

JDI ROUNDTABLE **ON MANUFACTURING** **COMPETITIVENESS IN NEW** **BRUNSWICK FORUM**



**FROM ABUNDANCE TO SCARCITY:
LABOUR SUPPLY IN NEW BRUNSWICK PRE-
AND POST-2008**

Jane Amachree

Executive Summary

The manufacturing sector in New Brunswick is facing a potential labour shortage due to challenges like an aging workforce, perennial out-migration and a mismatch between available workers' skills and employer needs. Manufacturers in different sectors are competing for the same in-demand skills. New Brunswick manufacturers are facing particularly acute challenges with labour supply given their relatively high reliance on labour intensive production and out-migration of young New Brunswickers to other provinces. These labour supply challenges hamper manufacturing competitiveness and discourage investment.

Most of the evidence about labour shortages so far has been based on modelled projections of supply and demand balances over the next decade. Manufacturers, meanwhile, say this issue affects them today. In this report, we investigate the degree to which labour shortages exist in New Brunswick now, and if they do, how severe they are. We present a number of statistical indicators highlighted by existing literature on the subject to describe labour markets in New Brunswick, Canada, Nova Scotia, and Ontario.

We find these statistical indicators suggest labour shortages exist in the province overall and are most apparent in the Southeast and Southwest regions of New Brunswick. Whatever competitive advantage New Brunswick once had from labour abundance is now gone as manufacturers compete for labour in a full employment economy. Most policy solutions to labour and skills shortages, such as changing immigration programs and seeking an alignment of PSE programs with labour market needs, are slow to implement and are not likely to provide much immediate relief for manufacturers in the province. Consequently, the main message for the Federal and provincial governments is as follows:

- **Data:** Governments need to pick up the pace of policy development and reforms with respect to growing labour supply. They should monitor labour market changes and make labour market indicators (LMIs) publicly available.
- **Technology:** Governments also need to create policies and conditions to spur investment in labour saving technology to raise labour productivity and reduce the high degree of labour reliance of many of the province's producers.
- **Workforce preparation:** Government needs to provide information and tools to equip newcomers for the job market and mobility in the manufacturing sector. Employers need to collaborate with training institutions and newcomer orientation bodies to prepare new labour market entrants.

Key Phrases

Labour shortage, ageing population, declining workforce, manufacturing, investment.

Key Points

- There is a labour shortage in New Brunswick, particularly in the manufacturing sector.
- The region has a shrinking labour force due to an ageing population and out-migration.
- Investment in new technologies and automation, development of targeted training programs and partnerships with educational institutions, and efforts toward immigrant attraction and retention may alleviate the situation.

Introduction

Are there labour shortages in New Brunswick?

Historically, New Brunswick has been considered a labour abundant economy with high unemployment and low wages compared to other regions of Canada. Abundant labour and low wages were the source of the province's competitive advantage and producers in the province relied on labour-intensive production technologies (McKenzie & Ferede, 2017).

After 2014 when the CDN-USD exchange rate declined, it became clear that something had changed in the New Brunswick labour market. Manufacturers and other employers have struggled since then to fill job vacancies and they report challenges in building and sustaining a stable workforce for their companies due to a skills mismatch and declining labour force participation (Raoul, 2018).

Labour shortages are perceived to be a by-product of an ageing population, out-migration and/or non-competitive wages. For instance, CBC business columnist Don Pittis points out "many (workers) are retiring", resulting in adverse effects on the Canadian workforce and "a falling participation rate" (2019). New Brunswick's ageing population places a significant fiscal burden on the provincial government.

As its population ages, New Brunswick grapples with a tightening labour market. The Department of Post-Secondary Education, Training and Labour (PETL) projects that there will be 120,000 job openings in New Brunswick over the next ten years and the overwhelming majority (97%) will result from replacement demand (NBjobs.ca, 2018, p. 7).

In manufacturing, there will be 10,000 job openings to replace exiting workers over the next 10 years. Meanwhile, the number of workers aged 15 to 64 for every resident over age 64 is expected to fall from 4.5 in 2009, to 3.1 in 2018, to 2.3 in 2027. Labour market entrants from the New Brunswick population are predicted to meet 55% of the job openings. Immigration at current levels of 4,000 people per year will address 10% of the replacement demand after backfilling for the assumed continued out-migration. That leaves a gap of 34% between projected labour demand and labour supply.

The availability of needed skills and labour for manufacturers is not a problem specific to New Brunswick. A CME/CSTEC (2017) report identified that projected labour shortages in manufacturing will negatively impact the sector across Canada as the number of labour market entrants will fall short of employer demands over the next decade. Manufacturing has an older, more highly skilled

workforce than other sectors, which means Canada can expect larger worker exits from manufacturing in the near future. Labour market entrants with the skills in demand are scarce because those skills are not currently being emphasized in education and Post-Secondary education in Canada (p. 16). For the skills and trades manufacturers require, there is competition from other sectors like oil and gas that pay higher wages, putting upward pressure on wage costs (p. 13). Finally, the CME/CSTEC report highlights the importance of regional development of labour supply over external recruitment. While immigration and in-migration will be important for meeting labour demand, employers prefer hiring from their own region due to the higher costs of recruiting from outside the region (p. 9). For New Brunswick, this point is particularly important because the wages paid in manufacturing in the province are lower than in other regions and raising wages in the absence of a productivity increase reduces competitiveness. The CME/CSTEC report identifies other disadvantages manufacturers in New Brunswick would have with respect to recruitment, such remoteness, which discourages immigration to the province, and an older population, which makes the scale of the recruitment problem larger and the recruitment pool shallower (p. 19).

According to Mike Holden, Chief Economist of Canadian Manufacturers and Exporters (SME), this labour and skills shortage “represents the single largest barrier to innovation and technology adoption in Atlantic Canada” (2019, p. 13). Not only does a lack of talent “stifle innovation,” but it “limits technology adoption because businesses cannot find workers with the specialized skills needed to assess, operate and maintain that equipment” (p. 5). This is particularly important for manufacturers in the region as they are having difficulty retaining workers (p. 15) due to employee concerns about upward mobility (in the case of small firms), the demand for better lifestyle benefits, and the less desirable rural areas where many of these businesses are located. Holden also points out that while automation offers productivity benefits, for manufacturers in New Brunswick, it would mean exchanging one shortage for another - unskilled vs. skilled (p. 13). He posits that “technology and skills are fundamentally interconnected” (p. 14) and urges the province to address the labour shortage prior to making a case for investments in technology.

In this paper, we explore how the labour market in New Brunswick has changed from labour abundance to labour shortage and the implications of that change for the manufacturing sector. We investigated the literature to determine what indicators are relevant for measuring labour shortages. In our analysis, we include an overview of the strengths and weaknesses of the indicators as well as the information they provide. These indicators are: employment rate; unemployment rate; job vacancy rates; ratio of unemployed persons to job vacancies; wage growth rates; labour productivity; and unit labour costs. We then consider a range of policy options to address the situation, such as the use of immigration

and training to increase labour supply, as well as increasing investment in capital to increase labour productivity.

Based on the indicators outlined above, we find that:

- The ratio of unemployed persons to job vacancies for New Brunswick has fallen since 2011, meaning there are fewer people available for every open job.
- There has been no growth in labour productivity but real wages and unit labour costs within the province are rising, resulting in deteriorating competitiveness of manufacturers in the province.

In light of these trends, New Brunswick employers are having a hard time finding and retaining employees. However, not all regions in the province face the same plight. The labour shortage is more severe for Southeast and Southwest New Brunswick. In contrast, in the Northeast, the ratio of unemployed persons to job vacancies is relatively large and does not suggest a shortage of labour. The fact that the region has the least year-to-year change in employment, the highest unemployment rates and the lowest participation rates within the province supports this assertion. On the other hand, utilization of employment insurance indicates a reliance on seasonal employment in the region, meaning many unemployed workers are not available as labour supply. It may also be the case that the skills levels of workers in the Northeast are relatively low, or not a match with the skills needs of firms.¹

In summary, New Brunswick faces a labour shortage crisis due to declining labour force participation, an ageing population, and underinvestment in manufacturing technology. It is vital that the province to pursue investment, automation and immigrant retention to remedy the situation.

The concept of a labour shortage: what does it mean and how is it measured?

While the concept of a “labour shortage” seems straightforward, Sue Richardson notes that there is no universally applied definition of labour shortages, nor are there objective measures or direct indicators. Arrow and Capron (1959) define a labour shortage as a situation where there are unfilled vacancies with salaries equal to those of skilled workers currently employed by the firm and performing equivalent service. They suggest there is also a “quality” aspect to a labour shortage situation, as employers may choose to fill vacancies with workers who in the prior to the skills shortage would have been seen as under-qualified and

¹ CSTE/CME (2017, p. 9) observes that “Occupational forecasts are conducted in terms of occupations with no nuancing for skills. As a result, manufacturing employers are often told that there is an ample supply of labour when their experience shows that this is not the case.”

unsuitable for doing the job. Richardson (2005) defines a labour shortage as a situation where the supply of workers is not sufficient to meet the demand at current rates of pay. A 2018 LMIC report defined a labour shortage as a “lack of candidates for a specific job in a specific labour market” with the core aspect being that “it is always specific to a labour market delimited by an occupational category and a geographical region.” The LMIC points out that it has to do with “the lack of applicants possessing the minimum qualifications to be considered viable, including whether the person is eligible to work in the region and in the occupation.” This occurrence can be observed in the form of unfilled jobs or persistent job vacancies, which could result in lower productivity and labour cost pressures for employers.

Shah and Burke (2005) suggest that employers are likely to report a labour shortage in two distinct circumstances. First, they may encounter a “skills gap” where job vacancies are filled but by workers considered by the employer to have deficient skills. Second, employers will report shortages when they have difficulty recruiting despite a sufficient supply of qualified people. Richardson (2005) argues that there needs to be a distinction made between situations where there is no-one available to hire with skills and/or credentials that are a minimum requirement for the job and situations where such people are available, but for some reason are choosing not to fill the vacancies. In the former case, firms will resort to “poaching” workers from other firms, whereas in the latter case, the vacancy can be filled by locating and attracting workers who do not have the requisite skill.

Labour shortages are defined as dis-equilibrium situations where demand exceeds supply because the price of labour has not increased (at least not sufficiently) to restore labour market equilibrium. However, there are other reasons for perceived dis-equilibrium that may not point to a real labour shortage. Complaints of a labour shortage could reflect a labour market that is in equilibrium but in which the adjustment to higher wages triggers complaints about labour shortages from firms with marginal profitability in the face of sudden and dramatic increases in labour demand.

Some stakeholder groups view labour shortages as “myths” intended to mislead the public for the purposes of promoting policies intended to lower wage costs for employers at the expense of broader economic well-being in the population.² A report by the Certified General Accountants Association of Canada (Lefebvre, Simonova & Wang, 2012) highlighted that whatever skilled labour shortages exist are short-lived, lasting usually less than one year before self-correcting.

Will the current dis-equilibrium faced by New Brunswick manufacturers self-correct as employers adjust to evolving industry and employee demands, or is the province

² See for e.g. Alberta Federation of Labour, 2006.

dealing with a larger-scale labour shortage that requires government intervention to remedy? Below, we take a closer look at what current labour market indicators in New Brunswick tell us.

Is there currently a labour shortage in New Brunswick?

To answer this question, we reviewed the existing literature which led to the identification of relevant indicators of labour shortages for this study. These indicators are: employment rate; unemployment rate; job vacancy rates; ratio of unemployed persons to job vacancies; wage growth rates; labour productivity; and unit labour costs. The table below gives a breakdown of sources that led to the selection of these variables, as well as the strengths and weaknesses of each indicator. Data for the province and comparison regions (NS, ON and Canada) are presented in subsequent sections.

Table 1: Strengths and Weaknesses of Indicators of Labour Shortage Within a Province

Indicator	Definition and Derivation	Strengths	Weaknesses	Used By
Unemployment Rate	This economic indicator measures the unemployed as a percentage of the labour force. The labour force is the sum of both employed and unemployed – those aged 15 and older who are actively looking for work or are already employed	<ul style="list-style-type: none"> It is measurable 	<ul style="list-style-type: none"> It does not account for discouraged or marginally attached workers It does not separate part-time or full-time workers It does not consider whether people have low-paying jobs 	Department of Employment and Social Development Canada (ESDC), NBjobs.ca, JobBank.gc.ca
Job Vacancy Rate	This refers to the share of unfilled jobs in relation to all available payroll jobs. It is calculated by dividing the number of vacant positions from the total labour demand, which includes occupied and vacant positions.	<ul style="list-style-type: none"> It is an objective measure It is measurable 	<ul style="list-style-type: none"> Non-representative of all labour demand Indicative of short-term labour demand Data processing takes time during which the actual rate may have changed 	Department of Employment and Social Development Canada (ESDC)
Wage Rate	The amount of compensation paid to a worker per unit of work-time.	<ul style="list-style-type: none"> It is observable 	<ul style="list-style-type: none"> Wage changes are not always indicative of hiring difficulties e.g. workers may earn more due to promotions or other pre-assigned rules and agreements Hiring difficulties and labour shortage may exist without an accompanying change in wages 	NBjobs.ca, JobBank.gc.ca, Labour Market Information Council (LMIC), Canadian Skills Training & Employment Coalition (CSTEC)
Employment Rate	This is the number of employed as a percentage of the total working aged population within a region.	<ul style="list-style-type: none"> It is measurable 	<ul style="list-style-type: none"> It does not account for those not in the working age population It does not serve as an accurate indicator of supply and demand in the labour market Data processing takes time during which the actual rate may have changed 	Department of Employment and Social Development Canada (ESDC), NBjobs.ca, JobBank.gc.ca, Labour Market Information Council (LMIC), Canadian Skills Training & Employment Coalition (CSTEC)
Annual Expansion Rate/ Demand	The share of population growth that exceeds the amount needed to replenish lost population. This is typically driven by economic growth	<ul style="list-style-type: none"> It is measurable 	<ul style="list-style-type: none"> This largely based on predictions and projections 	Canadian Skills Training & Employment Coalition (CSTEC), NBjobs.ca, Labour Market Information Council (LMIC)
Annual Replacement Rate/Demand	The portion of population growth that helps make up for population lost through death and out-migration and in the case of replacement demand, retirement.	<ul style="list-style-type: none"> It is measurable 	<ul style="list-style-type: none"> There is a time lag between the labour market gap and the data indicating that such a gap exists Labour market need (based on this measure) is the result of forecasts using data for a previous time period 	Canadian Skills Training & Employment Coalition (CSTEC), Labour Market Information Council (LMIC)

Labour shortage indicators: what story do they tell?

The above indicators are used to determine the existence of labour shortages because they provide insights on labour supply and demand. Demand and supply are economic concepts that help us identify whether there is a surplus or shortage. When supply exceeds demand, we have a surplus; when the reverse is true, we experience a shortage. We use this basic economic principle to determine if a shortage exists in New Brunswick. For the demand side, we consider employment levels, which declined post-2008 in the province (since 2007 for the manufacturing and sector) but have not changed much afterwards (as shown in figure 1 below).

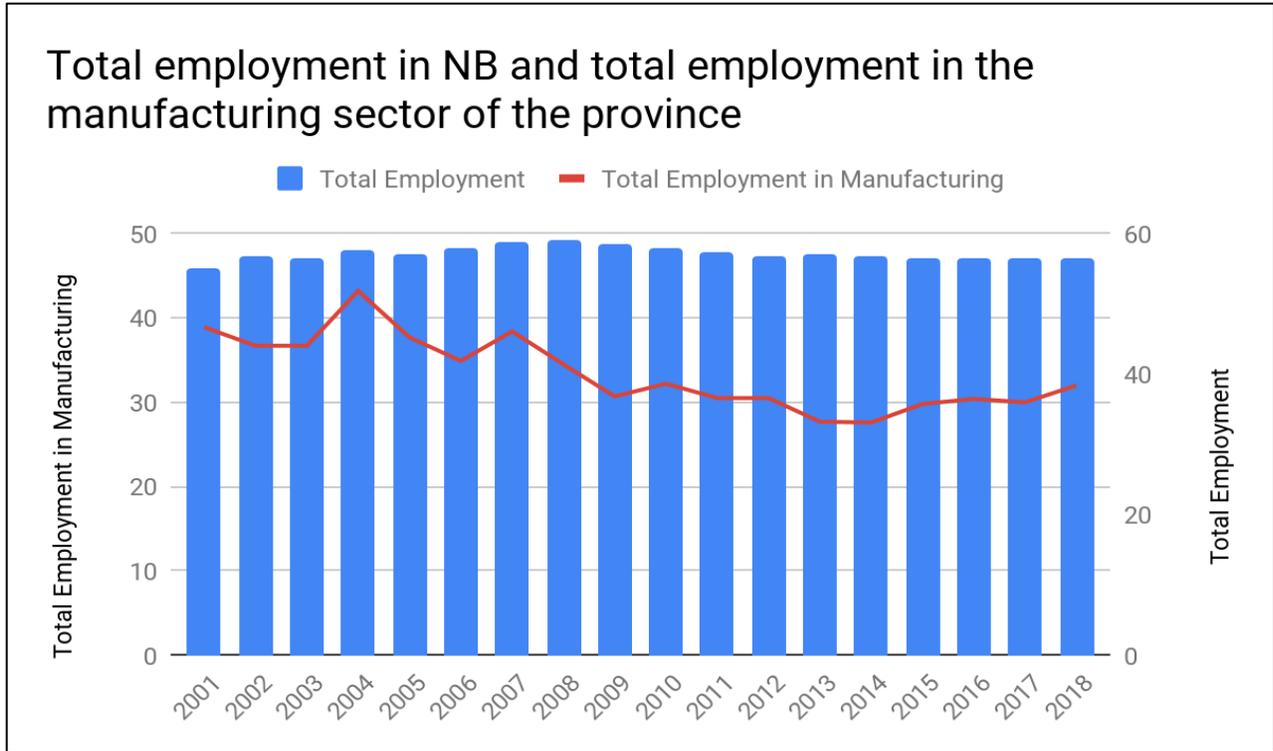


Figure 1. Total employment in NB (x1,000) (Source: Statistics Canada - Table 14-10-0355-01).

The dip we see in employment does not tell us whether the province is facing falling labour supply or falling demand. Looking at labour force trends during the same period may help us understand this downturn in overall employment.

In the Figure 2 below, we see a decline in both the size of the New Brunswick labour force and the total number of employed people ages 25-54. The shrinking labour force may be due to more New Brunswickers aging out of the labour force and not being replaced by young people and immigrants. This is affirmed by Figure 3, which shows that the number of labour market entrants is falling but the number of those leaving the workforce is on the rise. Employment and labour market size indicators show the labour market is getting tight because supply is declining at a faster rate than labour demand. This observation supports PETL’s projection that there will be “110,564 job openings in New Brunswick over the next ten years,” “the overwhelming majority (99.7%) resulting from replacement demand” (NBjobs.ca, 2017). PETL submits that “new entrants to the labour force are expected to form the main source of supply (65.5%), followed by other in-mobility (21.1%) and net in-migration (13.4%)” (NBjobs.ca, 2017).

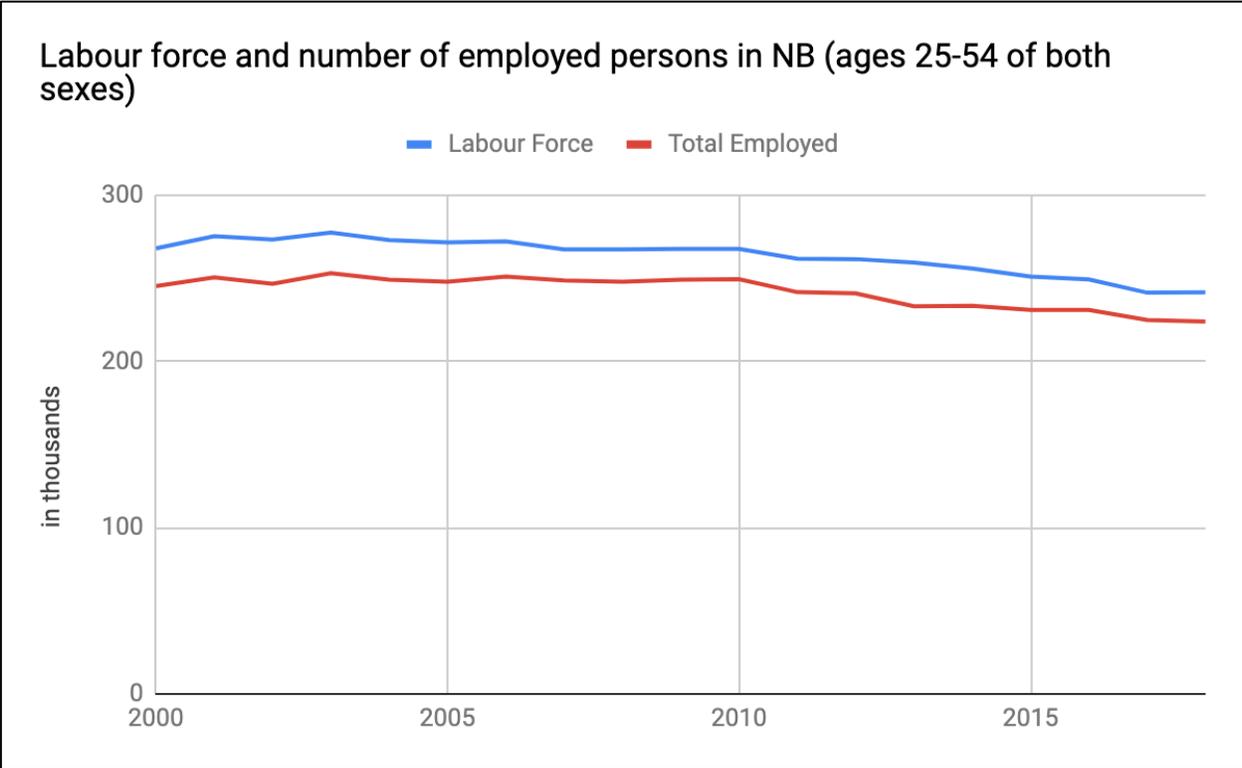


Figure 2. Labour force and total core-working population (Source: Statistics Canada - Table 14-10-0287-01).

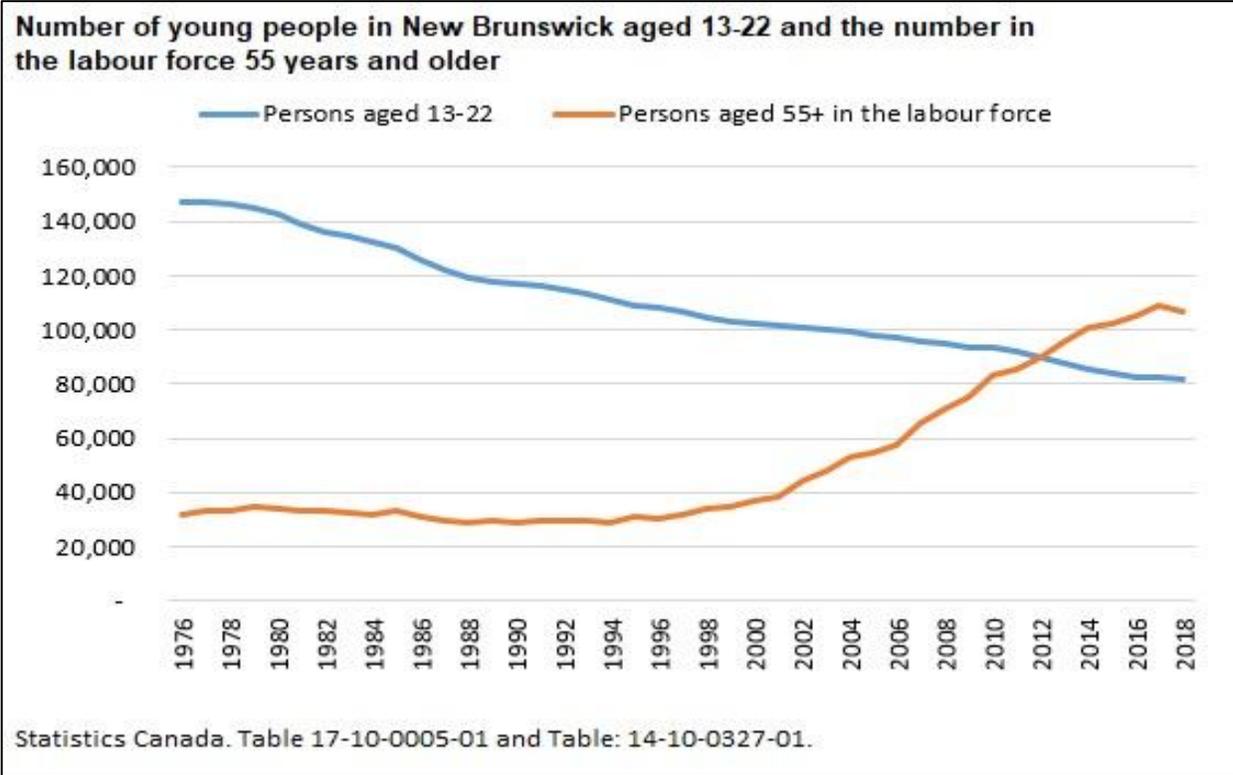


Figure 3. Trend for labour market entrants vs retirees/exits

A labour shortage exists in New Brunswick if labour demand exceeds labour supply. Although labour demand in the province has not changed much over the past decade, shortages are apparent in measures of supply side indicators such as labour market size. We can also compare the unemployment measure of supply to the demand side indicator of job vacancies.

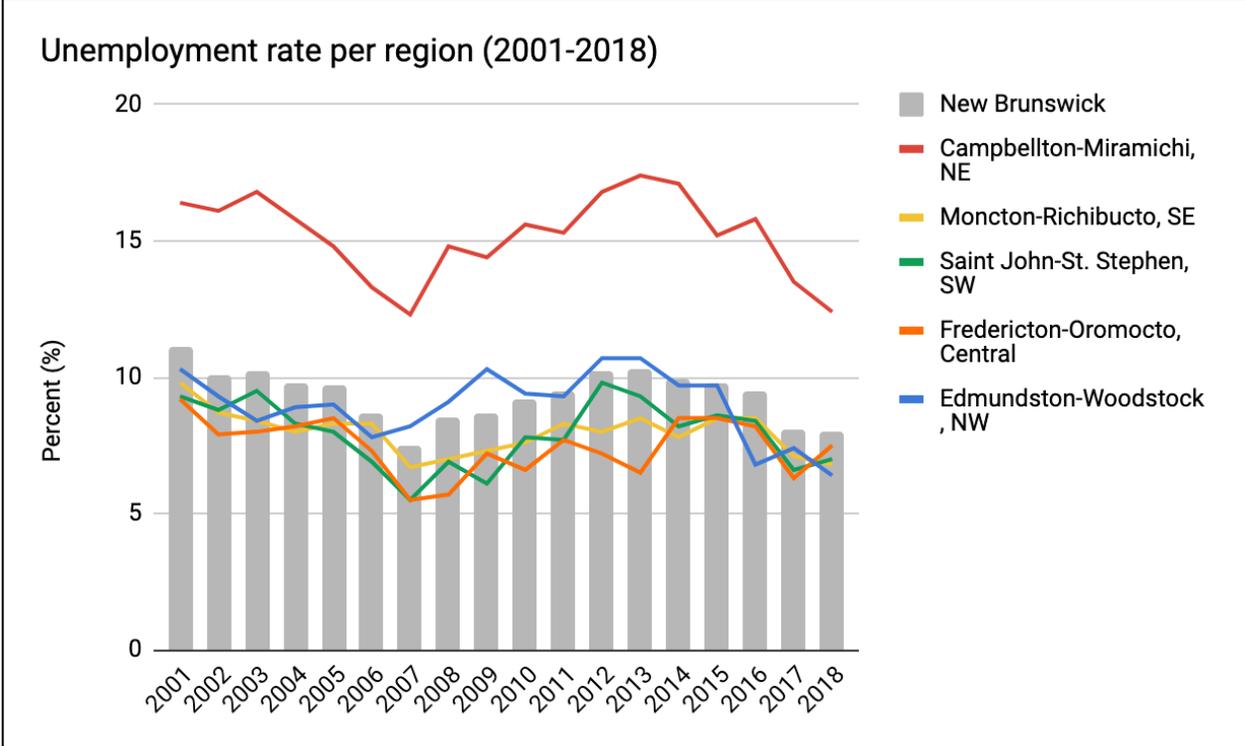


Figure 4. Unemployment trend per economic region (Source: CANSIM 282-0123).

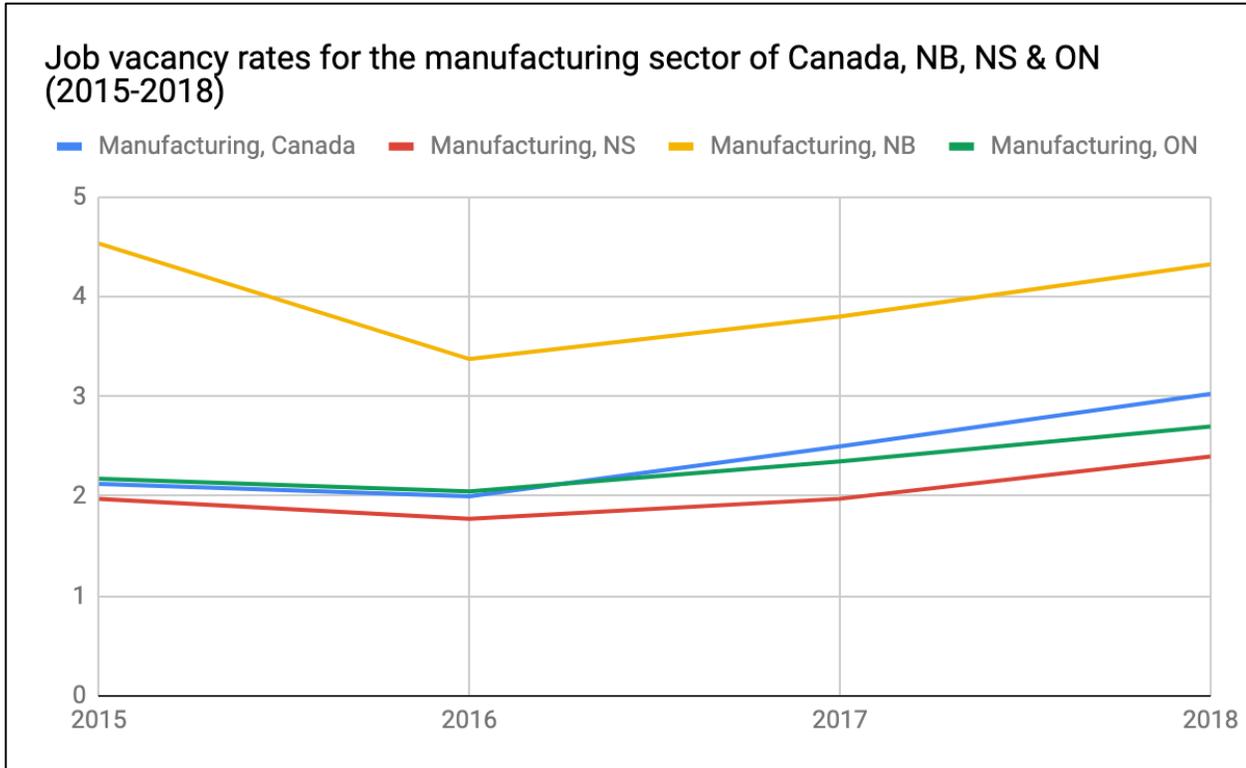


Figure 5. Job Vacancy Rates for Canada, New Brunswick, Nova Scotia & Ontario (2015-2018) (Source: Statistics Canada Table 14-10-0326-01).

In the above graphs, we see that unemployment in 2018 is as low as in 2007. In 2007, there was higher unemployment in regions of the province outside of Central and Southwestern New Brunswick, but in 2018, only the Northeast had high unemployment. As overall unemployment falls, job vacancy rates in manufacturing, measured as the number of unfulfilled jobs relative to all available payroll jobs, have been increasing in the province since 2016. Since 2014, rates of manufacturing vacancies have been higher in New Brunswick than in Canada overall.

Looking at the ratio between the number of unemployed persons to the number of job vacancies, we find evidence of a shortage. Below, Figure 6 compares the potential supply of workers immediately available for a given job opening to job vacancies. For this measure, lower numbers are worse because they imply that there are fewer workers looking to get a job relative to the number of available jobs. Lower counts for 2018 compared to 2011 indicate a tightening in the labour market. The decline in New Brunswick is sharper than the Canadian average and that of the comparison provinces, although the current ratio remains more favorable than those seen in Ontario and Canada generally. Within New Brunswick, we find that Northeast New Brunswick (Campbellton-Miramichi) is the only region of the province where the ratio does not point to a labour shortage (Figure 7). For the Southern regions of the province, the ratio of

unemployed workers to job openings matches that of Ontario and Canada overall.

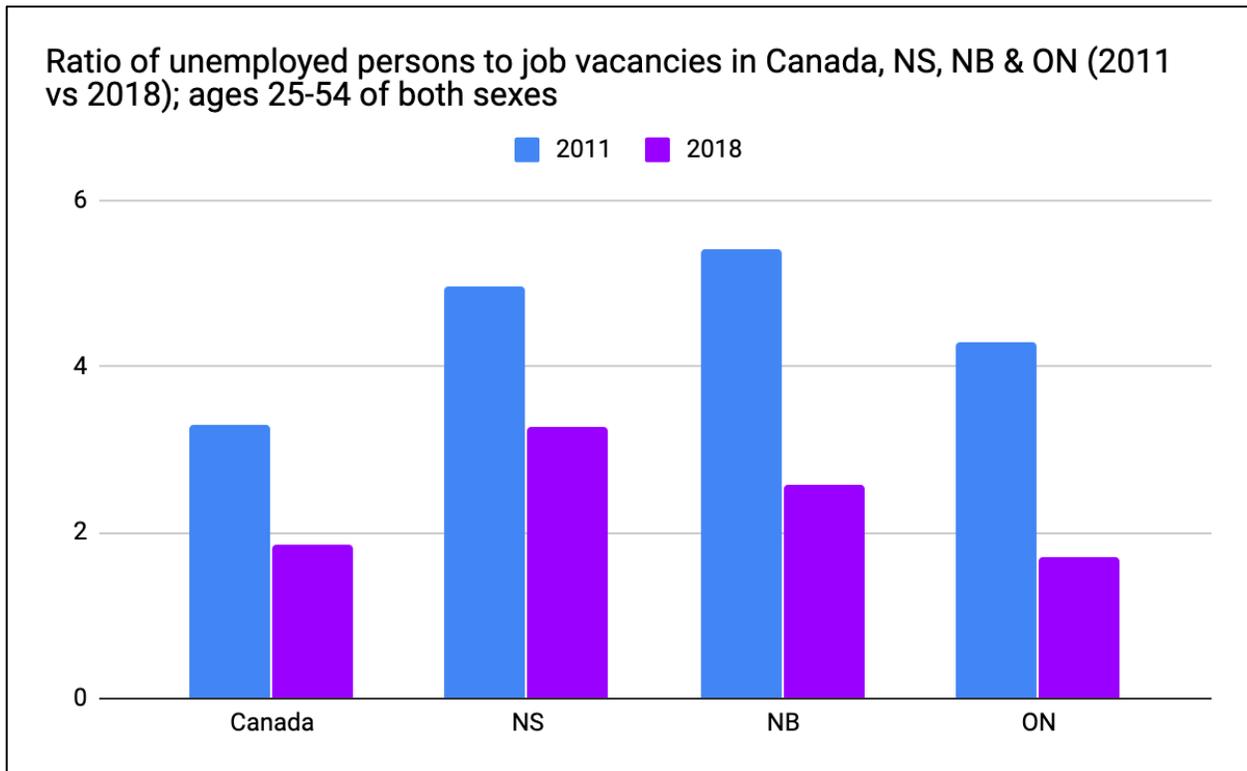


Figure 6. Ratio of unemployed persons to job vacancies (Source: Statistics Canada. Table 14-10-0225-01)

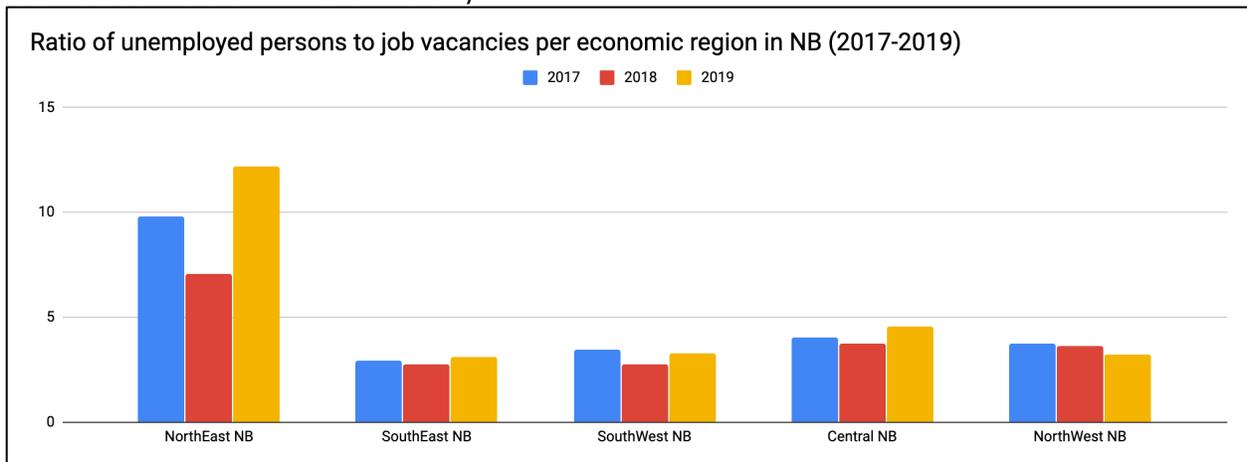


Figure 7. Ratio of unemployed persons to job vacancies per economic region in New Brunswick (Source: Statistics Canada and NBjobs.ca)

A labour shortage is a situation where, at a given level of the wage rate paid to labour, the demand for labour exceeds the available supply of labour. If the labour market is sufficiently flexible to adjust to changes in supply and demand, then a labour shortage should result in increases in wages paid to labour. Employers would be expected to raise the wage to compete for labour, and at

a higher wage there will be an increase in the supply of labour. Therefore the rate of wage inflation is another important indicator of whether there's a labour shortage problem in the province.

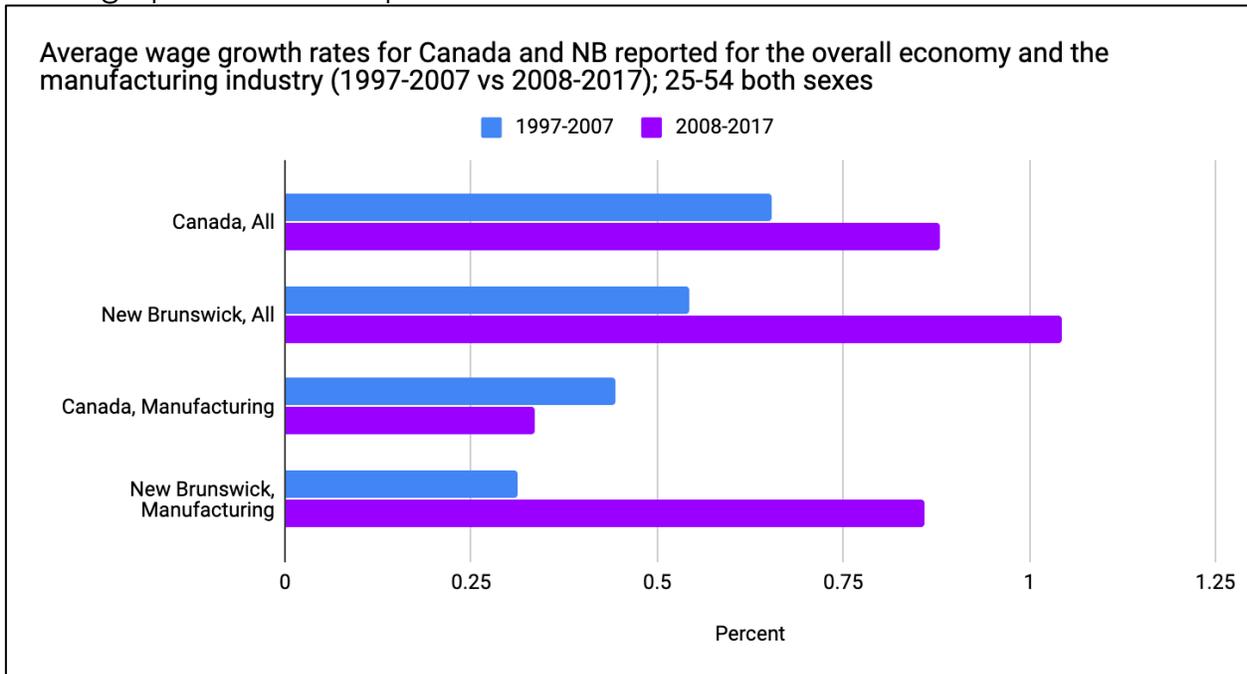


Figure 8a. Reported as annual averages of real wage growth rates (in constant dollars) per industry for each time period, with 2007 as base year (Source: Coe, Emery, & Mikola, 2019).

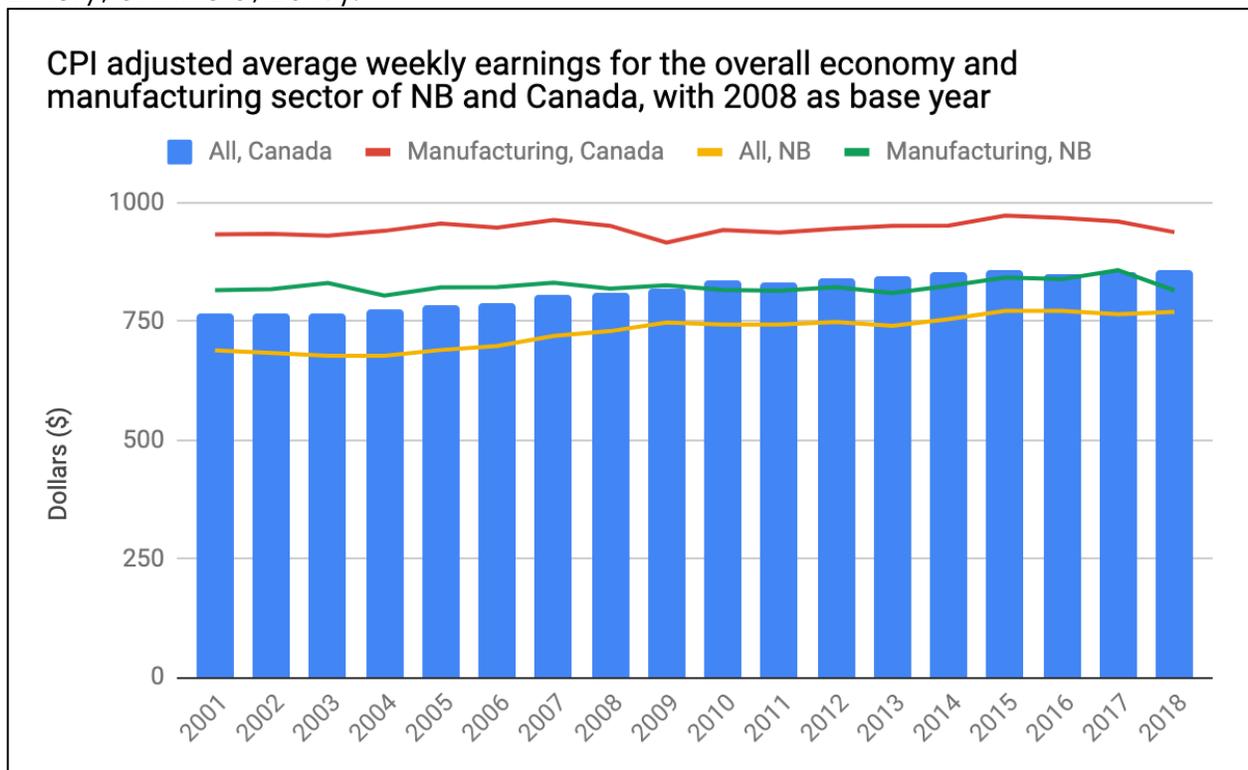


Figure 8b. CPI adjusted average weekly earnings (Source: Statistics Canada - Table 14-10-0203-01, formerly CANSIM 281-0026).

Figure 8 shows that while New Brunswick had weaker wage growth than Canada prior to 2008, post-recession real wages have increased considerably in New Brunswick compared to the rest of Canada. This suggests that real wages in New Brunswick are approaching the Canadian average. For manufacturing, wage growth in New Brunswick grew at a slower rate than all industries combined, which suggests either that the industry is struggling to keep up with growing wage demands in a tightening labour market, or that manufacturing labour demand is growing at a slower rate than in other industries. Growing job vacancy rates in the sector (Figure 5) point to the former scenario. It is notable, however, that the comparatively sluggish wage growth of manufacturing in the province was still significantly greater than in the rest of Canada: in fact, overall manufacturing wage growth fell in Canada while it was rising in New Brunswick. This may indicate that other provinces are placing less emphasis on the manufacturing industry, or that technological investments are resulting in less labour demand and less need to offer competitive wages.

Labour productivity statistics tell us the rise in wages in New Brunswick is not the result of increased labour productivity (Figure 9a and 9b) but evidence of a tightening market in which New Brunswick has rising wages and falling productivity. In contrast, Canada and Ontario have had sluggish wage growth alongside rising labour productivity in manufacturing.

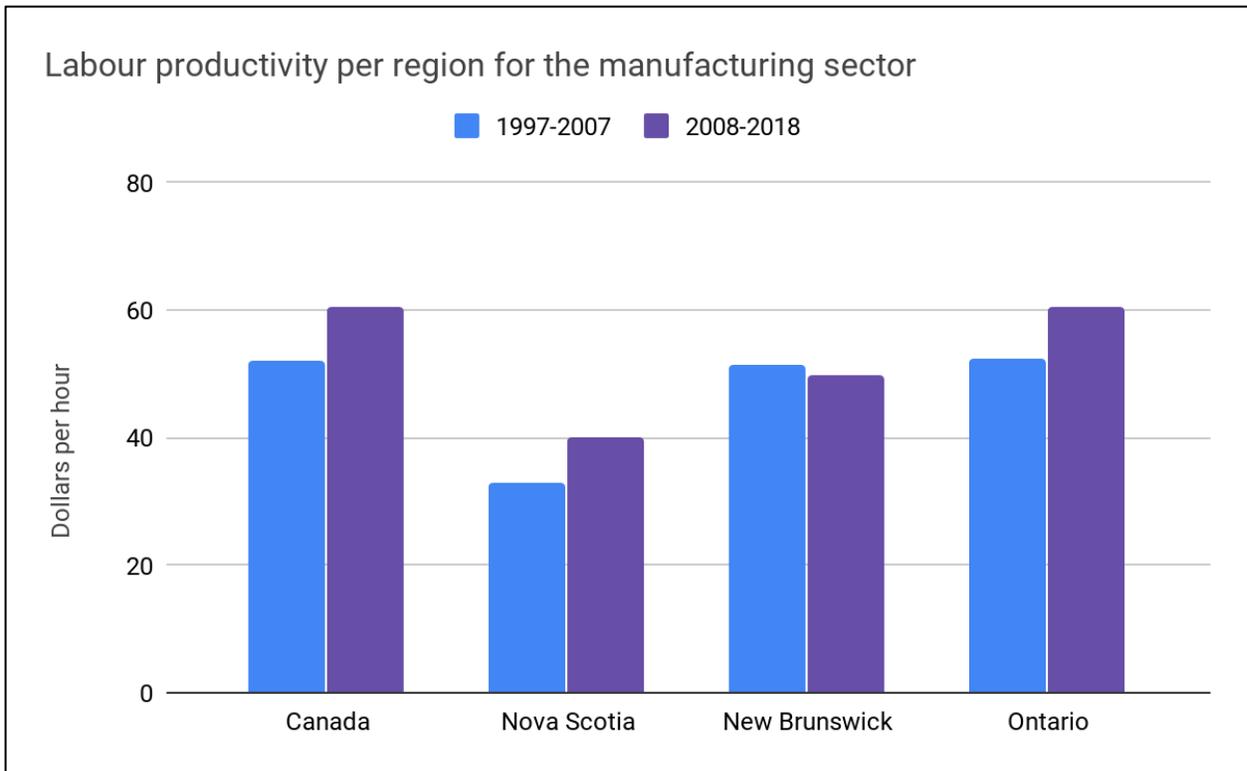


Figure 9a. Labour productivity per region (Source: Statistics Canada – Table 36-10-0480-01).

The growth rate of labour productivity in the manufacturing sector between 1997-2007 and 2008-2018 for Canada, NB, NS & ON

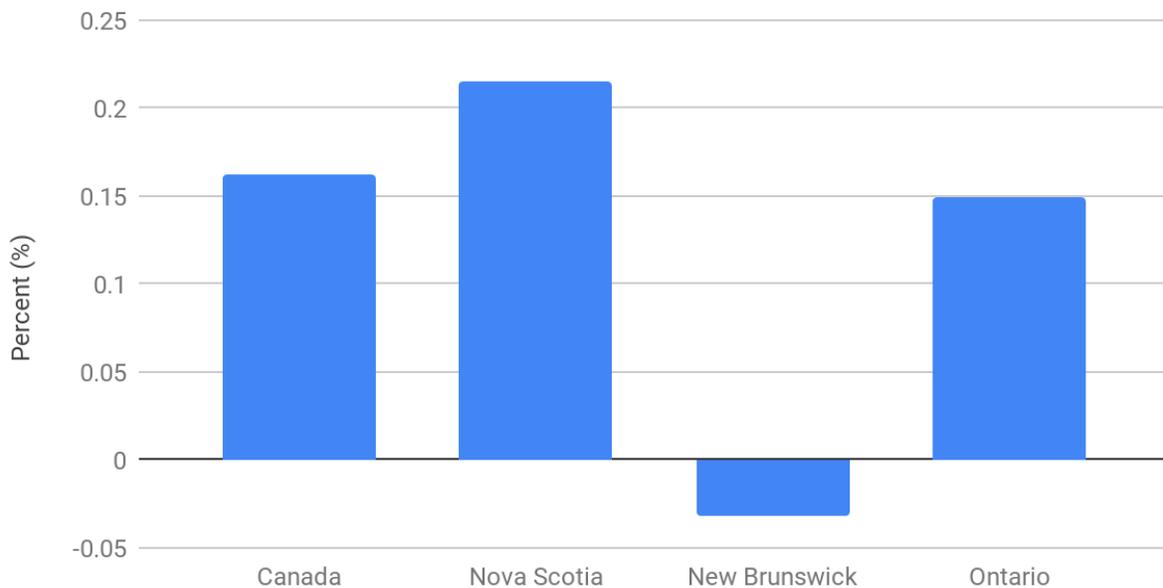


Figure 9b. Labour productivity growth rate per region (Source: Statistics Canada – Table 36-10-0480-01).

Additional evidence of a labour shortage can be found by considering the cost of labour to employers. Figures 10-12 show trends for this measure in both Canadian and US dollars for 1997-2007 vs. 2008-2018. It is important to note that rising unit labour costs (the labour cost associated with generating one unit of output) point to a tightening labour market. This is because higher unit labour costs imply labour compensation is capturing a larger share of the value of output.

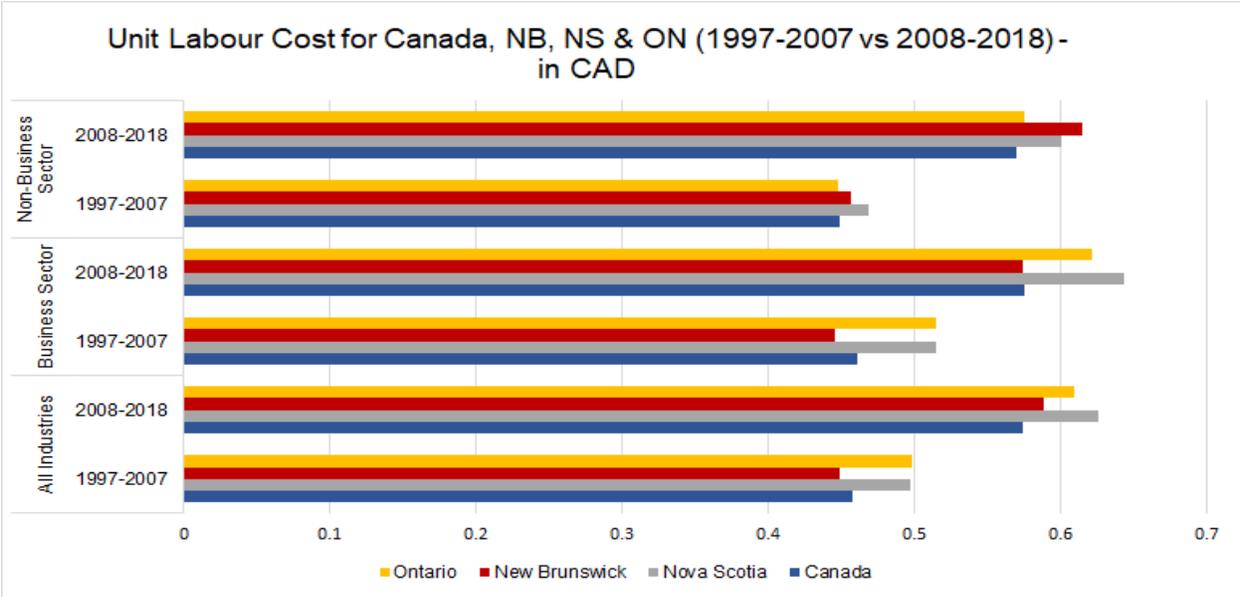


Figure 10. Unit labour cost in Canadian dollars per sector and region (Source: Statistics Canada. Table 36-10-0480-01).

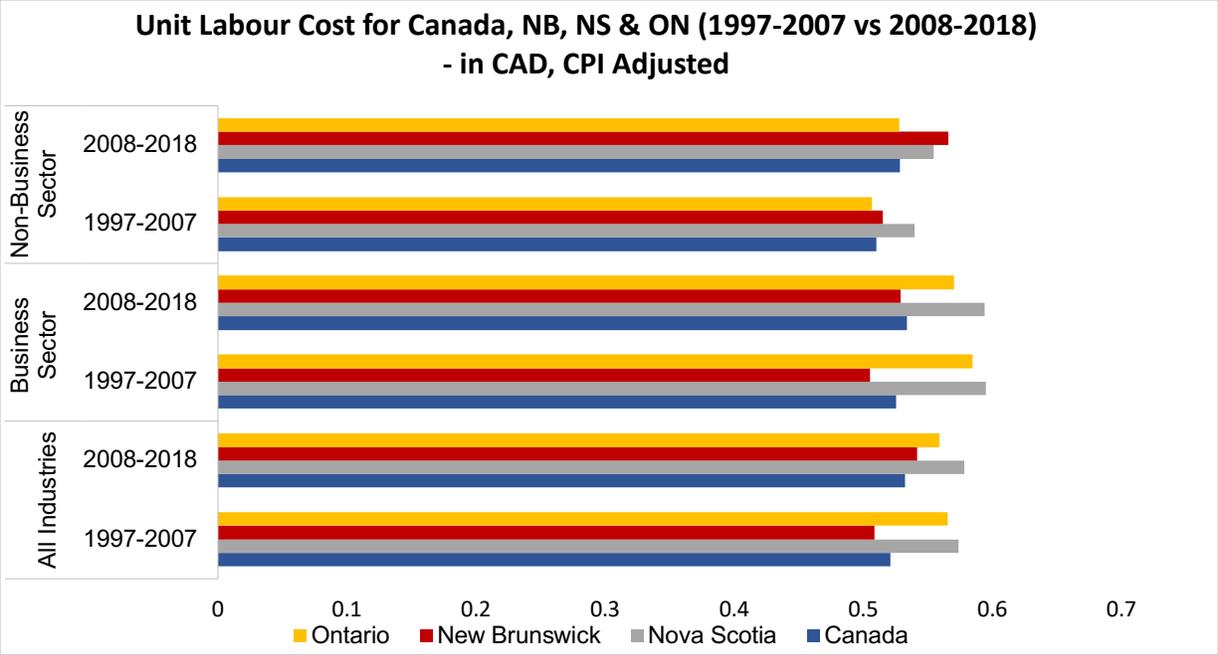


Figure 11. Unit labour cost in Canadian dollars per sector and region, CPI-adjusted (2007 purchasing power and 2002 as CPI base year) (Source: Statistics Canada. Table 36-10-0480-01).

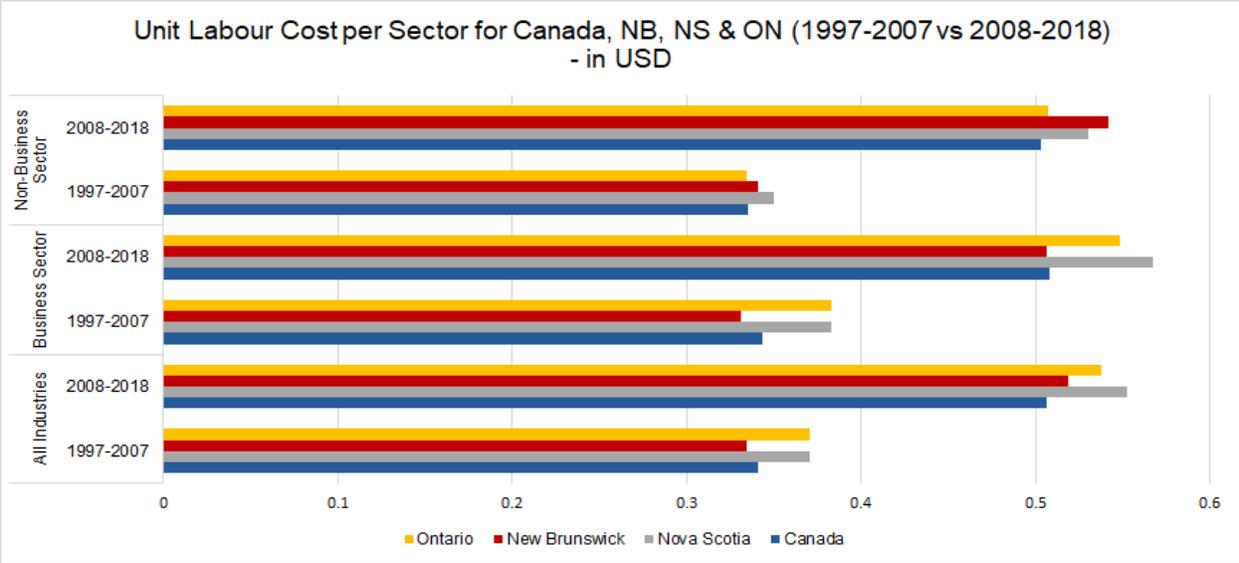


Figure 12. Unit labour cost in US dollars per sector and region (Source: Statistics Canada. Table 36-10-0480-01).

A lower ratio of unemployed persons to job vacancies, higher wage growth coupled with lower labour productivity, alongside rising unit labour costs, points to a labour shortage in New Brunswick and adversely affects the competitiveness/profitability of manufacturers in the region.

Discussion: labour shortages and what to do about them

Many proposed solutions for the current and emerging labour shortages in New Brunswick involve increasing the labour supply in the province, specifically for troubled sectors like manufacturing. For unskilled labour, immigration may prove an expedient approach, but given the high skill requirements of many manufacturing jobs, the time to train may mean that it will be a few years before the workforce for manufacturing increases. Consequently, policies aimed at improving productivity, such as automation and other labour saving approaches to production, may provide nearer-term returns.

This report offers recommendations on ways to mitigate New Brunswick's labour shortage and meet its future labour market needs. These recommendations are in keeping with those offered by the CME and Regional Industry Committee (RIC) of 15 regions. These recommendations are based on the knowledge that the province needs to take steps to retain and attract workers, given that its current worker shortages are eroding businesses' competitiveness and profitability. They also rely on strategic talent acquisition, since the acquisition of workers without the skills necessary to meet the province's job needs would pose a barrier to innovation and technology adoption. Essentially, New Brunswick needs to attract the right kind of talent and also develop the labour force it already has. Doing so would require collaboration between the government, the manufacturing sector, and training/learning institutions. However, each would have to be strategic in their decision-making, planning and performance of their role in reversing the labour shortage.

In the case of governments, our recommendation is for them to make labour market indicators (LMIs) publicly available. This is so that employers, training institutions and families would have a more informed view on hiring needs, skill requirements for the job market, and the training/education required to meet future labour market needs (CME/CSTEC, 2017). Also, they need to monitor the labour market and build on indicators to develop more accurate analyses and projections.

The government also needs to equip settlement and orientation providers with the right information and tools necessary for educating newcomers on the job market, work opportunities and upward-mobility in the manufacturing sector, as well as build their language skills to meet employers' requirements. Employers, on the other hand, need to be more collaborative with training institutions and newcomer orientation bodies. They need this partnership to ensure that labour market entrants possess the skills to meet their needs as employers of labour. This plan of action is necessary to help them shape the workforce of the future. Employers also need to be attentive to LMIs so they can predict future labour market needs and adjust their training and hiring objectives accordingly.

Based on the RIC recommendations, training institutions need to be informed on LMIs and use this information in deciding what learning/training to invest in, skills to acquire, and guidance to provide to youths. They need to ensure that the training received equips youths and newcomers to meet the skills requirements of the present and future labour market. For training institutions (technical colleges and other postsecondary institutions) to achieve this, they need to partner more with manufacturers and incorporate the feedback they receive from these employers into their curriculums. Parents and learning instructors should also encourage youths to pursue careers related to manufacturing and technical skills by hosting career fairs and promoting tours of manufacturing plants. Work-integrated-learning placements at manufacturing establishments could also be instrumental in reducing the cost of training, and spark an interest in technical careers among the youth (CME/CSTEC, 2017).

In summary, the above recommendations suggest that a partnership between governments, training institutions, manufacturing sector, and individuals is essential to building a workforce capable of meeting labour market needs. This level of collaboration would also ensure better integration of newcomers, design of employment-ready curriculum, greater interest in technical training and practical policy development.

Reference

- Alberta Federation of Labour (2006). Alberta relying on bogus labour shortage figures. Retrieved from <http://www.afl.org/index.php/Press-Release/alberta-relying-of-bogus-labour-shortage-figures.html>
- CME & CSTEC (2017). The Future of the Manufacturing Labour Force in Canada. Retrieved from <http://cstec.ca/sites/cstec/files/reports/The%20Future%20of%20the%20Manufacturing%20Labour%20Force%20in%20Canada.pdf>
- Nbjobs.ca (2019). New Brunswick Labour Market Outlook 2018-2027. Retrieved from <https://www.nbjobs.ca/sites/default/files/pdf/2019-04-15-lmo-report-en.pdf>
- Arrow, K. J. & Capron, W. M. (1959). Dynamic Shortages and Price Rises: The Engineer-Scientist Case. *Quarterly Journal of Economics*, 73, 305.
- Coe, P., Emery, J. C. H., & Mikola, D. (2019). Wage Growth in New Brunswick, 1997-2017. New Brunswick Institute for Research, Data and Training.
- Holden, M. (2019). Unlocking Atlantic Canada's Growth Potential: Removing Barriers to investment in Innovation and Advanced Manufacturing Technologies. Canadian Manufacturers and Exporters. Retrieved from <https://cme-mec.ca/wp-content/uploads/2019/07/CME-MEC-2019-ACOA-Report-Final.pdf>
- Lefebvre, R., Simonova, E. & Wang, L. (2012). Labour Shortages in Skilled Trades - The Best Guestimate? Certified General Accountants Association of Canada.
- LMIC (2018). What's in a Name? Labour Shortages, Skills Shortages, and Skills Mismatches. Retrieved from <https://lmic-cimt.ca/wp-content/uploads/2018/10/LMI-Insights-No.-3.pdf>
- Pittis, D. (2019). Latest data shows worker shortage is helping Canadians get richer. *CBC News*. Retrieved from <https://www.cbc.ca/news/business/wages-canada-economy-1.5164665>
- Richardson, S. (2005). What is a Skill Shortage? National Institute for Labour Studies, Flinders University.

Raoul, N. (2018). More with Less: Economic Growth with an Aging Workforce. *Canadian Federation of Independent Businesses (CFIB)*, 1-13.
<https://www.cfib-fcei.ca/sites/default/files/2018-12/More%20with%20less.pdf>

Shah, C. & Burke, G. (2005). Skills Shortages: Concepts, Measurement and Policy Responses. *Australian Bulletin of Labour*, 31, 44-71.

Appendix

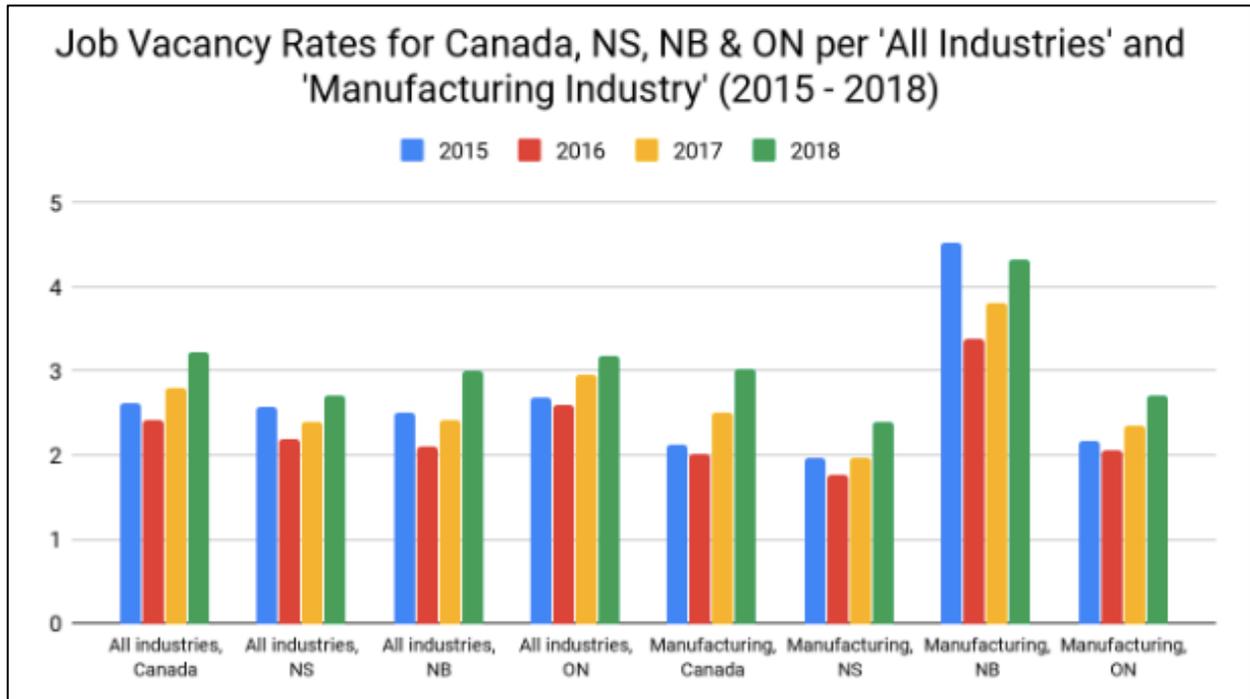


Figure A1. Job vacancy rates for Canada, NS, NB & ON per "All Industries' and 'Manufacturing Industry' (2015 - 2018) (Source: Statistics Canada Table 14-10-0326-01) .

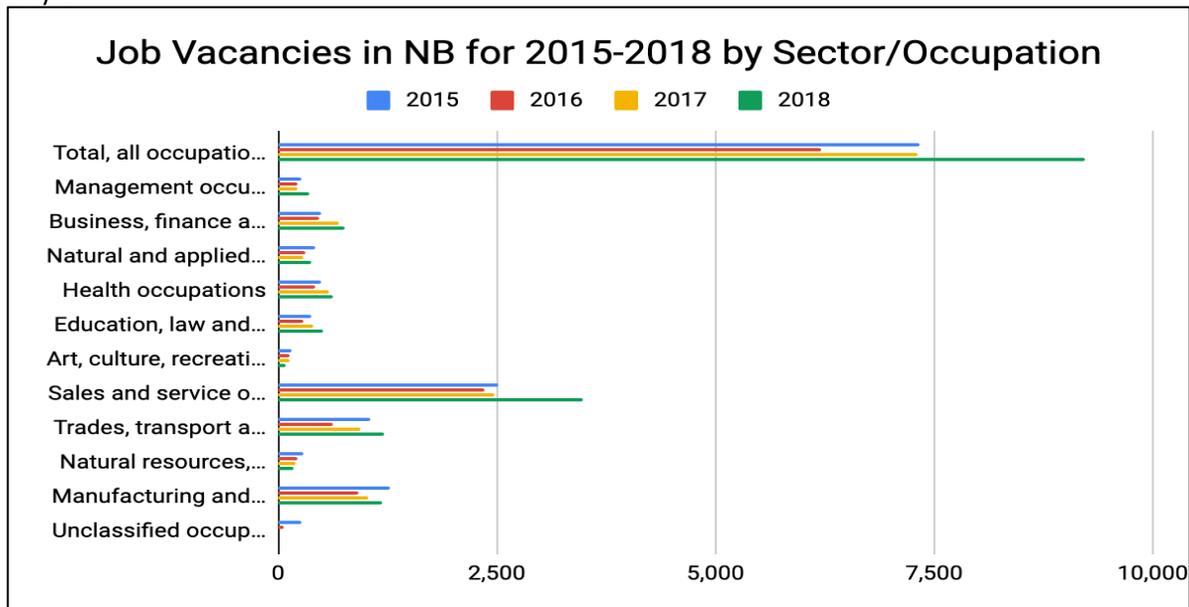


Figure A2. Job Vacancies in NB by Sector/occupation (2015 -2018) (Source: Statistics Canada Table 14-10-0326-01).

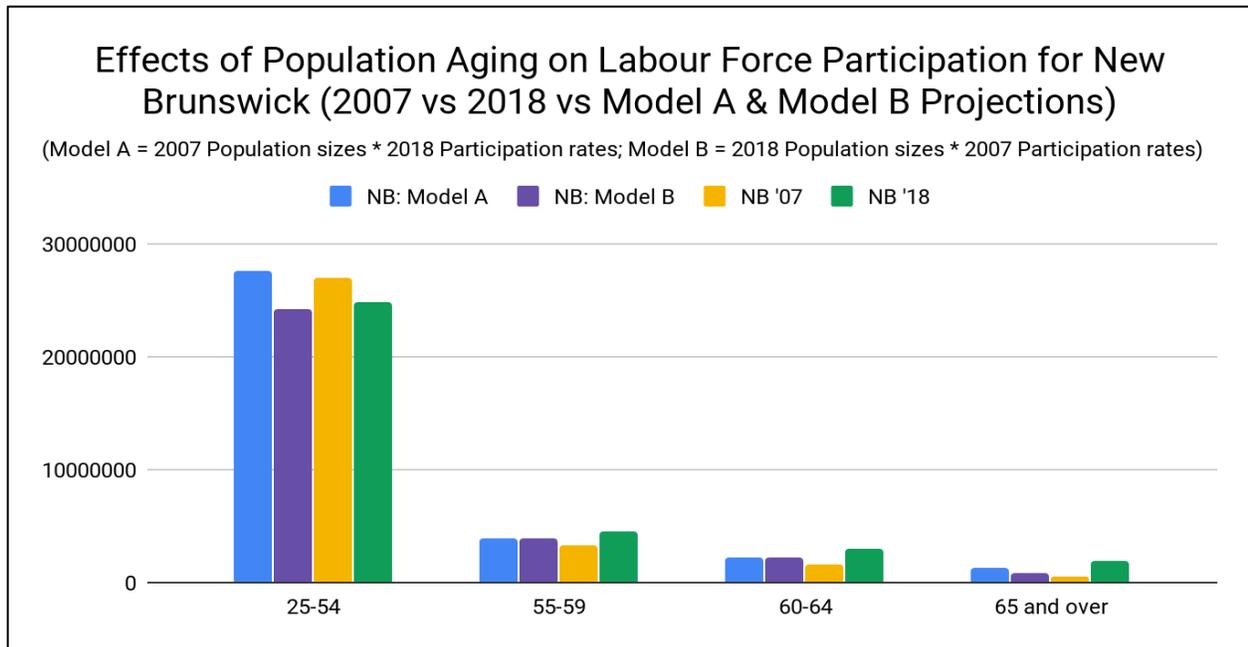


Figure A3. Labour force participation per age group (Source: Statistics Canada, Table 14-10-0017-01).

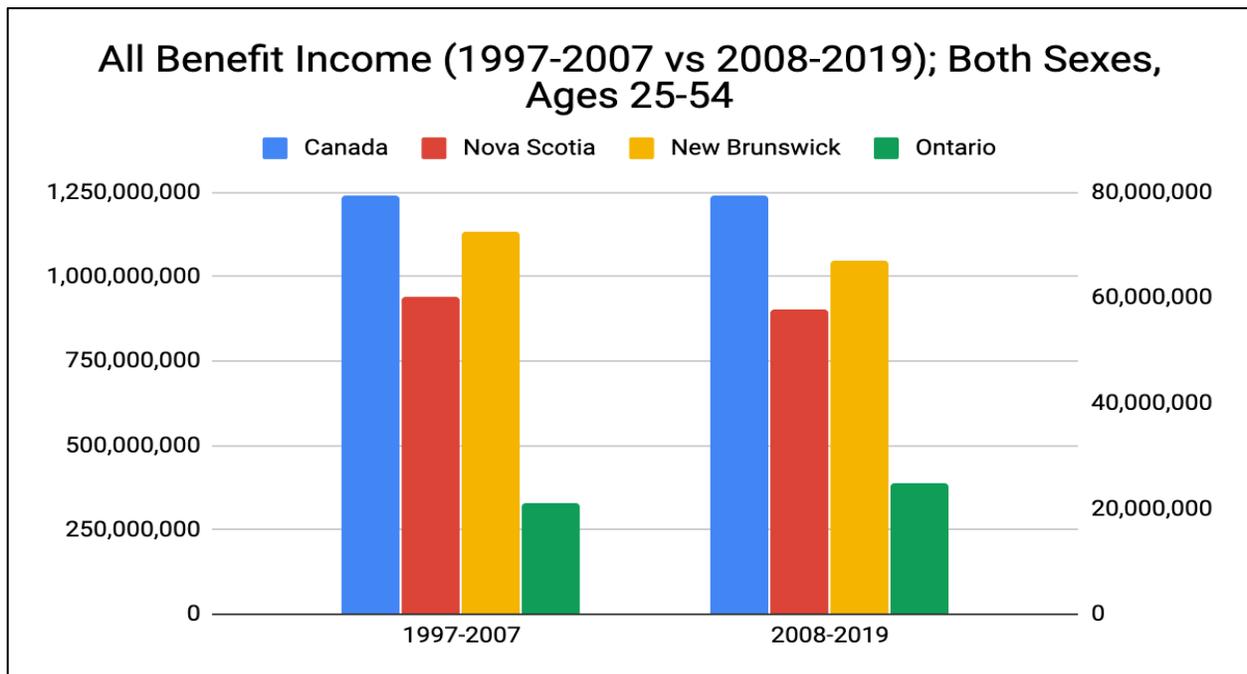


Figure A4. All benefit income (Source: Statistics Canada - Table 14-10-0014-01, formerly CANSIM 276-0035)

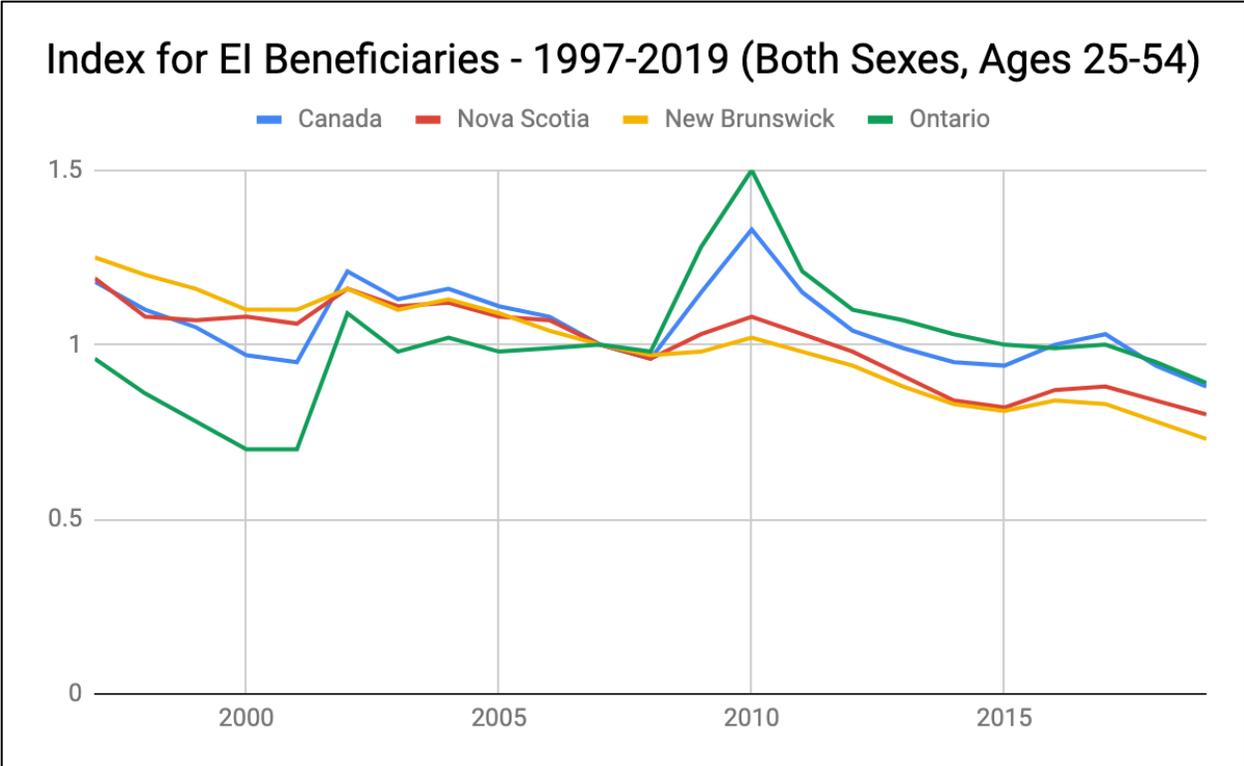


Figure A5. Employment insurance beneficiaries per region - 2007 as the base year (Source: Statistics Canada - Table 14-10-0014-01, formerly CANSIM 276-0035).

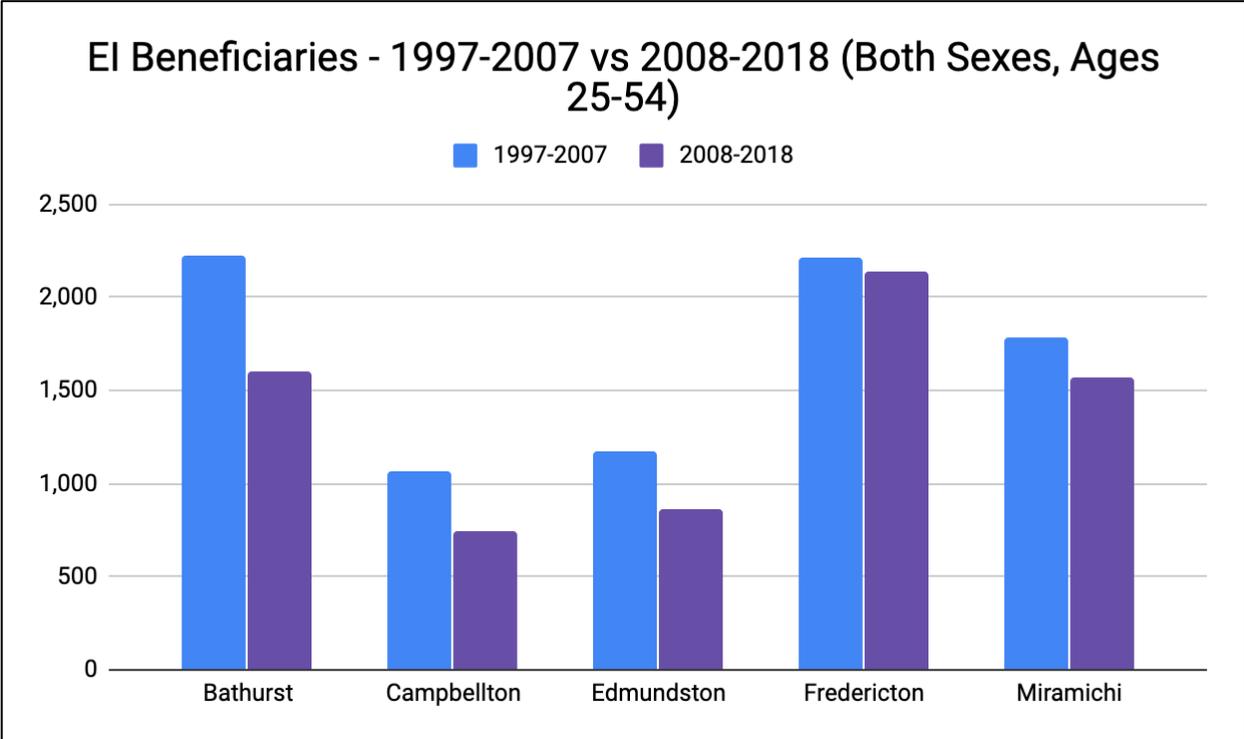


Figure A6. Employment insurance beneficiaries per economic region (Source: Statistics Canada - Table 14-10-0012-01, formerly CANSIM 276-0033).

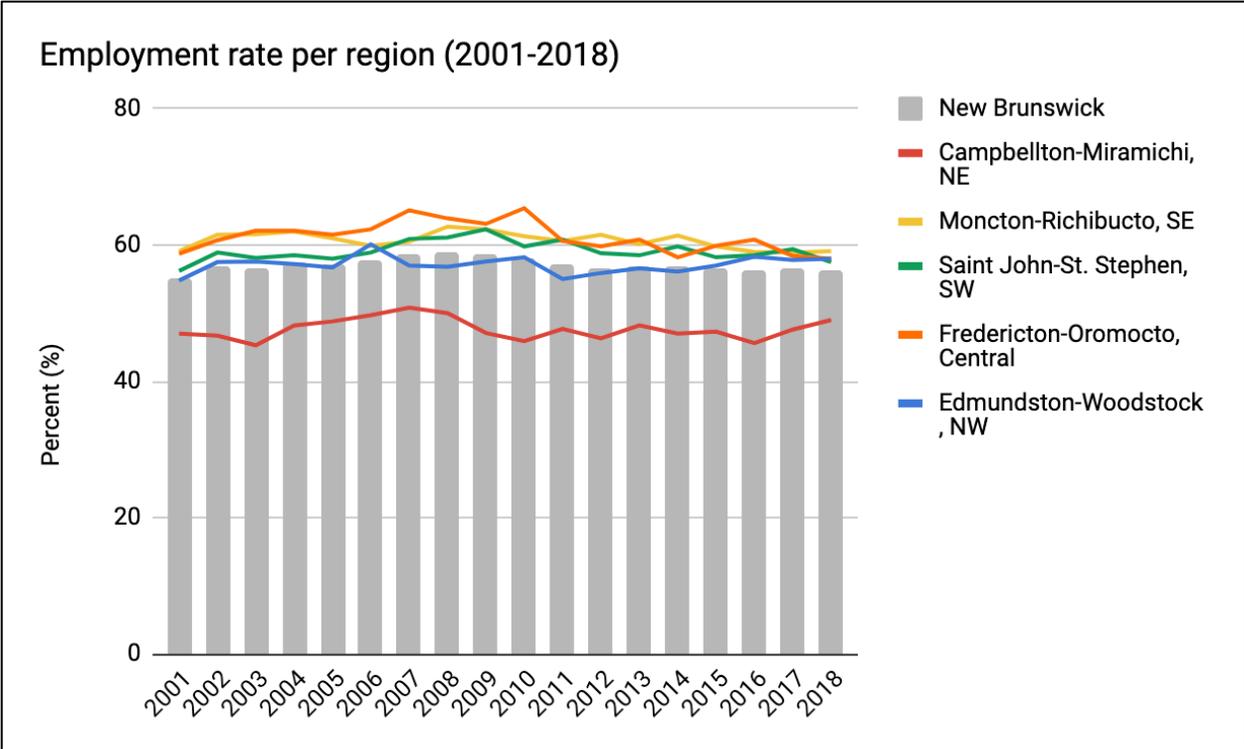


Figure A7. Employment trend per economic region (Source: CANSIM 282-0123).

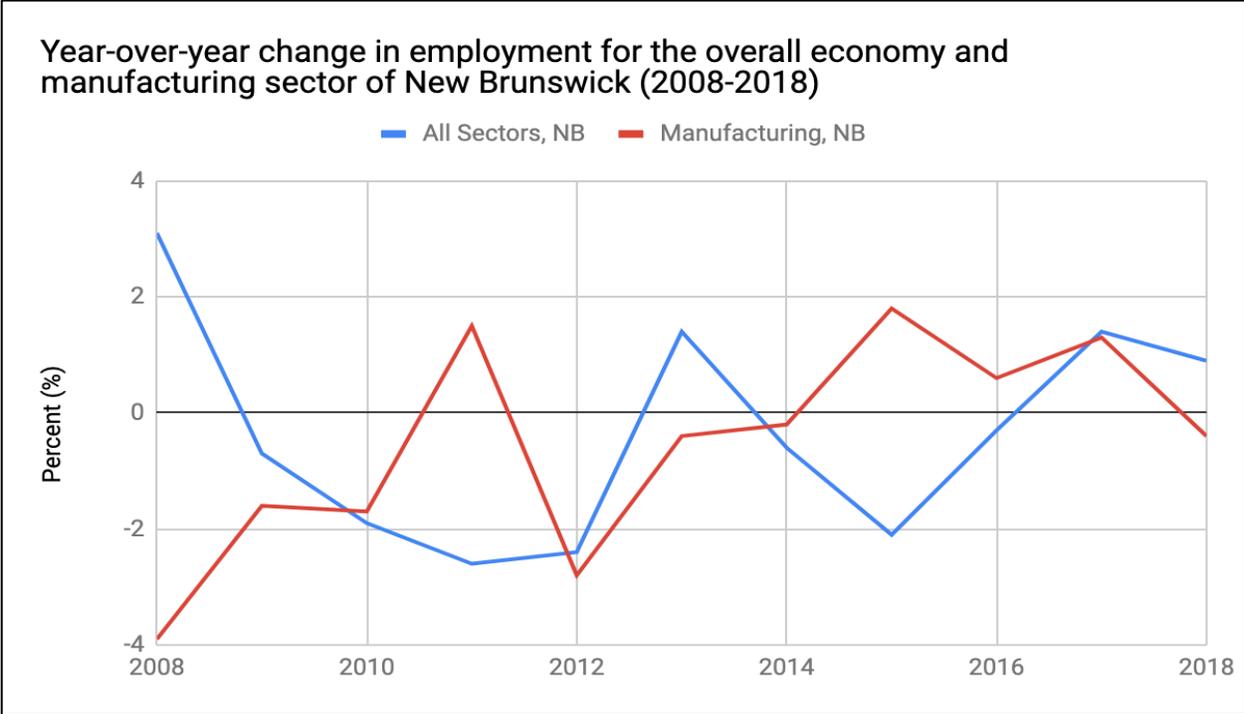


Figure A8. Annual change in employment for “all sectors” vs the manufacturing sector (Statistics Canada - Table 14-10-0092-01)

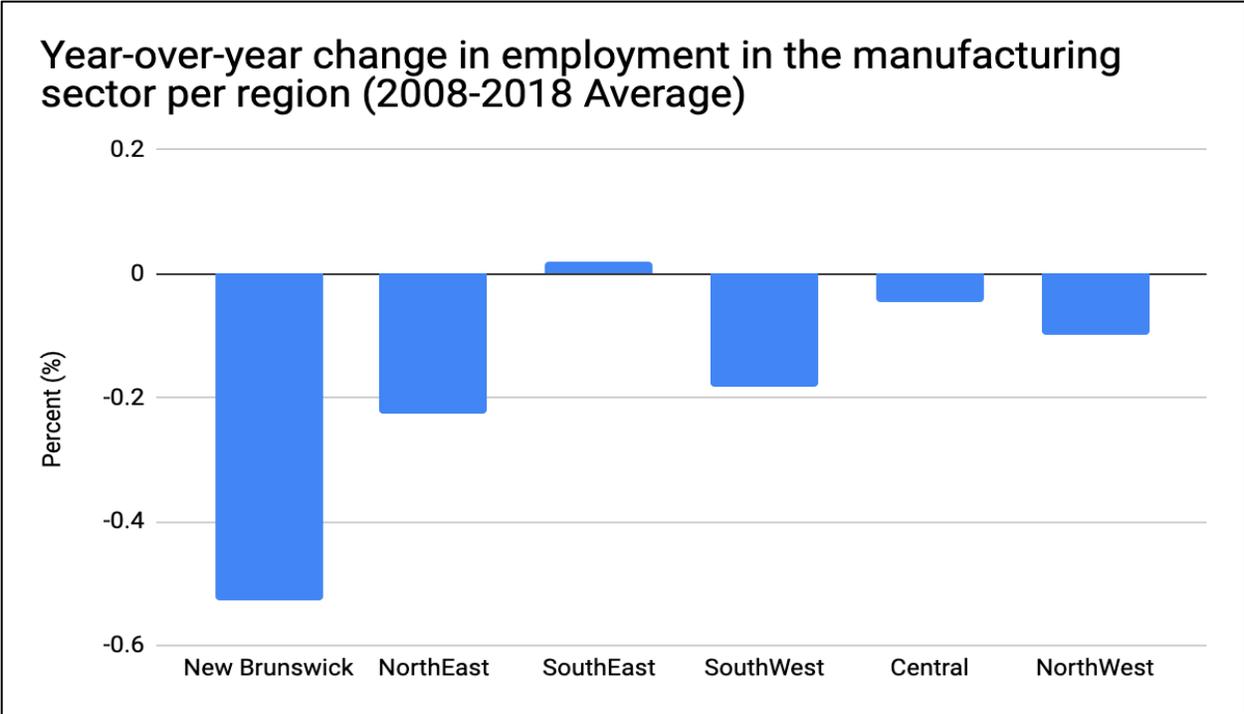


Figure A9. Annual change in employment for the manufacturing sector, split by economic region (Statistics Canada - Table 14-10-0092-01)