.5	16.9	1.8	1.6	52.5	0.7
Germany	27.4	40.5	—	2.4	29.4	0.0
Korea	28.0	19.5	0.2	11.8	37.1	3.3
Spain	28.2	35.3	—	7.5	28.2	0.5
Austria	29.7	33.7	6.2	1.3	28.2	0.7
Japan	30.6	38.5	—	10.3	20.3	0.3
Italy	30.9	29.5	—	8.0	25.7	6.0
OECD average	34.4	26.1	0.9	5.6	32.1	0.8
Luxembourg	36.3	27.9	—	7.5	28.1	0.1
Sweden	36.3	29.1	4.9	3.1	26.3	0.3
United Kingdom	36.5	18.5	—	11.8	32.7	—
Finland	38.7	26.7	—	2.3	32.0	0.1
Belgium	39.0	31.8	—	3.3	24.6	0.1
Ireland	39.3	14.8	0.6	6.5	38.4	—
Switzerland	42.9	25.5	—	8.3	23.3	—
United States	43.3	26.4	—	12.1	18.2	—
Norway	43.3	22.9	—	2.5	31.2	—
Iceland	44.3	8.6	—	5.9	41.0	0.2
Canada	**46.0**	**15.4**	**2.1**	**10.0**	**26.1**	**0.4**
Australia	55.2	—	5.6	9.5	29.7	—
New Zealand	59.6	—	—	5.2	35.2	—
Denmark	59.9	2.5	0.4	3.8	33.0	0.0

Source: OECD, 2005b.

Note: Categories may not add to 100.0 due to rounding.

3 Canada's uncompetitive business-tax system

Despite the fact that Canada relies heavily on income and profit taxes, Canadian corporate tax rates are often mistakenly compared in a favourable way to those of other countries. When comparing business taxes, there is a tendency to focus on comparisons of statutory rates for corporate income tax (CIT). Examining these statutory rates reveals that Canada has a lower statutory rate of general corporate income tax (34.3%) than, for example, the United States (39.5%) (Mintz et al., 2005).

Corporate income tax, while important in analyzing the competitiveness of our business-tax system, is however just one of many taxes that are levied on businesses in Canada. There are many other taxes that businesses pay that can significantly affect the after-tax rate of return of business investments. For instance, the federal government currently imposes a corporate capital tax, [20] a levy on the debt and equity of a firm. [21] In addition, all provinces, with the exception of Alberta, impose their own corporate capital taxes. Five Canadian provinces, British Columbia, Saskatchewan, Manitoba, Ontario and Prince Edward Island, also levy sales taxes on business inputs, which again alter the after-tax rate of return on capital investments.

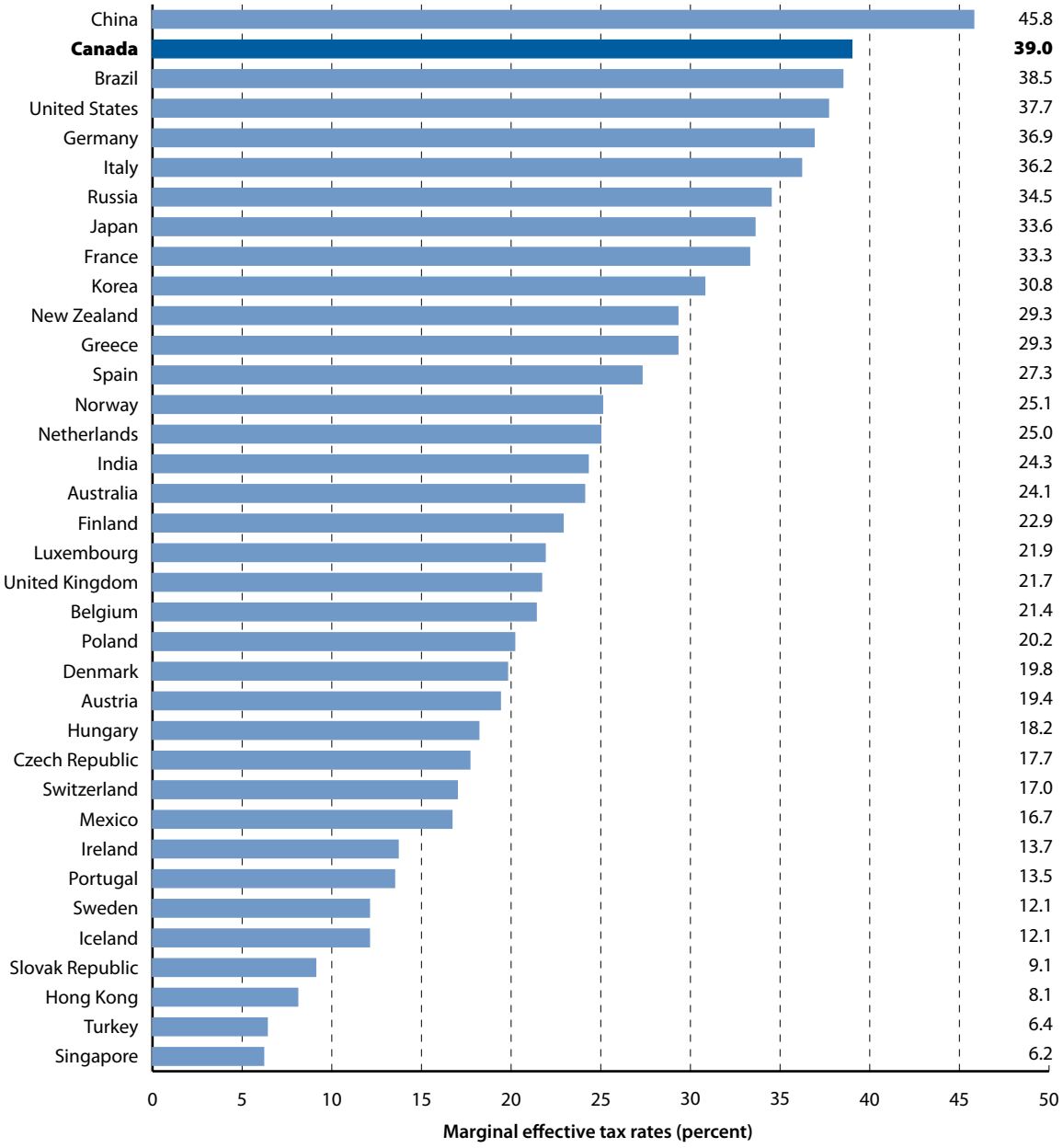
The tax base should also be factored into any analysis of the competitiveness of Canada's business taxes. For example, the federal and provincial governments offer many tax deductions and credits that reduce the tax burden for certain types of business investments. For example, the federal government provides tax credits for investments in activities ranging from Canadian film and video production, mineral exploration, and credit unions, to investment in Atlantic Canada. In addition, most provinces maintain their own set of business tax credits.

Finally, depreciation rates (capital cost allowances) can have a significant impact since higher rates of depreciation allow companies to off-set the costs of the capital investments more quickly, which reduces the tax burden of the investment.

To assess the competitiveness of Canada's business tax regime adequately an overall measure of all the taxes imposed on business investment is required. To that end, the most commonly used measure is the marginal effective tax rate (METR) on capital investment, a measure of the tax wedge between the pre-tax and after-tax rate of return on incremental business investment. [22] The METR is the tax rate that firms pay on an additional dollar of return generated from a capital investment. Indeed, METRs are the best indicator of the competitiveness of business taxes in that they are a comprehensive measure that includes income taxes, capital taxes, depreciation and inventory cost deductions, and sales taxes imposed on business inputs.

The most recent estimates of marginal effective tax rates that allow for international comparisons are those calculated by one of Canada's leading tax economists, Jack M. Mintz. [23] Figure 5 presents the marginal effective tax rates for 36 countries. Among these countries, Canada has the second highest marginal effective tax rate on capital investment, an average METR of 39.0%. Only China (45.8%) maintains a higher marginal effective rate than Canada. While the United States (37.7%) has an METR that is lower than Canada's, it is also

Figure 5: Marginal effective tax rates on capital investments, by country, 2005



Source: Mintz et al., 2005.

among the jurisdictions with high METRs. Canada's METR is more than double the average rate among the 20 countries with the lowest METRs. Interestingly, among the 20 most competitive capital-tax jurisdictions are European countries with rather large government sectors, including Sweden (fifth lowest METR), Iceland (eighth), Austria (13th), Denmark (14th), Belgium (16th), and Finland (19th). [24]

Canada's ranking on marginal effective tax rates on capital is somewhat surprising considering the business tax reductions introduced in Canada since 2000. For instance, the 2000 federal budget included a reduction in the general corporate income-tax rate from 28% to its current rate of 21%. As figure 5 indicates, the reduction in Canada's federal corporate

income-tax rate has done little to make Canada's business tax regime more competitive. Other countries have also been making their business-tax regimes more competitive by decreasing taxes on capital. [25] The 2003 budget of the federal government (Canada, Department of Finance, 2003) included provision for eliminating the non-financial corporate capital tax by 2008. [26] In addition, several changes at the provincial level are also scheduled. For example, British Columbia recently cut their general corporate income-tax rate from 13.5% to 12.0%. Despite these changes, Canada's marginal effective tax rate is still expected to be one of the highest among the OECD countries (Mintz et al., 2005).

4 How to improve business investment and increase productivity

To increase Canada's productivity, Canadian governments should improve the incentives for capital investment by reducing business taxes substantially. Reducing tax rates on capital to enhance capital investment and increase productivity is supported by an overwhelming body of independent research. In addition, the OECD recently recommended that Canada, "encourage greater capital deepening by further reducing effective taxes on capital." (OECD 2004: 112) Indeed, Canada's own federal department of finance provides a frank and economically sound analysis of the need to maintain a competitive tax system: "Capital is highly mobile internationally and a competitive tax system is critical to fostering business investment in Canada. Investment in new capital improves productivity, leading to economic growth, and higher wages and living standards" (Canada, Department of Finance, 2005a: 152).

Recent commitments by the federal government to reduce business taxes are simply not enough. The federal budget for 2005 proposed to eliminate the corporate income surtax by 2008 and reduce the general corporate income-tax rate by two percentage points (to 19% from 21%) by 2010. [27] Capital cost allowances (CCA) were also enhanced for some specific types of asset (combustion turbines, electricity transmission and distribution assets, oil and gas pipelines, and telecommunications infrastructure). [28] Finally, the federal government's *Economic and Fiscal Update* for 2005 accelerated the elimination of the corporate capital tax to 2006 (two years earlier than originally planned) and accelerated the CCA for forestry bioenergy.

The total reduction of business taxes proposed in the federal budget and *The Economic and Fiscal Update* for 2005 amounted to $10.0 billion over six years (2005/2006 to 2010/2011) despite an expectation of $227.1 billion in corporate income-tax revenue over the same six-year period. [29] In other words, the initiative reduces revenue from corporate income taxes by 4.4% over six years. In addition, the relief was heavily weighted towards the back end, with two thirds occurring in the last two years, 2009/2010 and 2010/2011.

What should be done?

To enhance the incentives for businesses to increase investment, all Canadian governments—federal, provincial, and local—should help reduce Canada's excessively high taxes on capital. Canada needs an ambitious prosperity plan that includes significant reductions in business taxes.

1 A five-year federal-provincial initiative to reduce business taxes

To reduce Canada's marginal effective tax rates on capital, the federal government and each province should commit themselves to a five-year plan to reduce corporate income-tax rates and eliminate the use of capital taxes. While we focus in this section on corporate income and capital taxes by providing cost estimates for each jurisdiction, we also include other

recommendations as well as options to offset revenue loses if governments determine that there are no areas of government expenditure that could be curtailed to finance the future improvement in the living standards of Canadians.

Corporate income taxes

The federal government and all provinces should make a concerted effort to reduce corporate income tax rates in order to reduce Canada's marginal effective tax rate on capital. The federal government should reduce the general corporate income-tax rate from 21.0% to 12.0%, the preferential rate levied on small businesses. [30] Reducing the general corporate income-tax rate to 12.0% will significantly lower Canada's average METR on capital investments and will eliminate the disincentive for small businesses to grow and expand beyond $300,000 (the threshold for the preferential 12% rate). [31] In addition, the federal government must accelerate its plan to eliminate the corporate income surtax. [32]

Canadian provinces should also aim to reduce their general corporate income-tax rates in order to reduce marginal effective tax rates on capital. Indeed, the provincial component of marginal effective tax rates on capital is greater than the federal component in all provinces, save for Alberta (Mintz et al., 2005). All provinces levy different rates on corporate income and offer different preferential rates for small business. The long-term goal for all provinces should be the equalization of general and small-business rates. As a first step, we recommend that all provinces reduce their general corporate income-tax rate by approximately 30% over the next five years. The suggested reduction in provincial general corporate income-tax rates follows Alberta's commitment to reduce its general corporate income-tax rate to 8.0%, a 30% reduction from the current rate of 11.5%.

Table 5 shows the current (2005/2006) federal and provincial general corporate income-tax rates along with targets for 2010/2011. [33] Reductions to federal corporate income tax will increase from $1.8 billion in 2006/2007 to $9.5 billion when fully implemented in 2010/11. [34] The planned federal reductions in corporate income tax will yield a cumulative amount of $28.8 billion over five years (2006/2007 to 2010/2011). With corporate income-tax revenue of $193.3 billion expected from 2006/2007 to 2010/2011, the federal initiative reduces corporate income-tax revenue by 14.9%. Reductions in provincial corporate income tax will add up to $18.3 billion over five years (2006/07 to 2010/11). In total, revenues from federal and provincial corporate income taxes will be reduced by $47.1 billion.

Corporate capital taxes

The corporate capital tax (CCT) is the most damaging and detrimental tax in Canada (Clemens et al., 2002). The corporate capital tax is a direct disincentive for capital accumulation as it is levied on corporations based on the amount of capital (debt and equity) employed, regardless of profitability. The capital tax is a very poor way to raise revenues for government because it impedes economic growth by discouraging investment and economic development. [35]

The federal government and all provinces save for Alberta impose either one or both categories of corporate capital taxes: the general CCT and the CCT on financial institutions. The federal government has committed itself to phasing-out the general corporate capital tax completely by 2008. [36] Similarly, British Columbia eliminated its general corporate

Table 5: Reductions in corporate income tax, 2006/2007 to 2010/2011

	Statutory general corporate income-tax rate		Reduction in revenue ($millions) from corporate income-tax		
	2005/2006	2010/2011	2006/2007	2010/2011	2006/2007–2010/2011
Federal	21.0	12.0	1,809	9,450	28,833
British Columbia	12.0	8.0	143	856	2,671
Alberta	11.5	8.0	189	718	2,404
Saskatchewan	17.0	12.0	19	102	300
Manitoba	15.0	10.0	52	274	806
Ontario	14.0	10.0	671	2,910	9,551
Quebec	8.9	6.0	157	570	1,786
New Brunswick	13.0	9.0	12	52	172
Nova Scotia	16.0	11.0	22	121	354
Prince Edward Island	16.0	11.0	2	9	28
Newfoundland	14.0	10.0	13	55	182
Total provincial					18,253
Total reduction in revenue from federal and provincial corporate income taxes					47,086

Sources: Statistics Canada, Public Institutions Division, 2005; provincial and federal government budgets for 2005; Canada, Department of Finance, 2005b; Treff and Perry, 2005; calculations by the authors.
Note: The current estimate of revenue loss is a worst-case scenario as estimates are static and do not include any positive effects from improved incentives. In other words, the supply-side impacts of the reductions in corporate income taxes and the elimination of the corporate capital tax have not been taken into consideration. Mankiw and Weinzierl (2004) provide evidence of the extent to which tax cuts are self financing: they estimate the effects of changes in taxes on capital and labour income and find that approximately 50% of a capital-tax cut pays for itself.

capital tax in 2001. Unfortunately, both jurisdictions still impose capital taxes on financial institutions, with the result that capital taxes will artificially penalize firms in the financial-services sector and raise costs for anyone using financial services like banking and insurance. All other provinces make use of both kinds of capital taxes to varying degrees.

The federal government and all the provinces should eliminate corporate capital taxes (CCT) completely over the next five years. As discussed above, the federal government will eliminate the general corporate capital tax by 2008; it should also eliminate the capital tax on financial institutions. The federal government does not provide revenue estimates for capital taxes but data from the Canadian Bankers Association (2005) indicate that the revenue generated from the capital tax on financial institutions is minimal. [37] We recommend that provincial governments reduce CCT revenues by 20% per year for five years (2006/2007 to 2010/2011), which amounts to $12 billion over five years.

The proposed five-year federal-provincial initiative to reduce business taxes amounts to $59.1 billion dollars including both CIT and CCT reductions. While this represents a significant reduction in tax revenue, the net impact will in all likelihood be much

Table 6: Reductions in corporate capital tax, 2006/2007 to 2010/2011

	Reduction in corporate capital tax revenue ($millions)		
	2006/2007	2010/2011	2006/2007–2010/2011
British Columbia	21	105	315
Alberta	0	0	0
Saskatchewan	76	410	1,200
Manitoba	34	181	533
Ontario	316	1,696	4,973
Quebec	317	1,501	4,585
New Brunswick	8	45	132
Nova Scotia	17	93	271
Prince Edward Island	1	3	10
Newfoundland	2	9	26
Total reduction in revenue from provincial corporate capital taxes			12,044

Sources: Statistics Canada, Public Institutions Division, 2005; provincial and federal government budgets for 2005; Canada, Department of Finance, 2005b; Treff and Perry, 2005; calculations by the authors.

lower than is currently estimated. That is, the current estimate of revenue loss is a worst-case scenario as estimates are static and do not include any positive effects from improved incentives. In other words, the supply-side impacts of the reductions in corporate income taxes and the elimination of the corporate capital tax have not been taken into consideration. Academic research discussed in section 2 of this paper indicates that a reduction in capital-based taxes alters the incentives for firms to investment in capital. That is, lower business taxes increase the after-tax returns to capital investment. Higher after-tax returns increase capital investment and ultimately increase productivity. Increased productivity makes firms more competitive and profitable and leads to increased wages for workers. In other words, reductions in business tax rates may increase rather than decrease corporate tax revenues when changes in the incentives to investment are taken into account. In addition, other tax revenues such as personal income taxes are expected to be positively affected by a more competitive business tax system. Mankiw and Weinzierl (2004) provide evidence of the extent to which tax cuts are self financing: they estimate the effects of changes in taxes on capital and labour income and find that approximately 50% of a capital-tax cut pays for itself.

2 Options for off-setting losses in revenue

The federal government and its provincial counterparts can take steps to offset revenue losses from the proposed initiative to reduce business taxes. First, all governments should broaden their tax bases. Second, they should limit spending increases. Finally, if the revenue losses from the proposed tax changes are too great, jurisdictions may want to increase consumption-based taxes. [38]

Broadening the tax base

One of most important principles of taxation is that taxes be neutral. In terms of business taxation, the tax system should not favour one type of investment over another. Indeed, a tax system that distorts investment decisions leads to an inefficient allocation of capital.

The federal government and most provinces currently offer tax rebates, reductions, exemptions, and credits that reduce the tax burden for certain types of business investments. For example, the federal government provides tax credits for investments in activities ranging from Canadian film and video production, mineral exploration, and credit unions to investment in Atlantic Canada. [39] In addition, most provinces have their own set of business-tax credits. Table 7 presents the corporate tax rebates, reductions, credits, and exemptions offered by the federal and provincial governments along with their tax-expenditure estimates for 2005/2006. [40] For example, the federal government's corporate tax expenditures amount to $3.0 billion in 2005/2006 or an estimated $17.3 billion from 2006/2007 to 2010/2011. [41]

The federal government and the provinces should improve their corporate tax systems by broadening the tax base by eliminating or curtailing these tax incentives. As a result, the federal government could off-set more than one half of the revenue losses expected from reducing business tax rates: the cost of the proposed federal tax cut is reduced from $28.8 billion to $11.5 billion through the elimination of the tax expenditures presented in table 7.

Limiting future increases in government spending

Most Canadian governments have significantly increased spending over the past five years; many have done so to a degree that is unsustainable. One option by which governments could off-set revenue losses from the proposed initiative to reduce business taxes is to limit future increases in spending. That is, holding spending increases to inflation plus growth in population will provide governments with increased fiscal room to reduce taxes. Put more simply, creating fiscal room for tax relief is attainable while actually increasing government spending. The key is to keep inflation-adjusted spending per person constant.

Table 8 presents the increase in program spending by the federal and provincial governments over the past five years (2000/2001 to 2004/2005) compared to growth in inflation and population. [42] All Canadian governments, save for British Columbia, have increased program spending at rates beyond the growth of population and inflation. For example, Saskatchewan's program spending increased by 25.7% from 2000/2001 to 2004/2005, outstripping the growth in population (–1.3%) and inflation (10.8%) by a significant margin. In fact, had Canadian governments increased program spending at the same rate as inflation and population growth over the past five years, an estimated $42.8 billion could have been used for reducing business taxes.

Shifting towards consumption-based taxes

Revenue losses from the proposed tax changes may be too great for some jurisdictions in that they would require significant reductions in government spending. As a last resort, jurisdictions can increase consumption-based taxes to allow for the proposed reductions in business taxes. That is, jurisdictions should move away from the most damaging types of taxes even if it means that the less damaging payroll and consumption taxes must be increased. (see section 2-4)

Table 7: Federal and provincial tax expenditures ($ millions)

Federal Government (2005)	
Labour-Sponsored Venture Capital Corporation Credit (LFVCCs)	200.0
$500,000 Lifetime Exemption for Small Business—Capital Gains	320.0
Rollover Investments in Small Business	4.0
Canadian Film or Video Production Tax Credit	215.0
Scientific Research and Experimental Development (SR&ED) Investment Tax Credit	1,915.0
Atlantic Investment Tax Credit	110.0
Mineral Exploration Tax Credit	58.0
Film or Video Production Services Tax Credit	130.0
Low Tax Rate for Credit Unions	70.0
Total	3,022.0
British Columbia (2004/05)	
Venture Capital Tax Credit	24.0
Employee Venture Capital Tax Credit	5.0
Film and Video Tax Credit	27.0
Production Services Tax Credit	43.0
Scientific Research and Experimental Development (SR&ED) Tax Credit	95.0
Mining Exploration Tax Credit	3.0
Total	197.0
Alberta	
None	
Saskatchewan (2005/2006)	
Royalty Tax Rebate	14.0
M&P Profits Tax Reduction	15.0
Investment Tax Credit for M&P	17.5
R&D Tax Credit	10.0
Total	56.5
Manitoba (2004/2005)	
Labour-Sponsored Venture Capital Fund Tax Credit	6.3
Mineral Exploration Tax Credit	0.4
Manitoba Equity Tax Credit	0.1
Manufacturing Investment Tax Credit	24.5
Film and Video Production Tax Credit	12.0
R&D Tax Credit	9.5
Co-Op Education Tax Credit	0.6
Odour-Control Tax Credit	0.5
Total	53.9
Ontario (2005 estimate)	
Labour-sponsored investment Fund (LSIF) Tax Credit	30.0
Research-oriented Investment Fund (ROIF) Tax Credit	2.0
$500,000 Lifetime Exemption for Farm Property and Small business - Capital Gains	130.0
Ontario Book Publishing Tax Credit	2.0
Ontario Business Research Institute Tax Credit	5.0

Ontario Computer Animation and Special Effects Tax Credit	4.0
Ontario Film and Television Tax Credit	80.0
Ontario Innovation Tax Credit	160.0
Ontario Interactive Digital Media Tax Credit	2.0
Ontario Production Services Tax Credit	40.0
Ontario Sound Recording Tax Credit	1.0
Manufacturing and Processing (M&P) and Resource Sector Credit	220.0
Non-taxation of the Federal Investment Tax Credit	180.0
Mining Tax Exemption	15.0
Total	871.0
Quebec (2005 estimate)	
Tax Credit for Contributions to a Labour Fund	119.0
Tax Credit for R&D	538.0
Tax Credit for Film and Television	90.0
Tax Credit for Corporations located in E-Commerce Place	84.0
Tax Credit for Processing Activities in Resource Regions	48.0
Tax Credit for Reporting of Tips	43.0
Tax Credit for Resources	42.0
Tax Credit for Production of Multimedia Titles	24.0
Tax Credit for Employment in the Gaspesie	6.0
Other	917.0
Total	1,911.0
Nova Scotia (2005 estimate)	
R&D Tax Credit	15.1
Film Industry Incentive	14.8
Equity Tax Credit	4.0
Labour-Sponsored Venture Capital Corporation Credit (LFVCCs)	1.0
Small Business Tax Holiday	0.3
Investment Tax Credit for M&P	0.2
Total	35.4
New Brunswick & Prince Edward Island	
[data not available]	
Newfoundland (2005/2006 estimate)	
Labour-Sponsored Venture Capital Tax Credit	0.2
Direct Equity Tax Credit	0.1
R&D Tax Credit	3.8
New Small Business Tax Holiday	0.3
Film and Video Industry Tax Credit	0.3
Total	4.7

Sources: British Columbia, Ministry of Finance, 2005b: 117; Canada, Department of Finance, 2005d: 16–26 (table 1), 27–34 (table 2); Manitoba, Department of Finance, 2005: D14; Newfoundland and Labrador, Department of Finance, 2005: 258; Nova Scotia, Department of Finance, 2005: "Highlights"; Ontario, Ministry of Finance, 2005b; Quebec, Ministry of Finance, 2005: iii–iv; Saskatchewan, Department of Finance, 2005: 59.

Table 8: Growth in program spending compared to inflation plus population growth, 2000–2004

	Program spending, 2000/2001	Program spending, 2004/2005	Growth in program spending, 2000/2001–2004/2005	Growth in inflation plus population, 2000–2004	Difference between growth in program spending and growth in inflation plus population	Increase in program spending ($millions) beyond growth in inflation and population
			(1)	(2)	(1) – (2)	
Federal Government	112,947	135,420	19.9%	13.9%	6.0%	16,346
British Columbia	24,909	27,665	11.1%	12.3%	–1.2%	–141
Alberta	19,168	24,991	30.4%	18.6%	11.8%	3,726
Saskatchewan	5,848	7,350	25.7%	9.5%	16.2%	3,791
Manitoba	6,688	8,142	21.7%	10.2%	11.5%	1,573
Ontario	59,874	74,797	24.9%	16.0%	8.9%	1,399
Quebec	47,493	57,610	21.3%	11.7%	9.6%	12,935
New Brunswick	4,399	5,176	17.7%	10.3%	7.4%	539
Nova Scotia	4,733	5,831	23.2%	10.7%	12.5%	1,000
Prince Edward Island	921	1,061	15.2%	12.9%	2.3%	86
Newfoundland	3,525	4,265	21.0%	6.4%	14.6%	1,566
						42,821

Notes: Inflation plus population growth used for the federal analysis is for Canada including the Yukon, Northwest Territories, & Nunavut. Federal program spending excludes transfers to provincial governments, which are accounted for in provincial spending. As a result, savings derived from limiting increases in government program spending to inflation plus population growth would be significantly greater if transfers were included.
Sources: Statistics Canada, Public Institutions Division, 2005; Statistics Canada, 2005b; calculations by the authors.

3 Additional tax changes

Capital cost allowances

Federal and provincial governments should adjust capital cost allowances (CCAs) to reflect the true costs of replacing assets. [43] Depreciation rates (capital cost allowances) can have a significant impact on the tax burden of investment. Higher rates of depreciation allow companies to off-set the costs of the capital investments more quickly, which reduces the tax burden of the investment. It is important that businesses are able to depreciate their assets over their useful economic lives.

Exempt business inputs from sales taxes

Sales taxes distort investment decisions when they are levied on business inputs such as computers, machinery, and other equipment. Currently, provincial sales taxes in British Columbia, Saskatchewan, Manitoba, Ontario, and Prince Edward Island are levied on business inputs. [44] All provinces should exempt business inputs from sales taxes either through a rebate program or, more productively, by integrating with the GST. [45]

Property taxes

Many Canadian municipalities tax business property at much higher rates than residential property, which significantly damages the business climate in these municipalities (Bish, 2004). High rates are a significant factor for businesses as they decide whether or not to remain in business or to make new investments. [46] While our proposal focuses on federal and provincial governments, this is an area of taxation where local governments could take the initiative.

4 Other recommendations

While our earlier recommendations focus exclusively on altering the incentives for investment through changes in the tax system, many other policy changes would improve Canada's productivity. The recommendations below, however, though they are important, would take significantly longer to introduce than a reduction in business taxes and thus would not immediately improve productivity.

Labour relations laws

All Canadian provinces and the federal government should improve the flexibility of the labour market by reforming labour laws. Canadian jurisdictions should focus particularly on labour-relation laws as Canada's provincial labour-relations laws are more rigid and unbalanced than those in the United States. Empirical evidence shows that jurisdictions with flexible labour markets enjoy higher rates of job creation, lower levels of unemployment, greater benefits from technological change, and higher rates of economic growth. [47]

Education

Education is a key determinant of productivity. Although Canada has the highest proportion of working-aged people with post secondary education and ranks among the top spenders on education as a share of GDP (OECD, 2004), much can be done to improve the education system, particularly for students in kindergarten to grade 12. Nearly 11% of Canadian students leave school without graduating (OECD, 2004). Further, many secondary schools consistently perform poorly. [48]

Regulations

The federal government and its provincial counterparts can improve productivity and the living standards of Canadians through regulatory reform that reduces the regulatory burden and increased accountability. While some regulations create benefits for Canadians (law enforcement; defining rights to private property, adjudicating disputes, and enforcing contracts; competition policy, company law, bankruptcy law, and rights to intellectual property) others limit freedoms to allocate physical and human capital efficiently. As a first step, Canadian governments should document and publish the amount they spend administering regulation and an estimate of what the private sector spends complying with regulation. The result would most probably lead to a more comprehensive program of reform. [49]

Improve interprovincial trade

Richard G. Harris (1999) points to the openness to trade and investment as a main driver of productivity. While international trade is commonly (and correctly) considered of critical economic importance, interprovincial trade within Canada gets little attention. All levels of government in Canada would be wise to improve interprovincial trade as a means to greater productivity growth. A domestic market free of barriers is essential for promoting the competitiveness and productivity of Canadians. As Robert Knox points out, "A strong domestic Canadian market is the product of a lot of things: efficient transportation and communications, a highly trained and mobile work force, innovation and leading-edge research, and efficient capital markets. It also depends on stability and predictability and on government policies, regulations, and administrative practices that support and promote openness, accessibility, and competition and do not protect local businesses and workers" (2001: 15–16). [50]

Conclusion

Canada is currently facing a productivity crisis: growth rates of labour productivity are declining, the productivity gap with the United States has grown substantially, and Canada's growth in labour productivity ranks near the bottom in international comparisons. One of the primary reasons for Canada's slow growth in productivity is the lack of capital investment. Indeed, improvements in Canada's future productivity will largely depend on its ability to increase business investment in new machinery, equipment, and technology. Canada should, therefore, improve the incentives for higher rates of capital investment. To that end, all Canadian governments, federal, provincial, and local, should help reduce Canada's excessively high taxes on capital. We recommend a significant reduction in corporate income-tax rates and the elimination of corporate capital taxes. Many jurisdictions would also benefit from broadening their tax bases, enhancing depreciation rates, and exempting business inputs from sales taxes. Finally, municipalities should bring tax rates on business property in line with those imposed on residential property.

Methodology

This section reviews the methodology employed to arrive at the estimated cost of the five-year federal-provincial initiative to reduce business taxes that has been proposed in this paper. The calculations are, in all likelihood, conservative estimates as the supply-side impacts of the tax reductions have not been taken into consideration. Academic research overwhelmingly concludes that reductions in capital-based tax rates alter the incentives for firms to invest in capital (see section 2). Higher rates of capital investment will increase productivity and make firms more competitive and profitable. As a result, short-run revenue losses from reducing business taxes may be partially off-set by changes in the incentives to invest. In the long run, reducing business taxes may actually increase rather than decrease corporate tax revenues. In addition, other tax revenues such as personal income taxes are also expected to be positively affected by a more competitive business tax system, further off-setting the revenue cost of reductions in capital taxes.

1 Revenue projections

Corporate income tax (CIT) and corporate capital tax (CCT) revenues were projected for each jurisdiction from 2006/2007 to 2010/2011 using a combination of historical data from Statistics Canada's Financial Management System and government budget projections.

Federal government

The 2005 Federal budget projects corporate income-tax revenue out to 2009/2010. The federal government's 2005 *Economic and Fiscal Update* provides average private-sector projections for 2010/2011 as well as changes to the budget projections. We construct projections of corporate income-tax revenue (2006/2007 to 2010/2011) from data contained in the 2005 *Federal Budget* and the 2005 *Economic and Fiscal Update*. CIT revenue projections are calculated prior to reductions in corporate taxes announced in the 2005 Budget.

British Columbia

CIT revenue in British Columbia grew by an average of 17.8% from 2000/2001 to 2004/2005 (Statistics Canada, Public Institutions Division, 2005). During that period, there was significant variation in CIT growth rates. For example, revenues from CIT decreased by 58.4% from 2001/2002 to 2002/2003 and increased by 59.2% from 2003/2004 to 2004/2005. The 2005 provincial government budget estimates that CIT revenues will decrease by an average of 4.2% a year from 2004/2005 to 2007/2008; a rather conservative estimate considering the Ministry of Finance's estimates for average growth in the corporate tax base (5.5%) and corporate profits (5.5%) from 2005/2006 to 2007/2008. Given strong rates of growth in both the corporate tax base and corporate profits, our model uses the average growth rate of total revenues (1.9 %) from 2004/2005 to 2007/2008 presented in the 2005 provincial budget to grow CIT revenues. British Columbia's 2005 budget estimates that CCT will

provide $105 million in revenues in 2006/2007 and 2007/208. We extend the zero growth assumption out to 2010/2011 to estimate CCT revenues.

Alberta

Alberta's 2005 provincial budget estimates CIT revenues out to 2007/2008. We use the average grow rate of CIT revenues from 2004/2005 to 2007/2008 (1.5%) based on the government's budget figures to estimate CIT revenue from 2008/2009 to 2010/2011.

Saskatchewan

Saskatchewan experienced large fluctuations in CIT revenue from 2000/2001 to 2004/2005 (Statistics Canada, Public Institutions Division, 2005). For example, CIT revenue decreased by 55.8% from 2000/2001 to 2001/2002 but increased 84.1% from 2002/2003 to 2003/2004. Large fluctuations in CIT revenues resulted in an average growth rate of 7.0% from 2000/2001 to 2004/2005. It is unlikely that Saskatchewan will experience higher growth in CIT revenue than British Columbia and Alberta, given that these two provinces are projected to be growth leaders in the coming years. Therefore, we use a more conservative growth rate to project CIT revenue forward, assuming that CIT revenue will grow at 1.5%, the same growth rate used for Alberta.

According to Statistics Canada's Financial Management System, Saskatchewan's CCT revenue increased at an average rate of 1.8% from 2001/2002 to 2004/2005. This average growth rate is used to project CCT revenues out to 2010/2011.

Manitoba

Manitoba has also experienced large fluctuations in corporate income-tax revenues. Highly volatile CIT revenues resulted in an average growth rate of 9.3% a year from 2000/2001 to 2004/2005. It is unlikely that corporate revenues in Manitoba would increase at this rate going forward considering the growth rates estimated for British Columbia and Alberta. Unfortunately, Manitoba's 2005 budget does not provide estimates of CIT revenue past 2005/2006. As a result, we grow CIT at 1.5% per year, half the average rate of total revenue growth from 2000/2001 to 2004/2005 and the same growth rate used for Alberta. We also grow CCT revenues by 1.5% per year out to 2010/2011.

Ontario

Ontario's 2005 provincial budget projects corporate income-tax revenue out to 2008/2009. We use the average growth rate of CIT revenue from 2005/2006 to 2008/2009 (2.0%) to project CIT revenues forward. According to Statistics Canada's Financial Management System, Ontario's corporate capital tax (CCT) revenue increased at an average rate of 1.8% from 2000/2001 to 2004/2005. This average growth rate is used to project CCT revenues out to 2010/2011.

Quebec

CIT and CCT revenue projections for Quebec are based on historical data from Statistics Canada's Financial Management System. Growth in CIT revenue from 2000/2001 to 2004/2005 averages 3.1% while CCT revenues decreased by an average of –1.3% per year. These growth rates were used to project CIT and CCT out to 2010/2011.

New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland

New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland all experienced large fluctuations in CIT and CCT revenues from 2000/2001 to 2004/2005 (Statistics Canada, Public Institutions Division, 2005). We used the less volatile growth in total revenues from 2000/2001 to 2004/2005 to estimate a growth rate for CIT and CCT revenues. Specifically, CIT and CCT revenues are assumed to grow at half the average growth rate of total revenues in each province (2.0%, 2.1%, 1.5%, & 1.9%, respectively).

2 Reductions in corporate income tax

General corporate income-tax rates for each jurisdiction are reduced according to different schedules depending on the number of percentage points the CIT rate is reduced. In most cases, the general CIT rates are reduced by either one half or one percentage point per year. The federal general income-tax rate is reduced by two percentage points per year from 2006/2007 to 2009/2010 and one percentage point in 2010/2011.

When available, estimated revenue losses per point reduction in the general CIT rate are taken from government budgets. Specifically, sensitivities were available from the federal government, British Columbia, Alberta, Manitoba, and Quebec. In jurisdictions where revenue sensitivity analysis is not available, a linear relationship between CIT revenues and rates is assumed. While imperfect, a linear relationship is used by several Canadian finance departments (see, e.g. Alberta, Ministry of Finance, 2005: 139).

3 Corporate capital taxes

Corporate capital taxes (CCT) are eliminated in each province over the period from 2006/2007 to 2010/2011. Specifically, CCT revenues are reduced by 20% per year (from the base) for five years (2006/2007 to 2010/2011) in each province.

Notes

1 The two most commonly used indicators of productivity are labour productivity and multi-factor or total-factor productivity. Labour productivity measures the increase in output per hour worked whereas total-factor productivity measures the increase in output for a given stock of capital and labour. For an excellent discussion of measuring productivity and a broader discussion of growth accounting, see Law, 2000.

2 Another method of calculating labour productivity is GDP per worker. This method however does not account for the number of hours worked. In other words, an increase in GDP per worker does not necessarily reflect an ability to produce more with a given amount of labour as workers may simply be working longer hours.

3 Note that the federal government first balanced its budget in March 1998.

4 Estimates of the productivity gap between Canada and the United States vary greatly. For example, The Centre for the Study of Living Standards estimates labour productivity in Canada at 81.8% of that in the United States in 2004 (Centre for the Study of Living Standards, 2005). Baldwin et al. (2005) find Canadian productivity to be 93.8% of that in the United States in 2002. The database of Groningen Growth and Development Centre and The Conference Board (2005) estimates the gap at 78.3%. Many of the discrepancies can be attributed to differences in estimates of the total hours worked in Canada and the United States. Despite the range, all sources show that labour productivity is considerably lower in Canada than in the United States and that Canada has been unable to close the gap.

5 See Baldwin, Maynard, and Wong (2005) for detailed estimates of the impact of each determinant in Canada.

6 Harris (1999) states that there is a "consensus view" on the three main drivers of growth in productivity: (1) investments in machinery and equipment; (2) investments in education, training, and development of human capital; and (3) the openness of the economy to international trade and direct foreign investment. It should be noted that the third main driver of productivity growth has no direct impact upon productivity but instead strengthens the incentives to commit resources to the first two: the openness of the economy increases the level of competition in the economy and increases the pressures on firms to adopt new technologies and invest in human and physical capital.

7 Personal income taxes also have an impact on capital accumulation. That is, higher rates of taxation on investment income (interest, dividends, and capital gains) decreases the after-tax rate of return, which leads to decreased savings and investment by individuals and thus a higher cost of capital for firms. Higher cost of capital decreases investment by making fewer investment opportunities viable. For a comprehensive review of the literature on the effects of personal income taxes on capital accumulation, see Clemens and Veldhuis, 2005.

8 "Capital taxes" used in the general sense to refer to the larger class of business taxes should not be confused with explicit taxes on capital such as the corporate capital tax levied by Canadian governments. These explicit taxes on capital, which are known to be the most economically damaging forms of taxation, are a direct tax on the amount of debt and equity of a firm. See Clemens et al., 2002.

9 (1) the adoption of accelerated methods for computing depreciation for tax purposes in 1954; (2) the reduction of lifetimes used for calculating depreciation on equipment and machinery in 1962; (3) the investment tax credit for machinery and equipment of 1962.

10 According to their estimates, the liberalization of depreciation rules in 1954 resulted in a substantial shift from equipment to structures. On the other hand, the investment tax credit and depreciation guidelines of 1962 caused a shift toward equipment.

11 Cummins uses a model in which technical advances are embodied in new capital, meaning that new capital is more productive than old capital.

12 The user-cost elasticity is estimated with a panel data set containing 3,296 manufacturing and non-manufacturing American firms for the period from 1972 to 1991.

13 Substantial variation can be found among studies. By performing meta-analysis, De Mooij and Ederveen (2003) aim to explain this variation by the differences in the characteristics of the underlying studies. Systematic differences between studies are found with respect to the type of foreign capital data used and the type of tax rates adopted.

14 Specifically, Hines finds that the tax elasticity of FDI is approximately −0.6 in much of the academic literature.

15 A number of other studies examine the economic or welfare costs of specific taxes in the United States: Feldstein, 1999; Gravelle, 2004, 1989; Gravellle and Kotlikoff, 1993; Cai and Gokhale, 1997; Lui and Rettenmaier, 2004; and Holtz-Eakin and Marples, 2001a, 2001b. For a summary of these studies, see US GAO, 2005.

16 These estimates do not include the cost of compliance. See US GAO, 2005 for an overview of American studies on compliance costs.

17 These cost estimates do not include the cost of compliance.

18 In other words, tax changes are revenue neutral. The lump-sum tax does not distort individual and firm behaviour by altering the incentives to work, save, invest, or undertake risk.

19 In many countries, social security taxes are payroll or wage taxes.

20 The 2003 budget of the federal government (Canada, Department of Finance, 2003) included provision for eliminating its use of the general corporate capital tax by 2008. However, a capital tax will still be levied on financial institutions.

21 See Clemens et al., 2002 for a complete analysis of the corporate capital tax.

22 See Chen, 2000 for a detailed explanation of how METRs are calculated and why they matter most for capital allocation.

23 Professor Mintz was the head of the federal government's Technical Committee on Business Taxation. See Mintz et al., 2005.

24 The size of government is best measured as a percentage of the economy consumed by government.

25 Yoo (2003) analyzes the evolution of corporate tax rates between 1991 and 2001 and finds that many OECD countries decreased their business taxes. In fact, percentage decreases in corporate income-tax rates in many countries have been much greater than that in Canada.

26 The 2005 *Economic and Fiscal Update* (Canada, Department of Finance, 2005b) accelerated the elimination to 2006. However, the 38th Parliament was dissolved shortly after the *Update* was published and thus the future of these policies depends on the outcome of the federal election in January 2006.

27 The corporate surtax introduced in 1987 to help balance the federal budget equates to a 1.12 percentage-point reduction in corporate income-tax rates.

28 Reductions in corporate taxes announced in the 2005 federal budget were canceled for political reasons in June 2005 and reintroduced in the federal government's *Economic and Fiscal Update* of November 2005 (Canada, Department of Finance, 2005b).

29 Corporate income-tax revenue does not include measures introduced in the 2005 budget and 2005 fiscal update.

30 In order for small businesses to be eligible for the reduced or preferential tax rate, they must be qualifying Canadian Controlled Private Corporations (CCPC) with assets below $15 million. In addition, only a certain portion of their income is eligible for the preferential rate. The threshold for income eligibility at the federal level is $300,000.

31 For more information on the tax barrier to small business growth, see Clemens and Veldhuis, 2005.

32 The corporate income surtax is currently 4%. Eliminating the surtax is equivalent to a 1.12 percentage-point reduction in corporate income-tax rates.

33 General corporate income-tax rates for each jurisdiction are reduced according to different schedules depending on the number of percentage points the CIT rate is reduced. In most cases, the general CIT rate is reduced by either one half or one percentage point per year. The federal general income tax rate is reduced by two percentage points per year from 2005/06-2009/10 and one percentage point in 2010/11.

34 When available, estimated revenue losses per point reduction in the general CIT rate are taken from government budgets. In jurisdictions where revenue sensitivity analysis is not available, a linear relationship between corporate income tax revenues and rates is assumed. While imperfect, a linear relationship between revenues and rates is used by several provincial finance departments (for example, see page 139 of Alberta's 2005 provincial budget).

35 See Clemens, Emes and Scott, 2002 for a review of the corporate capital tax.

36 The 2005 *Economic and Fiscal Update* (Canada, Department of Finance, 2005b) accelerated the elimination to 2006. However, the 38th Parliament was dissolved shortly after the *Update* was published and thus the future of these policies depends on the outcome of the federal election in January 2006.

37 The Canadian Bankers Association (2005) estimates that the six big Canadian banks paid $22 million in capital taxes in 2004. Thus, the federal government should not experience a significant revenue loss from the elimination of the capital tax.

38 Reducing business taxes and increasing consumption-based taxes changes a jurisdiction's tax mix towards increased reliance on less economically damaging taxes.

39 An interesting study by Austan Goolsbee (1998) explores the impact of investment tax incentives such as tax credits on the supply of capital. Goolsbee finds that much of the benefit of investment tax incentives does not go to investing firms but rather to capital suppliers through higher prices. The results suggest that capital goods prices rise significantly in response to changes in tax subsidies.

40 The estimated losses in revenue from these initiatives are called tax expenditures because they purposefully reduce government revenues. For a complete description of tax expenditure estimates at the federal level, see *Tax Expenditures and Evaluations 2005* (Canada, Department of Finance, 2005d) at <http://www.fin.gc.ca/toce/2005/taxexp05_e.html>.

41 Tax expenditures were increased at the rate at which federal corporate income-tax revenues were expected to increase. See the section, Methodology, page **33**.

42 Federal program spending excludes transfers to provincial governments, which are accounted for in provincial spending. As a result, savings derived from limiting increases in government program spending to inflation plus population growth would be significantly greater for the federal government if transfers were included.

43 Unfortunately, revenue loss estimates that result from adjusting capital-cost allowances are not readily available for most provinces.

44 Some provinces exempt certain goods used in production. For example, all provinces exempt many agricultural inputs. British Columbia exempts machinery and equipment from sales taxes. See Treff and Perry, 2005 for a complete delineation of sales-tax exemptions.

45 Unfortunately, estimates of revenue generated from sales taxes on business inputs are not readily available.

46 See Bish, 2004.

47 Karabegović et al., 2004a provides a detailed review of the empirical evidence regarding labour-market flexibility and economic outcomes.

48 The Fraser Institute regularly scores the achievement of Canada's secondary schools. See Cowley and Kozhaya, 2005 and Cowley and Easton, 2005a, 2005b, and 2005c.

49 See Jones and Graf, 2001; Jones et al., 2005.

50 See Arman et al., 1998 and Knox, 2001.

References

Alberta, Ministry of Finance (2005). *Budget 2005*. Edmonton, AB: Government of Alberta.

Arman, Faisal, Dexter Samida, and Michael Walker (1998). *Provincial Economic Freedom in Canada 1981–1998*. Critical Issues Bulletin. Vancouver, BC: The Fraser Institute.

Auerbach, Alan J. (1983). "Taxation, Corporate Financial Policy and the Cost of Capital." *Journal of Economic Literature* 21: 905–40.

Baylor, Maximilian, and Louis Beauséjour (2004). *Taxation and Economic Efficiency: Results from a Canadian CGE Model*. Department of Finance Working Paper. Ottawa, ON: Federal Department of Finance.

Baldwin, J.R., J.P. Maynard, M. Tanguay, F. Wong, and B. Yan. (2005). *A Comparison of Canadian and US Productivity Levels: An Exploration of Measurement Issues*. Economic Analysis Research Papers. Ottawa: Statistics Canada.

Baldwin, J.R., J.P. Maynard, and F. Wong (2005). *The Output Gap between Canada and the United States*. Analytical Paper. Ottawa: Statistics Canada.

Bartik, T.J. (1991). "The Effects of Property Taxes and Other Local Public Policies on Intrametropolitan Pattern of Business Location." In H.W. Herzog, Jr. and A.M.E. Schlottmann, eds., *Industry Location and Public Policy* (Knoxville, TN: University of Tennessee Press): 57–80.

Beaulieu, Eugene, Kenneth J. McKenzie, Jimmy Stephane Vu, and Jean-Francois Wen (2004). *Effective Tax Rates and the Formation of Manufacturing Enterprises in Canada*. Vancouver, BC: The Fraser Institute.

Bish, Robert L. (2004). *Property Taxes on Business and Industrial Property in British Columbia*. Fraser Institute Digital Publication. Vancouver, BC: The Fraser Institute.

British Columbia, Ministry of Finance (2005a). *Budget and Fiscal Plan 2005/06*. Victoria, BC: Government of British Columbia.

British Columbia, Ministry of Finance (2005b). *September Update: Budget and Fiscal Plan 2005/06–2007/08*. Victoria, BC: Government of British Columbia.

Cai, Jinyong, and Jagadeesh Gokhale (1997). "The Welfare Loss from a Capital Income Tax." *Federal Reserve Bank of Cleveland Economic Review* 33, 1.

Canada, Department of Finance (2003). *Budget 2003*. Ottawa, ON: Government of Canada.

Canada, Department of Finance (2004). *Budget 2004*. Ottawa, ON: Government of Canada.

Canada, Department of Finance (2005a). *Budget 2005*. Ottawa, ON: Government of Canada.

Canada, Department of Finance (2005b). *The Economic and Fiscal Update*. Ottawa, ON: Government of Canada.

Canada, Department of Finance (2005c). *A Plan for Growth and Prosperity*. Ottawa, ON: Government of Canada.

Canada, Department of Finance (2005d). *Tax Expenditures and Evaluations 2005*. Ottawa, ON: Federal Department of Finance. Available digitally at <http://www.fin.gc.ca/toce/2005/taxexp05_e.html>.

Canadian Bankers Association (2005). *Tax Statistics*. Available digitally at <http://www.cba.ca>.

Centre for the Study of Living Standards (2005). *Aggregate Income and Productivity Tables for Canada and the United States as of June 14, 2005*. Available digitally at <http://www.csls.ca/>.

Chen, Duanjie (2000). *The Marginal Effective Tax Rate: The Only Rate That Matters in Capital Allocation*. Toronto, ON: C.D. Howe Institute.

Chirinko, Robert, Steven M. Fazzari, and Andrew P. Meyer (1999). "How Responsive Is Business Capital Formation to Its User Cost? An Exploration with Micro Data." *Journal of Public Economics* 74: 53–80.

Chirinko, Robert, and Andrew Meyer (1997). "The User Cost of Capital and Investment Spending: Implications for Canadian Firms." In Paul J. N. Halpern, ed., *Financing Growth in Canada* (Calgary, AB: University of Calgary Press): 17–69.

Clark, Peter (1993). "Tax incentives and Equipment Investment." *Brookings Papers on Economic Activity* 1: 317–39

Clemens, Jason, and Niels Veldhuis (2005). *Growing Small Businesses in Canada: Removing the Tax Barrier*. Studies in Entrepreneurship and Markets 1. Vancouver, BC: The Fraser Institute.

Clemens, Jason, Joel Emes, and Rodger Scott (2002). *The Corporate Capital Tax: Canada's Most Damaging Tax*. Vancouver, BC: The Fraser Institute.

Cowley, Peter, and Norma Kozhaya (2005) *Report Card on Quebec's Secondary Schools: 2005 Edition*. Studies in Education Policy. Vancouver, BC: The Fraser Institute.

Cowley, Peter, and Stephen T. Easton (2005a). *Report Card on Ontario's Secondary Schools: 2005 Edition*. Studies in Education Policy. Vancouver, BC: The Fraser Institute.

Cowley, Peter, and Stephen T. Easton (2005b). *Report Card on Alberta's Secondary Schools: 2005 Edition*. Studies in Education Policy. Vancouver, BC: The Fraser Institute.

Cowley, Peter, and Stephen T. Easton (2005c). *Report Card on British Columbia's Secondary Schools: 2005 Edition*. Studies in Education Policy. Vancouver, BC: The Fraser Institute.

Cummins, Jason (1998). *Taxation and the Sources of Growth: Estimates from United States Multinational Corporations*. NBER working paper 6533. Cambridge, MA: National Bureau of Economic Research.

Cummins, Jason G., Kevin A. Hasset, and R. Glenn Hubbard (1994). *A Reconsideration of Investment Behavior Using Tax Reforms as Natural Experiments*. Brookings Papers on Economic Activity. Washington, DC: Brookings Institution.

Cummins, Jason, Kevin Hassett, and Glen Hubbard (1996). "Tax Reforms and Investment: A Cross-Country Comparison." *Journal of Public Economics* 62, 1-2: 237–73.

De Mooij, Ruud, and Sjef Ederveen (2003). "Taxation and Foreign Direct Investment: A Synthesis of Empirical Research." *International Tax and Public Finance* 10: 673–93.

Fazzari, Steven, R. Glenn Hubbard, and Bruce Petersen (1988). "Investment, Financing Decisions, and Tax Policy." *American Economic Review* 78, 2: 200–05.

Feldstein, Martin S., and Charles Horioka (1980). "Domestic Saving and International Capital Flows." *Economic Journal* 90, 358: 314–29.

Feldstein, Martin (1982). "Inflation, Tax Rules and Investment: Some Econometric Evidence." *Econometrica* 50, 4: 825.

Feldstein, Martin (1994). *Tax Policy and International Capital Flows*. NBER working paper 4851. Cambridge, MA: National Bureau of Economic Research.

Feldstein, Martin (1999). "Tax Avoidance and the Deadweight Loss of the Income Tax." *Review of Economics and Statistics* 81 4: 674–80.

Goolsbee, Austan (1998). "Investment Tax Incentives, Prices, and the Supply of Capital Goods." *Quarterly Journal of Economics* 93, 1: 121–48.

Goolsbee, Austan (2004a). "Taxes and the Quality of Capital." *Journal of Public Economics* 88: 519–43.

Goolsbee, Austan (2004b). "The Impact of the Corporate Income Tax: Evidence from State Organizational Form Data." *Journal of Public Economics* 88: 2283–99.

Gravelle, Jane (1989). "Differential Taxation of Capital Income: Another Look at the 1986 Tax Reform Act." *National Tax Journal* 42, 4: 441–63.

Gravelle, Jane (2004). "The Corporate Tax: Where Has It Been and Where Is It Going?" *National Tax Journal* 57, 4: 902–23.

Gravelle, Jane, and Laurence Kotlikoff (1993). "Corporate Tax Incidence and Inefficiency when Corporate and Noncorporate Goods Are Close Substitutes." *Economic Inquiry* 31, 4: 501–16.

Groningen Growth and Development Centre and The Conference Board (2005). *Total Economy Database (August 2005)*. Available online at <http://www.ggdc.net>.

Grubert, Harry, and John Mutti (2000). "Do Taxes Influence where US Corporations Invest?" *National Tax Journal* 53, 4, Part 1: 825–40.

Hall, Robert, and Dale W. Jorgenson (1967). "Tax Policy and Investment Behaviour." *American Economic Review* 57, 3: 391–414.

Harchaoui, Tarek, and Pierre Lasserre (1995). "Testing the Impact of Taxation on Capacity Choice: A 'Putty Clay' Approach." *Journal of Public Economics* 56: 377–411.

Harchaoui, Tarek M., and Faouzi Tarkhani (2005). *Four Decades of Productivity Performance in Canada*. The Canadian Productivity Review 1 (15-206-XIE2005001). Available online at <http://www.statcan.ca/bsolc/english/bsolc?catno=15-206-XIE2005001>.

Harris, Richard G. (1999). "Determinants of Canadian Productivity Growth: Issues and Prospects." Paper prepared for the Centre for the Study of Living Standards and Industry Canada's conference, *Canada in the 21st Century: A Time for Vision*, Ottawa, ON (September, 1999).

Hendricks, Kenneth, Raphael Amit, and Diana Whistler (1997). *Business Taxation of Small and Medium-sized Enterprises in Canada*. Working Paper 97-11. Prepared for the Technical Committee on Business Taxation. Ottawa, ON: Department of Finance.

Hepburn, Claudia (2001). *Can the Market Save Our Schools?* Vancouver, BC: The Fraser Institute.

Hines, James R. (1996). "Altered States: Taxes and the Location of Foreign Direct Investment in America." *American Economic Review* 86, 5 (December): 1076–94.

Hines, James R. (1999). "Lessons from Behavioural Responses to International Taxation." *National Tax Journal* 52, 2: 305–22.

Holtz-Eakin, Douglas, and Donald Marples (2001a). *Distortion Costs of Taxing Wealth Accumulation: Income Versus Estate Taxes*. NBER working paper 8261. Cambridge, MA: National Bureau of Economic Research.

Holtz-Eakin, Douglas, and Donald Marples (2001b). *Estate Taxes, Labour Supply, and Economic Efficiency*. Center for Policy Research Special Report. Washington, DC: American Council for Capital Formation.

Jog, Vijay, and Jianmin Tang (2001). "Tax Reforms, Debt Shifting and Tax Revenues: Multinational Corporations In Canada." *International Tax and Public Finance* 8: 5–25.

Jones, Laura, Tom Charette, Leanne Hachey, Shannon Martin, Pierre Emmanuel Paradis, and Robert Taylor (2005). *Rated "R": Prosperity Restricted by Red Tape*. Willowdale, ON: Canadian Federation of Independant Business.

Jones, Laura, and Stephen Graf (2001). *Canada's Regulatory Burden: How Many Regulations? At What Cost?* Fraser Forum Special Issue (August). Vancouver, BC: The Fraser Institute.

Jorgensen, Dale W., and Kun-Young Yun (1991). "The Excess Burden of Taxation in the United States." *Journal of Accounting and Finance* 6: 487–508.

Karabegović, Amela, Keith Godin, Jason Clemens, and Niels Veldhuis (2004a). *Measuring Labour Markets in Canada and the United States*. Fraser Forum Special Issue (September). Vancouver, BC: The Fraser Institute.

Karabegović, Amela, Keith Godin, Jason Clemens, and Niels Veldhuis (2004b). *Measuring the Flexibility of Labour Relations Laws in Canada and the United States*. Fraser Institute Digital Publication (September). Vancouver, BC: The Fraser Institute.

Knox, Robert (2001). "The Forgotten Trade Agreement: Should We Care about Canada's Agreement on Internal Trade?" *Fraser Forum* (June): 15–16.

Law, Marc T. (2000). *Productivity and Economic Performance: An Overview of the Issues*. Public Policy Sources 37. Vancouver, BC: The Fraser Institute. Available digitally at <http://oldfraser.lexi.net/publications/pps/37/>.

Liu, Liqun, and Andrew Rettenmaier (2004). "The Excess Burden of the Social Security Payroll Tax." *Public Finance Review* 32, 6: 631–50.

Manitoba, Department of Finance (2005). *Budget 2005*. Winnipeg, MB: Government of Manitoba.

Mankiw, Gregory, and Matthew Weinzierl (2004). *Dynamic Scoring: A-Back-of-the-Envelope Guide*. Cambridge, MA: National Bureau of Economic Research. Cambridge, MA.

McKenzie, Kenneth, and Aileen Thompson (1997). "Taxes, the Cost of Capital, and Investment: A Comparison of Canada and the United States." Working paper 97-3. Prepared for the Technical Committee on Business Taxation. Ottawa, ON: Department of Finance.

McKenzie, Kenneth, Mario Mansour, and Ariane Brûlé (1997). *The Calculation of Marginal Effective Tax Rates*. Working Paper 1997-15. Technical Committee on Business Taxation. Ottawa, ON: Department of Finance.

McQuillan, Peter E., and Cal Cochrane (1996). *Capital Tax Issues*. Working Paper 96-8. Technical Committee on Business Taxation. Ottawa, ON: Department of Finance.

Mintz, Jack, and Michael Smart (2004). "Income Shifting, Investment, and Tax Competition: Theory and Evidence from Provincial Taxation In Canada." *Journal of Public Economics* 88: 1149–68.

Mintz, Jack M., and Duanjie Chen (2005). "Assessing Ontario's Fiscal Competitiveness." *Canadian Public Policy* 31, 1 (March): 1–28.

Mintz, Jack M., Duanjie Chen, Yvan Guillemette, and Finn Poschmann (2005). *The 2005 Tax Competitiveness Report: Unleashing the Canadian Tiger*. Toronto, ON: The CD Howe Institute.

New Brunswick, Department of Finance (2005). *Budget 2005*. Fredericton, NB: Government of New Brunswick.

Newfoundland and Labrador, Department of Finance (2005). *Budget 2005*. St. John's, NF: Government of Newfoundland.

Nova Scotia, Department of Finance (2005). *Budget 2005*. Halifax, NS: Government of Nova Scotia.

Ontario, Ministry of Finance (2005a). *Budget 2005*. Toronto, ON: Government of Ontario.

Ontario, Ministry of Finance (2005b). *Economic Outlook and Fiscal Review, Background Papers*. Toronto, ON: Government of Ontario.

Organisation for Economic Co-operation and Development (OECD) (1997). *OECD Economic Survey: Canada*. Paris: OECD.

Organisation for Economic Co-operation and Development (OECD) (2004). *OECD Economic Survey: Canada*. Paris: OECD.

Organisation for Economic Co-operation and Development (OECD) (2005a). *Economic Policy Reforms: Going for Growth*. Paris: OECD.

Organisation for Economic Co-operation and Development (OECD) (2005b). *Revenue Statistics 1965–2004*. Paris: OECD.

Papke, Leslie (1987). "Subnational Taxation and Capital Mobility: Estimates of Tax-Price Elasticities." *National Tax Journal* 40, 2: 191–203.

Papke, Leslie E. (1991). "Interstate Business Tax Differentials and New Firm Location: Evidence from Panel Data." *Journal of Public Economics* 45, 1: 47–68

Prince Edward Island, Department of Provincial Treasury (2005). *Budget 2005*. Charlottetown, PEI: Government of Prince Edward Island.

Quebec, Ministry of Finance (2005). *2005–2006 Budget Plan*. Quebec, QC: Government of Quebec.

Rao, Someshwar, Andrew Sharpe, and Jeremy Smith (2005). *An Analysis of the Labour Productivity Growth Slowdown in Canada since 2000*. Ottawa, ON: The Centre for the Study of Living Standards.

Razin, Assaf, and Chin-Wa Yuen (1996). "Capital Income Taxation and Long-Run Growth: New Perspectives." *Journal of Public Economics* 59: 239–63.

Robson, William B.P., and Danielle Goldfarb (2004). *Tools for Workers: How Canada Is Faring in the Competition for Capital Investment*. Toronto, ON: The CD Howe Institute.

Saskatchewan, Department of Finance (2005). *2005-06 Saskatchewan Provincial Budget*. Regina, SK: Government of Saskatchewan.

Statistics Canada (2002). *Purchasing Power Parities and Real Expenditures, United States and Canada, 1992–2001*. 13-604-MIB, no. 39 (June). Ottawa, ON: Statistics Canada.

Statistics Canada (2005a). *Labour Force Historical Review 2004*. CD-ROM Version. Ottawa, ON: Statistics Canada.

Statistics Canada (2005b). *Provincial Economic Accounts*. Ottawa, ON: Statistics Canada.

Statistics Canada, Public Institutions Division (2005). *Financial Management System*. Ottawa, ON: Statistics Canada.

TD Economics (2005). *In Search of Well-Being: Are Canadians Slipping Down the Economic Ladder?* Topic Paper (January). Available digitally at <http://www.td.com/economics/topic/bc0105_well-being.pdf>.

Treff, Karin, and David B. Perry (2005). *Finances of the Nation 2004*. Toronto, ON: Canadian Tax Foundation.

United States Government Accountability Office (US GAO) (2005). *Tax Policy: Summary of Estimates of the Costs of the Federal Tax System*. Washington, DC: US GAO.

US Department of Commerce, Bureau of Economic Analsyis (2005). *Various Data Series: Personal Income: Gross Domestic Product, Personal Disposable Income & Population*. Available at <http://www.bea.doc.gov>.

US Department of Labor, Bureau of Labor Statistics (2005a). "Hours Worked." Special data request from the Office of Productivity & Technology.

US Department of Labor, Bureau of Labor Statistics (2005b). *Employment*. Available digitally at <http://www.bls.gov/lau/>.

US Department of Labor, Bureau of Labor Statistics (2005c). *Consumer Price Index*. Available digitally at <http://www.bls.gov/cpi/home.htm#data>.

Yoo, Kwang-Yeol (2003). *Corporate Taxation of Foreign Direct Investment Income 1991–2001*. OECD working paper 365 (August). Paris: OECD.

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