UNIVERSITY OF CALGARY

THE SCHOOL OF PUBLIC POLICY PUBLICATIONS

SPP Research Paper

Volume 14:21 September 2021

2020 TAX COMPETITIVENESS REPORT: CANADA'S INVESTMENT CHALLENGE

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SUMMARY

Canada is already at a disadvantage with lagging growth and productivity even before the massive economic destruction caused by the COVID-19 pandemic. Before the pandemic hit, Canada's corporate tax system was already becoming uncompetitive in attracting highly profitable investments relative to other developed countries. Canada's general corporate tax rate, averaging 26.1 per cent, is within spitting distance of the highest rates in the OECD. While some industries may benefit from special preferences, the corporate tax has become increasingly inefficient and complex with targeted measures, and in some cases impeding the allocation of capital to growth industries like communications and services.

This was having a serious effect on Canada's economic health before COVID-19. Business investment in Canada has lagged that of many countries since 2015, well before the pandemic. Productivity has been weak and wages for workers have been depressed, particularly for unskilled labour.

Additionally, the corporate tax system currently distorts the allocation of capital in the economy, favouring some sectors over others. In fact, some of the sectors least-favoured by the tax system — including retail and tourism, which face an eight-point tax disadvantage compared to the government-favoured manufacturing sector — are the very ones that had the roughest time during the pandemic and face a more difficult road to recovery.

† We wish to thank the editor, Ken McKenzie, and two anonymous reviewers for detailed comments that significantly improved the paper.

If Canada is going to "build back better," as some politicians claim to want, it will need investors willing to build things. That will require governments focusing on policies that stimulate economic growth, including tax reform.

While it is politically popular for some parties to push for higher corporate tax rates, that won't solve our investment problem. Some limited benefit can be realized by reducing tax rates and broadening the corporate base elsewhere but Canada's unwieldy corporate income tax has become too serious for those measures to sufficiently address the problem. A broader approach to corporate tax reform will be required to ensure that Canada is able to recover to good economic health after the COVID-19 pandemic.

The 2020 pandemic has altered the economy's course with the worst recession since the Great Depression. Well into the year 2021, COVID-19 health restrictions still linger and will continue to do so until herd immunity is established. This tax competitiveness report is therefore focused less on the year 2020, and more on the prospects for a post-COVID recovery. Will the priority be on growth, investment and getting people back to work? Or will governments be concerned about their damaged balance sheets and raise corporate levies?

Fiscal pressures could result in higher taxes. We will argue, however, that a focus on growth and productivity should be the priority for corporate tax policy if a country's investment performance has been weak prior to the pandemic. That is the case of Canada.

Most corporate tax changes in 2020 were responses to the pandemic.[1] Of 94 countries, 72 deferred payment of corporate taxes in 2020, 25 introduced new deductions or tax credits and 21 extended carry-forward or carry-back provisions for losses. Ten countries introduced accelerated depreciation. Canada was not one of these countries; by and large, no corporate tax changes occurred in Canada, except for Alberta accelerating by a year and half its corporate rate reduction from 10 to eight per cent, as of July 1, 2020.

Instead, Canada's policy focused on temporary relief, including tax deferrals, wage and rent subsidies, and liquidity programs. Perhaps this reflects that Canada already had a relatively low marginal effective tax rate (METR) on capital in 2020 (15.6 per cent with temporary accelerated depreciation and 19.5 per cent without), well below the averages for the G7, OECD and 94-country group surveyed in this study. While its METR is relatively low, Canada's corporate income tax rate — averaging 26.1 per cent — is above the current U.S. rate (25.7 per cent) and the OECD GDP-weighted average (25.8 per cent), the 10th highest of 34 OECD countries. It is not far off the highest corporate income tax rates among OECD countries (Portugal is at 31.5 per cent and Japan at 30.6 per cent).

While Canada's corporate tax system is competitive for marginal investments, due to temporary accelerated-depreciation allowances, it is less attractive for highly profitable projects that are "lumpy" (i.e., consisting of large lumps of capital investment), because of Canada's relatively high corporate income tax rate by international standards. More concerning is that the corporate tax system is distorting the allocation of capital in the economy.[2] Federal and provincial governments have recently been swinging back towards introducing new tax preferences, such as accelerated depreciation, in part to reduce fiscal costs. However, these initiatives create a more distortionary corporate tax system with respect to capital allocation, as seen in the wide variation in METRs across industries and assets.

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1 Analysis is based on legislation adopted by end of 2020. Any 2021 budgetary changes are not included in estimates.

2 Taxation is one source of distortion in capital markets. Others include regulations and imperfect competition, both potentially resulting in higher markups and regulations. In a recent paper, Baquee and Farhi (2020) find that the misallocation of capital reduces productivity by 15 per cent. Similarly, Da-Rocha, Mendes Tavaremal and Retuccia (2020) find that misallocation due to differential taxes on establishments cause substantial productivity losses — one half due to the static effect and other half to a dynamic effect.

A high-rate and non-neutral corporate tax system, we shall argue, undermines productivity. With lumpy investment, a high statutory tax rate that falls on economic rents, discourages the location of highly profitable resource- and knowledge-based projects in a country.[3] High corporate income tax rates also discourage companies from keeping profits in Canada as companies book more administrative and financing expenses here rather than in low-tax countries, despite recent policies to curtail profit-shifting.

This paper is focused on the taxation of investment; its focus is on the corporate income tax. As is well known, investment also depends on other factors, such as domestic and international demand for goods and services, infrastructure, regulations and policy uncertainty. The current weak investment climate in Canada is substantially influenced by other factors that we later mention. Nonetheless, we should avoid substantial increases in taxes on investment. This is a particular concern, as recent G7 discussions could encourage higher corporate taxes in the future, making it harder for economies to recover from the 2020 recession.

Critically, the investment climate in Canada needs to be improved. New capital spending is crucial, since companies replace older vintages of capital with more advanced technologies. Investment also increases available value-added to raise employment and worker salaries. Numerous studies, including McKenzie and Ferede (2018), find that reductions in corporate taxes contribute to higher wages as a product of more investment.

In the discussion below, we begin with a review of 2020 corporate tax changes among the 94 countries surveyed in this paper. This will be followed by our annual comparisons of corporate income tax rates and METRs across groups and individual countries. We then review METRs in Canada for industries and provinces, before turning to Canada's investment performance as background for directions for corporate tax reform.

CORPORATE TAX CHANGES: WHAT HAPPENED IN 2020?

With the pandemic-induced downturns in many sectors, governments implemented various programs to help support the economy. Tax payments were deferred. Central banks provided credit support to minimize bankruptcies. Governments provided temporary financial support for households and businesses, including wage subsidies. As part of a much broader package, corporate tax measures were typically in the form of tax deferral and temporary relief.

As shown in Table 1, 72 of 94 countries provided corporate tax deferrals (with 32 providing waivers for penalties and interest). With respect to corporate tax changes,

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3 Devereux and Griffith (2002) provide a measure of "average" effective tax rates to capture the notion that corporate location could be discouraged by high taxes on above-normal (economic) profits. However, ex post measurement of above-normal rates of return to capital may be evidence of compensation for risk instead of the presence of economic rent. Since we cannot disentangle risk from economic profits in measuring above-normal rates of return to capital, it is useful to at least provide comparisons of both statutory corporate income tax rates and marginal effective tax rates.

the two most popular were higher deductions or tax credits (typically temporary) and a more liberal treatment of tax losses, such as extending carry-back and carry-forward periods. Extending carry-back loss provisions was one of the more interesting shifts this year. This provided immediate cash to companies so long as they had paid corporate income taxes in earlier years. Canada did not make any adjustments to its loss-offsetting provisions.

Table 1: Number of Countries with Corporate Tax Adjustments During the COVID Recession

	G7	OECD	Global (95 countries)
Rate adjustment	1	2	5
*Deferral**	6	27	72
Interest/penalty waiver	1	10	32
*Wage subsidy**	3	8	15
*Capital subsidies**	3	9	9
Loan assistance/guarantee	2	6	7
Tax-loss extension	4	16	21
Higher deductions/credits	5	16	29

*Canada provided corporate tax deferrals and wage and rental subsidies as COVID relief measures.

Source: EY Tax COVID-19 Response Tracker (2020).

A few countries revised corporate income tax rates in 2020. The **United Kingdom** suspended its legislated tax-rate reduction from 19 to 17 per cent in 2020, while bumping up the capital-cost allowance for structures from two to three per cent. In the U.K.'s March 2021 budget,[4] it introduced a two-year, 130-per-cent super-deduction for depreciable assets. This will be followed by an increase in the corporate income tax rate from 19 to 25 per cent for profits in excess of 250,000 pounds beginning April 1, 2023. Besides reversing its low corporate-tax-rate policy, the shift represents another major change. Since 2008, the U.K. has lowered its top corporate income tax rate by 10 points to 20 per cent, eliminating the difference in rates between small and large firms. In 2023, corporate income tax rates will vary again by profit size.

Chile reduced its corporate income tax rate from 22 to 10 per cent for small and medium-sized businesses until 2023, while **Colombia** targeted a corporate income tax-rate reduction for air transport. **Kenya** lowered its general corporate income tax from 30 to 25 per cent, and **Romania** provided a discount to corporate tax payments on a short-run basis. Outside of Alberta's acceleration by a year and half of its corporate-rate reduction from 10 to eight per cent, no other rate or base changes of importance were adopted in 2020.

Several countries have legislated changes in corporate income tax rates beyond 2020. Of the 94 countries, these include Austria (from 25 per cent in 2020 to 21 per cent by

4 As we include legislated changes adopted by the end of 2020 in our analysis, any 2021 tax changes, such as the new U.K. budget, are not included.

2023), France (continuing its rate reduction to 25 per cent by 2022), Colombia (32 to 30 per cent by 2022) and Indonesia (22 to 20 per cent by 2022).

Not surprisingly, very few countries have made long-run adjustments to their corporate tax policies in 2020. Tax measures have been largely temporary to deal with the economic impact from health restrictions and lockdowns. With respect to the corporate income tax, a key post-COVID issue is whether to raise corporate tax to deal with fiscal pressures or reduce corporate taxes to encourage economic growth and economic adjustment. Governments used corporate tax policy to encourage growth in the year after the 2008 financial crisis. Unlike other taxes, corporate income tax rates and effective tax rates on capital continued to fall after 2009, despite the sharp increase in public debt among many countries. We will return to these issues below.

Probably, the most important shift in corporate tax policy recently are measures to reduce the scope for shifting corporate profits to low-tax jurisdictions. The G20 countries have agreed to a 15-per-cent minimum corporate income tax on foreign profits earned by companies with more than $750 million in revenues (similar to proposals made in OECD Pillar Two discussions).[5] While it is too early to tell how this proposal will be implemented, it could increase taxes paid by foreign subsidiaries of a parent residing in a capital-exporting country when covered taxes — foreign-profit and withholding taxes — are less than 15 per cent of profits. This current proposal will require agreement on the base (potentially book profits).

CANADA HAS LOST ITS CORPORATE INCOME TAX-RATE ADVANTAGE

Although 2020 has been a relatively quiet year for corporate tax reforms, we note that Canada virtually lost its corporate income tax-rate advantage after 2016. As shown in Figure 1 below, Canada's federal-provincial corporate income tax rate (including Alberta's eight-per-cent rate) was 26.1 per cent in 2020, about equal to the GDP-weighted average of corporate income tax rates in the OECD (25.8 per cent)[6]. In 2016, Canada had a tax advantage of almost five points, compared to the OECD weighted-average tax rate.

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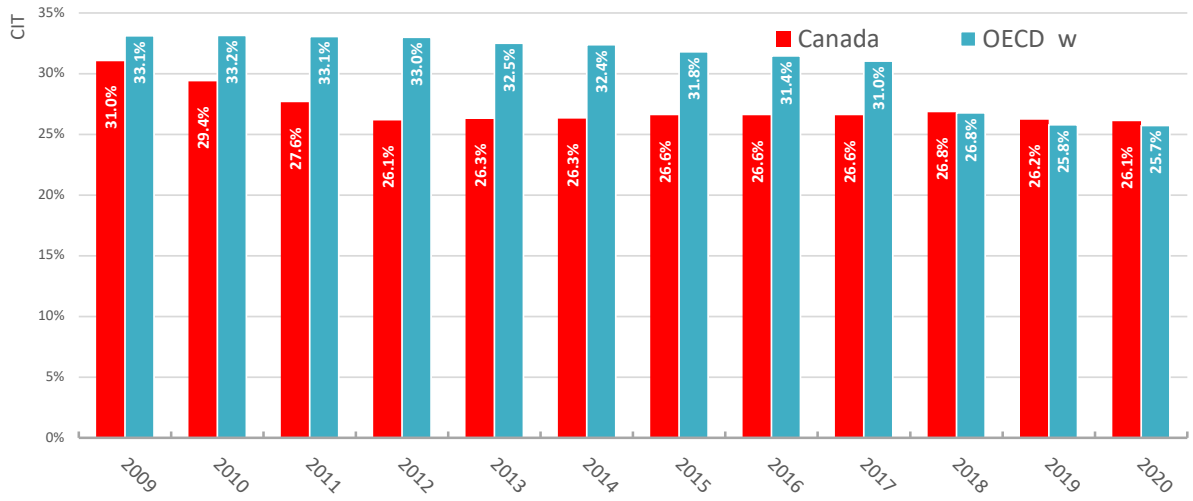
5 For Pillar Two discussions, see https://www.oecd.org/tax/beps/public-consultation-document-global-anti-base-erosion-proposal-pillar-two.pdf. The OECD has also discussed a special tax on large technology companies to shift from a pure-source base tax, according to where profits are earned, to one in which part of the income would be allocated to where users reside.

6 This rate includes the legislated rate reductions mentioned earlier and excludes the U.K.s rate hike legislated in 2021.

Figure 1: Canada and Weighted-Average General Corporate Income Tax Rates Among OECD Countries From 2009 to 2020



Note: General corporate income tax rates are the combined central-subnational corporate rate plus any profit-based contribution rates applicable to large companies. Legislated corporate tax rate changes are applied the year they are passed.

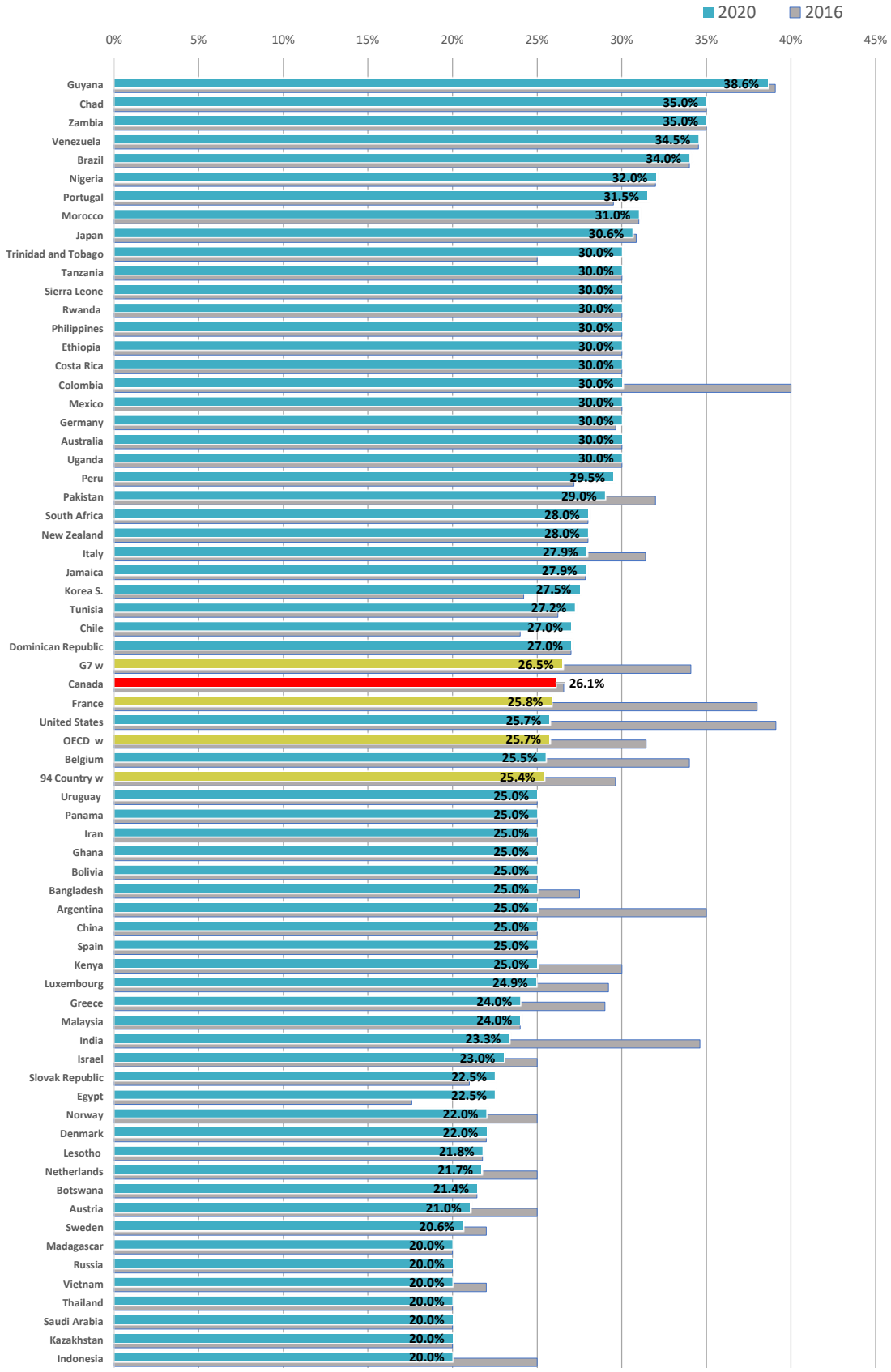
While Canada's general corporate income tax rate has changed little since 2013, other countries have reduced corporate income tax rates (Figure 2). This includes the U.S. (from 39.1 to 25.7 per cent after 2017) and France (from over 35 per cent to 25.8 per cent by 2022). The new Biden administration has proposed raising the U.S. rate to 28 per cent, although Congress will make the final determination. As mentioned above, the U.K. is reversing course by hiking its general corporate income tax rate in 2023 from 19 to 25 per cent, almost back to where it was in 2011 when the rate was 26 per cent.

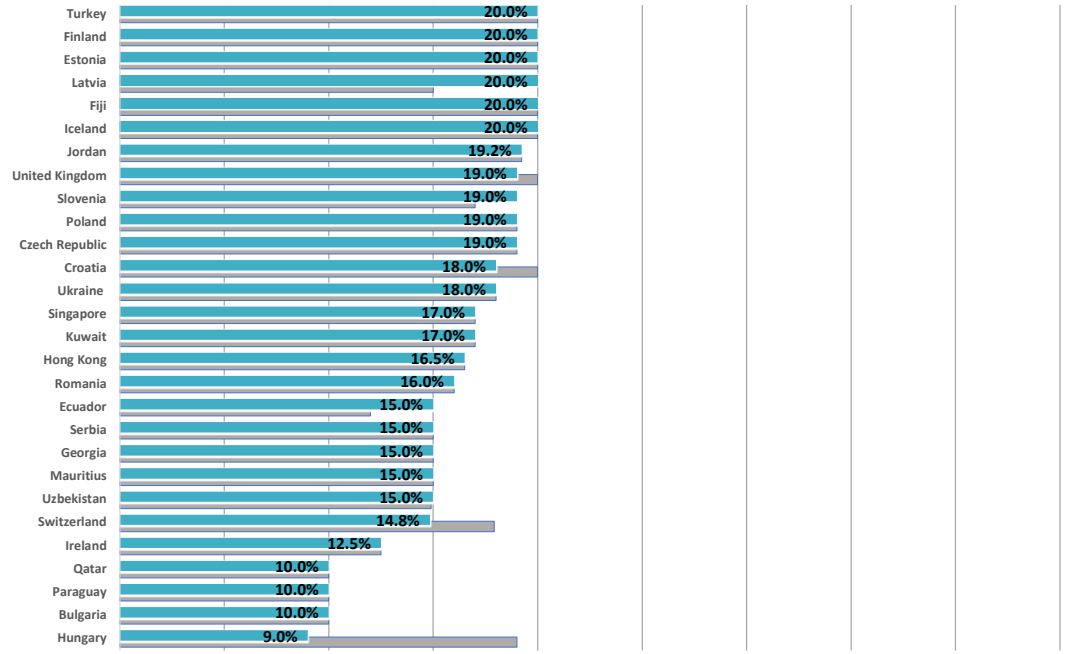
On a regional GDP-weighted average basis,[7] we note that Canada's corporate income tax rate is slightly below the Americas' average (26.8 per cent), slightly above the average for Asia and Oceania (25.6 per cent), and well above the European and 94-country averages (23.6 and 25.4 per cent, respectively). A comparison of individual corporate income tax rates is provided in Figure 2 below.

Overall, 64 of 94 countries now levy corporate income tax rates at 26 per cent or below, with the lowest rates found in Europe (Hungary at nine per cent, Bulgaria at 10 per cent and Ireland at 12.5 per cent).

7 Details in the appendix.

Figure 2: General Corporate Income Tax Rates by Country 2020 and 2016





w = GDP-weighted average.

Besides the U.S. and France, sharp reductions of over five points in corporate income tax rates since 2016 have occurred in Belgium (eight points), Greece (five points), India (12 points), Argentina (10 points), Colombia (10 points), Hungary (10 points), and Kenya (five points). Only a few countries have increased corporate income tax rates since 2016 (Egypt, Latvia, Pakistan, Taiwan, Trinidad and Tobago, Turkey, South Korea, the Slovak Republic, Tunisia and Slovenia). Generally, corporate income tax rates have continued to fall globally, dropping over four points from a GDP-weighted average of 29.6 per cent in 2016 to 25.4 per cent among the 94 countries. Canada has stood still, except for the tax-rate reduction in Alberta.

MARGINAL EFFECTIVE TAX RATES: IMPACT ON INVESTMENT

To gauge how corporate taxation in open economies impacts investment, we measure the METR, similar to our earlier reports. The tax paid on profits from investment depends on more than just the corporate income tax rate. It depends on provisions that determine taxable profits such as interest, depreciation, inventory cost, fees and other deductions including non-profit taxes. Investment allowances and tax credits also reduce the profit-tax base. On the other hand, inflation can affect the value of investment deductions. Depreciation and inventory deductions based on historical values are eroded by inflation, while nominal-interest deductions can be beneficial to holding assets with inflating values.[8] Overall, if tax deductions are more than the

8 Inventory deductions based on FIFO (first in, first out) valuation results in the use of the historical prices to measure the cost of replacing inventories. This results in a higher effective tax rate. LIFO (last in, first out) enables companies to deduct inventory costs closer to replacement cost. Many countries provide an average pricing approach.

economic (including inflation-indexed) costs of employing capital, then the effective tax rate on capital will be below the statutory corporate income tax rate, thereby encouraging capital investment. Alternatively, tax deductions that are smaller than economic costs can lead to an effective tax rate above the statutory corporate tax rate.

Other tax provisions also affect investment costs. These include sales taxes on capital purchases, wealth or asset-based corporate taxes and transfer taxes on real property and financial transactions. These additional taxes increase the effective tax rate on capital. In our analysis, we do not include labour taxes, such as employer-based payroll taxes, since these affect the cost of labour, not capital. As discussed in our 2019 report (Bazel and Mintz 2020), a tax on the cost of producing goods would be a weighted average of effective capital and labour tax rates, which we have calculated for provinces in Canada but are unable to apply to the 94 countries.

In the appendix, we provide some details on the parameters that drive the country models, including inflation rates, tax-depreciation rates, inventory-cost valuation, and other taxes. With most countries having value-added taxes (VATs) as sales taxes, few countries levy non-refundable sales tax on capital inputs purchased by manufacturing and service industries (except the VAT-exempt financial sector). We note that 13 countries levy asset-based taxes (the highest in Kazakhstan, at 1.5 per cent); that number would be much larger if we included effective municipal property tax rates that are not measurable across countries. The most frequently used taxes are capital transfer taxes (typically real estate transfer tax), which are applied in 56 countries. We assume that these taxes are applied at the time assets are initially purchased and avoided through tax-planning arrangements if assets are resold. To evaluate the effect of taxes, we estimate the METR, which is explained in Box A. The theoretical methodology used in the analysis has been provided in numerous past publications and is not repeated here.[9]

[9] See Mintz and Bazel (2015). We include all industries except oil and gas, mining and finance. For a more limited comparison of oil and gas by country, see Mintz (2016), and for mining, see Bazel and Mintz (2019).

BOX A

The impact of taxes on capital investment is based on an analytical measure of the marginal effective tax rate (METR). The METR is the annualized value of corporate taxes paid as a percentage of the pre-tax profitability of marginal investments. Marginal investments are those that are incremental to the economy: They earn sufficient profit to attract financing from investors, covering risk and taxes. At the margin, businesses invest in capital until the rate of return on capital, net of taxes and risk, is equal to the cost of financing capital (or the interest rate). If the rate of return is more (less) than financing costs, firms will invest more (less) in capital. Thus, if a government increases the tax rate, it will result in businesses rejecting marginal projects that were profitable before taxes were increased.

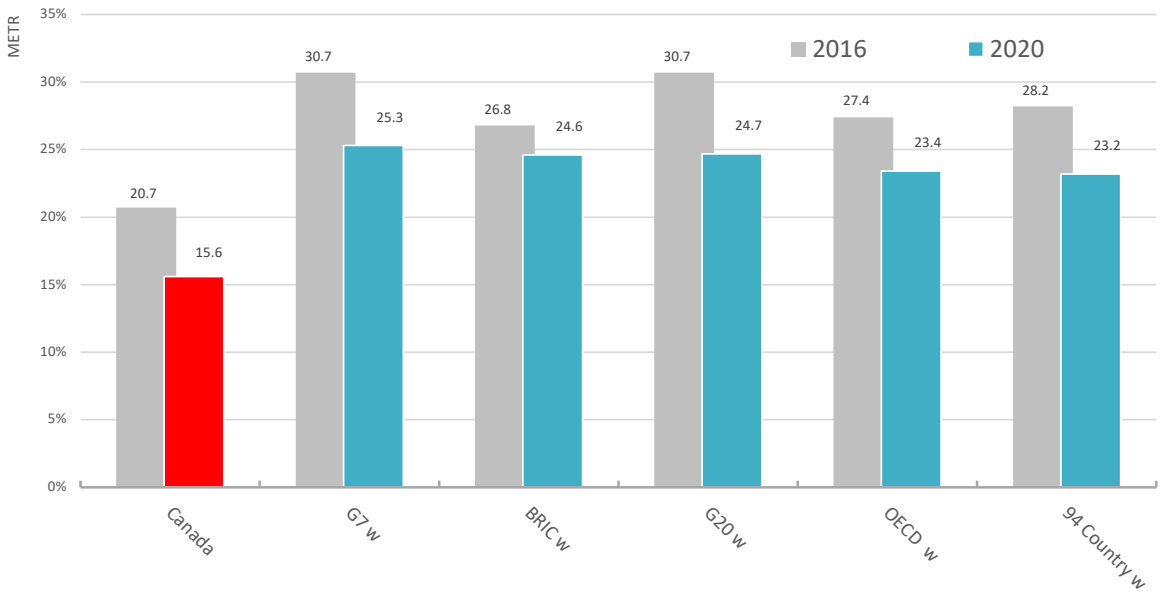
For example, suppose companies must pay out in after-tax profits a return (net of risk and taxes) equal to five per cent to attract financing from equity and bondholders for a new investment project. If the tax wedge is 50 per cent, it means that the company must earn a 10-per-cent net-of-risk rate of return to cover taxes and cost of financing. If the project earns less than 10 per cent as a pre-tax rate of return, the project will not move forward. Of course, some projects might earn more than a 10-per-cent rate of return on capital, but as long as the minimal rate of return is earned, a project will be profitable to undertake. Therefore, if the tax wedge decreases, more investment projects become profitable, since a lower rate of return is acceptable to cover both tax and financing costs.

Briefly, the effective tax rate, or tax wedge, is the portion of capital-related taxes paid as a share of the pre-tax rate of return on capital for marginal investments (on the assumption that businesses invest in capital until the after-tax return on capital is equal to the cost of financing capital). Taxes that impinge on capital investment include corporate income taxes (the rate and base), sales taxes on capital purchases (such as retail sales taxes), asset-based taxes (capital taxes and property taxes), and transfer taxes on real estate and financial transactions. In our analysis, we have included most taxes except municipal property taxes, since they are difficult to measure due to variations in municipal rates and bases, and are unobservable by industry (even for Canada).

In our analysis, we use similar capital structures to isolate tax differences among 94 countries (country-specific capital weights, if available, would give a different ranking). The capital structures, reflecting the distribution of assets among machinery, buildings, inventory and land investments, are based on Canadian data. Economic depreciation rates for assets are also based on Statistics Canada estimates. Bond interest rates reflect differences in inflation rates across countries (following the purchasing-power-parity assumption). Equity costs are based on a marginal supplier of finance equating the after-tax rates of return on stocks and bonds (the marginal investor is assumed to be a G7 investor holding an international portfolio of bonds and equity). The analysis includes manufacturing and service industries (services include construction, utilities, transportation, communications, trade, and other business and household services).

When it comes to investments with returns just sufficient to attract international capital, Canada's METR is competitive internationally. As shown in Figure 3, Canada's METR at 15.6 per cent is well below the OECD weighted average of 23.4 per cent. It is also well below the G7 average (25.3 per cent). It is also below the average of BRIC countries (Brazil, Russia, India and China), at 24.6 per cent, and the average of the 94 countries, at 23.2 per cent. Going back to 2016, Canada's METR was much higher, by almost five points (20.7 per cent), but so was the METR of other countries, which were especially influenced by the U.S. rate, prior to the tax reform implemented there on Jan. 1, 2021.

Figure 3: Canada's METR Compared to Other Country Groups



w = GDP-weighted average.

A significant step in reducing the METR from 20.7 per cent in 2016 to 15.6 per cent in 2020 in Canada was the adoption of temporary accelerated depreciation in November 2018, a move largely seen as a direct response to the U.S. tax reform containing a similar temporary incentive.[10] Introduced by Canada's minister of finance as part of the Accelerated Investment Incentive, new purchases of manufacturing and clean-energy machinery are expensed for five years, with a phase-out from 2024–27. Regular depreciation rates were boosted by one-and-a-half times the statutory capital-cost-allowance rate, also for five years, which were to be similarly phased out thereafter. The half-year convention — restricting first-year tax depreciation to one-half of the statutory capital-cost-allowance rate — was also dropped on a corresponding temporary basis. The provinces that collect their own corporate income tax (Quebec and Alberta) also adopted accelerated depreciation on a temporary basis.

10 As one element of U.S. reform, investments in assets with lives less than 20 years qualify for 100-per-cent bonus depreciation for five years (to be phased out thereafter).

When temporary accelerated depreciation is fully phased out in 2028, Canada's METR will rise from 15.6 per cent to 19.5 per cent.[11] The U.K. METR will rise from 21.2 to 26.5 per cent. The U.S. will also be phasing out bonus depreciation by 2028 and might be increasing its corporate tax rate (the Biden campaign proposed a corporate income tax rate of 28 per cent). If both of those measures are brought in, the U.S. METR will rise by almost a half, from 22.6 to 32.1 per cent. These increases will slow down investment — in the U.K., by potentially 20 per cent.[12]

On a regional basis (see the appendix), Canada's METR in 2020 is well below the average of its most direct competitors in the Americas (24.0 per cent), as well as Asia and Oceania (26.2 per cent) and Europe (21.1 per cent). Canada's METR is above that of Africa (12.7 per cent) and the Middle East and North African countries (7.9 per cent). As for all 94 countries, GDP-weighted average is 23.2 per cent, almost eight points higher than Canada's. Canada's existing METR is 40th lowest of 94 countries (Figure 4).

Much of Canada's competitiveness for marginal projects is driven by exceedingly low manufacturing METRs. As shown in the appendix, the manufacturing METR in Canada is only 9.4 per cent, one of the lowest in the OECD (the lowest are Estonia at 8.8 per cent, Slovenia and Switzerland both at 8.5 per cent, and Turkey at 5.3 per cent). Services are taxed more heavily in Canada at an METR of 17.6 per cent, about eight points higher than manufacturing. The Canadian METR on services is only somewhat below other countries.

Few other industrialized countries tax services so heavily relative to manufacturing as Canada does. Among the 94 countries, Brazil favours manufacturing more heavily than services (17.5 per cent and 40.1 per cent respectively) primarily due to a non-refundable VAT on capital purchases made by the service sector. Other countries that favour manufacturing over services include Guyana (24.3 and 34.8 per cent respectively), Kenya (3.3 and 17.1 per cent respectively) and Lesotho (11.9 and 23.9 per cent respectively). Some other countries have done the opposite — favouring services much more than manufacturing, such as Bolivia, Costa Rica, Egypt, Ethiopia, Iran, Ukraine and Zambia.

Leaving aside the obvious distortions favouring some business activities over others, it also raises issue regarding post-COVID recovery. The most heavily affected industries by the pandemic are services such as air transportation, retail and tourism, where economic adjustments will be critical. Yet, Canada and several other countries have a strong bias towards manufacturing, which has almost returned to its pre-pandemic production levels.

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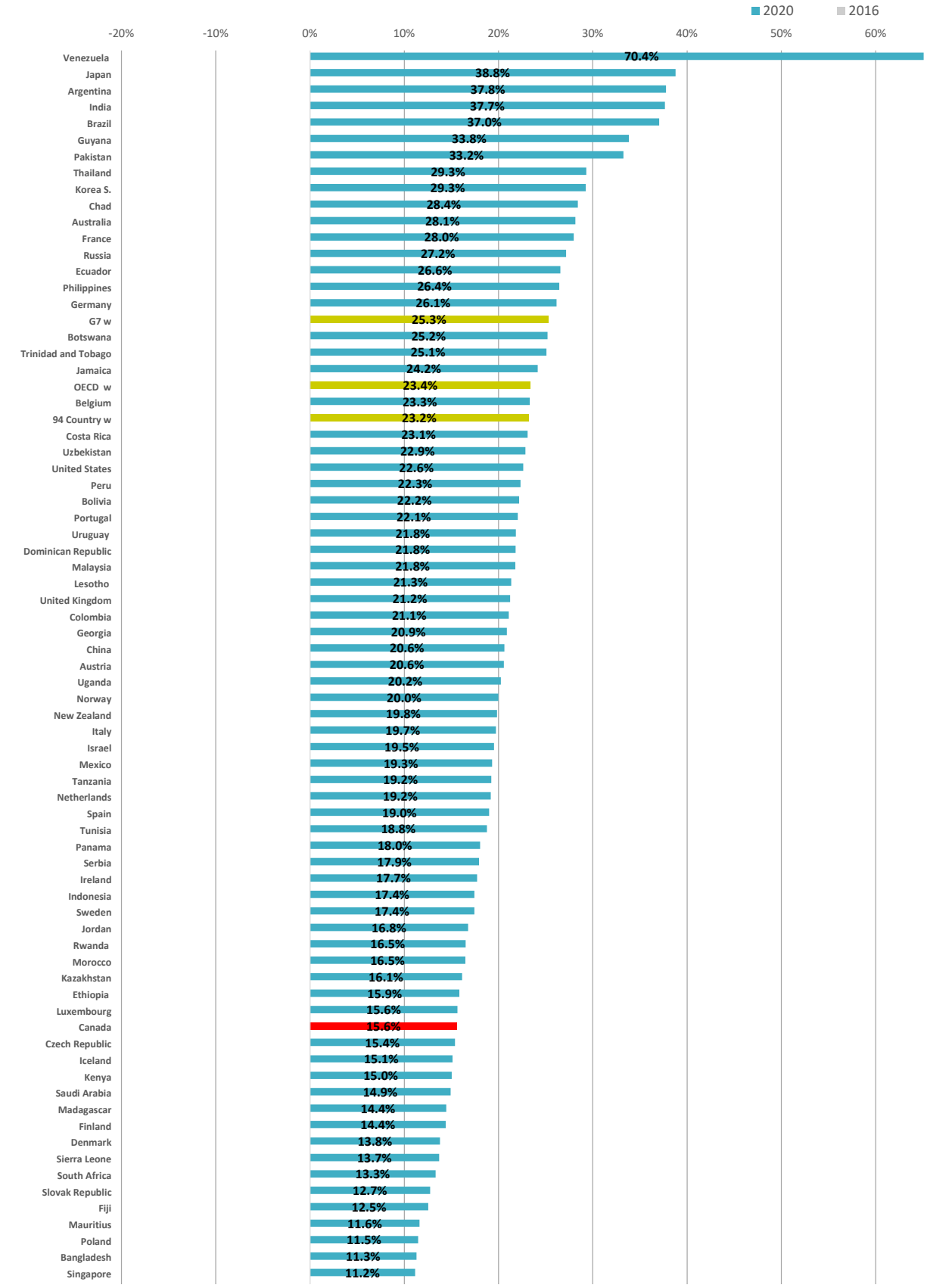
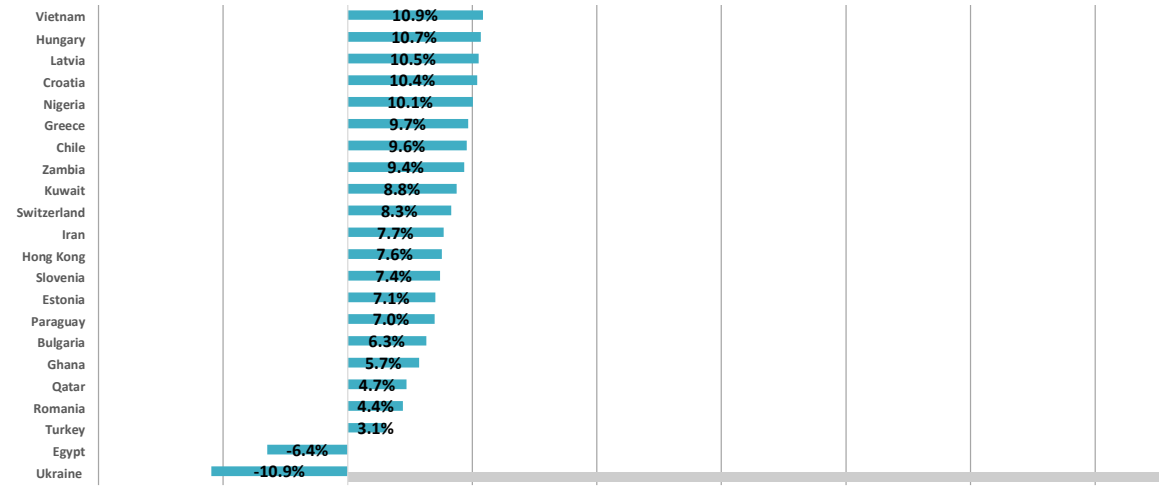
11 Some other tax changes occurred in Canada during the 2016–20 period, including the corporate-tax-rate reduction in Alberta. Thus, without accelerated depreciation, the 2020 METR is less than the 2016 METR.

12 See M. Devereux (2021). https://oxfordtax.sbs.ox.ac.uk/article/what-will-the-budget-do-for-corporate-investment.

Figure 4: METR by Country in 2020 and 2016





w = GDP-weighted average.

A MORE DETAILED LOOK AT FEDERAL-PROVINCIAL METRS

Given Canada's federal nature, a detailed look at federal-provincial METRs is in order. As shown in tables 2a and 2b, METRs are calculated by industry and province and by asset type and province for 2020. Also provided are the METR by industry and province in 2020 under the assumption that accelerated depreciation is fully phased out (Table 2c). What is striking is the degree of tax non-neutrality among provinces, assets, and industries, largely but not exclusively driven by federal policy through the Accelerated Investment Incentive and the Atlantic Investment Tax Credit.

As mentioned above, Canada has a corporate tax policy that strongly favours manufacturing, a trend going back to 1972 when U.S. competitiveness was a significant concern (Jog and Mintz 1989). Forestry and forest-related manufactured products is also heavily favoured, with an METR that is 7.2 per cent, driven by accelerated tax depreciation and the federal Atlantic credits and other various provincial tax credits (Figure 5a). Agriculture, transportation/storage, communication and utility sectors are taxed at rates close to the average METR in Canada, while the rest of the service sector (construction, trade and other household and business services) bear above-average METRs, in excess of 20 per cent. This bias against the service sector was a significant concern in the report of the Technical Committee on Business Taxation (1997), which recommended reducing corporate income tax rates to the tax rate on manufacturing income to improve neutrality. The federal government proceeded in that direction after 2000, but reversed course in 2007, amplifying differences further in 2018.

Table 2a: Federal-Provincial METRs by Industry and Province 2020

2020	Agriculture	Forestry	Electrical Power, Gas & Water	Construction	Manufacturing	Wholesale Trade	Retail Trade	Transportation & Storage	Communications	Other Services	Aggregate
Canada	14.7%	7.2%	15.4%	20.8%	7.4%	21.1%	22.9%	14.8%	15.9%	20.4%	**15.6%**
Newfoundland	10.1%	-16.1%	14.6%	22.6%	-13.3%	23.2%	24.0%	13.3%	14.1%	19.0%	**8.0%**
Prince Edward Island	-0.4%	-37.5%	15.5%	23.5%	-52.5%	24.4%	25.3%	19.8%	14.1%	22.7%	**11.3%**
Nova Scotia	7.9%	-16.5%	14.4%	21.9%	-20.5%	22.7%	23.9%	13.9%	14.0%	19.4%	**12.3%**
New Brunswick	2.2%	-16.2%	14.2%	21.8%	-12.3%	22.6%	23.6%	15.7%	13.8%	19.0%	**10.7%**
Quebec	15.0%	-1.2%	12.2%	19.5%	-0.7%	20.3%	21.4%	12.4%	11.1%	18.2%	**11.5%**
Ontario	15.2%	10.3%	13.0%	19.9%	11.5%	20.5%	22.1%	14.0%	12.8%	18.3%	**15.1%**
Manitoba	18.7%	1.9%	23.6%	26.7%	-3.9%	25.3%	26.3%	20.5%	25.0%	28.6%	**21.0%**
Saskatchewan	17.9%	10.9%	22.7%	25.7%	12.5%	26.0%	26.1%	18.5%	26.9%	27.6%	**20.6%**
Alberta	11.0%	9.2%	10.3%	16.7%	12.0%	17.2%	17.8%	9.7%	9.8%	13.8%	**12.1%**
British Columbia	21.3%	18.3%	25.8%	28.0%	18.2%	26.7%	28.8%	21.7%	30.3%	31.5%	**25.6%**

Table 2b: Federal-Provincial METRs by Province and Asset Type 2020

2020	Buildings	Machinery & Equipment	Land	Inventory	Aggregate
Canada*	20.8%	8.4%	12.4%	24.2%	**15.6%**
Newfoundland	12.2%	-12.0%	13.3%	27.9%	**8.0%**
Prince Edward Island	19.8%	-14.4%	14.3%	28.6%	**11.3%**
Nova Scotia	18.9%	-3.1%	13.7%	26.8%	**12.3%**
New Brunswick	17.0%	-6.2%	13.3%	27.0%	**10.7%**
Quebec	19.7%	-5.0%	12.4%	24.6%	**11.5%**
Ontario	20.9%	5.7%	12.7%	24.1%	**15.1%**
Manitoba	20.2%	22.9%	13.1%	25.0%	**21.0%**
Saskatchewan	21.7%	21.5%	11.4%	24.2%	**20.6%**
Alberta	16.3%	6.3%	9.4%	21.3%	**12.1%**
British Columbia	27.9%	27.9%	14.0%	25.1%	**25.6%**

Figure 2c: Federal-Provincial METRs by Province and Industry Without Accelerated Depreciation

2020	Agriculture	Forestry	Electrical Power, Gas & Water	Construction	Manufacturing	Wholesale Trade	Retail Trade	Transportation & Storage	Communications	Other Services	Aggregate
Canada	18.3%	13.3%	19.0%	23.0%	13.7%	23.2%	24.7%	17.8%	22.1%	24.5%	**19.5%**
Newfoundland	12.8%	-5.3%	18.9%	25.1%	-3.9%	25.6%	26.0%	17.6%	21.5%	24.0%	**13.3%**
Prince Edward Island	4.7%	-22.4%	19.8%	26.1%	-33.9%	26.7%	27.3%	22.7%	22.0%	27.0%	**16.3%**
Nova Scotia	10.8%	-5.7%	18.5%	24.3%	-8.0%	25.0%	25.8%	17.6%	21.1%	24.3%	**17.1%**
New Brunswick	6.2%	-5.6%	18.3%	24.3%	-2.6%	24.8%	25.5%	18.8%	21.0%	23.8%	**15.6%**
Quebec	18.4%	5.1%	16.2%	21.8%	5.7%	22.5%	23.3%	15.9%	18.2%	22.8%	**15.8%**
Ontario	18.8%	16.2%	16.8%	22.1%	17.8%	22.6%	23.9%	17.2%	19.4%	22.7%	**19.3%**
Manitoba	22.5%	9.1%	26.8%	28.7%	4.8%	27.3%	28.0%	23.2%	30.3%	32.1%	**24.5%**
Saskatchewan	22.2%	16.5%	25.9%	27.8%	17.9%	27.9%	27.8%	21.0%	31.9%	31.0%	**24.0%**
Alberta	14.6%	14.5%	13.7%	18.8%	16.8%	19.2%	19.5%	12.5%	15.9%	18.2%	**15.5%**
British Columbia	24.4%	23.4%	28.9%	30.0%	23.4%	28.6%	30.4%	24.4%	34.8%	34.7%	**28.7%**

This favouritism can also be seen in the METR bias towards machinery-intensive businesses (Figure 5b). While investments in machinery bear an METR of 8.4 per cent

and investments in land bear 12.4 per cent, investments in structures are taxed at 20.8 per cent and inventories at 24.2 per cent (the latter due to FIFO accounting).

As for the provinces, the METR on investment in British Columbia is the highest in Canada (and close to the OECD average) at 25.6 per cent. This is followed by Manitoba at 21 per cent and Saskatchewan at 20.6 per cent. All three of these provinces rely on the retail sales tax that results in high METRs on machinery and equipment and structures (Figure 5b). If the provinces harmonized their sales taxes with the federal GST, most sales taxes on capital purchases would be refunded, thereby reducing the METR.

The lowest METRs are in the Atlantic provinces, largely driven by the federal Atlantic Investment Tax Credit that is available to agriculture, forestry and manufacturing industries. Quebec also has a low METR at 11.5 per cent, driven by federal as well as provincial incentives for investments in machinery and equipment.

Alberta's METR is now 12.1 per cent, in part reflecting its corporate income tax rate of eight per cent. With the federal rate, Alberta companies bear a corporate income tax rate of 23 per cent, which is one of the lowest in North America (the U.S. federal rate is 21 per cent, and some states — Nevada, Ohio, Texas and Washington — currently do not have a corporate income tax[13]). If the U.S. increases its federal corporate income tax rate, Alberta will have the lowest corporate income tax rate in North America as well as one of the lowest METRs on capital.

While Canada has a relatively low METR to encourage capital investment, its corporate tax has become more distortionary. The inter-industry and inter-asset dispersion index (see Chen and Mintz 2010 for its explanation) has increased by more than two-and-a-half times from 2016 (.0732 compared to 0.0286). These non-neutralities have several economic impacts:

- They undermine productivity as businesses shift capital to projects in part to benefit from tax preferences. While some preferences may be given to activities that generate unremunerated benefits to other firms (e.g., research and development and exploration expenditures), many preferences are driven by political considerations rather than to correct market failures. Distortionary taxes, including the corporate income tax, have been found to reduce economic growth rates, unlike less distortionary taxes such as consumption taxes and property taxes (e.g., Kneller, Bleaney and Gemmel 1999 and Baquee and Farhi 2020).

13 These four states have gross receipt taxes. In related work, we have estimated an aggregate METR for a select group of U.S. states with gross receipt taxes rather than income taxes. We estimate an aggregate METR of 19.2 per cent in Texas, 18.1 in Nevada, 27.8 in Washington, and 16.2 in Ohio. These estimates along with others can be found in Alberta Budget 2021, Fiscal Plan, "Corporate Marginal Effective Tax Rate Comparison, 2020," p. 151, at https://open.alberta.ca/dataset/6f47f49d-d79e-4298-9450-08a61a6c57b2/resource/ec1d42ee-ecca-48a9-b450-6b18352b58d3/download/budget-2021-fiscal-plan-2021-24.pdf.

- Tax credits and hefty capital-cost deductions can push companies into non-taxpaying positions, blunting the effectiveness of incentives. On average, 59 per cent of corporations were non-taxpaying in the years 2012–16.[14]
- Targeted incentives for capital increase the demand for capital inputs, potentially resulting in higher capital-goods prices. Thus, the incentive accrues to suppliers of capital and can benefit suppliers rather than the firm (Goolsbee (1998) finds 35 to 70 per cent of the incentive accrues to suppliers).
- Incentives biased towards machinery reduce the demand for unskilled labour, while creating more demand for complementary inputs such as skilled labour. It can then contribute to more economic inequality (Slavìk and Yazici 2019).

CANADA'S INVESTMENT PERFORMANCE

It is well known that Canada's investment performance since the commodity-price crash in late 2014 has been subpar.[15] That has contributed to weak per capita GDP performance, which can ultimately impact labour compensation. In this section, we will tie these issues together.

Canada's business investment as a share of GDP — the investment rate — has had periods of weak performance, with various peaks and valleys, since 1981 (Figure 5). During the commodity boom, investment as share of GDP perked up, reaching as high as 18 per cent of GDP in 2006 and 2014, but fell back to 13 per cent of GDP by 2019. The current level of investment is better than the 1983–97 period, which generally saw investment lower than 13 per cent of GDP. At that time, Canada suffered two major recessions in the early 1980s and 1990s and experienced high public deficits and debt, accompanied by high interest and inflation rates. It was also a period of low productivity growth.[16]

As we pointed out last year, investment in residential real estate has grown since 2015, but not private non-residential investment (Bazel and Mintz 2020). The same trend holds true in 2020, with residential investment growing and non-residential investment in machinery and structures falling.[17]

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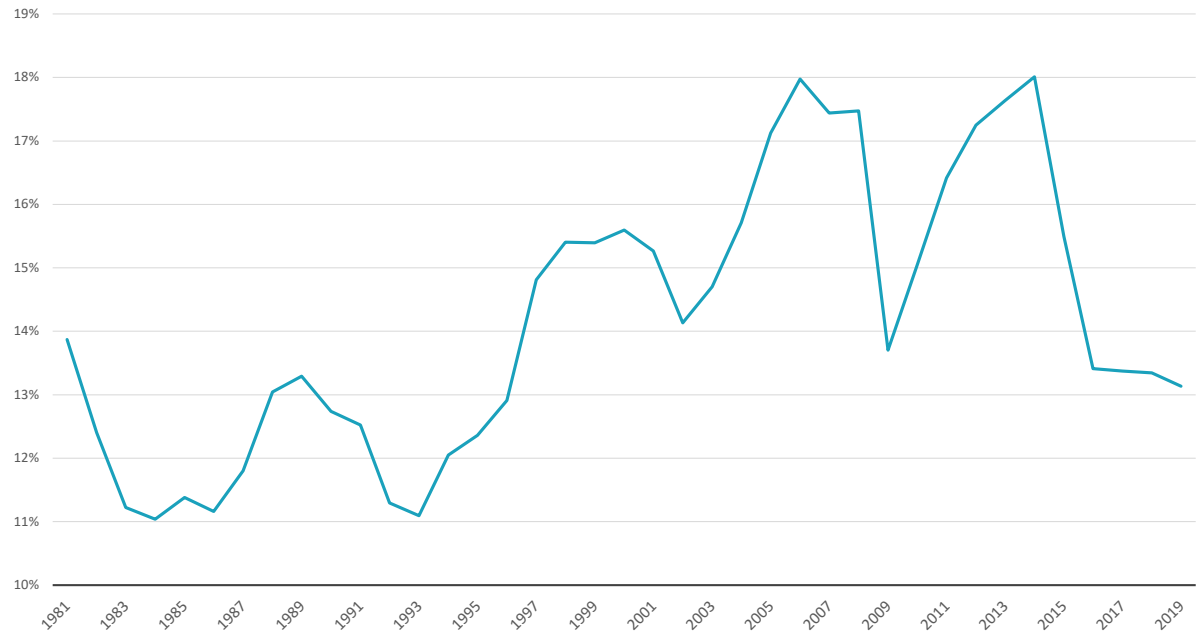
14 Canada Revenue Agency, Taxation Statistics, https://www.canada.ca/content/dam/cra-arc/prog-policy/stats/t2-corp-stats/2012-2016/t2-crp-sttstcs-tbl09-e.pdf. Little other data are provided to assess the impact of tax losses on investment by industry or size of firms. For early work, see Mintz (1988), which shows that tax losses can either increase or reduce METRs.

15 See, for example, W. Robson and M. Wu (2021), https://www.cdhowe.org/intelligence-memos/robson-wu---our-capital-investment-crisis.

16 See, CEIC Data, Canada's Labour Productivity Growth, 1977-2020, https://www.ceicdata.com/en/indicator/canada/labour-productivity-growth.

17 Statistics Canada, "Gross domestic product, income and expenditure, fourth quarter 2020," https://www150.statcan.gc.ca/n1/daily-quotidien/210302/dq210302a-eng.htm?HPA=1.

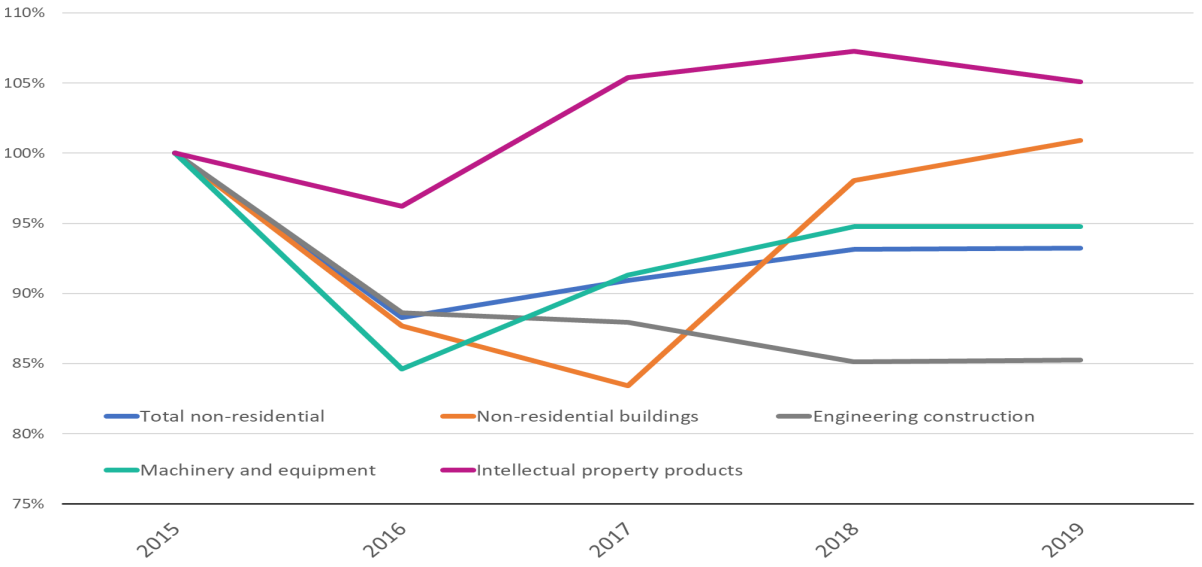
Figure 5: Private Real Non-Residential Investment as a Share of Real GDP, 1981–2019



Source: Statistics Canada Table 36-10-0096-01 and Table 36-10-0222-01.

More disaggregated information provides further understanding with respect to Canada's lagging investment performance. Real private non-residential investment declined by seven per cent since 2015 (Figure 6a). Engineering construction (e.g., heavy and civil engineering as defined by Statistics Canada) has been the weakest, falling 15 per cent, followed by machinery and investment, falling almost seven per cent. Non-residential building investment recovered to roughly its 2015 value in 2019, and investment in intellectual-property products rose five per cent over the four years.

Figure 6a: Private Non-Residential Real Investment Growth by Asset Type



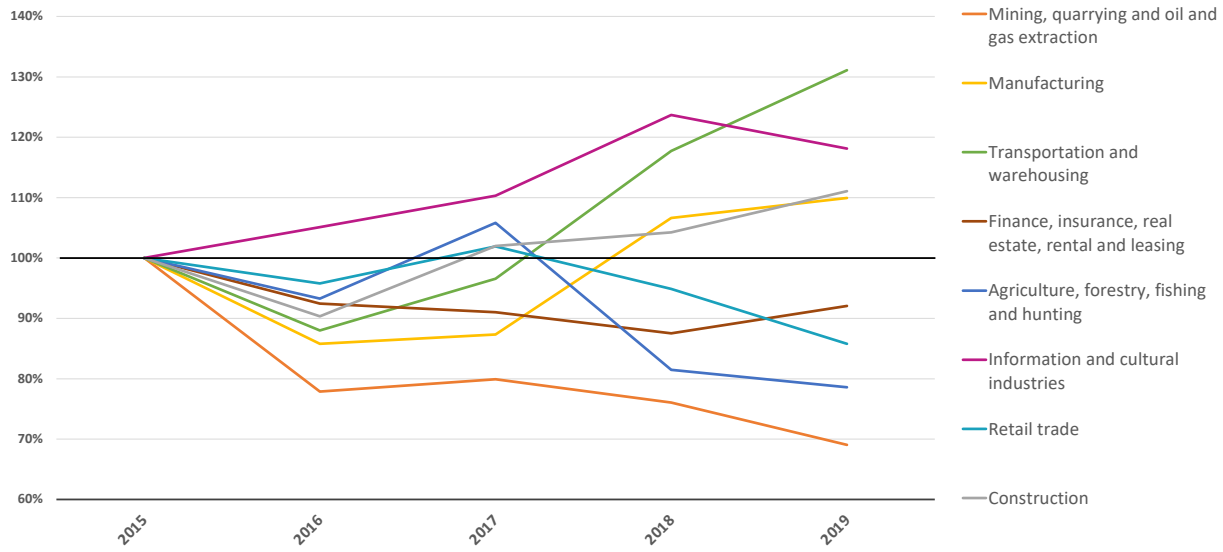
Source: Statistics Canada 36-10-0096-01.

Superficially, it might be presumed that much of the decline in business investment has been linked entirely to the resource sector, particularly the energy industry. However, that is not the case. As shown in Figure 6b, the largest decline from 2015 to 2019 was in mining, quarrying, and oil and gas (30 per cent) as expected, but several other industries experienced a loss in investment as well. These include retail trade (-14 per cent), agriculture, forestry, fishing and hunting (-21 per cent), and the finance, insurance, real estate, rental and leasing industries (-8 per cent).[18]

Manufacturing grew primarily in the last two years, perhaps reflecting expensing under the corporate income tax that was adopted November 2018. Construction investment rose roughly 10 per cent, partly influenced by the growth in residential real estate. The "information and cultural" industry rose just over 18 per cent from 2015 to 2019. The best performance over the four years was "transportation and warehousing," at 31 per cent, partly driven by the growth in digital trade.

Past studies on sectoral investment, such as Parsons (2008), have shown that an increase in the METR causes investment to decline. However, other factors clearly affect investment, such as growth in demand, interest rates, political stability and regulation.

Figure 6b: Private Non-Residential Real Investment Growth by Industry



Source: Statistics Canada 36-10-0096-01.

As we discussed in the previous section, the corporate tax is currently not a significant obstacle to business investment. Even without accelerated depreciation, Canada's corporate tax burden, measured by the METR, was below its most important competitors, including the United States. Nor has it changed much from 2015 to November 2019. However, other countries did not stand still, especially the U.S., where tax reform resulted in a sharp reduction in the METR. As discussed above, Canada's

18 If real estate was excluded from finance, insurance and leasing, the decline in investment would have been steeper, since real estate includes residential construction.

general corporate income tax rate is now slightly above the U.S. rate and the OECD average. Large-scale, lumpy investment projects that earn high economic rents, such as in knowledge-based and resource industries, are less competitive for companies to locate in Canada when the general corporate tax rate is high.

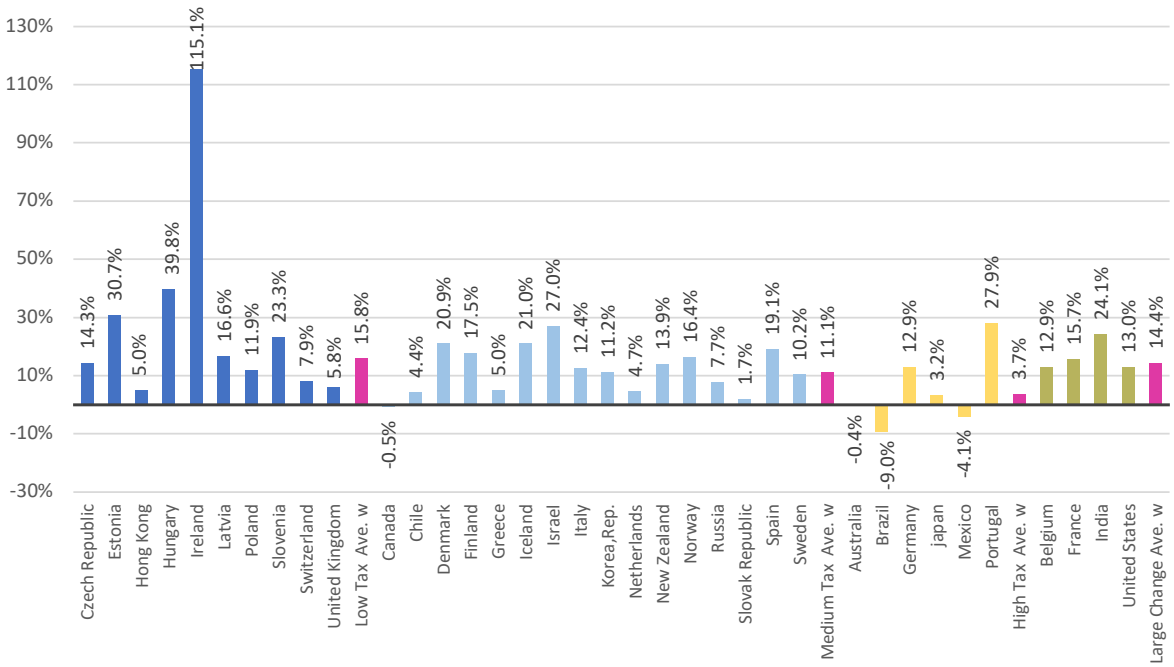
In Figure 7, we compare gross fixed capital formation, or what might be more commonly referred to as investment in physical capital (including both private and public investment) by OECD country. Certainly the commodity downturn affected resource economies most (e.g., Canada, Australia, Brazil and Mexico), although some other resource economies, such as Norway, India, Russia and New Zealand, had growing investment expenditures.

Countries are grouped according to whether a country is (i) high-taxed (corporate rates that are 30 per cent or above), (ii) low-taxed (19 per cent or less), (iii) medium-taxed (corporate tax rates ranging from 20 to 29 per cent) or (iv) experienced significant corporate-tax-rate reductions of at least five points during the period 2016–19. Only Estonia and Latvia tax distributed profits at 20 per cent (reinvested profits are exempt), so we treat these countries as low-taxed.

Once public investment is included, gross fixed capital formation in Canada shrank by 0.5 per cent during these four years, less than the medium-taxed country average (11.1 per cent). This contrasts to low-tax countries, which saw 15.8 per cent growth, with the highest growth being in Ireland (115.1 per cent). High-tax countries had paltry investment growth (3.7 per cent). Those countries that had sharp reductions in corporate rates, all of which had high corporate income tax rates in 2016, had quite good investment growth (14.4 per cent).

Among OECD countries, Canada had the fourth-worst growth in gross fixed capital formation since 2015, even worse than other economies with similar corporate income tax rates. Among the countries where investment is growing fastest, we see low-tax countries, including Ireland, Hungary and Estonia.

Figure 7: Percentage Change in Investment by Country from 2015 to 2019



Note: "Ave. W" represents the GDP-weighted average.

Source: National accounts data via OECD and World Bank.

Obviously, investment depends on multiple factors. The poor Canadian investment performance is partly related to economic adjustment arising from the commodity bust after 2014. However, the lack of investment in other industries is concerning, given its importance to the adoption of new technologies and productivity. Many factors can be considered, but the regulatory environment has been criticized the most.[19] High marginal statutory tax rates at the personal level also imposes a barrier in attracting skilled labour and entrepreneurs. The lack of business investment in the U.S. is explained by a lack of competition and tightened governance; less so by the switch to intangible expenditures or globalization (Gutiérrez and Philippon 2017).[20]

GDP GROWTH PERFORMANCE

Investment enables an economy to produce more product per worker hours — labour productivity. It also has "endogenous" growth effects as companies adopt the latest innovations associated with new vintages of capital. This could lead to a substitution for labour, but it also enables companies to reduce unit costs and become more competitive. As economic studies have shown, investment leads to more demand for

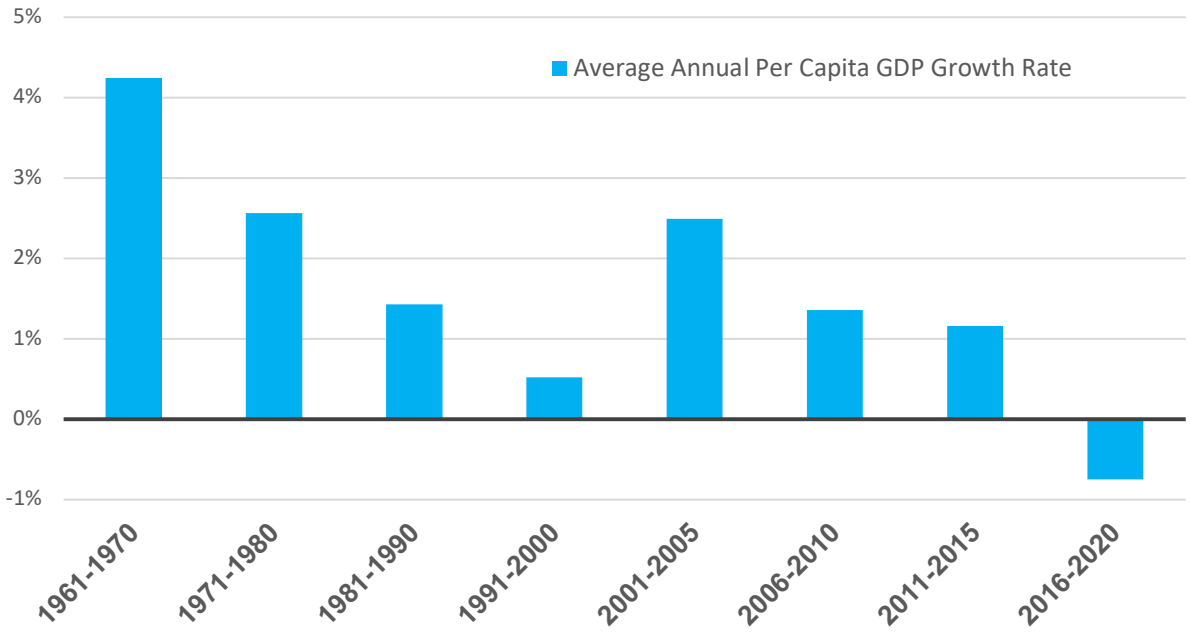
19 See, for example, Deloitte's review of factors impacting investment climate. While Canada's talent, economic stability, access to capital and domestic market support competitiveness compared to other countries, we are weak in innovation, high tax rates and regulation. https://www2.deloitte.com/ca/en/pages/finance/articles/canada-competitiveness-scorecard.html/#accordion1.

20 Investments in intangible assets (research and development, software and mineral exploration) contribute to labour productivity, but the effect is relatively small (Gu and MacDonald 2020).

labour as the growth in output more than compensates for any labour displacement.[21] This has been referred to as "capital deepening," in that workers become more productive and businesses more cost efficient due to capital investment.[22]

Reflecting declining investment, among other factors, Canada's average five-year GDP per-capita growth rate from 2016 to 2020 has turned negative (Figure 8) for the first time since the Great Depression. Although annual per capita GDP growth was exceptional in the early 1960s at over 4.2 per cent, it fell to an average of 0.5 per cent in the 1990s, consistent with Fortin's (1999) observation. It improved after 2000, helped by the commodity boom and, in part, corporate and personal tax reforms, but has swung negative to -0.75 per cent for the five-year period 2016–20. Excluding 2020, the 2016–19 average per-capita growth rate was only 0.45 per cent, similar to the underperforming years 1991–2000. In other words, 2020 swamped whatever little per capita growth Canada experienced in the previous four years.

Figure 8: Average Per Capita GDP Annual Growth Rates in Canada



Source: Statistics Canada, GDP (chained 2012 dollars) and population.

Lower per capita GDP growth can hurt labour compensation as well. In Figure 9 below, we show the relationship between hourly labour-compensation and labour-productivity measures by value-added (or GDP) per working hour by industrial sector.

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21 A typical economic model shows that a reduction in the cost of capital increases demand for capital as well as labour. The increase in demand for workers is driven by a higher return to labour induced by capital. Of course, labour displacement is a major policy concern in that some employees may have difficulty finding new employment unless they are retrained.

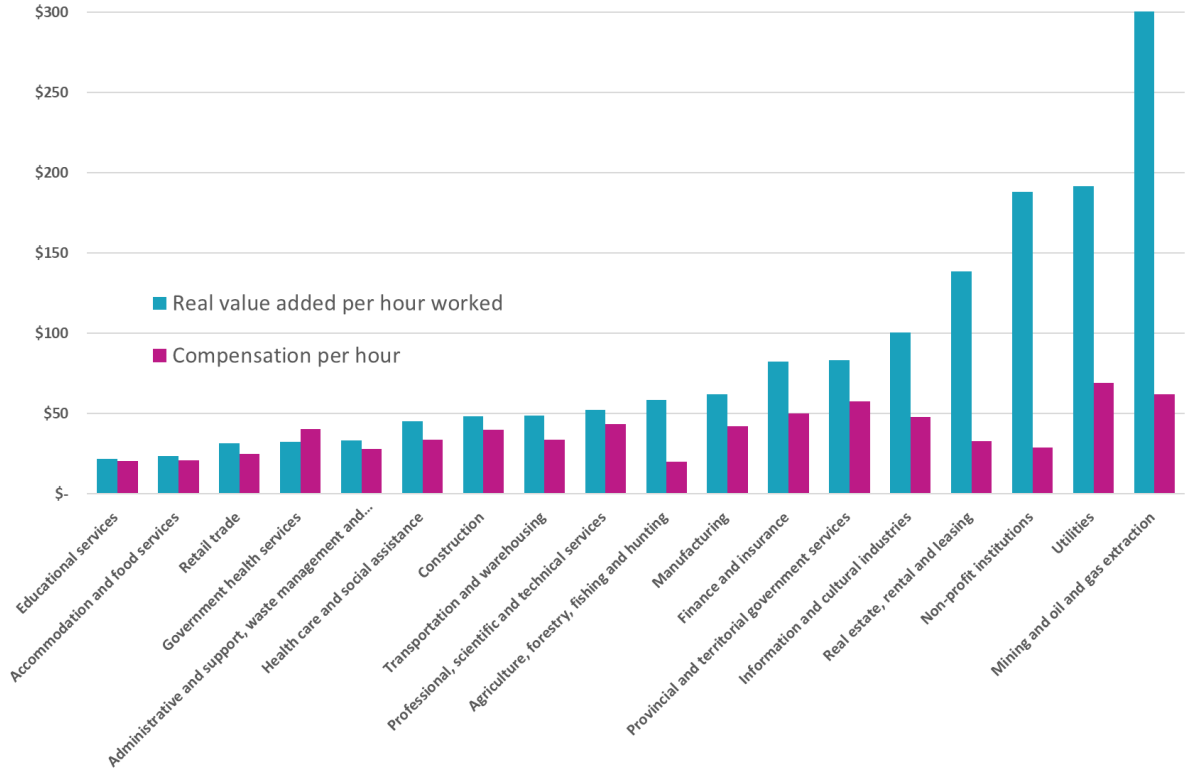
22 The International Labour Organization (2013) concluded in a global review that increases in labour productivity within economic sectors are the main driver of economic growth (rather than sectoral reallocation). However, more recent work suggests that inter-sectoral differences have a large impact on productivity (see footnote 2).

The non-renewable resource sector generates the highest value-added per working hour ($300) and pays the second-highest hourly labour compensation ($62). The regulated utility sector generates the second-highest value-added per working hour ($191) and pays the highest labour compensation ($69 per hour). Manufacturing generates value-added per hour equal to $62 and pays workers on average $42 per hour. Accommodation and food services — notably one of the hardest hit sectors in the pandemic — has the second-least value-added per hour at $23.50, with compensation of $20.90 per hour.[23]

In general, sectors with higher labour productivity tend to pay higher compensation to attract more highly skilled workers. The correlation between value-added per hour and hourly employment compensation is 0.61.

Another point to note is that sectors with high value-added not only better compensate labour, but also capital owners and governments. Thus, improvements in growth also lead to higher household investment income and tax revenues.

Figure 9: Real Value-Added and Employment Compensation per Hour Worked by Sector 2019



Notes: Total compensation per hour worked consists of all payments in cash or in kind made by domestic producers to workers for services rendered. It includes wages and salaries and employers' contributions for employees, plus an imputed labour income for self-employed workers.

Source: Statistics Canada 36-10-0480-01.

23 Note that value-added per working hour is quite high for the non-profit sector. This reflects the significant amount of voluntary labour in the sector that is included in working hours.

DIRECTIONS FOR CORPORATE TAX REFORM

So, what have we learned so far?

- Canada's corporate tax system is attractive to investment in marginal projects, although it is more distortionary, resulting in a greater capital misallocation in the economy since 2016. Canada also has a relatively high corporate income tax rate compared to many countries, thereby making Canada less friendly to projects with high economic rents from lumpy intangible capital or resource investments.
- Canada's pre-pandemic investment performance has been quite disappointing since 2015. Overall, business investment lags that of most countries.
- As a result of weak labour productivity and per-capita GDP growth, companies pay lower labour compensation.

Why corporate tax reform today?

It is important to consider what markets will look like in a post-COVID world once health restrictions can be lifted and economies return to growth. The medium-term implications are the following:

- Some business sectors, such as technology and transportation services linked to home delivery have grown during the recession. Retail and household services markets that do not depend on personal contact will continue to be disrupted by new technologies in future years. The multinational technology sector with large profits and low effective corporate tax rates will be favourite candidates for taxation, such as recently proposed digital taxes on sales either as a presumptive corporate income tax or an expansion of VATs on digital services or both.
- Some sectors were not much affected during the recession, or will have few recovery issues, such as utilities, health care, education, transportation and logistics, finance and insurance, manufacturing, fishing, forestry, construction, mining and public administration. Several sectors, such as health, transportation, technology and manufacturing, will be important for domestic security. If companies develop flexible working arrangements enabling more work-from-home, commercial real estate will be challenged to some extent.
- Some businesses were severely impacted by the pandemic and could take several years to recover, if they recover at all. These include accommodation and food services, tourism, airlines, retail trade, wholesale trade, commercial real estate and certain household and business services that relied on person-to-person contact. The resource sector is springing back to pre-pandemic levels in terms of production and pricing, but faces structural change as the world continues its energy transition.

The pandemic that led to a sharp increase in temporary unemployment initially will eventually result in structural unemployment that could last for long periods. Eventually, the economy will adjust, but during this recovery period significant new

investment is needed. Many have been arguing that Canada should "build back better." If that is the case, our private investment performance needs to be urgently addressed.

Since 2000, Canada has reformed its corporate tax system to improve neutrality and international competitiveness. With respect to international competitiveness, the federal-provincial corporate income tax rate, once the highest among OECD countries in 1999, has been reduced from 43 to 26 per cent. Capital taxes on non-financial businesses have been eliminated, except for provincial-municipal property taxes, which are levied at higher rates on non-residential compared to residential property. Sales taxes on capital purchases have been largely removed, as federal and provincial governments have shifted from one-stage retail sales taxes with significant taxes on business inputs to value-added taxes (only British Columbia, Manitoba and Saskatchewan continue to levy provincial retail sales taxes that result in high METRs, as shown above).

As for neutrality, the difference between large and small corporate income tax rates have been reduced at the federal level (although, not so at the provincial level). The federal government and most provinces have eliminated differences in corporate income tax rates among resource, manufacturing and non-manufacturing sectors. Capital-cost allowances have been adjusted to reflect economic depreciation, except for the renewal of manufacturing-machinery expensing in 2006 and the recent adoption of accelerated depreciation in 2018. Some investment tax credits still linger at the federal and provincial levels.

In recent years, Canada has shifted away from neutrality, with wide differences in tax burdens on business activities, as seen in our METR calculations above. To name a few: accelerated depreciation, the small-business deduction, flow-through-share tax credits, federal and provincial equity-financing credits, small-business enhanced research and development tax credits, the exploration tax credit, the federal Atlantic investment tax credit, provincial manufacturing tax credits, wind and solar tax credits, interest deductions to earn exempt income, and the pension-plan tax exemption for investments in controlled enterprises (Jog and Mintz 2013).

Even though there is a benefit to the rate reductions combined with base-broadening revenue-neutral corporate tax reform that we have pursued since 2000, further effort in this direction will likely achieve limited results. The most significant preferences, such as the small-business deduction and clean-energy and manufacturing tax preferences, are politically driven, so governments will be unwilling to remove them. Even if neutrality could be improved by eliminating tax preferences, many businesses and employees are unlikely to welcome tax hikes in the wake of the severe 2020 recession.

If foreign countries impose minimum taxes on subsidiaries operating in Canada, it could result in tax incentives being less effective in encouraging investment, at least for foreign companies operating here. While this may help reduce some distortions, it will increase taxes paid by foreign companies in Canada relative to domestic companies, as well as deter investment.

We suggest a broader approach to corporate tax reform be considered in the future. That will be a topic left to a forthcoming separate paper.

CONCLUSIONS

In the discussion above, several conclusions were reached. First, Canada's corporate tax system is attractive to investment in marginal projects, although it has become much more distortionary by favouring certain investment activities, including manufacturing, forestry and machinery-intensive businesses, while taxing more heavily services and structure-intensive firms. Second, Canada has a relatively high corporate income tax rate compared to most countries, thereby being less attractive for projects with high economic rents from intangible capital or resource investments. Third, Canada's investment performance has been moribund since 2015, well before the pandemic. Overall, business investment has lagged that of most countries.

As a result of weak labour productivity and per-capita GDP growth, companies pay lower labour compensation.

Canada could further pursue its corporate tax reforms by lowering rates and broadening tax bases. However, if the aim is to simply be at or below the OECD average, tax reform along these lines would have limited effects in spurring investment.

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APPENDIX

Marginal Effective Tax Rates (in per cent)

	Overall	Manufacturing	Service	Difference	Overall	Manufacturing	Service	Difference	Overall	Manufacturing	Service	Difference	Combined CIT Rate	
	2020				2016				2010				2020	2016
Australia	28.1	29.6	28.0	1.6	28.1	29.6	28.0	1.6	28.0	30.6	27.8	2.8	30.0	30.0
Austria	20.6	22.0	20.2	1.8	23.8	25.3	23.4	1.9	24.9	25.2	24.8	0.4	21.0	25.0
Belgium	23.3	24.0	23.2	0.8	23.8	24.4	23.7	0.7	12.8	12.6	12.8	0.2	25.5	34.0
Canada	15.6	9.4	17.6	8.2	20.7	15.7	22.7	7.0	20.8	15.0	24.1	9.1	26.2	26.6
Chile	9.6	12.2	9.1	3.1	8.2	10.6	7.8	2.8	5.8	7.2	5.5	1.7	27.0	24.0
Czech Republic	15.4	17.1	14.6	2.5	15.4	17.1	14.6	2.5	15.2	16.5	14.6	1.9	19.0	19.0
Denmark	13.8	16.2	13.4	2.8	13.8	16.2	13.4	2.8	16.8	18.4	16.6	1.8	22.0	22.0
Estonia	7.1	7.1	7.1	0.0	6.4	6.4	6.4	0.0	6.8	6.8	6.8	0.0	20.0	20.0
Finland	14.4	17.1	13.8	3.3	14.4	17.1	13.8	3.3	18.7	21.1	18.1	3.0	20.0	20.0
France	28.0	30.6	27.6	3.0	35.6	38.7	35.2	3.5	34.6	36.3	34.4	1.9	25.8	38.0
Germany	26.1	29.7	25.0	4.7	25.9	29.4	24.7	4.7	27.2	30.1	26.3	3.8	30.0	29.7
Greece	9.7	10.2	9.6	0.6	12.3	12.9	12.2	0.7	10.0	10.1	10.0	0.1	24.0	29.0
Hungary	10.7	12.1	10.2	1.9	14.4	16.9	13.6	3.3	14.6	16.5	14.0	2.5	9.0	19.0
Iceland	15.1	14.4	15.2	0.8	15.1	14.4	15.2	0.8	13.8	12.0	14.0	2.0	20.0	20.0
Ireland	17.7	18.2	17.5	0.7	12.0	12.0	12.0	0.0	15.8	16.0	15.7	0.3	12.5	12.5
Israel	19.5	21.0	19.3	1.7	20.6	22.1	20.3	1.8	17.5	18.4	17.4	1.0	23.0	25.0
Italy	19.7	19.7	19.7	0.0	-2.0	-2.2	-2.0	0.2	24.8	23.3	25.2	1.9	27.9	31.4
Japan	38.8	39.3	38.6	0.7	38.9	39.4	38.8	0.6	44.9	45.2	44.9	0.3	30.6	30.9
Korea S.	29.3	32.1	28.0	4.1	26.9	29.5	25.8	3.7	28.2	29.3	27.7	1.6	27.5	24.2
Luxembourg	15.6	19.4	15.4	4.0	18.2	22.3	18.0	4.3	18.1	22.7	17.9	4.8	24.9	29.2
Mexico	19.3	21.8	18.7	3.1	19.3	21.8	18.7	3.1	20.1	21.6	19.7	1.9	30.0	30.0
Netherlands	19.2	20.5	19.0	1.5	20.6	21.9	20.4	1.5	21.7	22.7	21.6	1.1	21.7	25.0
New Zealand	19.8	19.9	19.8	0.1	19.8	19.9	19.8	0.1	17.6	14.9	18.0	3.1	28.0	28.0
Norway	20.0	21.1	19.9	1.2	22.5	23.7	22.4	1.3	24.9	24.4	24.9	0.5	22.0	25.0
Poland	11.5	12.0	11.3	0.7	11.5	12.0	11.3	0.7	12.0	12.2	11.9	0.3	19.0	19.0
Portugal	22.1	21.3	22.2	0.9	20.5	19.8	20.6	0.8	20.8	19.5	21.0	1.5	31.5	29.5
Slovak Republic	12.7	15.7	11.9	3.8	12.7	15.7	11.9	3.8	11.2	13.9	10.4	3.5	22.5	21.0
Slovenia	7.4	8.5	7.1	1.4	6.5	7.5	6.2	1.3	8.1	9.3	7.6	1.7	19.0	17.0
Spain	19.0	19.9	18.9	1.0	19.0	19.9	18.9	1.0	24.0	24.4	24.0	0.4	25.0	25.0
Sweden	17.4	18.4	17.2	1.2	18.4	19.4	18.2	1.2	21.6	21.8	21.5	0.3	20.6	22.0
Switzerland	8.3	8.5	8.3	0.2	10.1	10.4	10.1	0.3	15.9	15.6	16.0	0.4	18.0	17.9
Turkey	3.1	5.3	2.5	2.8	3.1	5.3	2.5	2.8	4.2	4.1	4.3	0.2	20.0	20.0
United Kingdom	21.2	24.3	20.8	3.5	23.1	23.7	23.1	0.6	28.8	26.7	29.1	2.4	19.0	20.0
United States	22.6	23.6	22.4	1.2	34.6	39.9	43.8	3.9	34.6	32.1	36.0	3.9	25.7	39.1
Brazil	37.0	17.5	40.1	22.6	37.0	17.5	40.1	22.6	42.0	18.7	45.6	26.9	34.0	34.0
China	20.6	24.3	18.7	5.6	20.6	24.3	18.7	5.6	24.3	27.2	22.9	4.3	25.0	25.0
India	37.7	30.4	39.7	9.3	56.2	42.6	60.0	17.4	57.9	46.6	61.0	14.4	23.3	34.6
Russia	27.2	30.7	26.5	4.2	27.2	30.7	26.5	4.2	28.6	31.0	28.1	2.9	20.0	20.0
Argentina	38	41	37	4	270	364	249	115	35	35	35	1	25.0	35.0
Bangladesh	11.3	11.2	11.3	0.1	12.8	12.8	12.9	0.1	14.5	12.1	15.2	3.1	25.0	27.5
Bolivia	22.2	29.5	20.7	8.8	21.8	29.2	20.3	8.9	22.3	28.9	20.9	8.0	25.0	25.0
Botswana	25.2	25.0	25.2	0.2	24.9	24.7	24.9	0.2	26.8	25.7	26.9	1.2	21.4	21.4
Bulgaria	6.3	7.5	6.0	1.5	6.3	7.5	6.0	1.5	6.6	7.7	6.3	1.4	10.0	10.0
Chad	28.4	33.3	27.3	6.0	28.4	33.3	27.3	6.0	41.4	45.1	40.6	4.5	35.0	35.0
Colombia	21.1	24.9	20.3	4.6	24.9	30.4	23.9	6.5	14.5	20.3	13.3	7.0	30.0	40.0
Costa Rica	23.1	29.7	22.0	7.7	23.1	29.7	22.0	7.7	24.2	29.9	23.3	6.6	30.0	30.0
Croatia	10.4	13.4	9.8	3.6	12.1	15.4	11.4	4.0	13.4	16.9	12.7	4.2	18.0	20.0
Dominican Republic	21.8	25.4	21.1	4.3	21.8	25.4	21.1	4.3	30.6	30.3	30.7	0.4	27.0	27.0
Ecuador	26.6	28.7	26.1	2.6	25.1	26.9	24.7	2.2	30.4	31.8	30.1	1.7	15.0	12.0
Egypt	-6.4	7.3	-10.3	17.6	-6.8	7.3	-10.7	18.0	30.0	33.8	28.9	4.9	22.5	17.6

Fiji	12.5	16.8	11.7	5.1	12.5	16.8	11.7	5.1	18.6	22.8	17.8	5.0	20.0	20.0
Georgia	20.9	22.3	20.7	1.6	20.9	22.3	20.7	1.6	18.1	18.1	18.1	0.0	15.0	15.0
Ghana	5.7	12.9	4.0	8.9	5.7	12.9	4.0	8.9	8.1	11.0	7.4	3.6	25.0	25.0
Guyana	33.8	24.3	34.8	10.5	34.1	27.5	34.8	7.3	34.9	27.5	35.6	8.1	38.8	39.1
Hong Kong	7.6	8.8	7.5	1.3	7.6	8.8	7.5	1.3	7.0	8.7	6.9	1.8	16.5	16.5
Indonesia	17.4	21.0	16.1	4.9	20.9	25.0	19.3	5.7	21.9	24.8	20.8	4.0	20.0	25.0
Iran	7.7	22.7	4.6	18.1	8.3	22.7	5.4	17.3	13.4	20.6	11.9	8.7	25.0	25.0
Jamaica	24.2	22.1	24.4	2.3	31.0	29.8	31.2	1.4	27.3	19.5	28.2	8.7	27.9	27.9
Jordan	16.8	17.3	16.6	0.7	16.8	17.3	16.6	0.7	12.4	14.8	11.7	3.1	19.2	19.2
Kazakhstan	16.1	20.7	15.4	5.3	16.1	20.7	15.4	5.3	11.4	13.8	11.0	2.8	20.0	20.0
Kenya	15.0	3.3	17.1	13.8	18.1	4.1	20.6	16.5	19.8	3.7	22.6	18.9	30.0	30.0
Kuwait	8.8	9.9	8.6	1.3	8.8	9.9	8.6	1.3	9.4	9.6	9.4	0.2	17.0	17.0
Latvia	10.5	10.8	10.5	0.3	7.9	9.9	7.5	2.4	8.3	10.1	8.1	2.0	20.0	15.0
Lesotho	21.3	11.9	23.9	12.0	21.3	11.9	23.9	12.0	23.4	11.9	26.5	14.6	21.8	21.8
Madagascar	14.4	20.2	13.6	6.6	14.4	20.2	13.6	6.6	18.7	23.5	18.0	5.5	20.0	20.0
Malaysia	21.8	25.0	20.5	4.5	20.7	24.0	19.4	4.6	22.5	24.9	21.6	3.3	24.0	24.0
Mauritius	11.6	13.8	11.3	2.5	11.6	13.8	11.3	2.5	7.8	8.9	7.6	1.3	15.0	15.0
Morocco	16.5	21.8	15.0	6.8	16.5	21.8	15.0	6.8	16.9	21.1	15.7	5.4	31.0	31.0
Nigeria	10.1	22.8	8.1	14.7	10.1	22.8	8.1	14.7	12.2	22.1	10.7	11.4	32.0	32.0
Pakistan	33.2	36.3	32.5	3.8	33.9	35.0	33.6	1.4	41.6	42.6	41.3	1.3	30.0	32.0
Panama	18.0	18.2	18.0	0.2	18.0	18.2	18.0	0.2	19.7	20.0	19.7	0.3	25.0	25.0
Paraguay	7.0	9.6	6.0	3.6	7.0	9.6	6.0	3.6	8.5	9.5	8.2	1.3	10.0	10.0
Peru	22.3	22.7	22.3	0.4	20.7	21.6	20.5	1.1	23.7	30.2	22.3	7.9	29.5	27.2
Philippines	26.4	26.8	26.3	0.5	26.4	26.8	26.3	0.5	26.8	26.7	26.8	0.1	30.0	30.0
Qatar	4.7	7.0	4.4	2.6	4.7	7.0	4.4	2.6	5.1	6.9	4.8	2.1	10.0	10.0
Romania	4.4	6.3	3.8	2.5	4.4	6.3	3.8	2.5	4.9	6.1	4.5	1.6	16.0	16.0
Rwanda	16.5	24.8	15.6	9.2	16.5	24.8	15.6	9.2	18.1	24.8	17.4	7.4	30.0	30.0
Saudi Arabia	14.9	16.1	14.7	1.4	14.9	16.1	14.7	1.4	17.5	16.2	17.8	1.6	20.0	20.0
Serbia	17.9	20.1	17.3	2.8	19.2	20.7	18.7	2.0	15.6	16.3	15.4	0.9	15.0	15.0
Sierra Leone	13.7	12.8	13.7	0.9	13.7	12.8	13.7	0.9	22.4	14.9	22.8	7.9	30.0	30.0
Singapore	11.2	9.7	11.5	1.8	10.3	8.7	10.7	2.0	10.5	8.6	11.0	2.4	17.0	17.0
South Africa	13.3	17.3	12.6	4.7	13.3	17.3	12.6	4.7	14.6	17.4	14.1	3.3	28.0	28.0
Tanzania	19.2	20.2	19.1	1.1	19.2	20.2	19.1	1.1	19.8	18.7	19.9	1.2	30.0	30.0
Thailand	29.3	31.5	28.3	3.2	29.3	31.5	28.3	3.2	14.9	18.5	13.2	5.3	20.0	20.0
Trinidad and Tobago	25.1	22.8	25.6	2.8	20.2	18.2	20.6	2.4	20.7	18.7	21.2	2.5	30.0	25.0
Tunisia	18.8	22.9	17.8	5.1	18.1	22.2	17.2	5.0	25.0	28.5	24.2	4.3	27.2	26.2
Uganda	20.2	26.9	19.2	7.7	20.0	26.5	19.0	7.5	18.6	18.5	18.6	0.1	30.0	30.0
Ukraine	-10.9	2.0	-13.9	15.9	-10.9	2.0	-13.9	15.9	-12.8	1.9	-16.2	18.1	18.0	18.0
Uruguay	21.8	18.6	22.5	3.9	23.4	23.5	23.3	0.2	27.0	29.5	26.6	2.9	25.0	25.0
Uzbekistan	22.9	26.3	21.8	4.5	41.1	43.1	40.5	2.6	33.4	33.1	33.5	0.4	12.0	14.9
Venezuela	70.4	70.3	70.4	0.1	65.8	47.9	70.1	22.2	47.4	47.6	47.3	0.3	34.5	34.5
Vietnam	10.9	15.7	9.3	6.4	12.1	17.3	10.4	6.9	14.7	19.9	13.1	6.8	20.0	22.0
Zambia	9.4	20.3	8.2	12.1	9.4	20.3	8.2	12.1	8.9	17.5	8.0	9.5	35.0	35.0
G7 w	25.3				30.7				33.8				26.5	34.1
BRIC w	24.6				26.8				30.2				25.3	26.6
G20 w	24.7				30.7				31.3				26.0	30.9
OECD w	23.4				27.4				29.9				25.8	31.4
Africa w	12.7				12.8				15.0				29.7	29.6
Americas w	24.0				38.9				25.8				26.8	36.7
Asia Oceana w	26.2				27.6				30.6				25.6	30.0
Europe w	21.1				20.4				25.8				23.6	26.2
MENA w	7.9				8.1				25.8				21.0	20.8
94 Country*	18.2				21.4				20.1				23.6	24.5
94 Country w	23.2				28.2				28.9				25.4	29.6

* = Simple average.

W = GDP weighted average.

Parameters Used in METR Model

	Inflation	Tax Depreciation Range	Inventory Accounting	Asset	Capital Input Sale	Capital Transfer	Financial Transfer
	2020	2020		Applicable taxes			
Australia	1.7%	2.6% - 23.9%	Optional			5.6%	
Austria	1.5%	3.1% - 10.6%	Optional			4.6%	
Belgium	1.6%	7.0% - 32.9%	LIFO				
Canada	2.0%	4.0% - 55.0%	FIFO		0.8%	0.5%	
Chile	3.1%	7.5% - 39.7%	LIFO				
Czech Republic	1.7%	3.1% - 20.8%	Optional			4.0%	
Denmark	0.7%	5.1% - 22.7%	FIFO			0.6%	
Estonia	1.3%	9.9% - 21.6%	LIFO				
Finland	0.6%	8.2% - 28.7%	FIFO			4.0%	
France	0.8%	3.1% - 26.5%	Optional			5.1%	
Germany	1.1%	3.1% - 14.4%	LIFO			5.1%	
Greece	-0.1%	5.3% - 39.2%	LIFO				
Hungary	1.8%	3.3% - 48.1%	Optional				
Iceland	2.2%	3.3% - 30.5%	FIFO			1.6%	
Ireland	0.3%	2.0% - 12.4%	FIFO			7.5%	
Israel	0.1%	4.2% - 29.8%	Optional			10.0%	
Italy	0.6%	2.4% - 15.0%	LIFO				
Japan	0.5%	2.0% - 21.3%	Optional	1.4%			
Korea S.	1.1%	2.6% - 20.1%	LIFO			3.5%	
Luxembourg	1.2%	4.1% - 21.0%	Optional			7.0%	
Mexico	4.0%	5.1% - 15.4%	LIFO			3.5%	
Netherlands	1.3%	2.9% - 20.9%	Optional			7.0%	
New Zealand	1.2%	6.8% - 23.9%	Optional				
Norway	2.5%	3.6% - 24.5%	FIFO			2.5%	
Poland	0.9%	2.6% - 25.8%	LIFO				
Portugal	0.8%	2.2% - 19.8%	Optional			0.8%	
Slovak Republic	1.1%	5.0% - 17.3%	Optional				
Slovenia	0.8%	3.5% - 21.6%	Optional				
Spain	0.7%	2.1% - 29.2%	Optional			1.1%	
Sweden	1.3%	3.2% - 19.5%	FIFO			4.3%	
Switzerland	0.1%	5.7% - 31.9%	LIFO				
Turkey	11.7%	12.5% - 48.8%	Optional				
United Kingdom	1.5%	3.0% - 17.7%	FIFO			5.0%	
United States	2.0%	4.0% - 55.0%	Optional	0.3%	3.3%	0.4%	
Brazil	5.8%	4.1% - 11.7%	Optional		12.5%	4.0%	
China	2.0%	7.0% - 14.6%	Optional		1.0%	4.0%	
India	5.3%	5.1% - 35.0%	Optional			6.0%	
Russia	6.8%	3.1% - 20.8%	Optional	1.3%			
Argentina	38.8%	4.1% - 11.7%	LIFO	0.8%			
Bangladesh	5.7%	11.9% - 37.2%	Optional				
Bolivia	2.9%	2.6% - 16.9%	FIFO			3.0%	
Botswana	3.2%	2.5% - 24.5%	Optional			17.5%	
Bulgaria	1.4%	4.0% - 30.2%	Optional			1.6%	
Chad	1.1%	5.1% - 16.2%	Optional			10.0%	

Colombia	4.7%	5.0% - 19.4%	LIFO			
Costa Rica	1.4%	2.1% - 14.0%	LIFO		1.5%	
Croatia	0.4%	5.0% - 29.8%	Optional		4.0%	
Dominican Republic	2.2%	6.8% - 17.7%	LIFO		3.0%	
Ecuador	1.2%	5.0% - 15.0%	LIFO	0.1%		
Egypt	15.8%	5.1% - 26.8%	Optional			
Ethiopia	11.4%	5.0% - 21.0%	Optional			
Fiji	2.9%	5.0% - 17.8%	FIFO			
Georgia	3.9%	7.0% - 21.8%	Optional	1.0%		
Ghana	12.9%	10.0% - 29.6%	Optional		0.6%	
Guyana	1.0%	2.8% - 35.1%	Optional	0.5%		
Hong Kong	2.4%	3.6% - 92.9%	Optional		5.0%	
Indonesia	4.0%	5.1% - 14.0%	Optional		5.3%	
Iran	21.7%	5.0% - 10.4%	Optional		5.0%	
Jamaica	3.6%	3.8% - 12.8%	Optional	0.9%	6.0%	
Jordan	1.4%	4.0% - 23.9%	Optional		9.0%	
Kazakhstan	8.0%	10.0% - 26.0%	Optional	1.5%		
Kenya	6.2%	2.5% - 28.5%	Optional		3.0%	
Kuwait	2.1%	4.2% - 20.4%	Optional			
Latvia	1.7%	10.0% - 40.8%	Optional		2.0%	
Lesotho	4.9%	5.0% - 20.0%	FIFO			
Madagascar	7.1%	5.0% - 16.5%	Optional		5.0%	
Malaysia	1.9%	2.8% - 16.7%	FIFO		2.5%	
Mauritius	1.9%	5.0% - 38.1%	Optional		5.0%	
Morocco	1.2%	7.6% - 33.1%	Optional		3.5%	
Nigeria	13.0%	10.0% - 24.8%	FIFO			
Pakistan	5.2%	10.0% - 25.2%	Optional	1.5%	2.5%	
Panama	0.4%	6.8% - 23.9%	LIFO		2.0%	
Paraguay	3.5%	3.3% - 15.9%	Optional			
Peru	2.7%	4.6% - 20.0%	Optional		3.0%	
Philippines	2.8%	6.8% - 23.9%	Optional			
Qatar	1.0%	5.0% - 19.4%	Optional			
Romania	1.6%	3.4% - 24.7%	LIFO			
Rwanda	4.0%	4.1% - 19.7%	Optional			
Saudi Arabia	1.1%	5.0% - 24.3%	Optional			
Serbia	1.9%	2.5% - 14.8%	Optional	0.4%	2.5%	
Sierra Leone	11.8%	11.0% - 37.1%	Optional			
Singapore	0.1%	3.1% - 24.6%	FIFO		4.0%	
South Africa	4.9%	5.0% - 25.0%	Optional			
Tanzania	4.6%	5.0% - 25.3%	Optional			
Thailand	0.3%	5.0% - 21.0%	Optional			
Trinidad and Tobago	2.3%	10.0% - 24.9%	Optional		7.0%	
Tunisia	5.6%	5.0% - 20.3%	Optional		5.0%	
Uganda	4.3%	5.0% - 29.7%	Optional		2.0%	
Ukraine	20.9%	8.0% - 37.2%	Optional		1.0%	
Uruguay	8.0%	2.8% - 10.0%	LIFO	0.3%	4.0%	
Uzbekistan	11.7%	5.0% - 18.7%	Optional	2.0%		
Venezuela	1120.3%	6.8% - 23.9%	LIFO			
Vietnam	2.6%	3.4% - 25.1%	Optional		0.5%	
Zambia	10.3%	5.1% - 47.3%	Optional		5.0%	

About the Authors

Philip Bazel is a Research Associate at The School of Public Policy at the University of Calgary. In addition to publishing through The School of Public Policy, Philip has also played a role in projects consulting for governments and private organisations in the area of taxation and public finance.

Dr. Jack M. Mintz is the President's Fellow of the School of Public Policy at the University of Calgary after serving as the Palmer Chair and founding Director from January 1, 2008 to June 30, 2015. He also serves on the board of Imperial Oil Limited and is the National Policy Advisor for Ernst & Young. He is also a regular contributor to the *Financial Post* and is a member of the editorial board of *International Tax and Public Finance*. He currently serves as Chair of the Alberta Premier's Economic Recovery Council. Dr. Mintz became a member of the Order of Canada in 2015 as well as receiving the Queen Elizabeth Diamond Jubilee Medal in 2012 for service to the Canadian tax policy community.

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ISSN
ISSN 2560-8312 The School of Public Policy Publications (Print)
ISSN 2560-8320 The School of Public Policy Publications (Online)

DATE OF ISSUE
September 2021

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