

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



**ADDING HORSEPOWER: CAPITAL STOCKS AND
PRODUCTIVITY MEASURES IN NEW
BRUNSWICK'S MANUFACTURING SECTOR**

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Executive Summary

Investment is one of the best indicators of the health of the economy. Investment and the size of the capital stock are fundamental determinants of productivity and Gross Domestic Product. Economies and sectors within an economy with higher amounts of capital per worker have higher labour productivity and higher incomes. Further, in a small open economy like New Brunswick which relies on exports for growing its GDP, investment drives population growth. Investment is also critical for maintaining competitiveness as new machinery, equipment and buildings embody state of the art technologies and create advantages of scale economies

The manufacturing sector in New Brunswick has had a declining size of its capital stocks over the 1997-2017 period. The level of investment in the province have not been sufficient to offset depreciation of existing machinery, equipment and buildings, or to make up for the shuttering of plants. Total Employment in the industry has remained relatively stable, which resulted in a decline in the Capital to Labour Ratio after 2008 which has coincided with a divergence in labour productivity and wages between manufacturing in New Brunswick and provinces outside the Atlantic region.

Compared to other provinces, manufacturing in New Brunswick has a high concentration of its capital stock in four industries -- Petroleum and Coal Product Manufacturing (40%), Paper Manufacturing (20%), Food Manufacturing (14%), Wood Product Manufacturing (8%). Petroleum refining accounts for a large share of the capital stock in manufacturing but it does not account for a large share of employment in the sector. Therefore, it is important to look at Capital Stocks in the manufacturing with and without Petroleum and Coal Product manufacturing.

Within New Brunswick's important sub-sectors in manufacturing industry, the Capital to Labour Ratio declined in all of them, but with two distinct patterns. Total Employment in New Brunswick Manufacturing was relatively steady over the 1997-2018 period, but that was due to the significant increase in employment within the Food Manufacturing, whereas employment declined in the industries. For Wood Product Manufacturing and Paper Manufacturing, Capital Stocks declined at a greater rate than employment, so Capital to Labour Ratios fell. For Food Manufacturing, Capital Stocks and Employment both increased, although Employment increased at a greater rate than Capital Stocks did, so the Capital Labour Ratio still decreased. New Brunswick is not showing the same increase in capital intensity of production in these industries that we see in other provinces. New Brunswick manufacturing remains relatively labour intensive in its production processes.

New Brunswick's declining Capital Labour Ratio in manufacturing industry is crucial because it signals a lack of investment in productivity increasing machinery and equipment (as well as buildings, intellectual property, etc.) . Compared to Nova Scotia, Quebec, Ontario, and Canada as a whole, New Brunswick has had relatively low Labour Productivity for the Manufacturing sector overall and, with the exception of petroleum refining and Paper Manufacturing, its important sub-sectors, New Brunswick typically has had similar productivity to Nova Scotia, which is lower than for Quebec, Ontario, and Canada.

Lower and slower growing labour productivity can explain the relatively lower wages in New Brunswick Manufacturing.

In the past, low labour costs were a source of competitive advantage for manufacturers in the province but with less abundance of labour available as the population ages, perennial out-migration and education and training misaligned with skills needs of manufacturing, New Brunswick can no longer rely on its high reliance on lower wage labour intensive production and remain globally competitive. For the long-term future of New Brunswick Manufacturing, it is important for investment in Capital to increase, to raise productivity levels.

Introduction

Capital investment is crucial to increasing labour productivity and maintaining the long-term competitiveness of manufacturers in New Brunswick. To date, manufacturers have not been investing sufficiently to maintain the size of the capital stock in the sector. Though the value of New Brunswick's total manufacturing net capital stock (adjusted for inflation, and omitting petroleum refining) decreased over the 1997-2017 period, total employment has held relatively steady. This has resulted in a decrease in the size of the province's capital stock per worker, contributing to sluggish growth in labour productivity and wages.

The lack of investment in the New Brunswick manufacturing industry reflects a tendency among manufacturers in the province to rely on the value of the Canadian dollar to drive competitiveness, and to adjust their output based with the size of their workforce. This strategy did not require investment in capital to remain profitable. While this strategy may have been profitable prior to 2008, when New Brunswick was labour abundant, the province now suffers from labour shortages due to an aging population, among other factors¹. This means that NB manufacturers who wish to increase production by expanding their workforce cannot do so without raising wages, reducing their competitiveness. Rising labour costs could push manufacturers to invest in capital stocks and labour-saving technologies. However, there are concerns that labour shortages are discouraging investment in capital by reducing producer margins (Holden, 2019, p. 21).²

The relationship between labour and capital is crucial to understanding the larger patterns in manufacturing. The capital labour ratio (either measured as the ratio of capital stock to hours worked or capital stock to number of workers) gives insight into productivity as a measure of how labour combines with capital in the production of goods. A greater the ratio of capital (which includes facilities and equipment used in production) to labour means the labour can produce a higher quantity or quality of goods. A higher capital labour ratio reduces the cost of labour required for each unit of output, leading to a lower unit labour cost. Investment in manufacturing technology can contribute to a more advantageous capital-labour ratio by giving workers access to equipment that will allow them to be more productive.

¹ This is discussed in the paper "Labour Shortages in New Brunswick" [Jane Amachree, Prepared for JDI Roundtable, 2019]

² This lack of investment in new technologies may be partly due to a lack of the skilled workers required to operate advanced technologies. According to the Canadian Manufacturers & Exporters' bi-annual Management Issue Survey, 21% of Atlantic business said that a shortage of skilled labour was one of their largest barriers to adopting new technologies (Holden, 2019, pp. 16).

Canada has been slow to invest in manufacturing compared to the United States, which saw a 21% increase in investment for machinery and equipment from 2007 to 2016. During the same period, Canada saw a 17% decrease (Holden, 2019, pp. 8-12).

Compared to the rest of Canada, the Atlantic provinces are even further behind. The CAME's 2018 Management Issues Survey reports that only 29% of manufacturers in Atlantic Canada are using advanced manufacturing technologies, compares to a rate of 40% for Canada as a whole (Holden, 2019, p. 16).

The reasons for such low levels of investment in Canada, the Atlantic region and New Brunswick are not known. One perspective is that New Brunswick is simply not a profitable long-term option as a location for producers as it is too far removed from the markets. Another explanation may be that provincial policies around taxation of capital and regulations for businesses are discouraging manufacturers from investing in the province. While the former view suggests New Brunswick's time as a manufacturing province has passed, the latter perspective suggests creating a better business climate through incentives and policies could boost investment.

For the long-term competitiveness of the New Brunswick manufacturing sector, it is important to reduce reliance on a low exchange rate with the USD. While fluctuations in the exchange rate will always have a significant impact on manufacturing, investment in capital stocks would increase productivity and allow manufacturers expand production without expanding their labour. It is also possible that growing the labour force of skilled and unskilled workers through training programs, immigration and in-migration could allow New Brunswick for manufacturers to invest in the capital necessary to compete with American manufacturers, without the assistance of a favourable exchange rate.

This paper will investigate the capital stocks of the manufacturing industry in New Brunswick and associated productivity measures, while comparing them to national trends, as well as provincial trends in Nova Scotia, Quebec, and Ontario.

Manufacturing Capital in New Brunswick

Definition – *Capital Stocks (or Real Capital Stocks)*

- Capital refers to physical assets owned by firm(s) and used by labour in the production of goods and services. Capital can take the form of machinery and equipment, building construction, engineering construction, and intellectual property products. It does not include residential buildings.

- “Real” capital means that the value of the capital in each year has been adjusted for inflation, and “capital stocks” means that investment and depreciation (the degradation of capital over time) are accounted for using the following calculation: current year capital stocks = previous year’s capital - depreciation of previous year’s capital + current year Investment. If depreciation > investment, then capital stocks decline. If depreciation < Investment, then capital stocks increase.
- Capital stocks are measured as linear end-year net stock, in 2012 chained dollars.

Manufacturing Capital Shares

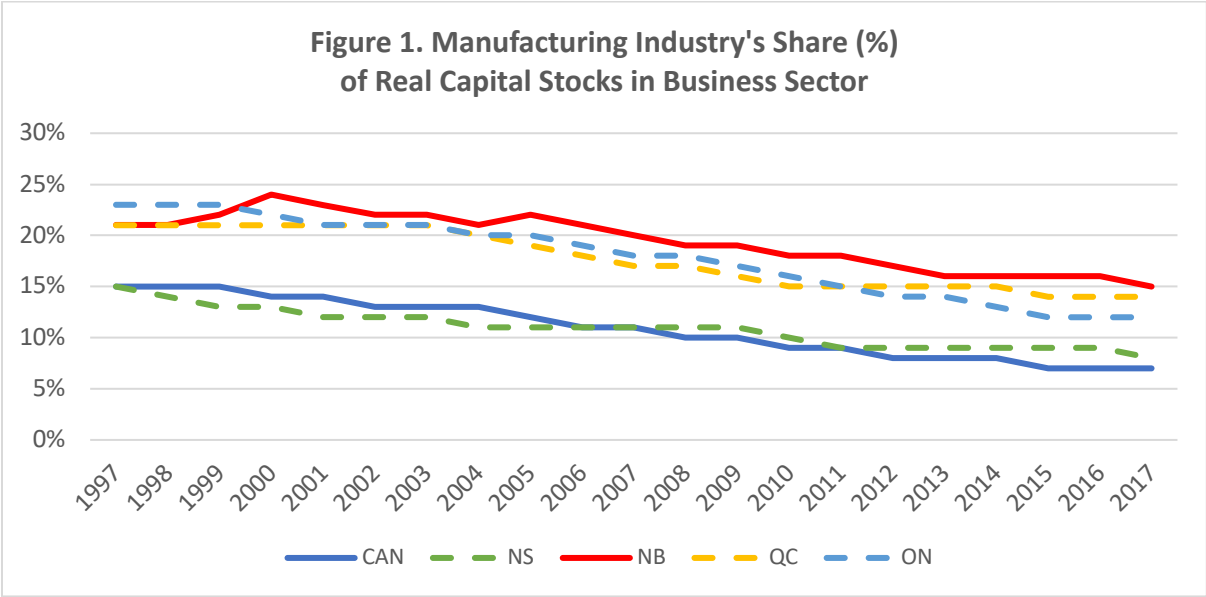
The manufacturing industry is a large sector of the New Brunswick economy as measured by the sector’s capital stock. Within the manufacturing industry, capital is concentrated within a few significant sub-sectors, which are food manufacturing, wood product manufacturing, paper manufacturing, and petroleum and coal product manufacturing. Petroleum and coal manufacturing has a large share of capital in NB, but even after removing it from our totals, the New Brunswick manufacturing industry is still more concentrated than in the other provinces and Canada.

In New Brunswick’s business sector (determined as whole economy minus education, health care and public administration), the manufacturing sector accounts for an important share of the total capital stock. Manufacturing accounted for over 20% of New Brunswick business sector capital between 1997 and 2007, before decreasing between 2007 and 2017 to 15% of the business sector capital stock. It is the second largest industry behind utilities.

Manufacturing’s decline was in large part due to the falling share of paper manufacturing capital stocks, which alone accounted for 10% of total business sector capital in 1997, but only 3% in 2017. Utilities has remained the single largest holder of business sector capital over the 1997-2017 period, with its share remaining around 30% over the whole period.

To gain an understanding of manufacturing’s importance to New Brunswick’s business sector, it is useful to compare New Brunswick with Canada and other provinces. Figure 1 compares New Brunswick’s manufacturing sector’s share of total business sector capital with that of Canada, Nova Scotia, Quebec, and Ontario. These comparisons were chosen because Nova Scotia serves as the best direct comparison, as a neighbour of similar size, and Quebec and Ontario are provinces traditionally associated with manufacturing.

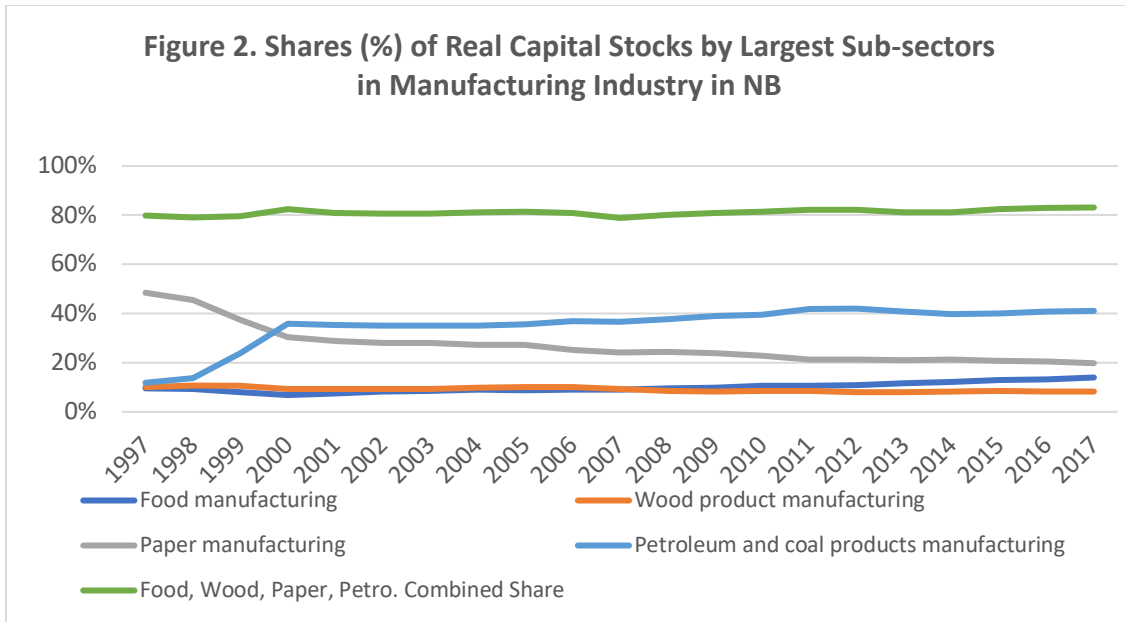
Figure 1 shows that New Brunswick manufacturing holds a similar position within the provincial business sector as Quebec and Ontario, and a larger presence than in Nova Scotia, and in Canada as a whole. This emphasizes the importance of manufacturing within New Brunswick.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

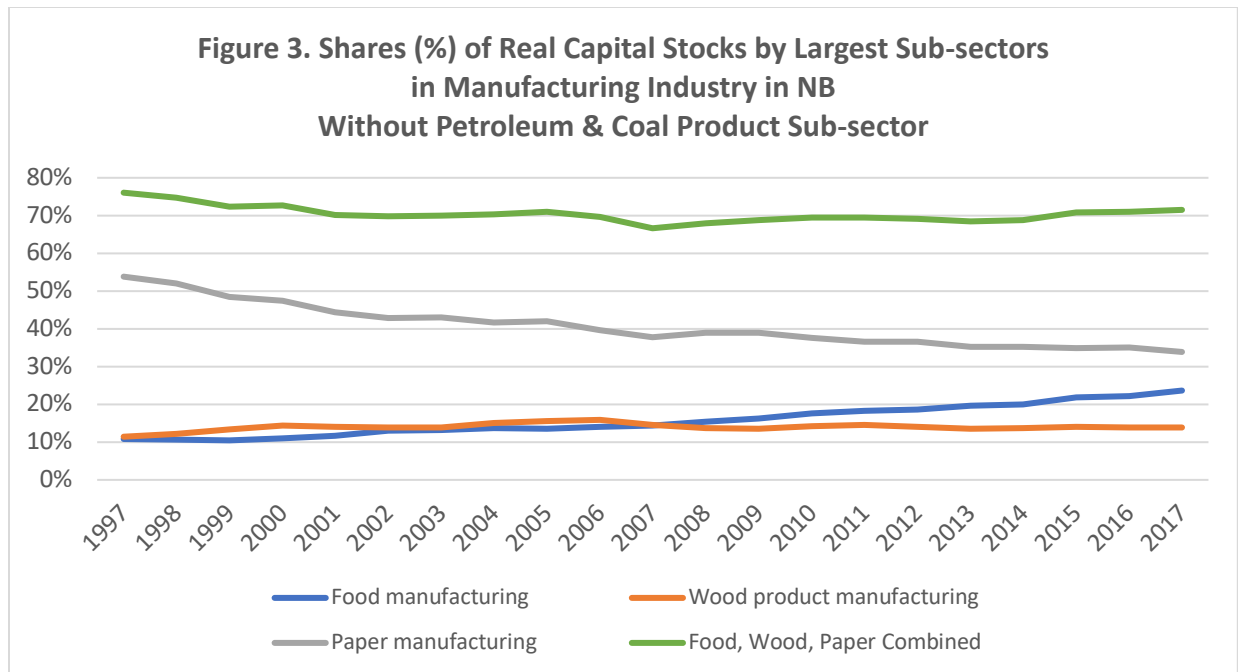
Within the manufacturing sector, the distribution of capital is very concentrated within a few sub-sectors. Figure 2 shows the largest manufacturing sub-sectors over the 1997-2017 period, and their combined share. The sub-sectors that held the largest shares of manufacturing capital were food, wood, paper, and petroleum and coal product manufacturing. These four sub-sectors have consistently accounted for approximately 80% of the manufacturing capital stocks. Paper manufacturing had the largest single share at close to 50% in 1997, but its share has fallen steadily, and now holds close to 20%. Petroleum's share saw significant growth between 1998 and 2000, and became the single largest sub-sector. Food manufacturing and wood product manufacturing's positions have held steady, with food manufacturing increasing its share slow from 7% in 2000, to 14% in 2017. None of the other sub-sectors ever rose above a 5% share.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

Petroleum and coal product manufacturing is a capital-intensive industry that has large capital stocks relative to the number of persons employed. To gain an accurate understanding of the shares of capital stocks for food, wood, and paper, it is useful to look at shares of capital stocks for sectors within the manufacturing industry while omitting petroleum. The capital shares of manufacturing sub-sectors with petroleum removed are shown in Figure 3.



Source: Statistics Canada. Table 36-10-0096-01.

Measured in 2012 Chained Dollars

The combined capital share of food, wood, and paper manufacturing after removing petroleum is not significantly different from the combined share including petroleum. In 1997, the combined share reached a high of 77% and stayed close to 70% for most of the rest of the observed period.

The full breakdown of each sub-sector's capital share can be seen in the appendix, both including and excluding petroleum from manufacturing total capital stocks.

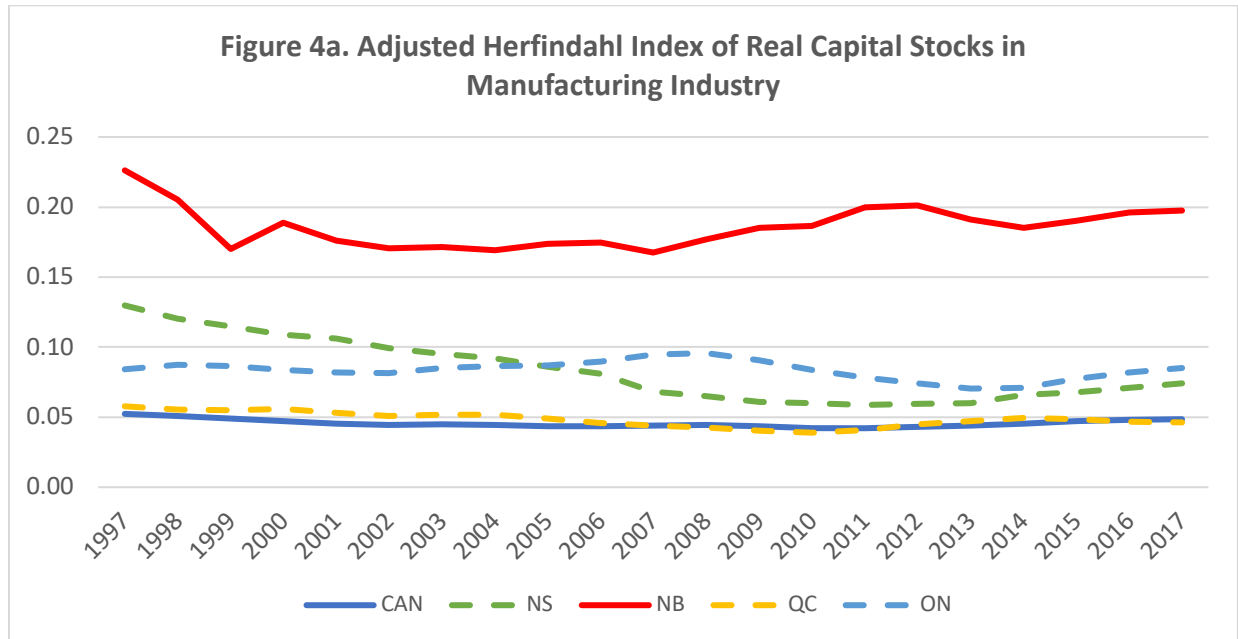
Concentration of Manufacturing Capital (using the Herfindahl Index)

Definition – Herfindahl Index

- The Herfindahl Index is a basic estimate of how concentrated an industry is. The equation is the Herfindahl Index is $H = \sum_{i=1}^N s_i^2$, with s_i representing the share of the sub-sector, and N the number of sub-sectors in the manufacturing industry.
- The Index ranges from a high of 1.0 (single sub-sector) to 0.0 (equal shares across all sub-sectors). There is no objective measure of what a high Herfindahl Index score is in different scenarios, so it is most useful for relative comparisons (comparing the same industry in different provinces or countries).
- The Adjusted Herfindahl Index equation is $H^* = (H - 1/N)/(1-1/N)$. The Adjusted Herfindahl Index accommodates for the number of sub-

sectors. The Adjusted Herfindahl Index can be interpreted in the same manner as the regular Herfindahl Index (Tombe & Mansell, 2016).

The manufacturing sector in New Brunswick is very concentrated around a few sub-sectors. Using the Herfindahl Index, we can measure and compare the concentration of capital in the industry across provinces, as seen in Figure 4a.



Source: Statistics Canada. Table 36-10-0096-01

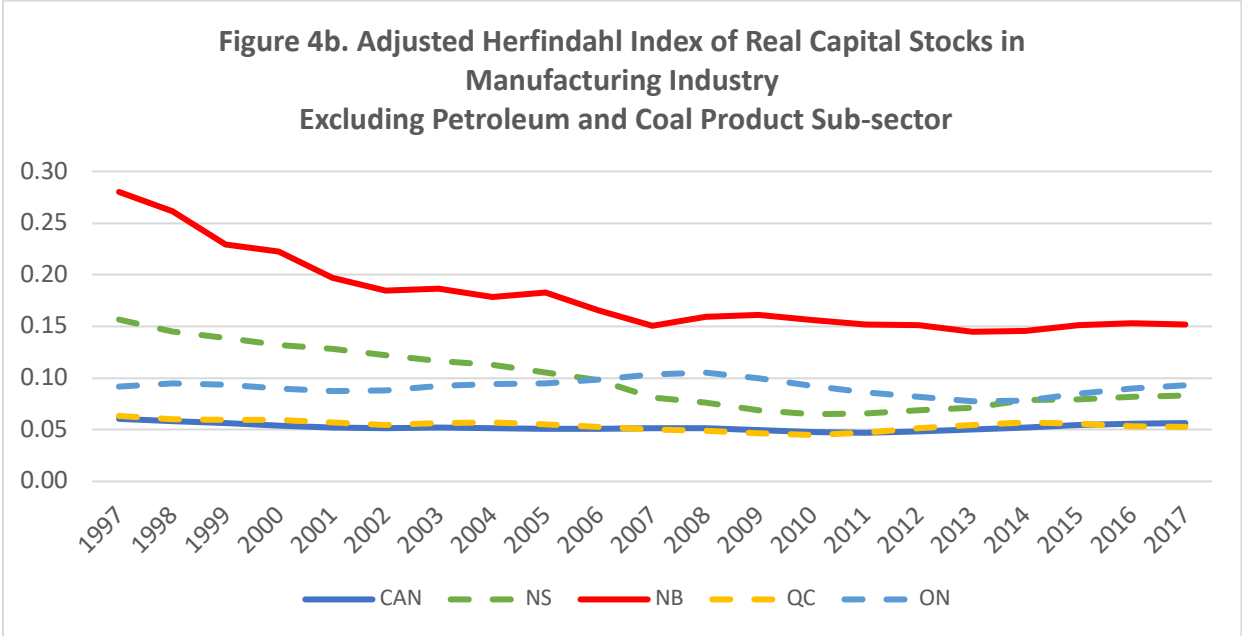
Measured in 2012 Chained Dollars

Note: Two digit NAICS code used, for 19 manufacturing sub-sectors.

By Author's calculations

According to the Herfindahl Index, New Brunswick has a higher level of concentration of manufacturing capital than Nova Scotia, Quebec, Ontario, or Canada overall. The Herfindahl Index does not show in which manufacturing industries the capital is concentrated, but tells us that, in other provinces, there are not other industries dominating in capital share as there are in New Brunswick.

It is also useful to look at the Herfindahl Index after removing petroleum. As seen in Figure 4b, New Brunswick still had a higher score than any of the other provinces and Canada across all observed years, even when removing for petroleum.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

By Author's calculations

Capital stock trends

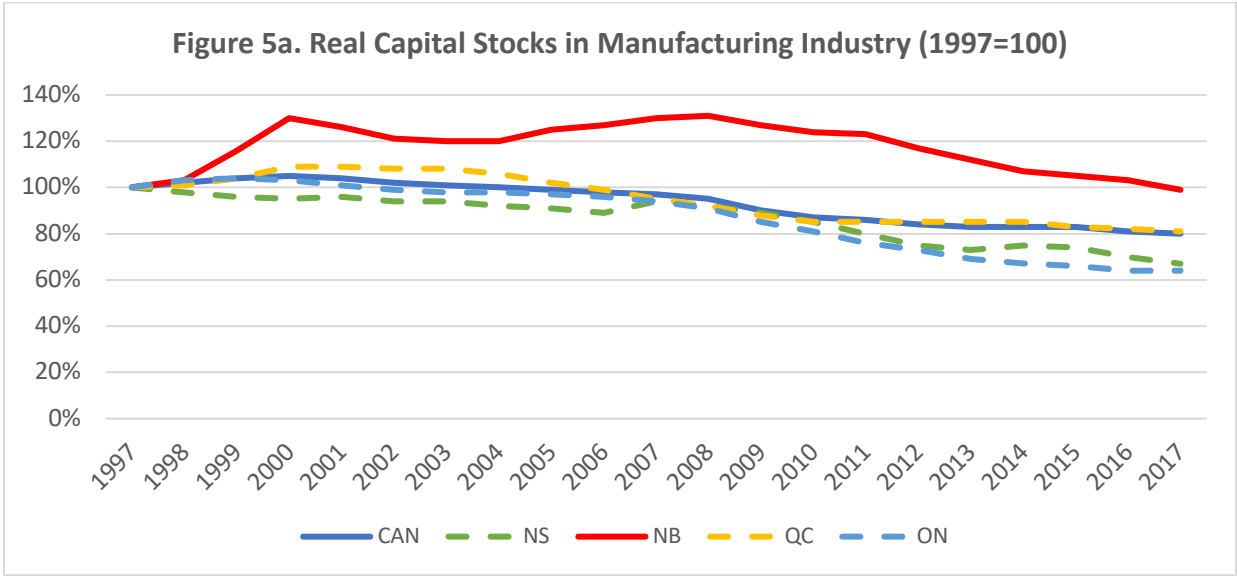
SUMMARY – Manufacturing capital stocks across the country have largely decreased, particularly since 2007. New Brunswick total manufacturing capital stocks grew from 1997 to 2008, but this growth was due to petroleum and coal product capital stock growth. Food manufacturing was the only sub-sector that had growth over the 1997-2017 period.

How have manufacturing's capital stocks in New Brunswick changed over the last twenty years, and how does that compare to other provinces, and Canada as a whole? The previous section looked at the relative share each sub-sector had within the manufacturing sector as a whole, but did not describe how the capital stocks themselves changed.

This section presents capital stocks by province as percentages relative to their 1997-2012 chained dollar amounts. We use an index rather than the actual

dollar values of the capital stock to simplify the presentation of comparative trends in the capital stocks.

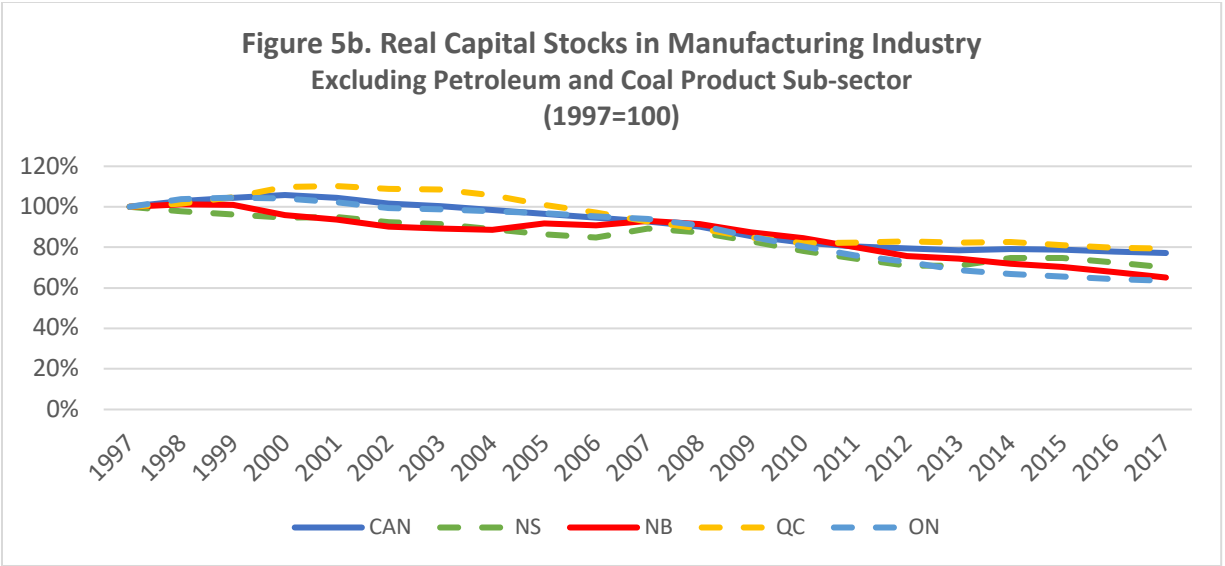
In Figure 5a, we can see that the size of New Brunswick's manufacturing capital stock increased between 1997 and 2000, and remained stable to 2008 before declining from 2008 until 2017. The trend for other provinces and Canada as a whole has been one of slow decline over the observed period. Nova Scotia and Ontario manufacturing capital stocks in 2017 were 60% of their sizes in 1997, while in Quebec they were 80% of their 1997 size. New Brunswick had a significant decline from a high of 131% (of 1997 levels) in 2008 to 99% in 2017.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

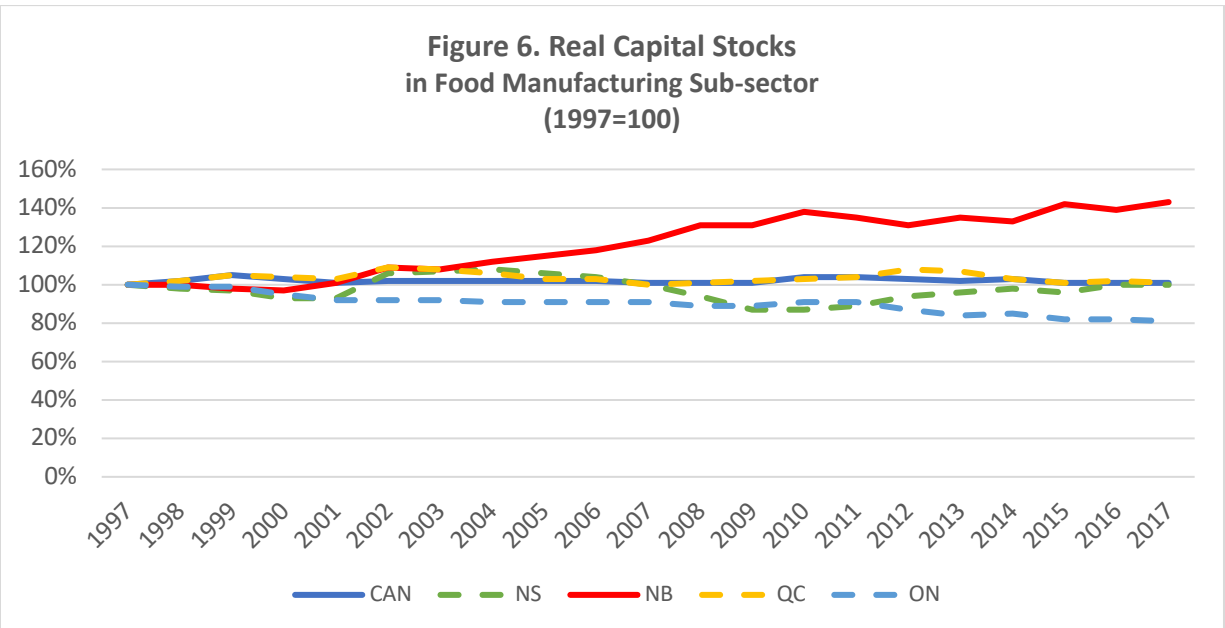
As shown in Figure 5b, after removing petroleum and coal product manufacturing capital from manufacturing totals, the New Brunswick trend changes significantly. It no longer has a sharp growth between 1997 and 2000, and decreases by 10% to 2004. Following a slight recovery from 2004 to 2007, the size of the manufacturing capital stock declines each year to 2017. It now follows a very similar trend to Nova Scotia and Ontario, falling to almost 60% of the 1997 value.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

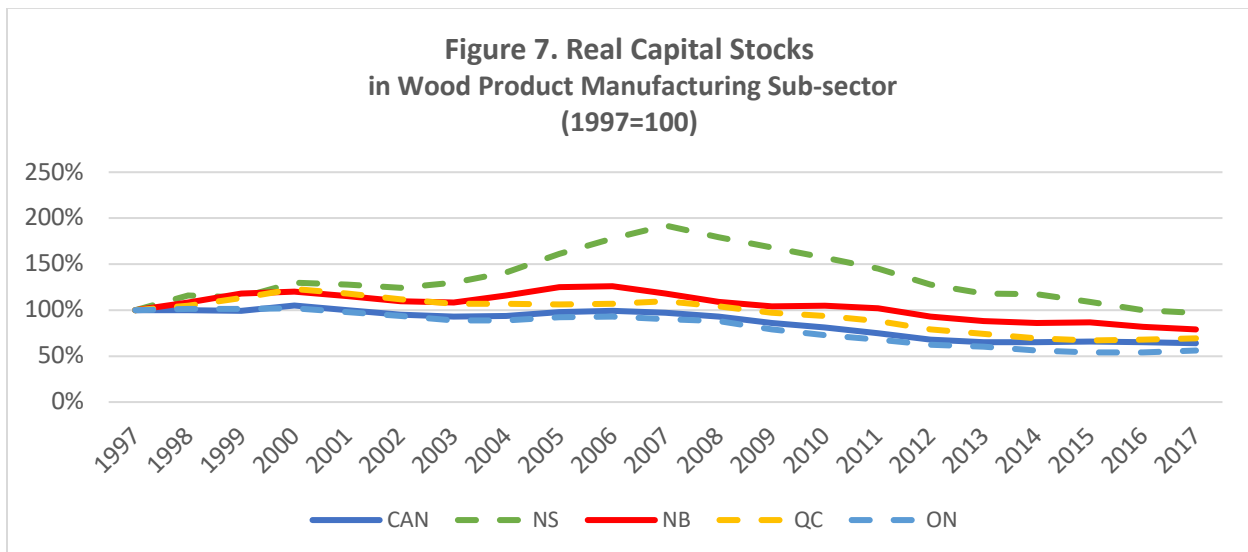
In Figure 6, we can see that New Brunswick's capital stocks in food manufacturing had a long-term increase over the 1997-2017 period. This is in contrast to the patterns seen in Canada and the other provinces, which fluctuated but did not change significantly over the whole period, with the exception of Ontario, which decreased steadily.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

Figure 7 shows how wood product manufacturing capital stocks have changed. New Brunswick increased slowly from 1997 to 2006, reaching a high of 126% of 1997 levels, before declining. The national pattern was a relatively consistent decline over the whole observed period. Quebec and Ontario mostly follow the national trend, but Nova Scotia had significant growth until 2007, before declining as well, but at a greater rate than the other provinces. It ended 2017 being 10% smaller than the value of its 1997 capital stock.



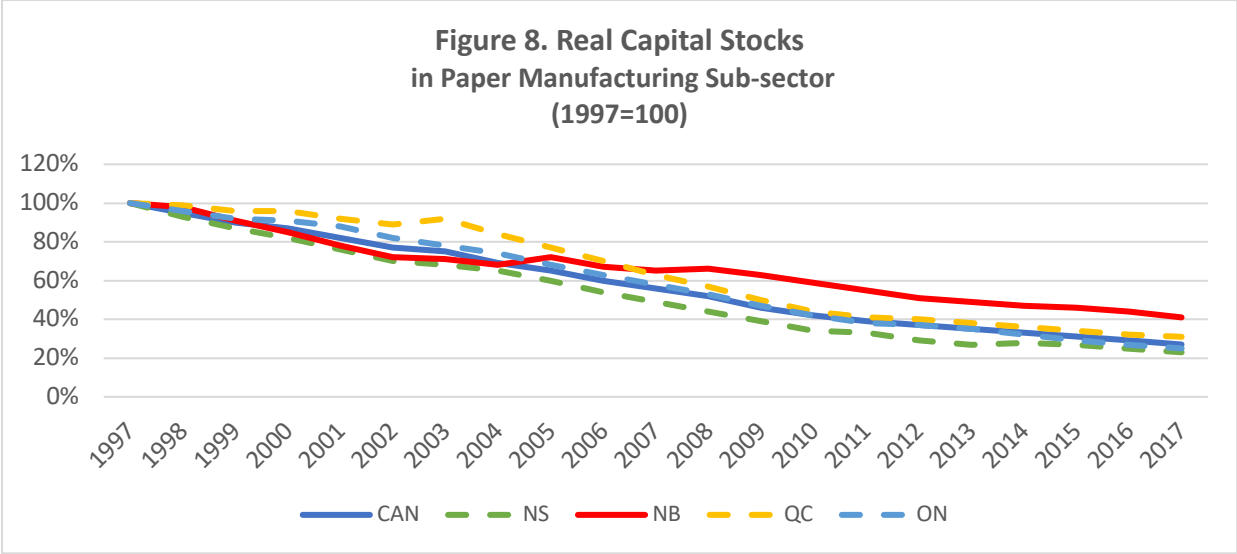
Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

Figure 8 presents paper manufacturing capital stocks, showing all provinces and Canada followed the same trend of significant and consistent decline. New Brunswick ended 2017 at 41% of its 1997 levels, with the other provinces even lower. Canada's decline was so consistent that each year's capital levels were lower than the previous year's. New Brunswick only had one year of positive growth (2005).

The decline of New Brunswick paper manufacturing's capital stock is the largest contributor to the whole manufacturing sector's decline. Paper manufacturing

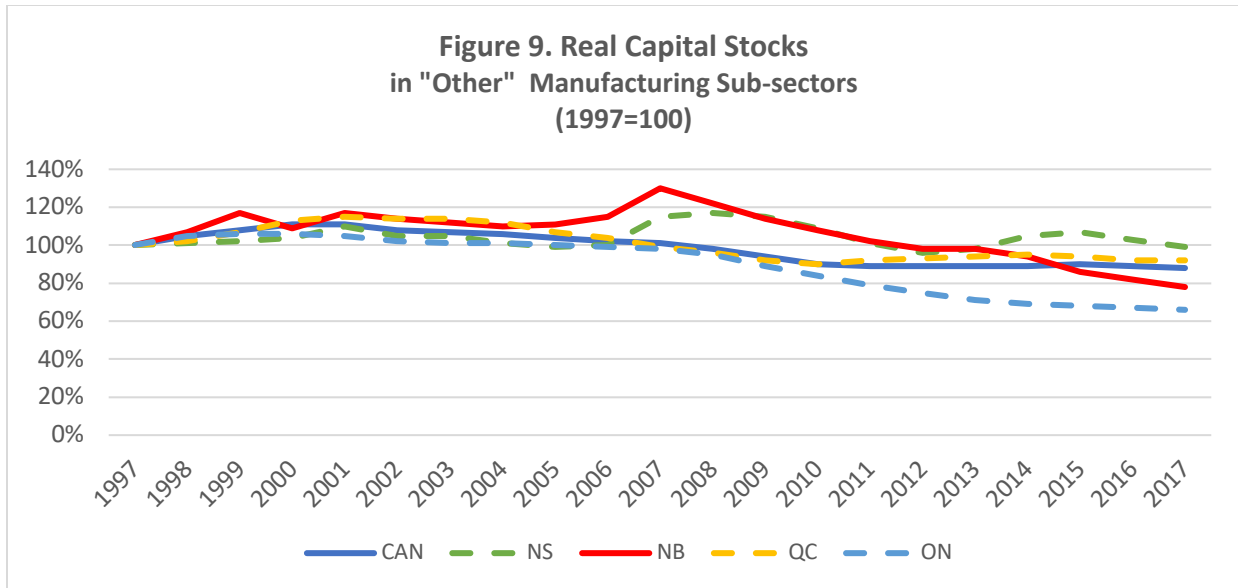
accounted for close to half of New Brunswick manufacturing capital in 1997, but its absolute size and relative share both declined significantly since.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

Figure 9 shows how the “other” combined categories (“other” = total manufacturing – [food + wood + paper + petroleum]) changed. New Brunswick had moderate growth between 1997 and 2007, but then declined to a low of 78% of 1997 levels in 2017. The national trend was of moderate decline, but stayed close to 90% of 1997 levels since 2010. Ontario saw the most significant decline, at 66% in 2017. Quebec followed the national trend very closely, while Nova Scotia declined the least in the long-term, finishing 2017 at 99%.



Source: Statistics Canada. Table 36-10-0096-01

Measured in 2012 Chained Dollars

Investment

Definition – *Investment Intensity*

Investment intensity is the ratio of investment expenditure to Real Value Added³. This is a technique borrowed and adapted from Baldwin et al. (2014), who used Investment as a share of GDP. Investment Intensity shows the ratio of output intended for increasing production capacity. RVA is discussed in more detail in a later section.

Investment Expenditure and Real Value Added are measured in 2012 Chained Dollars.

Source: Baldwin et al. (2014)

Total Investment Intensity

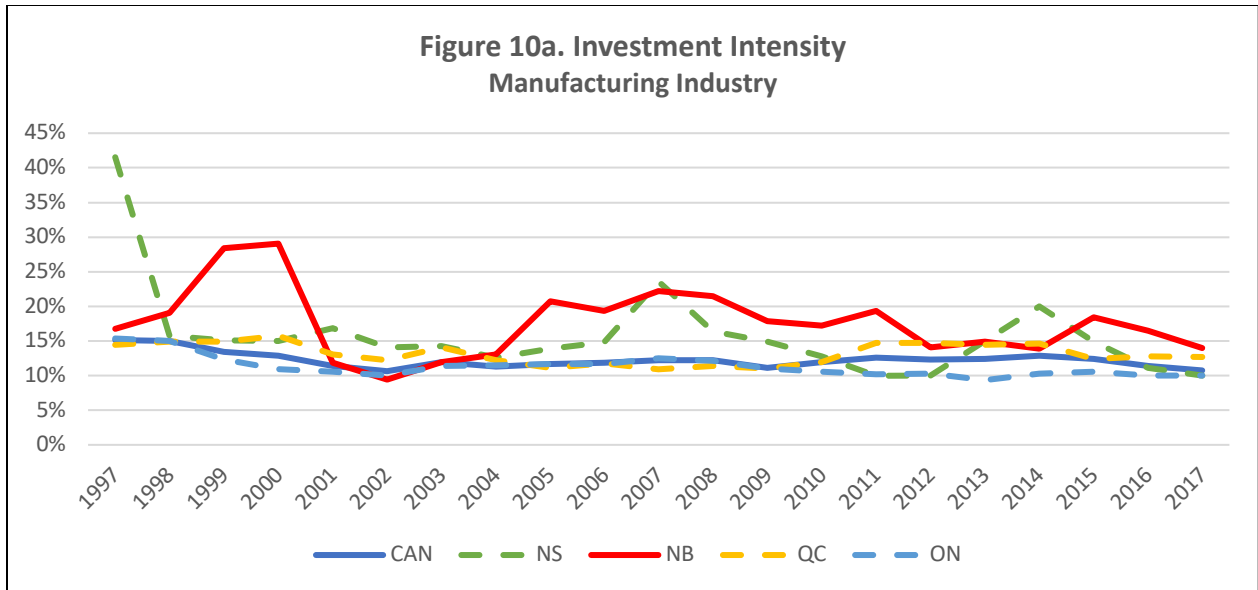
SUMMARY - New Brunswick had the highest or one of the highest rates of total investment intensity for total manufacturing over the 1997-2017 period. Its total investment intensity in 2017 was 14%, the highest overall. Removing the petroleum sub-sector made New Brunswick more similar to the other provinces and Canada, giving New Brunswick a total investment intensity of 10.5% in 2017,

³ Real Value Added is discussed in more depth in the “Real value Added” section.

below Quebec's high of 12.5%, and Canada's 11%. New Brunswick was higher than Ontario and Nova Scotia (both at 10%).

New Brunswick had the second highest total investment intensity rates for food manufacturing and wood product manufacturing in 2017, the third highest for paper manufacturing, and the second lowest for "other" manufacturing (although it was only 0.5% off Canada in third).

In Figure 10a, we can see that over the 1997-2017 period, New Brunswick consistently had a high Investment Intensity, compared to the other provinces and Canada as a whole. NB saw an increase in investment intensity between in 1997 (17%) and 2000 (29%) when the province had its highest rate of Investment Intensity. It then decreased sharply to around 12% in 2001, which was similar to ON and CAN. It continued at this general level until 2005, when it increased to above 20% again. It continued to have Intensity around the 20% level until 2012, when it decreased to closer to 15%. It had a short spike in 2015 at 18.5%, before ending in 2017 at 14% which was the highest rate among Canada for the year. ON and CAN had much more consistent Investment Intensity than NB, with little short-term variation. Their investment intensity was consistently between 10% and 15%, with a general long-term decline. Quebec had similar or slightly higher investment intensity than Ontario and Canada post 2010. NS had Investment Intensity over 40% in 1997, but it declined immediately to more similar values compared to other provinces, and it was often slightly above the Quebec, Ontario, Canada group, and on occasion higher than New Brunswick, for the rest of investigated period.

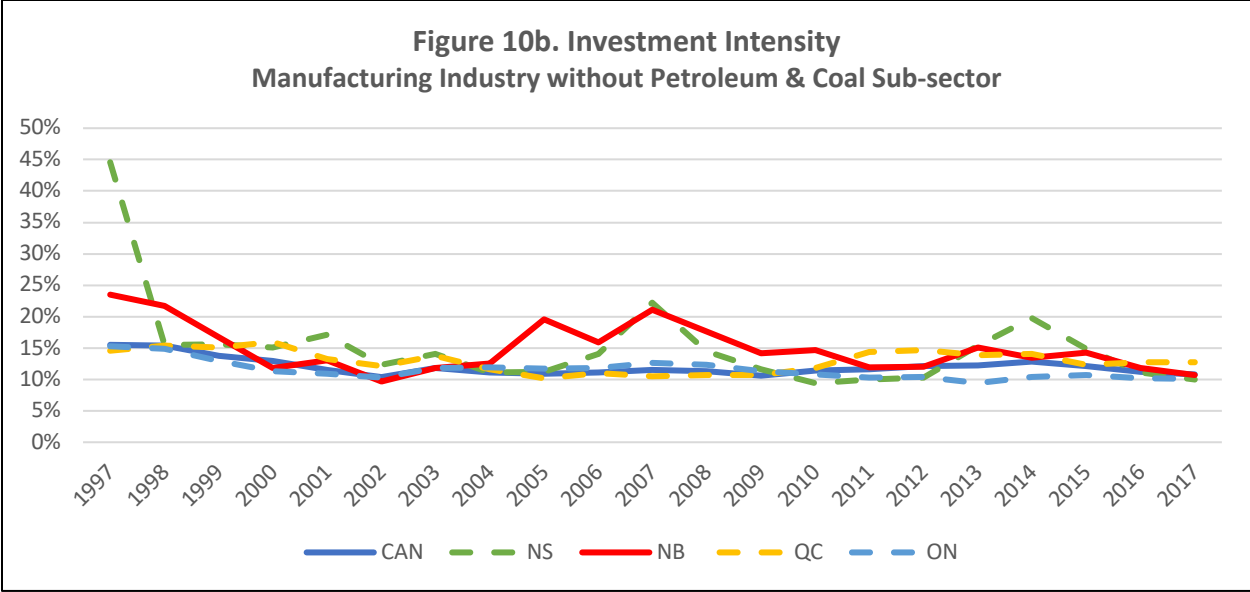


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

Looking at manufacturing industry without the petroleum and coal product sub-sector (Figure 10b), NB's Investment Intensity becomes more similar to the other provinces and CAN. NB's Investment Intensity in 1997 were 23.5%, but decreased to 12% in 2000, which was much closer to the others. NB continued to have similar Investment Intensity to the other provinces and CAN for the rest of the observed period, with the exception of a short-term increase between 2005 and 2007. In 2017, New Brunswick's investment intensity was only a little below Quebec (10.5% to 12.5%), and very similar to Canada's (11%). Nova Scotia and Ontario both had 10%.

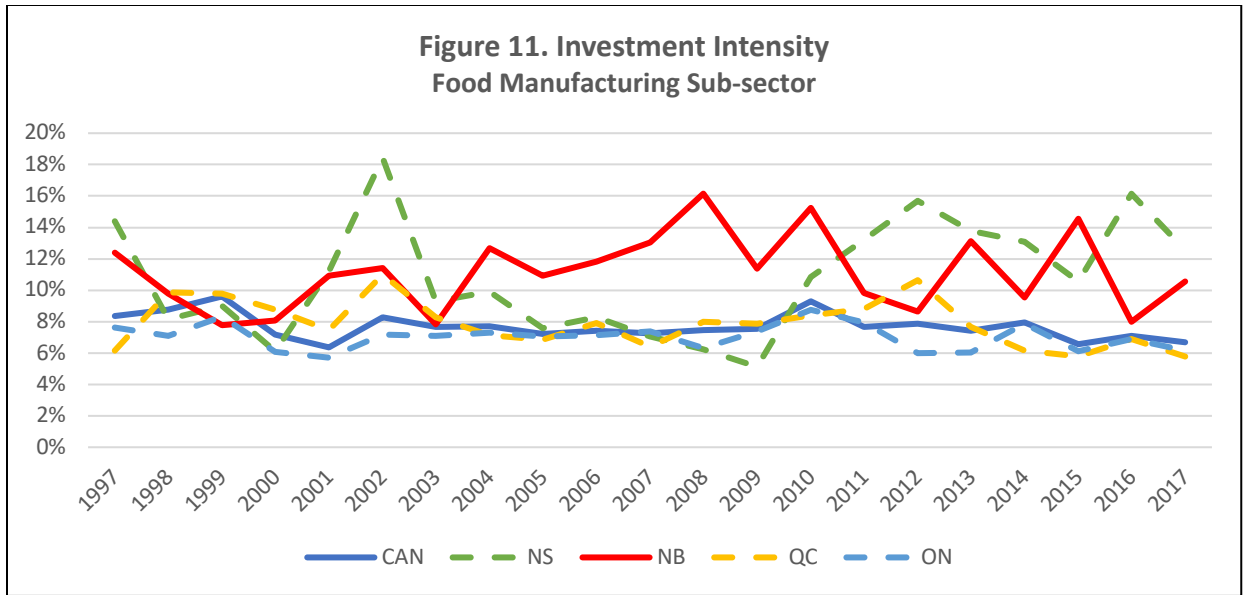


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

In Figure 11, we can see that New Brunswick had great fluctuation in Investment Intensity in its food manufacturing sub-sector. It generally had higher rates than Quebec, Ontario, and Canada throughout 1997-2017. New Brunswick had Investment Intensity of 12% in 1997, and it decreased to 8% in 1999. It had a short-term increase to 11% in 2000 and subsequently returned to 8% in 2003, before increasing to 16% in 2008 when New Brunswick had twice higher Investment Intensity compared to any other province or Canada. Investment intensity in New Brunswick then slowly decreased to 11% in 2017, with significant variation between years. Although investment intensity in Ontario and Canada were lower than in New Brunswick, but the variation of it in Ontario and Canada were significantly less than in New Brunswick. Quebec had both slightly higher Investment Intensity and variation compared to Ontario and Canada. Nova Scotia had even higher levels of variation than New Brunswick, and also had more extreme levels of Investment Intensity. New Brunswick or Nova Scotia had the highest levels of Investment Intensity in the country for almost every year in the observed period between 1997 and 2017, except for 1998-2000.

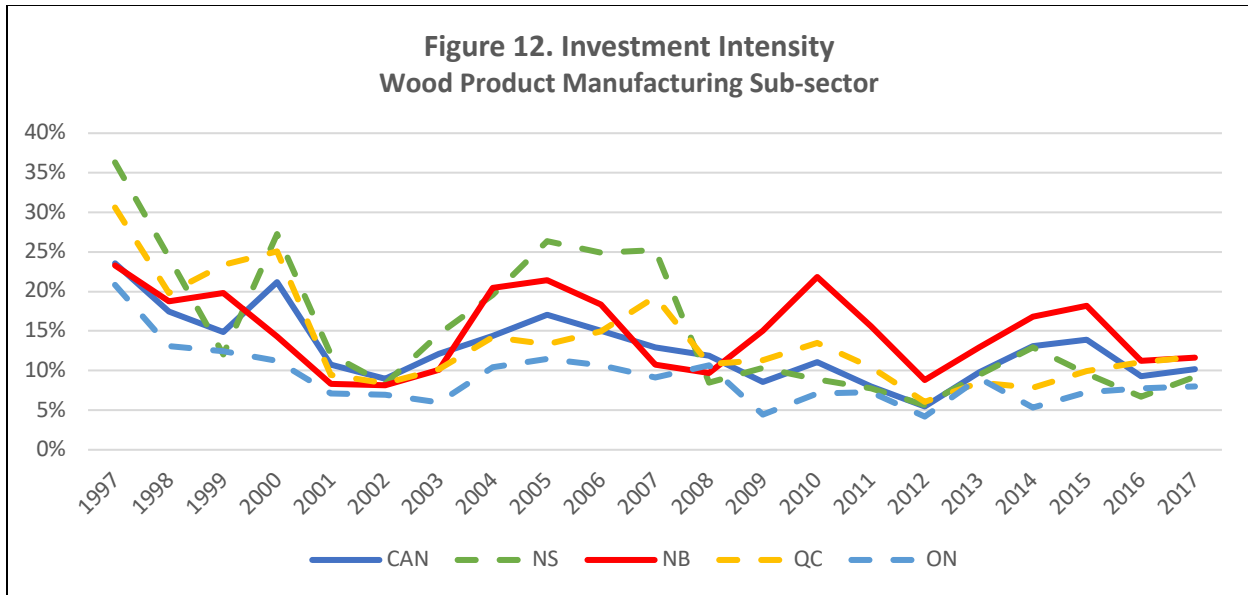


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

In Figure 12, we illustrate the Investment Intensity for wood product manufacturing sub-sector between 1997 and 2017, we observe strong trends in Investment Intensity in the sub-sector across all provinces and CAN, although these trends were much stronger in NB and NS, compared to ON and CAN. There was a general decline in Investment Intensity in the sub-sector in the country between 1997 and 1999, followed by a short-lived increase in 2000, that was immediately followed by declines until 2002. This was followed by a period of growth, that peaked between 2005 and 2007, depending on the province. There was then a short decline until 2008 /2009, before another increase. This peak in 2010 was much more significant in New Brunswick than in any of the other provinces or Canada. Another decline from 2010 to 2012 was followed by a minor increase from 2012 to 2015, with a short fall in 2016. 2017 ended with New Brunswick and Quebec had highest Investment Intensity with close to 12% of RVA going towards Investment in the provinces. Between 2009 and 2016, New Brunswick had the highest Investment Intensity in the country. Ontario had the lowest Investment Intensity for almost every year over the observed period.

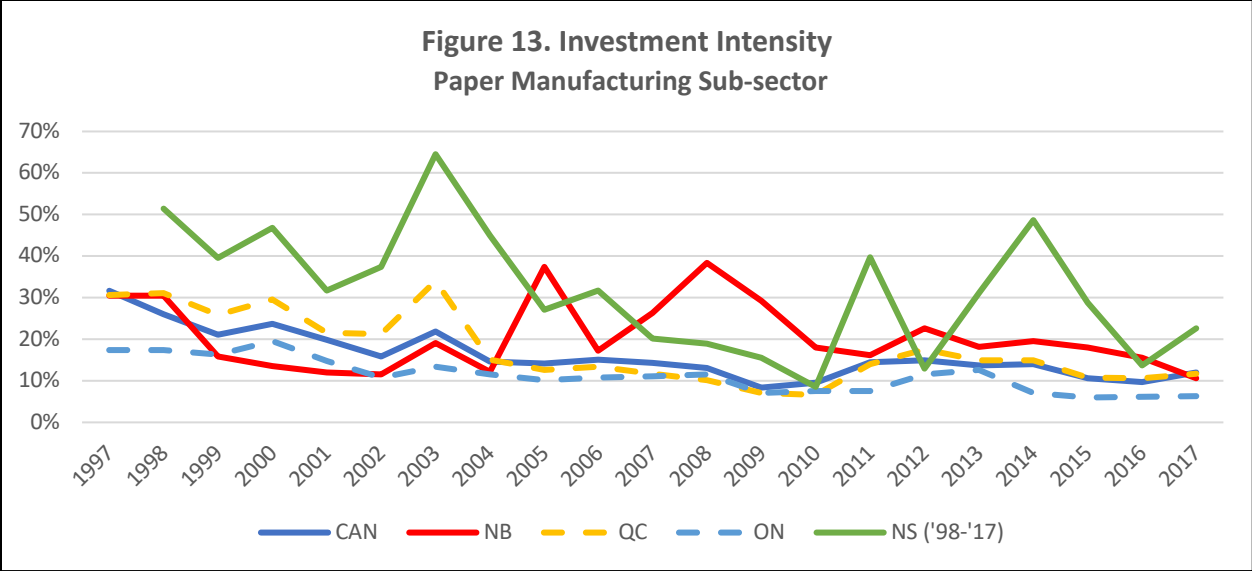


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

For paper manufacturing sub-sector' Investment Intensity (Figure 13), NB had Investment Intensity of 31% in 1997, which declined to 12% in 2001. It then increased to 37% in 2005 following by a decline to 13% in 2006, before increasing to its peak at 38% the following year. After this peak, NB's Investment Intensity in paper manufacturing sub-sector had consistent declines to 11% in 2017. NS continued to have very high Investment Intensity in the sub-sector, even after 1997, although It did decline to a low of 9% in 2010, but the province had one of the highest rates of Investment Intensity for most years over the observed period. Quebec, Ontario, and Canada had much steadier Investment Intensity in the sub-sector than New Brunswick and Nova Scotia.

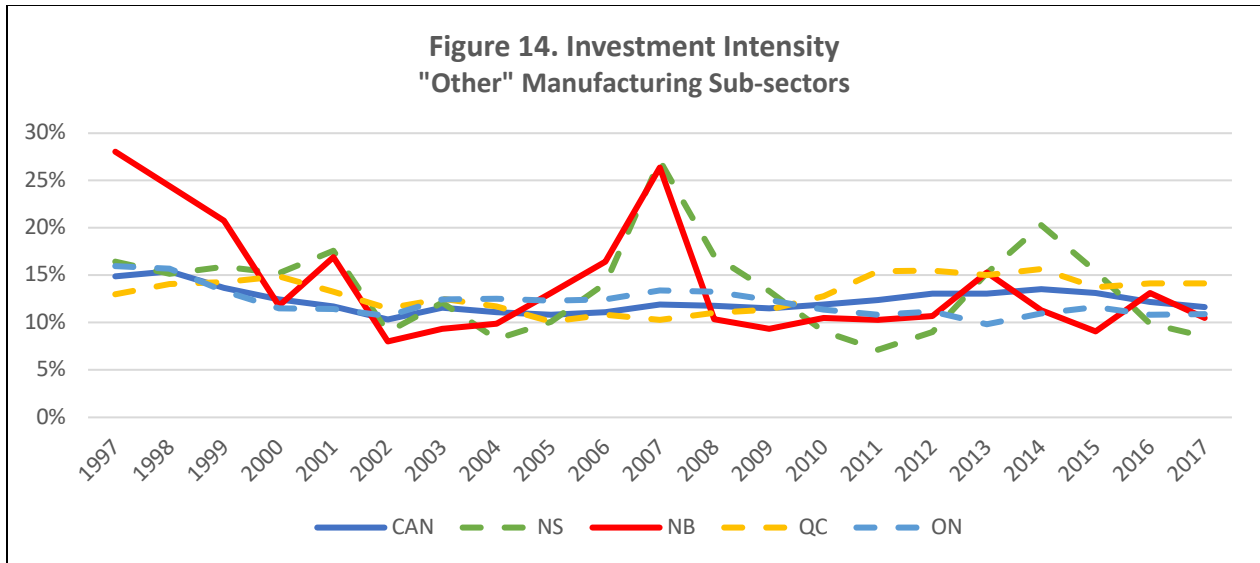


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author’s calculations

New Brunswick’s investment intensity for other manufacturing sub-sectors altogether (Figure 14), fell from 28% in 1997 to 8% in 2002. It then increased to 26% in 2007, before decreasing to 11% the following year. It continued around this level until 2017, with the exception of 2013 when it increased to 15%. From 2008 to 2017, New Brunswick frequently had one of the lowest, or even the lowest Investment Intensity rates for other manufacturing sub-sectors altogether. Quebec, Ontario, and Canada had much steadier investment intensity than New Brunswick. Nova Scotia had similar variations to New Brunswick from 2001 to 2017, although not always in the same years.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

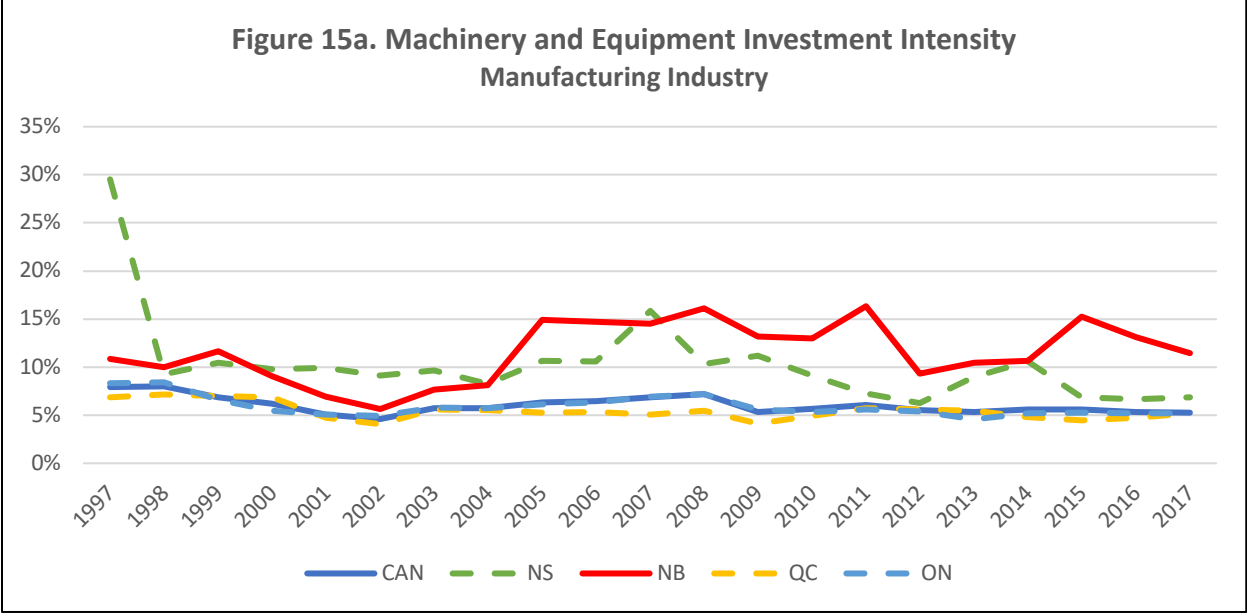
Machinery and Equipment Investment Intensity

SUMMARY - For machinery and equipment investment intensity, New Brunswick had generally similar patterns to total investment intensity. For total manufacturing without petroleum, New Brunswick had the highest investment intensity. Food and paper were similar, but wood manufacturing investment intensity for machinery and equipment was the lowest of all provinces and Canada in 2017 (it had a higher position for most of 1997-2017). For "other" manufacturing, New Brunswick had the highest machinery and equipment investment intensity on 2017.

This section looks at investment intensity in the same manner as the previous section, but only for machinery and equipment investment. Since we are looking at a part of total investment, machinery and equipment investment intensity is lower than total investment intensity.

In Figure 15a, we show the investment intensity by machinery and equipment, for the whole manufacturing industry. For New Brunswick, we see that the Investment Intensity decreased from 11% in 1997, to 6% in 2002, before increasing to 15% in 2005. It continued at a similar rate until 2012, when it decreased to 9%. It returned to 15% in 2016, before declining in 2017 to 11%. Except for 1997 and 2007, NB had the highest levels of Investment Intensity by machinery and equipment. Quebec, Ontario, and Canada had very steady

and similar levels over the observed period. NS had very high levels of investment intensity by machinery and equipment in 1997 (30%), but much more typical levels thereafter, it was mostly above Quebec, Ontario, and Canada, and often similar to New Brunswick.

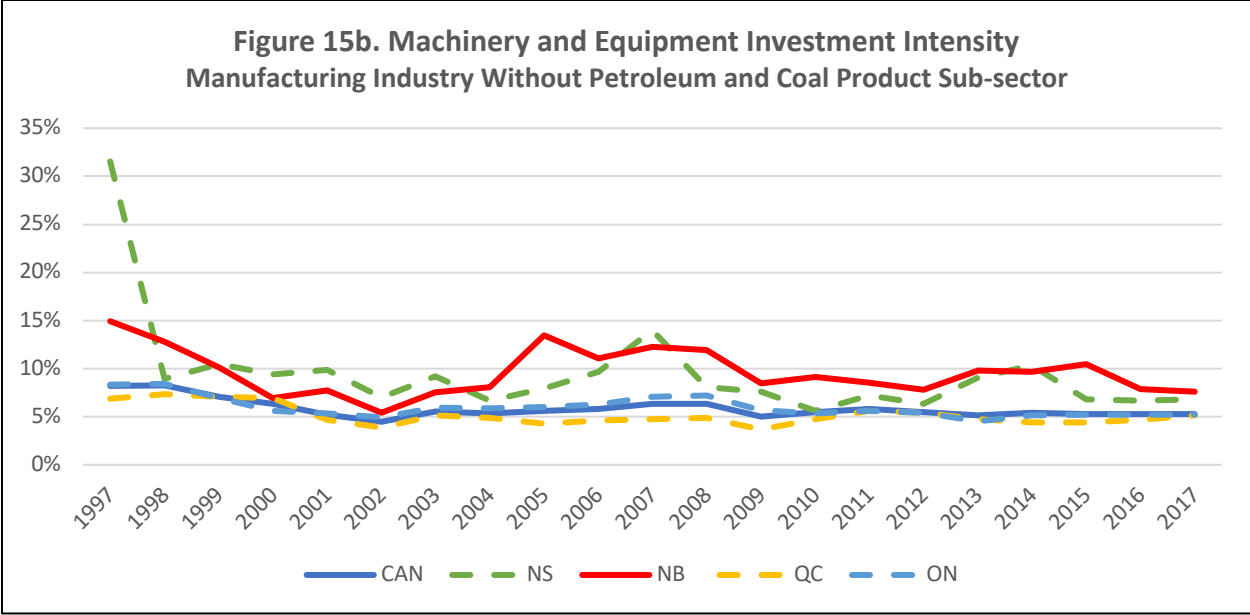


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

For machinery and equipment investment intensity for total manufacturing without petroleum and coal product sub-sector (Figure 15b), New Brunswick had closer values to Quebec, Ontario, and Canada, while still remaining higher. The general trends for New Brunswick remained very similar to Figure 6a, as they did for Nova Scotia.

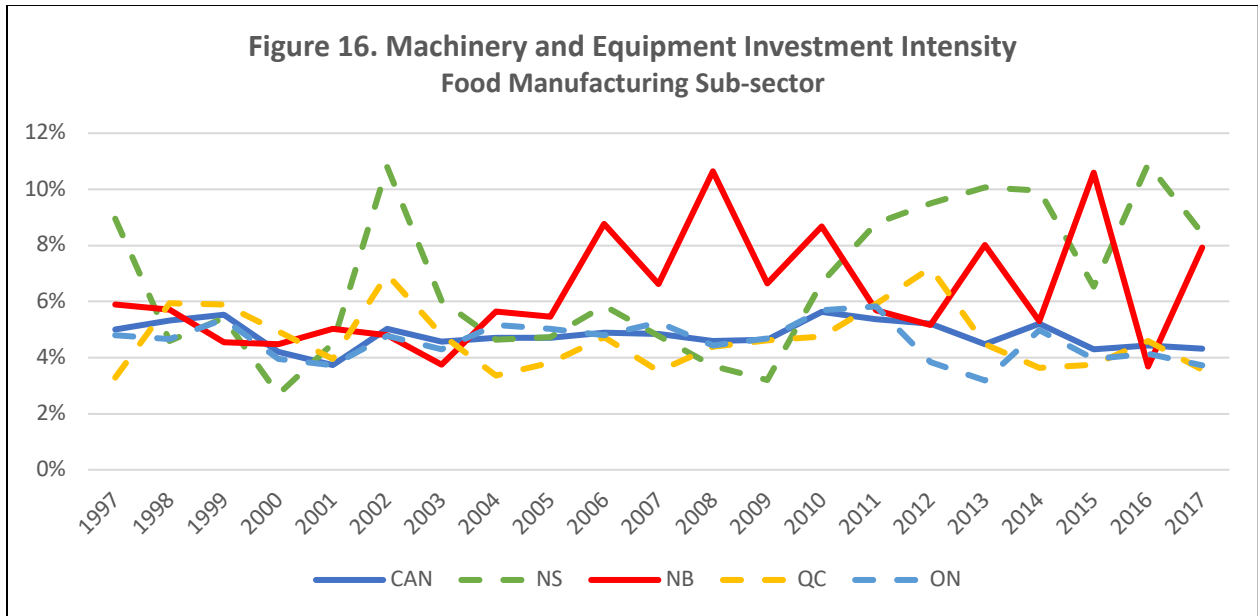


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

In Figure 16, we see that machinery and equipment investment intensity for the Food Manufacturing sub-sector for NB was similar to Quebec, Ontario, and Canada over the 1997-2003 period. From 2004 to 2017, it had significant variation between years, but overall had higher rates than previously (5% from 1997 to 2003, and 7% from 2004 to 2017). Over this period, New Brunswick had higher rates than Quebec, Ontario, and Canada, with the exception of 2010, 2011, and 2016. Nova Scotia also had significant Investment Intensity from 2010 to 2017, as well as 2002.

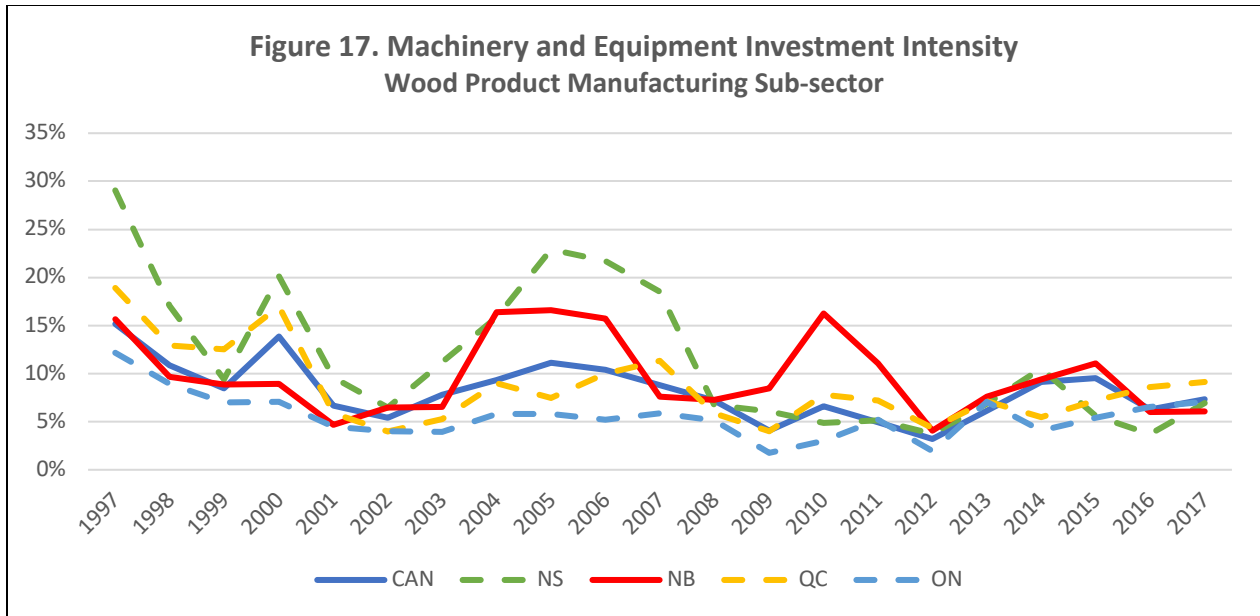


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

In Figure 17, we see that there are significant patterns across the provinces and Canada for machinery and equipment investment intensity for wood product manufacturing, as there was for Total Investment Intensity. There was a period of decline from 1997 to 1999, with a brief increase in 2000 (that NB and CAN did not experience), before continuing to decline until 2002. There was an increase that peaked in 2004 or 2005 (depending on the province), before a period of decline until 2008. NB then saw a sharp increase in 2010, that was not observed elsewhere on a noticeable level. From 2012, there was a general increase in machinery and equipment investment intensity until 2015, which was followed by a decline. These trends were strongest in New Brunswick and Nova Scotia, while weakest in Ontario.

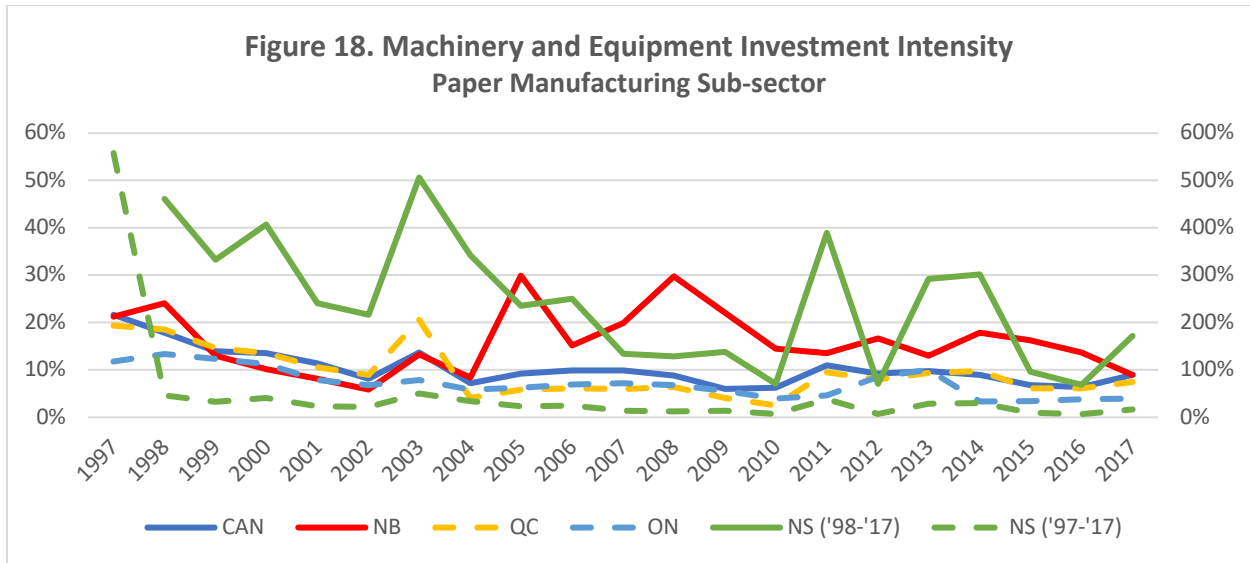


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

For machinery and equipment investment intensity in paper manufacturing sub-sector (Figure 18), NS had a very high level in 1997 (560%), as they did for Total Investment Intensity. The graph is adjusted similarly to show the post-1997 NS values on the left axis, and with 1997-2017 values on the right axis. NB had a period of decline from 1997 to 2002 (21% in 1997 to 6% in 2002), it had similar values to Quebec, Ontario, and Canada during time. After 2004, machinery and equipment investment intensity in NB increased to 30% in 2005. It fell to 15% the following year, but increased afterwards, and peaked at 30% in 2008. After the peak, it decreased until 2017, ended at 9% of machinery and equipment investment intensity. Over the 2005-2017 period, NB had the highest or second highest (to NS) machinery and equipment investment intensity. After its 506% Intensity rate for 1997, NS fell to 46% in 1998, and continued to have comparably high values to the other provinces. Overall, machinery and equipment investment intensity in NS declined over the 1998-2017 period with significant variation between years.

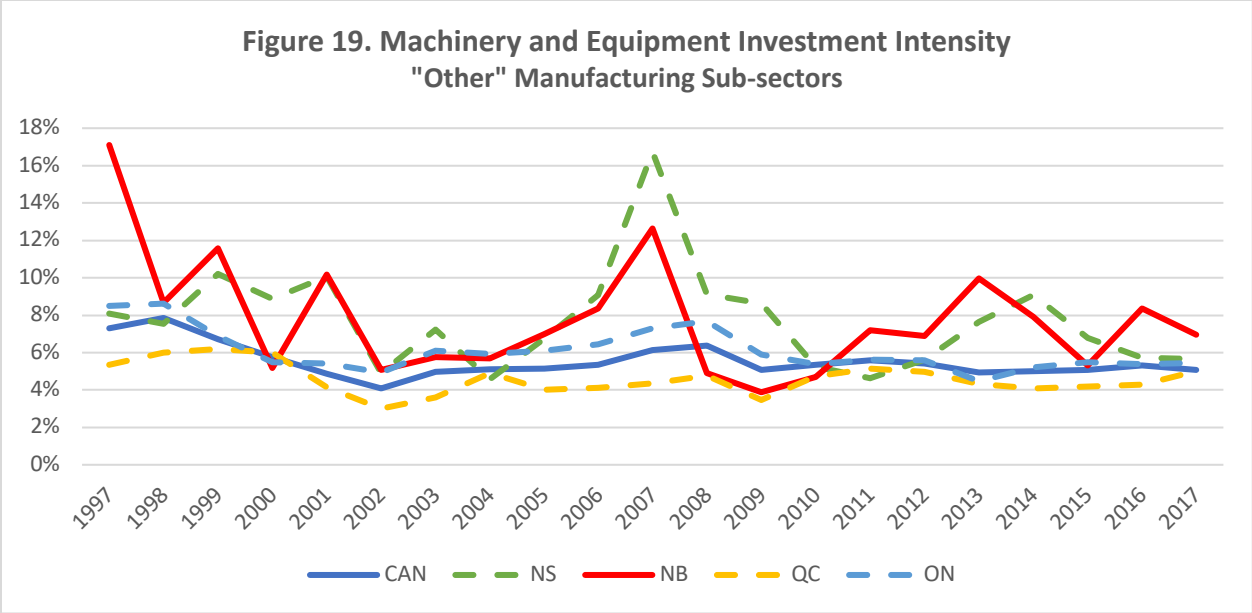


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

For machinery and equipment investment intensity in "other" manufacturing sub-sectors (Figure 19), New Brunswick saw significant variation between years. From 1997 to 2002, the rate in NB declined from 17% to 5%. By 2007, it had increased to 13%. This was followed by a decline to 4% in 2009, which was the lowest of the observed period. It increased afterwards, and remained between 5% and 10% until 2017. Over the 1997-2017 period, machinery and equipment investment intensity in New Brunswick was typically higher than Quebec, Ontario, and Canada, and New Brunswick finished 2017 with the highest rate. Nova Scotia saw greater variation than any of the other provinces.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

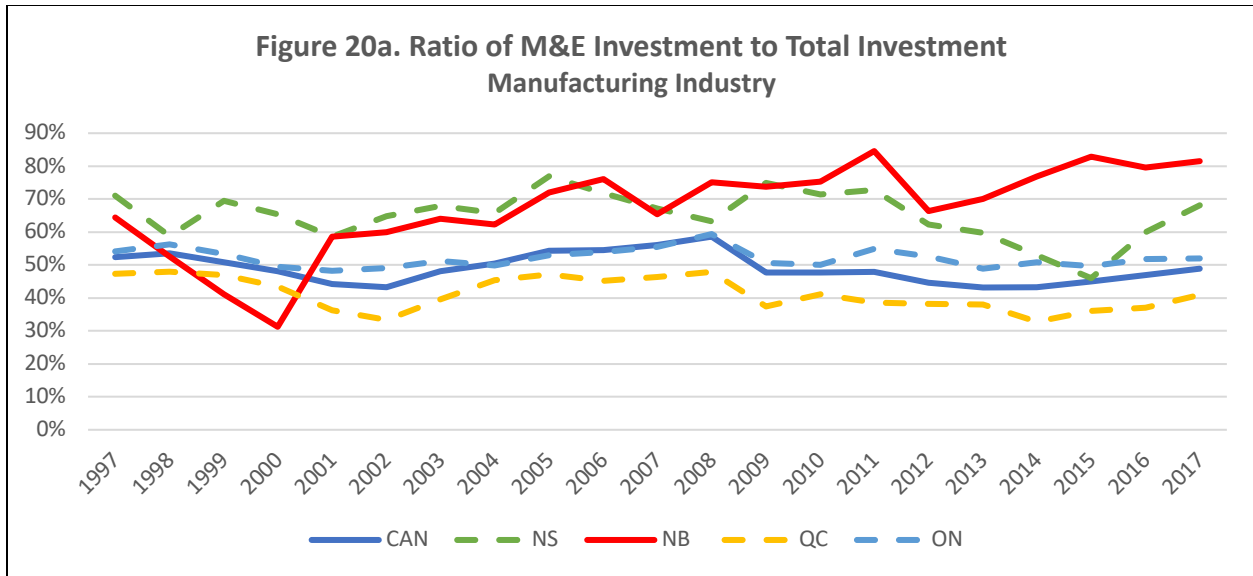
Investment Intensity measured in 2012 Chained Dollars

By Author's calculations

Ratio of Investment in Machinery and Equipment to Total Investment

SUMMARY – New Brunswick generally had a high ratio of total investment going towards machinery and equipment. In 2017, New Brunswick had the highest ratio of investment in machinery and equipment to total investment for total (with and without petroleum), food, paper, and “other” manufacturing. The sole exception being paper manufacturing.

It is also useful to look at the ratio of Investment Expenditure for Machinery and Equipment to Total Investment Expenditure (Figure 20a). For manufacturing industry as a whole, NB had one of the highest ratios of Machinery and Equipment Investment to Total Investment over the 1997-2017 period, and the outright highest ratio from 2010 to 2017. NB had a rate above 60% for every year except the 1998-2001 period, and from 2011 onwards it was at or above 80% for four of the seven years. NS had a similar high concentration of investment in Machinery and Equipment to NB (with the exception of the 2013-2017 period), but Quebec, Ontario, and Canada all had significantly lower levels of investment in machinery and equipment, with Ontario and Canada averaging close to 50% over the 1997-2017 period, and Quebec closer to 40%.

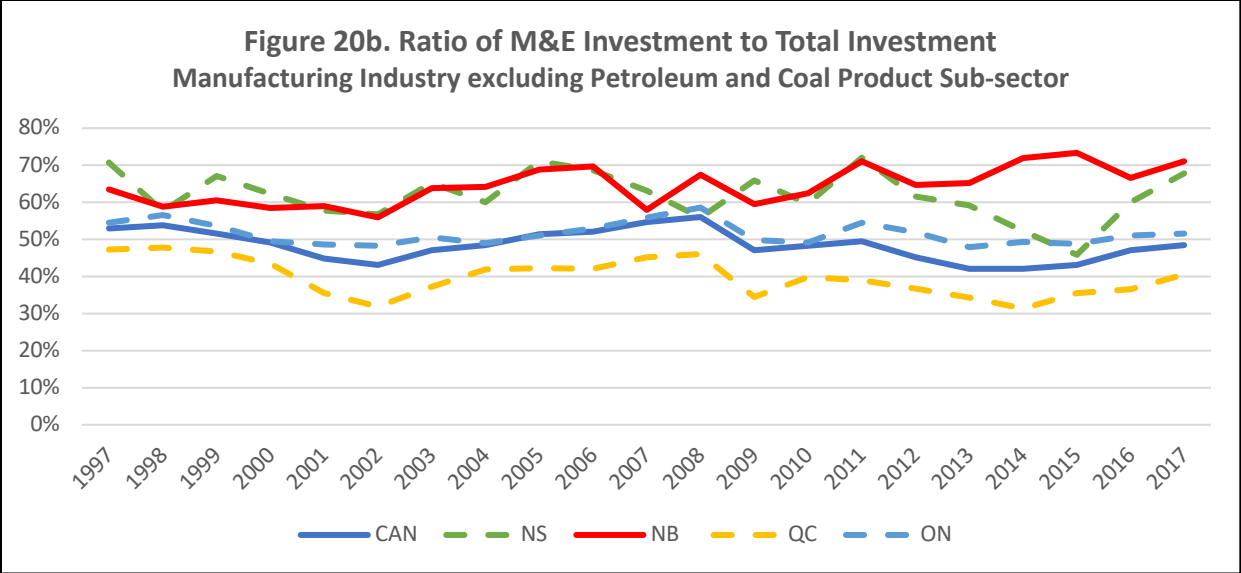


Source: Statistics Canada. Table: 36-10-0096-01

Investment measures in 2012 chained dollars

By Author's calculations

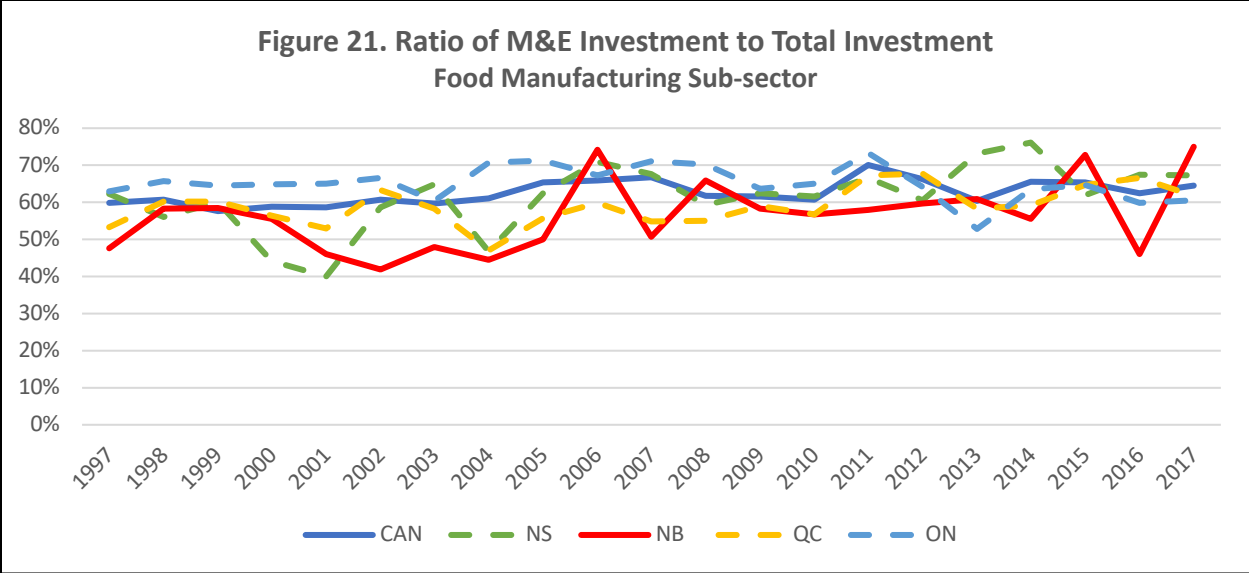
By looking at ratio of Machinery and Equipment Investment to Total Investment for manufacturing industry without petroleum and coal product sub-sector (Figure 20b), the patterns for each province and Canada remain very similar but become flatter. The ratio in NB did not have a dip between 1998 and 2001 as it did including petroleum and coal product sub-sector, and did not exceed 80% in any year.



Source: Statistics Canada. Table: 36-10-0096-01

By Author's calculations

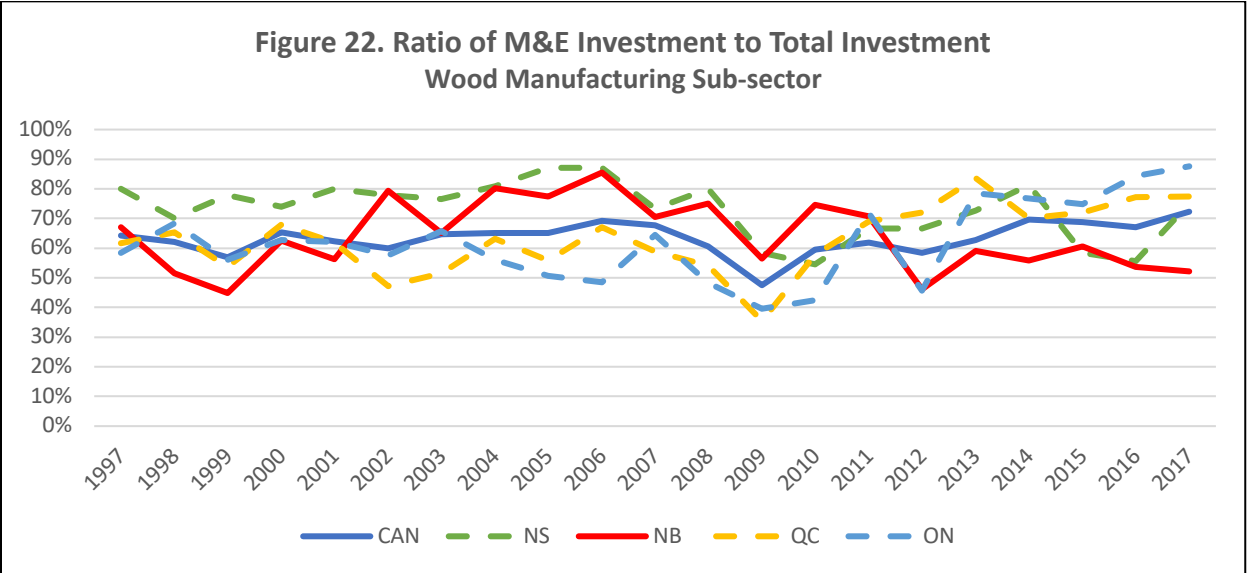
NB had a relatively lower ratio of Investment in Machinery and Equipment to Total Investment in food manufacturing sub-sector (Figure 21), compared to the other provinces. Over the 1997-2017 period, New Brunswick saw significant variation, with the ratio dropping below 50% from 2001-2005 and in 2016, while occasionally rising above 70%, in 2006, 2015, and 2017. Ontario and Canada had the steadiest ratio of machinery and equipment investment to total investment, with Quebec showing slightly more variation. The ratio in Nova Scotia had its variation similar to New Brunswick.



Source: Statistics Canada. Table: 36-10-0096-01

By Author's calculations

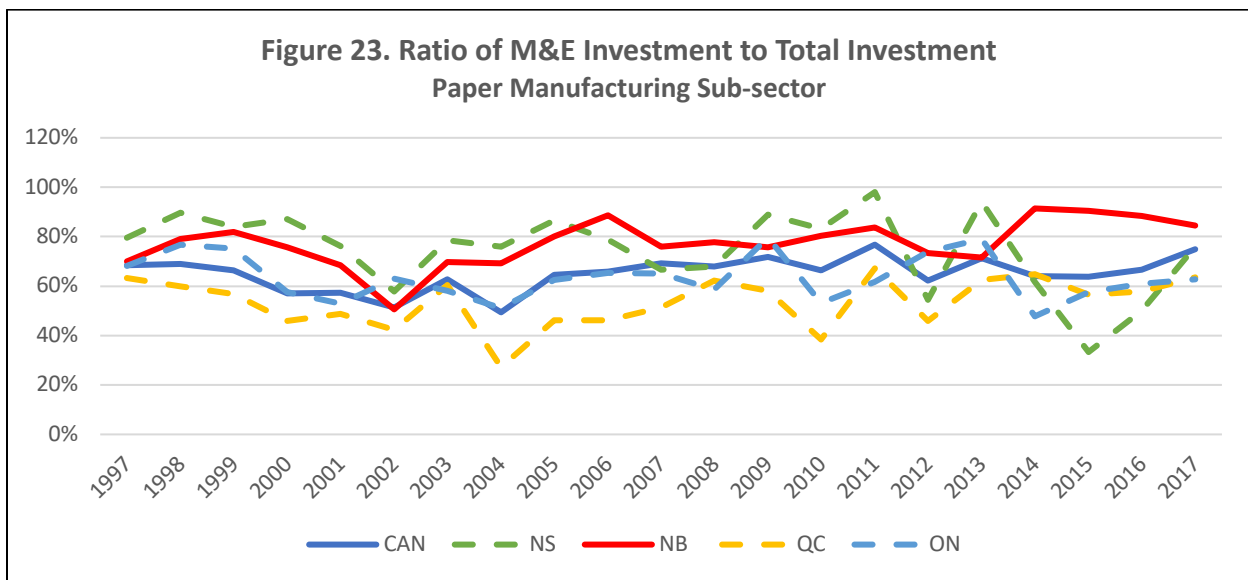
For wood product manufacturing sub-sector (Figure 22), New Brunswick had a comparatively low ratio of machinery and equipment investment to total investment from 1998 to 2001 and again from 2012 to 2017 (below 60%, and lower than the other provinces and Canada). New Brunswick's ratio increased after 2001, and from 2002 to 2011, New Brunswick had a higher ratio than Quebec, Ontario, and Canada, and a similar ratio to NS.



Source: Statistics Canada. Table: 36-10-0096-01

By Author's calculations

For paper manufacturing sub-sector, New Brunswick's machinery and equipment investment to total investment ratio was higher than Quebec, Ontario, and Canada for most of the observed period (Figure 23). New Brunswick invested more in machinery and equipment compared to total manufacturing (with and without Petroleum), and the other sub-sectors, averaging 77% over the whole period, and almost 90% from 2014 to 2017. The Canadian average over the 1997-2017 period was 65%. Nova Scotia had a similarly high ratio to New Brunswick, although it declined significantly after 2013. Quebec generally had the lowest ratio of investment going towards machinery and equipment in wood manufacturing sub-sector.

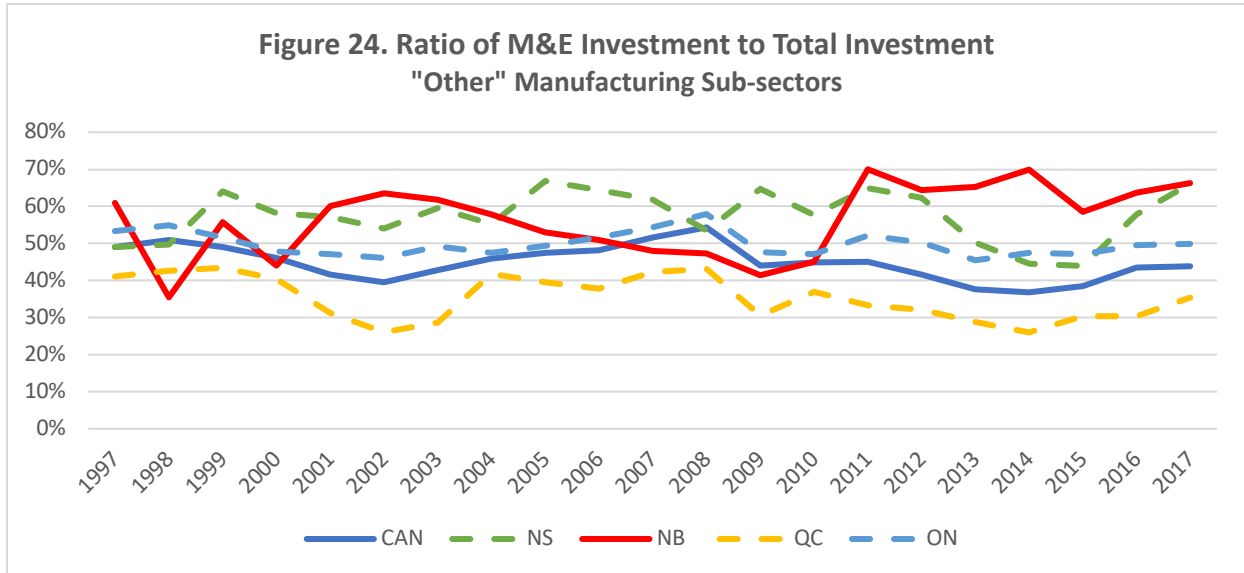


Source: Statistics Canada. Table: 36-10-0096-01

By Author's calculations

For "other" manufacturing (Figure 24), New Brunswick had significant variation with its investment in machinery and equipment to total investment ratio, and with a changing relative position to the other provinces and Canada. From 1997 to 2010, it ranged from a high of 63% in 2002 to a low of 35% in 1998. From 2011 to 2017, New Brunswick saw a new high of 70% of investment going towards

machinery and equipment, and it was higher than the other provinces and Canada.



Source: Statistics Canada. Table: 36-10-0096-01

By Author's calculations

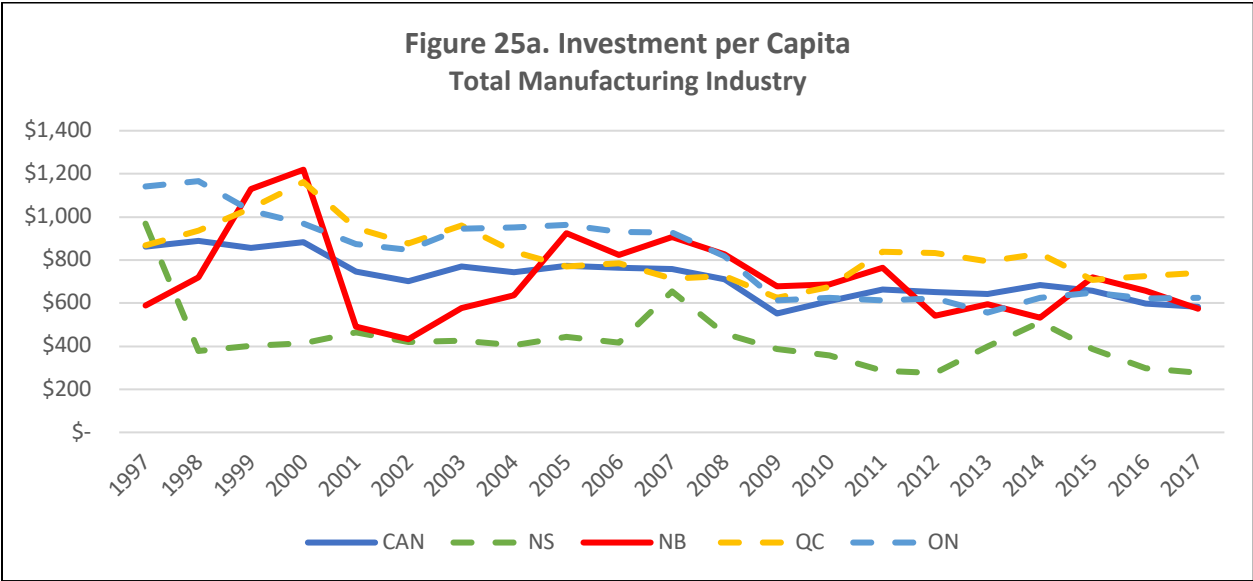
Investment per capita

Total investment per Capita

SUMMARY –New Brunswick had the highest per capita investment in the food, wood, and paper manufacturing sub-sectors in Canada for all the years during the investigated period between 1997 and 2017. This shows that for the size of New Brunswick's economy, there is a lot of investment going towards these sub-sectors. New Brunswick had the lowest per capita investment in "other" manufacturing sub-sectors, showing that investment in New Brunswick is very focused in food, wood, and paper manufacturing sub-sectors. Looking at total manufacturing without petroleum and coal product sub-sector, New Brunswick had one of the lowest rates of investment per capita, at similar levels to Nova Scotia, and significantly below Quebec, Ontario, and Canada. This shows that while New Brunswick might have strong investment in its important sub-sectors, but overall investment in manufacturing relative to the size of the economy was not.

Looking at investment expenditure per capita gives insight to the rate of investment, relative to the size of the population.⁴ Since population size is very steady in comparison to investment, this measure allows adjustment for the size of the economy while also showing how investment has changed overtime.

In Figure 25a, we see that New Brunswick’s rate of investment per capita in manufacturing industry had some significant changes over the investigated period between 1997 and 2017. It increased from \$720 per capita in 1997 to \$1200 by 2000, before declining sharply to \$490 per capita in 2001. It increased to \$920 by 2005. From 2005 to 2017, it decreased slowly, ended in 2017 by \$575 per capita. During the 2005-2017 period, New Brunswick had similar values of Investment per Capita in the industry to Ontario and Canada. Quebec had slightly higher per capita investment in 2017, at \$740 per capita, while NS had significantly lower at \$280. NS had the lowest investment per capita in manufacturing industry for the majority of the observed period.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

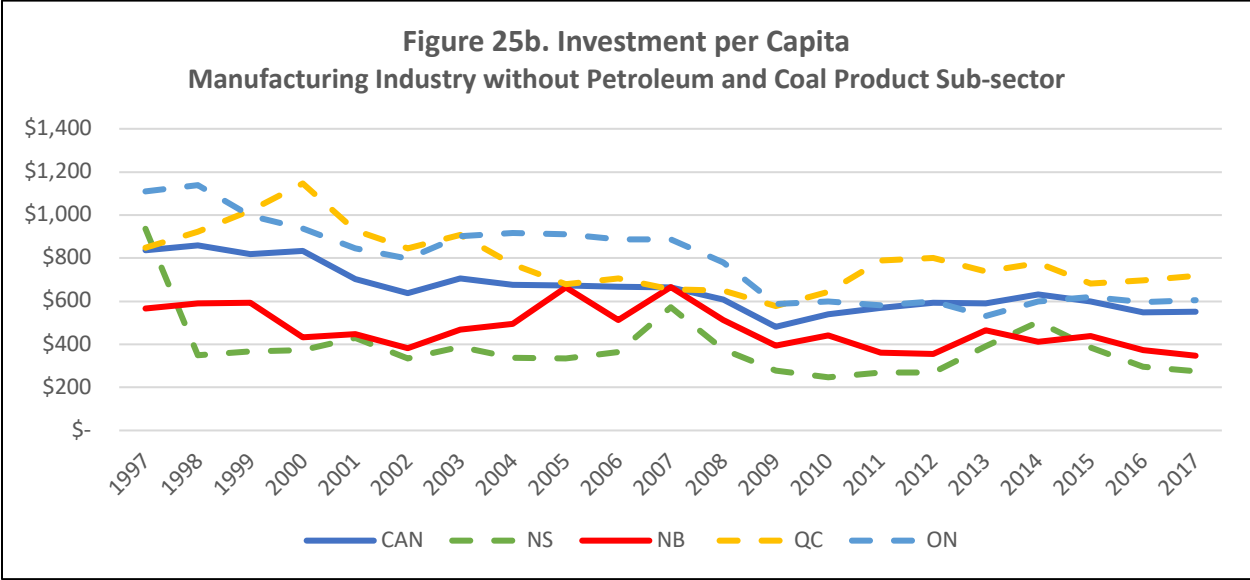
Investment measured in 2012 Chained Dollars

By Author’s calculations

After excluding petroleum and coal product sub-sector's capital from our totals (Figure 25b), NB’s manufacturing investment per capita fell significantly. It

⁴ Investment per capita, and Investment per working-age capita had almost identical trends for all provinces and Canada.

became much more similar to Nova Scotia than Ontario and Canada. The spike in investment from 1997 to 2000 was no longer present. New Brunswick ended 2017 with manufacturing investment per capita at \$350 per person, just above Nova Scotia, and significantly below Quebec, Ontario, and Canada.

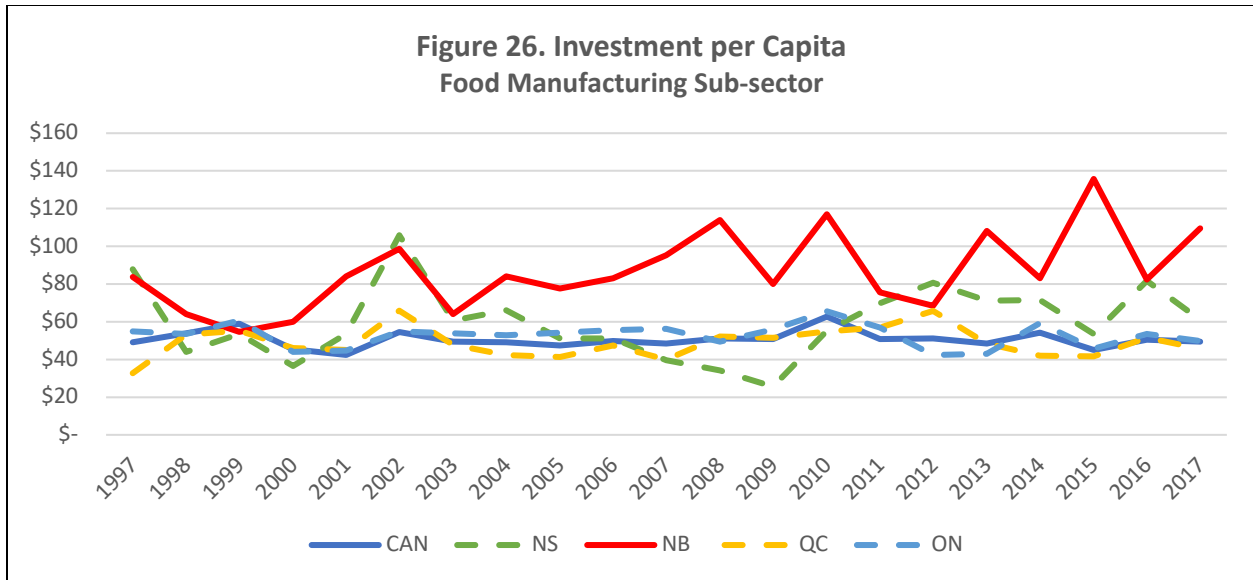


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author’s calculations

For total investment per capita in the food manufacturing sub-sector (Figure 26), New Brunswick had the highest rates of investment for most of the 1997-2017 period. There was a significant amount of variation between years, as a year of high per capita investment often followed by a year of lower per capita investment. The year to year variation was larger in New Brunswick and Nova Scotia, than in Quebec, Ontario, and Canada. New Brunswick saw a general increase in investment per capita in the sub-sector, particularly from 2008 onwards.

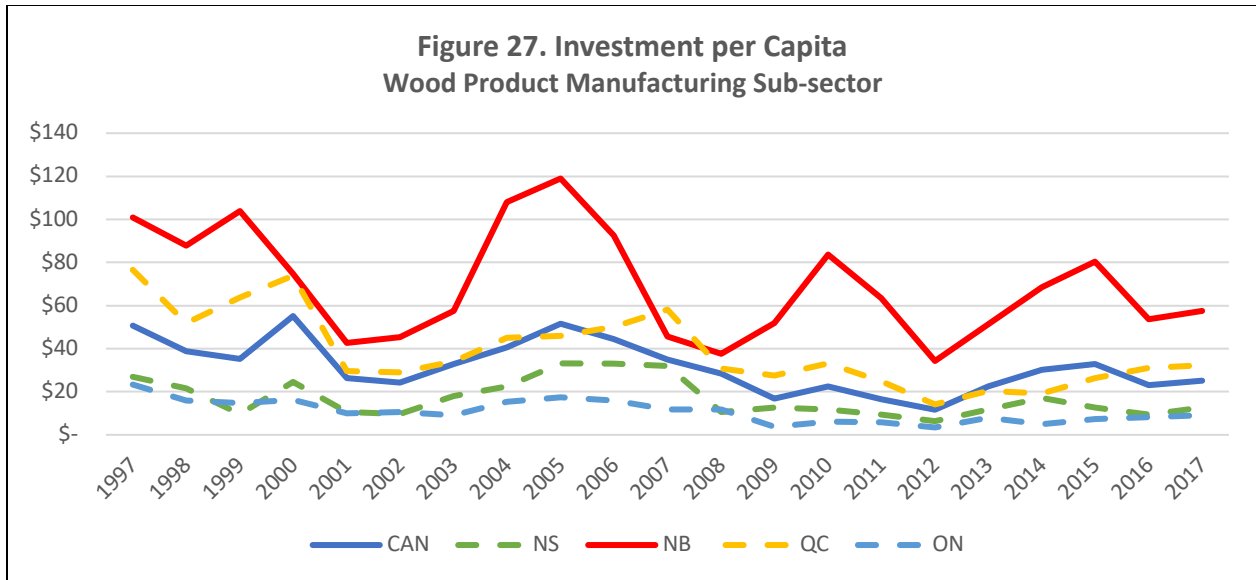


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

New Brunswick's investment per capita for wood product manufacturing was higher than the other provinces in almost every year of the observed period (Figure 27). 1999/2000, 2005, 2010, and 2015 all saw relative peaks in investment across Canada, but these increases were much larger in New Brunswick than elsewhere. During these investment spikes, New Brunswick had more than twice the levels of investment per capita in the sub-sector than any of the other provinces or Canada (with the exception of 1999/2000). There was a general decline in investment per capita in the sub-sector in New Brunswick over the 1997-2017 period, with the investment spikes declining, while the lowest years remained similar. In 2017, New Brunswick's investment was \$57 per capita, \$25 higher than the second highest (Quebec) in the country.

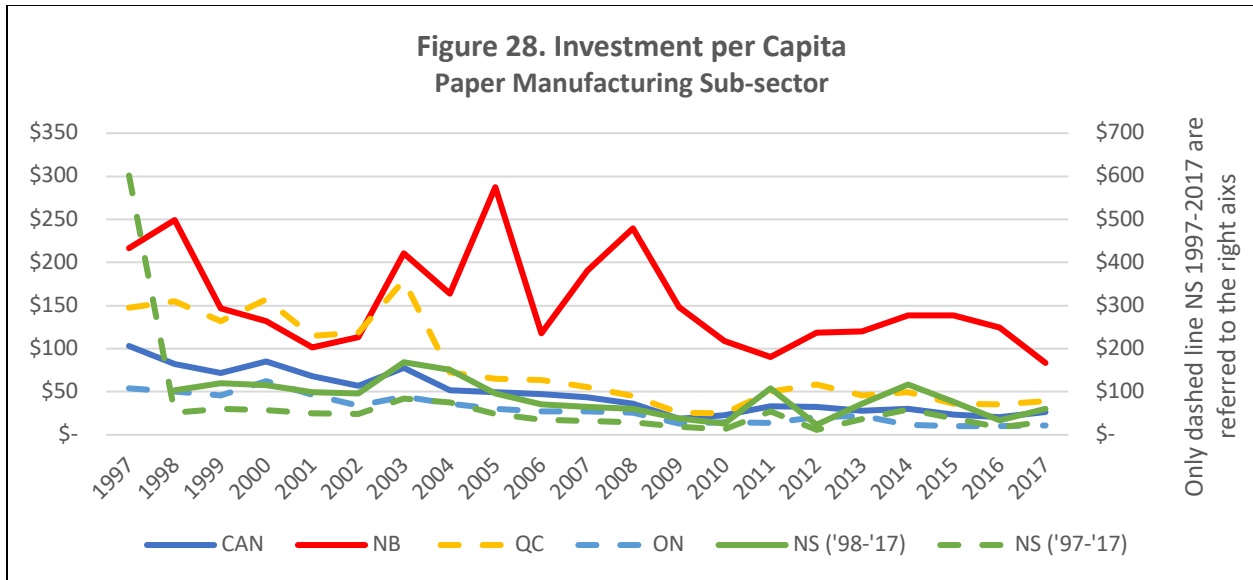


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

For paper manufacturing sub-sector (Figure 28), investment per capita in New Brunswick was higher than any of the other provinces and Canada for most of the 1997-2017 period, and for every year after 2001. After declining from 1998 to 2001 (from \$250 to \$115), investment per capita in the sub-sector increased to almost \$290 per capita. Investment in the sub-sector dipped the next year down to \$120, but increased again to \$240 in 2008. After 2008, there was a persistent decline in investment, and New Brunswick ended 2017 with \$85 per capita. From 2004 to 2017, New Brunswick had at least double the rate of investment per capita as any of the other provinces or Canada (with the exception of 2011). At its peak in 2005, New Brunswick had more than 4 times the rate of investment per capita in the sub-sector as Quebec which had the second highest. This shows that relative to its size, New Brunswick invested much more heavily in paper manufacturing sub-sector than any of the other provinces or Canada. Nova Scotia had investment of \$600 per capita in the sub-sector in 1997, but this level of investment was a one-off event. From 1998 onwards, Nova Scotia had investment rates per capita very similar to Ontario and Canada.

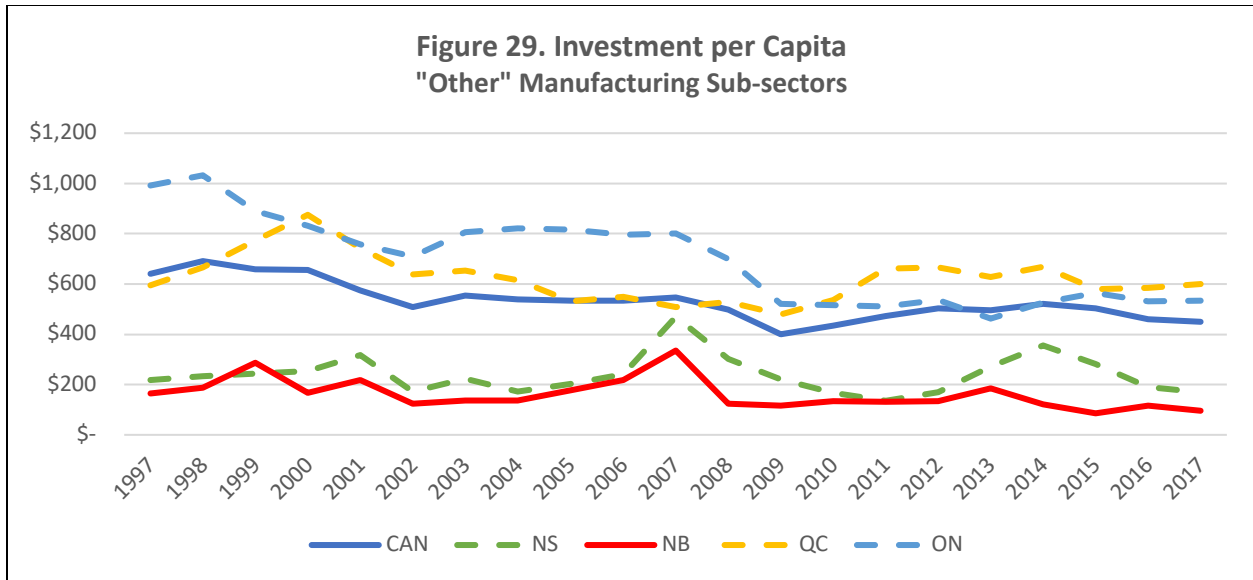


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

In “other” manufacturing sub-sectors (figure 29), we can see that New Brunswick frequently had the lowest rate of investment per capita compared to other provinces and Canada. New Brunswick had similar rates of investment to Nova Scotia for most of the 1997-2017 period, with Nova Scotia typically had slightly higher investment per capita than New Brunswick. At during its peak in 2007, New Brunswick had investment of \$335 per capita in “other” manufacturing sub-sectors, which was still much lower than Quebec, Ontario or Canada ever had. New Brunswick frequently had less than half the rate of investment of Quebec, Ontario and Canada did, and as little as 15% of Ontario's investment per capita in 2015. Both Ontario and Canada saw long-term decline in their investment rates, while Quebec had variation over the 1997-2017 period, ended 2017 with similar investment rates as it had in 1997.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

Machinery and equipment investment per capita

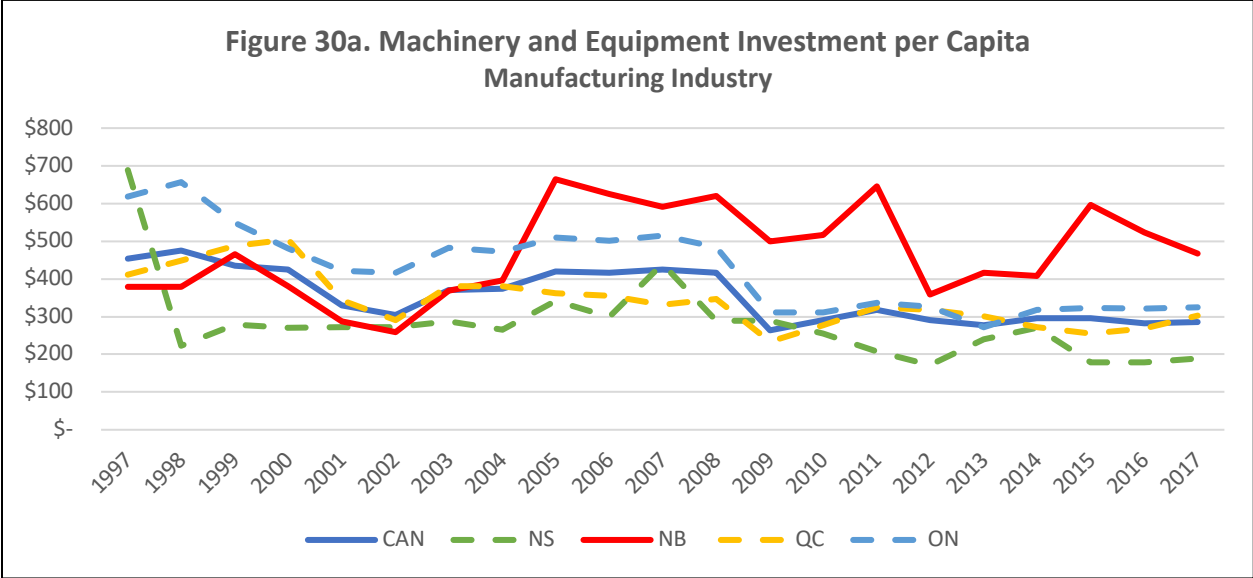
SUMMARY - For machinery and equipment investment per capita, the trends were quite similar to total investment per capita. New Brunswick had the highest per capita investment for machinery and equipment for food, wood, and paper manufacturing in 2017, but the lowest for "other" manufacturing sub-sectors. For total manufacturing without petroleum and coal product sub-sector, New Brunswick was just below the Canadian rate (although still second last). Compared to the total investment per capita, New Brunswick is less behind in machinery and equipment investment per capita.

This section looks strictly at investment for machinery and equipment per capita. Naturally these rates are lower than for total investment, but the patterns are slightly different. As shown earlier, machinery and equipment investment in constitutes the majority of manufacturing investment in New Brunswick.

In Figure 30a, we see that New Brunswick had the highest levels of machinery and equipment investment per capita for total manufacturing from 2005 to 2017. From 1997 to 2004, its rates of investment were quite similar to the national levels. New Brunswick did not see a sharp increase from 1997 to 2001 as it did for total investment per capita, showing that that the total investment spike was in other areas. New Brunswick's position compared to the other provinces and

Canada is significantly different from its position for total investment per capita, when it had similar rates to Quebec, Ontario and Canada from 2005 to 2017.

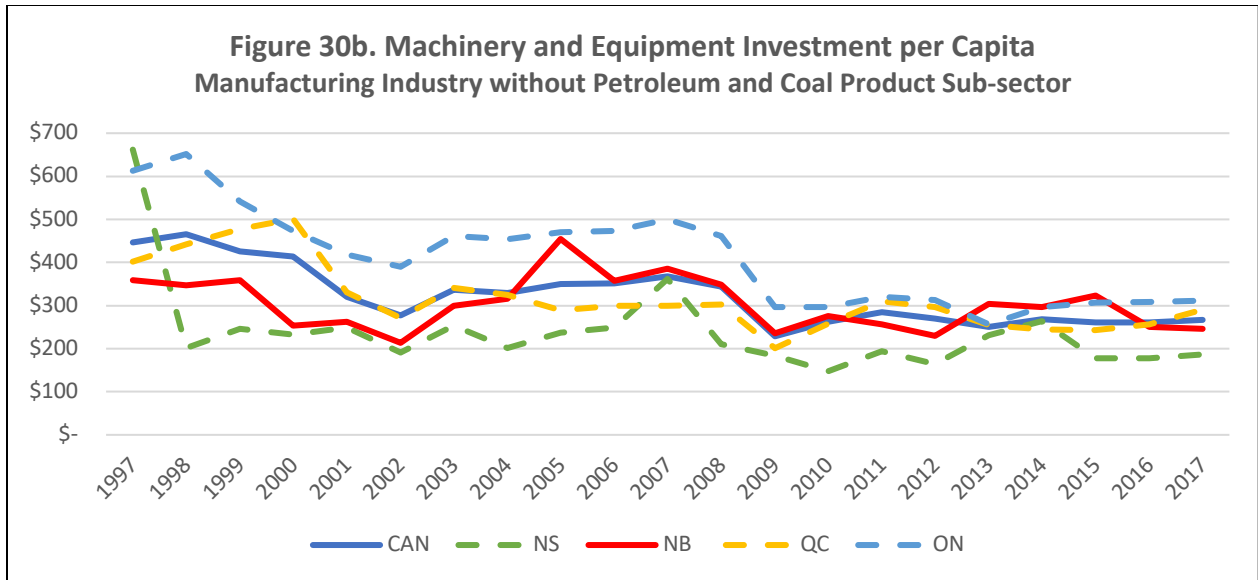
As seen when comparing Figures 30a and 30b, investment in machinery and equipment for the petroleum and coal product sub-sector accounted for a significant portion of New Brunswick’s investment. After removing petroleum and coal product sub-sector investment, New Brunswick is very similar to Quebec, Ontario, and Canada. When compared to total investment without petroleum and coal per capita, New Brunswick’s relative position is much higher for investment in machinery and equipment, which suggests that New Brunswick manufacturers do not (or may not have to) invest in other areas as much as manufacturers in Quebec, Ontario, and nation-wide have to.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author’s calculations

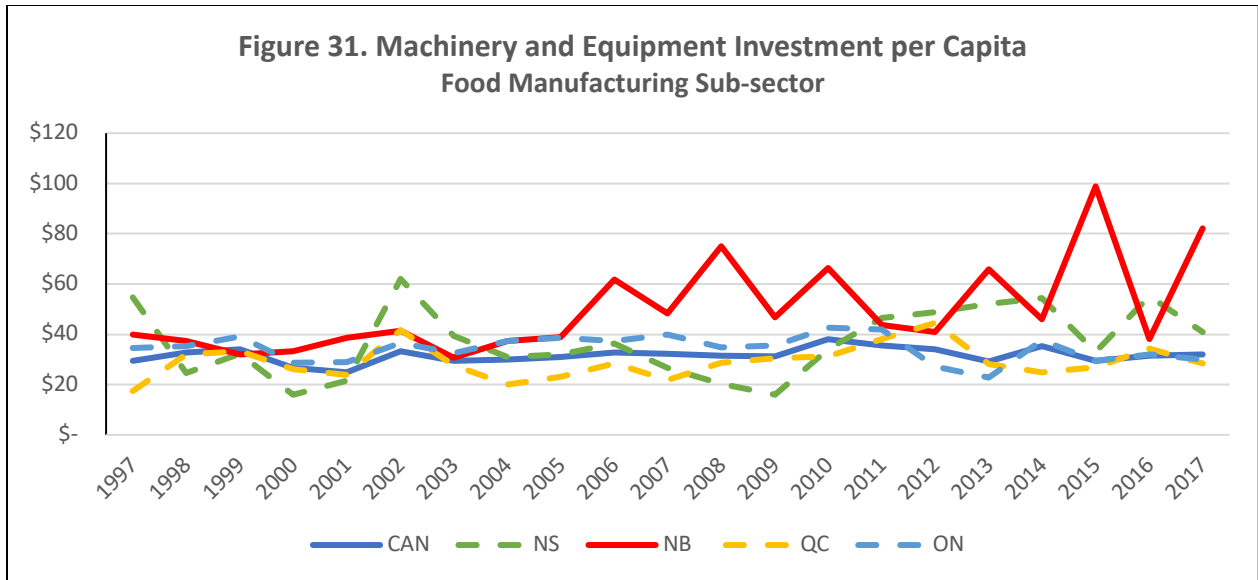


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

For investment in machinery and equipment per capita in the food manufacturing sub-sector (Figure 31), we can see that New Brunswick had relatively similar levels of investment (averaging just over 35%) from 1997 to 2005. From 2006 onwards, New Brunswick saw a significant increase in its investment per capita for machinery and equipment, and while going up and down between years, was distinctly higher than Quebec, Ontario, and Canada, averaging just under \$60 per capita from 2006 to 2017. Quebec, Ontario, and Canada continued at pretty similar rates to what they were at during the 1997-2005 period, while Nova Scotia dropped to a low of \$16 per capita in 2009, before increasing to over \$50 in 2013, 2014, and 2016.

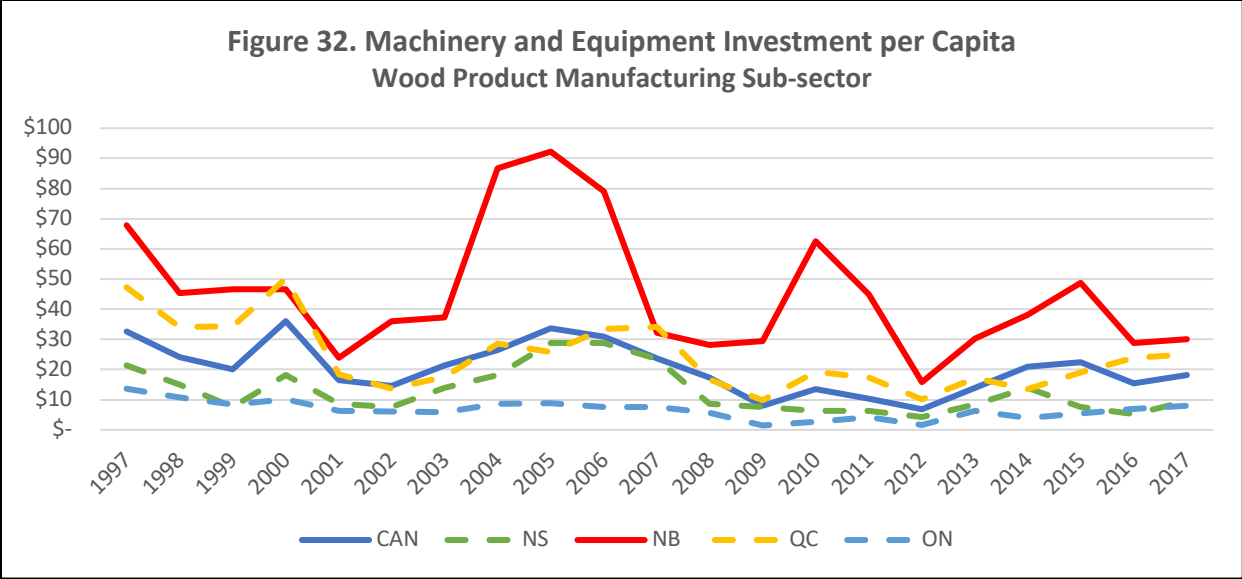


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

In Figure 32, we see that the patterns seen in total investment in wood product manufacturing sub-sector per capita are again present for machinery and equipment investment in the sub-sector. New Brunswick saw significant increases in investment in the sub-sector around the years 2005, 2010, and 2015, although not in 1999 as there was for total investment. New Brunswick again had the largest investment per capita in the sub-sector of the provinces and Canada for the majority of the observed period.

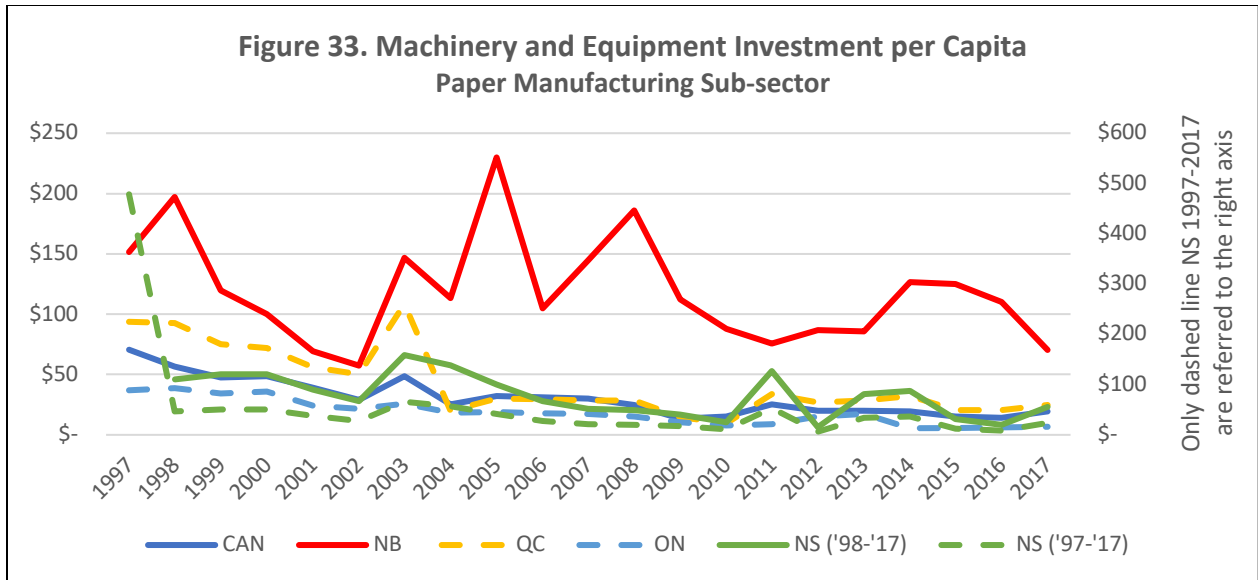


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

For machinery and equipment investment per capita in paper manufacturing sub-sector (Figure 33), New Brunswick had the highest rates of investment for most of the 1997-2017 (including every year after 2001), as they did for total investment per capita. The same basic patterns of growth and decline are present for New Brunswick, partially due to the high portion of total investment that machinery and equipment had formed.

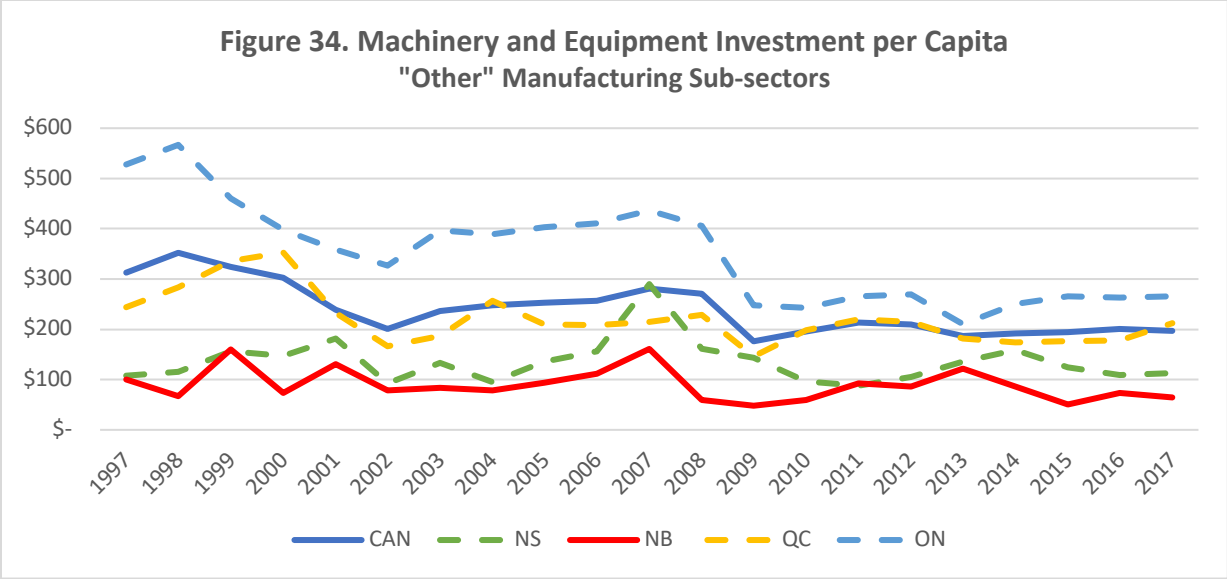


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

For "other" manufacturing sub-sectors machinery and equipment investment per capita (Figure 34), New Brunswick had the lowest or second lowest rate of investment over the 1997-2017 period. This is a continuation of its position for total investment per capita, although due to New Brunswick's higher fraction of total investment going towards machinery and equipment (over the 2011-2017 period), the gap between New Brunswick and the other provinces and Canada (most noticeably Quebec) shrank.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 17-10-0005-01

Investment measured in 2012 Chained Dollars

By Author's calculations

Employment

Definition - <i>Employment</i>
The quantity of people who work in an industry. Employment is measured by the number of jobs.

Employment Shares

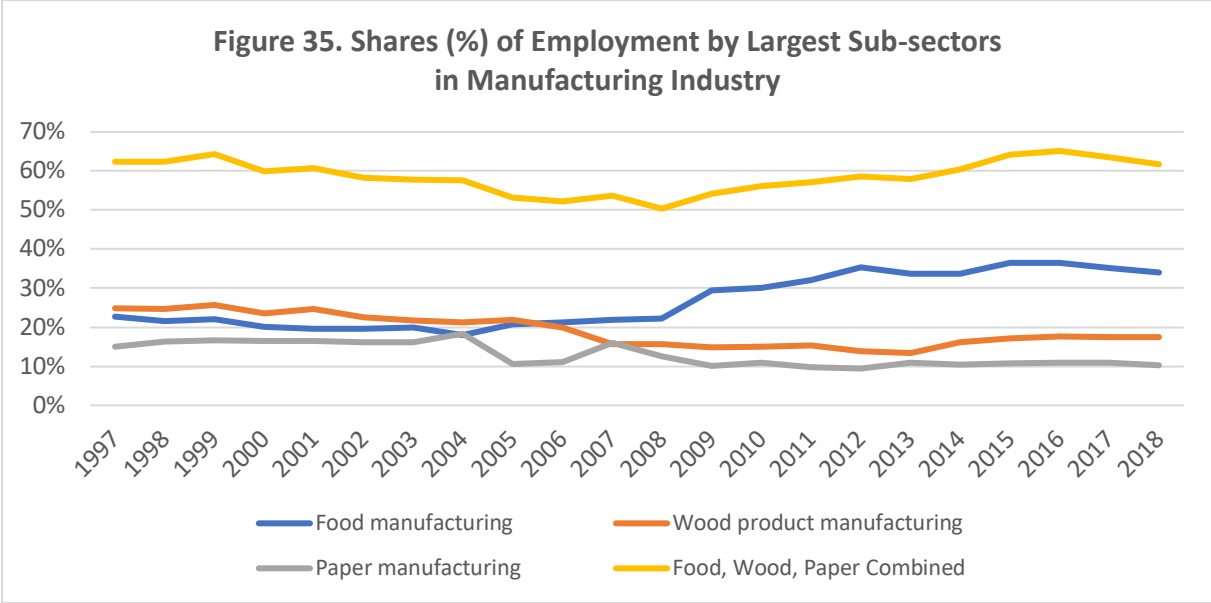
SUMMARY- New Brunswick manufacturing employment is concentrated in food, wood, and paper manufacturing. It is more concentrated than in Canada overall and in the other provinces.

It is important to examine employment trends when looking at capital, as the relationship of labour to capital is an important driver of productivity.

In Figure 35, employment shares of the primary sub-sectors in New Brunswick manufacturing show food, wood, and paper manufacturing were the largest employers in the sector, with no other sub-sector exceeding 9% of manufacturing employment in any year. However, these industries do not form as large a combined share of employment as they do for capital. Their

combined share remained above 50% of total manufacturing employment over the 1997-2018 period, but did not exceed 65% in any year.

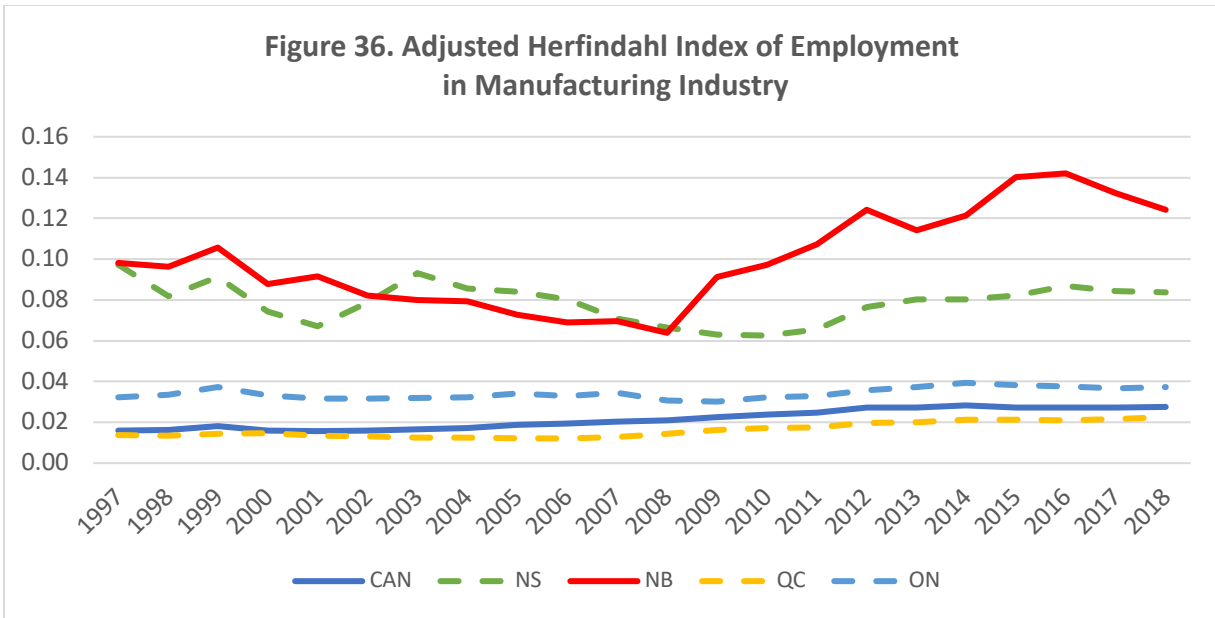
The breakdown of each sub-sector's share of employment is presented in the appendix.



Source: Statistics Canada. Table 36-10-0480-01

While petroleum and coal product manufacturing was a significant share of capital, it accounts for only a small portion of total employment: petroleum's peak employment share was 6%, and averaged 4% over the 1997-2018 period. The fact that its capital share is disproportionate to its employment share is why it is useful to look at the capital stocks without petroleum capital included.

Using the Herfindahl Index for labour, we can see how the concentration of manufacturing labour in New Brunswick compares to other provinces and Canada in Figure 36. New Brunswick and Nova Scotia have noticeably higher scores than Quebec, Ontario, or Canada. From 1997 to 2007, New Brunswick and Nova Scotia had similar scores. From 2008 to 2018, New Brunswick had a significantly higher score than Nova Scotia. This shows that New Brunswick manufacturing employment grew more concentrated after 2008, surpassing the other provinces and Canada.



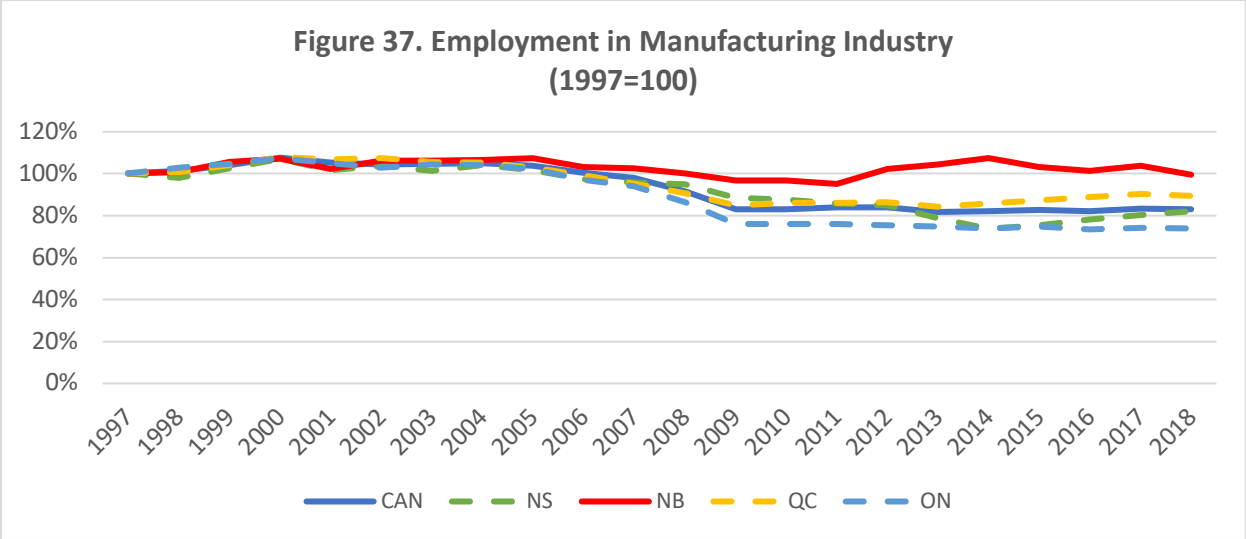
Source: Statistics Canada. Table 36-10-0480-01

By Author's calculations

Employment trends

SUMMARY – Employment has declined very slightly in the New Brunswick manufacturing sector, compared to steeper declines in Canada and the other provinces. The New Brunswick aberration is primarily due to the significant increase in employment in food manufacturing. For the other sub-sectors, employment has generally decreased, although these decreases have been relatively smaller for New Brunswick compared to Canada and the other provinces.

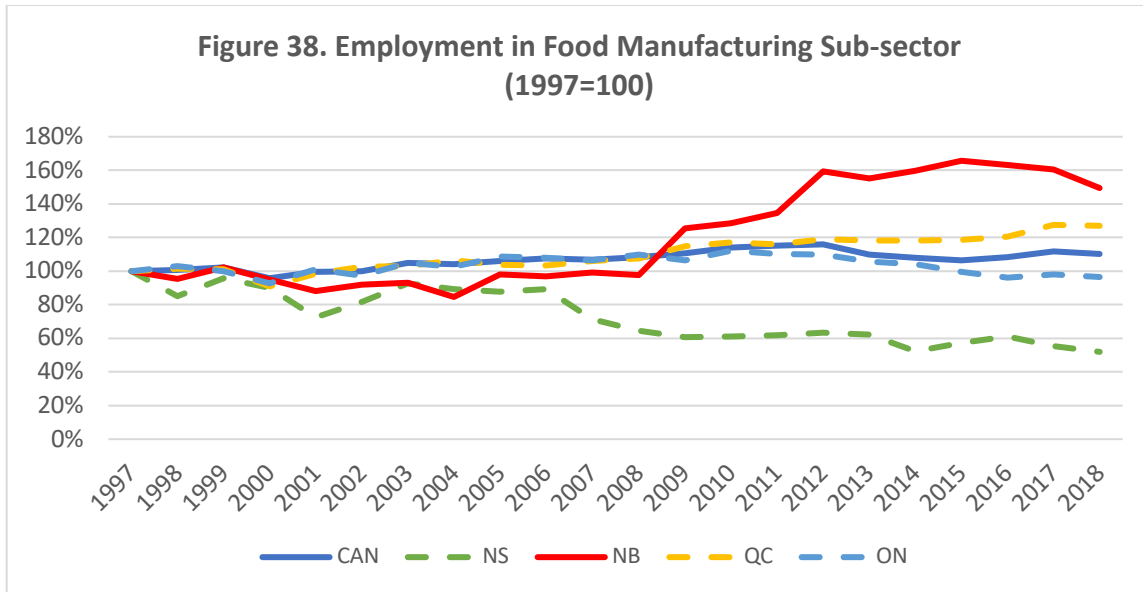
How have employment levels within manufacturing changed in absolute terms, rather than just as shares? From Figure 37, we can see that for the entire manufacturing sector, New Brunswick employment remained relatively steady over the 1997-2018 period. There was a slight decrease from 2005 to 2011, followed by an increase from 2011 to 2014, and it has been largely steady since. For Canada and the other provinces, there was a decrease between 2005 and 2009 (Nova Scotia continued to decline until 2014), before steadying.



Source: Statistics Canada. Table: 36-10-0480-01

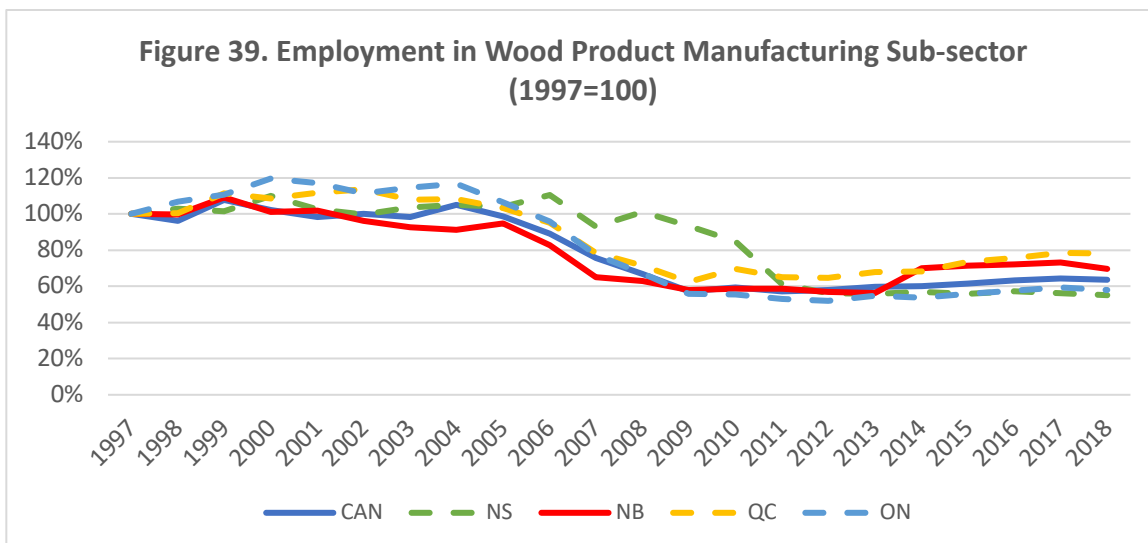
As noted earlier, petroleum and coal product manufacturing accounts very only a small part of total manufacturing employment, so unlike with measures of the capital stock, this sub-sector does not have a large impact on total employment in manufacturing.

In Figure 38, we can see how employment levels have changed for food manufacturing. New Brunswick saw small levels of decline from 1997 to 2004, but between 2004 and 2015, employment in the sub-sector increased from 85% to 166% of 1997 levels. There was a small decrease from 2015 to 2018. The national trend was quite steady over the observed period, with small average growth. Quebec and Ontario mostly followed the national trend, while Nova Scotia employment declined significantly over the 1997-2018 period, with close to half the levels of employment in food manufacturing in 2018 compared to 1997.



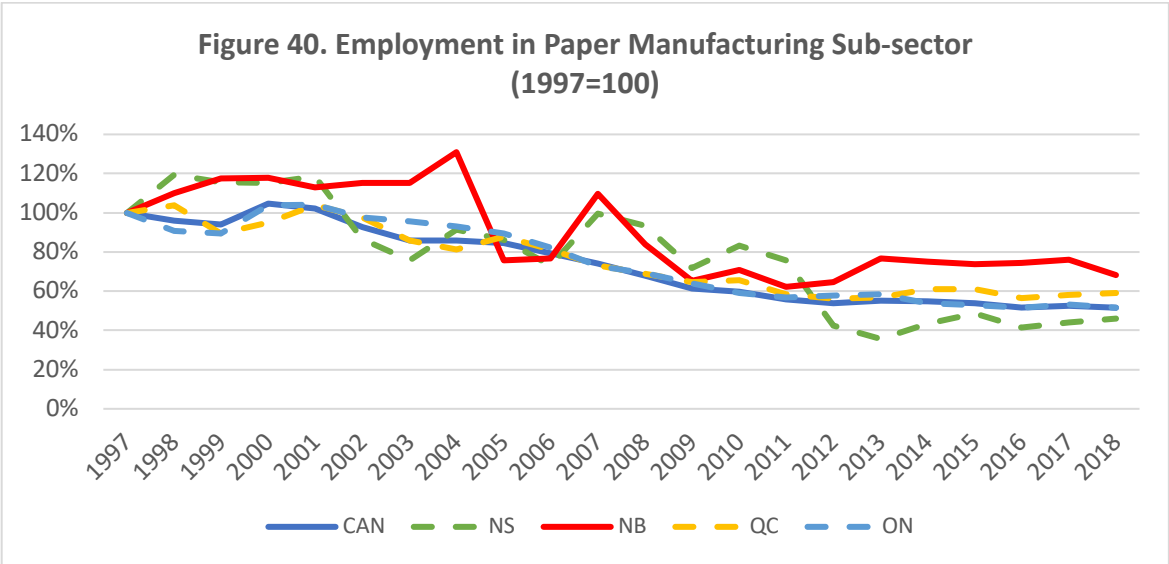
Source: Statistics Canada. Table: 36-10-0480-01

In Figure 39, we can see that employment levels in wood product manufacturing declined for New Brunswick, Canada, and the other provinces between approximately 2004/2005, and 2009. After 2009, employment generally remained steady, or increased in the case of New Brunswick and Quebec.



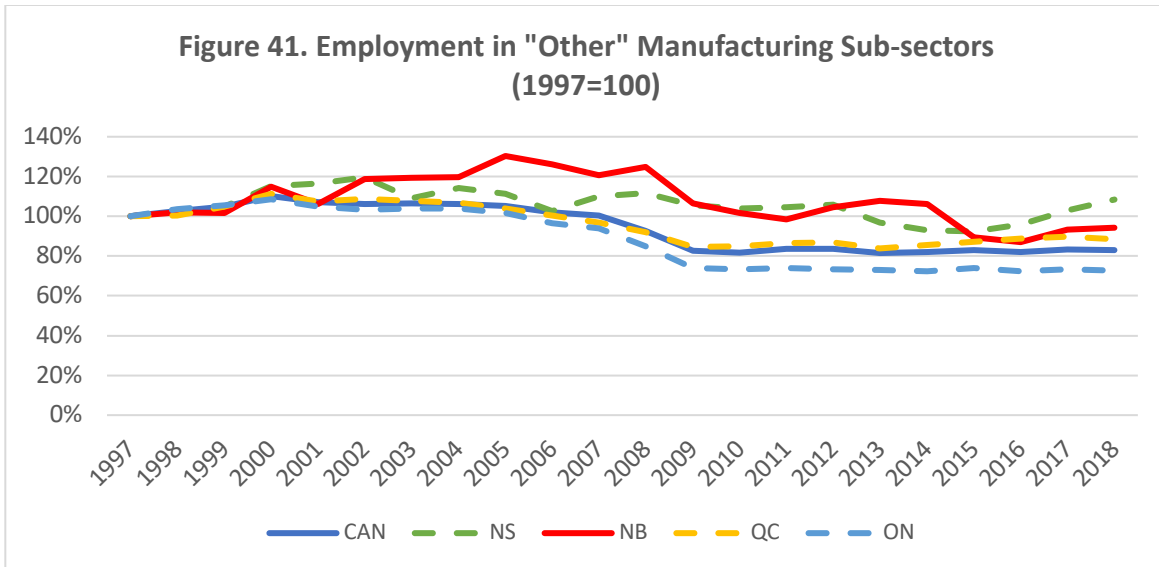
Source: Statistics Canada. Table: 36-10-0480-01

In Figure 40, we see that New Brunswick and Nova Scotia had significant variation in their employment levels compared to Quebec, Ontario, and Canada, which all had much smoother curves. This is in part due to the lower levels of employment in New Brunswick and Nova Scotia. The overall trend for all provinces and Canada was of general decline. New Brunswick's employment grew between 1997 and 2004, before declining significantly thereafter. Canada's employment decreased consistently (by close to half) over the 1997-2018 period. New Brunswick's employment declined close to 70% of its 1997 levels, which was higher level than any of the provinces.



Source: Statistics Canada. Table: 36-10-0480-01

We can see how employment changed in “other” manufacturing in Figure 41. New Brunswick had 30% growth from 1997 to 2005, before declining to 87% of 1997 levels in 2016, with small increases in 2017 and 2018. Canada had steady employment levels from 1997 to 2006, before declining to close to 80% of 1997 in 2009 and remaining in that zone until 2018. Quebec and Ontario followed similar patterns, while Nova Scotia had some variation over the 1997-2018 period, but this variation was mostly close to its 1997 levels.



Source: Statistics Canada. Table: 36-10-0480-01

Investment per Worker

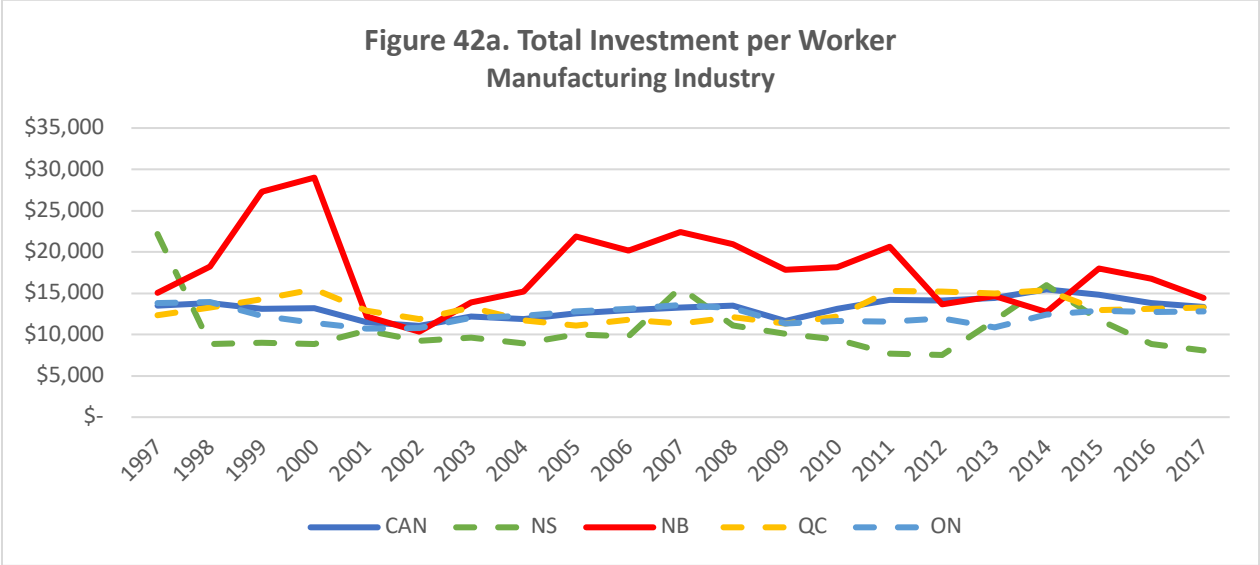
Investment per worker is a very different measure than investment per capita, as employment can change much more rapidly than total population. Therefore, both investment and employment trends have an important impact on this measure. This is why investment per worker is included in the larger Employment section, rather than under investment.

Total Investment per Worker

SUMMARY –For total manufacturing, New Brunswick had the highest rate of investment per worker in the country, by \$14,400 in 2017, as it did for the majority of the 1997-2017 period. After removing petroleum and coal product sub-sector, New Brunswick had the second lowest rate of investment per worker in the country by \$9,000 in 2017. For the most important sub-sectors, New Brunswick's 2017 rates of investment per worker were quite competitive with the other provinces and Canada. It was never the highest, but was relatively close to Quebec, Ontario, and Canada. Investment per worker in "other" manufacturing sub-sectors in New Brunswick was significantly below Quebec, Ontario, and Canada. This shows that New Brunswick's investment is focused in the important sub-sectors.

For total investment per worker for the total manufacturing industry (Figure 42a), we see that New Brunswick had the highest rate of investment for much of the 1997-2017 period. New Brunswick saw an increase from \$15,000 per worker in 1997 to \$29,000 per worker in 2000. Investment swiftly fell to \$12,200 the following

year, where it had similar values to the other provinces and Canada. New Brunswick continued at these levels until 2004, when it increased to \$15,200 per worker, and then \$21,900 the following year. New Brunswick averaged over \$20,000 from 2005 until 2011, before declining. It ended 2017 with investment of \$14,400 per worker, higher than any of the other provinces or Canada.

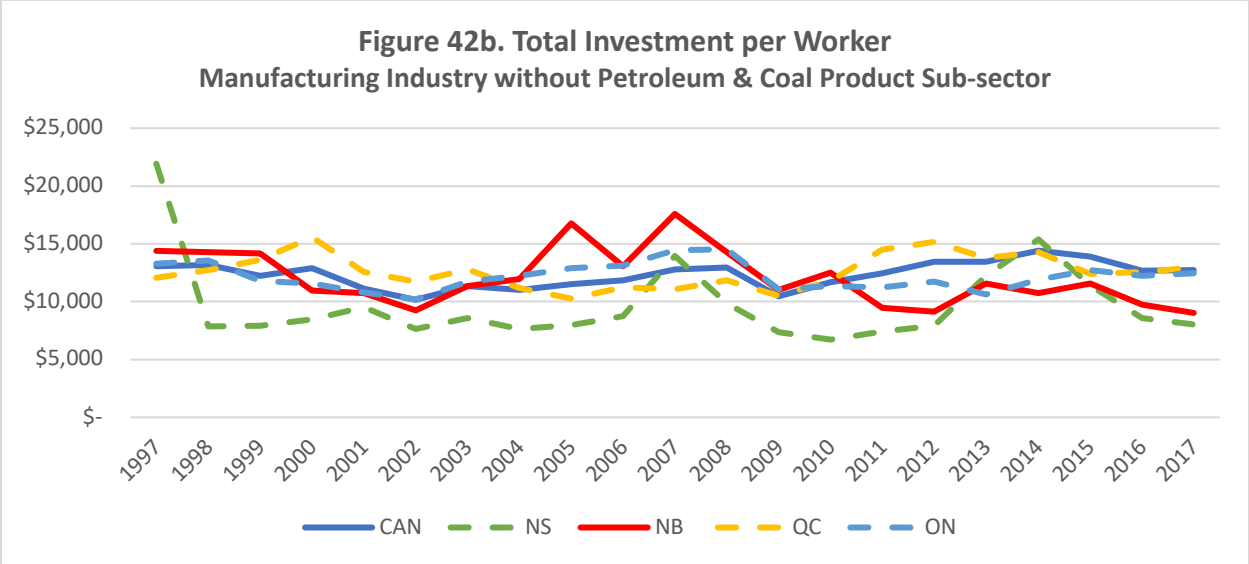


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

After removing the petroleum and coal sub-sector from total manufacturing (Figure 42b), investment per worker in New Brunswick decreased significantly, both absolutely, and in comparison to the other provinces and Canada. At its highest, New Brunswick's investment per worker was just under \$18,000 in 2007. There was no longer a spike in investment per worker from 1997 to 2000, and New Brunswick ended 2017 with \$9,000 invested per worker, which was second lowest to Nova Scotia.

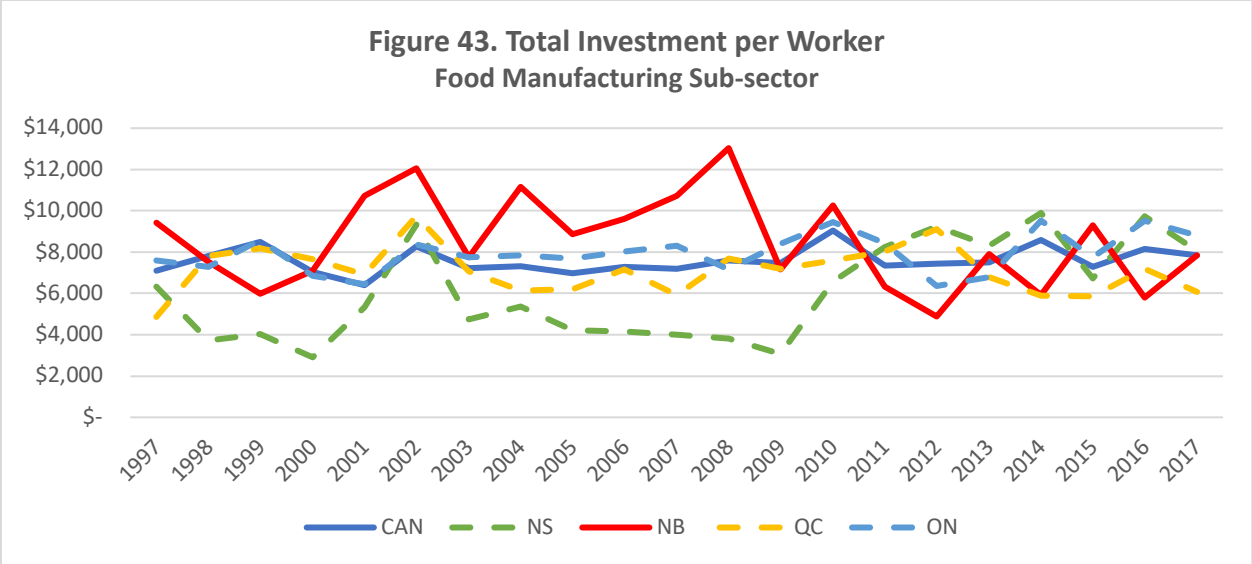


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For total investment per worker in food manufacturing (figure 43), New Brunswick had significant variation between years, and a long-term change. After declining from \$9,500 per worker in 1997 (the highest rate of investment of all provinces and Canada) to \$6,000 in 1999, New Brunswick rate of investment rose to \$12,000 in 2002, in the sub-sector. Despite low levels of investment in 2003, New Brunswick had the highest rate of investment per worker in the sub-sector, from 2000 to 2008. After 2008, New Brunswick had a long-term decline in investment per worker, due to the significant increase in employment (investment actually increased over this period) in the sub-sector. New Brunswick ended 2017 with just under \$8,000 invested per worker in food manufacturing, which was very similar to Nova Scotia, Ontario, and Canada, and close to \$2,000 higher than Quebec.

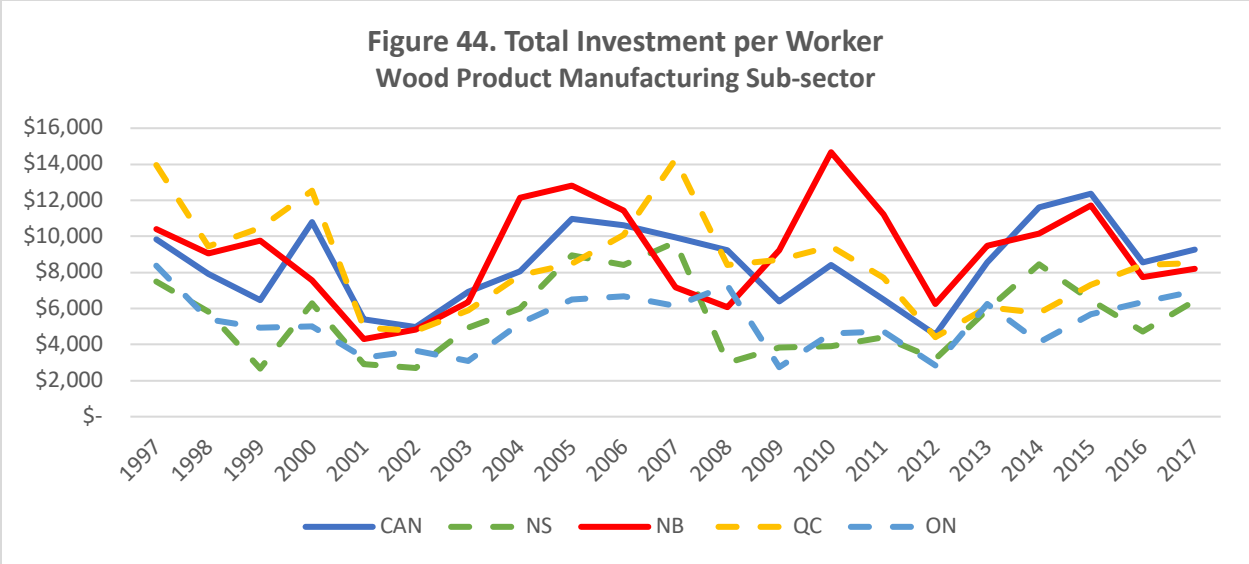


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For wood product manufacturing's total investment per worker (Figure 44), there are strong trends across the provinces and Canada. There was a general decline from 1997 to 2001 (with a short increase in 2000, that New Brunswick did not experience), before increasing consistently until 2005 (Quebec continued until 2007). This was followed by a short decline until 2008, before another increase from 2008 to 2010. There was another decline from 2010 to 2012, with another period of growth following until 2015, before a final decline. New Brunswick followed these trends quite closely, and frequently had one of (or the highest) rates investment from 2003 onwards. At its peak (2010), New Brunswick's rate of investment was almost \$15,000 per worker, and it is more than \$5,000 higher than the next highest (Quebec). New Brunswick ended 2017 with \$8,000 invested per worker, which was very similar to Quebec, Ontario, and Canada's rates, and higher than Nova Scotia's rate of \$6,000 per worker.

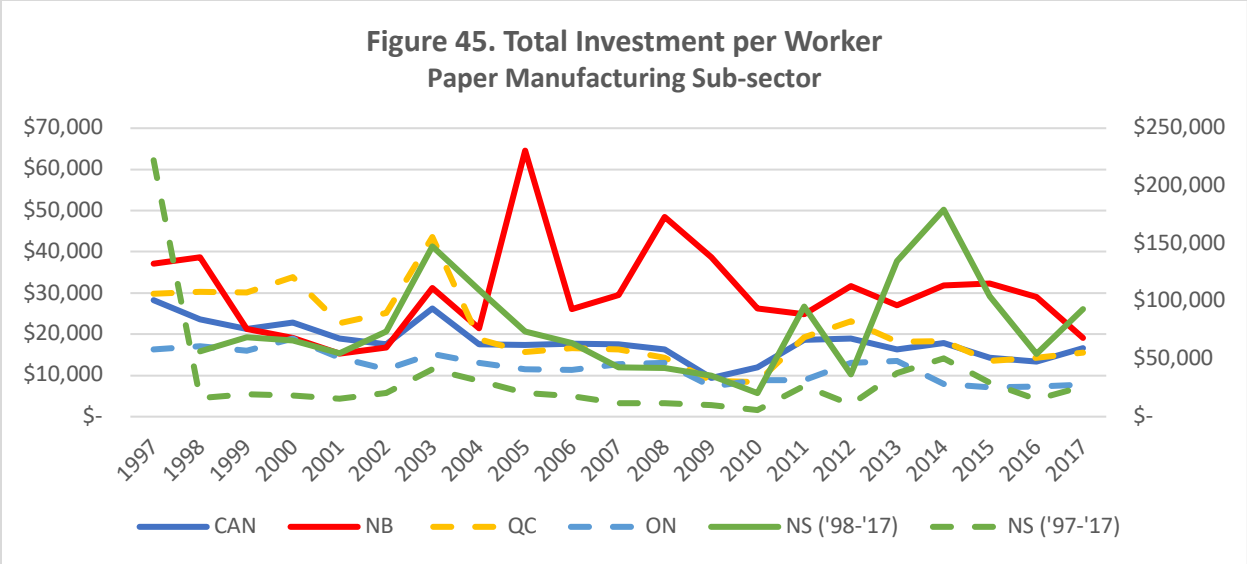


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

In Figure 45, we illustrate the total investment per worker for paper manufacturing. New Brunswick had similar rates of investment to the other provinces and Canada from 1999 to 2004, before investment per worker more than tripled in 2005 (increasing from \$21,000 in 2004 to \$65,000 in 2005). This rate of investment did not continue, but New Brunswick continued to have investment of \$25,000 and higher per worker until 2016, before declining to \$19,000 per worker in 2017. Over this period, New Brunswick had the highest rate of investment (with the exception of 2011, and 2013-2015). Over the 2006-2017 period, Quebec, Ontario, and Canada had much steadier and lower rates of investment, while Nova Scotia saw even greater variation than New Brunswick, having both the lowest and highest rates of investment in different years.

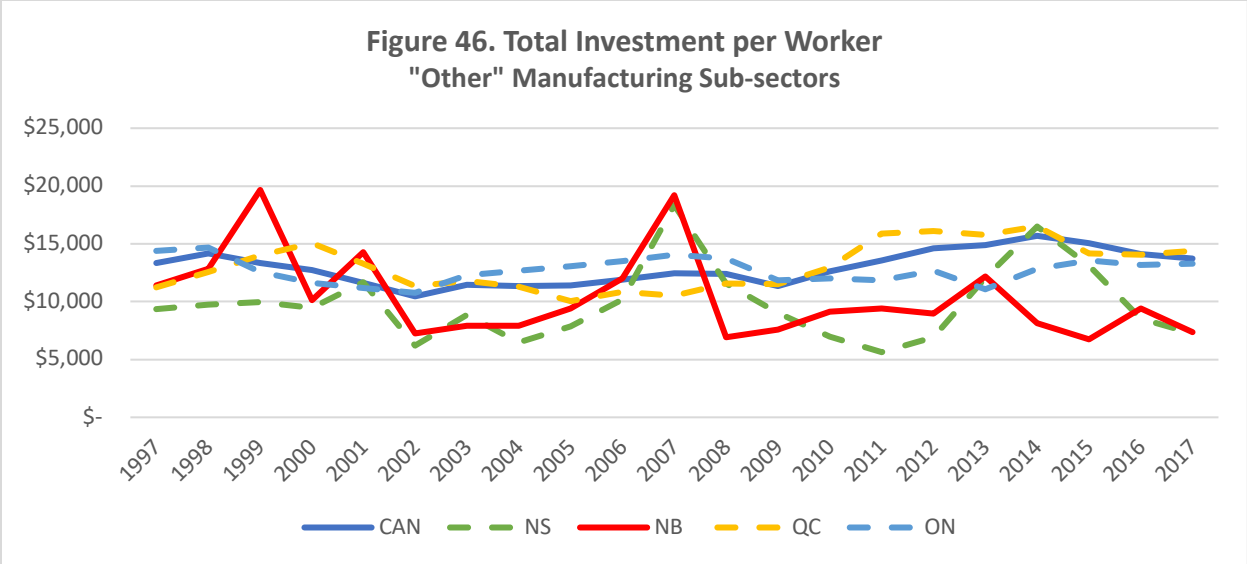


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For total investment per worker in “other” manufacturing sub-sectors (Figure 46), we can see that New Brunswick's rate of investment increased from 1997 to 1999 (rising from \$11,000 to \$20,000), before declining down to \$7,000 in 2002. Investment grew again between 2004 and 2007, reaching \$19,000. During the 1997-2007 period, New Brunswick had the highest levels of investment at its peak, but also had one of the lowest during its lower years. In 2008, investment per worker declined significantly, down to \$7,000 again, with the lowest rate of investment per capita. From 2008 to 2017, New Brunswick would continue to have the lowest (or second lowest) rate of investment, even as investment rose to \$12,000 in 2013. Quebec, Ontario, and Canada did not see the same variation in investment rates in “other” manufacturing sub-sectors as New Brunswick did, and over the whole observed period saw little change between their 1997 and their 2017 rates of investment. Nova Scotia followed similar growth trends to New Brunswick, particularly the increase in investment from 2004 to 2007. Nova Scotia also saw an increased in 2014, that New Brunswick only partially experienced in 2013.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

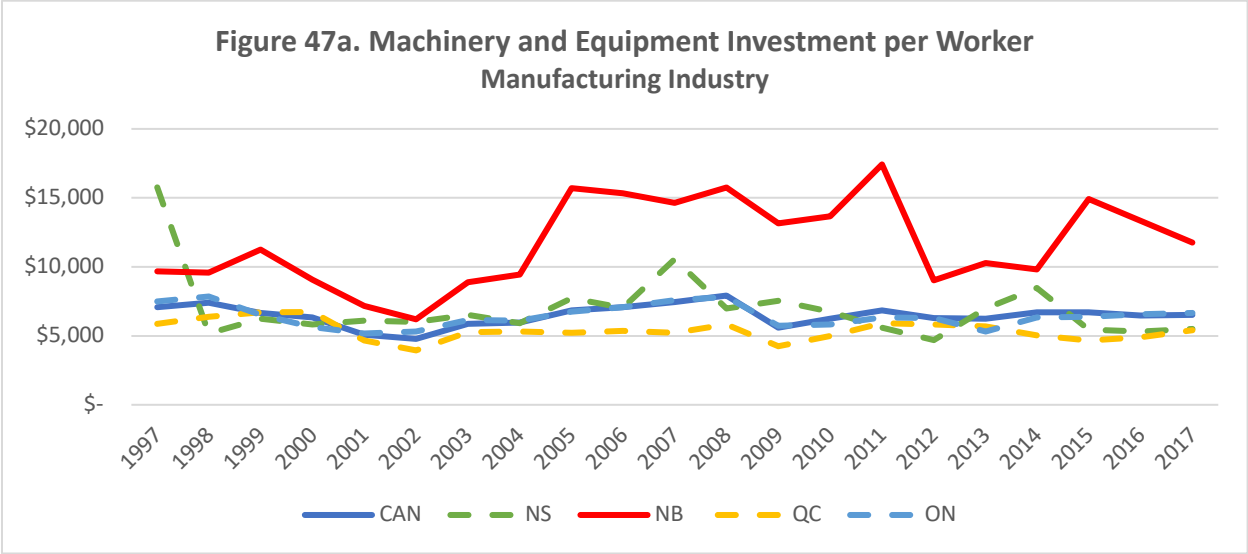
Machinery and equipment investment per worker

SUMMARY – The patterns of investment in machinery and equipment per worker were broadly similar to the patterns in total investment per worker. However, New Brunswick had a higher portion of its capital investment into machinery and equipment than the other provinces and Canada did. Therefore, New Brunswick's relative positions compared to total investment per worker were generally higher: New Brunswick continued to have the highest rate of investment per worker for total manufacturing in 2017, even after removing petroleum.

New Brunswick also had the highest investment in machinery and equipment per worker in food manufacturing. The exception to this was in wood product manufacturing, where New Brunswick had the lowest fraction of its investment going towards machinery and equipment, and New Brunswick's 2017 machinery and equipment investment per worker dropped relative to Quebec, Ontario, and Canada (New Brunswick had similarly low investment to Nova Scotia). For paper manufacturing, New Brunswick continued to have the second highest investment per worker to Nova Scotia. For "other" manufacturing sub-sectors, New Brunswick again had low investment per worker compared to Ontario and Canada, but not by as large a margin as it did for total manufacturing.

As seen in Figure 47a, machinery and equipment investment per worker for the whole manufacturing industry in New Brunswick was higher than any other province or Canada for every year except 1999. From 1998 to 2004, New Brunswick's rate of investment was larger, but never twice the size of the next highest. It averaged close to \$9,000 per worker over this period.

New Brunswick had seen a period of decline from 1999 to 2002, but this decline was mostly reversed over the next two years. From 2005 to 2011, New Brunswick's rate of investment in machinery and equipment per worker averaged \$15,000, a significant increase from 1998-2004, and frequently more than twice any of the other provinces or Canada. Investment per worker in machinery and equipment dropped significantly in New Brunswick in 2012, down to \$9,000. It increased again in 2014 up to just under \$15,000, but had decreased to \$12,000 again by 2017. Even down from its highest rates, New Brunswick's investment per worker in machinery and equipment was still almost twice as high as the next highest (Ontario). Investment per worker in machinery and equipment in the other provinces and Canada did not see nearly as significant changes as in New Brunswick, with the exception of Nova Scotia's significant investment in machinery and equipment in 1997, at \$16,000 per worker, which dropped to \$5,000 the following year.

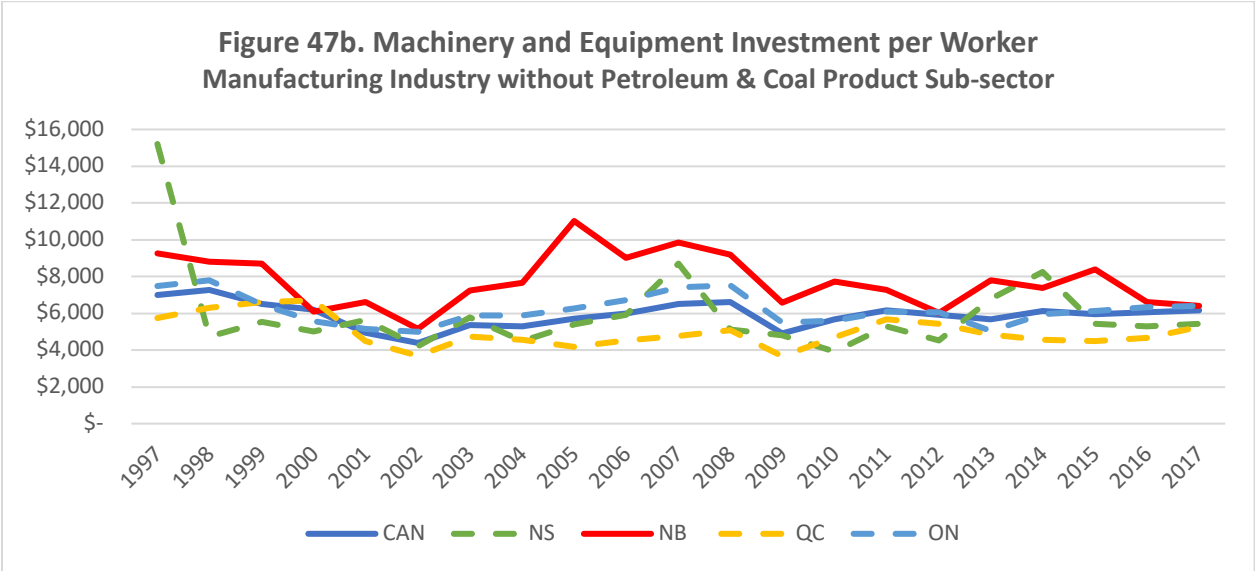


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

After removing petroleum and coal sub-sector (Figure 47b), New Brunswick's investment per worker in machinery and equipment dropped significantly. While still frequently the highest rate of investment over the 1997-2017 period, it no longer had the gap in investment that it did in the previous figure. There was a period of declining investment per worker in machinery and equipment from 1997 to 2002, before increasing to New Brunswick's peak rate of investment in 2005 (\$11,000 per worker). Investment per worker in machinery and equipment declined again from 2005 to 2012, increased slightly from 2012 to 2015, before falling again until 2017. New Brunswick's investment per worker in machinery and equipment in 2017 was \$6,400, the same as Ontario's, and very similar to Canada's. Nova Scotia and Quebec were about \$1,000 per worker lower.



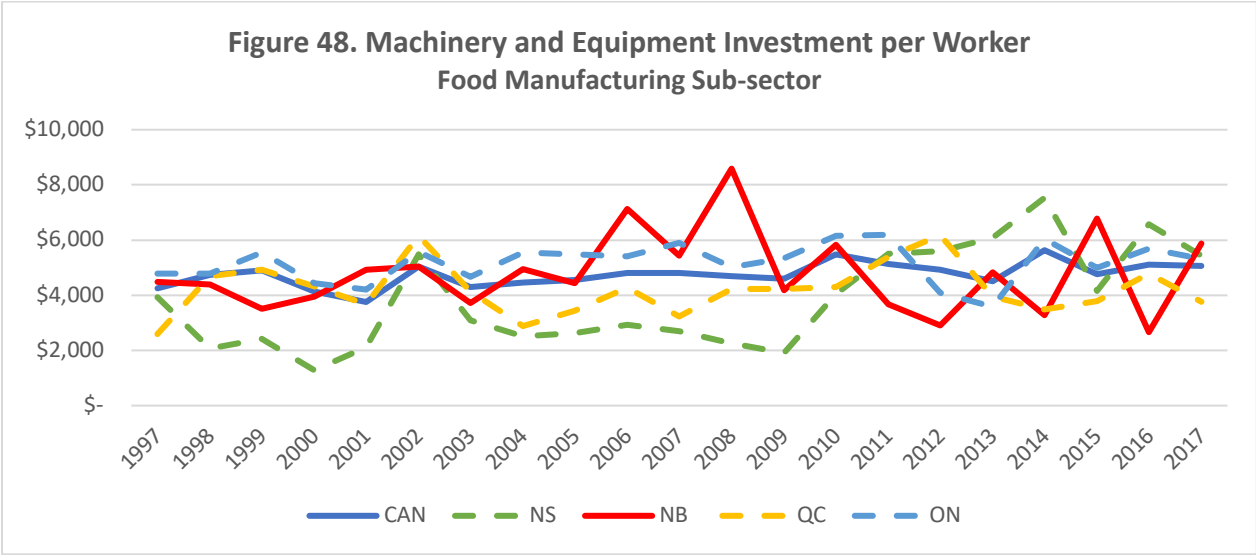
Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For food manufacturing (Figure 48), investment in machinery and equipment per worker in New Brunswick saw significant variation year to year, as well as longer-term changes. From 1997 to 2005, New Brunswick's rate of investment in machinery and equipment in the sub-sector was quite similar to the Canadian rate (mostly around \$4,000 to \$5,500 per worker). In 2006, New Brunswick had a jump in investment in machinery and equipment from \$4,400 per worker in 2005 to \$7,100 in 2006. Investment in machinery and equipment fell the next year to \$5,400, but increased in 2008 to \$8,600 per worker. From 2009 to 2017, New Brunswick's investment in machinery and equipment per worker in the sub-sector changed significantly from year to year, falling as low as \$2,900 per

worker to \$6,800 per worker. This was due to the variation in investment in machinery and equipment and an increase in employment levels, as the previous levels of investment in machinery and equipment were now spread over a larger group of workers.



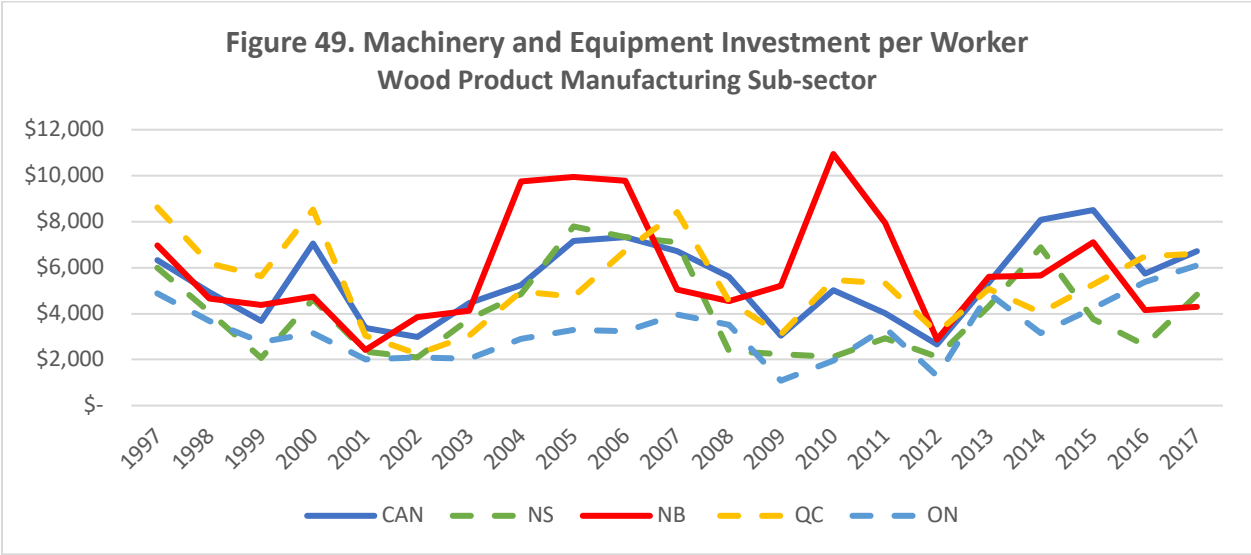
Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For machinery and equipment investment per worker in wood product manufacturing (Figure 49), we see that there are investment trends present across the provinces and Canada, although these trends were more significant in New Brunswick than elsewhere. There was a general decline from 1997 to 2001 (there was a spike in investment in machinery and equipment in 2000 that New Brunswick did not experience). New Brunswick fell from \$7,000 in 1997 to \$2,400 in 2001. This was followed by a period of growth, during which New Brunswick reached investment rates of \$9,700 per worker in 2004, which continued until 2006. From 2007/2008, there was a two-year decline, during which time New Brunswick fell to \$4,600 per worker. There was a spike in investment in machinery and equipment in 2010, with New Brunswick increasing to \$11,000 per worker. New Brunswick's investment fell the next year down \$2,900 (the other provinces and Canada also saw declines in investment in machinery and equipment. From 2012 to 2015, there was a period of growth, but investment in machinery and equipment in New Brunswick did not reach its previous heights. It fell again (in New Brunswick and elsewhere) in 2016. New

Brunswick ended 2017 with the investment rates of \$4,300 per worker. The significant fluctuation in investment in machinery and equipment per worker was driven by changes in investment, not due to trends in employment (which was quite smooth, and only declined significantly from 2005 to 2007).

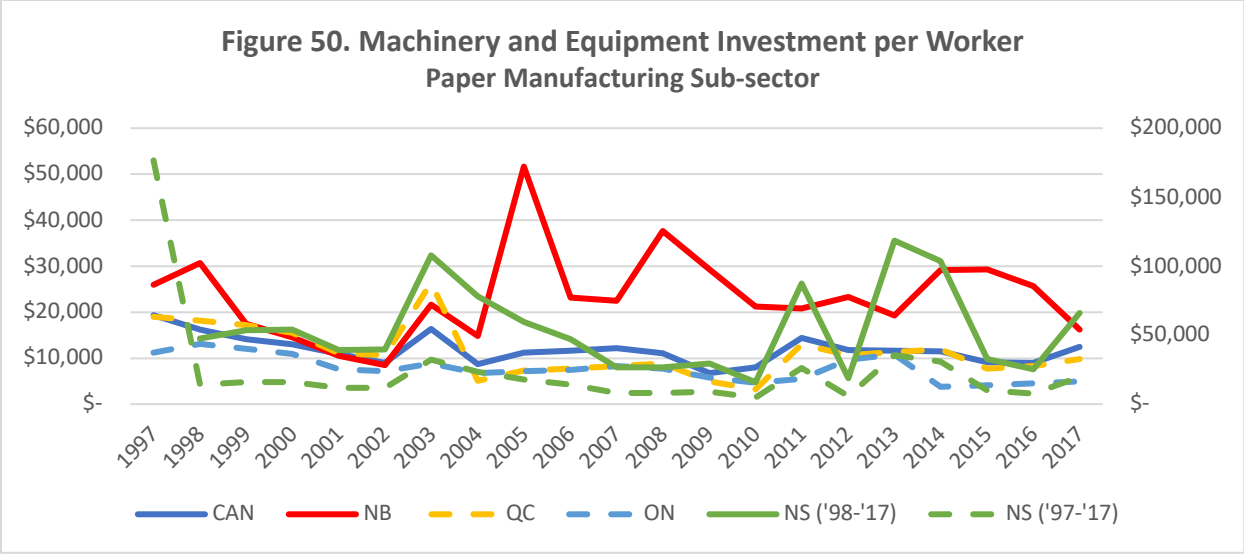


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

In Figure 50, we show the machinery and equipment investment per worker in the paper manufacturing sub-sector. New Brunswick had comparatively high investment in machinery and equipment in 1997 and 1998 (\$26,000 and 31,000 respectively), but fell to \$17,500 in 1999, which was similar to Canada. New Brunswick continued to have relatively similar investment rates to Canada until 2005, when it jumped to \$52,000 per worker, close to five times the rate of investment in machinery and equipment for Canada. Investment in machinery and equipment did not continue at this rate in New Brunswick, but from 2006 to 2016 it averaged \$25,500 per worker. This was at least twice the rate of investment of Quebec, Ontario, and Canada over most of this period. Nova Scotia also had high levels of investment in machinery and equipment over this period, but not consistently as New Brunswick did. Nova Scotia also had a very high level of investment in machinery and equipment in 1997, at \$176,500 per worker. This level of investment was an one-off event.

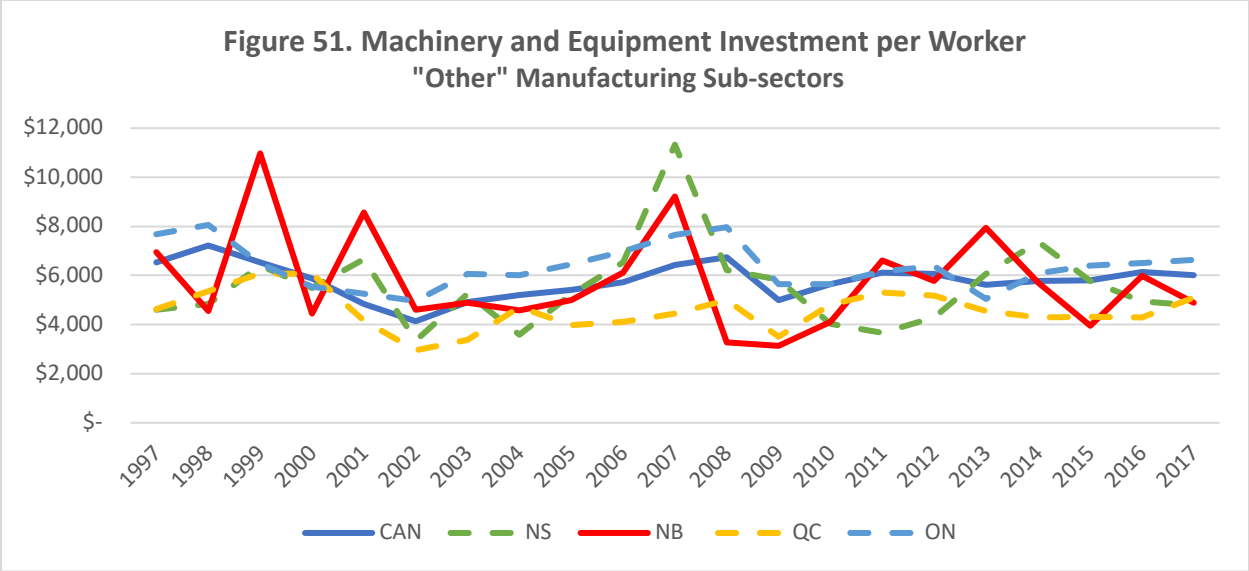


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

For “other” manufacturing sub-sectors' machinery and equipment investment per worker (Figure 51), New Brunswick had significant year to year variation during the 1997-2002 period. Investment ranged from \$4,500 (2000) to \$11,000 (1999). From 2002 to 2004, investment in machinery and equipment was around \$4,500 to \$5,000, before increasing up to \$9,200 per worker in 2007. Investment dropped down to \$3,300 per worker the following year, before increasing up to \$7,900 in 2013. Investment in machinery and equipment fell again, and New Brunswick ended 2017 with investment of \$4,900 per worker, the second lowest rate of investment in machinery and equipment to Nova Scotia.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Investment measures in 2012 chained dollars

By Author's calculations

Real value added

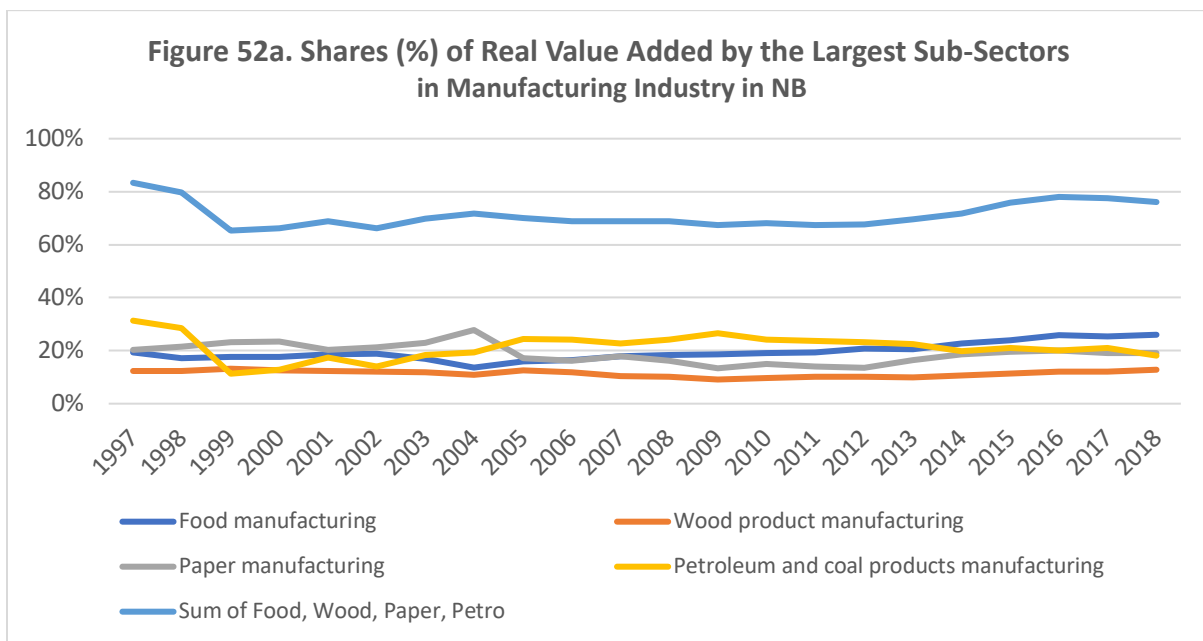
<p>Definition – <i>Real Value Added</i></p> <ul style="list-style-type: none"> • Real Value Added (or RVA) is the summed net changes in the value of a product from its inputs. • Example: the RVA of a loaf of bread would be the price the bread is sold at, minus the costs of the ingredients used to create it. • Real Value Added is a measure of value created (adjusted for inflation).
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SUMMARY –Real Value Added in New Brunswick's manufacturing sector increased from 1997 to 2018 for total manufacturing (both with and without petroleum), and for all important sub-sectors. "Other" manufacturing had the largest increased in RVA of any of them, while food manufacturing saw the largest increase of the three important sub-sectors. Food manufacturing had been increasing its RVA from 2004 to 2016, but this growth stopped in 2016. As food is the single largest contributor of RVA from 2014-2018, this is an area of concern for New Brunswick manufacturing.

Shares of real value added

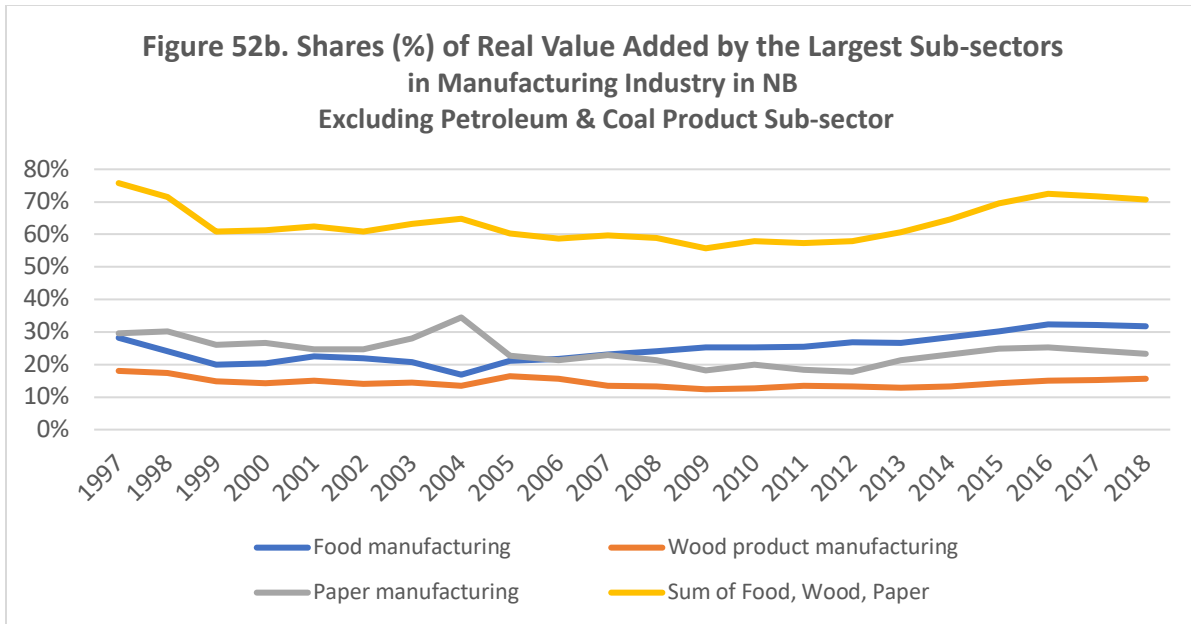
Figure 52a shows the primary sub-sectors of interest had a significant share of the RVA created in the New Brunswick manufacturing sector. The combined shares of food, wood, paper, and petroleum manufacturing was close to 70% of New Brunswick manufacturing RVA. No other sub-sector ever had a share larger than 6% in any one year of the observed period. Interestingly, food manufacturing had the single largest share of RVA from 2013 to 2018.

Once again petroleum and coal manufacturing had a significant share of RVA, but because the industry relies on imported crude oil, its contribution to overall value-added is less than its dominance in terms of the size of the capital stock. In Figure 52b, we can see that we combined share of food, wood, and paper manufacturing was lower than their share including petroleum, but it still averaged above 60% of manufacturing RVA. Again, no other sub-sector had a significant share of RVA (the highest share was 8% in a single year).



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars



Source: Statistics Canada. Table: 36-10-0480-01

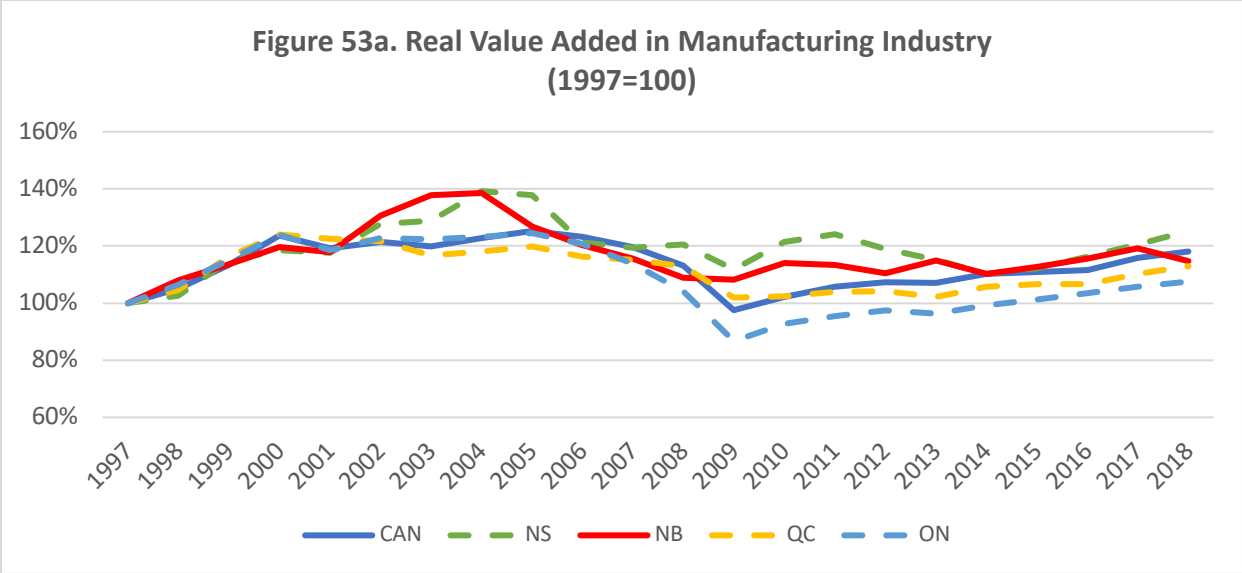
Measured in 2012 Chained Dollars

Real value-added trends

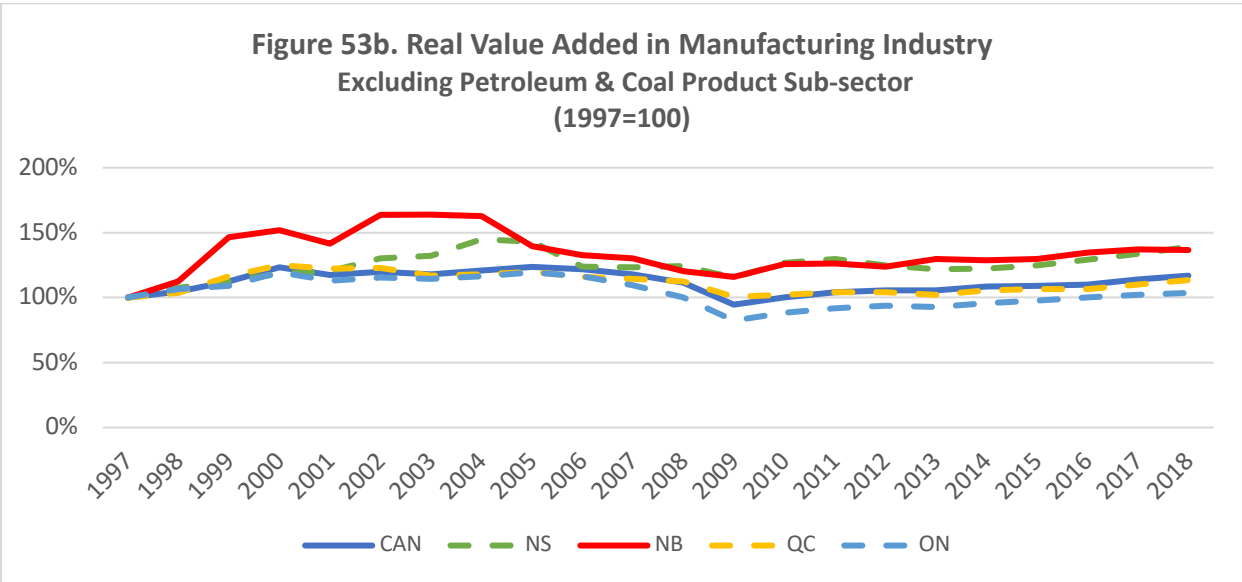
RVA is presented similarly to capital stocks (i.e. as percentages of the provinces' and Canada's 1997 values) to allow for comparisons across economies of drastically different sizes.

In Figure 53a, there is a strong trend for changes in RVA across all provinces and Canada. There was an increase from 1997 to around 2004/2005, before a decrease until approximately 2009. There was then a slow but steady growth until 2018. New Brunswick had the largest growth between 1997 and 2004, peaking at 140% of 1997 levels. It fell to 110% in 2009, and increased slightly to 115% over the next nine years.

After removing petroleum and coal products' RVA from manufacturing, the basic shape of New Brunswick's RVA growth remained very similar to that of other provinces, as seen in Figure 53b. The increase from 1997 to 2002 increased (RVA in 2003 with petroleum was 138%, but was 164% in 2003 without petroleum), and the low point in 2009 was also higher (108% with petroleum, 116% without petroleum). There was a steady increase afterwards until 2018. Canada and the other provinces also had similar change with and without petroleum.



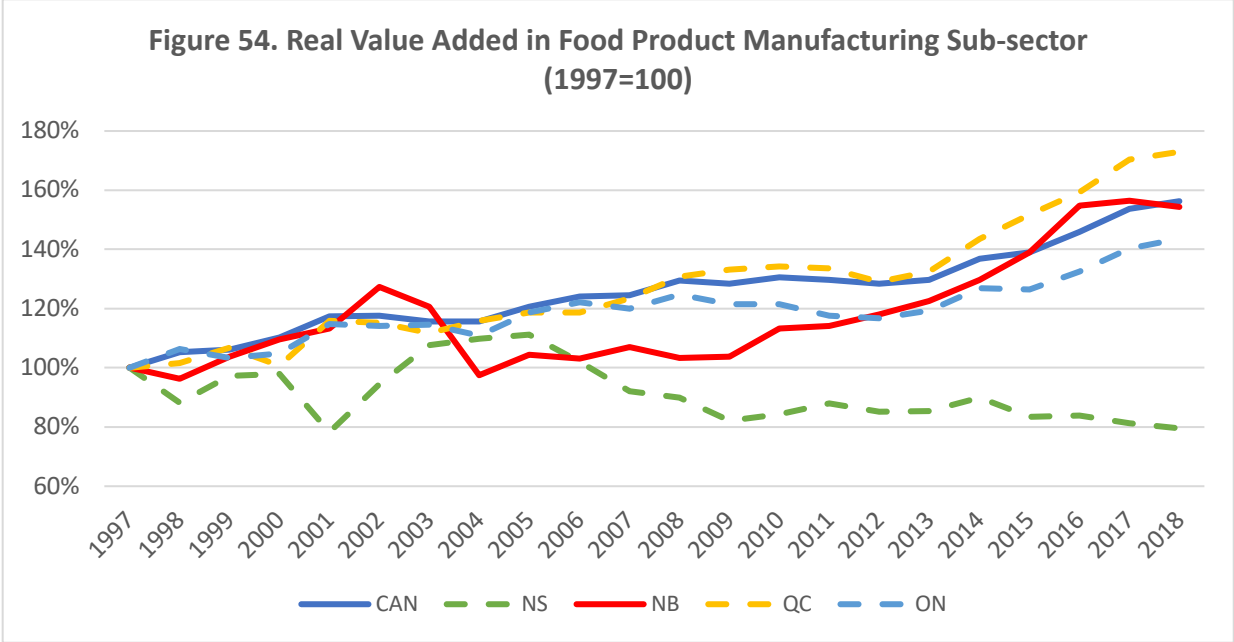
Source: Statistics Canada. Table: 36-10-0480-01
 Measured in 2012 Chained Dollars



Source: Statistics Canada. Table: 36-10-0480-01
 Measured in 2012 Chained Dollars

Figure 54 shows New Brunswick's food manufacturing sub-sector saw significant long-term growth RVA. There was a period of growth between 1997 and 2001 that was negated by a decrease of similar size between 2001 and 2004. After

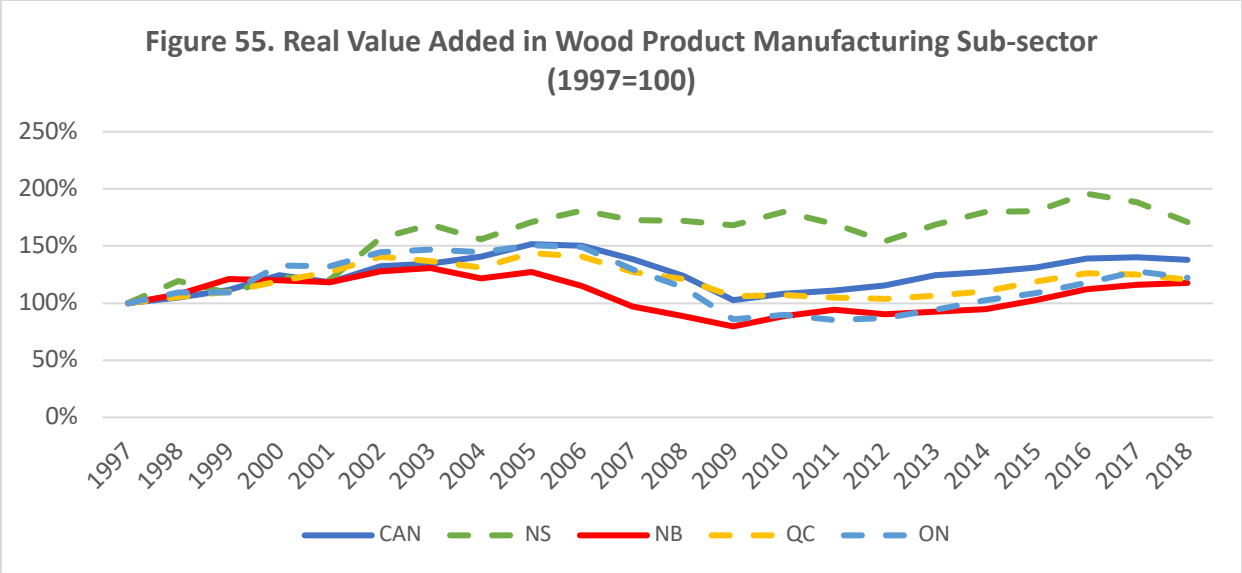
2004, RVA increased by close to 55% by 2016. Quebec was the only province that had higher growth than New Brunswick. Nova Scotia saw a significant decrease in RVA, ending at 80% of its 1997 values in 2018.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

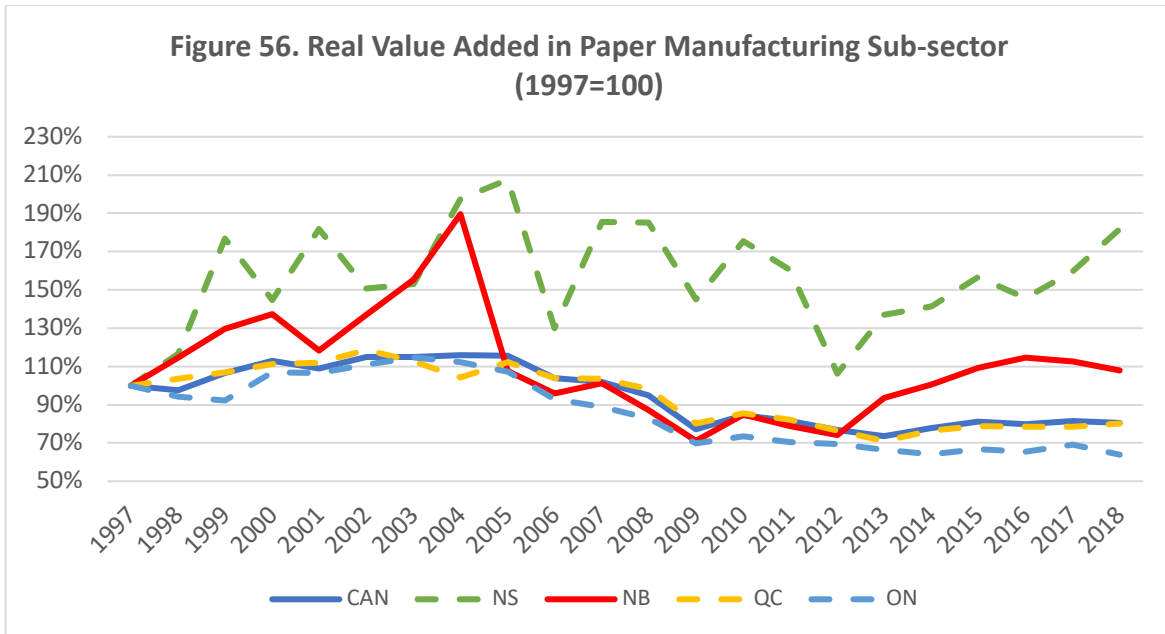
In Figure 55, there is a strong increase in wood product manufacturing RVA across all provinces and Canada (except for Nova Scotia). There was an increase in RVA from 1997 to about 2005, reaching peak volumes of the total observed period (for New Brunswick it was 2003). This was followed by a decrease until 2009, before increasing again until 2018. The net long-term growth for New Brunswick is an increase of 18%. Nova Scotia did not follow the same trend as the others, and did not experience the same decrease between 2005 and 2009 as the others. Its net growth was the largest, finishing 2018 with 171% of its 1997 values.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

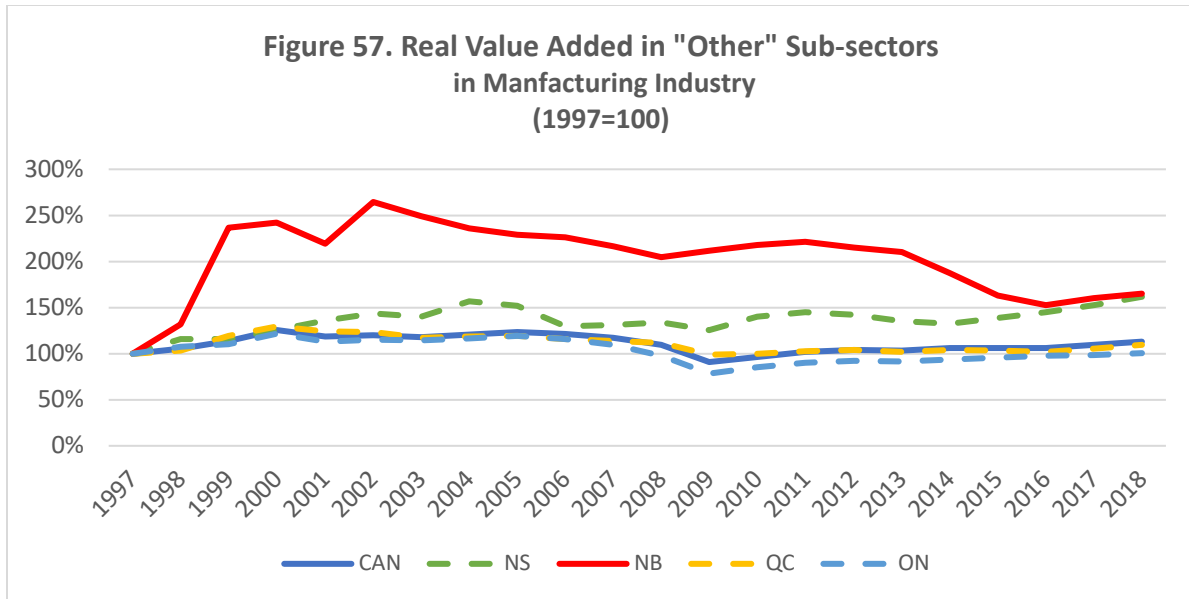
In Figure 56, we can see that Quebec, Ontario, and Canada had very similar changes in their RVA for the paper manufacturing sector, while New Brunswick and Nova Scotia differed significantly. Nova Scotia had enormous variation between years, but had the largest net growth at 182% of its 1997 values in 2018. New Brunswick had significant growth between 1997 and 2004, peaking at 190% of its 1997 values. Its RVA then dropped sharply to 107% in the next year, and continued to decline until 2009 (71%). After 2009, it increased again, ending 2018 at 108% of its 1997 values.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

In Figure 57, we can see that New Brunswick “other” manufacturing RVA had a significant period of growth between 1997 and 2002, before declining until 2018, but at a much slower rate. There was a long-term net increase of 65% between 1997 and 2018. Nova Scotia had a similar net-gain, but consistently grew at a slow rate. Canada, Quebec, and Ontario had small net gains.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

Productivity and Associated Measures

Closely connected to changes in capital stocks, labour, and RVA are productivity measures, which measure the efficiency of manufacturing industry. The measures we will look at are capital labour ratio, labour productivity, labour compensation, and unit labour cost. Unlike capital stocks, labour supplied, or RVA, these measures are presented in their actual values, rather than as percentages of their 1997 values.

Capital labour ratio

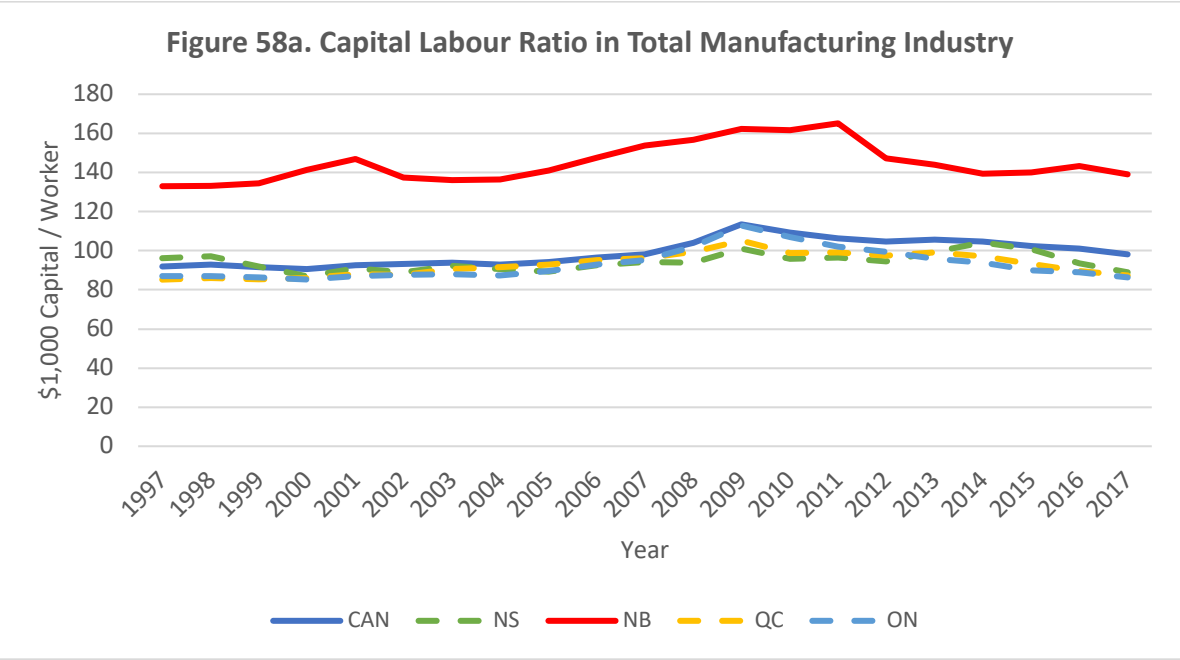
Definition – *Capital Labour Ratio*

- The ratio of capital to labour is simply the constant dollar value of the capital stock divided by the number of workers (or real capital stock / worker). This measure is important as a higher capital labour ratio means that the workers have greater capital to use, improving productivity.
- Different industries have different capital labour ratios, as some have comparatively labour intensive production (such as food manufacturing), while others have capital intensive production (such as petroleum manufacturing).

SUMMARY – The capital labour ratio across the manufacturing industry has been decreasing since approximately 2008/2011. For total manufacturing (with and without petroleum), wood, paper and “other,” there has been a decline in capital stocks and employment, but the capital stocks are decreasing more quickly. For food manufacturing, capital and employment have been increasing, but employment has increased at a greater rate, meaning the capital labour ratio has still decreased.

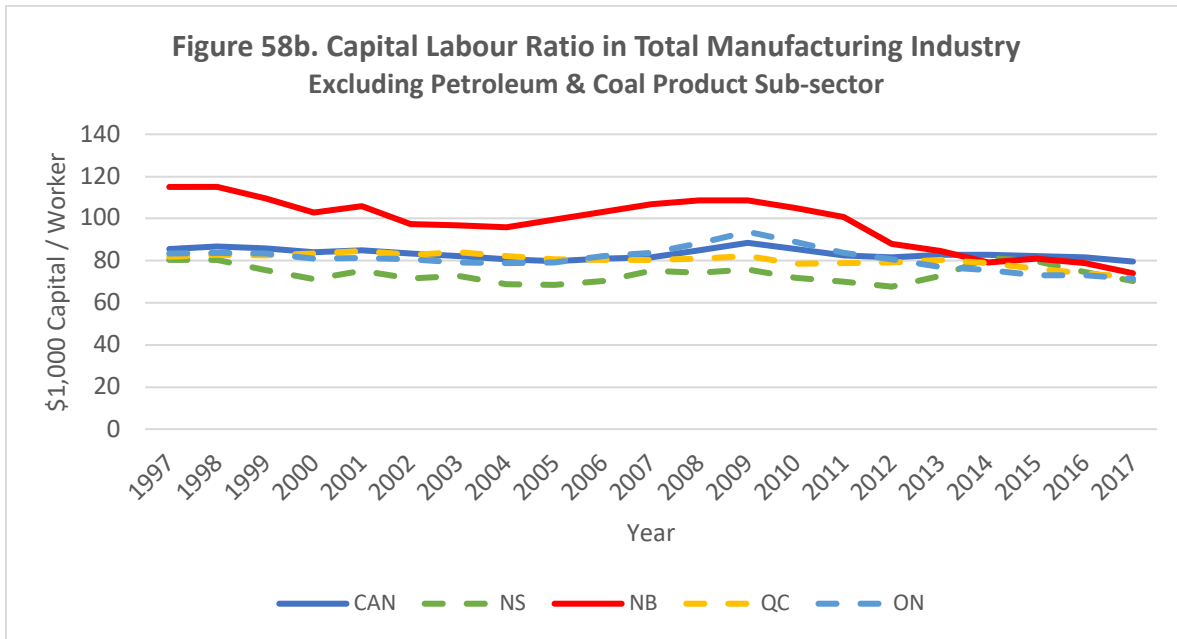
As shown in Figure 58a, New Brunswick has significantly higher capital labour ratio than Canada or any of the other provinces. From 1997 to 2011, New Brunswick’s capital labour ratio increased steadily before falling by almost the same amount between 2011 and 2018. The other provinces and Canada had markedly lower ratios, and mostly very similar to each other.

Part of the reason for the gap in capital labour ratios between New Brunswick and the other provinces and Canada is the significant influence petroleum manufacturing has on New Brunswick’s capital stocks. After removing petroleum’s capital stocks and labour, New Brunswick’s relative position changes significantly, as shown in Figure 58b. It remains higher than the other provinces and Canada until 2012, but there is a clear downward trend from 1997 to 2017. In 2017, New Brunswick, Nova Scotia, Quebec, and Ontario have very similar capital labour ratios, while Canada’s is slightly higher.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

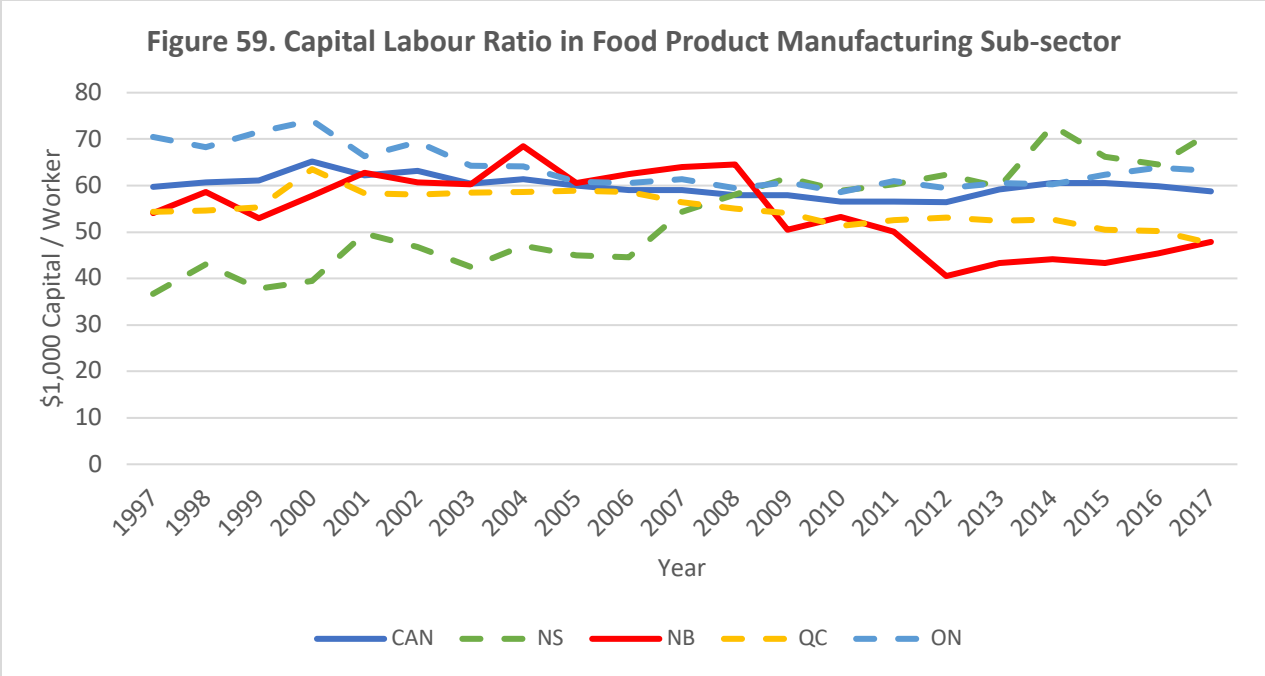


Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

In Figure 59, we can see that New Brunswick's food manufacturing sector's capital labour ratio grew from 1997 to 2008, before declining until 2012. It has increased slowly since then. The decline from 2008 to 2012 is largely due to the increase in employment coincident with low investment. Canada's capital labour ratio held quite steady while New Brunswick's ratio has been below the national level since 2011.

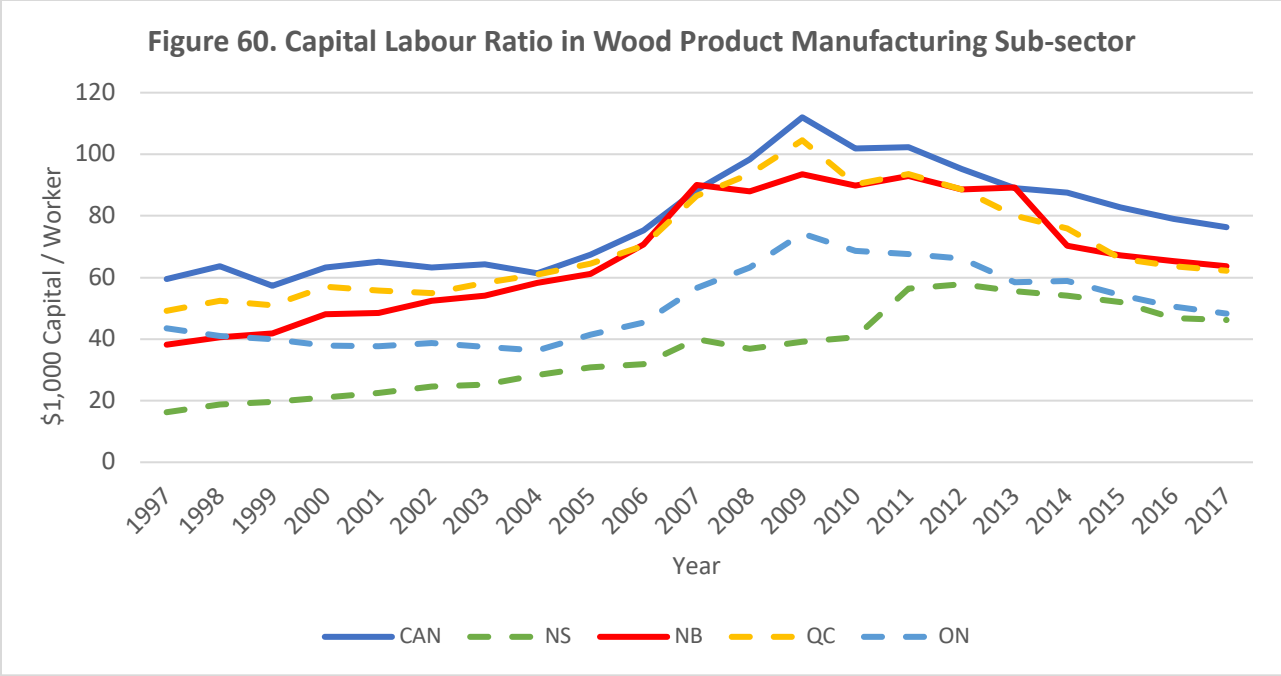
New Brunswick's decline in its food product manufacturing capital labour ratio is due to the increase in food product employment, which exceeded the proportionate increase in the value of the real capital stock, lowering the capital labour ratio after 2008.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

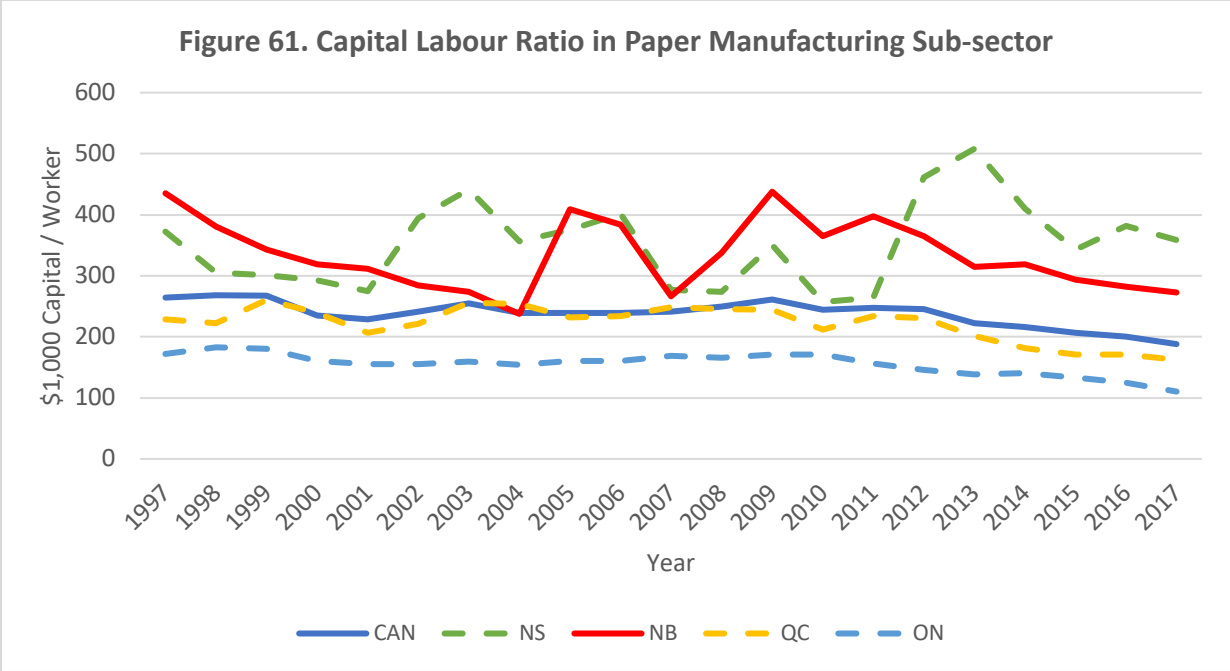
In Figure 60, we see steady growth in the capital labour ratio from 1997 to approximately 2009 for all provinces' and Canada's wood product manufacturing sector. This is followed by a decline. New Brunswick peaked in 2007 rather than 2009. Ratios for New Brunswick, Quebec, and Canada remained significantly above those of Nova Scotia and Ontario for almost all of the 1997-2017 period.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

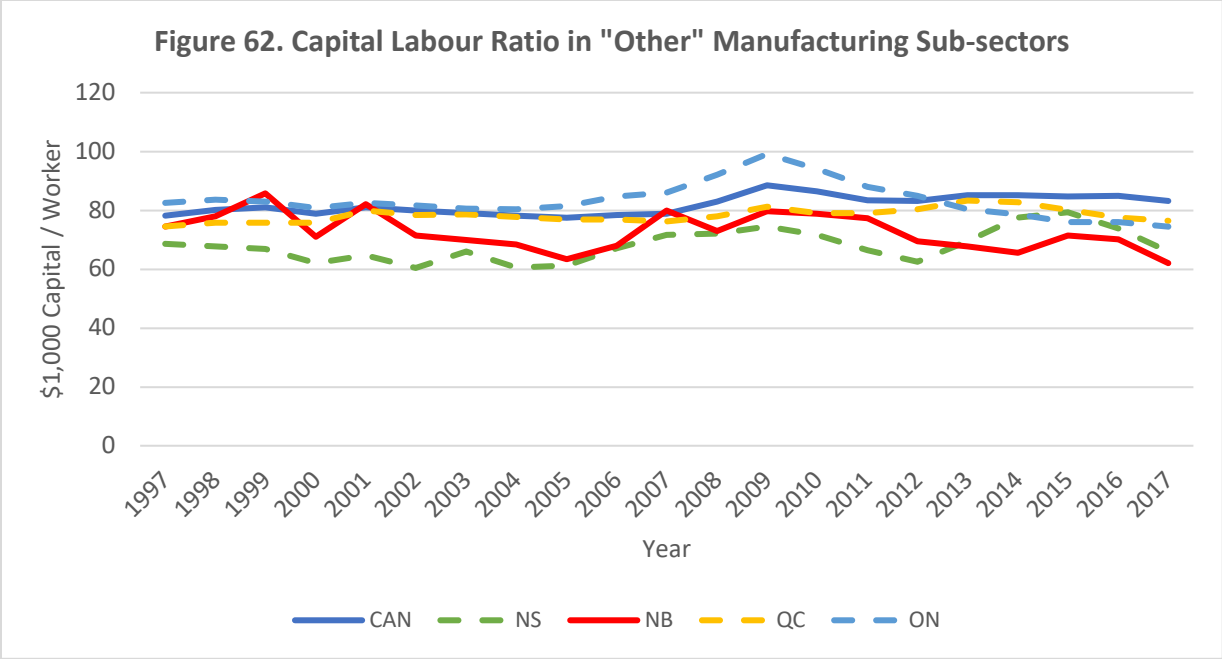
As seen in Figure 61, New Brunswick and Nova Scotia paper manufacturing capital labour ratios saw significant variation over the 1997-2017 period. This may be in part due to quantities of both capital and labour diminishing at different rates. Overall, there is a steady decline in ratios for all provinces and Canada.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

For “other” manufacturing (Figure 62), New Brunswick’s capital labour ratio was lower than those of Quebec, Ontario, and Canada. This is likely due to certain sectors (such as transportation) not being as significant to New Brunswick’s manufacturing sector as they are to other provinces’.



Source: Statistics Canada. Table: 36-10-0096-01 & Table: 36-10-0480-01

Capital Stocks measured in 2012 Chained Dollars

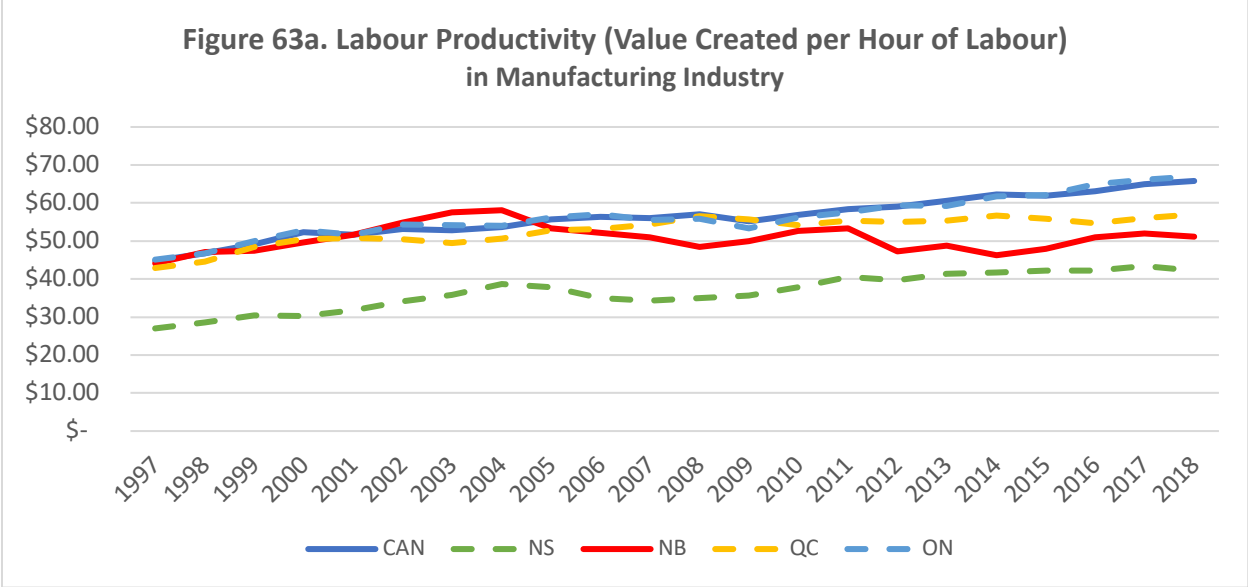
Labour Productivity

Definition – <i>Labour Productivity</i>
Labour Productivity is a measure of how much value is created during an hour of labour and of the efficiency of the labour. The equation for labour productivity is [Total Real Value Added] / [Total Hours Worked] = Real Value Added / H Worked.

SUMMARY- New Brunswick generally had lower labour productivity than Canada, Quebec and Ontario. New Brunswick and Nova Scotia had similar values for most manufacturing areas, with the significant exception of paper manufacturing, where New Brunswick had the highest labour productivity of any province, including the 2012-2018 period.

In Figure 63a, we see that labour productivity for total manufacturing for New Brunswick, Quebec, Ontario, and Canada was comparable in 1997, close to \$45 / H. Nova Scotia was considerably lower at \$27 /H. NB's Labour Productivity increased from 1997 to 2004, where it peaked at \$58 / H, higher than any of the other provinces or Canada. It then decreased, from 2004 to 2008, during which

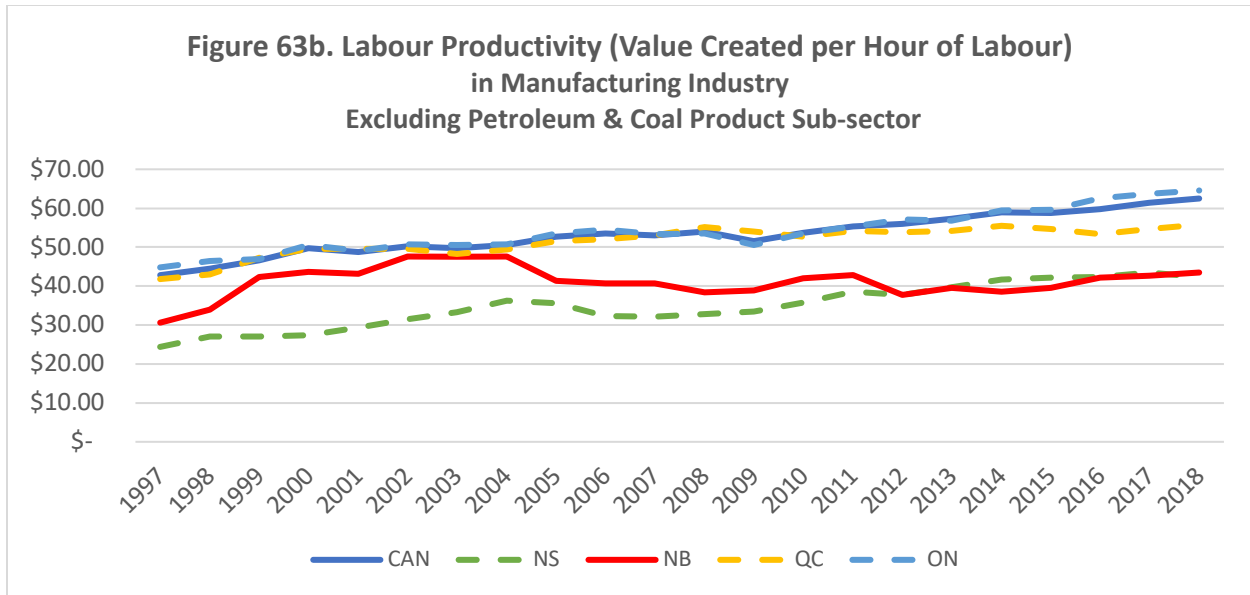
time Quebec, Ontario, and Canada surpassed it. From 2008 to 2018, New Brunswick’s labour productivity saw some variation, with a very small amount of long-term growth from \$49 / H in 2008, to \$51 / H in 2018. In 2018, New Brunswick had the second lowest labour productivity, ahead of Nova Scotia.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

After removing petroleum from total manufacturing (Figure 63b), we see that labour productivity dropped across all observed provinces and Canada, but dropped more in New Brunswick than in other provinces. New Brunswick did still see growth over the 1997-2004 period, but it was now just below Quebec, Ontario, and Canada, rather than above them. New Brunswick labour productivity still decreased from 2004-2008, and from 2008-2018, New Brunswick had similar labour productivity to Nova Scotia. New Brunswick saw larger long-term growth without petroleum, increasing from \$31 / H in 1997 to \$43 / H in 2017, compared to \$44 / H in 1997 and \$51 / H in 2018 when including petroleum.

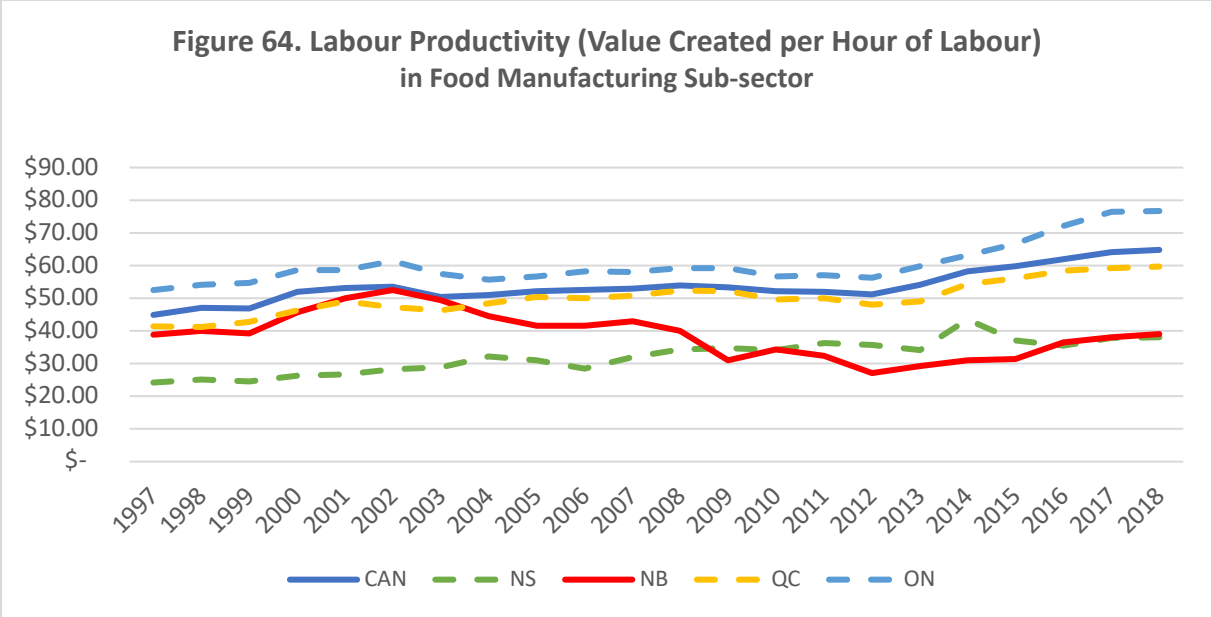


Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

In Figure 64, we see that New Brunswick's food manufacturing labour productivity decreased from 2002 to 2012, after growing from 1997 to 2002, when it had peaked at \$52.5 / H. Labour productivity decreased by close to \$20 / H from 2002 to 2012. New Brunswick's labour productivity increased by close \$10 / H from 2012 to 2018. The decrease in productivity was likely due to the decrease in the capital labour ratio, from the increase in employment levels. New Brunswick's labour productivity reached similar levels in 2018 compared to 1997.

Quebec, Ontario, and Canada all had similarly consistent growth over the observed period. Nova Scotia began with much lower productivity than any other province, but in 2018 had very similar productivity rates to New Brunswick.

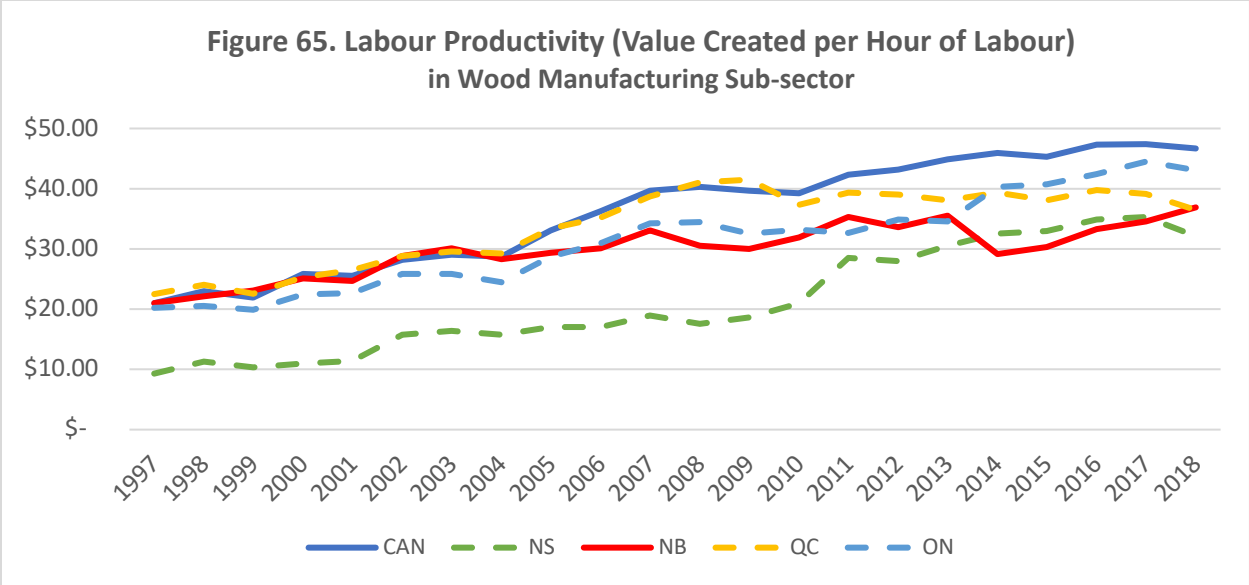


Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

Figure 65 shows wood product manufacturing labour productivity increased for all provinces significantly over the 1997-2018 period. Canada had the highest productivity rates for most of the period, while New Brunswick had similar productivity from 1997 to 2004, before its growth slowed in comparison to Canada. New Brunswick had a sharp decrease between 2013 and 2014, but productivity recovered by 2017. Nova Scotia began with much lower productivity, but ended 2018 with labour productivity only a little lower than New Brunswick and Quebec.

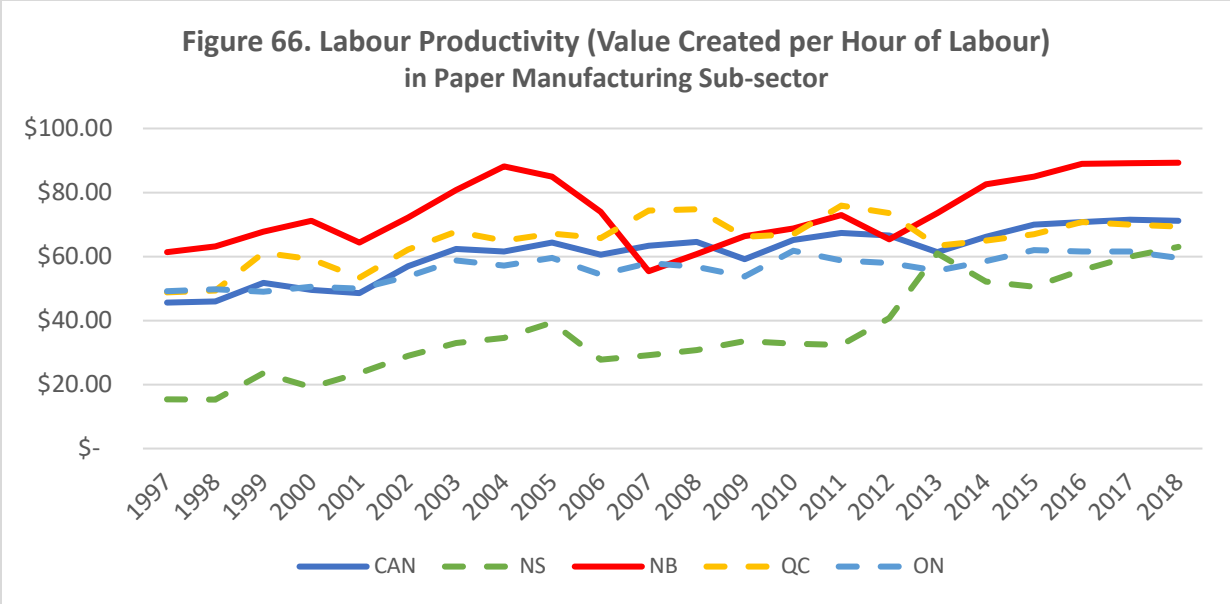
Converting labour productivity into percentage growth, New Brunswick finished 2018 with 75% above its initial 1997 levels. This is compared to only 16% growth for total manufacturing (42% for total manufacturing excluding petroleum). This shows that wood product manufacturing labour productivity has increased much faster than the rest of the manufacturing sector.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

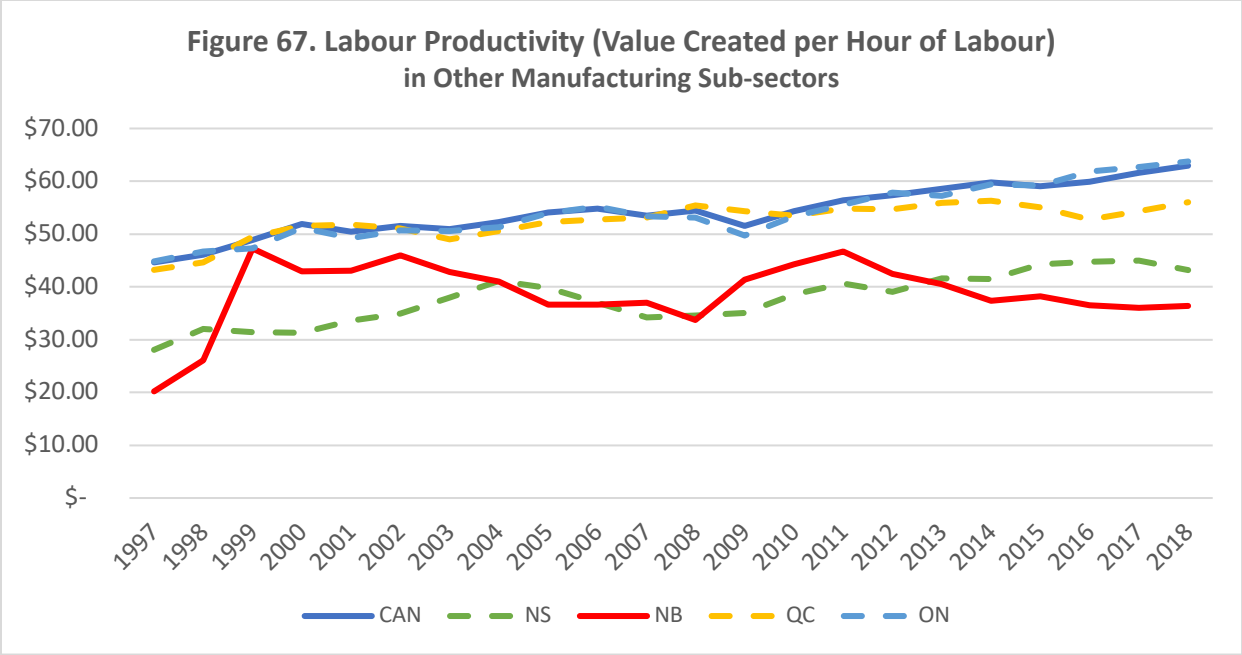
Figure 66 shows New Brunswick had the highest labour productivity in paper manufacturing for most of the 1997-2018 period. It had a significant dip between 2004 and 2007, falling from \$88 / H to \$55 / H, but began to increase again after 2007. New Brunswick had long-term growth from \$61 / H in 1997 to \$89 / H in 2018. Quebec, Ontario, and Canada had generally consistent growth over the 1997-2018 period. Nova Scotia had the lowest levels of productivity again, but levels increased \$15 / H in 1997 to \$60 in 2018, which was higher than Ontario's level of productivity.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

Figure 67 shows that New Brunswick's "other" manufacturing had low labour productivity over the 1997-2018 period. The province had a significant increase in productivity between 1997 and 1999, when it had similar productivity to Canada, Quebec, and Ontario. However, it then declined and returned to similar levels to Nova Scotia. It had another period of growth between 2008 and 2011, but it still remained much lower than Canada, Quebec, and Ontario. Over the 1997-2018 period, New Brunswick had some long-term growth, from \$20 / H to \$35 / H. This was still much lower than starting labour productivity values for Canada, Quebec and Ontario.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Chained Dollars

Labour compensation

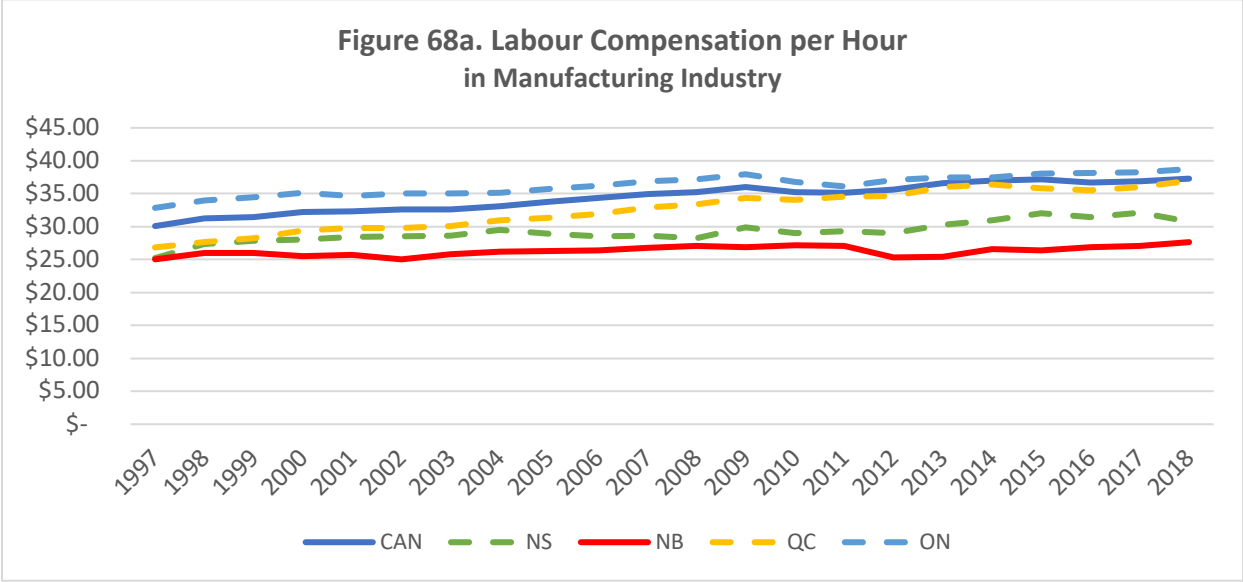
Definition – <i>Labour Compensation</i>
Total amount paid to employees per hour.

SUMMARY – New Brunswick had the lowest or one of the lowest labour compensation rates for total manufacturing (both with and without petroleum) and for the important sub-sectors. It was significantly lower than Canada, Quebec, and Ontario for sub-sectors. All areas of manufacturing saw mild long-term growth, except for paper manufacturing. Paper manufacturing was the sub-sector with the highest labour compensation, even in 2018 after it had decreased while the others had increased.

In Figure 68a, we see that New Brunswick’s labour compensation was the lowest of all provinces and Canada, for every year of the observed period. The province had some small growth from \$25 / H in 1997 to \$27.5 / H in 2018. New Brunswick’s 2018 labour compensation was still below Canada’s 1997 labour compensation of \$30 / H. All provinces and Canada saw growth across the observed period. Nova Scotia remained slightly above New Brunswick, but below Ontario and Canada. Quebec was closer to Nova Scotia and New

Brunswick earlier in the period examined, but became closer to Ontario and Canada over time.

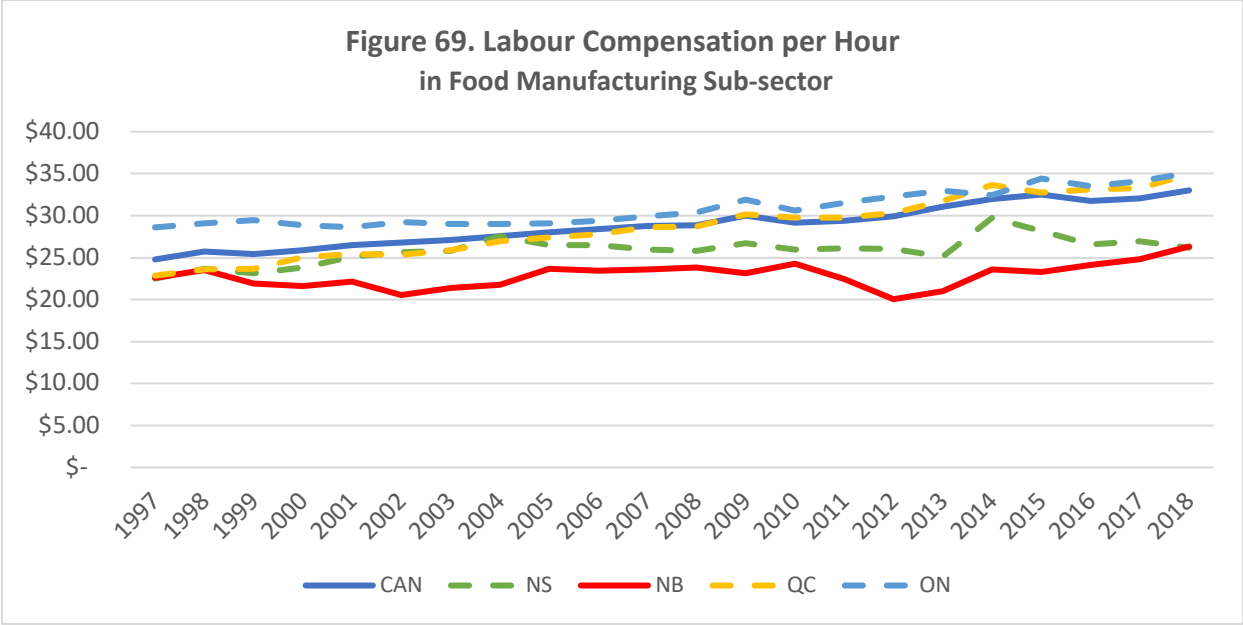
Because the share of sector employment in petroleum refining is small, the impact of petroleum refining on average labour compensation for the overall manufacturing sector is not large.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

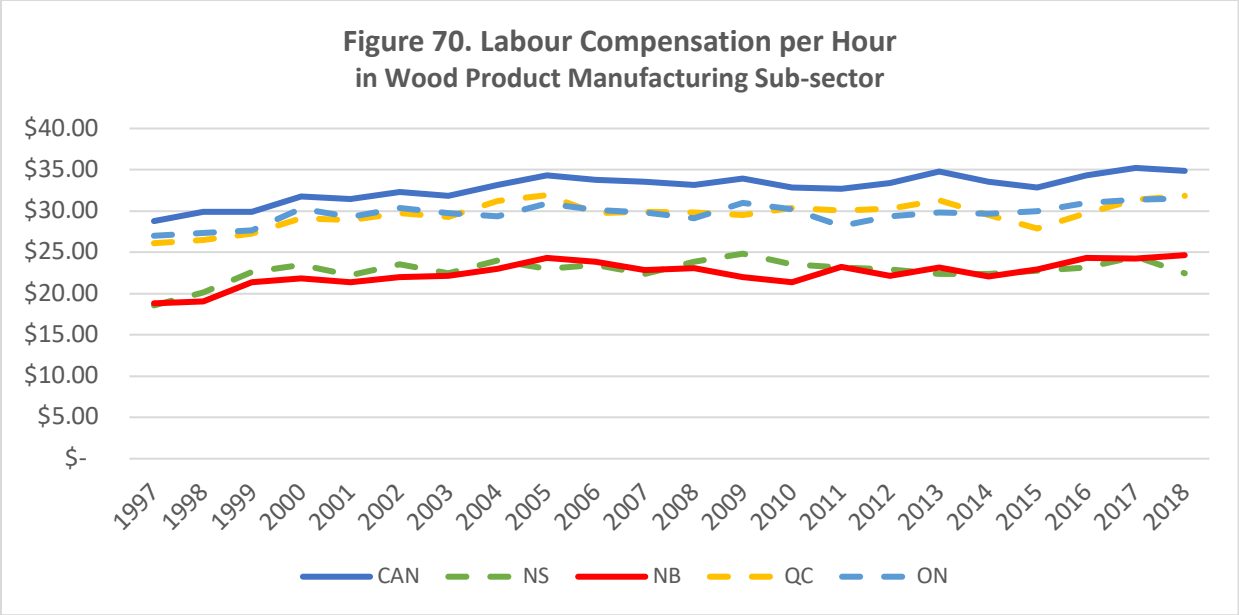
For food manufacturing, New Brunswick labour compensation per hour was below the national levels (Figure 69). The province had mild long term growth, with some short term fluctuations. Nova Scotia again had compensation slightly above that of New Brunswick for most of 1997-2018, with similar fluctuations. Quebec, Ontario, and Canada had higher compensation and fewer fluctuations.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

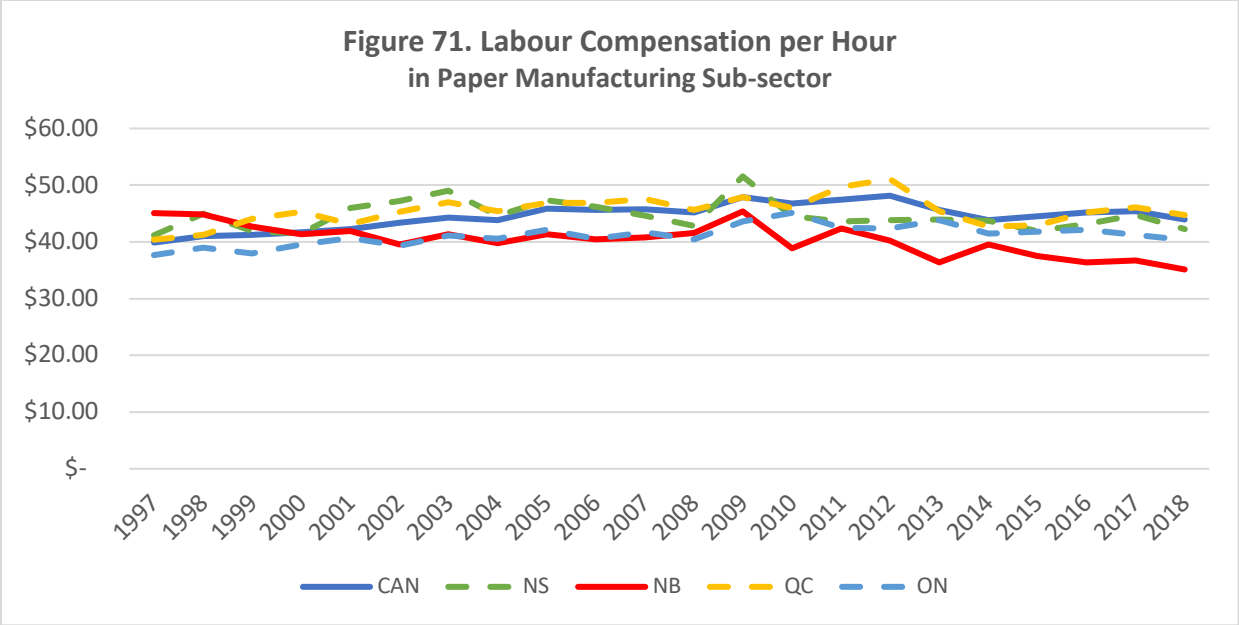
In Figure 70, we see that New Brunswick and Nova Scotia's wood product manufacturing labour compensation was significantly lower than those of Canada, Quebec, and Ontario. There was long term growth across all provinces and Canada. Quebec and Ontario are very close together, but are both below Canada in terms of compensation.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

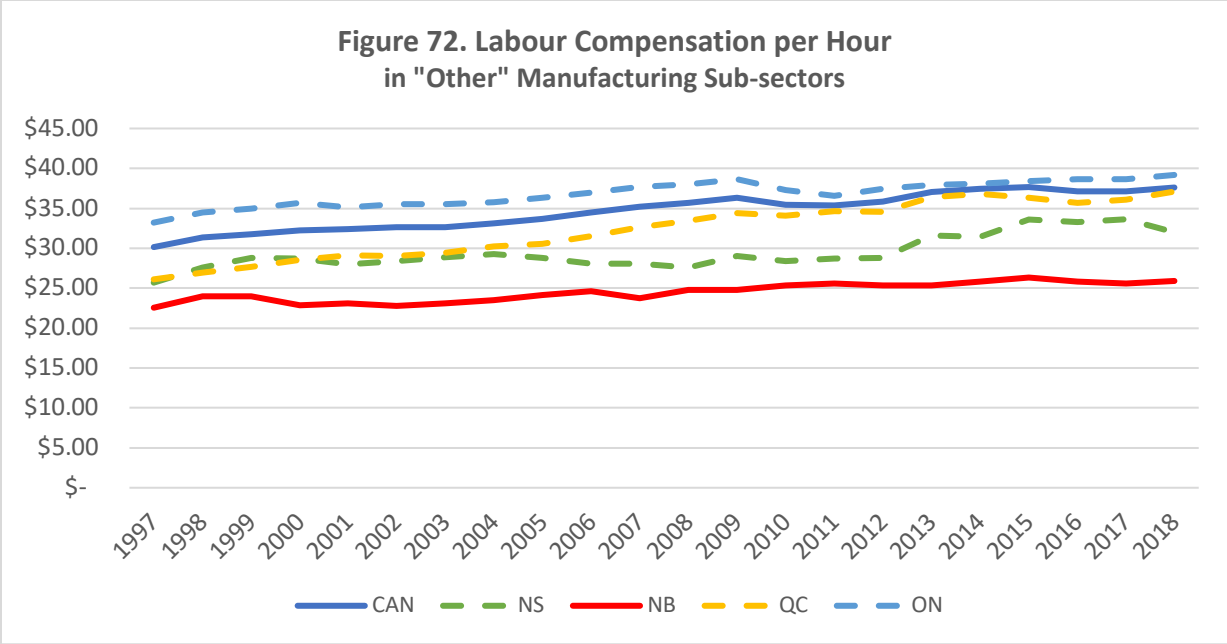
For paper manufacturing (Figure 71), New Brunswick actually had the highest labour compensation (compared to other provinces and Canada) in 1997, at \$45 / H, but fell both ordinally and absolutely since then. New Brunswick's paper manufacturing labour compensation in 2018 was \$35 / H. Canada saw less fluctuation than any of the provinces studied. It had mild long term growth, peaking in 2012.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

In Figure 72, we can see that for “other” manufacturing, New Brunswick consistently had the lowest labour compensation for the entire observed period. It increased slightly from \$22.50 / H in 1997, to close to \$26 / H in 2018. Nova Scotia and Quebec were at similar levels in 1997, and Ontario and Canada were significantly higher at \$33 / H and \$30 / H respectively. All other provinces and Canada also saw an increase in labour compensation over the observed period.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

Author's calculations

Unit Labour Cost

<p>Definition – <i>Unit Labour Cost</i>⁵</p> <ul style="list-style-type: none"> • Unit labour cost (ULC) is the cost of labour to produce one unit of output (i.e. \$1 of RVA). The equation for this measure is [Cost of Labour (\$)] / [Unit of RVA (\$1)]. • This measure is about the relationship between efficiency of labour, and the cost of that labour. A low wage, low efficiency worker could have the same ULC as a high wage, high efficiency worker. • ULC should be below 1.0 in the long-term, because otherwise the cost to produce the output is larger than the value of output, meaning negative profits.
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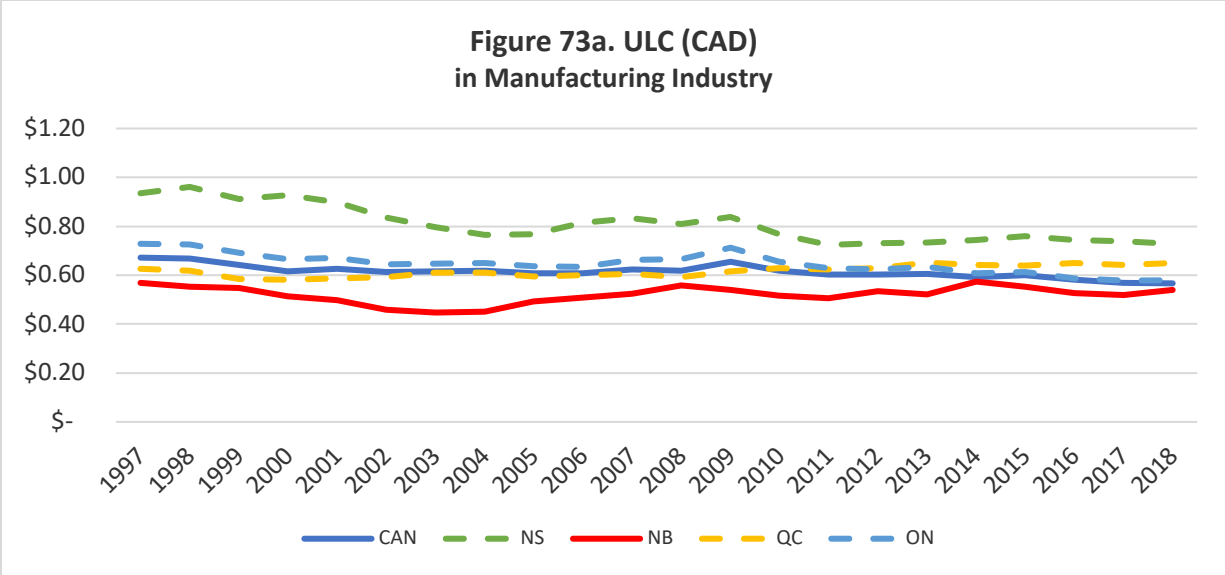
⁵ ULC can be measured in both CAD and USD (both will be included in the final indices for each industry), but in this section only ULC in CAD will be compared.

SUMMARY – For total manufacturing, New Brunswick had the lowest ULC over the whole 1997-2018 period. After removing for petroleum, the province's ULC was similar to those of Canada, Quebec and Ontario, which means manufacturing in New Brunswick was competitive compared to other provinces. Food manufacturing had a significant increase in ULC between 2007 and 2009, due to a reduction in labour productivity, which was the result of a lowering capital labour ratio caused by an increase in employment and the capital stock not increasing at a similar rate. For sub-sectors other than food manufacturing, New Brunswick had a competitive ULC. The wood product manufacturing ULC in CAD was quite high for all provinces, but with the exchange rate, it was lower in USD, making it a profitable export. Across the manufacturing Industry, New Brunswick relied on its low labour compensation to compensate for its low productivity.

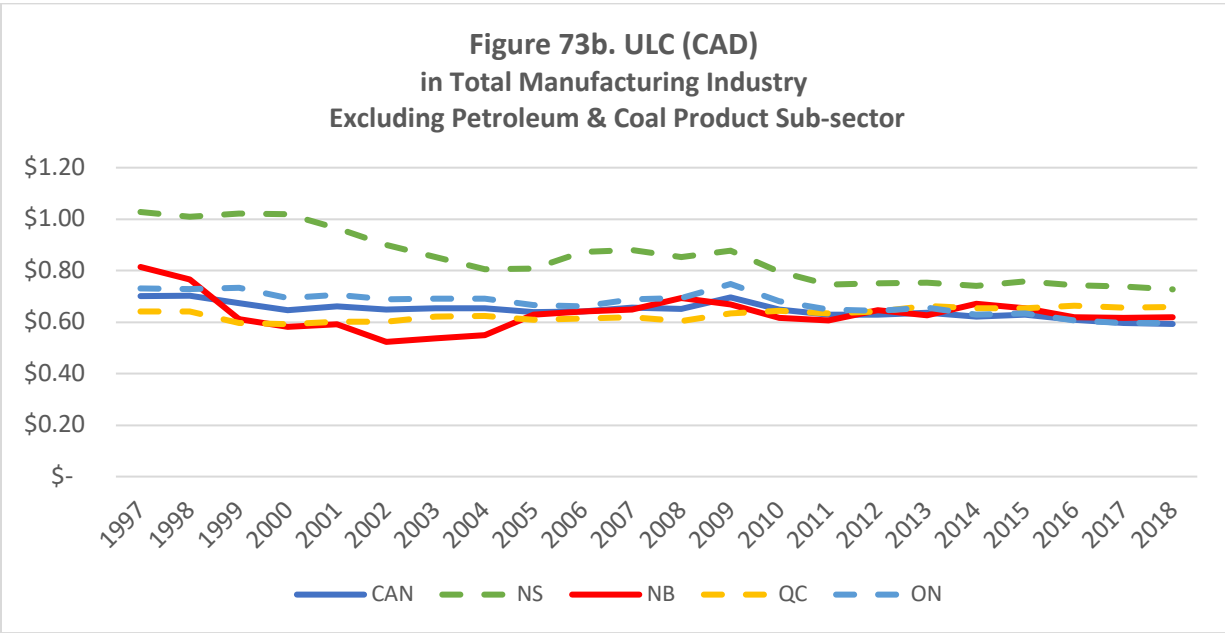
In Figure 73a, we can see that for the general manufacturing sector, New Brunswick had the lowest ULC over the entire observed period. Quebec, Ontario, and Canada are comparable with ULCs above New Brunswick's, while Nova Scotia had the highest ULC for all years. New Brunswick's low ULC is due to its low labour compensation.

Removing petroleum from calculation eliminates New Brunswick's status as a lower ULC province across all years. From 2005 to 2018, it had very similar ULC to Quebec, Ontario, and Canada. Nova Scotia continued to have the highest ULC.

Figure 73b suggests that despite low labour costs in New Brunswick, low productivity of labour means that there is no clear competitive advantage for the province's manufacturers other than in comparison to Nova Scotia.



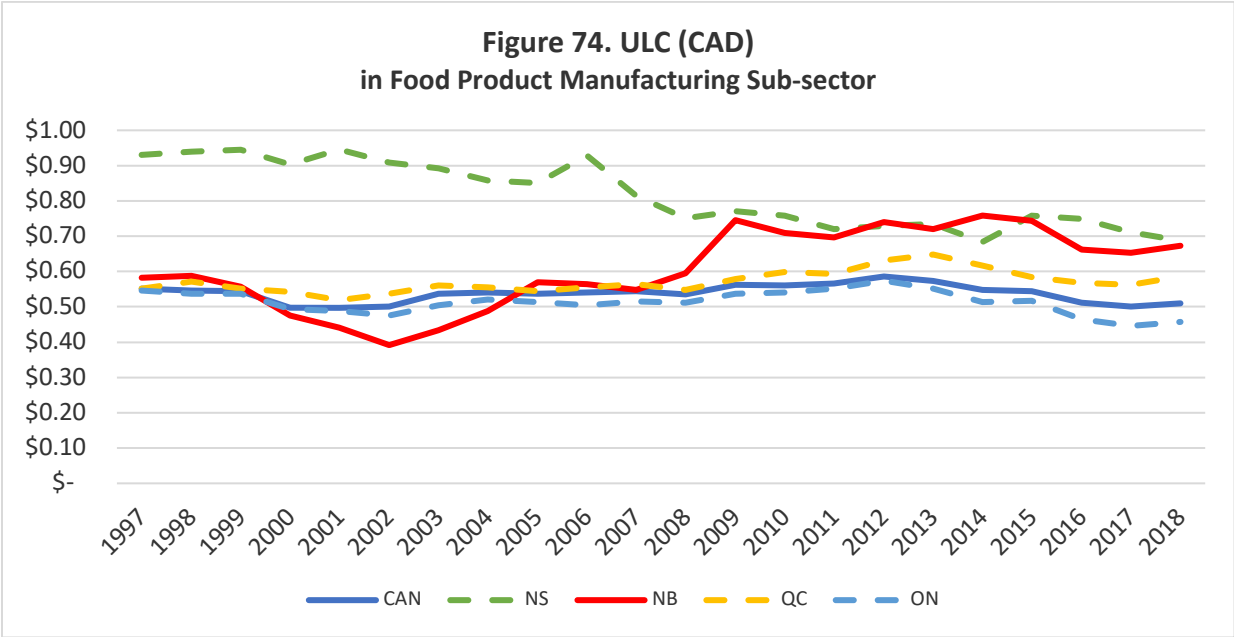
Source: Statistics Canada. Table: 36-10-0480-01
 Measured in 2012 Real Dollars (CPI Adjusted)



Source: Statistics Canada. Table: 36-10-0480-01
 Measured in 2012 Real Dollars (CPI Adjusted)
 Author's calculations

In Figure 74, we can see that New Brunswick's food product manufacturing ULC changed significantly. It decreased from 1997 to 2002, but returned to close to 1997 levels from 2004 to 2007. It then increased again between 2007 to 2009 before decreasing slightly after 2009, but remained significantly above the 1997-2007 levels. This jump was likely due to a decrease in labour productivity, brought about by the declining capital labour ratio (which was caused by the significant increase in employment).

Nova Scotia had high ULCs until 2006, after which time it decreased to similar levels to New Brunswick's by 2009. Ontario, Quebec, and Canada had relatively steady ULCs, similar to New Brunswick's 1997-2007 levels. Relative to labour productivity in food manufacturing, low labour costs are not a source of competitive advantage in New Brunswick for this sub-sector.

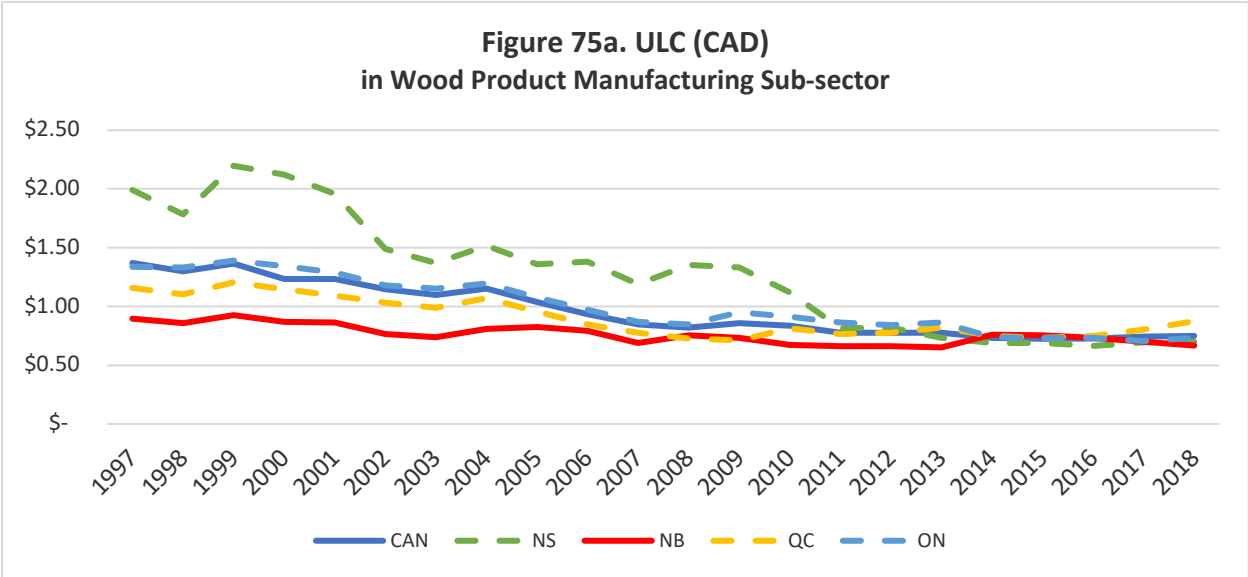


Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

Figure 75a shows New Brunswick's wood product manufacturing ULC was either the lowest or close to the lowest over the entire observed period. The province's ULC declined in the long-run, from \$0.9 in 1997 to \$0.7 in 2018, but the other provinces and Canada decreased much more. In 2018, the ULCs across all the provinces were very similar. ULCs for wood product manufacturing are extremely high and suggest negative profitability. As we show below, evaluating

ULCs in USD shows factoring in the exchange rate alters this conclusion. The products destined for export were profitable because of the exchange rate.

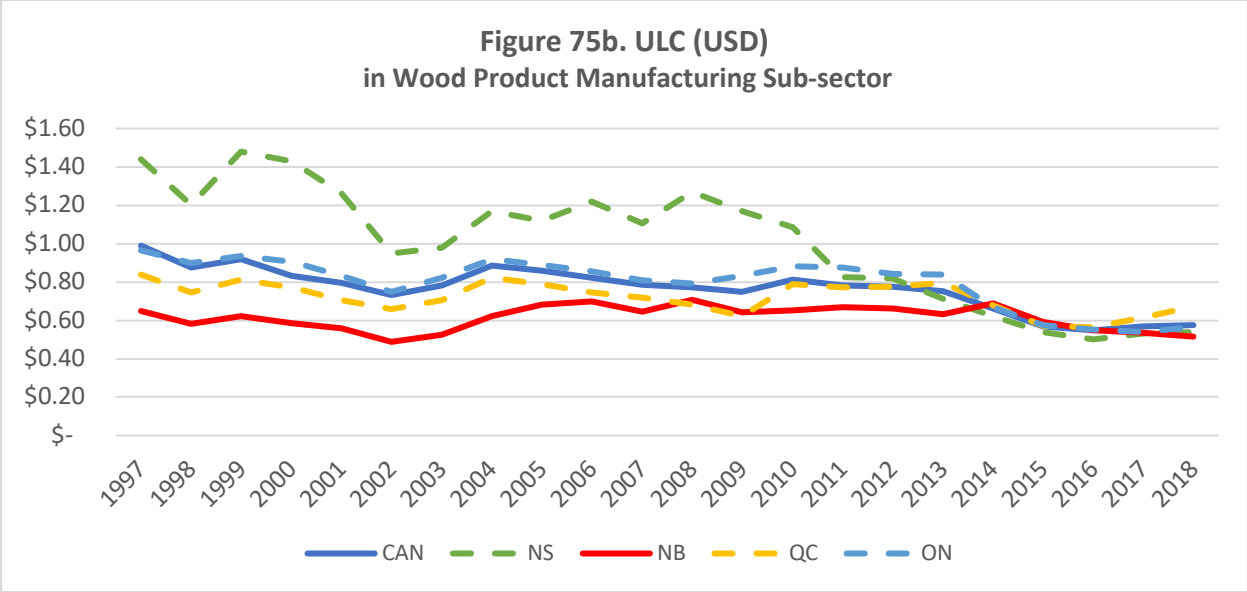


Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

Wood product manufacturing is heavily influenced by the American market. Therefore, while the exchange rate is important for all New Brunswick manufacturing, it is of particular importance for wood product manufacturing. For this reason, it is useful to look at the ULC in USD. This is the same ULC as in CAD, but multiplied by the exchange rate.

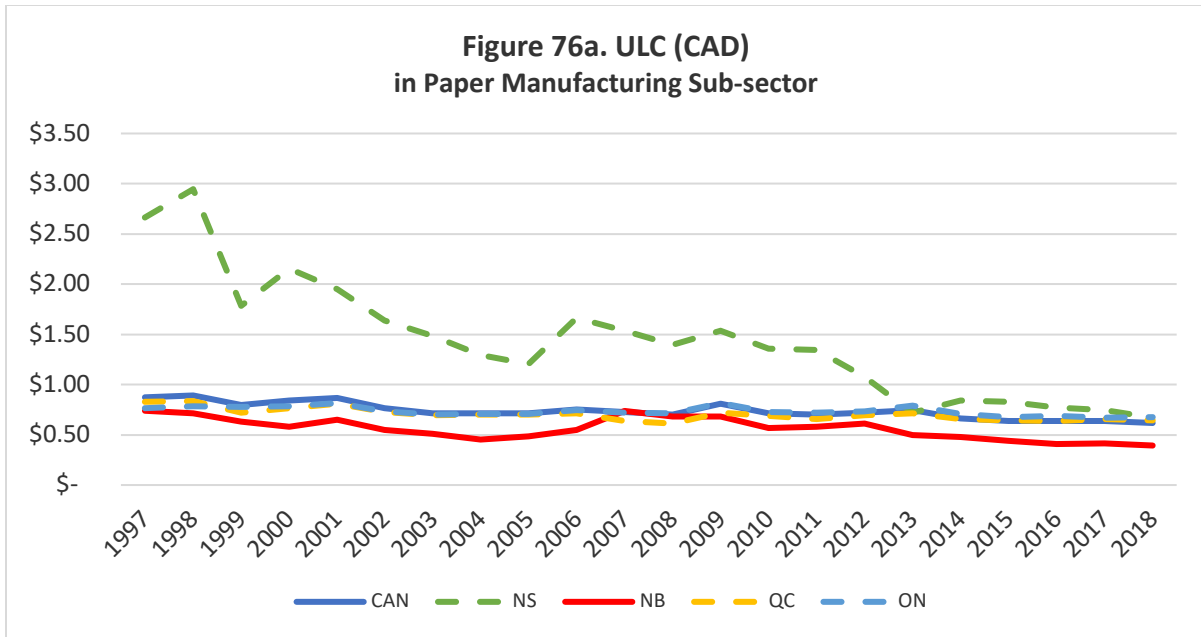
In Figure 75b, we see that the patterns for ULC (USD) for wood product manufacturing is very similar to patterns for the ULC (CAD) in Figure 40a, but at a much lower value: New Brunswick's ULC (USD) is close to 0.52 in 2018, while it was 0.67 in ULC (CAD). These lower rates make exporting wood products to the United States profitable.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

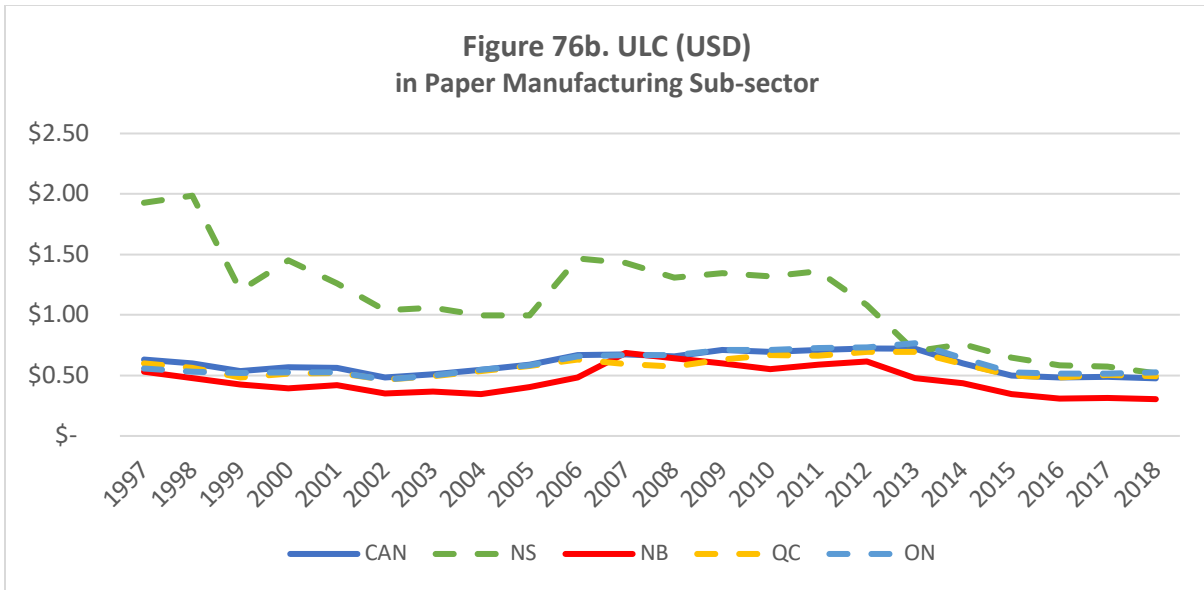
Figure 76a shows New Brunswick's paper manufacturing ULC is consistently the lowest, except for the years 2007-2009 when it was very close to the other provinces' ULCs. There are two periods of decline, from 1997 to 2004, and again from 2007 to 2018 (although between 2010 and 2012 there is a pause). Between 2004 and 2007, New Brunswick's ULC increased. ULCs for Quebec, Ontario, and Canada were slightly above New Brunswick's, but not significantly. Nova Scotia had a much higher ULC from 1997-2011, but it decreased in the long term, and was close to those of Quebec, Ontario, and Canada by 2013.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

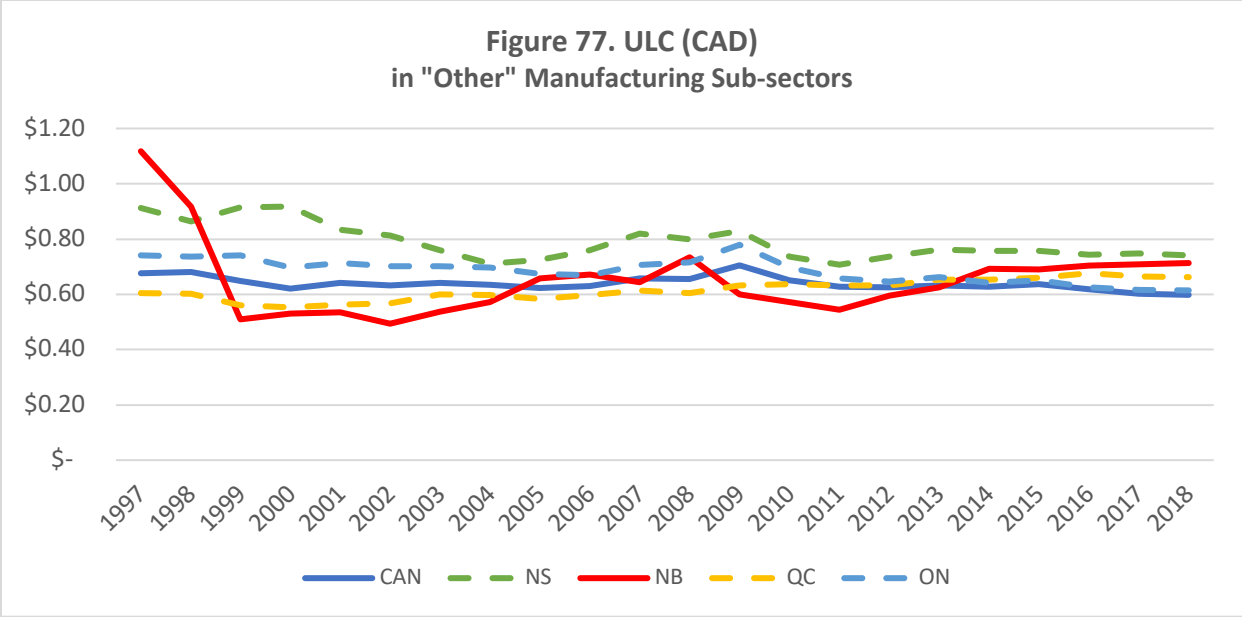
Similar to wood product manufacturing, New Brunswick paper manufacturing relies on exporting to the United States, meaning that looking at ULC in USD is again useful (Figure 76b). The same general patterns remain, although New Brunswick's decline between 2007 and 2018 becomes more pronounced in USD (the 2010-2012 period sees a slight increase in ULC that is quickly eliminated by the resumption of the decline in 2013). Factoring in the exchange rate lowers the more recent ULC (USD), but the ULC (CAD) for paper was already much lower than it was for wood products.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

In Figure 77, New Brunswick “other” manufacturing’s ULC saw a significant drop from 1997 to 1999, before increasing with some volatility until 2018. From 1999 to 2013, it had one of the lowest ULCs of Canada and the observed provinces, but by 2018 it had the second highest ULC after Nova Scotia.



Source: Statistics Canada. Table: 36-10-0480-01

Measured in 2012 Real Dollars (CPI Adjusted)

Author's calculations

Discussion and Conclusion

The manufacturing industry plays a very important role in the New Brunswick economy, both in terms of capital and employment. Key sub-sectors in terms of capital and employment are petroleum refining, food manufacturing, wood product manufacturing, and paper manufacturing.

Total manufacturing capital stocks have been decreasing due to declining investment, both in New Brunswick and elsewhere in Canada - particularly since 2007. However, after removing petroleum and coal products from consideration, it becomes apparent that New Brunswick's manufacturing capital stocks have been decreasing consistently since 1997. Food manufacturing was the one important sub-sector where capital stocks have increased.

Employment in New Brunswick manufacturing has held steady due to an increase in employment in food manufacturing. These two factors have combined to reduce the capital labor ratio in New Brunswick manufacturing. This is true in terms of total manufacturing (both with and without petroleum included), wood, and paper. Food manufacturing also saw its capital labour

ratio decrease, although this was due to employment in this sub-sector increasing quicker than capital stocks.

New Brunswick's low capital labour ratio has resulted in low labour productivity compared to Quebec, Ontario, and Canada as a whole. However, New Brunswick's low labour compensation has meant that it has a competitive unit labour cost compared to Quebec, Ontario, and Canada. New Brunswick had the lowest ULC for total manufacturing (with and without petroleum), wood product manufacturing, and paper manufacturing. New Brunswick paper manufacturing is unique, however, in that it had the highest labour productivity and lowest labour compensation compared to the other provinces and Canada.

As New Brunswick manufacturing is dependent on exporting goods to the United States, the exchange rate places a crucial role. As seen in the indices of New Brunswick manufacturing, RVA and ULC (USD) have a close relationship, with a low exchange rate increasing output. New Brunswick manufacturers have relied on a low exchange rate for a long-time to access the American market, and have varied their manufacturing output based on the exchange rate, giving the appearance of not being able to compete with American competition when the exchange rate does not give them an advantage. This is due to the higher productivity of their American competition (Holden, 2019, p. 12).

Due to the apparent labour shortage discussed in "Labour Shortages in New Brunswick" (2019) and New Brunswick's reliance on cheap labour and a low exchange rate to remain competitive, the future of New Brunswick's manufacturing industry remains uncertain. Manufacturers are not currently able to expand their production through increased labour, and a shortage of skilled labour is being cited as a hurdle for manufacturers to invest in new machinery and equipment (Holden, 2019, p. 16).

It is possible that growing the manufacturing labour forces through training investments as well as encouraging immigration and in-migration of both skilled and unskilled workers could allow New Brunswick to both solve its labour shortage problem, and enable manufacturers to invest in the capital necessary to compete with American competition without the assistance of a favourable exchange rate. Capital investment may also be required to increase productivity. Investment in newer production technologies and equipment, for example, could increase output without relying on a large, unskilled labour force.

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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>

Statistics Canada. Table 36-10-0480-01 Labour productivity and related measures by business sector industry and by non-commercial activity consistent with the industry accounts. Retrieved from <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610048001>

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'Labour shortages in NB', Work in Progress, Jane Amachree, 2019

Appendix

Table A1. NB Manufacturing Industry' Capital Shares	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Food manufacturing	10%	9%	8%	7%	8%	9%	9%	9%	9%	9%	9%	10%	10%	11%	11%	11%	12%	13%	13%	13%	14%
Beverage and tobacco products manufacturing	2%	1%	1%	1%	1%	1%	1%	1%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Textile and textile product mills manufacturing	2%	2%	3%	3%	4%	5%	5%	5%	4%	3%	3%	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%
Clothing and leather and allied product manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wood product manufacturing	10%	11%	10%	9%	9%	9%	9%	10%	10%	10%	9%	9%	8%	9%	8%	8%	8%	8%	8%	8%	8%
Paper manufacturing	48%	45%	38%	31%	30%	28%	29%	27%	25%	24%	24%	24%	24%	23%	21%	21%	21%	21%	21%	21%	20%
Printing and related support activities	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Petroleum and coal products manufacturing	11%	12%	22%	34%	34%	34%	34%	34%	35%	36%	36%	37%	39%	39%	42%	42%	41%	40%	40%	41%	41%
Chemical manufacturing	3%	3%	3%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Plastics and rubber products manufacturing	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	2%	1%	1%	1%	1%
Non-metallic mineral product manufacturing	2%	2%	2%	2%	2%	2%	2%	2%	3%	5%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Primary metal manufacturing	3%	3%	3%	2%	3%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	3%	3%	3%	3%	3%
Fabricated metal product manufacturing	1%	1%	1%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	1%
Machinery manufacturing	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Computer and electronic product manufacturing	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Electrical equipment, appliance and component manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Transportation equipment manufacturing	4%	4%	3%	3%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Furniture and related product manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%
Miscellaneous manufacturing	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%
Food, Wood, Paper, Petro Combined	79%	78%	78%	82%	80%	80%	80%	80%	81%	81%	79%	80%	81%	81%	82%	82%	81%	81%	83%	83%	83%

Source: Statistics Canada. Table 36-10-0096-01

Capital measured in 2012 chained dollars.

Table A2. NB Manufacturing Industry¹ Capital Shares Excluding Petroleum & Coal Product Sub-sector	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Food manufacturing	11%	11%	10%	11%	12%	13%	13%	14%	14%	14%	14%	15%	16%	18%	18%	19%	20%	20%	22%	22%	24%
Beverage and tobacco products manufacturing	2%	2%	1%	1%	1%	1%	1%	2%	2%	4%	5%	5%	5%	5%	5%	6%	6%	6%	5%	5%	4%
Textile and textile product mills	2%	2%	4%	5%	7%	7%	7%	7%	6%	5%	5%	5%	4%	4%	3%	3%	3%	2%	2%	2%	2%
Clothing and leather and allied product manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wood product manufacturing	11%	12%	13%	14%	14%	14%	14%	15%	16%	16%	15%	14%	14%	14%	15%	14%	13%	14%	14%	14%	14%
Paper manufacturing	54%	52%	48%	47%	44%	43%	43%	42%	42%	40%	38%	39%	39%	38%	37%	37%	35%	35%	35%	35%	34%
Printing and related support activities	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Chemical manufacturing	3%	4%	3%	3%	3%	3%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Plastics and rubber products manufacturing	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	3%	2%	2%	2%	3%
Non-metallic mineral product manufacturing	2%	2%	3%	3%	3%	3%	3%	3%	4%	7%	6%	6%	6%	6%	5%	5%	5%	5%	5%	4%	4%
Primary metal manufacturing	3%	3%	3%	4%	4%	4%	3%	3%	2%	2%	2%	2%	2%	2%	2%	3%	4%	5%	5%	5%	5%
Fabricated metal product manufacturing	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%
Machinery manufacturing	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	1%	2%	1%	1%	1%	1%	1%	1%	1%	2%
Computer and electronic product manufacturing	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Electrical equipment, appliance and component manufacturing	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Transportation equipment manufacturing	5%	5%	4%	4%	4%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	2%	2%
Furniture and related product manufacturing	0%	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Miscellaneous manufacturing	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	3%	3%	3%	3%	3%	2%	2%	2%	2%	1%
Food, Wood, Paper, Petro Combined	76%	75%	72%	73%	70%	70%	70%	70%	71%	70%	67%	68%	69%	69%	69%	69%	68%	69%	71%	71%	71%

Source: Statistics Canada. Table 36-10-0096-01

Capital measured in 2012 chained dollars.

Table A3. NB Manufacturing Industry' Labour Shares (measured as hours worked)																						
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Food manufacturing	22%	20%	21%	19%	19%	20%	20%	18%	20%	21%	21%	22%	30%	30%	32%	36%	34%	34%	36%	36%	35%	34%
Beverage and tobacco products manufacturing	2%	2%	2%	2%	1%	2%	2%	2%	2%	3%	2%	3%	3%	3%	3%	2%	4%	3%	2%	2%	2%	3%
Textile and textile product mills	2%	3%	2%	3%	3%	4%	5%	6%	4%	3%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Clothing and leather and allied product manufacturing	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Wood product manufacturing	26%	26%	27%	25%	26%	23%	23%	22%	23%	21%	16%	16%	15%	16%	16%	14%	14%	17%	18%	18%	18%	18%
Paper manufacturing	15%	16%	16%	16%	16%	16%	16%	18%	11%	11%	16%	13%	10%	12%	10%	10%	11%	10%	11%	12%	11%	11%
Printing and related support activities	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%
Petroleum and coal products manufacturing	1%	1%	0%	1%	1%	1%	1%	1%	3%	3%	3%	4%	6%	5%	5%	4%	4%	4%	4%	3%	4%	4%
Chemical manufacturing	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Plastics and rubber products manufacturing	3%	3%	3%	3%	4%	4%	4%	4%	5%	6%	5%	5%	4%	3%	4%	4%	4%	4%	4%	4%	5%	5%
Non-metallic mineral product manufacturing	3%	3%	3%	3%	3%	4%	4%	3%	4%	5%	4%	5%	4%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Primary metal manufacturing	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Fabricated metal product manufacturing	4%	5%	6%	6%	6%	6%	6%	5%	6%	7%	8%	9%	9%	8%	7%	7%	7%	7%	6%	5%	6%	5%
Machinery manufacturing	3%	3%	3%	3%	4%	4%	5%	5%	6%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	4%	4%
Computer and electronic product manufacturing	2%	2%	1%	2%	1%	1%	0%	0%	1%	1%	0%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Electrical equipment, appliance and component manufacturing	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Transportation equipment manufacturing	3%	3%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%	2%	2%	2%
Furniture and related product manufacturing	3%	3%	3%	4%	3%	4%	4%	3%	5%	5%	5%	5%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Miscellaneous manufacturing	4%	4%	4%	4%	4%	5%	4%	6%	6%	6%	5%	6%	4%	6%	6%	6%	6%	6%	4%	3%	3%	3%
Food, Wood, Paper Combined	63%	63%	65%	60%	62%	59%	59%	58%	54%	53%	54%	51%	55%	57%	58%	60%	59%	61%	65%	66%	64%	63%

Source: Statistics Canada. Table 36-10-0480-01