

Increasing Labour productivity

An Important Challenge for Québec

Summary

1. Some economic sectors in Québec are posting strong labour productivity. But this is not the case for the economy overall. The total productivity in the Québec economy falls short of the productivity in Ontario and the United States, particularly in commercial services. This productivity gap is also widening.
2. Because of the looser labour market in Québec, which is characterized in particular by a higher unemployment rate and lower labour costs, Québec businesses have focused on hiring rather than on investing in machinery and equipment. Québec workers are thus not as well equipped in physical capital than are workers in Ontario or the United States.
3. Quebeckers are not as highly educated as their neighbours in Ontario and the United States. But this gap is disappearing; young Quebeckers now enter the labour market with educational levels as high as workers in Ontario and the United States.
4. Québec businesses are smaller and thus less advanced regarding innovation and the adoption of new technologies.
5. There are many ways to increase productivity in Québec, which in turn will lead to greater wealth, better public services, and the means for ensuring the sustainable development of its economy.

1

Québec's productivity: Successes and where it is lagging behind

Labour productivity, which is measured by dividing the real GDP by the number of hours worked, is the most important factor for ensuring long-term economic growth. Stronger productivity growth leads to better economic performance, because it enables workers to create more wealth.

Several industrial sectors in Québec have shifted their focus to productivity and they are today among the leaders in their fields in North America. In the manufacturing sector, where productivity is the easiest to measure, these achievements are seen especially in the aerospace industry, paper manufacturing, and primary metal manufacturing. Several branches in Québec's computer and electronic products sectors have also made strong progress.

These sectors present specific characteristics including the following: they generally consist of large businesses that invest a great deal in machinery and equipment and in research and development. They are also

generally very interested in participating in international trade. As we will see, these factors are the key to strong productivity.

However, labour productivity in the Québec economy overall does not match that of the sectors which are posting the highest performance. The total GDP per hour worked is lower in Québec than in our neighbours and trading partners, the United States and Ontario. This productivity gap is hindering growth in the standard of living and in the salaries of Quebeckers.

In comparing Québec's productivity to Ontario's, we find that Québec's low productivity is concentrated in commercial services;¹ such an observation is all the more significant because this sector accounts for a large part of the economy.

Trade and financial services are the sectors where the gap is particularly prominent. The manufacturing sector

¹ This sector includes all services excluding public and semi-public organizations (health, education and government services).

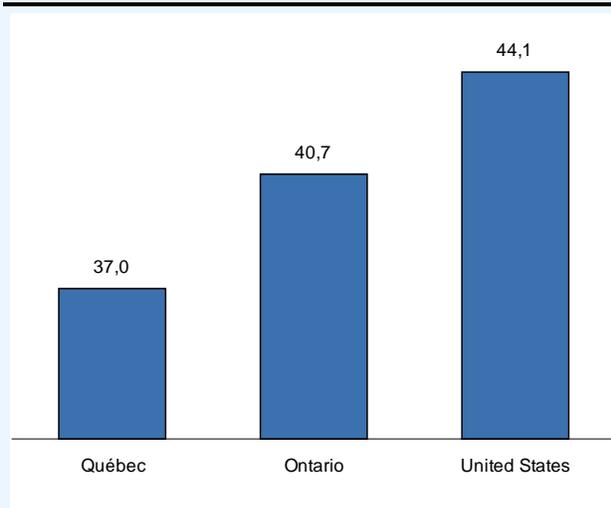
is still lagging slightly behind, even though it has bridged the gap to a certain extent in recent years.

American statistics on hours worked per sector are not directly comparable with Canadian statistics. However, some general observations may still be made on the basis of the statistics on productivity per worker.

We also find that Québec's productivity gap with the United States is the widest in several areas of commercial services. As we saw in the case of the comparison with Ontario, the largest gaps are in businesses and financial services. In addition, Québec's manufacturing sector is still posting a lower productivity level than that of the American manufacturing sector.

LABOUR PRODUCTIVITY MEASURED BY REAL GDP PER HOUR WORKED

(in chained 2000 dollars, PPP in OECD countries: 1997-2003)



Sources: Statistics Canada, Bureau of Economic Analysis.

Québec's productivity is growing more slowly than elsewhere, which means the gap is widening

Over the past twenty years, Québec's economic performance in terms of productivity has fallen behind the economic performance of Ontario and the United States. During this period, Québec's productivity gap has slightly widened, due to slower growth compared to its neighbours.

The slow growth of productivity in Québec makes its impact felt in various ways. Real salaries have increased more slowly in Québec than elsewhere. In considering the components making up the standard of living, we find that this slower productivity growth is playing an increasingly important role in explaining the gap in Québec's standard of living compared to the standard of living in Ontario and the United States.

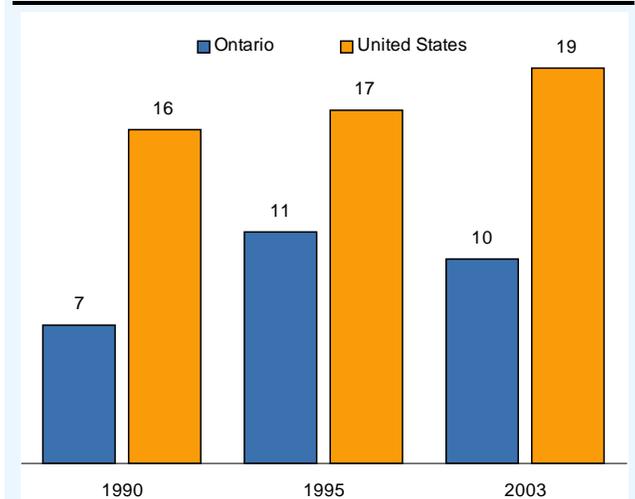
If Québec's productivity had grown at the same rate as Ontario's during the last 20 years, its average standard of living (GDP per capita) would have been, all other things being equal, \$2,230 higher in 2003.

It was especially from 1990 to 1995 that Québec's productivity gap with Ontario widened. During this same period, its gap with the United States widened only slightly. After 1995, productivity growth in the United States led the way, supported by the investment boom in various sectors of the new economy. Québec's productivity also grew much faster than before, but this has not allowed it to catch up with the United States.

On the other hand, the jump in Québec's productivity exceeded the rate of productivity growth in Ontario. Indeed, Québec posted higher productivity growth than Ontario from 1995 to 2003.

PRODUCTIVITY GAP IN REAL GDP PER HOUR WORKED WITH REGARD TO ONTARIO AND THE U.S.

(in percentages)



Sources: Statistics Canada, Bureau of Economic Analysis, Bureau of Labour Statistics, OECD.

A productivity gap with multiple causes

Several phenomena contribute to Québec's under-performance in productivity. The first of these is the low rate of investment in machinery and equipment.

Québec workers are still not as highly educated as their counterparts in Ontario and the United States. This is a situation which further hinders their productivity. Finally, Québec is also lagging behind in research and development and in the use of information technologies.

2

Lack of investment in machinery and equipment

There is a direct correlation between the level of labour productivity and the physical capital stock used by workers to perform their productive activities.

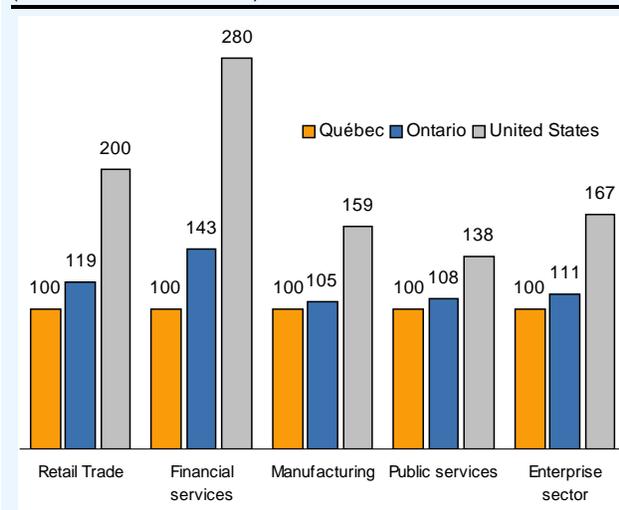
The most productive industries are capital-intensive, particularly in machinery and equipment. We can thus explain a part of Québec's labour productivity gap with Ontario and the U.S. by comparing the capital stock in machinery and equipment per worker.

Between 1991 and 2003, each employee in Québec's business sector had access to, on average, a stock of machinery and equipment valued at \$27,390.²

This stock is close to 10% lower than the stock available to Ontario workers (\$30,280) and more than 40% lower than the stock available to American workers (\$45,853). The gap is particularly high in the financial services and retail trade sectors.

CAPITAL STOCK IN MACHINERY AND EQUIPMENT PER WORKER

(Québec=100, 1991-2003)

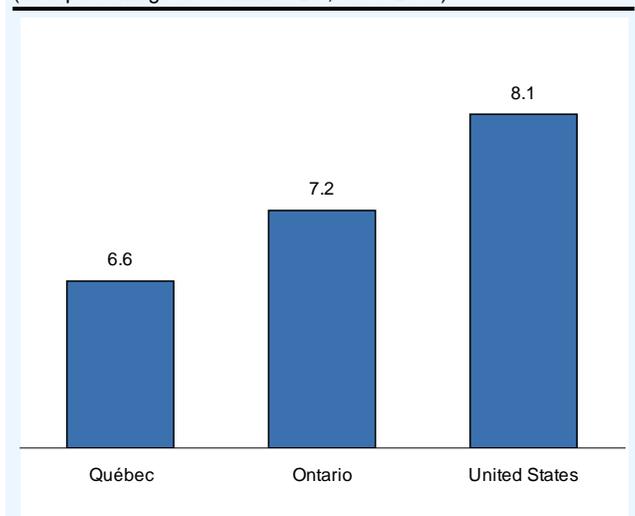


Sources: Statistics Canada, Bureau of Economic Analysis, Bureau of Labour Statistics, CSLS.

In the same way that capital stock determines the level of labour productivity, variations in the stock of machinery and equipment per worker are the main determining factor for productivity growth. Québec's productivity gap can be largely explained by the fact that it is under-investing in machinery and equipment.

In each of the past 20 years, Québec's economy has not once surpassed the performance of Ontario and the United States in investment in machinery and equipment. The investment gap with the United States has also widened since the late 1990s. Between 1990 and 2003, Québec devoted 6.6% of its GDP to investments in machinery and equipment, compared to a rate of 7.2% in Ontario and a rate of 8.1% in the United States. A similar situation prevailed at the end of this period: in 2003, Québec's rate was 5.8%, compared to 6.7% in Ontario and 7.6% in the U.S.

The recent widening of these productivity gaps is largely due to the increased capital gap between Canada and the United States. Québec's gap with the U.S. in the use of machinery and equipment has grown, especially in the manufacturing sector. During the 1990s, Québec's net capital stock in machinery and equipment per worker has increased more slowly than it has in the U.S.

INVESTMENT RATES IN MACHINERY AND EQUIPMENT
(as a percentage of nominal GDP, 1990-2003)

Sources: Statistique Canada, Bureau of Economic Analysis

The evolution of the relative cost of investment and employment is one of the key factors behind this phenomenon. The relative price of capital compared to labour fell more slowly in Québec than in the U.S., an effect due in good part to the depreciation of the Canadian dollar. In particular, the price of investments in information and communication technologies dropped more slowly in Québec.

In addition, Québec's looser labour market, characterized by a high unemployment rate and a

² Constant 2000 dollars.

relatively low labour force participation rate, is keeping the cost of labour down.³

Québec businesses have thus found it more advantageous to focus on hiring rather than on investments in machinery and equipment. The opposite trend in the U.S. (low capital costs and a tight labour market) has stimulated investment. Therefore, the cost of capital in relation to labour has intensified the impact on Québec's capital gap with the U.S.

The relatively low level of foreign direct investment in Québec (FDI) also plays a role in the machinery and equipment investment gap. FDI is associated with the creation of fixed capital. For each FDI dollar there is, on average, a corresponding, increase of 22 cents in capital investments on machinery and equipment.⁴ But Québec receives just 17.5% of foreign direct investments into Canada whereas it accounts for 20% of all investments in machinery and equipment.

3

The role of human capital

Physical capacity is not the only factor contributing to the productive capacities of workers. These capacities also depend on workers' levels of education and training and more generally on what is called their human capital. The level of workers' human capital is difficult to measure, but certain variables, such as the number of years of education attained by workers allow us to estimate it.

At the microeconomic level, many studies show that there is a strong correlation between individual incomes and the number of years of education completed and thus, under the hypothesis of a competitive labour market, with productivity. In addition, the unemployment rate is inversely proportional to education levels.

Young Quebecers are bridging the education gap

Québec is lagging behind with regard to the proportion of persons aged 25 to 64 who have a high school diploma or a university education. But this gap is disappearing as older Quebec workers with less

education leave the labour market and are replaced by younger workers with more education. This phenomenon is less prevalent in Ontario and the U.S., where the education gap between young and old is narrower.

Moreover, when we compare academic statistics for 2003 with those for 1993, we see that the proportion of the labour force aged 25 to 54 without a high school diploma fell much more in Québec and Ontario (8 percentage points) than in the United States (0.5 percentage point). The same thing is occurring among those aged 15 to 24; the proportion of persons in this age group without a high school diploma dropped by 6 percentage points in Québec from 1993 to 2003, compared to a decrease of 2.0 points in Ontario and an increase of 2.0 points in the U.S. The proportion of university graduates changed very little over the same period.

Young Quebecers have fully caught up with their Ontario and U.S. counterparts according to another measurement of educational attainment: Québec's rate of high school completion now compares favourably to the rates in Ontario and the U.S. However, Québec is still behind in the number of university graduates, particularly at the bachelor's level.

4

Research & development and technology***R&D and technical innovation***

Technological innovation is vital to productivity growth. The OECD has estimated that a sustainable increase in research and development spending by the private sector amounting to 0.1% of GDP increases real GDP per person by about 1.2%.⁵ R&D spending results in productivity gains not only in innovative industries but also in industries that adopt the technologies made possible by R&D.

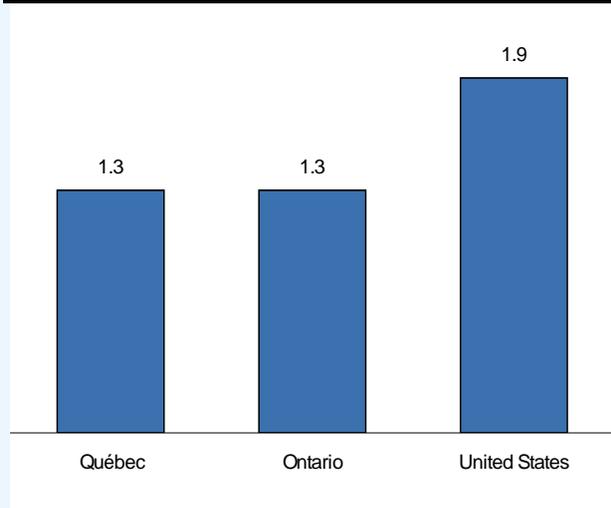
Money spent on R&D promotes physical investment in future periods. This is especially the case with information and communication technologies (ICTs). To benefit more from the new economy, Québec needs a well-educated and well-trained labour force.

³ This correlation is reported in Rao, Tang and Wang, "Canada's Recent Productivity Record and Capital Accumulation," *International Productivity Monitor*, Number 7, Fall 2003.

⁴ Hejazi and Pauly, "Foreign Direct Investment and Domestic Capital Formation," Working Paper Number 36, Industry Canada, April 2002.

⁵ OECD, *Understanding Economic Growth: A Macro-level, Industry-level and Firm-Level Perspective*, 2004, p. 50.

RESEARCH AND DEVELOPMENT INVESTMENT RATES (as a percentage of nominal GDP, 1990-2003)



Sources: Statistics Canada, Bureau of Economic Analysis, National Science Foundation.

At the North American level, Québec is lagging behind in its R&D spending. During the 1990s, its R&D spending in the private sector was, like Ontario's, lesser than in the United States.

The size of businesses is a determining factor for innovative capacities. Large companies enjoy significant economies of scale, which allow them to invest more in machinery and equipment and in R&D. Spending in R&D increases productivity, especially in high-tech industries with large firms.

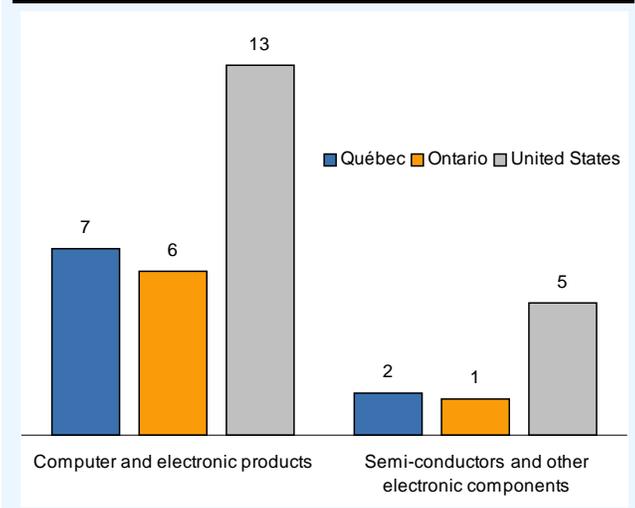
Adoption of new technologies

The acceleration in productivity growth in the United State's manufacturing sector is due in particular to production in the ICT sector. Productivity growth has been rapid, especially in computers and electronic products. This sector contributed strongly to the jump which began after 1996. The impetus that the production of new technologies has given to the manufacturing sector has been weaker in Québec because the local ICT industry is smaller.

In the services sector, the use of ICTs is the driving force behind productivity improvements, through the creation of new industries such as e-commerce and through the streamlining of inventory management and distribution networks.

PRODUCTION IN ICT SECTORS

(as a percentage of manufactured added value, 1997-2002)



Sources: Statistics Canada, U.S. Census Bureau.

The use of new technologies in commercial services has developed more slowly and less intensely in Québec than in the U.S. This gap in the use of ICTs has contributed to the widening of the productivity gap in the tertiary sector. The share of production factors attributed to ICTs between 1998 and 2001 was, on average, 6.8% in Québec and 7.0% in Ontario, compared to 14.9% in the U.S.

The productivity gap in the tertiary sector is seen especially in the wholesale and retail trade sectors, where the growth in labour productivity is lower in Ontario and Québec than in the U.S.

The common factor: Size of enterprises

Firm size is recognized as one of the factors that affect productivity in numerous economic sectors. For example, the bigger companies in the manufacturing sectors, retail trade and financial services are more productive than the small or medium-sized ones.

Large businesses can count on numerous advantages. They have easier access to financing, which gives them superior investment capacity.

They also have a greater capacity for organizing and developing production support activities such as management, marketing, research and development, and worker training.⁶

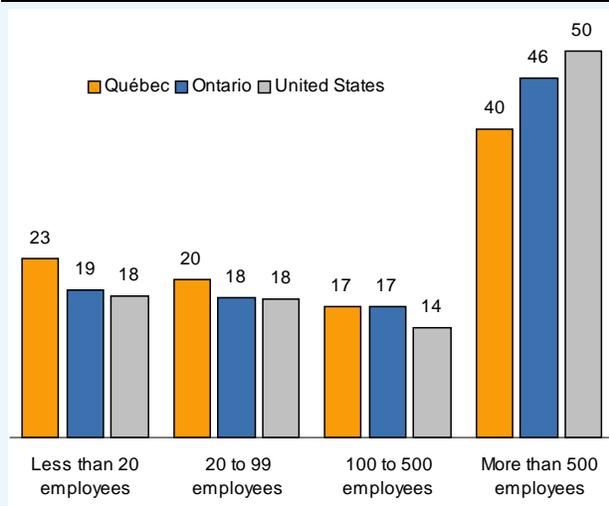
⁶ According to Statistics Canada's Workplace and Employee Survey (WES), half of the Canadian companies with fewer than 20 employees do not offer any training to their workers. Also, 64% of R&D spending in the Canadian private sector is by companies with annual income exceeding \$100 million.

Furthermore, several international studies show that the level of adoption of new technologies is directly linked to the size of firms.⁷

The Québec economy consists predominately of small firms, for a number of reasons including a smaller market.

DISTRIBUTION OF THE LABOUR FORCE ACCORDING TO ENTERPRISE SIZE

(average percentages in 2000-2001)



Sources: Statistics Canada, Office of Advocacy of the U.S. Small Business Administration, U.S. Census Bureau.

In the economy overall, 23.1% of Québec workers in 2001-2002 were employed by businesses with less than 20 employees, compared to 18.9% in Ontario and 18.3% in the U.S. At the other end of the spectrum, we find that 39.7% of Québec workers worked for companies that employed more than 500 employees, compared to 46.3% in Ontario and 49.7% in the U.S.

This structural difference is one of the factors that explain Québec's lower productivity. More specifically, it contributes to differences in terms of investment, R&D, and ICTs.

In addition, a study conducted by the Institut de la statistique du Québec (ISQ) on the manufacturing sector found that companies with less than 50 employees achieve a productivity level equal to 65% of the average for the sector. In general, manufacturing companies with less than 500 employees post below-average productivity, while those with 1000 or more employees record productivity levels more than twice as high as the average.

5

Conclusion

If the low productivity performance in Québec continues, it will bring with it a lower standard of living for Quebeckers. This can only be reinforced by the shorter work weeks and the lower retirement age of Québec workers. The fact that the labour force is ageing and will shrink in the future adds to the importance of addressing this issue.

There are numerous avenues open to Québec for improving productivity. They include increasing investment efforts, carrying out more research and development, promoting the adoption of new technologies, and encouraging SMBs to expand in size. It is also important to continue to improve training conditions for Québec workers.

Improving labour productivity will lead to greater wealth for Québec society, a greater variety and better quality of public services, and the means for ensuring the sustainable development of Québec's economy.

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This document is available on the website of the Ministère des Finances at: www.finances.gouv.qc.ca.

⁷ OECD, *Understanding Economic Growth*, 2004, page 92.