School of Public Policy
UNIVERSITY OF CALGARY

BRIEFING PAPER
Volume 17:17
October 2024

Productivity Growth in Canada: What is Going On?

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http://dx.doi.org/10.55016/ojs/sppp.v17i1.80080

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TABLE OF CONTENTS

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EXECUTIVE SUMMARY

Canada is seriously lagging in productivity growth, which is the only means countries have to raise their citizens' standard of living. Overall, Canadian business productivity fell by 0.6 per cent over the past five years. This is in sharp contrast to the United States, which enjoyed a 10.1 per cent increase over the same period. This trend of faster U.S. growth has held true since the mid-1990s, with Canadian productivity rising by about half as much as the American rate. In fact, Canada trails not only the U.S. but all advanced countries in Northern and Western Europe, as well as Australia.

Going by sector, Canada's recent productivity declines have been concentrated in holding companies, transportation and warehousing, construction and manufacturing. The latter three categories are responsible for two-thirds of the decline in productivity. For transportation and warehousing, the effects of the COVID-19 pandemic on travel are a major contributor. For construction, the decline comes from residential and non-residential work, as opposed to engineering construction. For manufacturing, a significant source is transportation equipment manufacturing, particularly in the automotive sector.

Provincially, Alberta, Saskatchewan and Newfoundland and Labrador have the highest productivity, thanks to the oil and gas industry. B.C., Ontario, Quebec and Manitoba are slightly below the national average while the Maritime provinces have productivity levels 25 to 31 per cent lower than the national average.

However, Ontario and Alberta are responsible for the lion's share of Canada's slumping productivity growth, due to their weight in the national economy. Ontario is behind 48 per cent of the decline, while Alberta's share is 22 per cent.

From 2020–23, Canada's capital intensity grew only slightly — not much faster than hours worked. This means that investment has not been high enough to boost productivity. Canadian investment fell from 2.1 per cent annually from 1998–2019 to just 0.5 per cent annually between 2020 and 2023. The main culprits are non-residential buildings (such as offices and factories), along with machinery and equipment. Investment in these capital goods decreased by 5.9 per cent annually in the non-residential sector and by 3.1 per cent in machinery and equipment.

The fall in non-residential investment is likely the result of more people working from home. The fall in machinery and equipment is more puzzling. With tight labour markets, companies should want to invest in automation to save on labour costs, but this doesn't seem to be happening.

Canada has seen essentially no productivity growth in recent years, and much of the decrease is in a few core sectors. The picture is not complete, but since the output of those industries is easy to measure, it suggests that the slowdown is real.

To increase productivity, governments should look at income tax rates, excessive red tape, regulatory harmonization, a lack of competition and barriers to foreign entry into the economy. Governments also need to look at improving their own productivity to avoid crowding out the private sector and to free up resources. There isn't a one-size-fits-all solution. A broad range of policy options are necessary to solve Canada's productivity problem.

INTRODUCTION

As every economic policy-maker and commentator knows, productivity growth is essential in a modern economy if there is to be any sustained growth in living standards. And yet productivity growth in Canada has gone from being disappointingly slow prior to the COVID-19 emergency to stopping altogether. Indeed, Carolyn Rogers, senior deputy governor of the Bank of Canada, made clear her view in a speech in March 2024 that Canada faces a productivity emergency (Rogers 2024). Many if not most of the major challenges that policy-makers in Canada face right now — from dealing with an aging population to building more houses to meeting Canada's defence obligations — will become much more difficult to meet without the additional resources that higher productivity would provide.

In this paper, we look at the recent evolution of productivity growth in Canada in order to better understand the nature of this emergency. We begin by discussing what productivity is conceptually, and how it is measured in practice. We then discuss why economists think productivity is so important, as well as why non-economists do not always share this view. Next, we look at how productivity in Canada has evolved, both recently and over the last few decades, in comparison with the United States. We also compare Canadian productivity levels to other OECD countries. We then look to see if weak productivity growth is concentrated in particular industries or provinces. Next, we decompose the sources of productivity growth into the contributions of labour quality, capital intensity and total factor productivity (TFP) and compare this to the U.S. As weak investment seems to be one of the main contributors to Canada's poor performance, we look more closely at which kinds of capital investment have been the most responsible for this weakness. We conclude with a brief discussion of some of the avenues through which policy-makers could address weak productivity growth.

WHAT IS PRODUCTIVITY AND WHY DOES IT MATTER?

Productivity is a relatively straightforward concept to define. It is the ratio between a measure of real output — that is, output adjusted for changes in prices — and a measure of input. The most common input measure analysts use is a measure of labour effort, either total employment or total hours. This gives you what is known as labour productivity — output per unit of labour effort — and this is the most common measure of productivity. As we shall see later, there are other measures, particularly total factor productivity (TFP), which uses an aggregate of labour and capital as the input. However, labour productivity is the measure that one most often sees in the financial press and in public discourse, partly because it is closely connected to average wages.

In practice, measuring productivity is not as easy. While it is relatively straightforward to calculate total hours worked in the economy, through survey or administrative data, measuring real output is much more complicated. The usual approach is to calculate the output of an industry or economy in actual, nominal dollars, and then use a measure of prices to convert output in a given year to what it would have been in a base year at the prices of that base year. Thus if nominal dollar output doubled, but prices also doubled, we would say that real output had remained constant.

One challenge with this approach is that it is not applicable to sectors of the economy which do not sell their output. These are referred to as the non-business sector, which includes most parts of the public sector, such as defence, education and health care, as well as charities and churches. Statistical organizations calculate nominal output by simply adding up the costs of inputs such as

labour and capital. One cannot construct true productivity data from this measure of nominal output, and so analysts will often focus on the business sector, which is what we will do in this paper.[1]

Even in the business sector, measuring real output can be challenging. While calculating price changes for standardized commodities such as a barrel of oil or a pound of butter is straightforward, calculating prices for goods like cars is not, because their characteristics are changing. While cars are more expensive than they were a generation ago, they are also more fuel-efficient, safer and are packed with electronic gadgets. Once prices are adjusted for this increase in quality, it is not at all clear that they have actually risen. The job of statistical agencies gets even harder when new products — such as smartphones — appear, with no historical price data at all. Harder still are services like social media which are often provided for free, and thus have no price to measure. Although there are ways to address these problems, it is quite likely that measures of real output, and thus productivity, are imperfect, to say the least.

Why should we care about productivity? For economists, the answer is clear: productivity growth is the only way for countries to increase their citizens' standard of living over the long run. Just adding more people may increase overall output but will not necessarily increase income per capita. Working more hours will increase income — albeit at the cost of reduced leisure or home production — but there are only so many hours in the day, which means that this is no way to increase income over the long run. Swings in export prices, particularly for natural resources such as oil, may allow for an increase in incomes without an increase in production. As Canadians and particularly Albertans know well, these prices are volatile, and in general do not rise relative to other prices in the economy over the long run; rather, it's the reverse. Increases in real output per hour have driven the manifold rises in standards of living in every developed country (and most developing countries) since the Industrial Revolution.

Unfortunately, the public does not always share economists' enthusiasm for productivity. The public often associates the word with working harder — working with greater intensity or for longer hours — than working smarter, which means investing in new technologies, hiring more educated workers and using more innovative production methods, which is what economists actually want to see.

Another worry that politicians and the general public can have about productivity growth is that because it means fewer people can produce the same amount of output, it means job losses and higher unemployment. Historically, this has been particularly true when new technologies come along, from the spinning jennies in the late 18th century, to industrial robots in the 1980s, to artificial intelligence today. However, as economists have pointed out time and again, while new technologies can certainly cause dislocation for certain categories of worker, the end result is almost always more output overall, rather than fewer people employed. Worries about overall job loss seem particularly unfounded in Western countries today, with complaints about labour shortages and governments relying on immigration to offset an aging population. There could be some workers who lose relatively well-paying jobs, but a growing economy would provide resources for easing their transition to a different economy.

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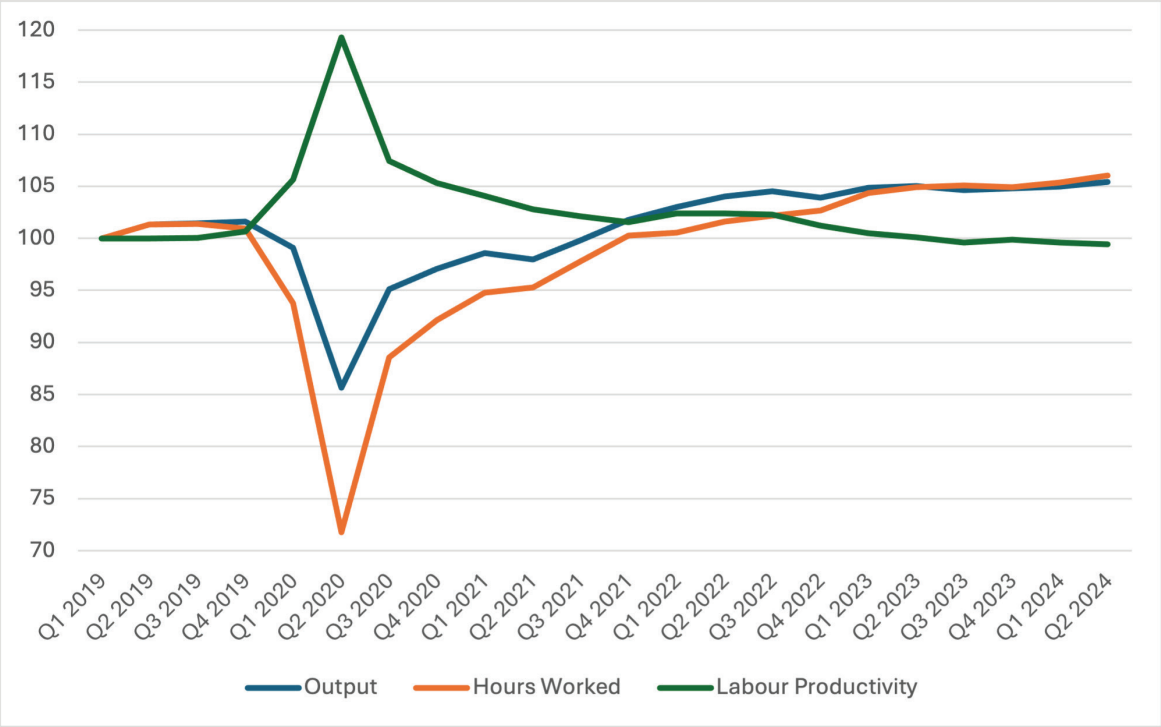
[1] Some statistical agencies, most notably the U.K. Office for National Statistics, do calculate measures of productivity for some parts of the government sector by using direct measures of output. See U.K. Office for National Statistics (2024).

TRENDS IN CANADIAN PRODUCTIVITY GROWTH AND INTERNATIONAL COMPARISONS

SHORT-TERM TRENDS

In Chart 1 below, we show how Canada's productivity has evolved since 2019. Output dipped during the COVID-19 lockdown period in 2020, but subsequently recovered, so that by the second quarter of 2024, output was 5.4 per cent above what it was in the first quarter of 2019. Hours worked dipped even more during COVID-19, and then recovered faster, so that hours worked in 2024Q2 were 6.0 per cent above 2019Q1.

Chart 1. Canada's Short-run Productivity Performance



Source: Statistics Canada Table 36-10-0206-01, Indexes of Business Sector Labour Productivity

Note: Data are for the business sector. Q1 2019=100. Measure is output per hour in 2017 dollars.

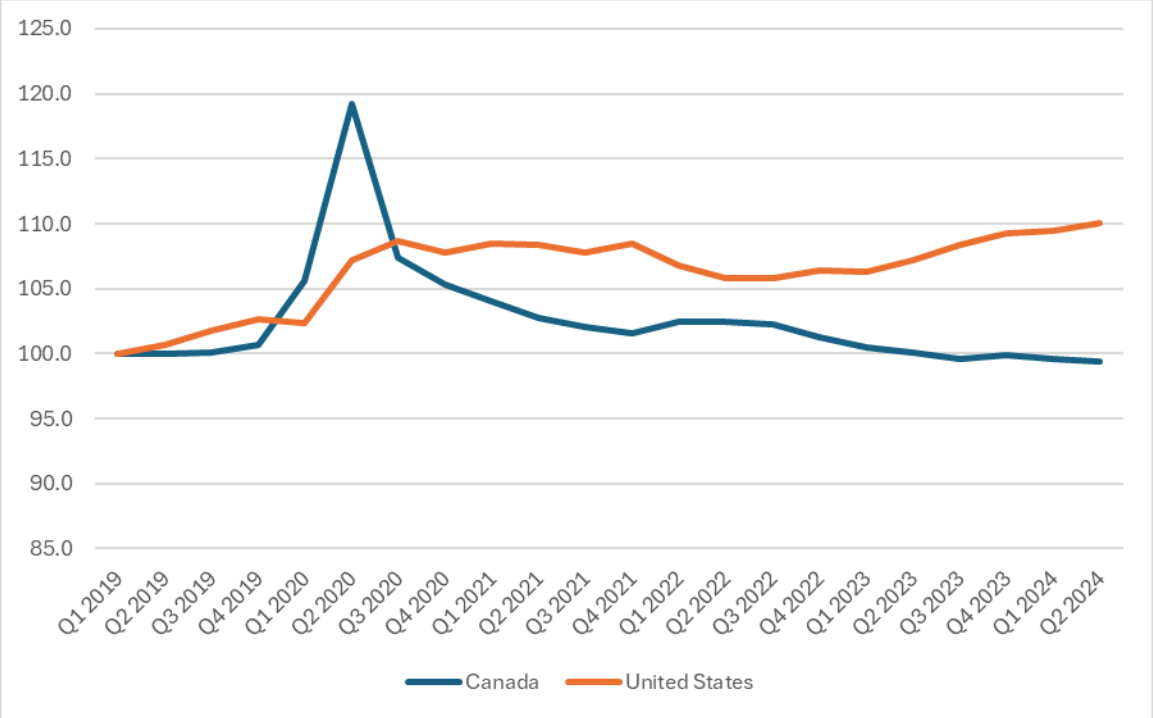
What were the implications for productivity? Because hours declined more than output during COVID-19, productivity rose dramatically. Essentially, the sectors that were disproportionately hit by lockdowns, such as food service and accommodation, also have relatively low productivity, and so the removal of these workers from the workforce raised productivity. Once the lockdowns were over, these workers returned to their jobs and productivity fell back down again. Since then, faster growth in hours worked than in output has meant further declines in productivity.

Overall then, the level of productivity in the Canadian business sector fell by 0.6 per cent between 2019Q1 and 2024Q2, as the 6.0 per cent growth in hours outstripped the 5.4 per cent growth in output. This decline is a significant cause for concern: it is not uncommon for productivity to fall during a recession, as firms keep workers on the payroll so that they can quickly bring them back

when times are better. However, currently the unemployment rate is relatively low and firms are complaining about labour shortages.[2]

The decline in the level of productivity since 2019 becomes all the more troubling when we look at the United States. Chart 2 below compares the productivity performance for the two countries, from 2019Q1 to 2024Q2, for the business sector. One can see that the U.S. had a smaller increase in productivity during COVID-19, likely as a result of less strict lockdowns in many states. However, it did not lose all of its COVID-19 productivity gains, and recently productivity has been growing at healthy pace. As a result, productivity was 10.1 per cent higher in the U.S. in 2024Q2 than it was in 2019Q1, compared to Canada, where, as we have seen, productivity is slightly below 2019Q1 levels.

Chart 2. Comparative Productivity Performance of Canada and the United States Since 2019Q1



Sources: Statistics Canada Table 36-10-0206-01, Indexes of Business Sector Labour Productivity; U.S. Bureau of Labor Statistics, Productivity and Cost

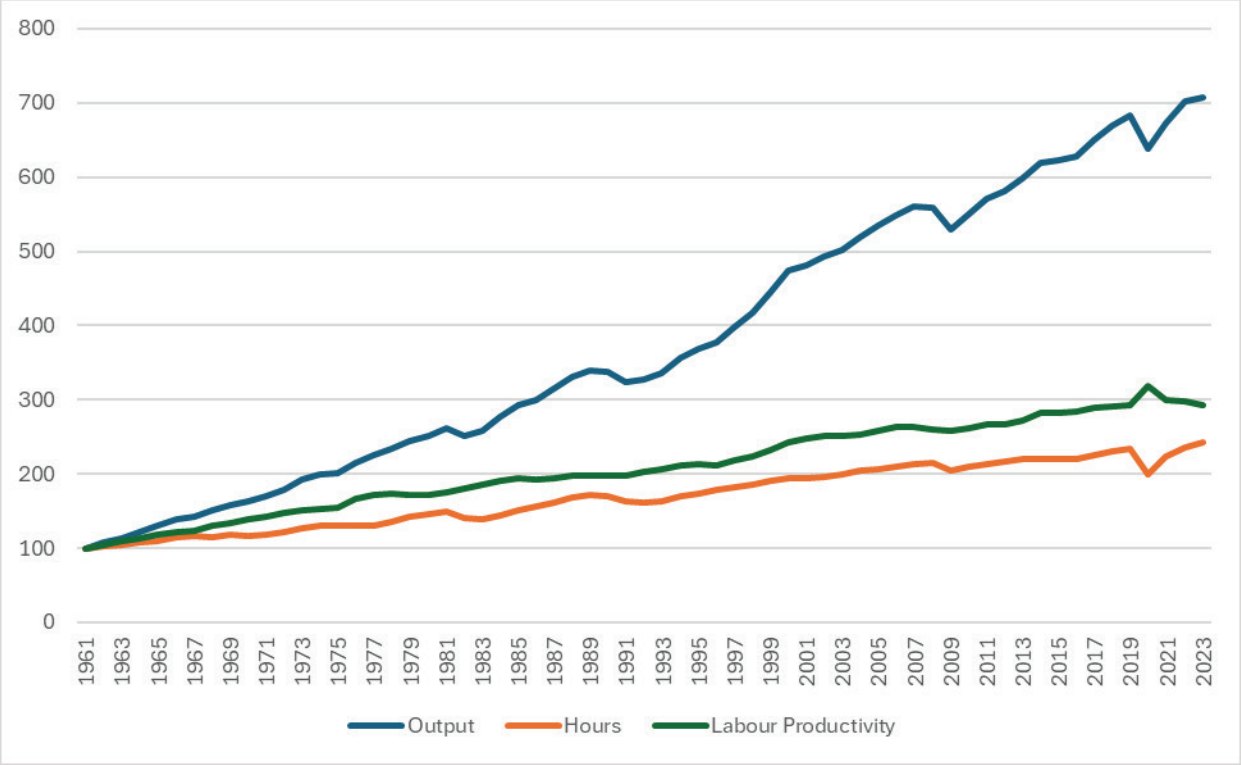
Note: Data are for the business sector (Canada), and non-farm business sector (U.S.). Q1 2019=100. Measure is output per hour in 2017 dollars.

[2] See Canadian Federation of Independent Business (2023).

LONGER TERM TRENDS

Chart 3 shows the growth of output, hours and labour productivity (measured as output per hours) for the business sector in Canada since 1961. Over this 62-year period, total output increased seven-fold. This was partly the result of total hours more than doubling — entirely the result of population growth since average hours fell — and a tripling of productivity. This is an impressive performance; notable also though is that productivity growth has been falling. In the 30 years between 1961 and 1991 productivity doubled; however, over the next 30 years productivity only increased by half.

Chart 3. Canada's Long-run Productivity Performance

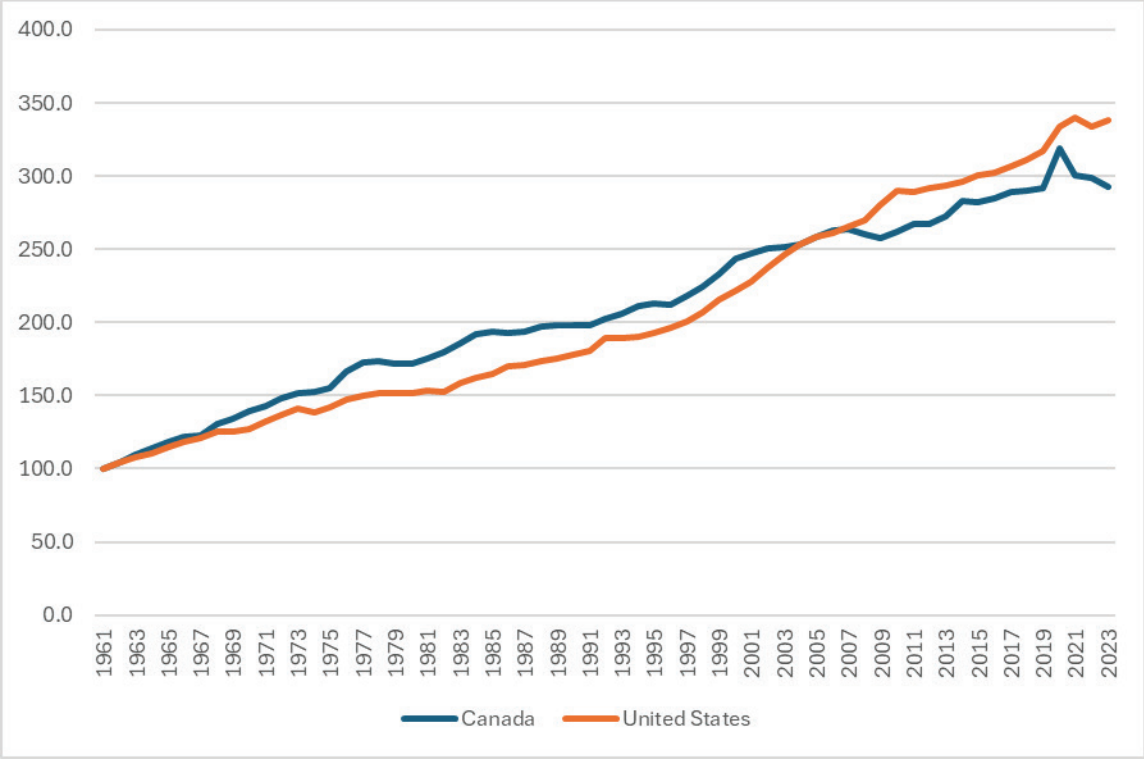


Sources: Statistics Canada Table 36-10-0208-01, Multifactor Productivity, Value-added, Capital Input and Labour Input in the Aggregate Business Sector and Major Sub-sectors, By Industry; Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent with the Industry Accounts

Note: Data are for the business sector. Q1 2019=100. Labour productivity measure is output per hour in 2017 dollars.

We next compare Canadian productivity growth to the United States. Chart 4 below shows how the level of productivity has changed in both countries since 1961. Canadian productivity grew faster than in the U.S. up to the late 1970s, but subsequently slowed. Indeed, since about the mid-1990s the U.S. has had considerably faster productivity growth than Canada, with U.S. productivity growing 75 per cent between 1995 and 2023, whereas in Canada productivity grew by only 37 per cent — half as much.

Chart 4. Comparative Productivity Performance of Canada and the United States Since 1961



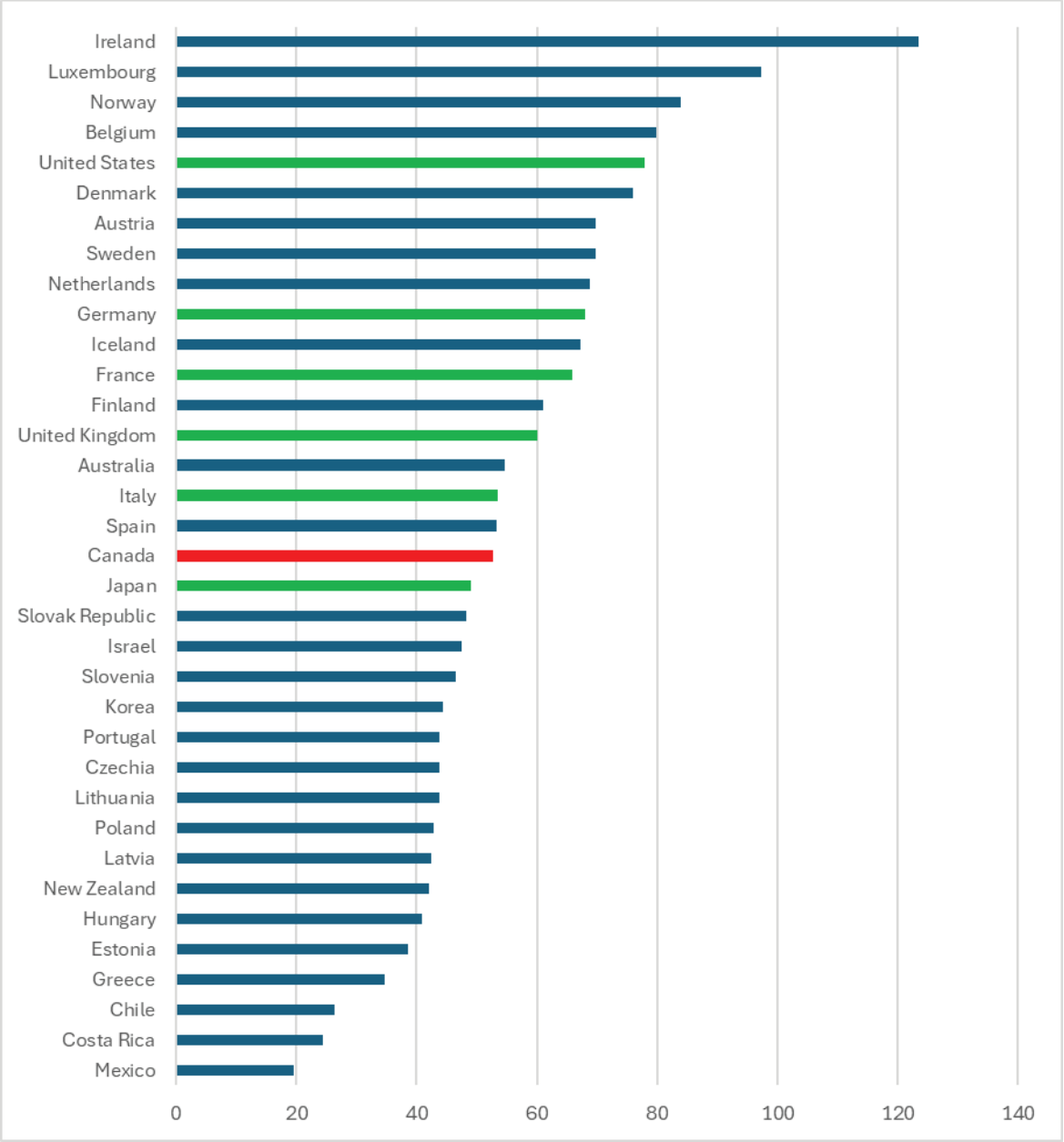
Sources: Statistics Canada Table 36-10-0208-01, Multifactor Productivity, Value-added, Capital Input and Labour Input in the Aggregate Business Sector and Major Sub-sectors, By Industry; Table 36-10-0480-01, Labour Productivity and Related Measures by Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts; U.S. Bureau of Labor Statistics: Annual Labor Productivity and Related Measures for Major Sectors.

Note: Data are for the business sector (Canada), and non-farm business sector (U.S.). Q1 2019=100. Measure is output per hour in 2017 dollars.

COMPARISON TO OTHER OECD COUNTRIES

Thus far, we have been looking at the rate of productivity growth, but ultimately what we care about is the level of productivity. Chart 5 shows the comparative levels of productivity across the OECD for 2023. (Unlike the other data we show in this paper, these data are for the entire economy). While Canada certainly has higher productivity levels than developing countries such as Mexico and Chile, and higher levels than former Soviet-bloc countries such as Poland and Czechia, Canada lags all other advanced countries in Northern and Western Europe, as well as the U.S. and Australia. Canada is sixth out of the seven G7 countries, and lags even countries such as Spain or Italy. At US$52.80 per hour (in 2015 dollars), Canada's productivity is 12 per cent below the U.K., 20 per cent below France and 32 per cent below the U.S.

Chart 5. Comparative Productivity Levels in the OECD



Source: OECD Productivity Database

Note: Data are for total economy. Measure is US dollars per hour at purchasing power parity. Constant 2015 prices.

Canada is slightly ahead of Japan and Korea; however, it should be noted that these countries have quite inefficient and fragmented service sectors. Nonetheless, they have high levels of productivity in their export-oriented manufacturing industries.

INDUSTRY BREAKDOWN

In this section, we look at productivity by industry. As noted above, we do not have proper measures for the government sector, including publicly funded health and education, and so we focus on the business sector.

In Table 1 below, we show the share of business sector output and productivity levels for each of 19 different industries. Five of these industries are in the goods sector, which accounts for 36.9 per cent of overall business sector output. Manufacturing is the largest sector, accounting for 13.6 per cent of output; productivity in that sector is $67.20, well above the economy-wide average of $59.10. Construction, accounting for 10.2 per cent of output, has below average productivity — $48.10 per hour. Mining, oil and gas, 7.8 per cent of output, has very high productivity indeed — $196.60 per hour — which reflects its high levels of capital input.

Table 1. Output Shares (2019) and Productivity Levels (2023) By Industry

	Share of Business Sector Output	Productivity Level
Business sector industries	100.0	59.10
Goods-producing businesses	36.9	71.10
Agriculture, forestry, fishing and hunting	2.4	58.50
Mining and oil and gas extraction	7.8	196.30
Utilities	3.0	196.60
Construction	10.2	48.60
Manufacturing	13.6	67.20
Service-producing businesses	63.1	54.00
Wholesale trade	7.0	72.20
Retail trade	6.8	35.60
Transportation and warehousing	6.5	45.60
Information and cultural industries	4.2	102.00
Finance and insurance	9.0	89.80
Real estate, rental and leasing	6.4	159.10
Professional, scientific and technical services	8.5	58.20
Holding companies	0.4	21.00
Administrative etc.	3.8	36.20
Educational services	0.3	33.70
Health care and social assistance	4.0	48.70
Arts, entertainment and recreation	0.9	34.90
Accommodation and food services	3.2	25.30
Other private services	2.1	29.30

Source: Statistics Canada Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts

Notes: Share of business sector output is measured as a share of nominal output in 2019. Productivity measure is output per hour in 2017 dollars.

Turning to the service sector, which accounts for the other 63.1 per cent of business sector output, we can see that the largest sector is finance and insurance, which accounts for nine per cent of output, and which has above average productivity of $89.80. The next largest is professional, scientific and technical services, which accounts for 8.5 per cent of output and has slightly below average productivity of $58.20. The highest productivity levels are in real estate, rental and leasing ($159.10) and information and cultural ($102.00), whereas the lowest are in holding

companies ($21.00) and accommodation and food services ($25.30). As with the goods sector, the most capital-intensive sectors have the highest productivity levels.

What are the trends in productivity growth across these different industries? The first two columns of Table 2 show the average rate of productivity growth for two periods: 1998 (which is when the data begin) to 2019, and 2020 to 2023. Overall, there was a very significant decline in productivity growth, as we have seen, with business sector productivity growth falling from an annual growth of 1.3 per cent over 1997–2019, to essentially no productivity growth at all over 2020 to 2023. The third column shows the change in the growth rate — the difference between the 2020–2023 number and the 1997–2019 number.

Table 2. Change in Productivity Growth Rates By Industry 1998–2019 vs. 2020–2023

	1998-2019	2020-2023	Change in Growth Rate	Contribution to Growth
Business sector industries	1.3	0.0	-1.3	-1.3
Goods-producing businesses	1.4	-1.2	-2.6	-1.0
Agriculture, forestry, fishing and hunting	3.9	2.1	-1.8	0.0
Mining and oil and gas extraction	-0.4	-0.5	-0.1	0.0
Utilities	0.8	-2.2	-2.9	-0.1
Construction	0.4	-2.6	-3.0	-0.3
Manufacturing	1.6	-0.4	-2.0	-0.3
Service-producing businesses	1.5	0.6	-0.9	-0.6
Wholesale trade	2.9	1.0	-2.0	-0.1
Retail trade	2.2	1.9	-0.3	0.0
Transportation and warehousing	1.1	-2.5	-3.6	-0.2
Information and cultural industries	2.1	0.4	-1.8	-0.1
Finance and insurance	2.2	1.6	-0.6	-0.1
Real estate, rental and leasing	1.0	2.0	1.0	0.1
Professional, scientific and technical services	0.9	0.0	-0.9	-0.1
Holding companies	2.2	-20.4	-22.6	-0.1
Administrative etc.	0.4	-1.4	-1.8	-0.1
Educational services	0.6	5.8	5.2	0.0
Health care and social assistance	-0.3	-1.2	-0.9	0.0
Arts, entertainment and recreation	-0.5	1.0	1.5	0.0
Accommodation and food services	0.8	0.6	-0.2	0.0
Other private services	1.5	1.6	0.1	0.0

Source: Statistics Canada Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts

Notes: Share of business sector output is measured as a share of nominal output. Productivity measure is output per hour in 2017 dollars. Contribution to growth is calculated using 2019 nominal output shares. Averages are compound annual averages.

Overall, productivity growth fell by 1.3 percentage points between the 1998–2019 period and 2020–2023. The biggest declines were in holding companies (-22.6 percentage points), transportation and warehousing (-3.6 percentage points) and construction (-3.0 percentage points). A few industries improved: educational services (5.2 percentage points) and arts, entertainment and recreation (1.5 percentage points).

However, because an industry such as holding companies is a very small share of output (only 0.4 per cent), its contribution to the decline in overall business sector productivity growth is minimal. What matters is declines in productivity growth in industries that are a significant share of output. This information is provided in the fourth column, which shows each industry's contribution to the decline in overall output growth. From this, we can see that the key contributors to the 1.3-percentage-point decline in productivity growth between 1998–2019 and 2020–2023 are construction and manufacturing, each of which explains 0.3 percentage points, or just under a quarter, of the decline. Transportation and warehousing explains another 0.2 percentage points, or about a fifth, of the decline. In total then, 62 per cent of the decline in productivity growth comes from three industries that account for 30 per cent of output. Had productivity growth in these industries not dropped, overall business sector productivity growth would have been 0.8 per cent over the 2020–2023 period, as opposed to being flat.

What explains the fall in productivity growth in these three sectors? The drop in productivity growth in transportation and warehousing is partly attributable to urban transit and air transportation, both of which were heavily affected by lower passenger levels due to COVID-19. Truck and rail transportation also saw significant declines as a result of a supply shortage partly attributable to COVID-19. The declines in construction and manufacturing are more puzzling. In construction, the declines come largely from residential and non-residential construction, so houses, apartment buildings and office buildings, rather than engineering construction — mines and pipelines. In manufacturing, about a third of the two-percentage-point decline in productivity growth is attributable to transportation equipment manufacturing, particularly the auto sector.

PROVINCIAL BREAKDOWN

We turn now to an examination of productivity trends by province. In Table 3 below, we show output shares and productivity levels for the 10 provinces (we exclude the Territories because of their small size). Unsurprisingly, Ontario and Quebec account for the largest share of national output, given their large population size. Interestingly, Alberta accounts for more of national output (16 per cent) than British Columbia (13 per cent), despite its smaller population. This is because of Alberta's much higher productivity, which is in turn linked to its oil and gas industry. Indeed, the provinces with the highest productivity (20 to 28 per cent above the national average) — Saskatchewan, Alberta and Newfoundland and Labrador — all have oil and gas sectors. All the other provinces have productivity levels below the national average. In the case of B.C., Ontario, Manitoba and Quebec, their productivity levels are only a little below (four to eight per cent) the national average. The three Maritime provinces lag further behind, with productivity levels 25 to 31 per cent lower than the national average.

Table 3. Output Shares (2019) and Productivity Levels (2023) By Province

	Share of National Output	Productivity Level
Canada	100.0	59.10
Newfoundland and Labrador	1.5	70.60
Prince Edward Island	0.3	40.50
Nova Scotia	1.6	43.70
New Brunswick	1.4	44.40
Quebec	19.5	55.00
Ontario	38.7	56.70
Manitoba	3.0	54.30
Saskatchewan	3.8	75.90
Alberta	16.9	75.00
British Columbia	12.9	57.50

Source: Statistics Canada Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts

Notes: Data are for the business sector. Share of national output is measured as a share of nominal output in 2019. Productivity measure is output per hour in 2017 dollars.

Which provinces are most responsible for the decline in productivity between 1997–2019 and 2020–2023? Table 4 below addresses this question. The largest decline in productivity (-5.4 per cent) was in Newfoundland and Labrador, reflecting the decline in the high-productivity oil and gas sector. Other provinces saw declines of between -2.6 per cent (Manitoba) and -0.7 per cent (Quebec), except for B.C., which only saw a decline of 0.2 per cent. The two provinces driving the decline in national productivity growth were Ontario (0.6 percentage points, or 48 per cent of the decline) and Alberta (0.3 percentage points, or 22 per cent of the decline). This is a combination of their weight in the national economy (almost half), and the above average declines in productivity in these provinces.

Table 4. Change in Productivity Growth Rates By Province 1998–2019 vs. 2020–2023

	1998-2019	2020-2023	Change in Growth Rate	Contribution to Growth
Canada	1.3	0.0	-1.3	-1.3
Newfoundland and Labrador	2.2	-3.1	-5.4	-0.1
Prince Edward Island	1.1	-0.5	-1.7	0.0
Nova Scotia	1.3	-0.2	-1.6	0.0
New Brunswick	1.1	-0.5	-1.6	0.0
Quebec	1.3	0.6	-0.7	-0.1
Ontario	1.2	-0.3	-1.6	-0.6
Manitoba	2.0	-0.5	-2.6	-0.1
Saskatchewan	1.5	0.5	-1.0	0.0
Alberta	1.0	-0.8	-1.8	-0.3
British Columbia	1.4	1.1	-0.2	0.0

Source: Statistics Canada Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts

Notes: Data are for the business sector. Share of national sector output is measured as a share of nominal output. Productivity measure is output per hour in 2017 dollars. Contribution to growth is calculated using 2019 nominal output shares. Averages are compound annual averages.

TRENDS IN THE COMPONENTS OF PRODUCTIVITY GROWTH

Since the seminal work of Robert Solow (1956), economists have generally divided the sources of productivity growth into three main components. The first is the growth in capital intensity, which is the amount of capital each worker has. The capital stock includes not just tangible capital, such as factories, mines, office buildings and machinery and equipment, but also intangible capital such as intellectual property. The second component is the quality of the labour force, or how much human capital the average worker has. This is usually measured by the workers' education and experience levels. The third component is total factor productivity (TFP), and it is that portion of productivity growth that cannot be explained by the growth in the capital stock or labour quality. Instead, it is the result of such things as advances in technology (e.g., microchips) or changes in how production is organized (e.g., the assembly line). Statistical agencies calculate TFP by subtracting the assumed contributions of capital stock growth and labour quality growth from labour productivity growth, so that measured TFP is actually the residual that cannot be explained by these other two factors; for this reason, TFP is often called the Solow residual, or even a "measure of our ignorance."[3]

In Table 5 below, we break labour productivity growth down into these three components. Productivity growth during the 1998–2019 period was mostly driven by growth in capital per hour worked, accounting for 0.9 percentage points of the 1.3 per cent annual average increase. This increase in capital intensity is partly explained by the surge in investment in the energy sector over this period. Labour quality and TFP growth contributed less than 0.3 and 0.2 percentage points, respectively.

(One caution here is that increases in labour quality largely reflect increases in educational attainment. However, almost all of recent labour force growth is driven by immigration, and while immigrants often have significant educational attainment, employers don't often value this. As a result, the recent growth in labour quality may be overestimated, and the recent rapid increase in immigration may be putting down pressure on productivity).

Table 5. Labour Productivity By Component – Canada

	1998-2019	2020-2023	Change in Growth Rate
Labour Productivity Growth	1.3	0.0	-1.3
Contribution of Capital Intensity	0.9	0.1	-0.8
Contribution of Labour Quality	0.3	0.3	0.0
Total Factor Productivity Growth	0.2	-0.3	-0.5

Sources: Statistics Canada Table 36-10-0208-01, Multifactor Productivity, Value-added, Capital Input and Labour Input in the Aggregate Business Sector and Major Sub-sectors, By Industry; Table 34-10-0163-01, Flows and Stocks of Fixed Non-residential and Residential Capital, By Sector and Asset, Provincial and Territorial; Table 36-10-0480-01, Labour Productivity and Related Measures By Business Sector Industry and By Non-commercial Activity Consistent With the Industry Accounts; author's calculations

Notes: Data are for the business sector. Labour quality data for 2023 estimated from 2019 growth rate. Capital intensity data for 2023 estimated from quarterly capital stock data and total hours worked data. Averages are compound annual averages. Labour productivity growth is the sum of the contributions of capital intensity, labour quality and TFP growth.

[3] See Hulten (2000).

Over the 2020–2023 period, capital intensity grew only slightly. While the capital stock did grow, it did not grow much faster than hours worked, leaving capital intensity largely unchanged. In other words, investment has not been high enough to boost productivity, unlike the earlier period, when it accounted for more than half of productivity growth. TFP actually fell over the 2020–23 period, by 0.3 per cent annually.

It is interesting to compare these numbers to those in the U.S., which we do in Table 6. As we saw earlier, the U.S. has had much higher productivity growth than Canada for several decades: for the period 1998–2019, productivity growth averaged 2.2 per cent, well above Canada's 1.3 per cent. Interestingly, all that differential can be accounted for by higher TFP growth, the contribution of capital intensity and labour quality were the same.

Table 6. Labour Productivity By Component – United States

	1998-2019	2020-2023	Change in Growth Rate
Labour Productivity Growth	2.2	1.6	-0.6
Contribution of Capital Intensity	0.9	0.8	-0.1
Contribution of Labour Quality	0.3	0.3	0.0
Total Factor Productivity Growth	1.0	0.5	-0.5

Source: U.S. Bureau of Labor Statistics, Office of Productivity and Technology, Annual Total Factor Productivity and Related Measures for Major Sectors

Notes: Data are for the business sector. Contributions estimated using average factor shares. Averages are compound annual averages. Labour productivity growth is the sum of the contributions of capital intensity, labour quality and TFP growth.

Turning to the 2020–2023 period, the U.S. saw a fall in annual TFP growth of 0.5 percentage points — the same as in Canada. The contribution of the growth of labour quality was constant, and similar to Canada. The big difference between the U.S. and Canada is that the U.S. did not have a significant fall in the growth of capital intensity. In other words, U.S. businesses continued to invest enough to keep the capital stock growing significantly faster than hours worked. As a result, while productivity growth dropped after 2019, it only did so by half as much as the drop in Canada.

Why has capital intensity — capital per worker hour — been so slow? To examine this question more closely, we can break down investment in the capital stock into its four main components, which we do in Table 7 below. (Note, unlike Table 5, which measures the contribution of capital per worker hour to productivity, here we look at the volume of investment, so the change in the capital stock). The main contributors to the slowdown in the growth of investment from 2.1 per cent annually over 1998–2019 to only 0.5 per cent annually over 2020–2023 are non-residential buildings (such as office buildings and factories) and machinery and equipment. Investment in both these types of capital goods has actually declined, with investment in non-residential buildings declining by 5.9 per cent annually and machinery and equipment by 3.1 per cent annually. Meanwhile, investment in engineering construction (mines and pipelines, for example) has continued to grow, and investment in intellectual property products (such as software) is actually growing a little faster than before.

Table 7. Investment by Major Component

	1998-2019	2020-2023	Change in Growth Rate	Contribution to Growth
Total non-residential	2.1	0.5	-1.6	
Non-residential buildings	1.0	-4.9	-5.9	-0.7
Engineering construction	3.0	2.8	-0.2	-0.1
Machinery and equipment	1.3	-1.8	-3.1	-1.0
Intellectual property products	2.9	4.0	1.0	0.2

Sources: Statistics Canada Tables 34-10-0097-01 and 34-10-0163-01, Flows and Stocks of Fixed Non-residential and Residential Capital, By Sector and Asset, Provincial and Territorial

Note: Data are for non-residential investment in the business sector, in 2017 constant prices. Contributions estimated using average factor shares. Averages are compound annual averages.

The decline in non-residential investment is likely related to increased working from home due to COVID-19; there is little incentive to invest in large office towers when people are less likely to need them. The decline in machinery and equipment investment is more worrying. With labour markets fairly tight after COVID-19, one would have expected firms to want to invest in labour-saving machinery. This does not seem to have occurred.

CONCLUSIONS

Productivity matters enormously for Canadians' economic well-being; yet Canada has seen essentially no growth in productivity in recent years, despite healthy growth in the U.S. As a result, Canada now has lower levels of productivity than most other advanced economies.

Much of the overall decline in productivity is concentrated in a few key industries, including manufacturing, construction and transportation. These are sectors where output is relatively easy to measure; this implies that the slowdown is real and not simply a result of our inability to account for factors such as quality improvements. From a provincial perspective, Ontario and Alberta are the main contributors to the decline.

When we break down productivity growth into its main components, we find that a reduction in capital investment per hour, particularly in machinery and equipment and non-residential buildings, is responsible for much of the decline in productivity growth since 2019. This is consistent with the weakness in the capital-intensive sector of manufacturing. While COVID-19 has affected investment in a few sectors, such as urban transit, the fact that in the U.S. capital investment has kept pace with labour force growth suggests COVID-19 is not the primary culprit behind the weakness in investment.

On the other hand, TFP growth — the portion of productivity growth not explained by changes in labour quality and capital intensity — fell in both Canada and the U.S. While it is tempting to blame this on the post-COVID-19 trend towards working from home, this is probably premature. Nonetheless, it does seem plausible that some common factor is pulling down growth in both countries.

Overall, weak investment is the most obvious explanation for why productivity growth in Canada has been weak, relative both to past performance and to the U.S. However, the weakness of TFP suggests other factors are also at play. Construction stands out as an industry where productivity levels are falling for reasons that go beyond weak capital investment.

What might be some ways to increase productivity? One area to look at would be the tax system. While measuring the competitiveness of Canada's corporate income tax system relative to other countries is a complicated task, the Trump administration's corporate tax reforms certainly made Canada less attractive relative to the U.S. than it used to be. High personal tax rates discourage saving and therefore investment, as well as incentivizing talented people to move to the U.S. with its lower personal tax rates.

Another place to look would be Canada's regulatory system. The environmental assessment system in Canada is onerous and lengthy. According to Pierre Gratton, president and CEO of the Mining Association of Canada, it takes 10–15 years for a new mine to be built in Canada.[4] Residential and commercial building construction can also be impeded by lengthy and onerous planning and inspection regimes at the municipal level. More generally, different regulatory systems at the provincial level make it harder for goods and labour to move around the country, with significant economic costs.[5]

Economists also fret about the lack of competition in Canada, given the small and spread-out nature of the Canadian economy, as well as the explicit barriers to foreign entry in sectors such as airlines, banking and telecommunications.[6] Lack of competition reduces the pressure on firms to invest and innovate, which in turn stifles productivity growth.

What about the quality of the labour force? Does Canada need to invest more in human capital, by encouraging more education, or more immigration of educated people? One of the ironies of Canada's present situation is that the formal schooling level of a Canadian worker has never been higher, with post-secondary education rates that are very high compared to the rest of the OECD. Furthermore, immigration into Canada is the highest in 50 years, with immigrants having significantly higher education levels than the Canadian-born, which has helped keep measured labour quality growing.

However, Canada might be hitting diminishing returns to increasing levels of human capital. If higher levels of education simply serve as a signal of underlying ability rather than that the individual has acquired skills useful to an employer, then more education, while beneficial to the individual, does not improve productivity. Furthermore, as noted above, while immigrants may have high levels of education, it is not clear that employers recognize the value of their credentials. The average new arrival in Canada, whether permanent or temporary, earns significantly less than their Canadian counterparts, and this is truest at higher education levels.[7] In this case, measures of labour quality may be overstating the importance of education to productivity growth.

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4 See Gratton (2023).
5 See Manucha and Tombe (2024).
6 See, for example, Geloso (2024).
7 See Sargent (2024).

Finally, there is government itself. Although, government productivity doesn't enter directly into the business sector productivity statistics, government spending can nonetheless have an important influence on productivity. First, government takes productive resources — capital and labour — away from the rest of the economy (unless there is a recession and resources are lying idle). This process is called "crowding out." Between 2015 and 2023, hours worked in the public sector grew much faster than in the private sector, so that the public sector increased its share of total hours from 18.3 per cent to 19.3 per cent. Second, many things that governments do — such as providing infrastructure, publicly provided R&D and even health care — can have a direct impact on private-sector productivity. Improving government productivity so that government can contribute more to private sector productivity while freeing up resources for the private sector, would be another way to boost business sector productivity.

To conclude, Canada has a very serious productivity problem, and the country risks slipping further behind not just the U.S., but behind other OECD countries such as the U.K. and France, which we consider our peers. Weak investment is the most important driver of this decline, but certainly not the only factor. Governments will have to look seriously at a broad range of policy options to improve private-sector incentives to innovate and invest, as well as looking to their own operations to make sure that government is as efficient as possible, and not placing too great a burden on Canada's private sector.

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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
October 2024

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