

ECONOMIC VIEWPOINT

The Structural Transformation of Quebec and Other Provincial Economies in the Last 60 Years

Major changes have transformed the economic structures of Quebec and the other Canadian provinces since the early 1960s. It's interesting to measure how these changes shaped the makeup of each province. To do this, we looked at the distribution of production and employment between the major economic sectors and the industries within the manufacturing sector. This distribution was measured in 20-year intervals, starting in 1958 and ending in 2016. The changes in the service sectors were also examined. The data gathered shows that major changes occurred in the makeup of the provincial economies over the course of these 60 years. Quebec stands out as the province with the most diversified manufacturing sector. Furthermore, of all the Canadian provinces and regions, only British Columbia developed greater diversity in its manufacturing sector for the period from 1997 to 2016. Below is a look at how the economic structures of Quebec and the other provinces have changed.

Structural Changes: Conditions That Don't Depend Solely on the Desire for Change

We generally associate a state's or region's concentrated economic activity or lack of diversity with a certain vulnerability. Reliance on one or a few economic sectors is synonymous with increased risk to a region's strength when one of these run into trouble. On the other hand, diversity is increasingly considered a preferred path to prosperity, with many governments around the world seeking to transform and diversify their economies in spite of globalization, which tends to favour specialization.

The growth or decline of the different economic sectors is largely determined by conditions that governments, local administrations and entrepreneurs cannot control. One good example is the transformation of the global economy over the last few decades. In particular, we've seen manufacturing and trade growth centres shift on a global scale. This leads to some regions winning and some losing.

Changing an economic structure takes time. Over the years, we've seen that a region's or a state's industrial framework included significant inertia. How can we be so sure? Through experience and analysis, we can state that it's impossible to transform in only a few years an industrial structure that has

become ill-suited to the trends of the global economy.¹ Some regions or countries can have trouble diversifying because they're the victims of what some call Dutch disease. This is the existence on their soil of a highly productive and profitable economic sector that drives wages and prices up, drains capital and labour and, by doing so, casts a shadow over the emergence or development of other economic areas. This kind of impact is characteristic of the resources sector, especially hydrocarbon development, but it can also occur in urban areas that depend heavily on an industrial sector as an economic driver, as is the case with the automotive industry in southwestern Ontario² or aluminum production in the Saguenay region.

Does this mean that it would be a mistake to think that a region's or state's industrial structure can be changed? No, but transformations really only become apparent and significant in the medium or long term. That's why the structural changes to Quebec's economy and that of the other Canadian provinces will be analyzed over a period of time exceeding half a century.

¹ Pierre-Marcel DESJARDINS and collab., *The Evolution of Canada's Regional Economies: Structural Patterns, Emerging Trends and Future Challenges*, Institut national de la recherche scientifique, 2013, p. 6-12.

² *Ibid.*, p. 17.

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NOTE TO READERS: The letters k, M and B are used in texts and tables to refer to thousands, millions and billions respectively.

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The study is aimed at seeing how all of the provincial economies have changed in the last six decades. It will also determine how the Quebec economy compares with that of the other provinces or regions in Canada.

A Changing Economic and Political Landscape, from Post-war to Today

From the end of World War II until today, the economies of Quebec and the rest of Canada have had to adapt to major changes.

Internal Changes

- ▶ From 1945 until the 1960s, Quebec, like other Western societies, experienced a baby boom, which translated into a massive influx of workers into the labour market of the 1970s and 1980s. However, the birth rate then plunged, such that Quebec has had to deal with a growing labour shortage in recent years.
- ▶ Another major internal change during the period was greater access to education. Quebec has had to work twice as hard since the Quiet Revolution.
- ▶ Lastly, provincial governments and municipal administrations began to play a greater social and economic role during this time. As a result, their expenditures went from less than 15% of GDP in the early 1960s to roughly 35% in the 2000s.³

External Changes

- ▶ Globalization
 - In the 1950s, the Quebec economy was still largely shaped by the National Policy instituted in 1879 by the federal government under John A. Macdonald. This policy relied on strong protectionist tariffs to encourage economic activity within Canada in an effort to replace imports. It also targeted the consolidation of the Canadian market, not only through customs tariffs, but also through a transportation and communication infrastructure stretching “from coast to coast.” Furthermore, the Canadian economy maintained a preferential relationship with its former mother country, the United Kingdom, and with the other former British colonies, which granted each other preferential tariffs.
 - After World War II, the world counted on greater openness, especially in trade. Under these circumstances, the Canadian policy proved to be outdated and inappropriate. In 1947, the General Agreement on Tariffs and Trade (GATT) and, in 1995, its replacement, the

World Trade Organization (WTO), led to a major reduction in protectionism in Canada and a significant number of other countries.

- In North America, this new spirit of open trade first translated into the Auto Pact between Canada and the United States in 1965 and later into the following general agreements: the Free Trade Agreement (FTA) in 1988, the North American Free Trade Agreement (NAFTA) in 1994, and lastly, the Canada–United States–Mexico Agreement (CUSMA) in 2018.
- Trade liberalization and expansion between countries was also supported through political changes, such as the end of the Cold War and the opening of China and the Eastern Europe countries to the market economy. In addition, the surge in global trade was facilitated by technical and commercial developments, such as containerization, distribution network consolidation,⁴ and the development of telecommunications, which substantially reduced the costs and delays inherent to doing business on an international scale.
- These changes had a major impact on national economies regardless of their size. In the case of advanced economies like Quebec’s and those of the other provinces, they exposed a high number of industries to intense competition from countries with lower wages and looser regulations (e.g., textiles, clothing and furniture). Yet, some sectors were able to thrive thanks to the new markets that opened internationally (e.g., aerospace, financial services, commodities and engineering).
- ▶ Shifting development centres
 - In the years since World War II, the global economy’s development centres shifted. Since the time of the Industrial Revolution, economic growth has occurred mostly in countries bordering the North Atlantic. During the 30 glorious, post-war years, this Atlantic-based boom was even more significant, as the European countries had to rebuild everything that had been destroyed by the conflict. As for the United States, economic activity was largely concentrated in the area sandwiched between the northeast coast and the Great Lakes. Quebec and Ontario benefited immensely from their proximity to the most prosperous and lively markets in the world.
 - Things started to change in the 1970s, as the Western economies were undermined by a series of oil shocks and several years of slow growth accompanied by stagflation. At the same time, several so-called “developing” countries began to supply the global market with highly competitive products, especially consumer

³ Pierre FORTIN, *La Révolution tranquille et l'économie : où étions-nous, qu'avons-nous accompli, que nous reste-t-il à faire?*, Université du Québec à Montréal, Conference at the Grande Bibliothèque as part of the series “La Révolution tranquille, 50 ans d’héritages,” May 11, 2010, p. 8–9.

⁴ Pierre-Marcel DESJARDINS and collab., *op. cit.*, p. 13.

goods and base products like steel. These included South Korea, China, Singapore, and some of the countries of Southeast Asia and the Indian subcontinent, i.e., the Pacific Rim countries. They joined Japan, which had risen rapidly from the ashes of World War II, as well as the west coast of the United States and Canada. These countries succeeded in creating a new development centre. Over the last few decades, these countries have become the avowed rival of the Atlantic centre, going so far as to surpassing it in terms of economic trade and growth rate.

- This shift in economic activity could be felt on the North American continent. The stagflation of the 1970s severely impacted the northeastern United States and the eastern Canadian provinces, including Quebec. The economies of these states and provinces watched the decline of the industries that had guaranteed their prosperity for more than a century. Observers began to talk of a Rust Belt to describe the states bordering on the Great Lakes grappling with the closures of a number of factories and the rapid decline of major industries, such as steel. Montreal, like New York and Boston, struggled for years. Factory closures and layoffs multiplied in sectors described as “soft.”

► The technological revolution

- The last 50 years were also marked by technological innovations that profoundly influenced and directed economic development.
- The most obvious and structurally important of these technological developments is the one that transformed the fields of information and communications. We’ve seen transistors, computers, micro-computers, the Internet, exchange platforms and the early stages of artificial intelligence arrive in rapid succession. By enabling new design, manufacturing (robotization, 3D printing), marketing and distribution processes, these developments have disrupted the way of doing things in the vast majority of economic sectors. Many observers have spoken of a new industrial revolution.
- Major technological breakthroughs were also made in life sciences (genetic engineering, genomics) and materials (nanotechnologies, in particular). They have paved the way for innovations that have improved performance and efficiency in areas as diverse as agriculture, construction and healthcare. Like the shift in development centres, these technological advances have helped transform industrial structures by making some products obsolete and creating niches for new products or services.
- Canada and Quebec have participated to varying degrees in the rise and adoption of these technological

breakthroughs. Whether through the development of innovative technologies, the appearance of companies associated with these innovations, or corporate modernization programs, all of these initiatives have led to the gradual change of their economic framework.

- This is a broad outline of the economic and trade backdrop against which this analysis was made. It’s a varied picture that provides a brief overview of the upheavals of the last 60 years. But before presenting the results, a concise description of the methodology used is required.

How to Measure Change

The structure of Quebec’s economy today is very different from that back in the 1960s, if only because services are much more prevalent, and the aerospace industry has largely replaced the production of consumer goods (e.g., textiles, softwood lumber, furniture and paper). Similar observations can be made for the other provinces.

The facts are known and well documented. Once these general conclusions are reached, how to know if Quebec is more diversified than the other provinces? How many variables should be used to answer this question? Which ones should be picked? Over which time period? These are some of the questions that we needed to answer. The box 1 on page 4 presents the variables that were used in the analysis.

Capturing change is a challenge in and of itself. It’s a little like trying to measure a moving object. As a result, the definition and makeup of some economic sectors were reviewed as the economy evolved. That’s why the classification of economic activities became increasingly accurate and the number of categories multiplied. We can guess that information was less accurate at the end of the 1950s and in the 1960s and 1970s, before becoming more accurate in the 1980s. We had to choose. We could not go into detail if we were to present a few observations. That’s why the analysis covered major blocks.

The Major Periods Used for the Analysis and the Reference Years

Rather than limit ourselves to simply looking at the structural differences between Quebec’s economy and that of the other provinces from 1960 to today, this study examines how these economies gradually transformed themselves. Twenty-year intervals were used. Doing it this way helps to better understand the influence of some factors on the economies’ structures and diversity. As a result, this analysis focuses on the changes that occurred between four key moments over the last 60 years.

The Watershed of the 1960s

- The 1960s mark a turning point between the post-war boom and the beginning of the changes resulting from the Quiet Revolution. At that time, traditional industries benefited from high protectionist tariffs; the Quebec and federal

governments were still mostly counting on foreign investment to ensure economic development, and the business climate was positive thanks to major public investment projects (the St. Lawrence Seaway, the Trans-Canada Highway, oil pipelines, the Bersimis hydroelectric station, etc.) and private investment projects (Place Ville Marie, Tour TELUS [initially CIL House] and Tour de la Bourse). Montreal was still the major economic and financial centre of Canada.

- ▶ Based on available data, the figures for 1958 and 1961 were used to report on this period, which is the study's baseline.

The 1960s and 1970s

- ▶ During the 1960s and 1970s, the Quiet Revolution significantly changed the role of the Quebec state. It was a time during which tariff barriers were considerably reduced, which created turmoil for local businesses. The nationalization of electricity became an asset in a world in which oil prices were skyrocketing. It was the era of large-scale construction projects (Olympic facilities, hydroelectric dams, highways, etc.) and the development of an expertise in services (electrification, civil engineering, etc.). It was also the time when Toronto seized the title of major urban centre from Montreal and the role of the major hub for international flights to Canada.

- ▶ Furthermore, in the 1970s, Quebec, like other developed nations, was characterized by stagflation, i.e., the simultaneous presence of high inflation and low economic growth. The figures for 1978 were used to shed light on the changes that took place during that tumultuous period.

The 1980s and 1990s

- ▶ Following the serious recession of 1981–1982 and the governments' inability to tackle stagflation, the state's role was called into question in Quebec and elsewhere among developed nations. Among the most notable and structurally key elements during these two decades were the partial stepping back of the state, the departure of a share of the Anglophone business class, and the emergence of a lively Quebec entrepreneurial class described as "Quebec Inc." It was a time when industrial clusters were adopted, and a period known for the implementation of the Free Trade Agreement (FTA) and the North American Free Trade Agreement (NAFTA), the rise of the Celtic and Asian Tigers, the fall of the Berlin Wall, and the emergence of new powers grouped under the BRICS acronym (Brazil, Russia, India, China and South Africa). Not to mention the rise of the "dotcoms," driven by the technological revolution.
- ▶ The figures for 1997 were used to reflect the changes between the 1980s and 1990s.

BOX 1

Variables Used for the Analysis

The economy's structure can be examined from different angles, including the importance of international trade, company size, spatial concentration, capital-labour ratio, foreign ownership, the private-public share, etc. Two variables were used for this study for their ability to represent the importance of different economic activities and the availability of applicable data. These variables are:

- ▶ Production defined as being the added value measured in dollars.
- ▶ Employment defined as the total number of women and men working for companies.

The data on the economic sectors and manufacturing and service industries was converted into four indicators, with each one focusing on how the provincial economies have changed and diversified.

- ▶ The first indicator used is the number of major sectors or industries responsible for at least one-third of production and employment.
- ▶ The second indicator is the share of production and employment provided by half of the sectors and industries.
- ▶ The third indicator is the Herfindahl Hirschman Index (HHI). It's commonly used to measure production in an industry concentrated in the hands of a limited number of companies.
- ▶ The fourth indicator used is the structural similarity index (SSI). Its purpose is to estimate the extent to which the structure of Quebec's economy differs from that of the other provinces or regions in Canada.

These indicators are described in greater detail in Appendix A on page 10.

The 2000s and 2010s

- ▶ At the dawn of the new millennium, China became a member of the WTO and established itself as the world's workshop for a wide range of consumer products. This forced developed economies like Canada's and Quebec's to reorganize. They had to redirect their production and services towards niches further based on innovation and specialization. At the same time, the urgent demand for commodities from the emerging countries also required that Canada and Quebec resume the role of supplier (fossil fuels, metals, wood, agricultural products). This caused the Canadian dollar to appreciate, which was difficult for local businesses to support.
- ▶ The financial crisis of 2008 put an end to the surge in demand and prices for natural resources. Investment projects in this area slowed markedly in Canada and elsewhere. At the same time, the difficult recovery of developed economies post-recession sharpened protectionist reflexes somewhat around the world, especially in the United States. And there was also the impact of the technological developments that disrupted retail trade and the traveler accommodation sector. Lastly, the more recent scarcity, even shortage, of workers has curbed the expansion of some companies on a national level.

The Results

To see so many upsets in recent decades, you may think that nothing remains of what was in place in the early 1960s, but this isn't the case. Earlier, we said that a region's or a state's industrial framework includes significant inertia; yet, some changes took place. Here's a general outline.

The results are presented in three parts: for the economy as a whole, for the manufacturing sector and, lastly, for the services sector. Details as to the methodology used are provided in Appendix A on page 10.

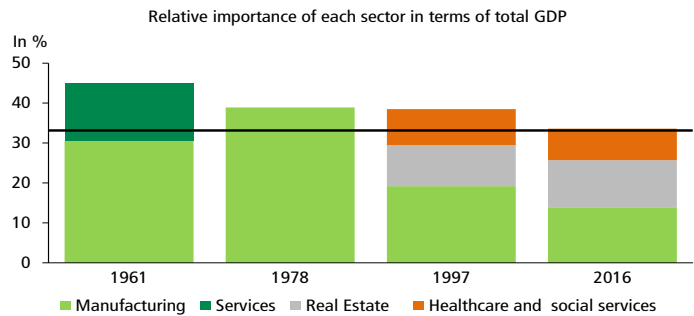
The Quebec Economy on Its Own

First, when looking at **the economy as a whole** by comparing the variation in GDP and employment for the sectors that represent one-third of the economy (graphs 1 and 2), we see greater diversity between 1961 and 2016 (Appendix B, tables 1 and 2 on page 11). In fact, the manufacturing sector has endured, but its relative importance has shrunk. If we repeat the exercise for the sectors that represent half of the economy, the verdict is not unanimous: there is more diversification based on GDP but a little less based on employment. In terms of employment, the importance of retail trade, healthcare and social services affects the result. Lastly, based on the Herfindahl-Hirschman Index (HHI) (see the box 1 on page 4), the Quebec economy was more diversified in 2016 than in 1961.

Second, in terms of **manufacturing**, if we consider the top one-third of GDP and employment, the results are not very convincing. The manufacturing sector is clearly less concentrated than the economy as a whole. We also noted the endurance of

GRAPH 1

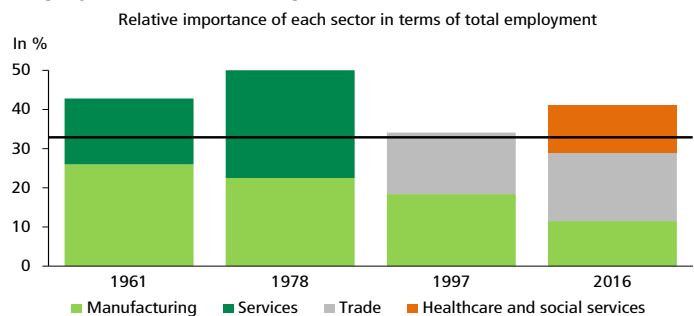
Quebec: Change in one-third of the economy from a percentage of GDP standpoint



Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 2

Quebec: Change in one-third of employers from a main employment sectors standpoint



Sources: Statistics Canada and Desjardins, Economic Studies

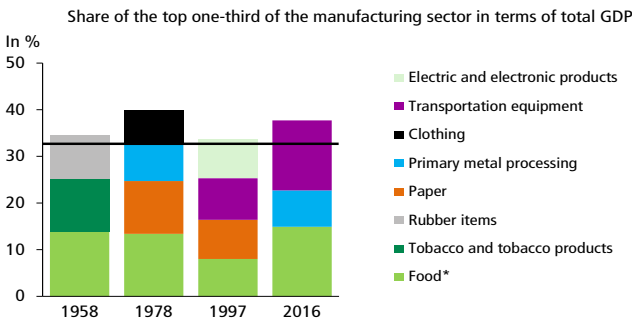
the food and beverages sector over time. Some sectors are no longer among the front runners. After six decades, exporting industries with the most added value (transportation equipment and metal products, among others), have replaced the less productive sectors (rubber products and tobacco, in particular) (graphs 3 and 4 on page 6 and Appendix B, tables 3 and 4 on page 11).

If we continue to look at manufacturing and half of the sectors to see their share of GDP and employment, there is also no clear verdict either. Based on production, there is less diversification due to the increased importance of the primary metal, oil and food industries. However, based on employment, diversification increased over time. Lastly, based on the HHI, there's no unanimity either on the overall trend.

Third, as regards **services**, the analysis is inconclusive: the data poses a problem. The level of detail is too low for the years 1961 and 1978 such that they don't really lend themselves to a comparison.

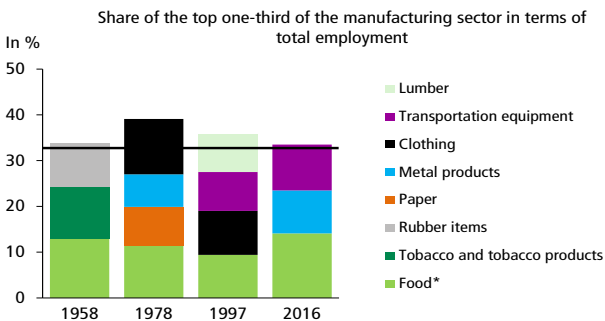
What we can conclude, however, is that, overall, the Quebec economy diversified over time by being less dependent on a few major sectors. As expected, the manufacturing industry became

GRAPH 3
Quebec: Manufacturing companies with the highest added value have gradually taken over based on GDP



* Includes beverages for 1958, 1978 and 1997.
 Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 4
Quebec: The same conclusion applies to the manufacturing sector when comparing changes in employment



* Includes beverages for 1958, 1978 and 1997.
 Sources: Statistics Canada and Desjardins, Economic Studies

less important in favour of the services sector. Manufacturing has obviously undergone a transformation. Exporting sectors with the highest added value replaced more traditional industries in which Quebec had lost its advantages due, in particular, to the reduction in trade barriers.

The Quebec Economy Compared with That of the Other Provinces

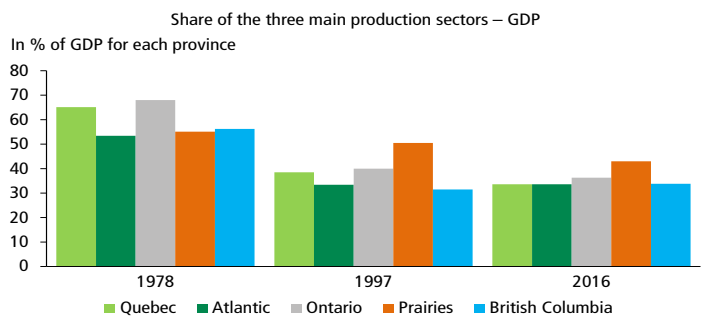
We repeated the exercise to compare Quebec with the other Canadian provinces. Here, too, the results can be divided into three parts: the economy as a whole, manufacturing and the services sector. Due to the availability of data, comparisons were made starting with 1978.

First, for **the economy as a whole**, we noted that the structural differences between Quebec and the other provinces decreased over time. The observation is the same whether we look at GDP or employment growth. Furthermore, the manufacturing sector had become much less important across Canada. However, services grew, and we noted that real estate moved up. A fact worth noting is that Quebec is the only province in which the healthcare and social assistance sector is among the top tier of the sectors that cornered the top one-third of the economy in terms of GDP in 2016. Another fact worth noting

is that manufacturing is where the differences are the greatest compared with other provinces. This issue will be addressed later in the text. As for the distribution of economic activity among the main sectors over the decades, there is clearly significant homogeneity across Canada.

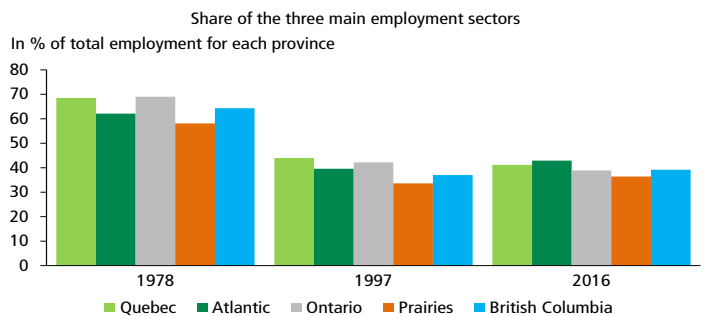
If we continue to look at the economy as a whole and one-third of the main production sectors (real GDP) and employment, we see that the concentration has lessened (graphs 5 and 6 and Appendix B, tables 5 and 6). This reduction became evident as of 1997. The concentration remains the highest in the Prairies (in production). This observation remains true for production if we take into account the top half of the sectors for total production (graph 7 on page 7 and Appendix B, table 7 on page 12). Still, when it comes to employment in the top half of the sectors, we see increased concentration in all provinces and the major regions in 2016 (graph 8 on page 7 and Appendix B, table 8 on page 12).

GRAPH 5
Production concentration was lower as of 1997 across Canada



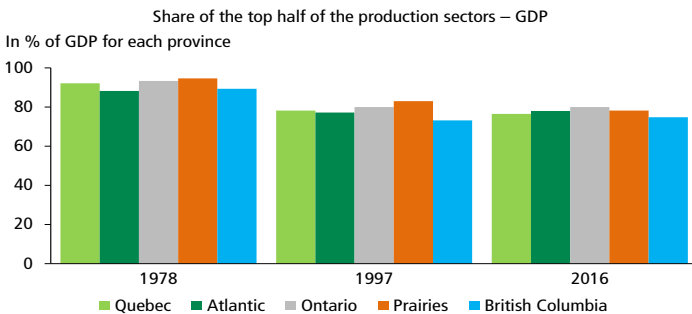
Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 6
Employment concentration was lower as of 1997 across Canada



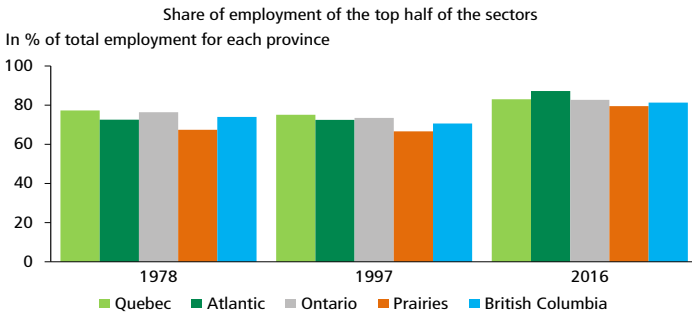
Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 7
Production concentration was lower as of 1997 across Canada



Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 8
Employment concentration increased as of 2016 across Canada, with Quebec following suit



Sources: Statistics Canada and Desjardins, Economic Studies

As for the HHI, it shows accrued diversification over time between 1978 and 2016 (graphs 9 and 10 on page 8 and tables 9 and 10 in Appendix B on page 12). We note that Quebec was the most diversified province or region in 2016 in terms of production, contrary to employment.

Second, in terms of **manufacturing**, a few major observations can be made. When it comes to production in this sector, food remains among the front runners for both production value and employment over time. It ranks first or second in all of the provinces or regions. Transportation equipment manufacturing has become more important. It was even ranked first in Quebec in 1997 (aerospace and rail transportation). A fact worth noting is that, in British Columbia, the lumber and paper sectors are still important but less dominant than in the past.

By continuing to observe the manufacturing sector through employment, we noted the very strong showing of the food and transportation equipment sectors. We also saw the growing importance of metal products. For Quebec, the clothing sector, previously in the lead, has tumbled, and the production of durable goods has grown, eclipsing non-durable products in the

process (e.g., paper and clothing). This confirms the observations already made in previous studies.⁵

Whether we focus the analysis on the third or half of the sectors that dominate manufacturing, the conclusion remains the same: Quebec is more diversified in terms of manufacturing than its counterparts—provinces or regional groups. Quebec stands out as the only province or region in which the top three sectors struggle to surpass the one third of employment in the manufacturing sector, which testifies to a greater diversity.

Lastly, in terms of **services**, we noted significant similarities between Canada’s diverse provinces and regions. From a production standpoint, the analysis reveals that real estate and rental and leasing services, as well as social assistance and public administration, top the lists everywhere. Ontario’s financial and insurance sectors stood out in 1997 and in 2016. It’s worth noting that education, which dominated everywhere in 1978, no longer ranks among the leaders in 1997 and 2016.

From the perspective of employment, there’s a little more disparity between provinces in the large services sector. Across Canada, healthcare and social assistance remain one of the most important sectors. Retail trade is also a heavyweight everywhere in 1997 and in 2016 (except in the Atlantic region in 2016).

Due to the lack of comparable data for 1961 and the limited details on services in 1978, it’s impossible to make any major observations in terms of the index for a third of the service sectors. The same goes for the analysis of half of the sectors. The HHI reveals that the degree of diversity in the service sectors differs little from one province or region to another.

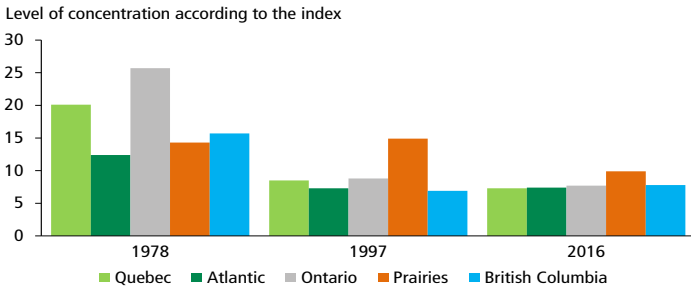
What the SSI Says

Appendix C on page 13 shows the structural similarity indexes between Quebec’s economy and that of the Atlantic provinces, Ontario, the Prairies and British Columbia. Below are the main observations to emerge:

- ▶ The economies of Ontario and Quebec generally share a similar structure. The main exception to this rule being services in 2016: greater similarity was observed between the service sectors in Quebec and the Prairies.
- ▶ The differences between Quebec and the other provinces or regions are greater in the manufacturing sector.
- ▶ Over the decades, the structural differences between Quebec and the other provinces or regions decreased mostly likely because of the growing importance of services across the country. In fact, we observe the same predominance

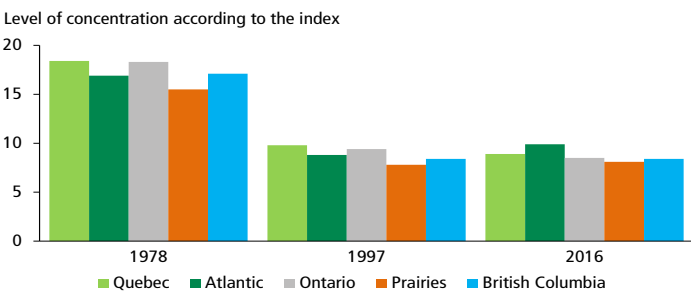
⁵ John R. BALDWIN and Ryan MACDONALD, *The Canadian Manufacturing Sector: Adapting to Challenges*, Statistics Canada, Economic Analysis Division, *Economic Analysis Research Paper Series*, No. 11F0027M – No. 057, July 2009, 55 p.

GRAPH 9
According to the Herfindahl-Hirschman Index, there is a general trend towards diversification in all provinces based on GDP



Sources: Statistics Canada and Desjardins, Economic Studies

GRAPH 10
According to the Herfindahl-Hirschman Index, there is also a trend towards diversification based on employment



Sources: Statistics Canada and Desjardins, Economic Studies

of services like healthcare and social services, education, public administration, real estate and retail trade.

- ▶ The observations are roughly the same for production and employment.

Future Perspectives

What factors could change the current structure of the Quebec economy and that of the other provinces? Consistent with the reasoning that changes take time to work, there’s little room for cyclical factors in this analysis unless they leave a deep mark.

Increased protectionism is one of the factors that could lead to a structural reconfiguration of Quebec’s economy insofar as it would overwhelm the opposite trend: more open trade. We would then see an increase in protectionist tariffs. As a result, certain sectors that would then be somewhat sheltered from the competition could benefit from a second wind. Under these circumstances, the economy could diversify more. If the Canadian dollar were to depreciate, this effect could become even more pronounced.

If e-commerce were to expand even more, it, too, could gradually reshape the economic structure. If e-commerce’s hold were to

spread more, and content and goods were to be increasingly produced abroad, some sectors, such as retail trade, printing and advertising, to name but a few, could become less important. There was less diversity in terms of economic activity here when these losses were not offset by the arrival of new economic sectors.

Furthermore, it’s possible to think that incorporating e-commerce even more into economic and human activities in Quebec would cause, in turn, new industries to spring up or new trades or professions—which have mostly been lacking here until now—to appear. These scenarios could come to fruition insofar as Quebec invests massively in spreading e-commerce and its applications. It’s possible to think that the “production diversion” seen in some sectors could be offset by others to Quebec’s benefit.

Changing demographics are unavoidable and will have an impact. The aging population will affect the housing, consumer, and healthcare and social assistance sectors, to name but a few. We’ll see the development of new ways of doing things, especially in these fields. These changes will call for new employment duties or responsibilities to be developed. In contrast, we may wonder if the demand in healthcare and social assistance will be such that the economic importance of this sector will grow even more.

It’s easy to imagine that the labour shortage, coupled with automation, could lead to some sectors becoming less important, as robots carry out the tasks. The manufacturing sector immediately comes to mind, but it’s increasingly evident in areas as different as law and financial transactions. The transformation of the economic structure could be seen mostly through the optic of employment. All that remains to be measured is if the value of producing something will remain the same, increase or decrease. More widespread automation is a factor that, on its own, could change the game with or without any major demographic shift.

Energy and environmental changes could also cause a structural transformation of the Canadian and Quebec economies. The waxing or waning importance of the oil resources extracted from the tar sands will have an impact on oil-producing provinces of course, but also on the Canadian dollar. This could play out positively or negatively for the international trade in goods and services and lead to an adjustment of the makeup of different economic sectors.

To respond to increasing environmental concerns, demand for hydroelectric energy could grow. The production and transmission of electricity could be pushed forward as well as all of the expertise developed in Quebec in the construction of dams and in maintaining a vast network. The electrification of transportation could see a major surge and help reshape a part of Quebec’s economic framework. There are many possibilities.

Conclusions

The economies of Quebec and the other Canadian regions have changed significantly in the last 60 years. They did it under the effect of factors such as trade liberalization, intense competition from emerging countries, the arrival of new technologies, household income growth and the expanding role of the state in response to different needs.

As a result, the various service sectors have gained significant importance in Quebec and across Canada. In fact, the dominant economic sectors in Canada are now trade, real estate, and healthcare and social assistance. The growing prevalence of services is especially apparent in employment. In contrast, agriculture, resource development and manufacturing have lost in economic importance. Manufacturing in Quebec was better able to resist crumbling compared with elsewhere in Canada; yet, it did decline, especially at the start of the new millennium. Except for the food sector, the sectors producing consumer goods are no longer number one among the most important industries in Canada. This is especially true in Quebec, where these industries had been well established.

The structural similarity index shows that Quebec's economy most resembles that of Ontario. The index also reveals that the structure of Quebec's economy differs less and less from the economies of the other Canadian provinces and regions. This

convergence of provincial economies is due in large part to the growing share of the main service sectors in the different provinces. The same service sectors dominate everywhere, which ends up compensating immensely for the noticeable differences in manufacturing or the primary industries (box 2).

The services sector's growing share of the provincial economies has also gradually reduced their structural diversity. Except for British Columbia, the diversification of the provincial and regional manufacturing sectors stopped or went into reverse between 1997 and 2016 after advancing during the previous decades. The reversal in trend could also be due in part to the increased specialization of the provincial economies based on their comparative advantages within globalization. Even as it reflected the same long-term trends, Quebec succeeded in maintaining a more diversified manufacturing sector compared with the rest of Canada over the last 60 years.

Lastly, the study showed that the economy's structure and diversity can vary significantly depending on whether production or employment is used to measure them. These differences are due to the variations in labour productivity from one sector to another. As a result, the most productive industries do better when examined from the perspective of production; others do better when looked at from the optic of employment.

BOX 2

Overall Conclusions

Quebec

- ▶ We noted that Quebec's manufacturing sector diversified over time except during the final period looked at between 1997 and 2016.
- ▶ We noted the endurance of the manufacturing sector despite lower importance over the years.
- ▶ Quebec's manufacturing sector is less concentrated than the economy in general.
- ▶ After six decades, exporting industries with the most added value have replaced less productive ones.

Quebec and the Other Provinces

- ▶ Across Canada, manufacturing is declining in importance while services have grown in importance (especially real estate).
- ▶ The differences between Quebec and the other provinces are the greatest in manufacturing.
- ▶ Manufacturing in Quebec was better able to resist crumbling compared with elsewhere in Canada.
- ▶ Over the last 60 years, the structural differences between Quebec and the other provinces have decreased: the conclusion is the same whether the analysis focuses on production or employment.
- ▶ The distribution of economic activity between the main sectors has remained remarkably homogeneous across Canada over the years.
- ▶ The structural similarity index shows that Quebec's economy most resembles that of Ontario.

Appendix A

Methodology

Indicators

The data on economic sectors and manufacturing and services industries was divided into four indicators, with each one focusing on how the provincial economies have changed and diversified. Each of these indicators come with advantages and disadvantages. It also seemed necessary to base the analysis on the complementary information provided by one or the other.

One-Third of the Economy

This indicator is composed of a number of sectors or industries responsible for at least one-third of production and employment. It provides an overview of the degree of economic diversification with the understanding that the lower the number, the more the economy is concentrated in the hands of a limited number sectors or industries. It also helps see how the economy's predominant groups were able to change from one period to another. In fact, this may be the main reason why this indicator is interesting, given that the number of industries or sectors needed to cross the one-third threshold can't vary much and that, in some cases, this threshold can be crossed by a fairly wide margin as indicated by the results.

It is agreed that the significance of this indicator might have varied between the 1950s and today, given that, as mentioned above, the number of 2- or 3-digit categories has increased due to successive changes to the classification system.

In short, this indicator was used because it holds informational value as to the changes in identifying the dominant activities at different times, but it doesn't lend itself to a comprehensive assessment as to economic diversity.

Half of the Sectors or Industries

Another indicator used is the share of production and employment provided by half of the sectors or industries. This indicator provides information similar and complementary to that produced by the previous indicator. It doesn't reflect the same bias resulting from an increase in the number of categories as one classification system replaced another. On the other hand, its one disadvantage is that, for the years in which there's an odd number of sectors or manufacturing industries, the number representing half must be rounded up or down. We decided to round down. So, when the number of sectors was nine, half was defined as the first four sectors rather than the first five. Another solution would have involved taking the average between the importance of the first four and the importance of the last five, but this method would have been difficult to interpret and explain. Fortunately, the above-mentioned bias doesn't affect the validity of the interprovincial comparisons in any way. Like the

previous indicator, but to a lesser degree, this indicator also has the disadvantage of being insufficiently sensitive, with the more important half of the sectors and industries easily grabbing a share that represents three-quarters or more of the economy and that this share is fairly stable from one period to another.

The Herfindahl-Hirschman Index (HHI)

Sharing some similarities with the Gini coefficient, which is used to measure income distribution within a population, the Herfindahl-Hirschman Index (HHI) is an indicator commonly used to measure the production in an industry concentrated in the hands of a limited number of companies and, if need be, to justify the intervention of the authorities responsible for maintaining a competitive market. In this study, its purpose is to provide a rational measurement of the degree of the economy's diversification.⁶ It's determined by calculating the sum of the squares of the shares relative to each economic sector or industry.

The indicator can be calibrated according to different scales. In this study, if 20 is the number of sectors or industries, the HHI is shown on a scale where 5 (100/20) translates into the equal importance of all the sectors or industries and 100 into the concentration of any economic activity in a single sector or industry. In other words, the higher the HHI, the less diversified the economy. Compared to the previous two indicators, the HHI has the advantage of taking into account the relative importance of all of the economy's sectors, not just the most important ones. Moreover, it lends itself well to comparisons between eras and provinces. Unfortunately, it is a number and, as such, doesn't provide any qualitative indication as to economic transformation.

The Structural Similarity Index (SSI)

The purpose of the SSI is to measure how much the structure of Quebec's economy differs from that of the other provinces or regions in Canada. Depending on the case, the index is defined as the average of the absolute deviations expressed in percentage points between Quebec and each of the other provinces or regions concerning the relative importance of each of the sectors and industries in any of these economies.

⁶ This index is also used for the same purposes by the Institut de la statistique du Québec, especially in the 2013 edition of [Portrait statistique du secteur manufacturier au Québec](#).

Appendix B

Tables

TABLE 1
Quebec: main production sectors – One-third of the economy

IN % OF QUEBEC'S GDP	1961	1978	1997	2016
Manufacturing	30.6	38.9	19.2	13.9
Services	14.5	---	---	---
Real estate services	---	---	10.3	11.8
Healthcare and social services	---	---	9.0	7.9
Total	45.1	38.9	38.5	33.6

Sources: Statistics Canada and Desjardins, Economic studies

TABLE 3
Quebec: the main goods-producing industries

IN % OF GDP OF THE MANUFACTURING SECTOR	1958	1978	1997	2016
Food and beverages	13.8	13.4	8.0	---
Transportation equipment	---	---	8.9	15.0
Tobacco and tobacco products	11.5	---	---	---
Paper	---	11.3	---	---
Paper and related products	---	---	8.4	---
Primary metal processing	---	8.0	---	7.8
Electric and electronic products	---	---	8.3	---
Food*	---	---	---	14.9
Rubber items	9.3	---	---	---
Clothing	---	7.1	---	---
Total	34.6	39.8	33.6	37.7

* In 1997 and 2016, food and beverages were considered separately.
Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 5
Three main production sectors

IN % OF THE PROVINCE'S OR REGION'S GDP	1978	1997	2016
Atlantic	53.4	33.4	33.6
Quebec	65.1	38.5	33.6
Ontario	68.0	40.0	36.3
Prairies	55.1	50.5	43.0
British Columbia	56.2	31.5	33.8

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 2
Quebec: main employment sectors

IN % OF TOTAL FOR QUEBEC	1961	1978*	1997	2016
Manufacturing	26.0	22.5	18.4	11.5
Services	16.8	29.3	---	---
Trade	---	---	---	17.5
Wholesale and retail trade	---	---	15.7	---
Healthcare and social services	---	---	---	12.2
Total	42.8	51.8	34.1	41.2

* The data available for 1978 is broken down into fewer categories (9) than the others (15, 19 and 20), which partly explains the high percentages noted.

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 4
Quebec: main employment industries of the manufacturing sector

IN % OF EMPLOYMENT IN THE MANUFACTURING SECTOR	1958	1978	1997	2016
Food and beverages	12.9	11.5	---	---
Transportation equipment	---	---	8.5	10.0
Tobacco and tobacco products	11.4	---	---	---
Paper	---	8.4	---	---
Metal products	---	7.1	---	---
Lumber	---	---	8.3	---
Metallic products	---	---	---	9.4
Food*	---	---	9.4	14.1
Rubber items	9.5	---	---	---
Clothing	---	12.1	9.6	---
Total	33.8	39.1	35.8	33.5

* In 1997 and 2016, food and beverages were considered separately.
Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 6
Three main employment sectors

IN % OF THE PROVINCE'S OR REGION'S TOTAL	1978	1997	2016
Atlantic	62.1	39.6	42.9
Quebec	68.5	44.0	41.2
Ontario	69.0	42.2	38.9
Prairies	58.1	33.6	36.4
British Columbia	64.3	37.0	39.2

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 7
Share of production held by the top half of the sectors

IN % OF GDP	1961	1978	1997	2016
Atlantic	---	88.2	77.2	78.0
Quebec	83.3	92.1	78.2	76.5
Ontario	---	93.3	80.0	80.0
Prairies	---	94.6	83.0	78.2
British Columbia	---	89.3	73.2	74.8

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 8
Share of employment held by the top half of the sectors

IN % OF TOTAL EMPLOYMENT	1961	1978	1997	2016
Atlantic	---	72.6	72.5	87.2
Quebec	89.5*	77.3	75.1	83.0
Ontario	---	76.4	73.5	82.7
Prairies	---	67.4	66.6	79.5
British Columbia	---	74.0	70.6	81.3

* Imprecise data due to a significant, unattributed residual.
Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 9
Sectoral production diversity provincially

HERFINDAHL-HIRSCHMAN INDEX	1961	1978	1997	2016
Atlantic	---	12.4	7.3	7.4
Quebec	15.2	20.1	8.5	7.3
Ontario	---	25.7	8.8	7.7
Prairies	---	14.3	14.9	9.9
British Columbia	---	15.7	6.9	7.8

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 10
Sectoral employment diversity provincially

HERFINDAHL-HIRSCHMAN INDEX	1961	1978	1997	2016
Atlantic	---	16.9	8.8	9.9
Quebec	14.6	18.4	9.8	8.9
Ontario	---	18.3	9.4	8.5
Prairies	---	15.5	7.8	8.1
British Columbia	---	17.1	8.4	8.4

Sources: Statistics Canada and Desjardins, Economic Studies

Appendix C

Structural Similarity Index

TABLE 11
Sectoral employment in 1978 – Exemple of Index calculation

DISTRIBUTION IN %	ATLANTIC	QUEBEC	SPREAD*
Agriculture	2.1	2.9	0.8
Other branches of the primary sector	5.0	2.1	2.9
Manufacturing industries	14.5	22.5	8.0
Construction	7.2	5.4	1.8
Transportation, communications, other utilities	10.5	8.8	1.7
Trade	18.8	16.7	2.1
Finance, insurance, real estate	3.8	5.3	1.5
Services	28.8	29.3	0.5
Public administration	9.3	7.1	2.2
Total	100.0	100.0	21.5
Structural similarity index – Average variation			2.4

* Absolute value

Sources: Statistics Canada and Desjardins, Economic Studies

TABLE 12
Structural similarity index between Quebec's economy and that of the other provinces or regions

INDEX	ATLANTIC				ONTARIO				PRAIRIES				BRITISH COLUMBIA			
	1958	1978	1997	2016	1958	1978	1997	2016	1958	1978	1997	2016	1958	1978	1997	2016
Sectors																
Production	---	1.9	1.5	1.6	---	1.1	0.7	0.8	---	4.1	3.4	2.6	---	1.6	1.7	1.6
Employment	---	2.4	1.5	0.9	---	0.9	0.7	0.4	---	3.6	1.7	1.3	---	1.7	1.3	0.9
Manufacturing																
Production	4.5	4.0	3.5	3.7	2.4	2.2	1.8	1.6	3.7	3.0	2.8	3.4	3.6	4.4	3.1	1.9
Employment	4.5	5.2	3.8	2.9	2.5	2.4	2.4	1.2	4.0	3.1	2.2	1.3	4.6	3.9	2.7	1.9
Services																
Production	---	1.6	1.1	1.3	---	1.4	1.0	1.1	---	2.4	1.0	0.8	---	3.2	1.2	1.5
Employment	---	2.3	1.0	1.1	---	1.2	0.8	0.7	---	1.2	0.5	0.4	---	1.3	0.9	0.8

Sources: Statistics Canada and Desjardins, Economic Studies