Understanding Productivity Trends and Policy Pathways in Canada

September 26, 2024

Presentation to the Strategic Research Network

Key Messages

- **Productivity is essential for achieving sustainable economic growth and** raising living standards in Canada.

- **Usually observed, felt over the long term – Canadian economy facing steady decline in productivity growth**.
  - Other G7 countries have also experienced declines but Canada's pace has been more severe, decreasing Canada's competitive position in the global economy.

- **Declining productivity growth due to multiple factors** including sub-optimal business investment; lagging R&D; skills mismatches, and the business environment for growth.

- **Recent and ongoing government initiatives, such as those related to competition and AI, could help lift productivity growth**.
  - **Opportunities for additional policy action** include applying a productivity lens to new policies/programs, establishing a productivity commission, examining options for a business investment strategy, and working closer with firms on how they deploy human capital.

- **Public policies can only go so far** in mobilizing growth. Leadership from the private sector will also be critical to boost Canada's productivity over the long-term.

What is productivity and how is it measured?

Productivity is the **effectiveness of transforming inputs into output:**

Inputs

Includes labour, capital, intermediate goods, raw materials.

Outputs

Are goods and services.

Productivity is usually **measured in two ways:**

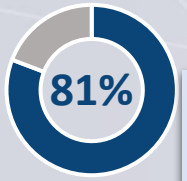
Labour productivity

Real GDP (output) divided by hours worked.

Multifactor productivity (MFP)

A measure of how efficiently both labour and capital are used together in the production process. Called a "measure of ignorance" as it's calculated by finding the proportion of output unexplained by other inputs.

Productivity analysis typically focuses on the **business sector,** while the public sector is also important.



Business sector share of GDP in 2023

The business sector makes up **the majority of output** and has granular information needed to measure output and inputs using firm level data.

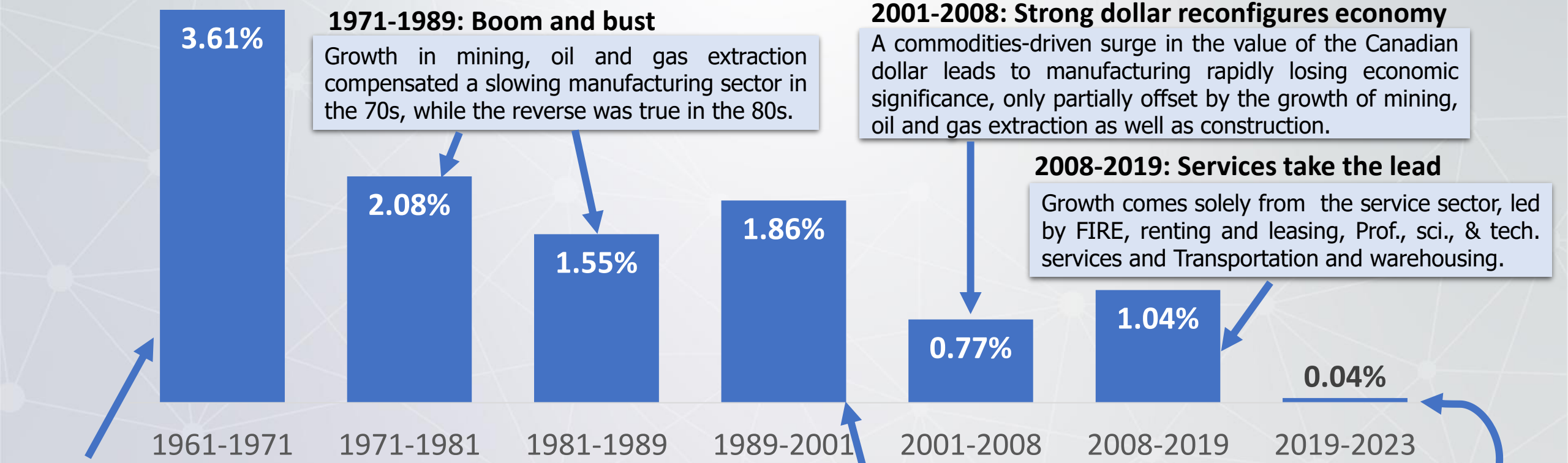
How do you value a teacher?

Public sector employees often **create value indirectly** by generating social good instead of profits.

Productivity trends and in Canada

Productivity has been on a long-term decline in Canada

Figure: Labour Productivity Growth in the Canadian Business Sector (per cent per year, compounded annually)



1961-1971: Manufacturing surges

Strong performance in manufacturing drives growth, while finance, insurance and real estate (FIRE), renting and leasing and construction gain importance.

1971-1989: Boom and bust

Growth in mining, oil and gas extraction compensated a slowing manufacturing sector in the 70s, while the reverse was true in the 80s.

1989-2001: Export-led growth

After a severe recession, strong gains in FIRE, durable goods manufacturing and Prof., sci., & tech. services drove productivity growth.

2001-2008: Strong dollar reconfigures economy

A commodities-driven surge in the value of the Canadian dollar leads to manufacturing rapidly losing economic significance, only partially offset by the growth of mining, oil and gas extraction as well as construction.

2008-2019: Services take the lead

Growth comes solely from the service sector, led by FIRE, renting and leasing, Prof., sci., & tech. services and Transportation and warehousing.

2019-2023: An uncertain future?

Post-2015 decline in business investment and low MFP growth have led to stagnant labour productivity.

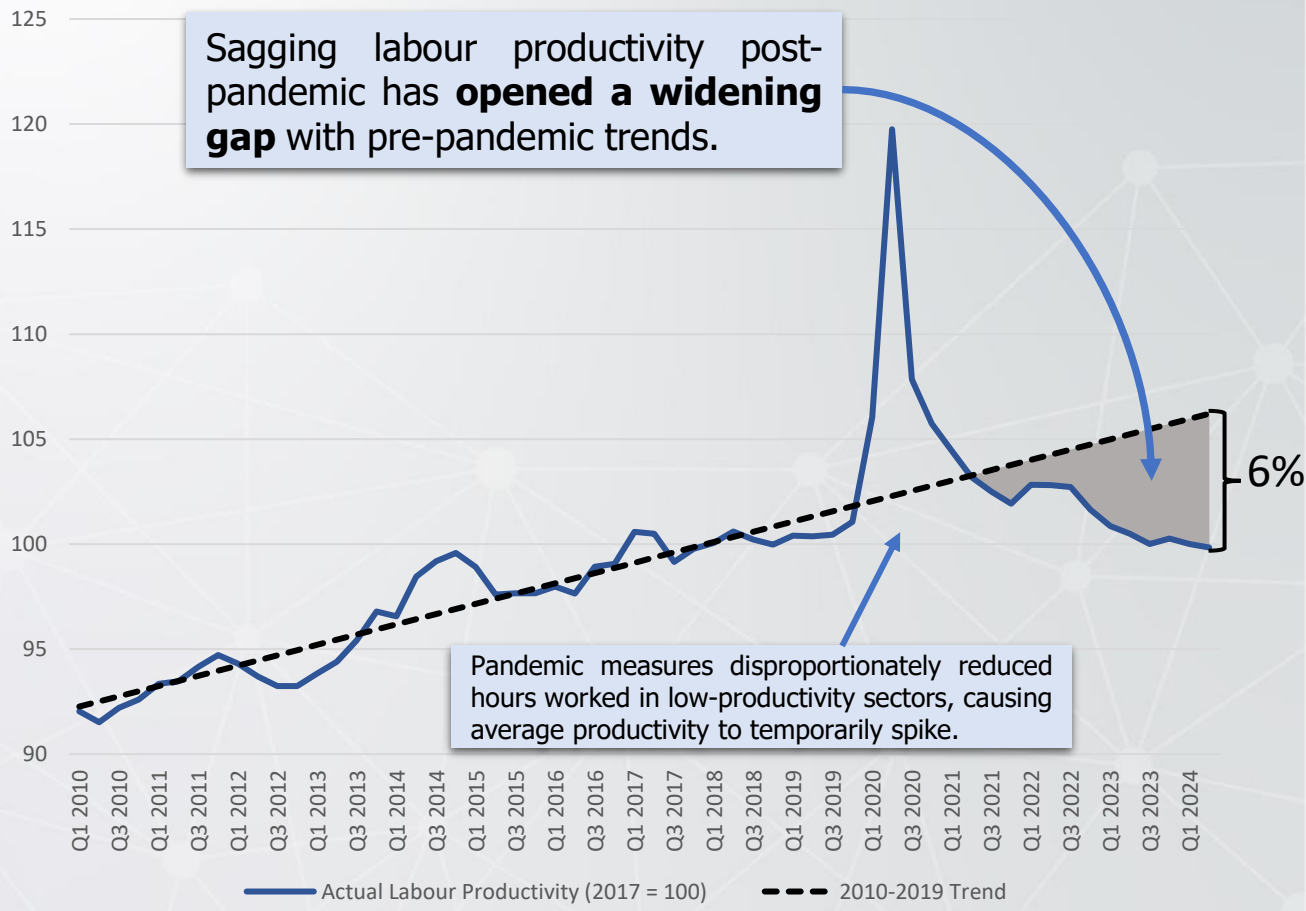
Recent labour productivity declines have erased all gains since 2017

- Canada's overall 1.8% decrease in labour productivity in 2023 was the **worst in the OECD**.

- Recent poor performance has **erased all productivity growth** since 2017.
  - Labour productivity in Q2 2024 is **6% below** what it would have been if labour productivity growth maintained its 2010-2019 trend.

- Over 2019-2023, several key sectors have seen significant drops in labour productivity:
  - **Construction** (-10%)
  - **Transportation and warehousing** (-9.7%), most notably in **air transportation** (-34.1%) and **ground transit** (-22.2%)
  - **Energy sector** (-3.2%)

Figure: Labour Productivity in the Canadian Business Sector: 2010Q1-2024Q1 (normalized, 2017 = 100)

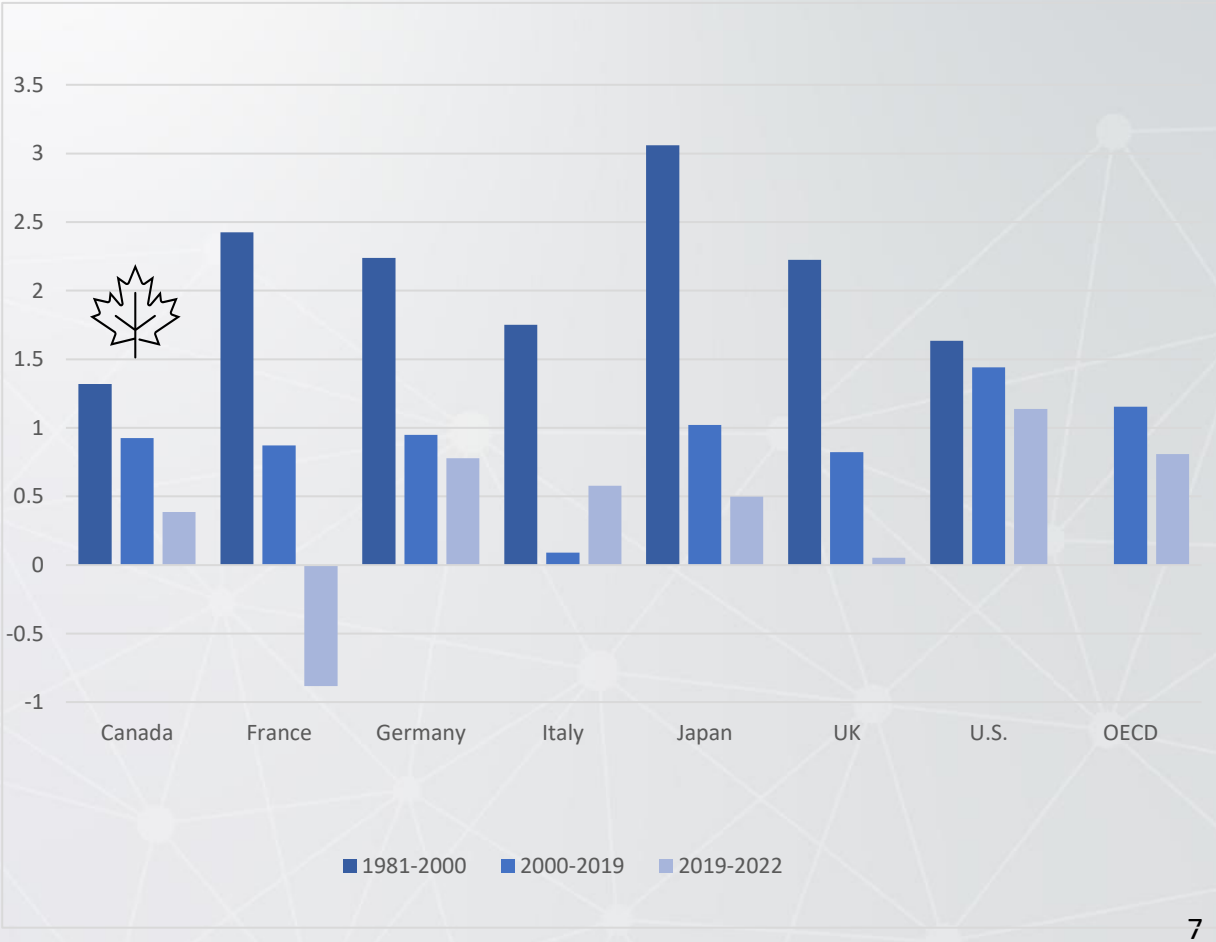


Source: Statistics Canada Table 36-10-0206-01

Canada's productivity slowdown mirrored among G7 peers

- **Canada is not alone in grappling with slowing labour productivity growth**, as all other G7 nations have followed a similar pattern (see figure).
- But Canada has **fallen to 6th in the G7** in GDP per hour worked.
- Post-2000, **Canadian labour productivity growth was broadly in line with most of the G7** – apart from the United States, which led the way in terms of labour productivity growth.
- **The US continued to increase its advantage** in labour productivity over 2019-2022, keeping labour productivity growth in the total economy above 1%, more than double Canada's rate (0.4%).
  - Canada was 85% as productive as the United States in 1970, but only 72% as productive in 2022.

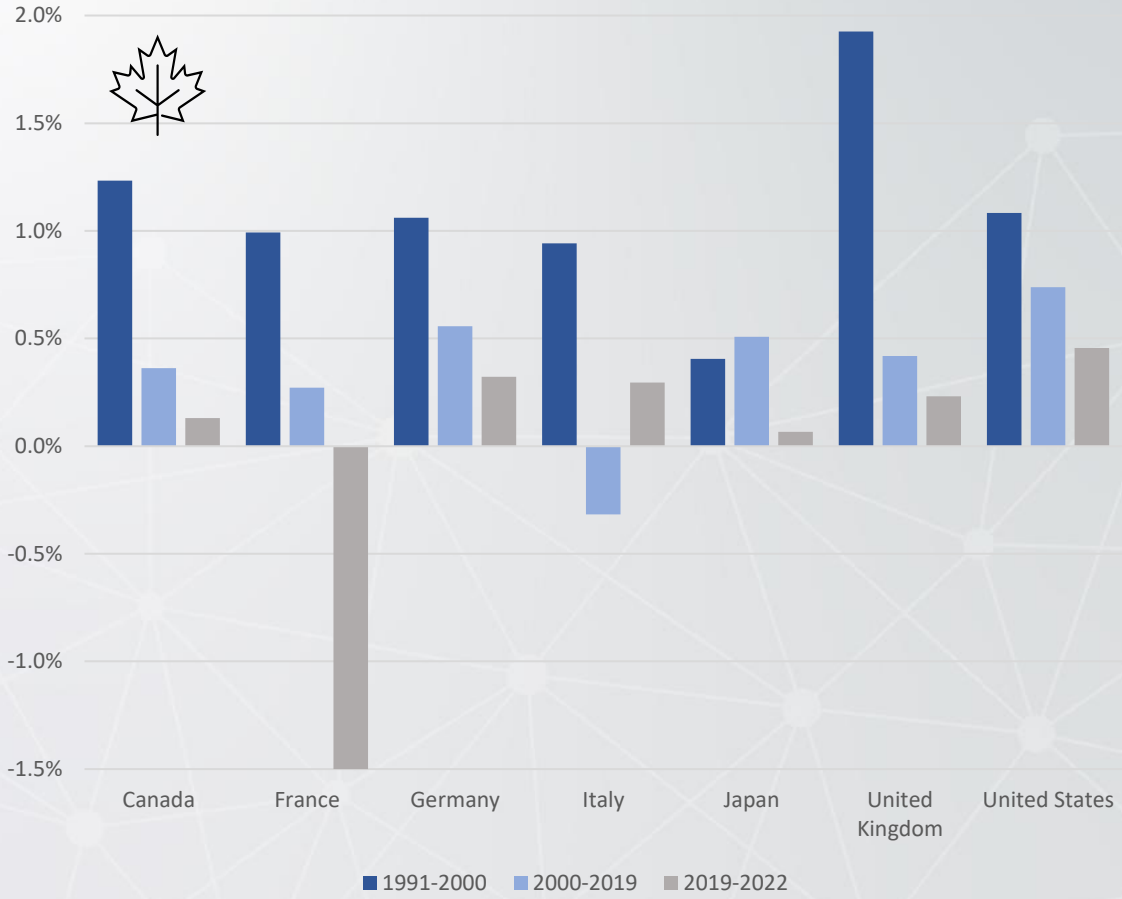
Figure: Total Economy Labour Productivity Growth, Comparing G7 and OECD Countries (per cent per year, compounded annually)



Canada's multifactor productivity growth is also a cause for concern

- Canada's low/declining relative labour productivity to the U.S. is driven by **weakness in multi-factor productivity**, which has not improved in decades.
- Multi-factor productivity looks at **overall effectiveness with which inputs (capital and labour) are used to produce output** in an economy.
- Since 2019, MFP growth in the total economy has **averaged only 0.1% annually**.
- In the business sector, almost 90% of all labour productivity growth since 2000 has come from capital deepening and the rest from improved labour quality, while MFP has **not contributed** at all.
- This slowdown has also been **broadly mirrored across G7 countries**, but Canada's relative standing has fallen. Canada ranked **2nd in the G7 for total economy MFP growth from 1991-2000 but has dropped to 4th**.

Figure: Total economy MFP growth in the G7, 1991-2022 (per cent per year, compounded annually)



Canada is at risk of long-term decline in overall living standards

- Without fundamental changes to our approach to productivity and growth, **Canada's standard-of-living challenges will persist well into the future**.
- Canada is also one of the few advanced countries that has **not recovered its pre-pandemic level of per capita GDP.**
- OECD forecasts that **Canada could have the weakest real GDP per capita growth** among advanced economies.
- Other G7 countries are **expected to add two times or more** to real GDP per capita.

Relative living standards projected to decline under status quo

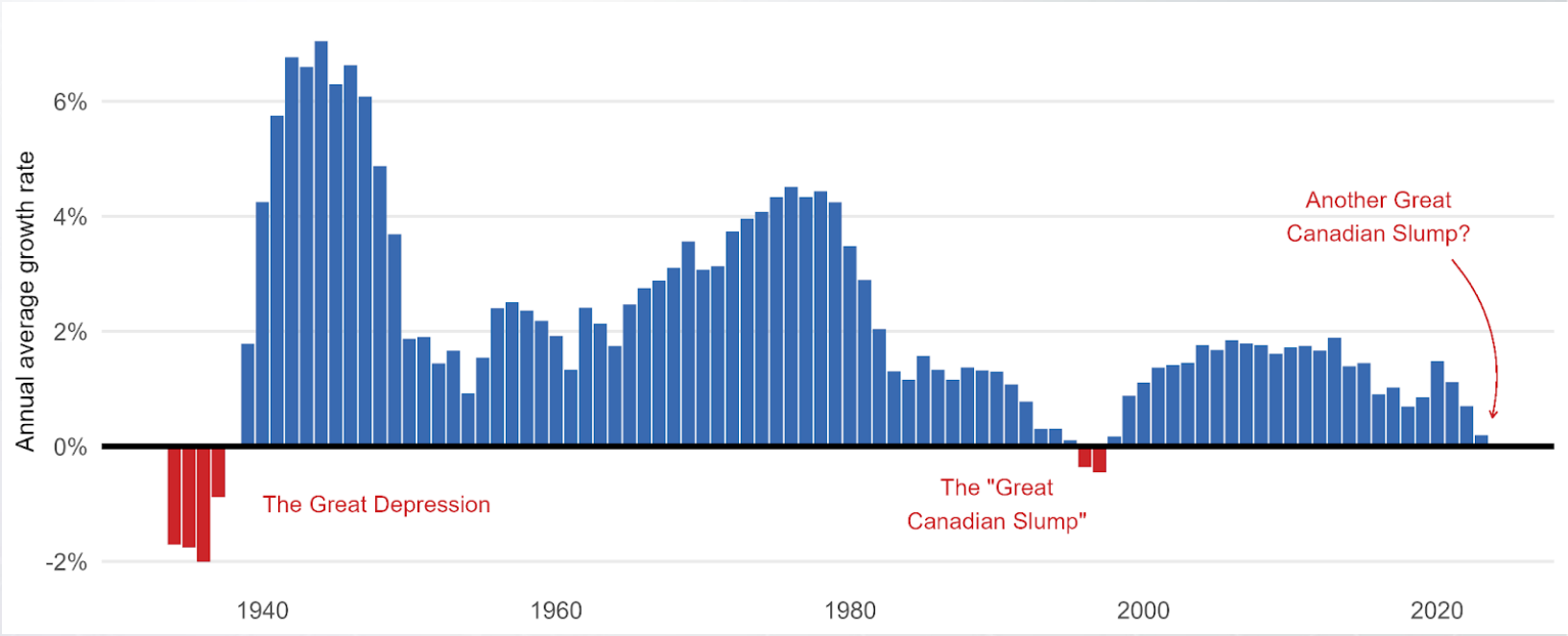
GDP per capita ($CAD PPP), select OECD countries

Source: OECD

Weak productivity amplifies affordability pressures on Canadians

- **Labour productivity and pay** (e.g. income) are tightly connected.
- Since 2015, labour productivity has only grown by 0.2% per year on average, **leading to real disposable income per capita growth slowing to 1990s levels**. (see figure)
- **Real disposable income is the money people have left after taxes**, adjusted for inflation. It's what consumers can spend or save

Figure: Real disposable income per capita growth (8-year moving average), 1926-2023



Source: Trevor Tombe, "The 'Great Canadian Slump' is back"

The Great Canadian Slump

Because each hour worked yields little more than it used to, real incomes have stagnated.

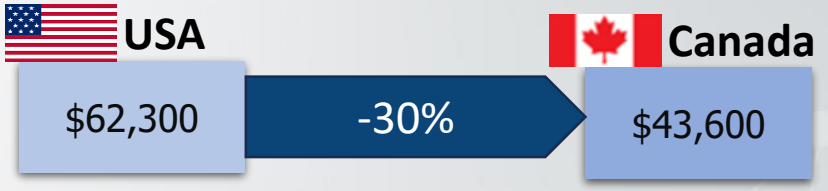
Weak productivity growth amplifies affordability pressures on Canadians

Canadians, when compared to their peers abroad…

- Earn **less**;
- Work **more**; and,
- Spend **more** on things like housing.

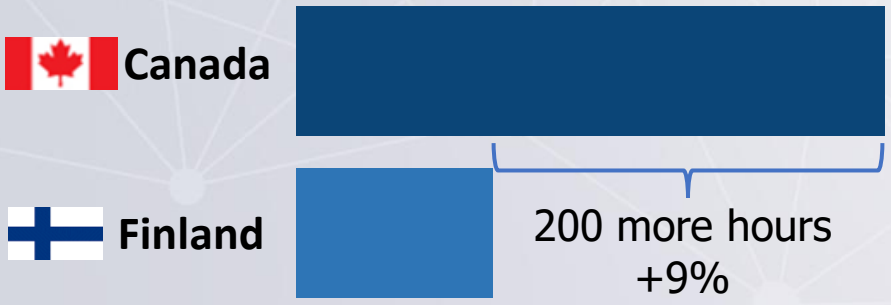
Wages

Average Income, US$

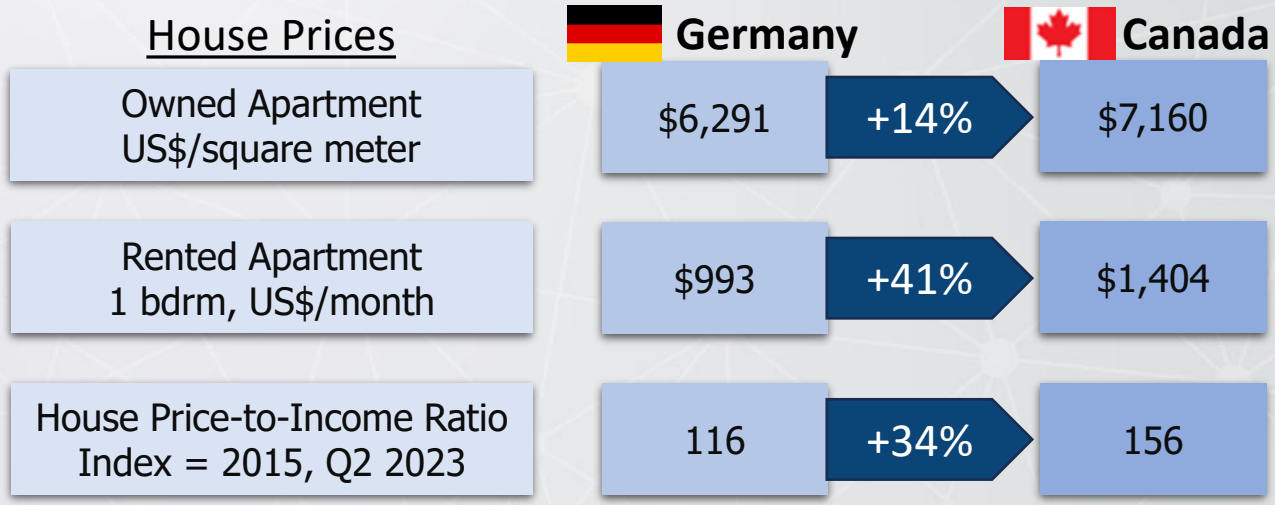


Hours Working

To keep Canada's economy level with Finland, every year each Canadian is working…



Housing Affordability



Note: All data is the latest available; Average disposable income represents annual figures.
Source: OECD; Bank of Canada Housing affordability index;

Causes of weak productivity in Canada

Four elements contribute to stronger productivity

1. Capital Deepening

Improving the **quality of tangible and intangible capital** to improve the efficiency of workers

2. Innovation

Through R&D, **develop new products or processes** that can increase output with fewer inputs

Increased Productivity

3. Skills

Improving worker and managerial skills, organizational practices, and job design to **better utilize the workforce**

4. Business environment for growth

Increased competition and **lowered barriers to trade** between jurisdictions can boost productivity

Firms are not investing enough in productivity-enhancing activities

Investment in productivity enhancement concerningly low

Canada is **last in the G7** in Machinery and Equipment and Intellectual Property Product investment rates, which are key to driving productivity growth. (see figure)

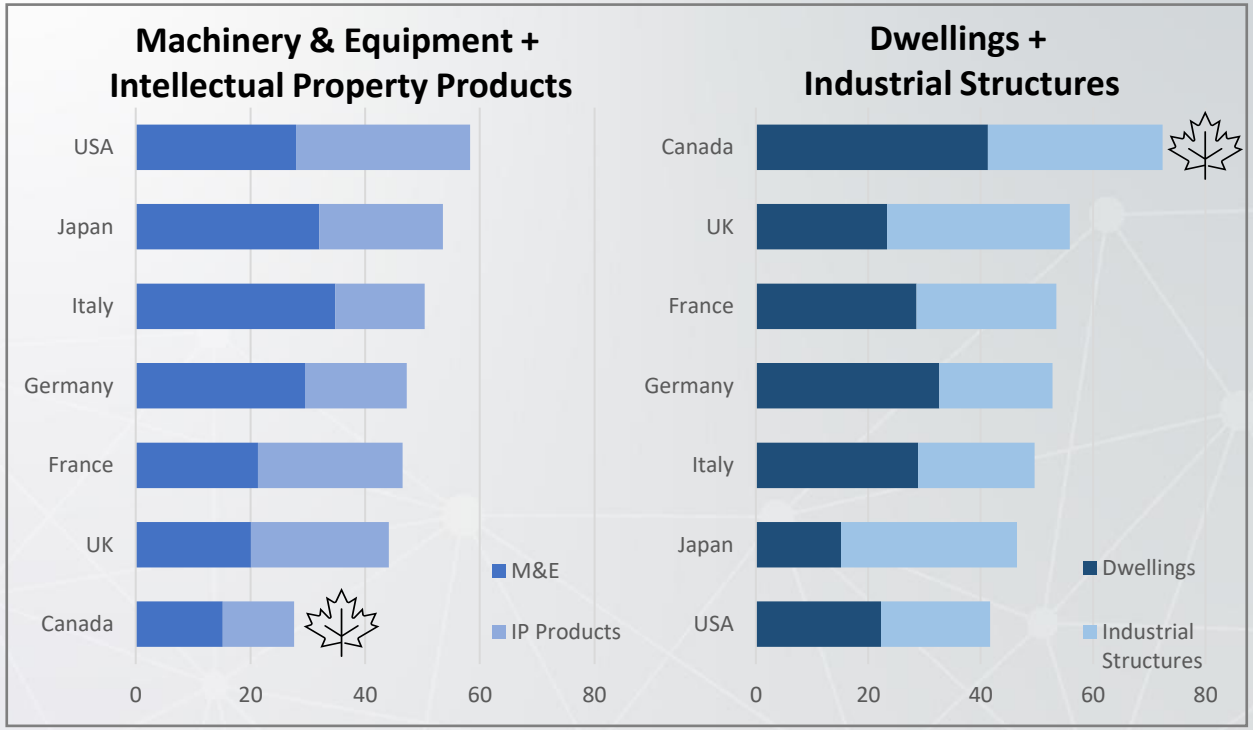
M&E investment

Key for **capital deepening –** Canada's investment is only half that of the US, except for information and communication technologies equipment, which is about the same.

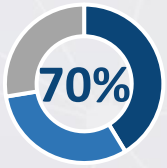
Intellectual property products

Includes **intangible capital** like software, proprietary data, mineral exploration, entertainment products, and **Research and Development**. These kinds of investment are important for the development of new products, services, and processes that can raise labour productivity.

Figure: The Composition of Gross Fixed Capital Formation in the G7, 2021



Investment in structures now dominates

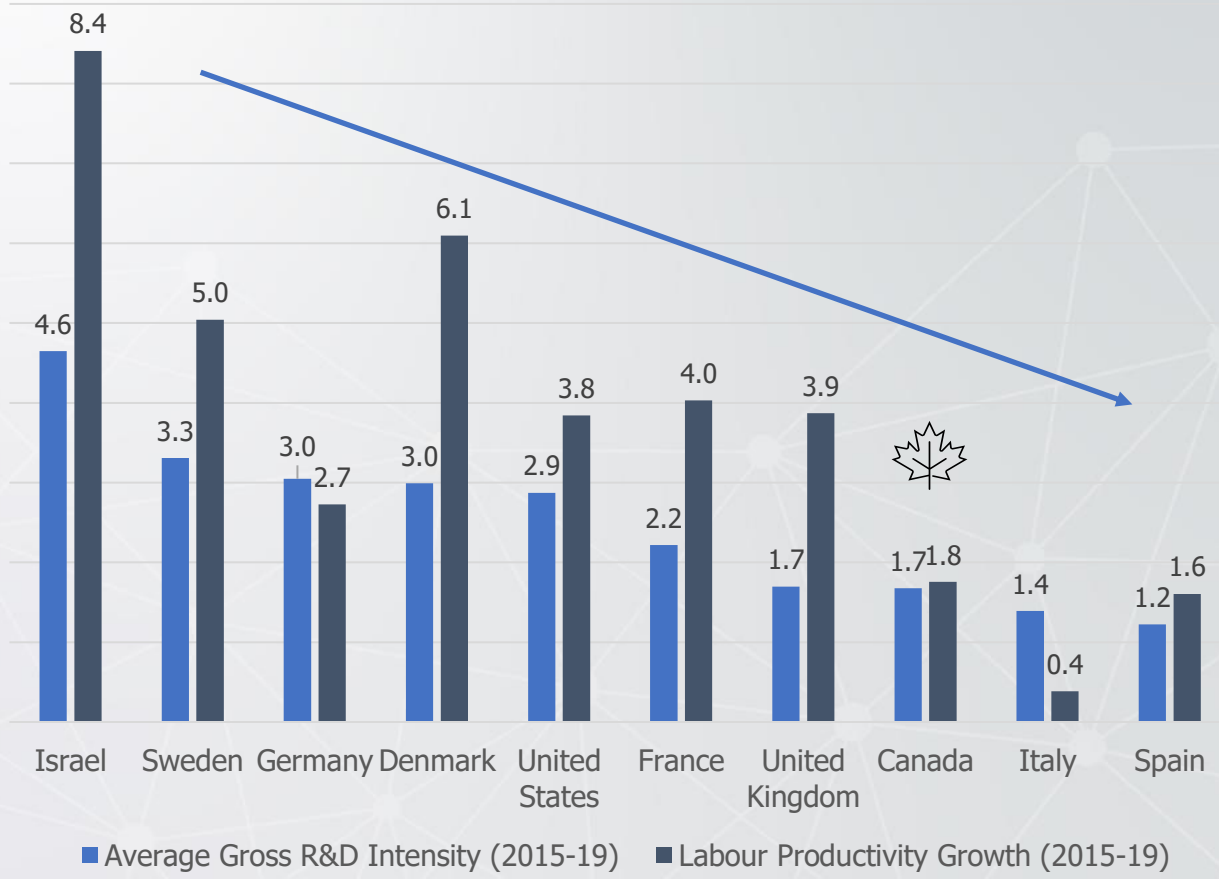


Dwellings and industrial structures now make up ~70% of fixed capital investment, by far the highest in the G7. Represents a 40% increase from 2000, with the largest jump occurring after the 2014-2015 fall in commodity prices. (see figure).

Canada's lagging R&D intensity drags on productivity growth

- Canada's **lower R&D intensity is directly linked to weaker productivity growth**, ranking third from the bottom among selected jurisdictions (see figure)
- **Weak R&D intensity stifles innovation**, hinders economic growth, and limits the economy's ability to respond to emerging challenges.
- **R&D enables firms to develop new products, services, and processes** that can give them a competitive edge in the market
- **R&D and innovation can have spillover effects** across sectors. Knowledge gained from one innovation may lead to further developments in unrelated areas, amplifying the overall impact on productivity.

Figure: R&D Intensity and Labour Productivity Growth in select countries, 2015-2019

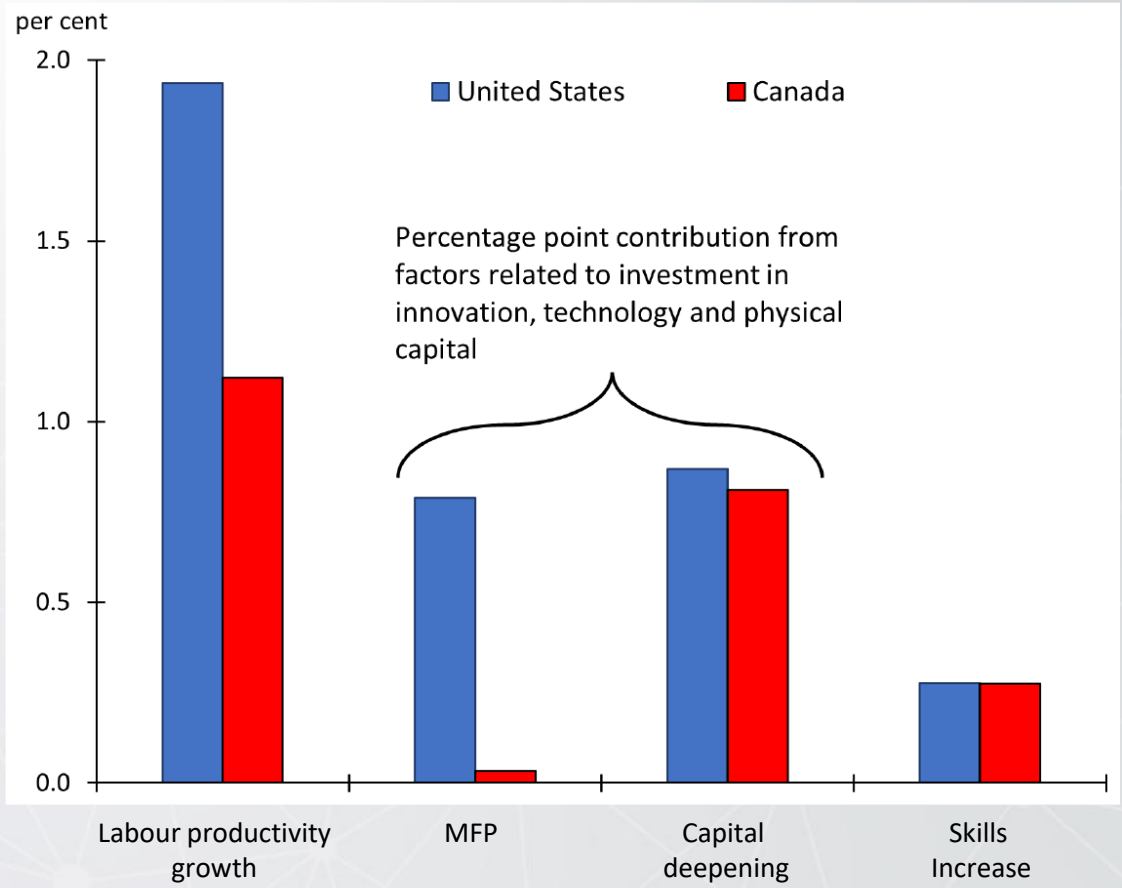


Note: Based on gross domestic expenditures on R&D as a share of GDP.
Source: OECD

A lack of innovation exacerbates productivity gaps as firms invest less in R&D

- **The US-Canada labour productivity gap is driven by a lack of MFP growth** in Canada (see figure).
- **Canada compares similarly to the U.S. on the contributions of capital deepening and skills composition** (e.g. level of human capital) to overall productivity growth.
- MFP growth is caused by many things, most notably the development of new products, adoption of new processes – which are the result of R&D.
- Canada's **Business expenditure on R&D** (BERD) is a key component of stimulating MFP growth.
- Canada ranks 6th in the G7 and **is the only G7 country to see its share of BERD decrease** since 2000. (See Annex A)

Figure: Canada-US Decomposition of Labour Productivity Growth in the Business Sector, 1999-2019



Note: Data reflects growth in the business sector for Canada and the private business sector for the United States
Source: Rossell, Dowsett and Paterson (2023)

The economy needs higher levels of skills, well aligned with employer demand

Canada 18th in OECD for university education

Canada ranks 18th of 36 OECD countries among those aged 25-64 with a bachelor degree or better (33%). However, 59% of Canadians aged 25-64 have finished tertiary education (e.g. college and university) – the highest in the OECD.

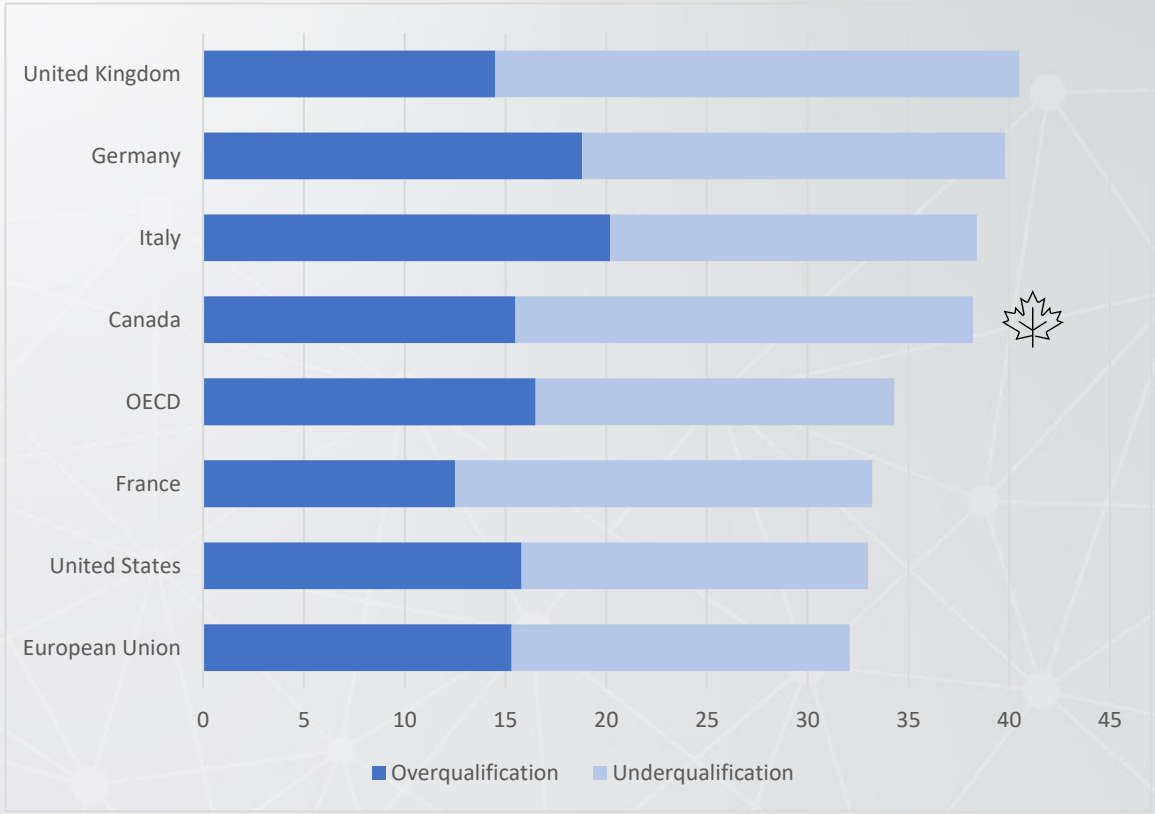
Skills mismatch rates high compared to OECD

In 2019, **38.2% of Canadians were mismatched** in their job – of these **22.7% of Canadians held jobs they were underqualified for** (see figure). While overqualification rates were similar to the US and EU, more than **half of bachelor's degree holders were overqualified.**

Reducing mismatch yields productivity gains

According to the OECD, reducing the qualification mismatch rate by one standard deviation would increase labour productivity by 5%.

Figure: Share of mismatched workers, 2019



Source: OECD

Skill gaps among workers, managers also perpetuate productivity gaps

Canadian managers less educated than US counterparts

In 2021, 47% of Canadian managers held a university degree, compared with 60% of US managers. Managerial education can help innovation by disseminating best practices, increasing the ability to adapt to and manage change, and integrate new technologies in the workplace.

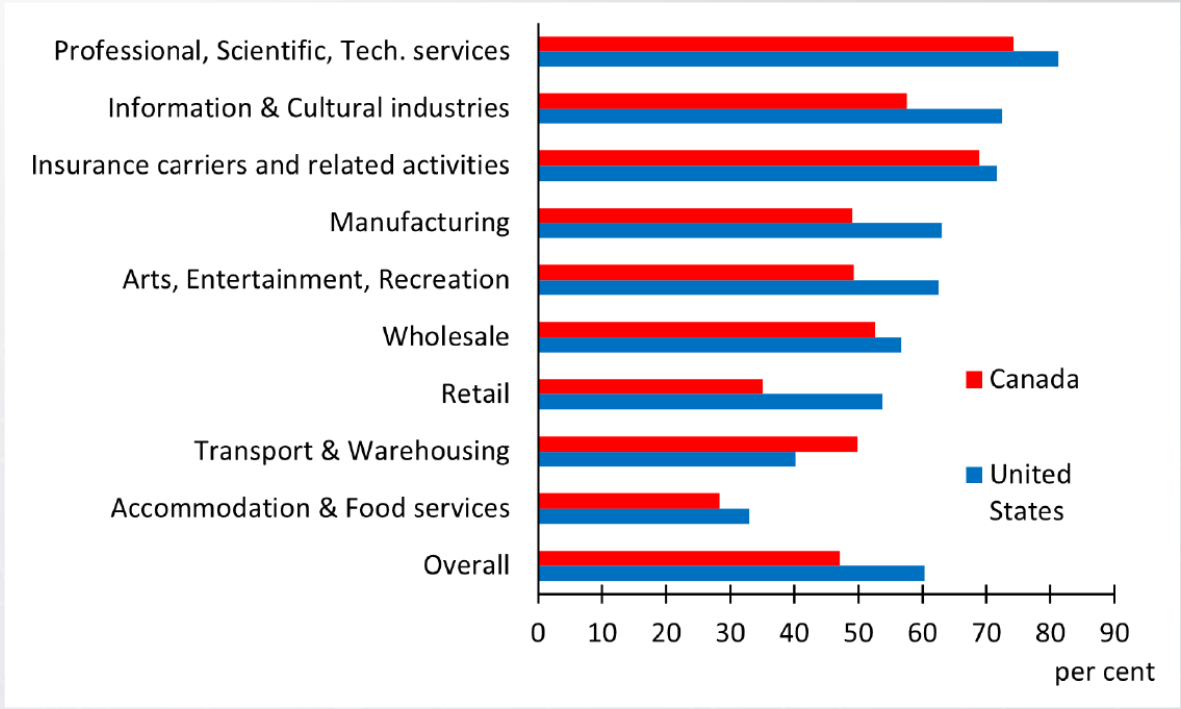
Majority of firms report skills gaps in their workforces

In 2021, 56.1% of Canadian businesses reported that their workforce was not fully proficient to perform their jobs at the required level. Skill gaps were particularly acute in large firms, utilities, manufacturing, and construction.

Canada trails European peers in young STEM graduates

In 2019, new STEM graduates made up 1.4% of all 25-34 year olds in Canada, a level similar to the US, but lower than Germany (2.3%), France (1.9%) and Finland (2.4%).

Figure: Share of university-educated managers in selected industries and overall, 2021, Canada and US



Source: Rosell, Dowsett, and Paterson (2023)

Canada's regulatory environment may be hindering productivity growth

- Firms are more likely to invest in innovation if they have access to large markets.
- Canada has a relatively small population that is broadly dispersed geographically, naturally creating small, segmented markets.
- This is further exacerbated by these markets being divided between multiple jurisdictions, which create barriers to expansion.

Three key barriers to interprovincial trade inhibit cross-provincial expansion:

1. Extra-jurisdictional registration fees

Firms seeking expansion across provincial lines typically have to pay registration fees in every jurisdiction they operate in. Only Ontario and Nova Scotia have completely waived such fees.

2. Lack of mutual recognition of regulations

There is no agreement between provinces recognizing occupational health and safety rules or workers' compensation registration. Firms often face high compliance costs to operate in multiple jurisdictions.

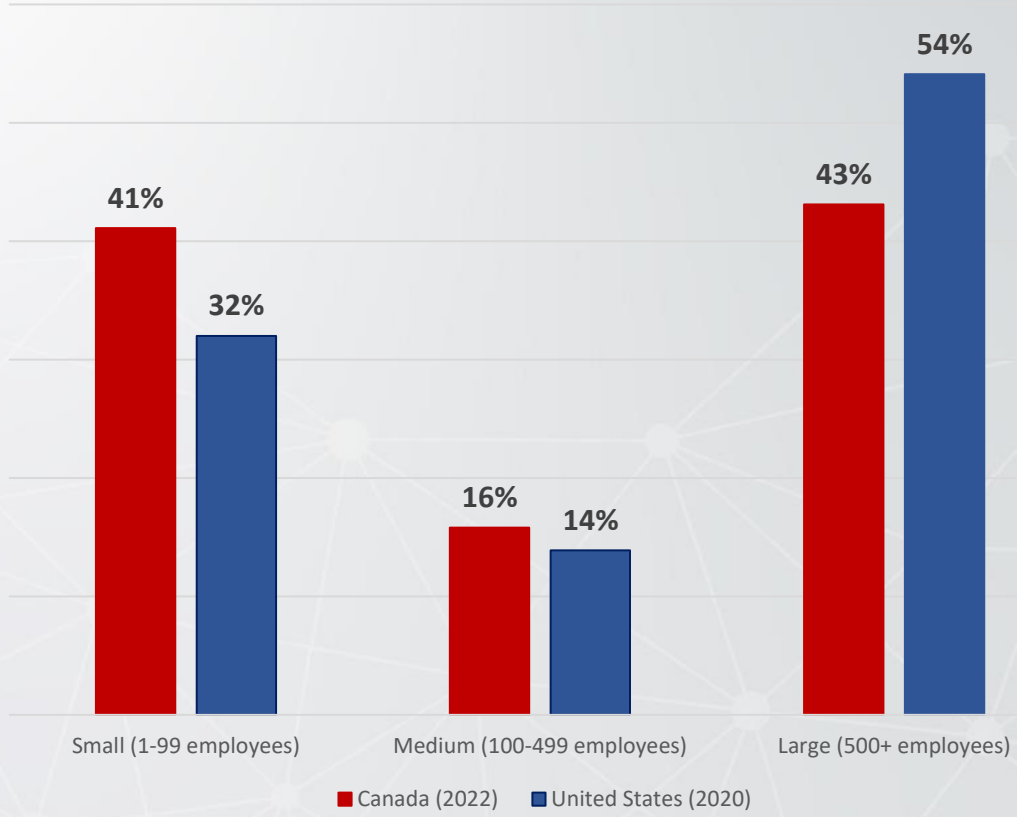
3. Barriers to labour mobility

While the Canada Free Trade Agreement allows for recognition of certified workers across Canada, governments can post exceptions as needed. These exceptions limit the ability for skilled professionals to relocate and create barriers for firms looking to recruit the talent they need to grow. Some provinces have regulations in place that provide transparency and timelines for registration decisions.

The prevalence of small firms in Canada contributes to the productivity gap

- The disparity in **firm size distribution contributes to the productivity gap**.
- In 2022, small firms accounted for a larger share of business sector employment in Canada (41%) compared to the U.S. (32%) (see figure).
- Previous research from 2015 covering the period 2002-2008 on the Canada-US productivity gap has estimated that **Canada's higher small firm share accounts for 15-25%** of the observed gap.
- However, **lower productivity among Canadian SMEs** relative their American counterparts **explained over half** of the overall productivity gap (see Annex B for more information).

Figure: Distribution of employment by Firm Size in Canada and the United States



Figures exclude Public Administration
Source: Canada – Employment for all employees by enterprise size, annual, Survey of Employment, Payrolls and Hours . United States – US Census Bureau, SUSB 2020 Tables.

Policy opportunities

Recent government initiatives could lift productivity in the near to medium term

Budget 2024 announced a series of initiatives that can positively influence productivity, such as:

- Boosting **Canada's compute infrastructure** to support researchers and **AI** start-ups.
- Enhancing the **SR&ED program**
- Enabling businesses to immediately **write off the full cost of innovation-related investments** such as in patents, network infrastructure, computers, and equipment for data processing.
- Strengthening **Canada's research capacity** and develop new talent**.**
- Supporting the development of **innovative housing solutions**
- Advancing **work on regulatory "sandboxes" to create agile rules** that allow businesses to reach their full potential.
- **Removing internal trade barriers by harmonizing regulations** between provinces.

Competition key to promote business investment and productivity

According to Statistics Canada, a 1% increase in the entry rate raises investment per worker by $35 for firms with at least 100 employees and $39 for firms with less than 100 employees.

The impact of generative AI on productivity is just starting to be felt

TD Economics estimates that Canada's real GDP could be up to 5%–8% higher in the next ten years than current baseline. That implies a 0.5%–0.7% lift to Canada's annual-productivity.

Different policy avenues could be considered based on international best practices

Policy Options	Considerations	Best practices
Productivity Lens Center government decision-making around the question: "How will this policy affect productivity?"	Promoting productivity requires a whole-of-government approach.	Drawing from Canada's commitment to GBA Plus Analysis.
Canadian Productivity Commission Create an independent body to research and promote pro-productivity policies in Canada.	Canada has lacked an independent economic advisory body since 1993.	Similar commissions have been established in Australia, UK, Ireland, Germany, and France
Develop a Business Investment Strategy Develop a strategy that outlines objectives, priorities, and criteria for business investment support, aligned with stimulating productivity	Almost 90% of labour productivity growth from 2000 is due to increased capital intensity. Since 2015, the single largest cause of falling labour productivity growth is falling business investment rates.	The UK's Harrington Review of Foreign Direct Investment outlines a vision to boost business investment, setting targets across sectors and working closer with business to develop new tools and strategies
Adjust programs to focus on workforce innovation Programs could look for opportunities to work closer with firms on how human capital is deployed within a workplace.	Only 28% of Canadian firms employ high-performance work practices.	Similar programs employed in UK, Finland, France, Ireland, and Australia

Annex

Annex A: Canada's lack of R&D-intensive sectors drives low-levels of

- **Industry structure** is related to Canada's performance in BERD.
- Canada has **the lowest share of high and medium-high R&D intensive sectors** in the G7 (see top figure).
- Canada's performance by sector varies, **ranking second** in the G7 in ICT and **last in Manufacturing** (see bottom figure).
- **Closing the gap in Manufacturing BERD** would allow Canada to catch up with its G7 peers.

Figure: Nominal GDP Share (%) of medium-high to high R&D intensive industries, 2019

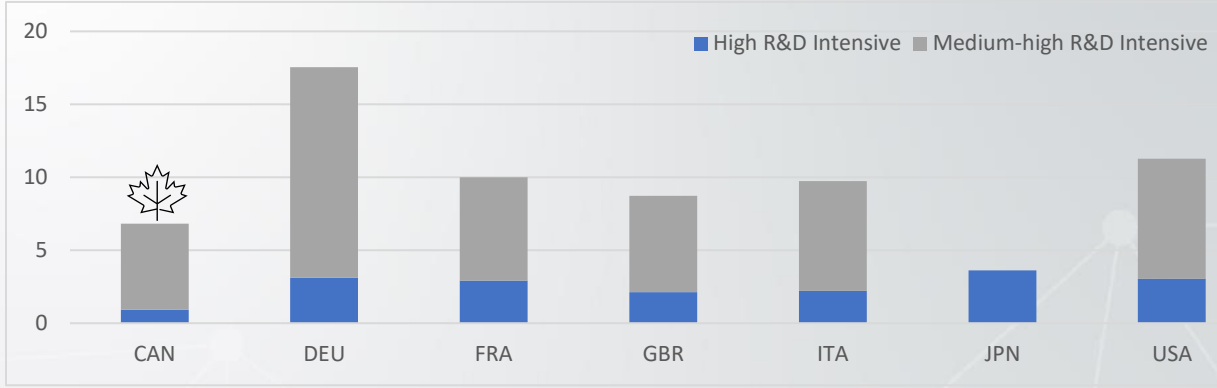
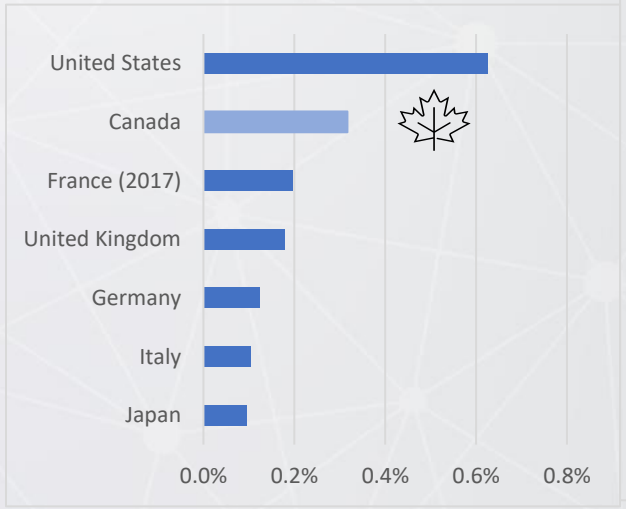
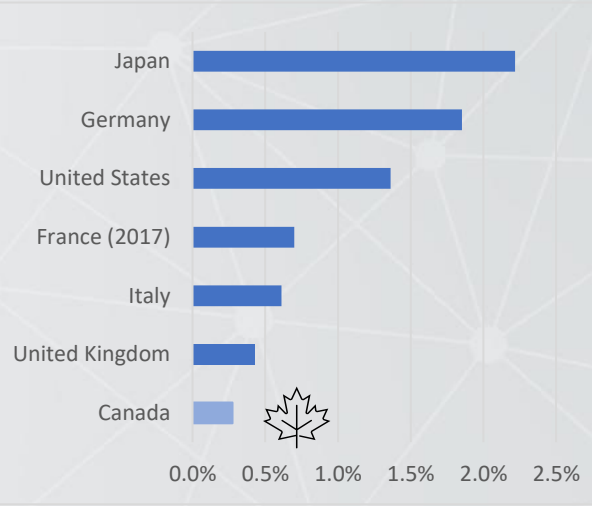


Figure: BERD in ICT sectors to total GDP (%) (left) compared to ratio for Manufacturing sectors (right), by G7 Country 2019

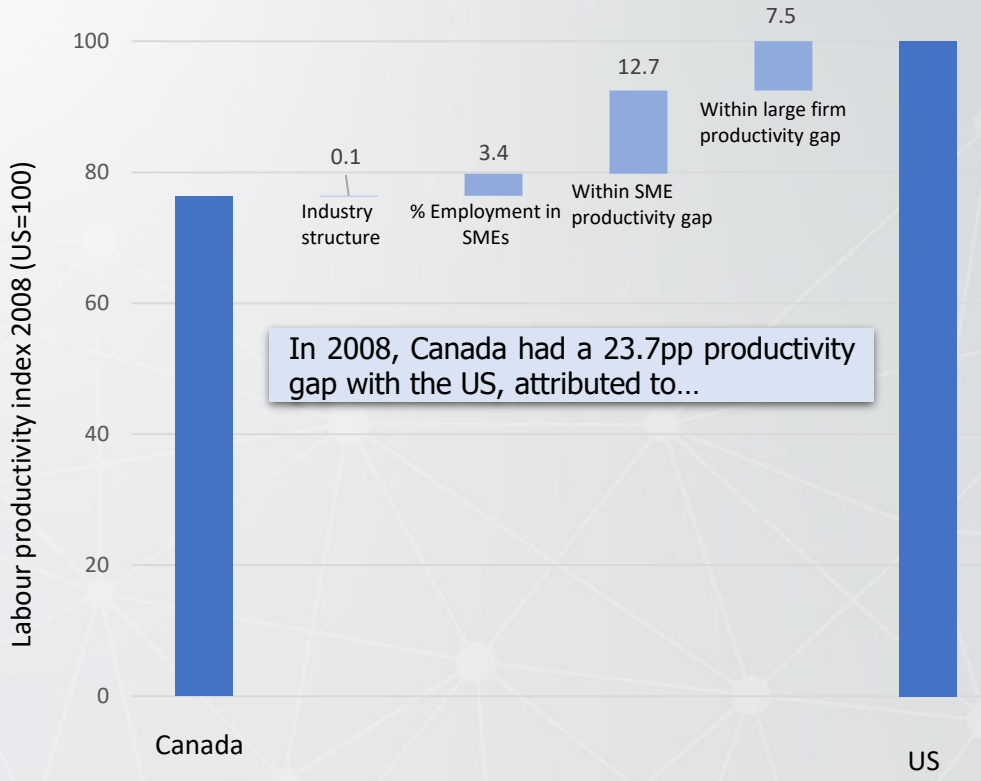




Annex B: The productivity gap is mainly driven by within size and within industry

- Existing evidence suggests structural differences are not the primary factor explaining the gap.
- Within size class estimates were the primary factor explaining our productivity gap with the US.
  - However, some of the within size class productivity differences could still be related to size (e.g., if US SMEs are larger than Canadian SMEs).
- Previous ISED research found limited impact from differences in industry structure. (See Figure)
  - In 2008, industry structure had virtually no effect, i.e., Canada has been well-aligned with areas of comparative advantage.
  - ISED and Statistics Canada are working on updating this estimate.
- A more contemporary piece found similar results for 2015
  - Adopting US industry structure would have raised Canada's GDP by $37B while raising within industry productivity to US levels would raise Canada's GDP by $781 B.
  - Simply shifting production to more advanced industries would not close the gap--Canada also has a high productivity gap with the US within these industries.
  - Natural resource industries are highly productive, and concentration in these industries helped lower the gap.

Figure: Canada-US Productivity Gap Decomposition, 2008

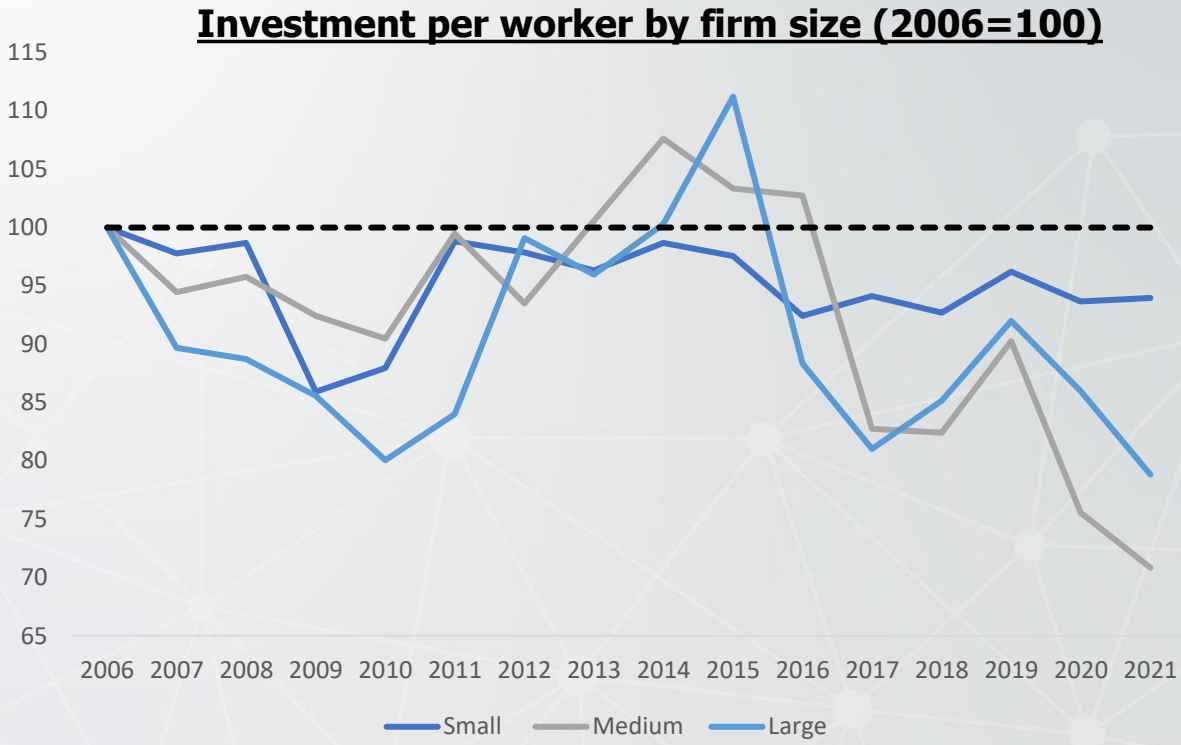


Source: Tang, J. (2016), "Industrial structure change and the widening Canada—US labour productivity gap in the post-2000 period," Industrial and Corporate Change, 1-20.

Annex C: Competition and entry important incentives for firms to invest

- Canadian business investment per worker plummeted by 20% over a 15-year stretch from 2006-2021.
- That means that for every worker, businesses invested $628.80 less in their companies in 2021 than they did in 2006.
- Several indicators of competition (e.g., market concentration, mark-ups, entry and exit rates) suggest competition has declined in Canada over the past two decades.
- There is a link between softening competition and weaker business investment.

Figure: Investment per worker among Canadian firms declined by 20% from 2006 to 2021



Source: Gu, W. (2024) "Investment Slowdown in Canada After the Mid-2000s: The Role of Competition and Intangibles"