Productivity Performance in Canada: Recent Trends and Potential Explanations

Wulong Gu, Senior Advisor

Economic Analysis Division, Statistics Canada

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Outline

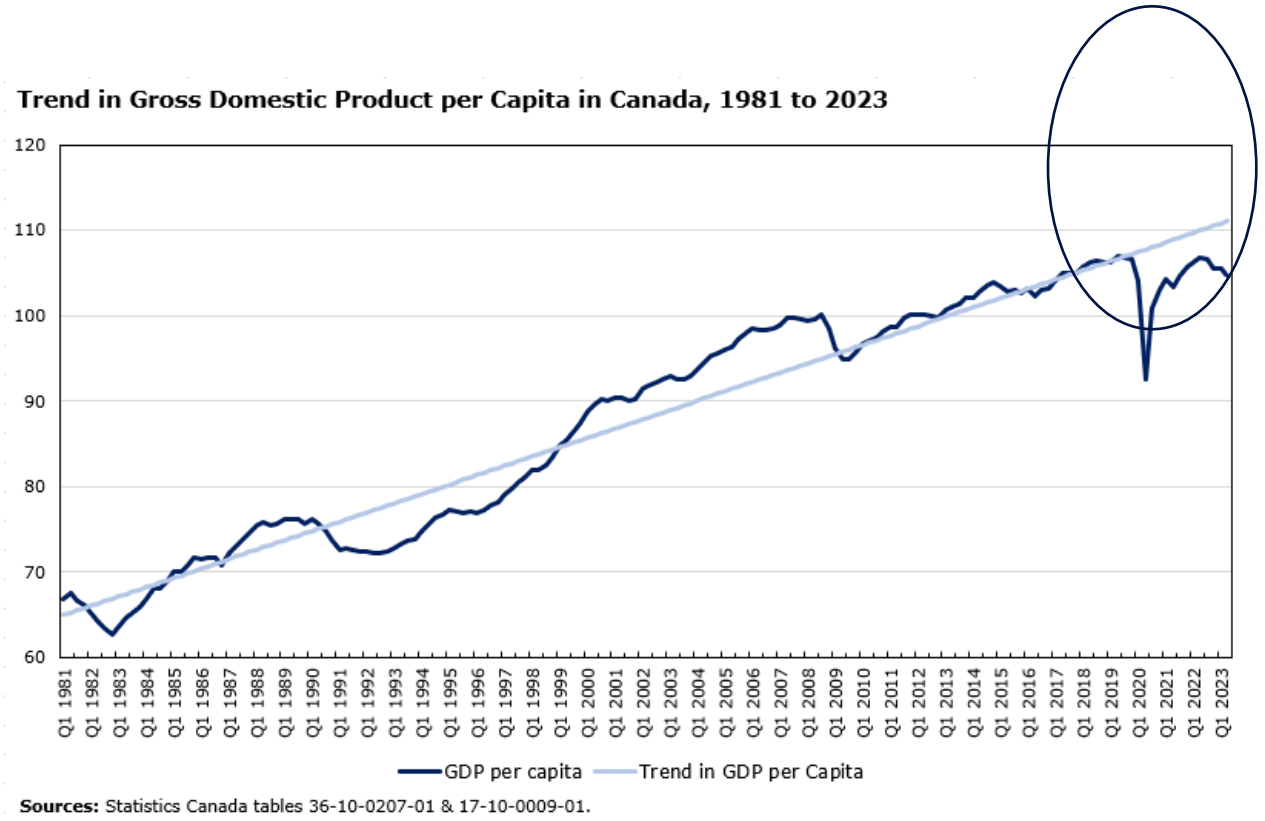
- Productivity performance in Canada
- Productivity growth during the pandemic period
- Potential explanations for low productivity growth in Canada

What is productivity?

- Productivity is a summary statistic that measures the efficiency with which an economy transforms inputs into outputs.
  - There are many ways to measure productivity but the most common is labour productivity, expressed as real gross domestic product per hour worked.
    - Its importance is due to its close relationship with rising standards of living.
  - More complex measures, like multifactor factor productivity (MFP), simultaneously account for multiple factor inputs (labour and capital). It is measured as real GDP per unit of combined labour and capital.
    - Its growth also helps to raise living standards through innovation and technical change.

Productivity growth is the main driver of rising living standards

- GDP per capita can increase in three ways:
  - **Higher labour productivity** (output per hour worked)
  - **Higher work intensity** (hours worked per job)
  - **A higher employment-to-population ratio**
- In the four decades before the pandemic, **nearly all** of the increase in GDP per capita was due to labour productivity growth.
- Structural trends in the labour market related to population aging and work intensity suggest that productivity will remain the key driver of living standards in the post-pandemic era.



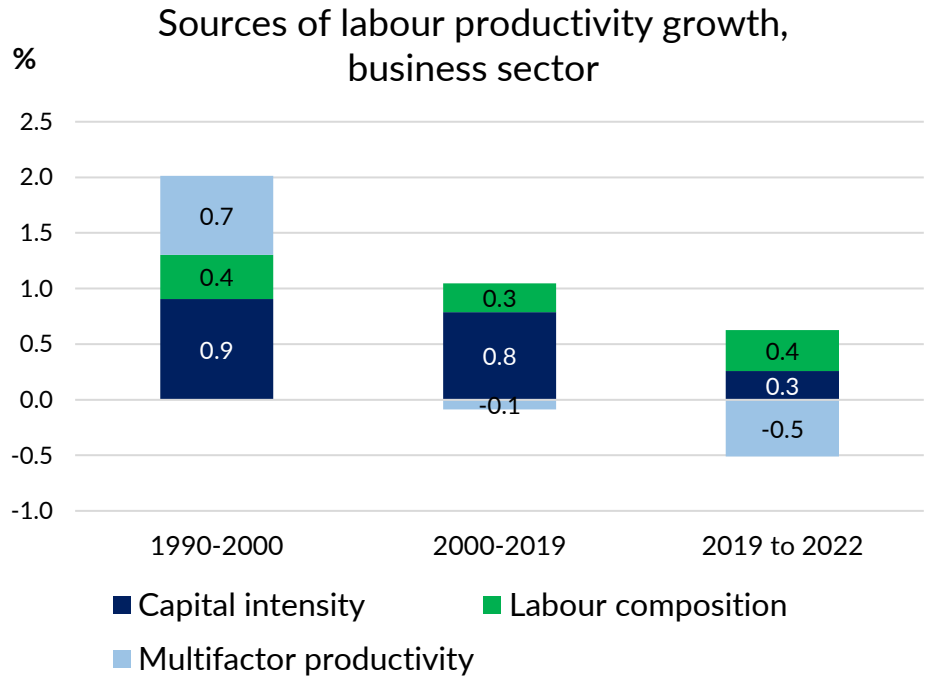
$$\Delta \frac{GDP}{Pop} = \Delta \frac{GDP}{Hour} + \Delta \frac{Hours}{Job} + \Delta \frac{Job}{Pop}$$

Where does labour productivity growth come from?

- Many factors determine the rate of growth in labour productivity:
  - Capital intensity: the amount of capital (machinery and equipment, and structures) available to workers;
  - Labour composition: the proportion of skilled workers associated with education and experience; and
  - Multifactor productivity (MFP): innovation, changes in organizational structure and improvements in technology
- Using the growth accounting framework recommended by the OECD, Statistics Canada decomposes labour productivity growth into these three components.

The sources of labour productivity growth

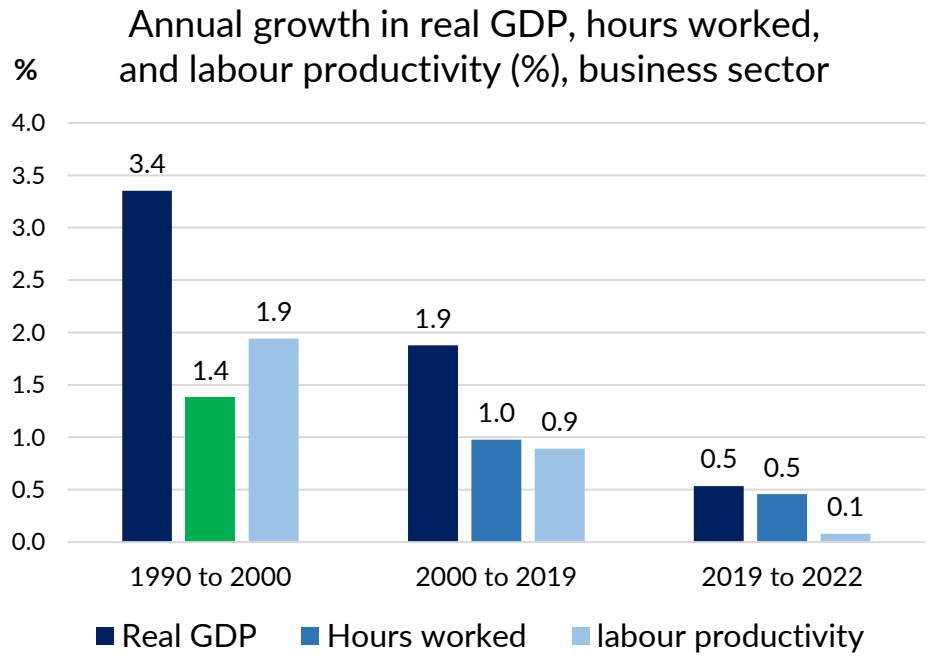
- Pre-pandemic labour productivity growth was mainly from investment in capital.
- Increases in skills was also an important contributor.
- MFP growth has been volatile. It was high in the 1990s, flat from 2000 to 2019, and negative from the pandemic onward.



Sources: Statistics Canada table 36-10-0208-01

Labour productivity growth has declined since 2000

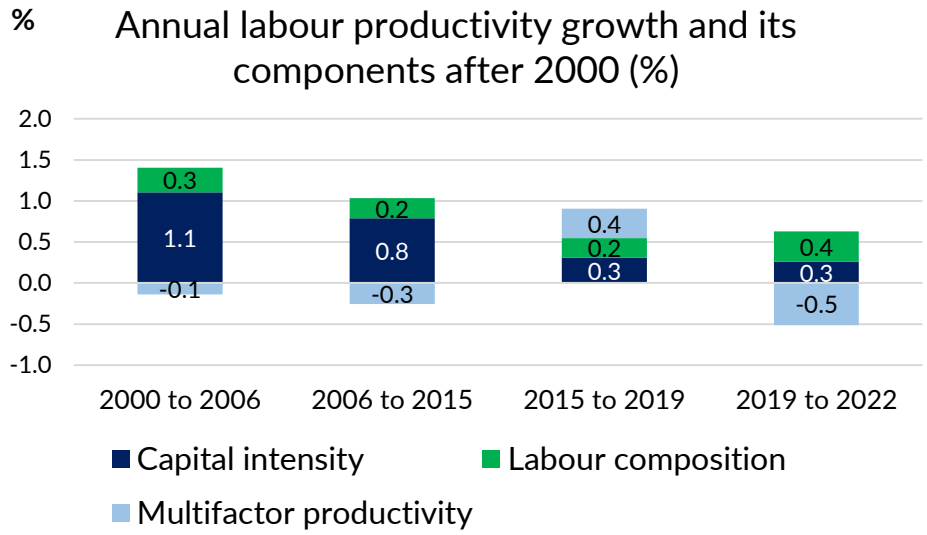
- Labour productivity and output growth have declined since 2000.
  - The 1990s are characterised by rapid productivity growth fuelled by the spread of information and communication technologies and the implementation of free trade agreements with the U.S. and Mexico.
  - Since 2000, labour productivity and output growth have declined.



Sources: Statistics Canada table 36-10-0208-01

The post-2000 decline in labour productivity growth

- Before 2015, the decline in labour productivity growth was mostly due to slower and negative growth in MFP, and to a lesser extent due to low investment or the decline in the effect of capital intensity.
- After 2015, slower labour productivity growth was mainly due to low capital investment.
- During the pandemic period, there was a continuation of low investment and negative growth in MFP. As a result, there was essentially no growth in labour productivity from 2019 to 2022.

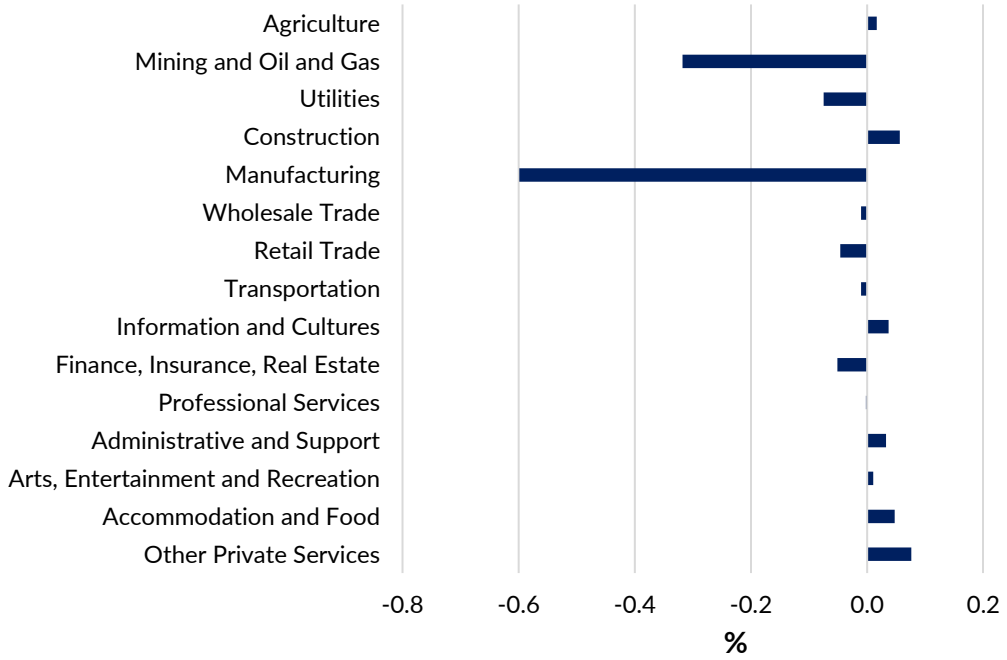


Sources: Statistics Canada table 36-10-0208-01

Industry contribution to the decline in MFP growth in 2000 to 2015 compared with 1990 to 2000

- MFP growth in the period 2000 to 2015, which was lower than in the 1990s, was the predominant factor in the slower labour productivity growth in that period.
- The slower MFP growth in the period 2000 to 2015 was mostly due to two major sectors: manufacturing, and mining, oil and gas.

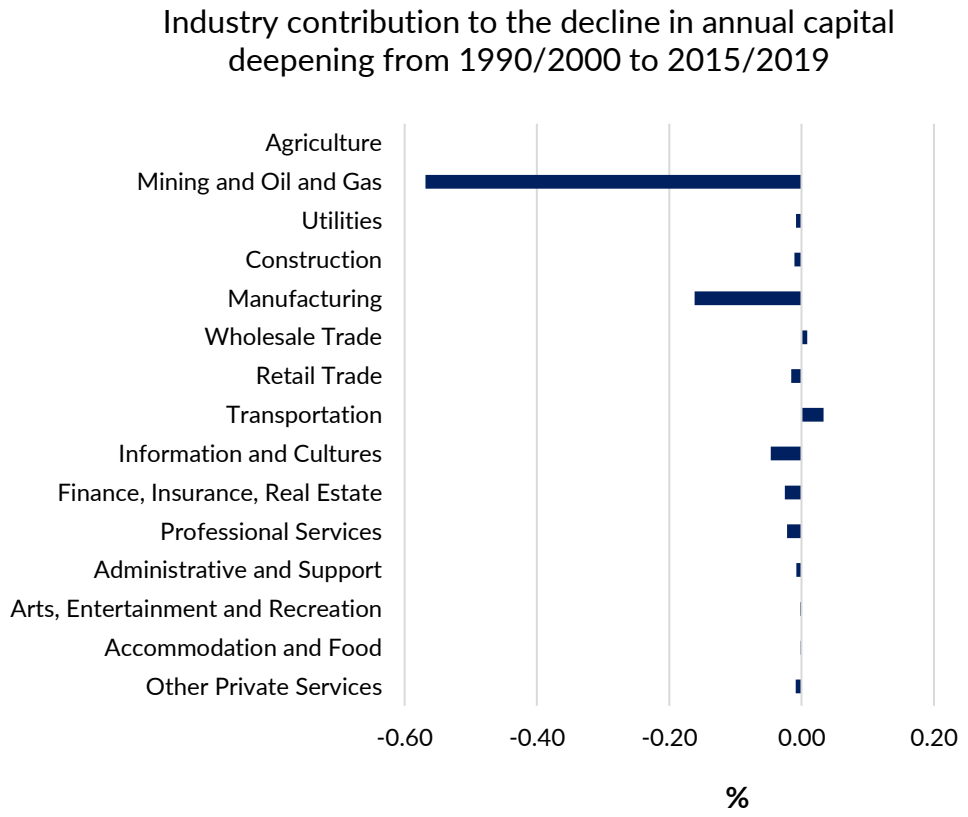
Industry contribution to the decline in annual MFP growth from 1990/2000 to 2000/2015



Sources: Statistics Canada table 36-10-0208-01

Industry contribution to the decline in investment and capital intensity after 2015

- After 2015, investment was weak and the effect of capital intensity declined, which was responsible for slower labour productivity growth.
- The weak investment and the decline in the effect of capital intensity were pervasive across industries.
    - The decline was the largest in the mining, oil and gas sector with the collapse of global commodity prices that started in 2014.

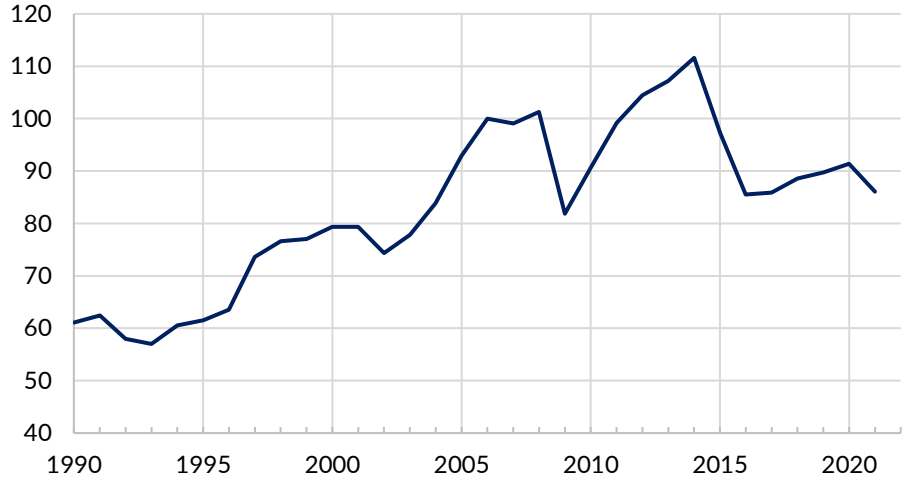


Sources: Statistics Canada table 36-10-0208-01

What happened to investment?

- Investment per worker, a key determinant of growth in labour productivity, increased in the 1990s and early 2000s.
- It started to weaken around 2006 and declined after 2014 with the collapse of commodity prices that started in 2014.
- Weak investment is not unique to Canada but the decline was more pronounced compared with the U.S.
- Studies point to weak demand, less competition and shifts towards expenditures in intangibles (as opposed to physical capital) as likely causes.
    - Fay et a. 2017; Gu and Willox 2019; Gutierrze and Philippon, 2017; Crouzet and Eberly, 2019.

Investment per worker, business sector, 1990 to 2021, index 100 = 2006

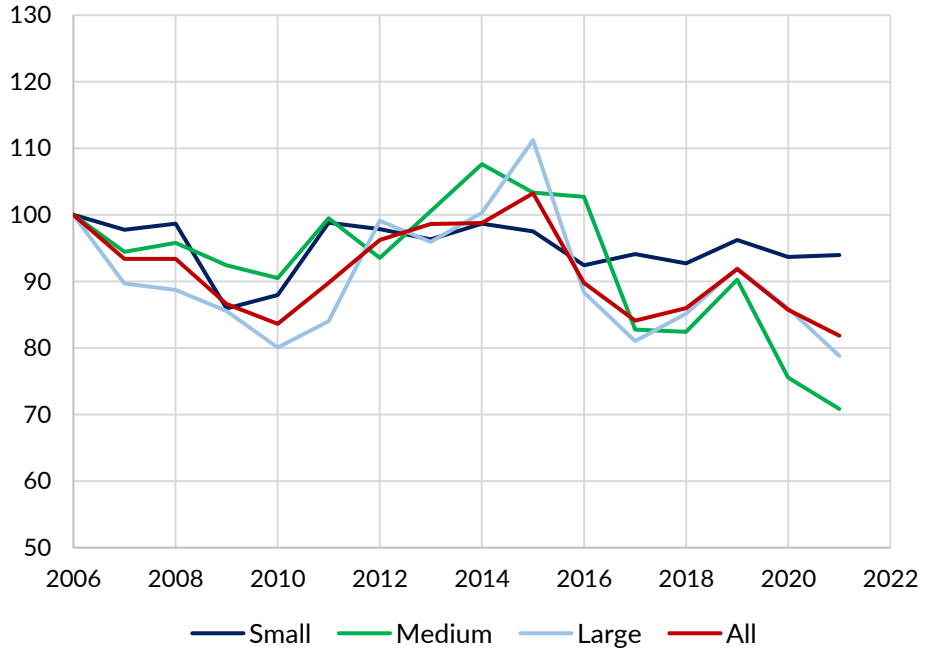


Sources: Statistics Canada tables 36-10-0480-01 & 36-10-0096-01

Weak investment after 2006

- The decline in investment per worker after 2006 can be mainly traced to the decline in large and medium-sized firms. Investment per worker for small firms declined less.
- Large and medium-sized firms accounted for 90% of the overall decline in investment per worker from 2006 to 2021, more than their share of investment (65% in 2021).
- Foreign-controlled firms contributed 30% of the decline in investment per worker, more than their share of investment (20% of investment 2021).

Investment per worker by firm size, 2006 to 2021, index 100 = 2006

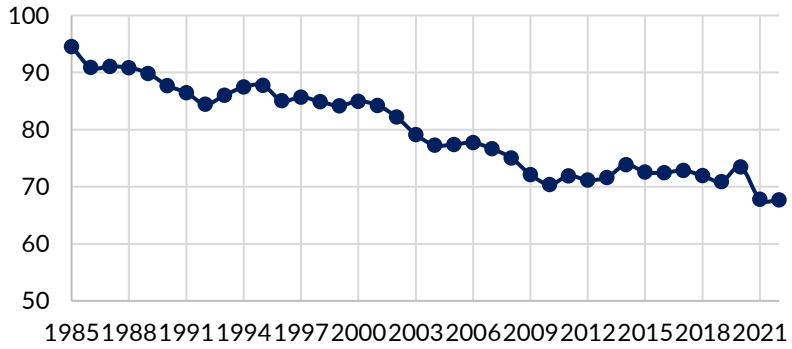


Source: The National Accounts Longitudinal Microdata File of Statistics Canada

Canada – U.S. relative level of labour productivity declined after 1985

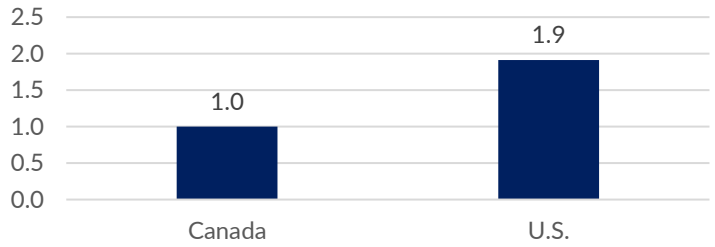
- Labour productivity growth was lower in Canada than in the U.S. for the period 1985 to 2022, leading to a decline in the relative level of labour productivity in Canada.
- In 1985, the level of labour productivity in Canadian businesses was only 5 percent below that of U.S. businesses.
- By 2022, Canadian business sector labour productivity fell to less than 70% of the U.S. level.

Canada/US relative labour productivity, business sector, index U.S. = 100



Source: Update based on Baldwin and Gu (2009): "Productivity Performance in Canada, 1961 to 2008: An Update on Long-term Trends," Statistics Canada

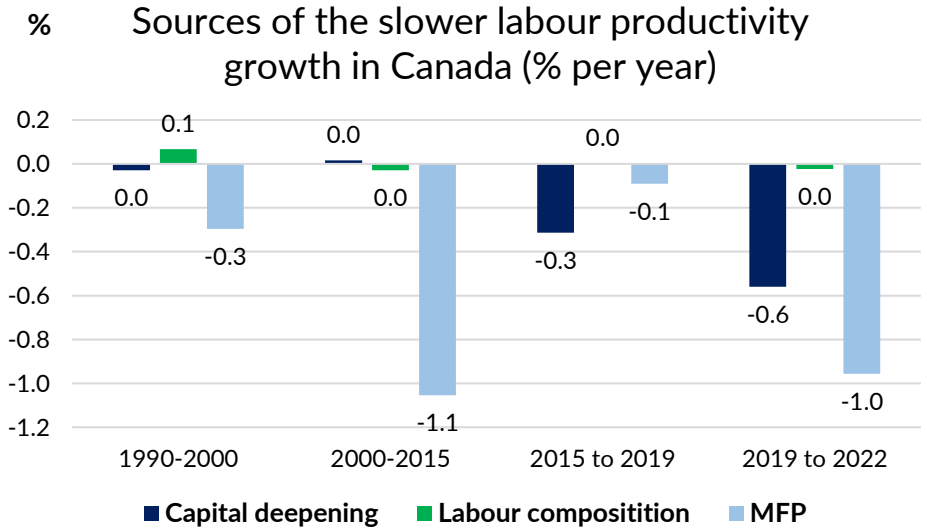
Labour productivity growth in the business sector (% per year), 1985 to 2022, Canada and the U.S.



Sources: Statistics Canada and the Bureau of Labor Statistics

The sources of Canada's lower labour productivity growth relative to the U.S. since 1985

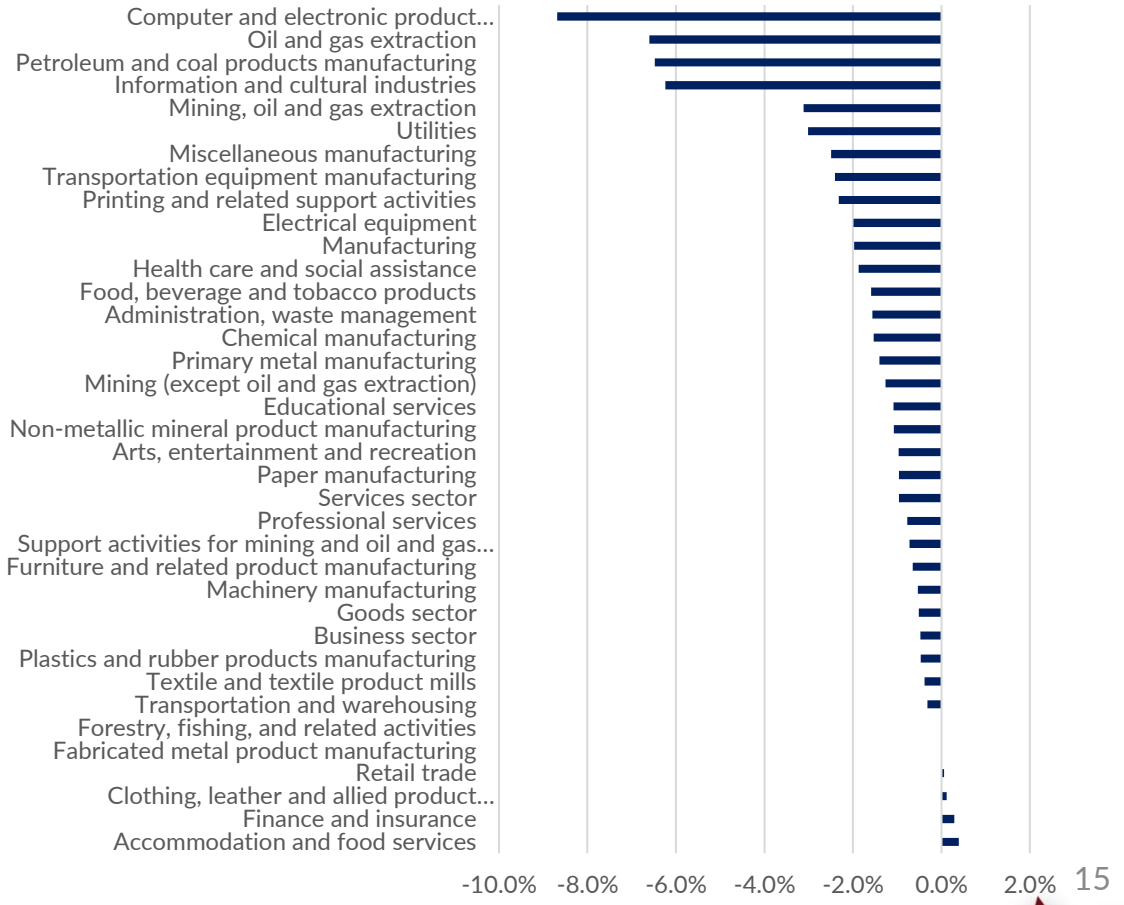
- Before 2015, lower labour productivity growth in Canada was due to lower MFP growth in Canada: technology, innovation, firm organization, firm scale.
- After 2015, capital intensity and lower MFP growth contributed to Canada's relatively low labour productivity growth. But weak investment is a more important factor for relatively low labour productivity growth in Canada.
- Slower capital intensity and slower MFP growth continued in Canada during the pandemic period relative to the U.S.



Sources: Statistics Canada and the Bureau of Labor Statistics

Canada-US labour productivity growth by industry

- Labour productivity growth was lower in Canada than in the U.S. in most industries from mid 1980s to 2019.
    - The large difference is in information and communication technologies (ICT) related manufacturing and services sectors, and mining sectors.
- Lower productivity growth in Canadian industries continued in the pandemic period.

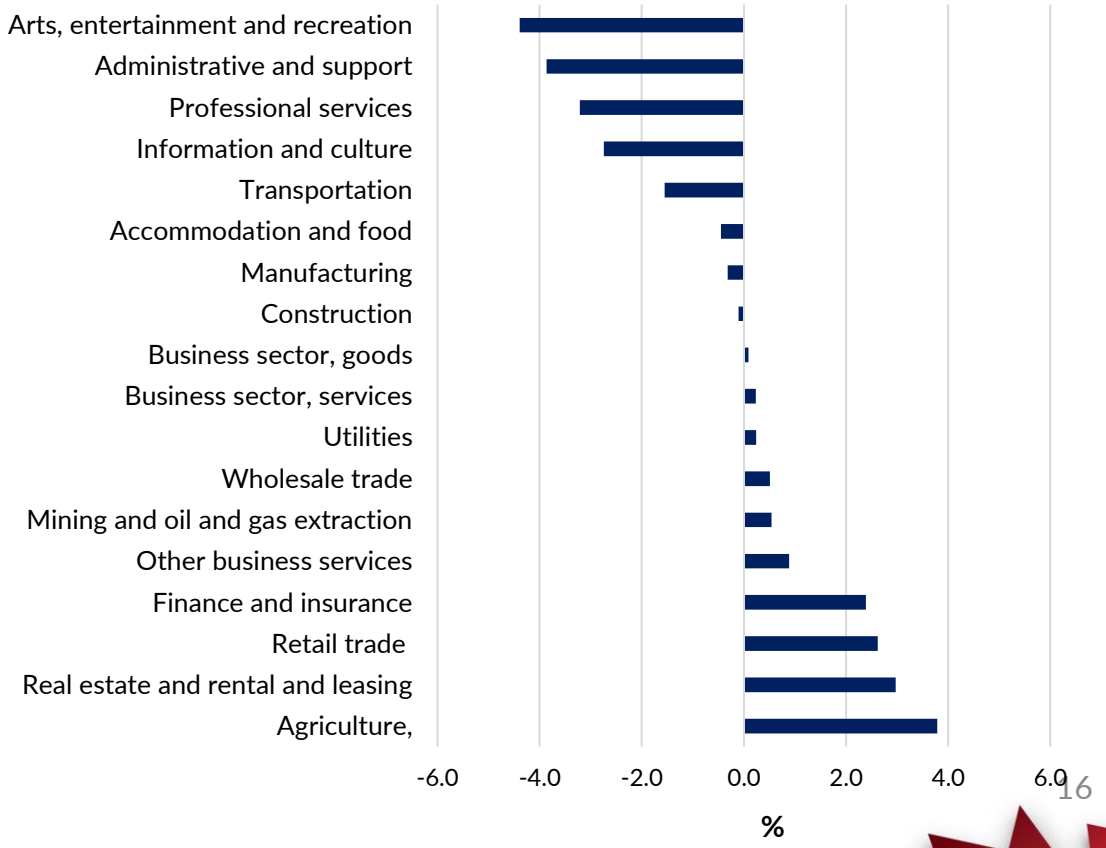


Sources: Statistics Canada and the Bureau of Labor Statistics

Productivity growth during the pandemic

- Business sector labour productivity growth was flat.
- Declines in labour productivity in about half of the major industries was offset by gains in the other half.
- Declines were largest in arts and entertainment; administration and support; professional services; and information and culture.
- Agriculture, retail trade, and finance and real estate recorded the strongest growth.

Annual labour productivity growth by industry, 2019 to 2022



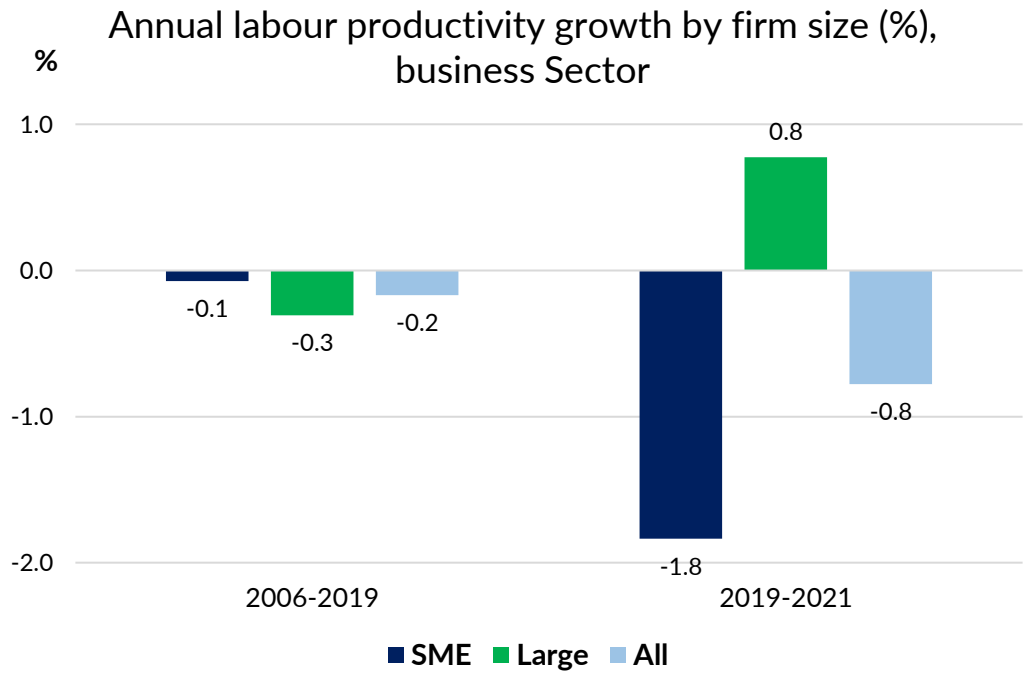
Sources: Statistics Canada table 36-10-0480-01

Productivity growth during the pandemic

- Industries that rely heavily on digital technologies were more resilient during the pandemic.
  - Higher digital intensity in finance and wholesale trade contributed to productivity gains, while the rapid recovery in retail volumes reflected the rapid transition to digital-based platforms.
- Manufacturing industries with more exposure to foreign supply shocks experienced larger declines in labour productivity over the pandemic.
  - Reshoring efforts intended to shorten supply chains and limit exposure to external shocks may come at a cost to productivity.

Productivity growth by firm size during the pandemic

- Lower labour productivity growth during the pandemic period can be traced to the decline in labour productivity in SMEs. Labour productivity increased in large firms from 2019 to 2021.
- Before the pandemic, labour productivity declined more among large firms than SMEs, which is consistent with the outsized decline in investment per worker for large firms.



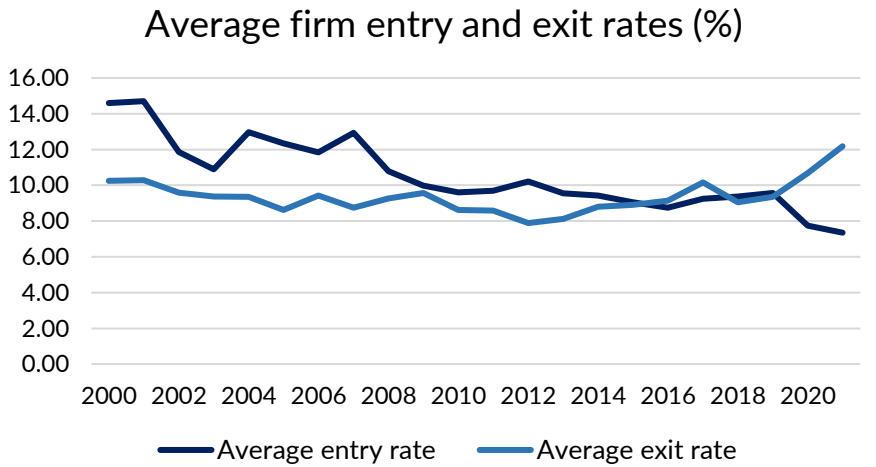
Source: The National Accounts Longitudinal Microdata File of Statistics Canada

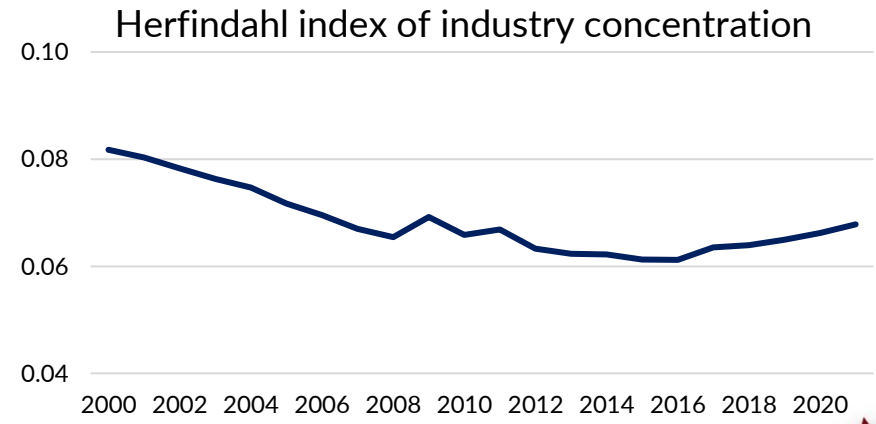
Potential explanations: innovation and capital intensity

- The information points to lower MFP growth and lower capital intensity as the two main sources of the decline in labour productivity growth after 2000, especially compared with the U.S.
- This is the longstanding concern for Canada: Canada is not taking advantage of opportunities to increase output and labour productivity through capital investment and innovation in products and processes.

Potential explanations: competitive intensity

- Declining competitive intensity may have contributed to the decline in investment after 2006
  - Entry rates have declined in Canadian industries.
  - Industry concentration increased after 2015.
  - Poor competitive intensity is associated with weak investment, accounting for slower productivity growth.

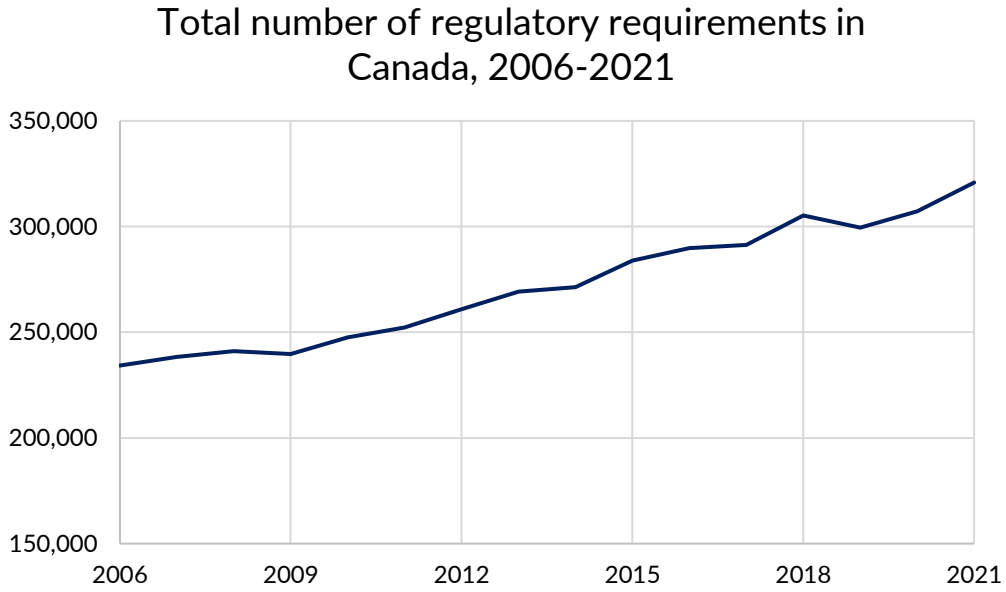




Source: The National Accounts Longitudinal Microdata File of Statistics Canada

Potential explanations – regulatory accumulation

- Over the last two years, Transport Canada and the KPMG have developed a measure of regulatory requirements at the federal level at the NAICS 4 digit level with contribution from Statistics Canada.
- The number of regulatory requirements rose at 2.1% per year or a total of 40% in Canada for the period 2006 to 2021.
- This increase in the number of regulatory requirements is found to have a negative effect on firm output growth and firm labour productivity growth.



Gu, W. (forthcoming)," Regulatory Accumulation, Business Dynamism and Economic Growth in Canada" Statistics Canada

A summary

- Labour productivity is the main driver of improving living standards.
- Labour productivity growth in Canada comes from investment in capital and workers' skills.
- Multifactor productivity growth reflects innovation and technological change, which has been low and even negative since 2000.
- Labour productivity growth declined in Canada after 2000 due to weak MFP growth, and declining capital intensity especially among large and medium-sized firms.
- Labour productivity growth in Canada has been lower than in the U.S. since the mid-1980s.
    - This was due to lower MFP growth before 2015.
    - In recent years, weak investment and lower capital intensity have been the main factors behind Canada's lower productivity growth.
    - At the industry level, the big difference between Canada and the U.S. is in information and communication technologies (ICT) or digital-related services and manufacturing industries.

A summary

- During the pandemic, Canada's labour productivity was stagnant and weak compared to the U.S.
  - Industries that relied more heavily on digital technologies were more resilient.
  - Manufacturers with more exposure to foreign supply shocks experienced larger declines in labour productivity.
  - SMEs were affected more compared with large firms with larger declines in output and labour productivity in SMEs.
- Persistently weak innovation and capital investment in Canada since 2000 contributed to the decline in labour productivity growth, which is more striking when compared to the U.S.
- Weak competitive intensity and heavy regulatory burdens on firms have contributed to Canada's persistently poor productivity performance and stagnating living standards.