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Northern Projections
Human Capital Series - TIMISKAMING DISTRICT

Who We Are - Northern Ontario Workforce Planning

Workforce Planning Ontario is a network of 26 Workforce Planning Boards covering four regions across the province. Workforce Planning Boards gather intelligence about the supply and demand side of the local labour market and work in partnership with employers, employment services, educators, researchers, economic development, government and other stakeholders to identify, understand and address labour market issues. This includes supporting and coordinating local responses to meet current and emerging workforce needs.

Given the unique geography and labour market issues that impact Northern Ontario, all 6 planning boards in the north have collaborated to form Northern Ontario Workforce Planning. They include: Algoma Workforce Investment Corporation (AWIC); Far Northeast Training Board (FNETB); The Labour Market Group (LMG); Northwest Training and Adjustment Board (NTAB); North Superior Workforce Planning Board (NSWPB); and Workforce Planning for Sudbury & Manitoulin (WPSM). FNETB and NSWPB are currently pilot sites for Local Employment Planning Councils (LEPC).



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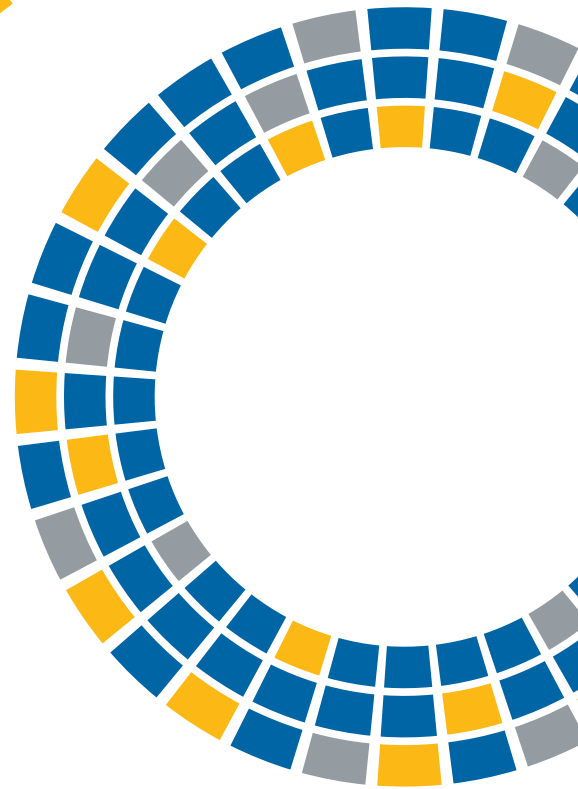
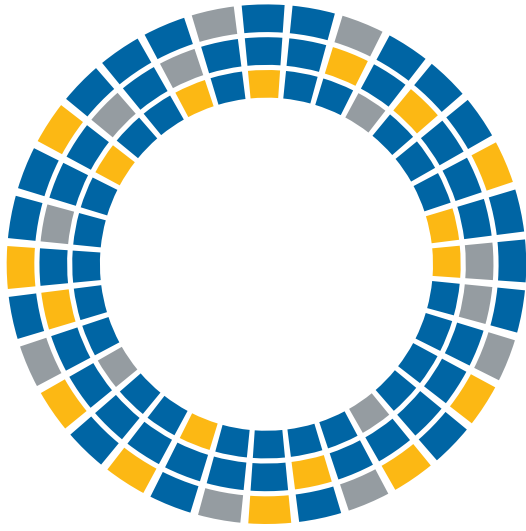
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The Northern Ontario Workforce Planning Boards and *Employment Ontario* project are funded by the Ontario government.

The views expressed in this document do not necessarily reflect those of Employment Ontario.



Who We Are

Some of the key players in this model, and their roles, are as follows:

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Author's calculations are based on data available at the time of publication and are therefore subject to change.

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Dr. Bakhtiar Moazzami



Dr. Moazzami has taught Economics and Econometrics at Lakehead University since 1988. He is well known for his research activities particularly related to Northern Ontario. He has written many reports on Northern Ontario's economic development challenges and opportunities. He was commissioned by the Ministry of Northern Development and Mines to undertake a comprehensive study of Northern Ontario's economy as a part of the research conducted for the Growth Plan for Northern Ontario. Included in the study were the identification of growing, declining and emerging industrial clusters in the region. Professor Moazzami has also written extensively on Northern Ontario's Aboriginal people and Northern Aboriginal economy. Dr. Moazzami's expertise and influence reaches beyond Lakehead University and Northern Ontario. He has been a regular guest speaker at the University of Waterloo's Economic Development Program.

Executive Summary

Timiskaming district's economy has undergone a significant transformation over the past three decades. The objective of this study is to examine past and present trends and characteristics in Timiskaming's economy and to forecast its future challenges and opportunities. The authors find that there are several socio-economic and labour market trends unfolding that will have an adverse impact on Timiskaming's competitive position and the standard of living of residents if not addressed immediately. The author's recommend that Timiskaming district must: 1) bolster its population levels, 2) improve rural and Aboriginal education, and 3) refocus existing resources and stimulate entrepreneurship and economic diversification.

Timiskaming district's population declined from 40,307 in 1986 to 32,634 in 2011, a decline of 19 percent. Many factors explain the declining population. First, Timiskaming has experienced notable out-migration throughout 2002-2014. Second, Northeastern Ontario has been receiving disproportionately low rates of immigration which impacts population growth in Timiskaming. Third, the total fertility rate in Northeastern Ontario (1.60) has been significantly below the generational replacement rate of 2.1. This has meant that the baby boomers are followed by much smaller generations.

Trends of out-migration, low rates of immigration and low fertility rates in the regional economy, coupled with rising life expectancy in Canada have resulted in the aging of Timiskaming's population. Individuals below the age of 20 in the region have declined from 30 percent of the total population in 1991 to 21 percent in 2011, while the share of seniors rose from 10 percent in 1991 to 19 percent in 2011. As a result, the total dependency ratio — the number of mouths to feed relative to the number of working-age persons — is above the provincial average and growing.

The total population in Timiskaming district is expected to continue to decline by 7 percent from 2013 to 2041, while the Aboriginal population is expected to rise by 26.3 percent, resulting in an increase in their share of the region's population from 5.0 percent to 7.0 percent over that period. Along with the decline in the total population, the size of the Timiskaming's labour force is expected to decline by 24.5 percent between 2013 and 2041. The size of the Aboriginal labour force, however, is expected to increase by 10 percent, which will increase their share of Timiskaming's labour force from 4.5 percent in 2013 to 6.6 percent in 2041.

This study also shows that the human capital composition of the working age population – for both the total population and the Aboriginal population – in Timiskaming district is below that in Northeastern Ontario, Ontario and Canada. If educational

achievement continues at their current levels in Timiskaming district, the human capital composition of the workforce will decline in the coming years, ultimately having an adverse effect on labour productivity, labour income and output in the district.

The declining supply of labour and labour productivity in Timiskaming district are only half of the story. Recent technological change and the emergence of the knowledge economy have changed the requirements of the labour market. Various studies suggest that about 66.9 percent of current jobs require post-secondary education and this skill requirement will rise to about 77.1 percent by 2030. Currently, Timiskaming district is significantly below these levels, so it is anticipated that if the skill levels of the workforce in the region remain at their current level or decline in the future while skill requirements of the workforce rise, the region will end up with people without jobs and jobs without people. Even if markets adjust to bring demand and supply of labour into balance, the social impact of having many unemployable people will be enormous.

The findings in this study suggest that many of the demographic and economic trends affecting Timiskaming district are foreboding. As such, the region's long-term prosperity lies in its ability to:

- 1) Bolster its population levels by using dependency ratios – the number of mouths to feed relative to the number of working-age persons – to find an appropriate target. Specifically, Timiskaming should strive to close their dependency ratio gap with that of Ontario's, which can be achieved through immigration, in-migration and youth retention strategies.
- 2) Improve rural and Aboriginal education levels – if education levels in Timiskaming district remain at their current level or decline in the future while skill requirements of the workforce rise, the region will end up with people without jobs and jobs without people. The evidence in this report demonstrates that higher educational attainment leads to higher participation and employment rates and lower unemployment rates.
- 3) Refocus existing resources and stimulate entrepreneurship and economic diversification – despite the demographic challenges, the region enjoys significant natural resources, agricultural opportunities and access to the large North American market. Timiskaming's long-term and prosperous growth depends on its ability to utilise and refocus existing economic development resources in order to stimulate and support entrepreneurship aimed at strengthening and enhancing industrial clusters.

Introduction

The objective of this study is to examine past and present trends and characteristics in Timiskaming district's (hereafter also referred to as Timiskaming) economy and to forecast its future challenges and opportunities. The study focuses primarily on the supply side of the economy. The authors examine the region's labour market including its human capital composition; employment trends; the shifting occupational composition of the employed workforce; the shifting of the region's industrial composition from goods-producing to services-producing sectors; the declining share of the private sector; the region's rising dependency on the public sector; and declining labour income and gross domestic product (GDP) in Timiskaming.

The report begins by examining demographic change in Timiskaming district over the past three decades and by defining and estimating various dependency indicators.

The study then looks into the future and provides projections for the total and Aboriginal populations of Timiskaming district over the next three decades. From these population projections, the study estimates past, present and future trends in the size and composition of Timiskaming's labour force.

In the following section, the study defines and quantitatively measures the human capital composition of Timiskaming district's workforce in the coming years. This section also discusses the implications of the growing application of technology in the production process and, accordingly, the future skill requirements of the workforce.

The report then moves on to discuss the consequences of shifting the composition of the employed labour force in Northeastern Ontario from goods-producing, dominated by private businesses, to services-producing, predominantly financed by the public sector. The study also examines the shifting occupational composition of the employed workforce, and the implication thereof for total income and GDP in Timiskaming.

The study concludes with a summary and discussion of some policy implications.

Data Sources

Most of the data used are based on detailed information regarding individual census subdivisions (CSDs) in Timiskaming district and Northeastern Ontario obtained through special tabulations from Statistics Canada. Except for the population data, the 2011 data are based on the 2011 National Household Survey (NHS). Total population forecasts are based on data made available by the Ontario Ministry of Finance.

Population Groups Studied

The report provides information on the following four population groups:

- The total population;
- The francophone population, defined as individuals who report their mother tongue to be French;
- The Aboriginal population, defined by Statistics Canada as persons who reported identifying with at least one Aboriginal group – that is, North American Indian, Metis or Inuit – and/or those who reported being a Treaty Indian or a registered Indian, as defined by the Indian Act, and/or those who reported they were members of an Indian band or First Nation; and
- Immigrant population defined as persons who are, or have ever been, landed immigrants in Canada.

The Geographical Specification of Northeastern Ontario

Northern Ontario is subdivided into Northwestern and Northeastern Ontario. The three most western Census districts – namely Rainy River, Kenora and Thunder Bay – constitute Northwestern Ontario. The region that lies north and east of Lakes Superior and Huron constitutes Northeastern Ontario. It is defined to include the following census divisions: Cochrane, Timiskaming, Algoma, Sudbury, Nipissing, Manitoulin, Parry Sound and Greater Sudbury. The federal government and FedNor also include Muskoka district in their definition of Northeastern Ontario. The provincial government removed the district of Muskoka from the jurisdictional area of the Ministry of Northern Development and Mines and the Northern Ontario Heritage Fund in 2004, but has continued to include Parry Sound as a Northern Ontario division. This is what the authors have assumed in the present study.



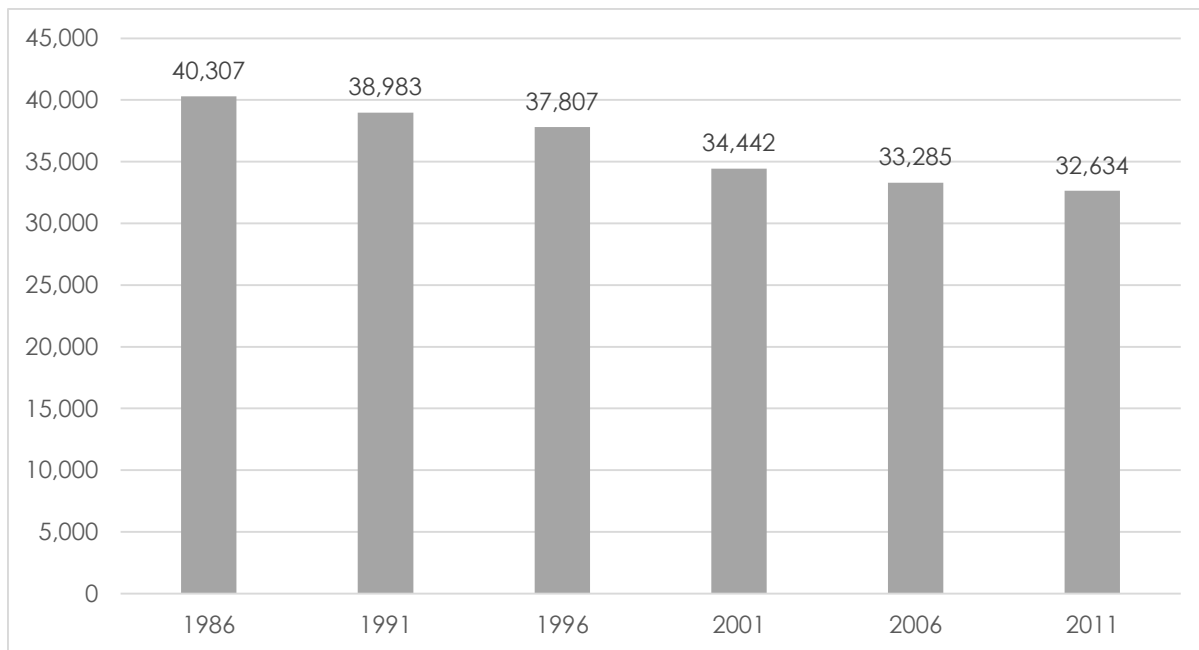
Demographic Change in Timiskaming District: The Past Three Decades

Timiskaming district covers 13,300 square kilometers and recorded a population of 32,634 in 2011. It has a population density of 2.5 persons per square kilometer which is well below that of Ontario (14.1). According to Statistics Canada's census of population, Timiskaming's population has declined steadily from 40,307 in 1986 to 32,634 in 2011, which translated into a 19 percent decline over this period (Figure 1).

In terms of net migration flows, Timiskaming experienced both intraprovincial and interprovincial out-migration from 2002 to 2014 (Table 1). Intraprovincial out-migration refers to the movement of individuals to another region within the province, while interprovincial migration is the movement of individuals from one province to another.

In addition to out-migration of youth in the region, rising life expectancy and lower fertility rates have contributed to the aging of Timiskaming's population. Average life expectancy at birth in Canada increased from 71.13 years in 1960 to 81.24 years in 2012. At the same time, the large baby-boom generation, born in the two decades following World War Two, is now beginning to retire. The generations that followed were much smaller, primarily due to a declining fertility rate. As a result the share of individuals in Timiskaming district below the age of 20 has declined from 30 percent in 1991 to 21 percent in 2011, while the share of seniors rose from 10 percent in 1991 to 19 percent in 2011 (Figure 2). During the same period, the share of individuals between the ages of 20 to 34 declined from 24 to 15 percent, while individuals aged 35 to 64 increased from 27 to 44 percent.

Figure 1: Population, Timiskaming District, 1986–2011



Sources: Statistics Canada, Census of Canada; and idem, National Household Survey.

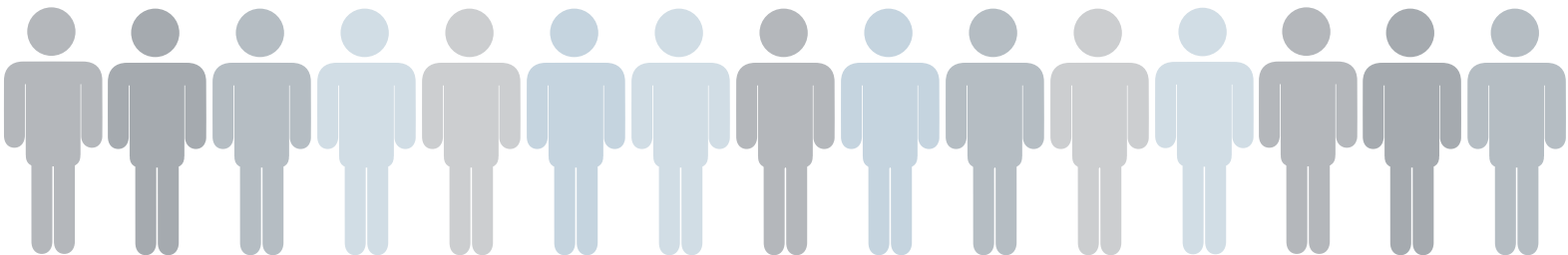
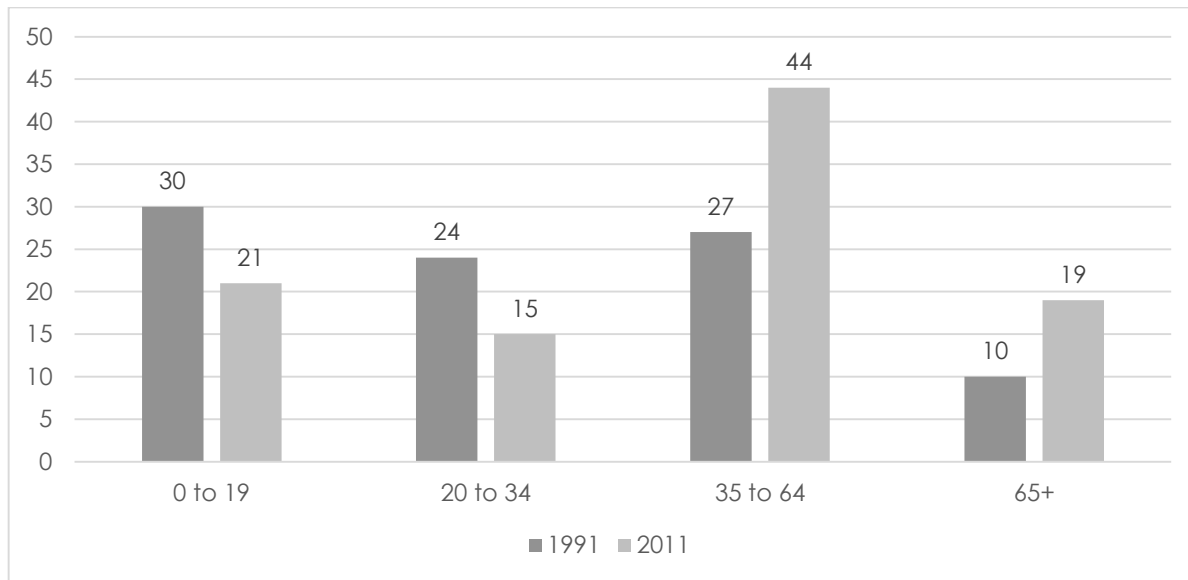


Figure 2: Age Distribution of Population, Timiskaming District, 1991–2011



Source: Author's calculations based on Statistics Canada, Census of Canada, and National Household Survey, custom tabulation.

Table 1: Net Migration Flows, Timiskaming District, 2002–2014

	Net Interprovincial Migration	Net Intraprovincial Migration	Total Net Migration
Timiskaming	-568	-1,510	-2,078

Source: Author's calculations based on Statistics Canada, CANSIM database, table 051-0053.

These demographic changes have had a significant impact on social and economic conditions in Timiskaming. The population will continue to age in the foreseeable future, with implications for the supply of labour, production capacity, and the ability of Timiskaming to stay economically viable. One important aspect of the aging population relates to the relationship between economically active and economically dependent age groups – that is, the ratio between the working population on the one hand and the young and elderly on the other.

This study examines three dependency ratios: old age dependency, defined as the number of persons ages 65 years and older relative to the working-age population (ages 20 to 64); youth dependency, defined as the ratio of the number of persons ages 20 years and younger to the working-age population; and total dependency ratio, defined as the ratio of the total dependent population, which is essentially the number of mouths to feed, to the working-age population. This last ratio is a crude measure of the burden or cost associated with demographic change in terms of raising and educating children as well as taking care of the elderly at any given time. Assuming jobs are available for the working-age population, a rising dependency ratio suggests that there are more dependent persons per each member of the working-age population. A declining dependency rate implies that there are more working persons per dependent, enabling a region to reap the benefits of increased production capacity, therefore lowering the costs associated with the declining proportion of dependents.

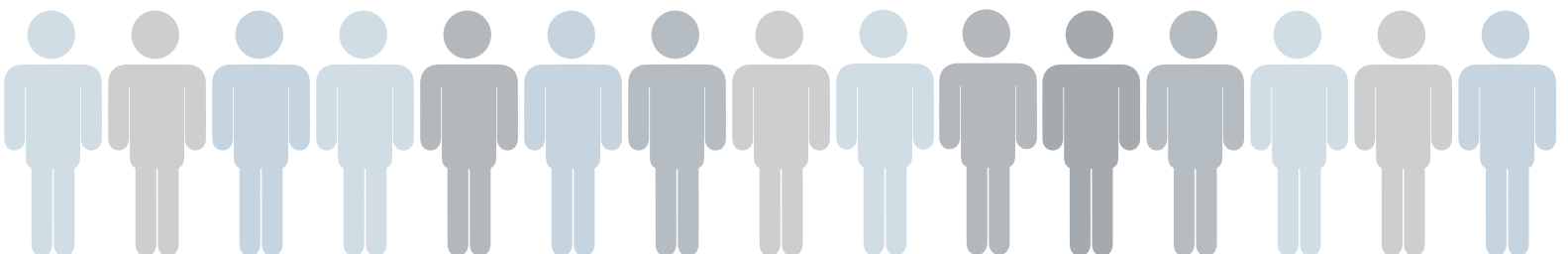
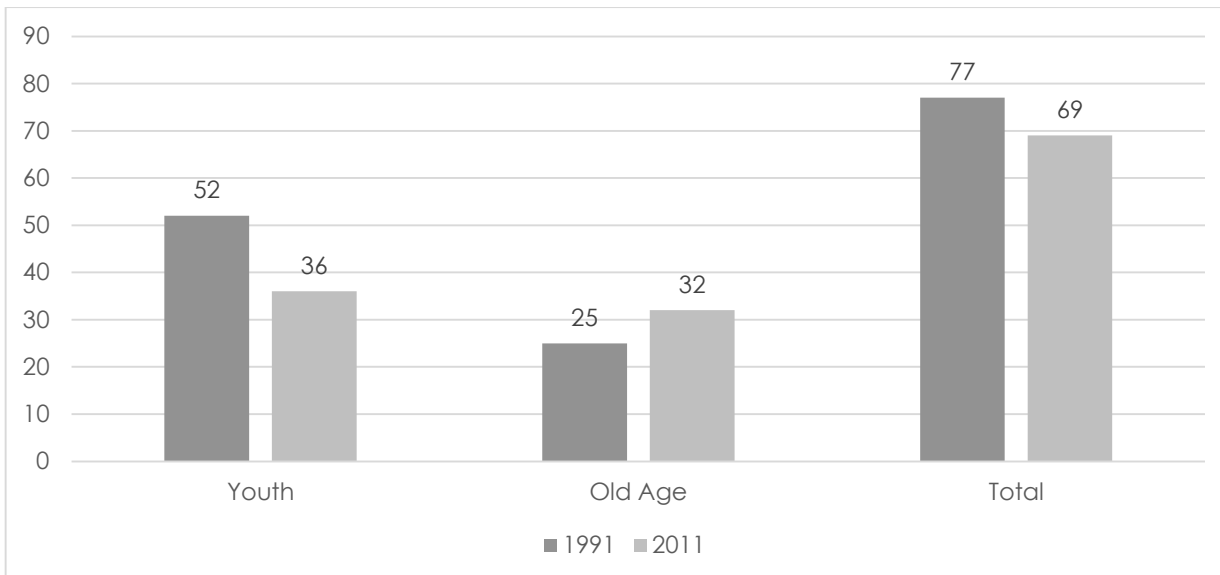


Figure 3 shows that, in Timiskaming district, the youth dependency ratio declined from 52 persons per every 100 working-age persons in 1991 to 36 in 2011 due to the fact that the number of youth declined much faster than the number of working-age persons. During the same period, the youth dependency index declined from 44 to 38 youth to every 100 working age persons in Ontario.

At the same time, the old age dependency rose from 25 to every 100 working age individuals in 1991 to 32 in 2011 due to an increasing number of seniors relative to the working age population. In other words, there were 4 working persons in 1991 per each senior, but only 3.1 per senior in 2011. The ratio of seniors to working age population in Timiskaming district (32) is significantly above the provincial value of 24 to every 100 working age persons in 2011. Having higher old age dependency ratios can have budgetary implications related to health care and other expenditures required to care for the seniors in the coming years. This ratio is expected to continue to rise as working age persons retire and change their status from working to retired in the future.

Overall, the total dependency rate – the number of youths and seniors relative to those of working age – declined from 77 in 1991 to 69 in 2011, suggesting the district increased its capacity to support its non-working population over the period, although this ratio was still above the provincial average of 62 in 2011. This ratio is expected to rise as the baby boomers start to retire in the coming years. Decreasing the gap between the dependency ratios in Timiskaming district and those of the province as a whole could be a goal the region might strive to achieve in the long term.

Figure 3: Ratio of the Working-Age Population to Other Age Groups, Timiskaming District, 1991–2011



Source: Author's calculations based on Statistics Canada, Census of Canada, and National Household Survey, custom tabulation.

Demographic Change in Timiskaming District: The Next Three Decades

This part of the study provides population projections for Timiskaming district, both for the total population and for the Aboriginal population. Estimates for the former are based on projections by the Ontario Ministry of Finance; estimates for the latter are based on Northern Ontario's Demographic Model, developed by the author.

A few words regarding the Ministry of Finance projections are in order. First, the ministry's 2011 population estimates are about 1,266 greater than those reported by the 2011 census, having been adjusted for net undercoverage by the census, especially of the region's Aboriginal population in Timiskaming district and Northeastern Ontario.

Second, the Ministry's estimated parameters for fertility at the census division level were modelled to maintain regional differences. The census division-to-province ratio for mean age at fertility in the most recent period was assumed to remain constant.

Thirdly, the Ministry's mortality estimates at the census division level were developed using a ratio methodology. The Ministry applied the Ontario-level mortality structure to each census division's age structure over the most recent three years of comparable data and calculated the expected number of deaths. It then compared these estimates to the actual annual number of deaths in each census division over this period to create ratios of actual-to-expected numbers of deaths. These ratios were then multiplied by provincial age-specific death rates to create death rates for each census division. These were then applied to the corresponding census division population to derive the number of deaths for each census division.¹

Population Projections for Timiskaming District

Timiskaming district's total population is expected to decline from 33,509 in 2013 to 31,152 in 2041 (Table 2). The continuing aging of Timiskaming's population is also evident from the Ministry of Finance's projections (Table 3), with the share of individuals under age 20 expected to decline from 20.97 percent in 2013 to 20.19 percent in 2041, the share of working-age people (ages 20 to 64) projected to decline from 59.15 percent in 2013 to 47.36 percent in 2041, and the share of seniors is expected to rise from 19.88 percent in 2013 to 32.44 percent in 2041.² As the next part of the study will show, the dramatic decline in the working-age population has important implications for the future availability of a qualified labour force in the district.

Table 2: Population Projections by Age Group, Timiskaming District, 2013–2041

Timiskaming	0 - 19	20 - 44	45 - 64	65+	Total
2013	7,027	9,115	10,705	6,662	33,509
2020	6,571	8,537	9,588	8,021	32,717
2030	6,717	7,797	7,507	10,007	32,028
2041	6,291	7,389	7,366	10,106	31,152

Source: Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

Table 3: Population Projections by Age Distribution, Timiskaming District, 2013–2041

Timiskaming	0 - 19	20 - 64	65+
2013	20.97	59.15	19.88
2020	20.08	55.40	24.52
2030	20.97	47.78	31.24
2041	20.19	47.36	32.44

Source: Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

Projections of the Aboriginal Population

In making projections of Timiskaming's Aboriginal population out to 2041, this study employs Northern Ontario's Demographic Forecasting Model, which is based on the Cohort Component method.³ The base year data for the projection are from Statistics Canada's National Household Survey for 2011. In projecting the future Aboriginal population, this study does not adjust for the undercoverage of Aboriginal people in the region — as mentioned above, there were 1,266 omitted persons in Timiskaming district alone — so the projections should be considered conservative. This study also assumes zero net migration of Aboriginal people over the forecast period, since the existing evidence suggests there is relatively low mobility among the region's Aboriginal population. The fertility rate for the Aboriginal population is assumed equal to that in rural Northeastern Ontario, and the mortality rate to equal the rate for the general population of Canada based on the 2011 census.

¹ See Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

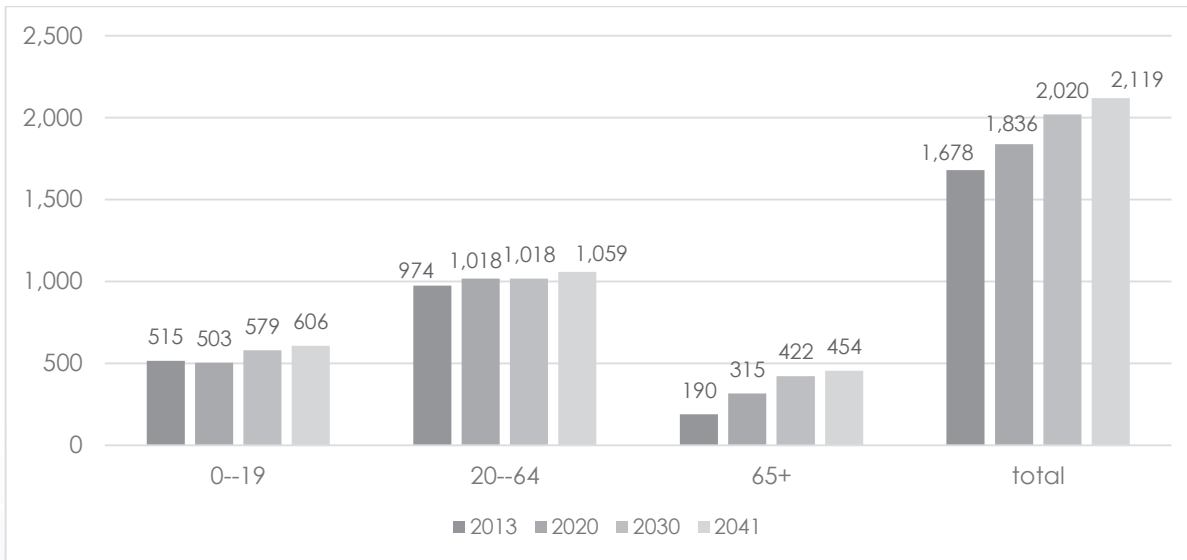
² Focus is placed on individuals aged 20 to 64 as the core working-age population since there has been a declining trend in the labour force participation rate of Ontario's youth in recent years primarily due to a significant rise in enrolment rates in postsecondary education institutions.

³ For a complete discussion of this model, see B. Moazzami, "It's What You Know (and Where You Can Go): Human Capital and Agglomeration Effects on Demographic Trends in Northern Ontario" (Thunder Bay, ON: Northern Policy Institute, 2015).

Based on these assumptions, Figure 4 shows that Timiskaming's Aboriginal population is expected to rise from 1,678 in 2013 to 2,119 in 2041, a growth rate of 26.3 percent. The number of individuals under age 20 are expected to increase by about 17.8 percent during this period, while working-age Aboriginals are expected to rise by about 8.7. The number of individuals aged 65 and over are expected to rise by about 138.9 percent from 2013 to 2041.

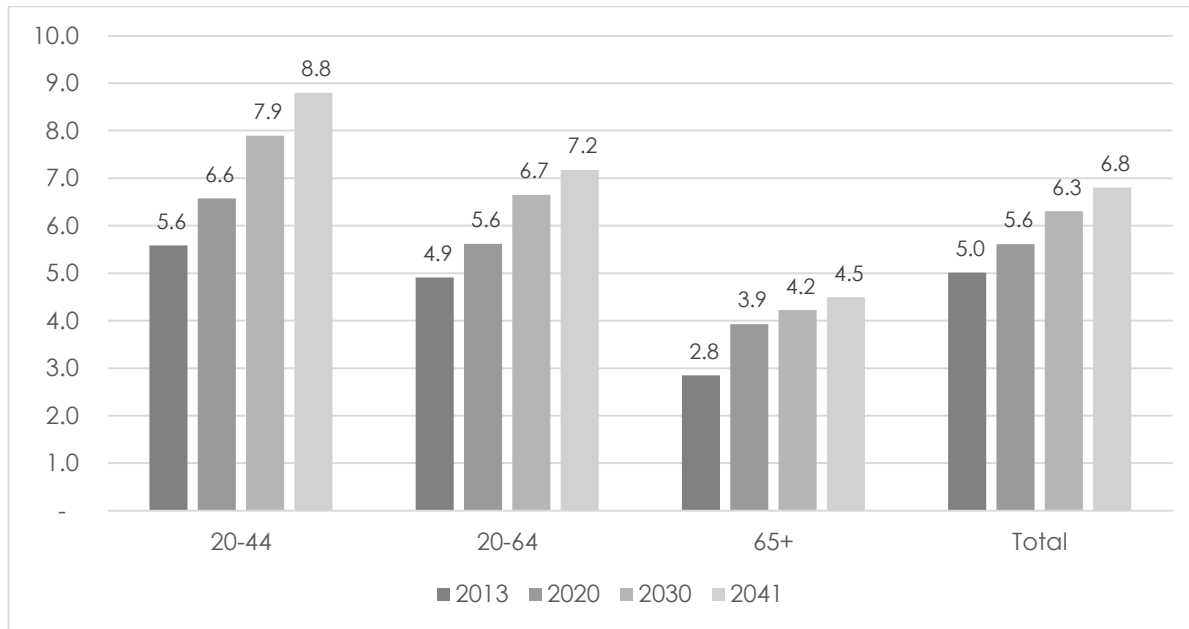
The Aboriginal population's share of total population in Timiskaming is relatively small but growing (Figure 5). It is expected to increase from 5.0 percent in 2013 to about 6.8 percent in 2041 (Figure 4). The share of prime-working-age population (those ages 20 to 44) is expected to increase from 5.6 percent in 2013 to 8.8 percent in 2041. Similarly, the share of working-age Aboriginals (those ages 20 to 64) is expected to increase from 4.9 percent in 2013 to 7.2 percent in 2041. The share of Aboriginal seniors is expected to rise from 2.8 percent in 2013 to 4.5 percent in 2041.

Figure 4: Aboriginal Population Projections by Age Group, Timiskaming District, 2013–2041



Source: Author's calculations based on Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

Figure 5: Projections of the Share of the Aboriginal Population, Timiskaming District, 2013–2041



Source: Author's calculations based on Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

Timiskaming District's Labour Force: Past, Present and Future Trends

Demographic changes have a direct impact on the supply side of the economy through their influence on the labour force. Population aging and a declining share of working age people can seriously restrain future economic development unless productivity growth accelerates or steps are taken to increase participation of older workers, youth and other underrepresented groups in the labour force.

This study has shown that the Aboriginal population represents a growing segment of Timiskaming district's total population and its working-age population. A significant gap exists, however, between the level of educational achievement of Aboriginal individuals and that of the general population, resulting in a severe labour market outcome disparity that affects the current and future productive capacity of Timiskaming's labour force.

Labour Market Trends in Northeastern Ontario and Timiskaming District

Table 4 shows various labour market indicators for Northeastern Ontario in 2001 and 2011. The total core working-age population (ages 15 to 64) in the region declined from 365,020 in 2001 to 364,100 in 2011. During the same period, labour force participation rate among women rose by 3.8 percent resulting in an increased number of people in the labour force. The Ontario Ministry of Finance reports that, "[t]he most significant trend driving the aggregate labour force participation rate in Ontario has been the increase in the number of women in the workforce. Labour force participation rates for adult women have risen dramatically, from 57.0 percent in 1976 to 82.0 percent in 2013."⁴ Total employment among men declined while that among women increased from 2001 to 2011. The unemployment rate among men and women both declined slightly during this period.

The labour force participation rate of Aboriginal men declined from 70.3 percent in 2001 to 66.6 percent in 2011. On the other hand, the participation rate among Aboriginal women increased from 49.2 percent in 2001 to 55.1 percent in 2011. The unemployment rate among Aboriginal men declined from 21.3 percent in 2001 to 16.4 percent in 2011, which can be attributed partly to some previously unemployed persons having stopped participating in the labour force. The unemployment rate among Aboriginal women also declined from 16.5 percent in 2001 to 11.0 percent in 2011. The

4 Ontario, Ministry of Finance, "Ontario's Long-Term Report on the Economy" (Toronto, 2014), [PAGE 15].

labour market outcome for Aboriginals who live on reserve is different from those who live off-reserve, where those living on-reserve have lower participation rates and much higher unemployment rates.

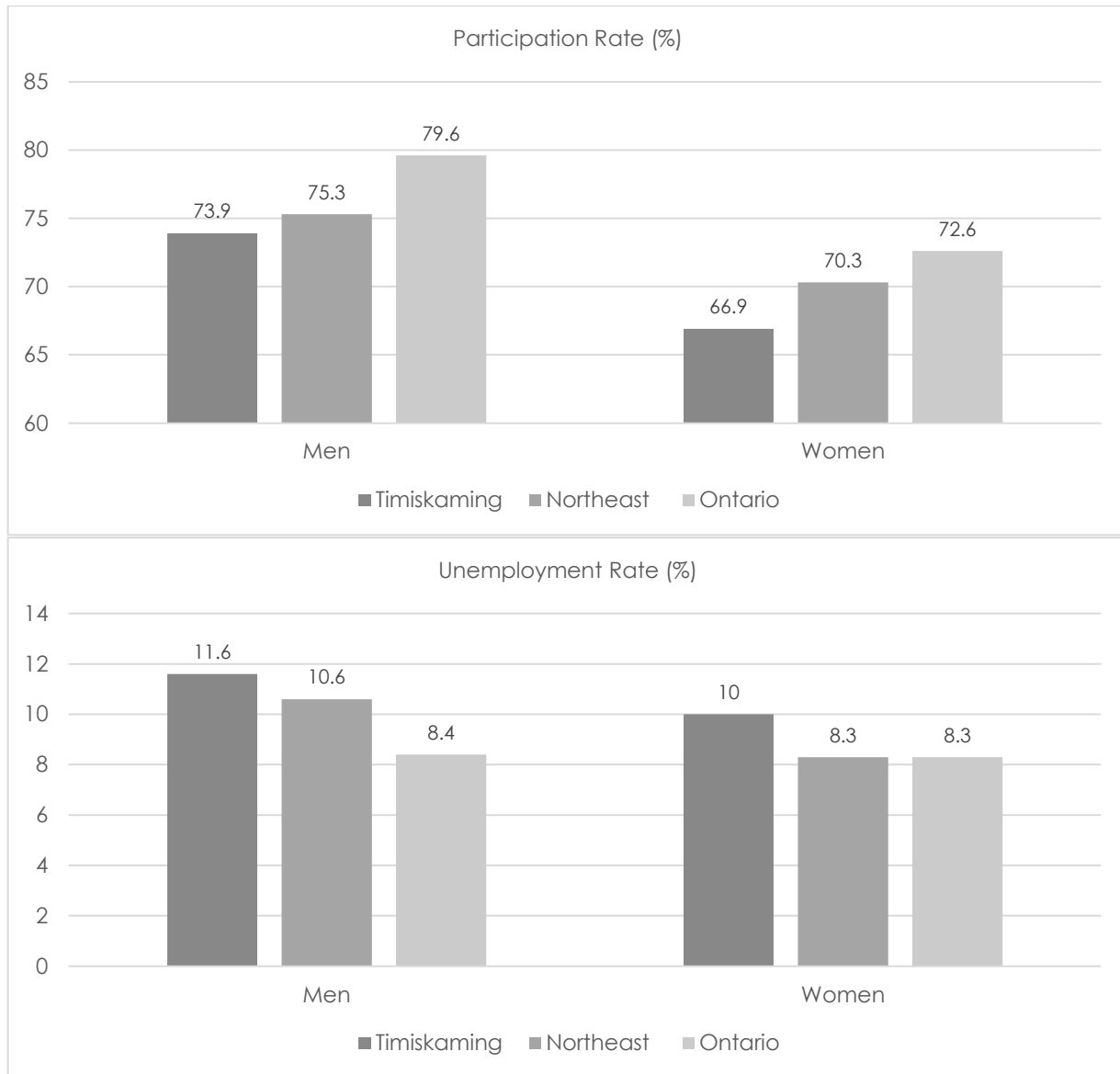
In terms of Timiskaming district, unemployment rates for both men and women in Timiskaming district were higher than both Northeastern Ontario and Ontario in 2011, while, at the same time, participation rates in Timiskaming were lower than these jurisdictions (Figure 6).

Table 4: Labour Market Trends, Northeastern Ontario, 2001 and 2011

Labour Market Outcome	Men		Women	
	2001	2011	2001	2011
Total Regional Population				
Total population 15 to 64 years of age	179,755	180,120	185,265	183,980
In the labour force	137,045	135,580	123,265	129,300
Employed	122,290	121,260	112,320	118,615
Unemployed	14,760	14,320	10,945	10,680
Not in the labour force	42,705	44,540	61,995	54,680
Participation rate	76.2	75.3	66.5	70.3
Employment rate	68.0	67.3	60.6	64.5
Unemployment rate	10.8	10.6	8.9	8.3
Francophones				
Total population 15 to 64 years of age	44,465	37,800	46,575	40,405
In the labour force	33,855	28,640	30,285	27,975
Employed	30,060	26,125	28,230	26,390
Unemployed	3,795	2,510	2,060	1,585
Not in the labour force	10,605	9,155	16,285	12,430
Participation rate	76.1	75.8	65.0	69.2
Employment rate	67.6	69.1	60.6	65.3
Unemployment rate	11.2	8.8	6.8	5.7
Immigrants				
Total population 15 to 64 years of age	9,555	7,345	10,650	8,660
In the labour force	7,165	5,415	6,440	5,480
Employed	6,670	5,055	6,070	5,080
Unemployed	495	355	370	400
Not in the labour force	2,390	1,930	4,205	3,175
Participation rate	75.0	73.7	60.5	63.3
Employment rate	69.8	68.8	57.0	58.7
Unemployment rate	7.0	6.6	5.8	7.3
Aboriginals				
Total population 15 to 64 years of age	13,015	19,135	13,855	20,635
In the labour force	9,145	12,740	8,155	12,765
Employed	7,195	10,655	6,810	11,360
Unemployed	1,950	2,085	1,345	1,410
Not in the labour force	3,870	6,400	5,700	7,870
Participation rate	70.3	66.6	58.9	61.9
Employment rate	55.2	55.7	49.2	55.1
Unemployment rate	21.3	16.4	16.5	11.0

Sources: Statistics Canada, Census of Canada, and National Household Survey, custom tabulation.

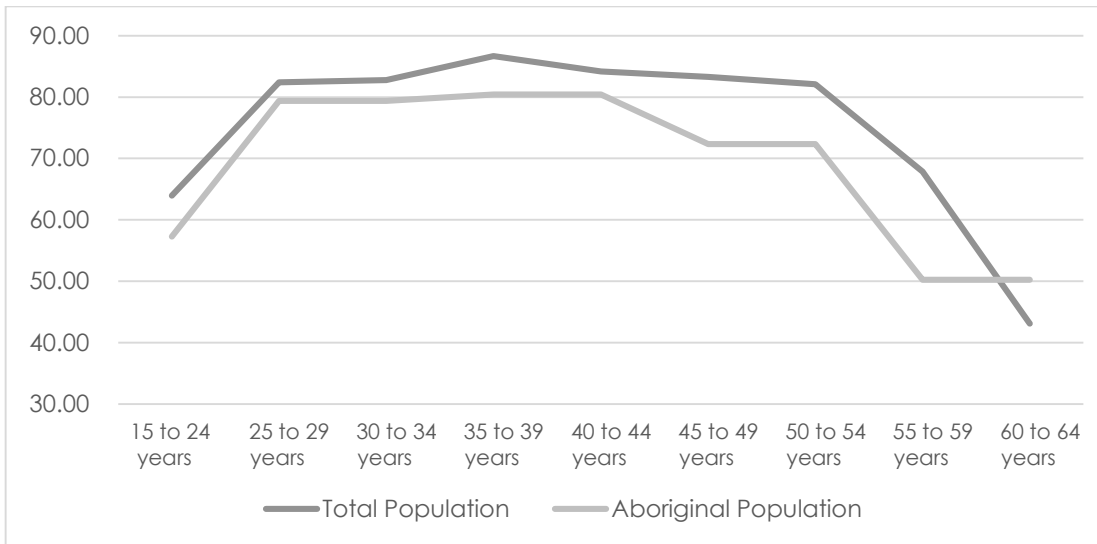
Figure 6: Labour Force Participation and Unemployment Rates, Timiskaming District and Northeastern Ontario, 2011



Sources: Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

In general, Aboriginals tend to participate in the labour force less than that of the total population. As Figure 7 shows, their labour force participation rate was below the regional average in 2011. Their unemployment rate was also significantly higher than the regional average. In fact, their lower labour force participation rate is partly attributable to the high unemployment rate among the Aboriginal workforce and partly related to their below average level of educational attainment of the Aboriginal labour force is below the regional average.

Figure 7: Labour Force Participation Rates (%), Total and Aboriginal Population, by Age Group, Northeastern Ontario, 2011



Sources: Statistics Canada, Census of Canada, and National Household Survey, custom tabulation.

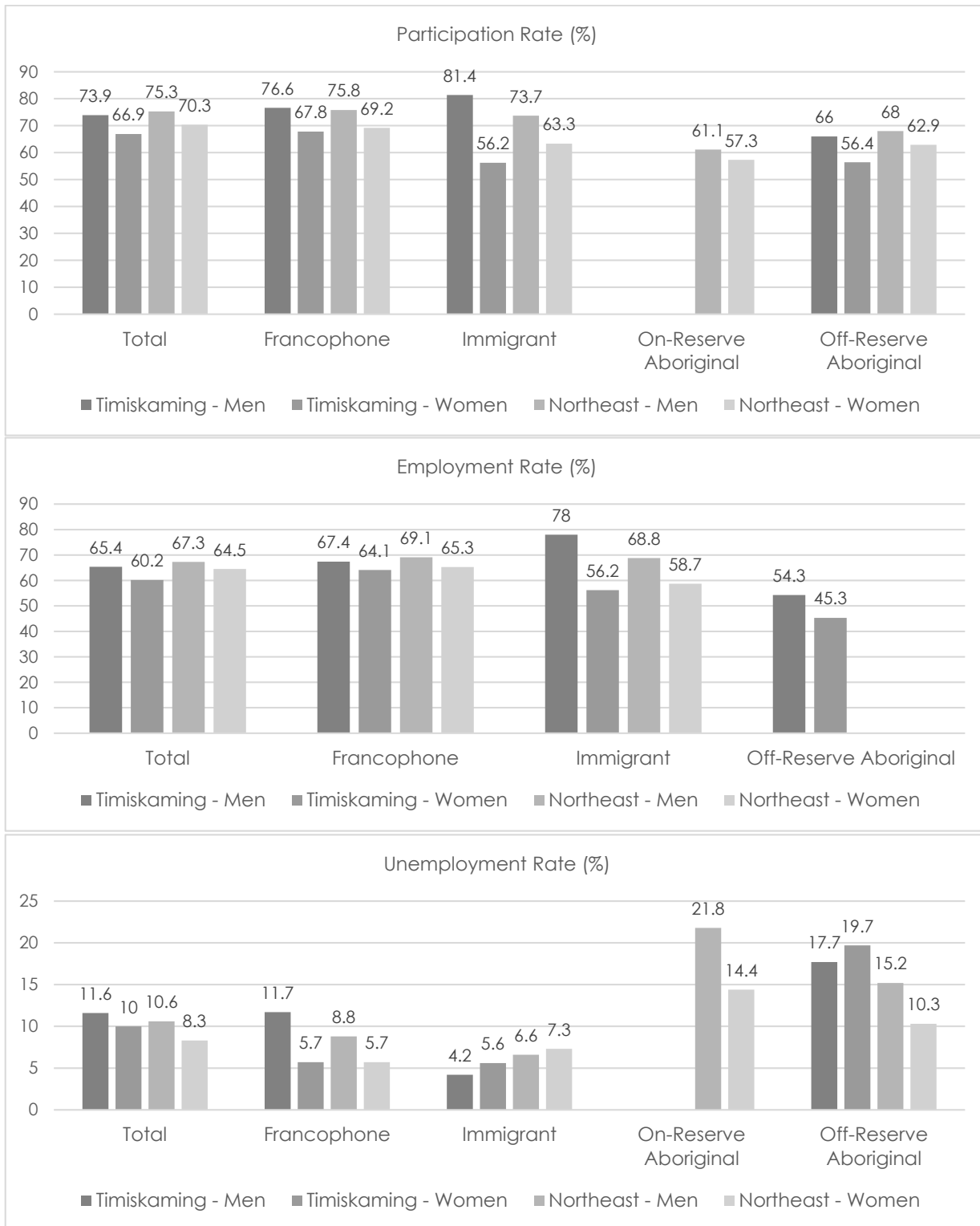
Figure 8 compares labour force characteristics among various demographics of the population in Timiskaming district and Northeast Ontario. Note that the indicators for population groups with fewer than 500 individuals are not very reliable. The labour force participation rate among men is 73.9 percent in Timiskaming compared to 75.3 percent in Northeastern Ontario and 76.0 percent in Ontario in 2011. The Aboriginal populations living off-reserve have the lowest participation rates compared to the rest of the population, while on-reserve participation rates are suppressed in Timiskaming district. The participation rate among women is 66.9 percent in Timiskaming compared to 70.3 percent in Northeastern Ontario and 72.6 percent in Ontario. The participation rate among the Aboriginal women off-reserve in Timiskaming is considerably lower than the levels across Northeastern Ontario.

The unemployment rate among men in Timiskaming is 11.6 percent compared to 10.6 and 8.4 in Northeastern Ontario and Ontario, respectively. The unemployment rate among women in Timiskaming is 10 percent compared to 8.3 percent in both Northeastern Ontario and the province as a whole. The unemployment rate among off-reserve Aboriginal men and women are the highest in Timiskaming at 17.7 percent and 19.7 percent, respectively, while on-reserve data is suppressed.

The employment rate which represents the share of the working-age population who were employed was 65.4 for men in Timiskaming compared to 67.3 percent in Northeastern Ontario in 2011. Again, the employment rates are generally lower for the Aboriginal population. The employment rate among the working age women is 60.2 percent in Timiskaming compared to 64.5 percent in the Northeast.



Figure 8: Labour Force Participation, Employment and Unemployment Rates (%), Ages 15 to 64 years, Timiskaming District and Northeast Ontario, 2011



Note: Missing bars indicate that data was not available.

Sources: Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

Size and Composition of the Future Labour Force

To forecast the future labour force in Timiskaming District and Northeastern Ontario, this study uses detailed population projections along with information regarding labour force participation rates for men and women in different age groups. It is assumed that participation rates during the projection period (out to 2041) stay constant at their 2011 level. Different assumptions regarding participation rates would alter the labour force estimates, but only to a limited extent. The main determinants of the future labour force are the size and age distribution of the population in each jurisdiction.

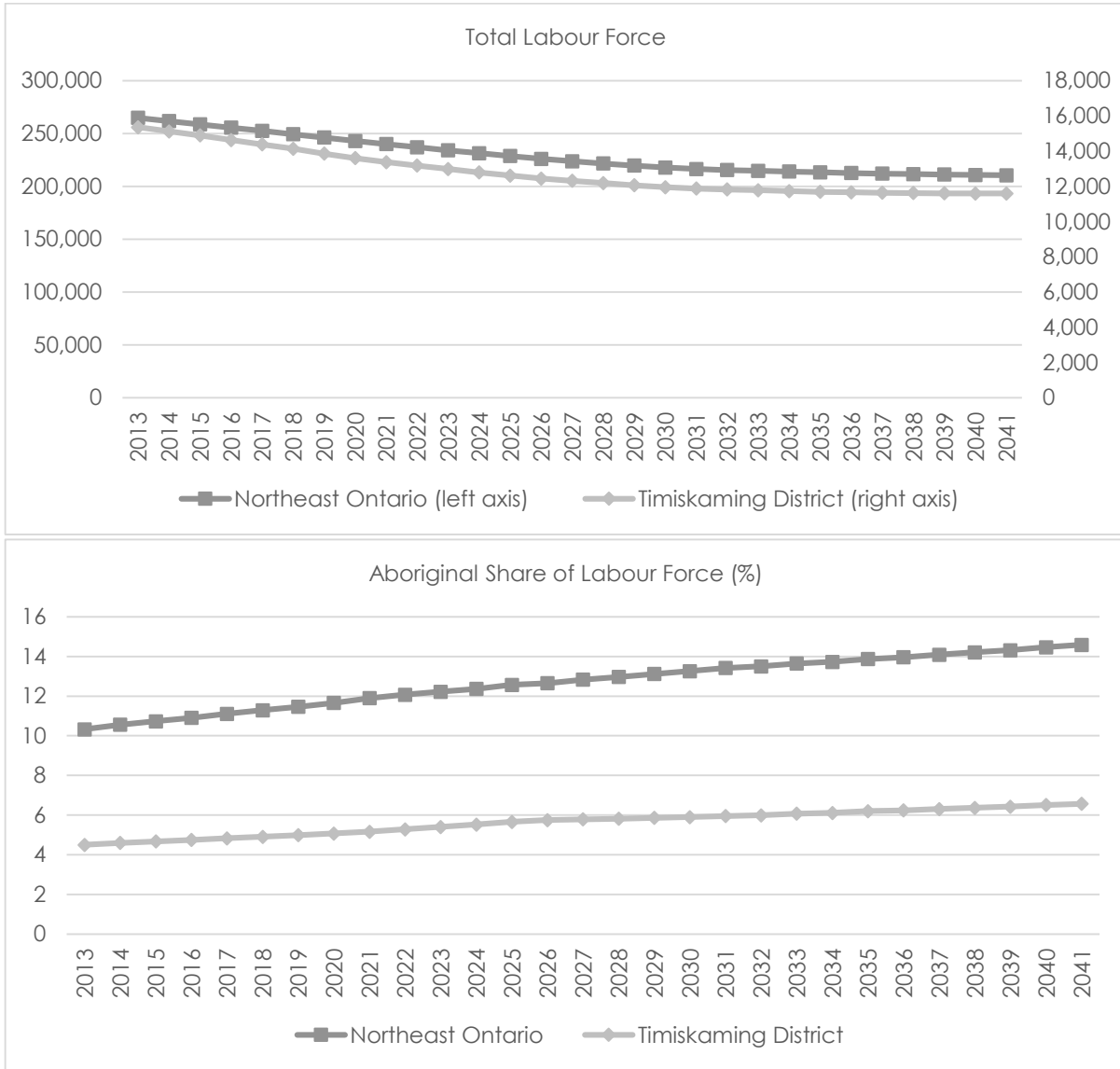
Table 5 and Figure 9 provide labour supply projections for Timiskaming district for the period from 2013 to 2041. The district's labour force is expected to decline by about 24.5 percent over the period, while the Aboriginal labour force is expected to increase by about 10 percent. As a result, the share of Aboriginals in the total regional labour force is expected to increase from 4.5 percent in 2013 to 6.6 percent in 2041.

Table 5: Projected Labour Supply, Total and Aboriginal, Timiskaming District and Northeastern Ontario, 2013–2041

Year	Timiskaming District			Northeast Ontario		
	Total Labour Force	Aboriginal Labour Force	Aboriginal Share (%)	Total Labour Force	Aboriginal Labour Force	Aboriginal Share (%)
2013	15,353	692	4.5	264,860	27,372	10.33
2014	15,117	695	4.6	261,674	27,632	10.56
2015	14,893	695	4.67	258,626	27,751	10.73
2016	14,629	695	4.75	255,558	27,874	10.91
2017	14,382	695	4.83	252,470	28,059	11.11
2018	14,134	693	4.91	249,289	28,142	11.29
2019	13,855	691	4.99	246,155	28,200	11.46
2020	13,604	689	5.07	242,891	28,327	11.66
2021	13,376	690	5.16	239,896	28,554	11.9
2022	13,175	695	5.28	236,948	28,590	12.07
2023	12,980	701	5.4	234,070	28,611	12.22
2024	12,789	706	5.52	231,333	28,627	12.37
2025	12,607	714	5.66	228,687	28,737	12.57
2026	12,441	715	5.75	226,057	28,594	12.65
2027	12,316	713	5.79	223,711	28,695	12.83
2028	12,186	709	5.82	221,550	28,741	12.97
2029	12,060	707	5.86	219,616	28,813	13.12
2030	11,949	705	5.9	217,788	28,885	13.26
2031	11,872	706	5.95	216,402	29,033	13.42
2032	11,824	708	5.99	215,433	29,087	13.5
2033	11,780	715	6.07	214,669	29,304	13.65
2034	11,734	717	6.11	213,998	29,374	13.73
2035	11,690	724	6.2	213,288	29,586	13.87
2036	11,663	728	6.24	212,569	29,671	13.96
2037	11,639	734	6.31	211,992	29,880	14.09
2038	11,619	740	6.37	211,538	30,067	14.21
2039	11,605	746	6.43	211,198	30,240	14.32
2040	11,597	754	6.51	210,792	30,497	14.47
2041	11,592	762	6.57	210,397	30,706	14.59

Source: Author's estimates based on Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

Figure 9: Future Supply of Labour, Total and Aboriginal Share, Timiskaming District and Northeast Ontario, 2013–2041



Source: Author's estimates based on Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

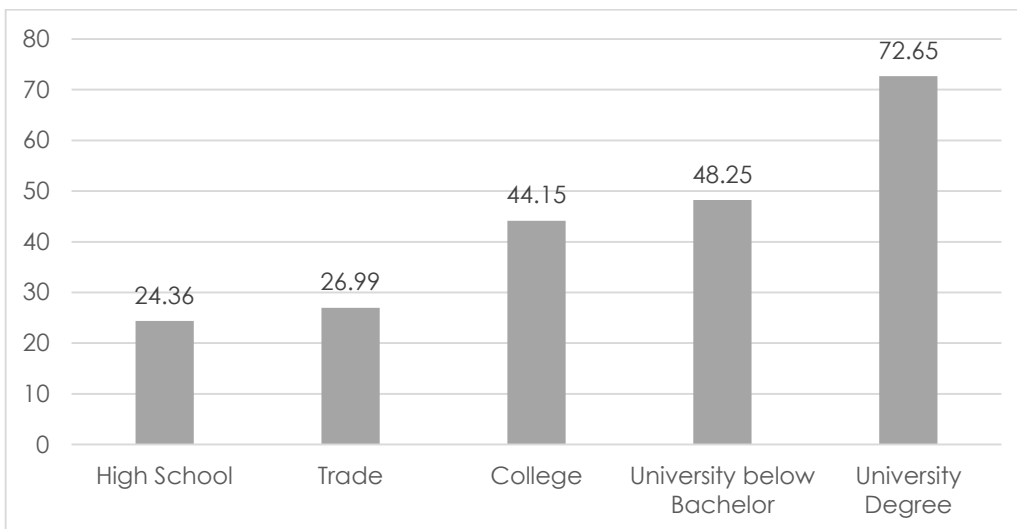
Productivity and the Human Capital Composition of the Workforce in Timiskaming District and Northeastern Ontario

Productivity growth is directly linked to the human capital composition of the workforce. Human capital is defined as the stock of knowledge, skills and abilities embodied in individuals that directly affects their level of productivity. Since knowledge and skills are acquired through education and experience, investing in human capital represents an avenue through which Timiskaming district can enhance productivity and minimize the impact of its declining labour force.

To estimate the human capital composition of the regional workforce, one needs to specify and measure a proxy for human capital that also reflects and incorporates a measure of productivity of the workforce in Timiskaming and Northeastern Ontario. To obtain such an index, this study first estimated a standard earnings model using the 2006 census micro-data file.⁵ This study used data pertaining to all working Canadians between the ages of 15 and 64 who were not attending school and whose employment earnings were greater than \$1,000 and less than \$1 million. The benchmark or reference group is those with less than a high school diploma.

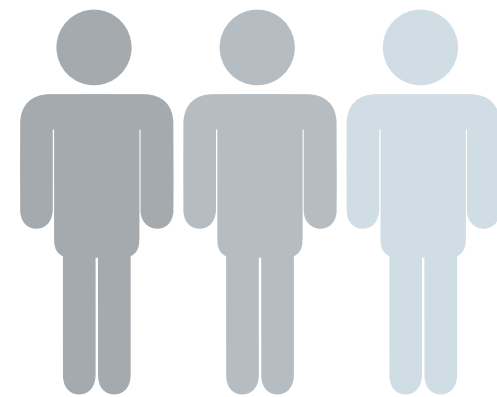
The estimated return-to-schooling coefficients (Figure 10) show the increased earnings, compared to the reference group, of obtaining different levels of education. Therefore, they represent the average rate of return to schooling at the national level. For example, obtaining a high school diploma increases a person's earnings by 24.4 percent above the earnings of those without a high school diploma. Similarly, obtaining a trade or college diploma increases earnings by 27.0 and 44.1 percent respectively. A university degree increases earnings by 72.6 percent. The return to schooling estimates reflect higher productivity resulting from an increased level of education. In short, the returns to education increase as the level of schooling rises, reflecting higher earnings commensurate with higher productivity as the level of education increases.

Figure 10: The Return to Education (%), by Level of Educational Attainment, Canada, 2006



Note: Persons with an education who do not have a job are not included.

Source: Author's estimates based on Statistics Canada's 2006 Census Microdata file.

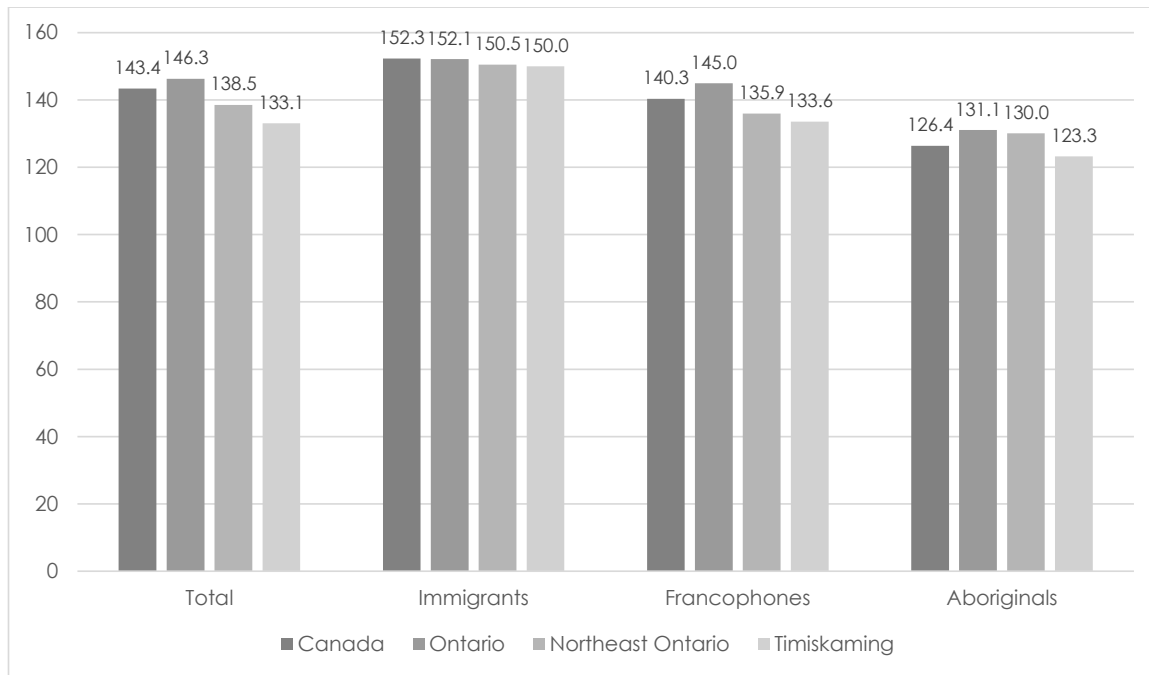


⁵ The earnings model is of the form $\ln Wage = \alpha + \sum \beta_j S_j + \sum \gamma_i X_i + \varepsilon_i$, where S_j is the highest level of schooling, X_i is other control variables which include age categories, marital status, and so on, and ε_i is an error term.

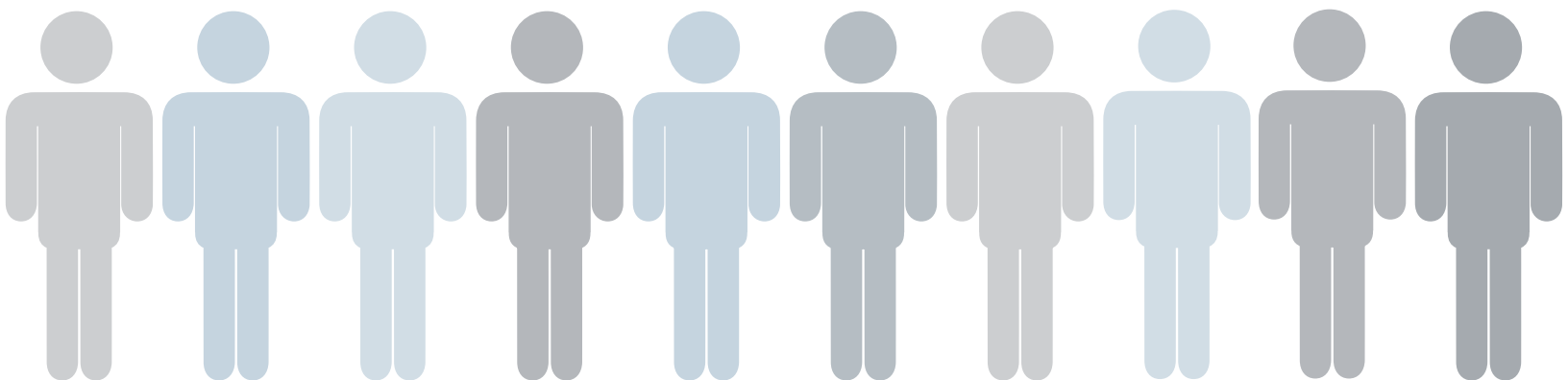
This study then used the estimated return-to-schooling coefficients as weights to calculate a weighted average index of the share of individuals aged 15 to 64 with different levels of schooling for each of the districts in Northeastern Ontario.⁶ Figure 11 shows estimated human capital indexes for working-age Aboriginals, immigrants, francophones and the total population in Canada, Ontario and Northeastern Ontario.⁷ The estimated indexes range from 100 if none of the area's residents have completed high school to about 200 if all residents have obtained a university degree.

As Figure 11 shows, the human capital composition of the working-age population in Timiskaming is below that in Northeastern Ontario, Ontario and Canada. The human capital indexes for immigrants in the Northeast are lower than the total working-age population at the national, and provincial and levels, while indexes for the Aboriginal labour force are significantly below the total working-age population.

Figure 11: Human Capital Index for the Working-Age Population, Canada, Ontario, Northeastern Ontario and Timiskaming District, 2011



Source: Author's estimates based on Statistics Canada's 2006 Census Microdata file.



⁶ $HCI = \exp\{\sum \beta_i \cdot S_i \text{ shares}\}$, where HCI stands for Human Capital Index, exp stands for exponential, and S_i shares are the share of the population ages 15 to 64 with S_i level of education in a given census subdivision. The formulation of the human capital measure is based on R.E. Hall and C.I. Jones (1999), "Why Do Some Countries Produce So Much More Output per Worker than Others?" *Quarterly Journal of Economics* 114 (1, 1999): 83–116. See also Francesco Caselli, "Accounting for Cross-Country Income Differences", *First Draft*, November 2003.

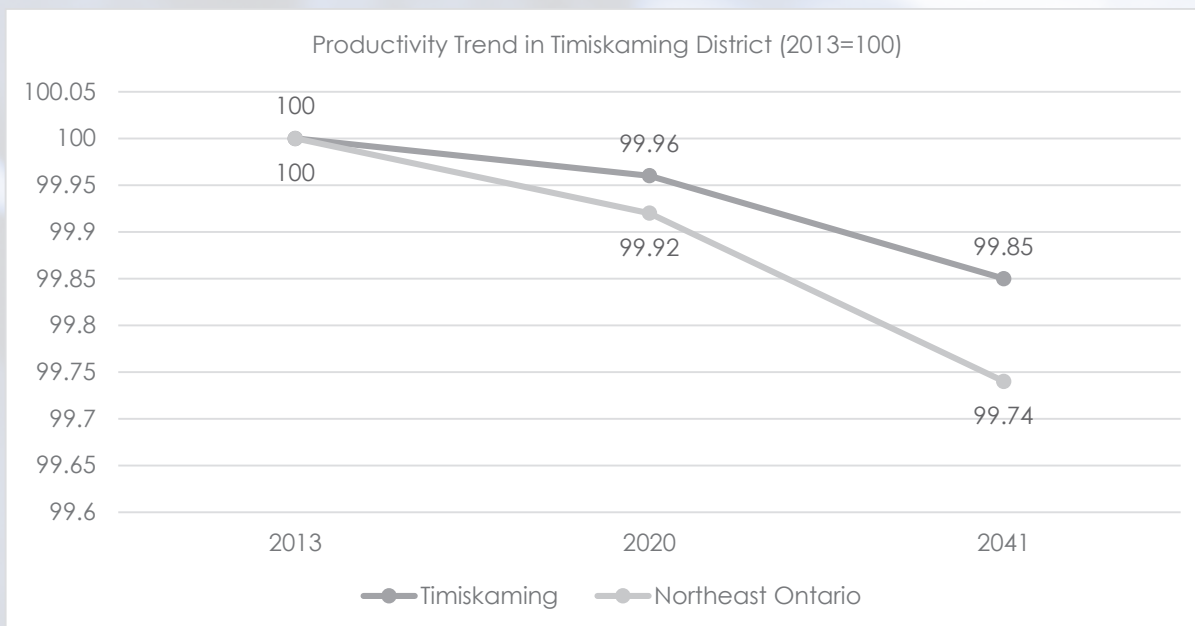
⁷ Note that the human capital indexes reported here are numerically different from the ones reported in Moazzami (2015) since here the return to education or productivity measure in Canada is used as a benchmark in calculating the above indexes instead of Ontario. Using Canada as a benchmark has an advantage of making the indexes comparable to other provinces as well.

A Perfect Storm: Declining Labour Supply and Labour Productivity in Timiskaming District

Earlier, this study identified two important demographic trends in Timiskaming. First, the working-age population is declining; as a result, the supply of labour is expected to decline over the coming years. Second, a growing Aboriginal labour force potentially could offset that trend, but the human capital composition of the Aboriginal workforce is lower than regional and provincial levels, so if the current situation continues, future labour productivity will decline.

To estimate the human capital composition of the future regional workforce, this study combined the labour force projections with the human capital indexes for various segments of the workforce. As Figure 12 shows, that if the current level of educational achievement continues, the human capital composition of the workforce will decline in the coming years in both Timiskaming District and Northeast Ontario, however Timiskaming is expected to decline at a slower rate. This index is positively correlated with labour productivity, labour income and output in the region.

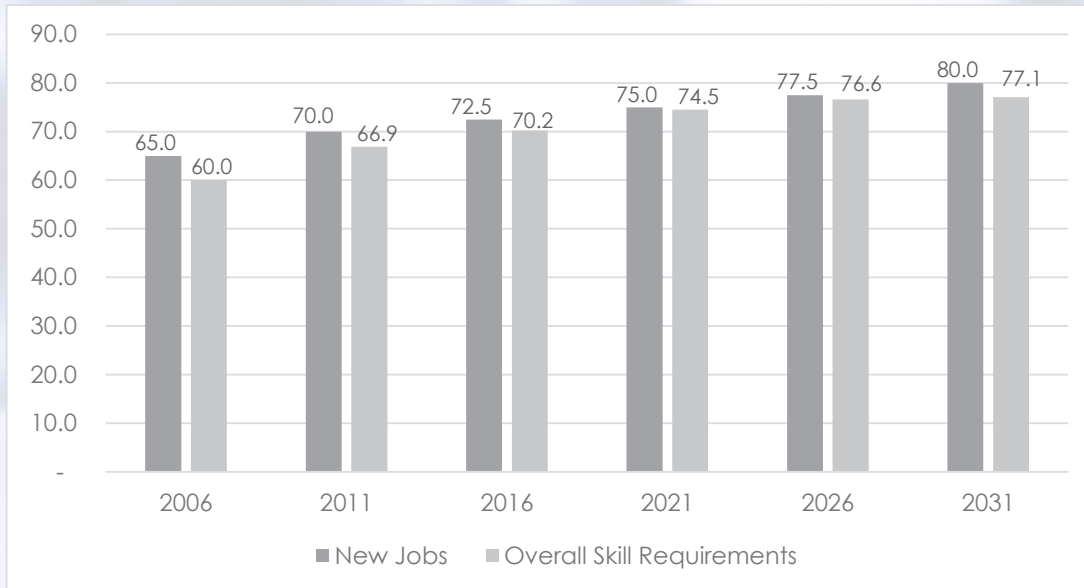
Figure 12: Human Capital Composition of the Workforce in Timiskaming District and Northeastern Ontario, 2013–2041



Source: Author's estimates based on Ontario, Ministry of Finance, "Ontario Population Projections, 2013-2041" (Toronto, 2014).

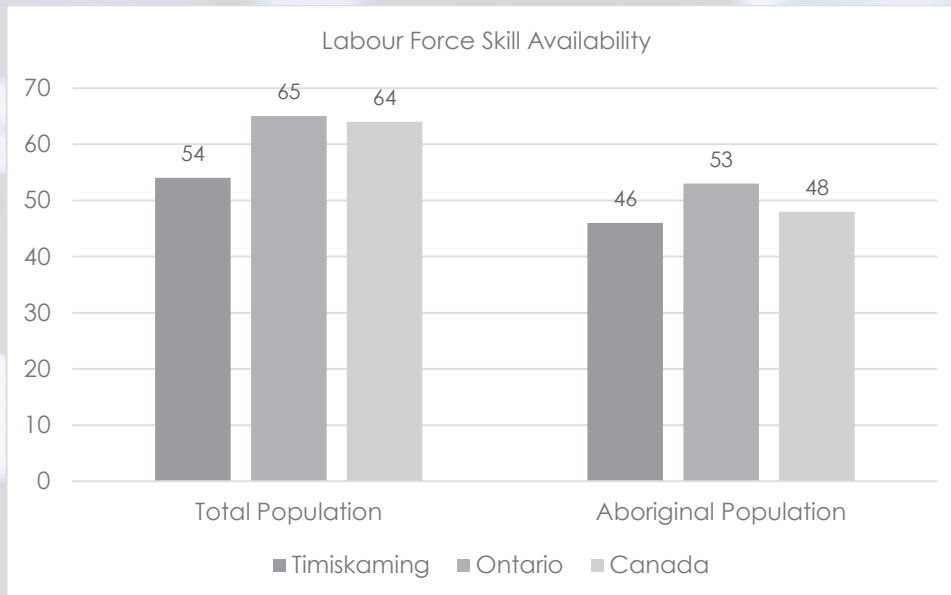
The declining supply of labour and declining labour productivity in Timiskaming District is only half of the bad news. Technological changes and the emergence of the knowledge economy have altered the requirements of the labour market. Various studies suggest that, by 2031, about 80 percent of the workforce need to have post-secondary credentials such as an apprenticeship, college or university degree. Currently, 70 percent of the new jobs and an average of 63.4 percent of all jobs require some post-secondary credential.⁸ Based on various studies by the Ontario Ministry of Education, Human Resources and Skills Development Canada, the British Columbia Ministry of Skills, Training and Education, the British Columbia Ministry of Advanced Education and Labour Market Development and other government agencies, Miner Management Consultants provides estimates of the percentage of new jobs that will require post-secondary education in the coming years (Figure 13). Yet, as Figure 14 shows, the skill levels of the prime-working-age population in Timiskaming District is lower than the skill levels in Ontario and Canada for both the total population and the Aboriginal population. More importantly, the present skill level in Timiskaming is significantly below the current estimated skill requirements of about 63.4.

Figure 13: Percentage of Jobs Requiring Post-Secondary Education, Canada, 2006–2031



Source: Rick Miner, "People without Jobs, Jobs without People: Canada's Future Labour Market" (Toronto: Miner Management Consultants, 2010).

Figure 14: Percentage of the Labour Force Ages 25–64 with Postsecondary Credentials, Timiskaming District, Ontario and Canada, 2011



Source: Author's estimates based on Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

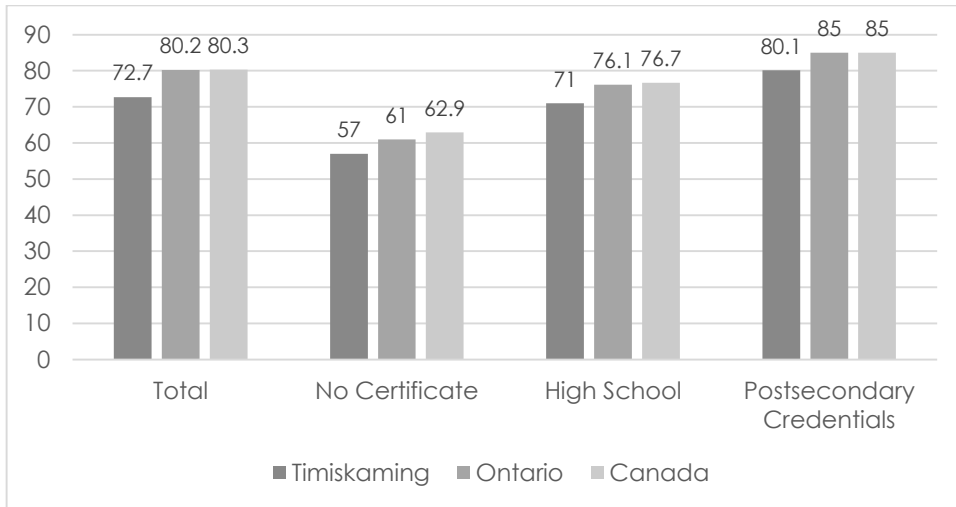
Since the Aboriginal labour force will account for a significant and growing share of Timiskaming District's future workforce, it is vital for the social and economic viability of the region to adopt education policies that enable this segment of the labour force to meet the requirements of the future labour market.

Does the level of skills affect labour market performance – that is, the likelihood of employment, labour force participation and unemployment rates? Figure 15 shows that a higher skill level increases the likelihood of participation in the workforce. In Timiskaming district in 2011, the participation rate of the prime working age population (25-64) without a high school diploma was 57 percent compared to 71 percent for those with a high school diploma and 80.1 percent for those with a postsecondary credentials. Figure 15 also shows that total labour force participation rates in Timiskaming district lag behind the provincial and national averages.

Similarly, as shown in Figure 16, the average unemployment rate among those without a high school diploma was 13.8 percent compared to 9.2 percent for those with a high school diploma and 7.4 percent for those with a postsecondary credentials. Overall, the total unemployment rate in Timiskaming District was much higher than Ontario and Canada.

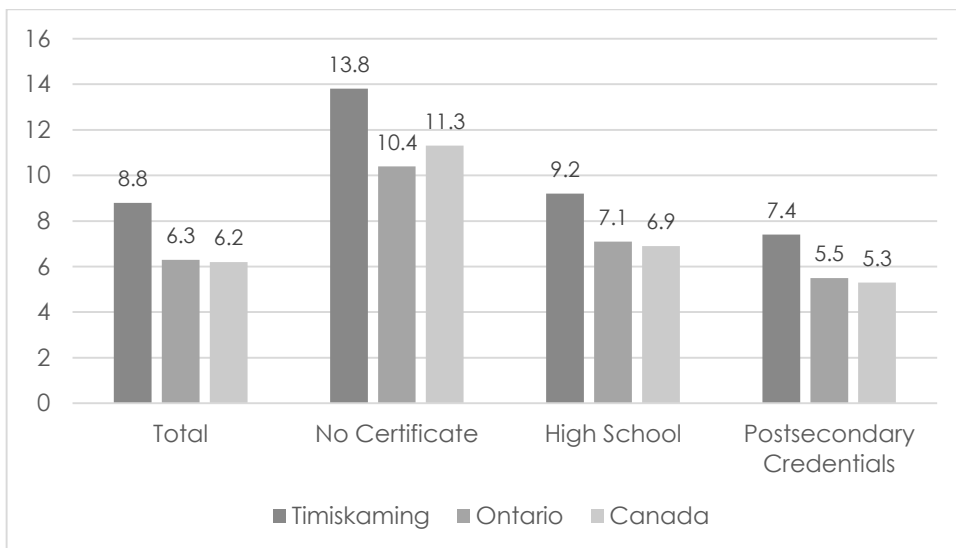
The employment rate – defined as the percentage of the prime working age population who are employed – was 47.4 percent for those without a high school diploma, which increases to 64.5 percent for those with a high school diploma and 74.1 percent for those with a postsecondary credential (Figure 17). Again, the employment rates in Timiskaming lag behind provincial and national averages.

Figure 15: Labour Force Participation Rate by Level of Educational Attainment (%), Canada, Ontario and Timiskaming District, 2011



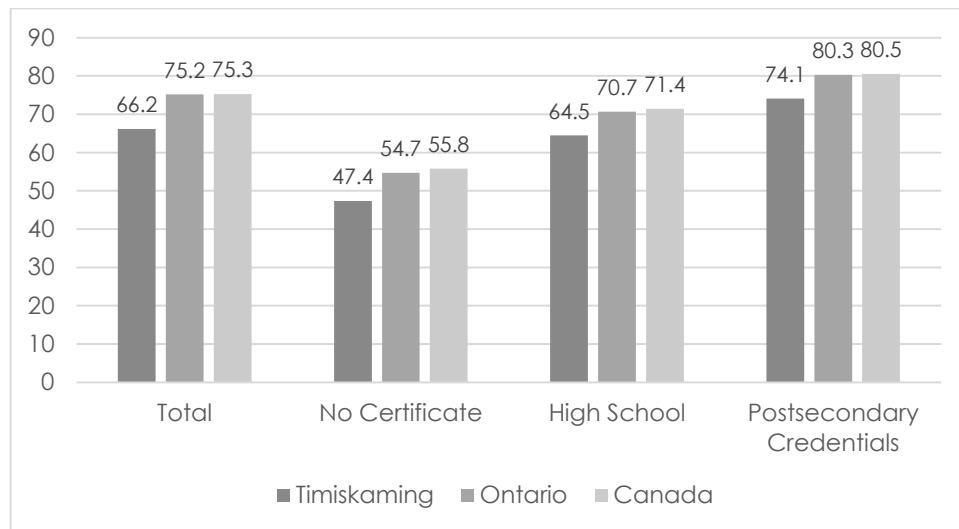
Source: Author's calculations based on Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

Figure 16: Likelihood of Unemployment by Highest Level of Schooling (%), Canada, Ontario and Timiskaming District, 2011



Source: Author's calculations based on Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

Figure 17: Labour Force Employment Rate by Level of Educational Attainment (%), Canada, Ontario and Timiskaming District, 2011



Source: Author's calculations based on Statistics Canada, Census of Canada 2011, and National Household Survey 2011, custom tabulation.

Recently, 50 companies in advanced manufacturing, manufacturing, mining and professional and scientific services were surveyed in Northern Ontario.⁹ Of these, 22 had operations in Northern Ontario and other jurisdictions (multilocal) and 28 were multinationals operating in Northern Ontario. Fifteen had their headquarters in Northern Ontario, 11 were located in Northwestern Ontario and 39 were located in Northeastern Ontario. When asked to rank barriers or factors negatively affecting their firm's growth and/or investment, the top-ranked barrier turned out to be the difficulty of finding qualified employees (29 percent of multi-local firms and 24 percent of multinational firms), well ahead of transportation costs (11 percent), government regulations (9 percent), poor infrastructure (7 percent), energy costs (7 percent) and shipping cost (5 percent). In a survey by the Canadian Council of Chief Executives of more than 100 of Canada's largest employers in all industrial sectors and regions of the country in March 2014, more than 70 percent identified the scarcity of skilled workers as the primary barrier to filling available positions.¹⁰

In short, individuals who do not have post-secondary credentials have a higher likelihood of non-participation in labour force and face a greater probability of unemployment, and these probabilities will only increase in the coming years. To the extent that the skill level of the workforce in Timiskaming district is below the estimated requirement needed for emerging

occupations, the region will face a situation of workers with qualifications that do not match the existing jobs and of jobs that cannot find qualified workers — Miner's "People without Jobs, Jobs without People." Even if markets adjust to bring labour demand and supply into balance, the social impact of having many unemployable people in the region will be enormous.

The evidence above suggests that one potential solution to Timiskaming's declining workforce size and productivity is to promote higher education through increased access to services, especially for the Aboriginal population who experience lower levels of educational achievement. One of the benefits of investing in education is a lower likelihood of unemployment and dependency on government transfer payments. Additionally, agreements such as the Trans-Pacific Partnership will continue to make labour more mobile among various countries, increasing the importance of achieving higher levels of education. In this case, workers in Northern Ontario will not only be competing with other workers in Ontario and Canada, but will be facing competition from other countries as well. To the extent that the skill level of the workforce in Timiskaming district is below the estimated skill requirement needed for the emerging occupations, the region will face workers whose qualifications do not match the existing jobs and jobs that cannot find qualified workers.

⁹ B. Moazzami, "Multi-national and Multi-local Enterprise Initiative, Survey of Northern Ontario Companies and Analysis of the Results" (prepared for the Federal Economic Development Initiative for Northern Ontario, March 2012).

¹⁰ Canadian Council of Chief Executives, "Taking Action for Canada: Jobs and Skills for the 21st Century" (Ottawa, March 2014).

The Consequences of Shifting the Composition of the Employed Labour Force in Timiskaming District

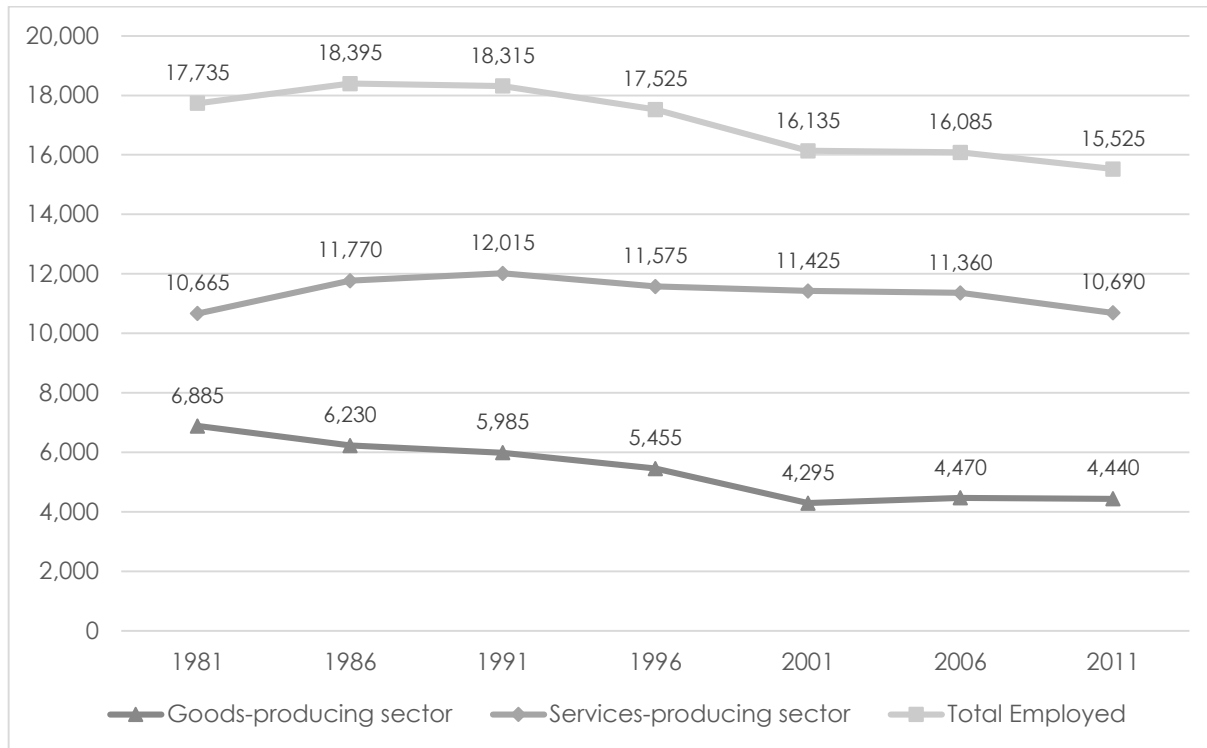
The structure of Timiskaming district's workforce has been changing due to a population that is simultaneously declining and ageing. At the same time, the industrial and occupational composition of the employed workforce is shifting due to changing market conditions. As a result, the size and industrial makeup of the employed workforce has changed over the past three decades. There has been a continuous shift away from the goods-producing sector dominated by private businesses to the services-producing sector, a large portion of which is publicly funded. Using data from various censuses of Canada as well as the 2011 NHS, Table 6 and Figure 18 show the changing industrial composition of the employed workforce in Timiskaming district.

Table 6: Industrial Composition of the Employed Workforce Ages 15 and Older, Timiskaming District, 2001–2011

	2001	2006	2011	Employment change from 2001 to 2011	
	(number)			(number)	(percent)
Goods-producing sector	4,295	4,470	4,440	145	3.38
Agriculture, forestry, fishing and hunting	980	1,110	880	-100	-10.20
Mining and oil and gas extraction	555	770	1,095	540	97.30
Utilities	175	150	170	-5	-2.86
Construction	1,180	1,085	1,175	-5	-0.42
Manufacturing	1,405	1,355	1,120	-285	-20.28
Services-producing sector	11,425	11,360	10,690	-735	-6.43
Wholesale trade	430	375	215	-215	-50.00
Retail trade	1,960	1,935	2,350	390	19.90
Transportation and warehousing	1,120	1,065	875	-245	-21.88
Information and cultural industries	420	295	235	-185	-44.05
Finance and insurance	330	260	330	0	0.00
Real estate rental and leasing	180	145	175	-5	-2.78
Professional, scientific and technical services	500	510	310	-190	-38.00
Management of companies and enterprises	10	0	0	-10	-100.00
Administrative and support, waste management and remediation services	405	500	365	-40	-9.88
Educational services	1,295	1,165	1,030	-265	-20.46
Health care and social assistance	1,795	2,050	2,095	300	16.71
Arts, entertainment and recreation	215	155	125	-90	-41.86
Accommodation and food services	1,105	1,175	800	-305	-27.60
Other services (except public administration)	765	895	745	-20	-2.61
Public administration	895	835	1,040	145	16.20

Source: Author's calculations based on Statistics Canada, Census of Canada (various years), and National Household Survey 2011, custom tabulation.

Figure 18: Employment in the Goods- and Services-Producing Industries, Timiskaming District, 1986–2011



Source: Author's calculations based on Statistics Canada, Census of Canada (various years), and National Household Survey 2011, custom tabulation.

The shift away from the goods-producing sector has seen a net employment loss of 35.5 percent since the early-1980s. Total employment in the agriculture, forestry, fishing and hunting sector declined by 10 percent from 2001 to 2011, while manufacturing employment experienced a decline of 20 percent over the period. On the other hand, employment in mining and oil and gas extraction nearly doubled from 555 in 2001 to 1,095 in 2011. Growth in this industry has resulted in modest growth in the goods-producing industry as a whole from 2001 to 2011. It is imperative to acknowledge that the goods-producing sector is a major component of the region's economic base and its change in employment can have a serious impact on the region's long-term economic growth potential. The multiplying effect between employment in goods-producing industries and total regional employment equals 1.87, meaning that each job in goods-producing industries support 1.87 jobs in the regional economy.

The growth of the services sector over the period 1986 to 2011 was largely stagnant, with some growth from 1981 to 1991, followed by modest declines until 2011. Since 2001, declining growth was spread across nearly all industries, most notably in wholesale trade (50 percent), information and cultural industries (44 percent), arts, entertainment and recreation (42 percent), and professional, scientific and technical services (38 percent). On the other hand, growth in the services-producing sector has been derived from employment in retail trade (20 percent), health care and social assistance (17 percent) and public administration (16 percent). In fact, the growth of health care and public administration, which are referred to as quasi-base sectors since they are financed from outside the region, has to a large extent mitigated the decline of other sectors of the economy.

The changing industrial composition of the workforce has also been accompanied by a shift in the occupational structure of the employed workforce (Table 7). Employment in the natural and applied sciences, health occupations, occupations in social sciences and education, and trades, transport and equipment operators and related occupations has increased while employment in business, finance and administrative occupations, sales and services, occupations unique to primary, processing and manufacturing industries has declined over the period 2001 to 2011.

Table 7: Employed Workforce by Occupation, Timiskaming District, 1996–2011

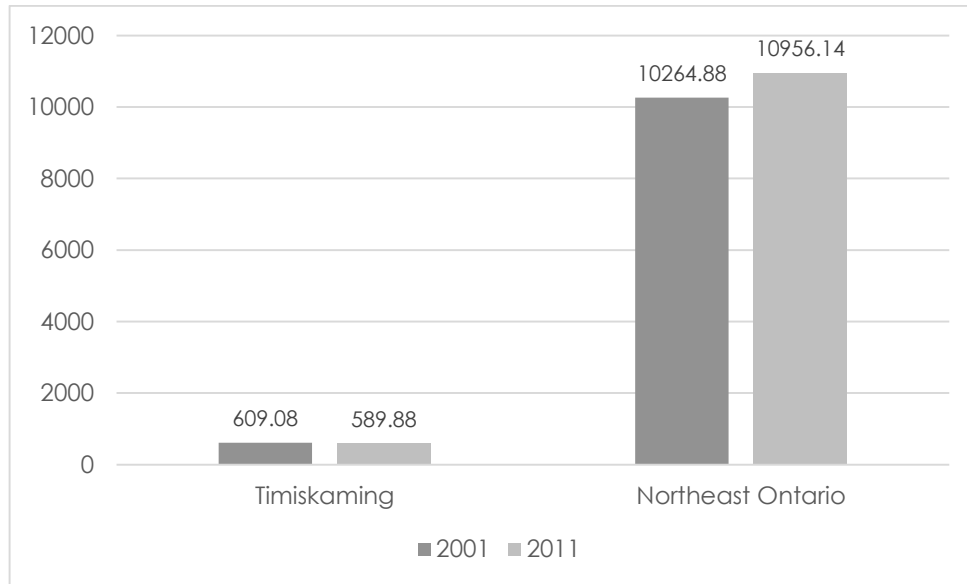
	1996	2001	2006	2011	Employment change from 1996 to 2011	
	(number)				(number)	(percent)
Management occupations	1,590	1,485	1,295	1,445	-145	-9.12
Business, finance and administrative occupations	2,505	2,335	2,425	1,860	-645	-25.75
Natural and applied sciences and related occupations	625	580	605	685	60	9.60
Health occupations	880	765	895	1,045	165	18.75
Occupations in social science, education, government service and religion	1,185	1,445	1,405	1,760	575	48.52
Occupations in art, culture, recreation and sport	270	225	205	230	-40	-14.81
Sales and services occupations	4,460	3,695	3,775	3,365	-1,095	-24.55
Trades, transport and equipment operators and related occupations	3,130	3,255	3,120	3,240	110	3.51
Occupations unique to primary industry	1,665	1,235	1,410	980	-685	-41.14
Occupations unique to processing, manufacturing and utilities	725	720	675	525	-200	-27.59

Source: Statistics Canada, Census of Canada (various years), and National Household Survey 2011, custom tabulation.

Labour Income and Gross Domestic Product in Timiskaming District

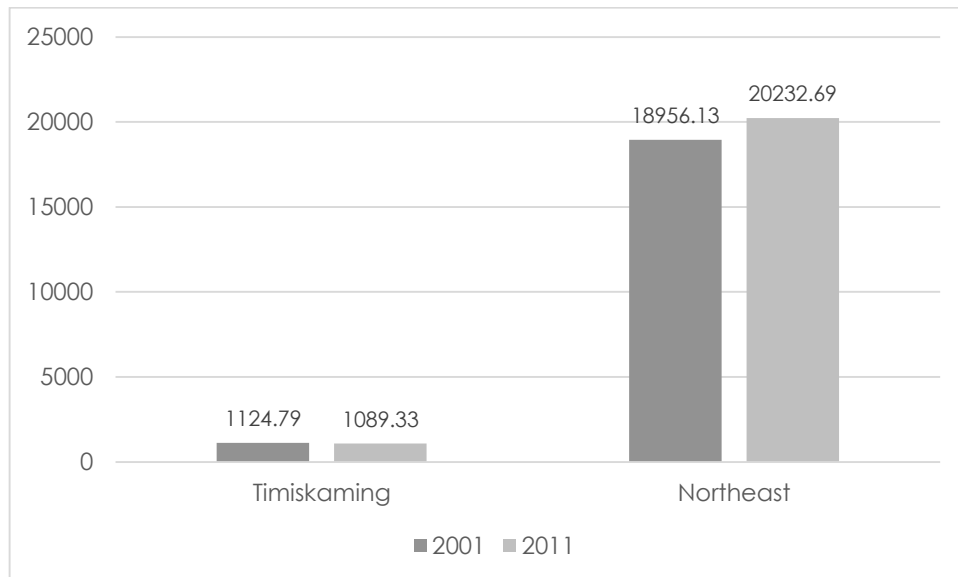
The changing size and composition of Northeastern Ontario's employed workforce has impacted total labour income and output in Timiskaming district. Using detailed employment by occupation and industry data along with average employment earnings by industry and occupation, this study estimated trends in total labour income in 2010 dollars in Timiskaming district, shown in Figure 19. Labour income is influenced by size, productivity and the occupational composition of the employed workforce. From 2001 to 2011, labour income in Timiskaming district decreased by 3.2 percent compared with a 6.7 percent increase in Northeastern Ontario during the same period. Assuming that the share of labour in regional gross domestic product (GDP) stayed relatively constant during 2001–2011, it is evident that Timiskaming district also experienced negative GDP growth from \$1.12 to \$1.09 billion during this period, as shown in Figure 20.

Figure 19: Total Labour Income (millions of 2010 dollars), Timiskaming District, 2001–2011



Author's calculations based on Statistics Canada, Census of Canada (various years), and National Household Survey 2011, custom tabulation.

Figure 20: Regional Gross Domestic Product (millions of 2010 dollars), Timiskaming District, 2001–2011



Author's calculations based on Statistics Canada, Census of Canada (various years), and National Household Survey 2011, custom tabulation.

Overall, between 1986 and 2011, major changes occurred in the structure of Timiskaming district's and Northeastern Ontario's economy, population and workforce. An ageing and declining population and rising Aboriginal workforce resulted in a declining supply of labour and a lower level of human capital than will be necessary for the jobs of the future. In the past, Northeastern Ontario's economic prosperity was based on a staples economy that relied on the export of natural resources. In other words, regional economic development was dependent on the growth of the goods-producing sectors of the economy. These sectors formed a major component of the region's economic base and had a high-value-added and multiplier effect. To a large extent, however, the recent growth of the healthcare and public sectors in Timiskaming has mitigated the declining economic base and stabilized the regional economy.

In short, recent structural changes have shifted the regional economic focus from predominantly producing for export markets to mostly producing for domestic consumption. The share of the private sector and private investment in the regional economy has declined and the public sector's share has increased significantly.

Concluding Remarks

Northeastern Ontario's economy has undergone a significant transformation over the past three decades. Its traditional resource-based industries have declined, while the economy's dependence on government-funded programs, such as healthcare, education and government, has risen significantly. The resource-based sectors have always been subject to cyclical fluctuations and boom and bust cycles with forestry cycles being about twice as long as mining cycles since the regeneration of forests takes much longer. While the mining sector appears to be benefiting some from the low Canadian dollar, the renewal of the forestry industry is not expected to happen until around 2025. In addition to these regional trends and characteristics, this study reports several other fundamental trends that will continue to impact Timiskaming district's competitive position and the standard of living of residents negatively if not addressed immediately.

Aging and Declining Population

Timiskaming district's population has declined by 19 percent over the period from 1986 to 2011. Many factors explain the declining population. First, Timiskaming has experienced notable out-migration throughout 2002-2014. Second, Northeastern Ontario has been receiving disproportionately low rates of immigration which impacts population growth in Timiskaming. Third, the total fertility rate in Northeastern Ontario (1.60) has been significantly below the generational replacement rate of 2.1. This has meant that the baby boomers are followed by a much smaller generations.

Rising life expectancy and out-migration of youth have resulted in the aging of Timiskaming District's population. The baby boomers were followed by much smaller generations in number primarily due to a declining fertility rate. During the same period, average life expectancy at birth in Canada increased from 71.13 years in 1960 to 81.24 years in 2012. As a result the share of individuals in Timiskaming District below the age of 20 has declined from 30 percent in 1991 to 21 percent in 2011 while the share of seniors rose from 10 percent in 1991 to 19 percent in 2011. During the same period, the share of individual's ages of 20 to 34 has declined from 24 percent in 1991 to 15 percent in 2011.

Declining Human Capital Content of the Labour Force

This study projects that the total labour force in the Timiskaming district will decline by 24.5 percent over the period from 2013 to 2041. While the Aboriginal labour force will increase by about 10 percent, increasing their share total labour force from 4.5 percent in 2013 to 6.6 percent in 2041. At the same time, the human capital composition of the working-age population in Timiskaming is below that in Northeastern Ontario, Ontario and Canada, while the human capital composition of the Aboriginal labour force is significantly below the regional, provincial and national levels. Findings show that if the current level of educational achievement continues, the human capital composition of the workforce in Timiskaming district will decline in the coming years, therefore having an adverse effect on labour productivity, labour income and output in the region.

People Without Jobs and Jobs Without People

The declining supply of labour and declining labour productivity in Timiskaming District is only half of the bad news. Technological changes and the emergence of the knowledge economy have altered the requirements of the labour market. Various studies suggest that, by 2031, about 80 percent of the workforce need to have post-secondary credentials such as an apprenticeship, college or university degree. Currently, 70 percent of the new jobs and an average of 63.4 percent of all jobs require some post-secondary credential. Yet, the skill levels of the prime-working-age population in Timiskaming district is lower than the skill levels in Ontario and Canada for both the total population and the Aboriginal population, and more importantly, the present skill level in Timiskaming is significantly below the current estimated skill requirements.

Individuals who do not have post-secondary credentials have a higher likelihood of non-participation in the labour force and face a greater probability of unemployment, and these probabilities will only increase in the coming years. To the extent that the skill level of the workforce in Timiskaming district is below the estimated requirement needed for emerging occupations, the region will face a situation of workers with qualifications that do not match the existing jobs and of jobs that cannot find qualified workers — Miner's "People without Jobs, Jobs without People." Even if markets adjust to bring labour demand and supply into balance, the social impact of having many unemployable people in the region will be enormous.

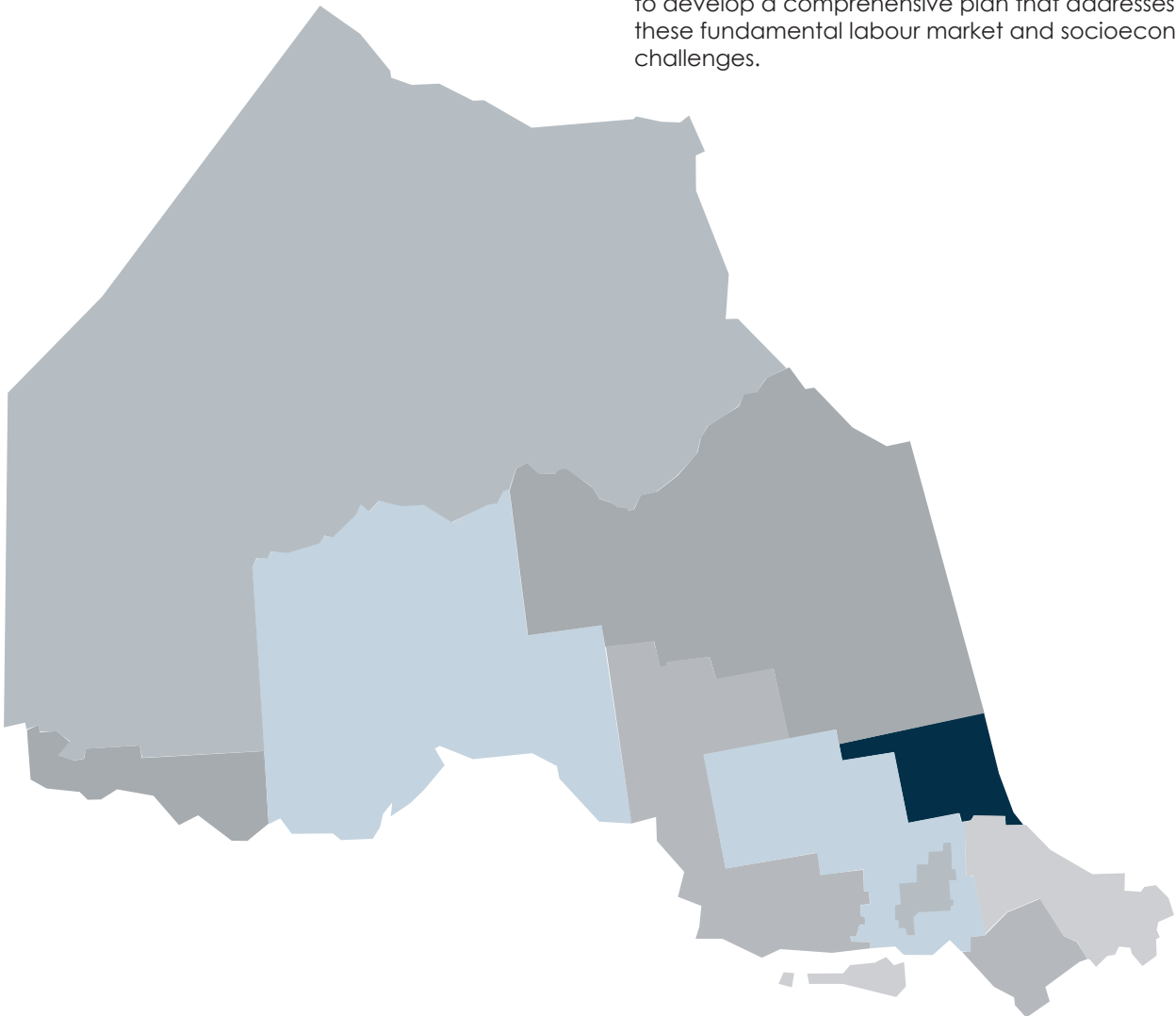
Changing Industrial Composition of the Workforce

The structure of Timiskaming District and Northeastern Ontario's workforce has been changing due to a population that is simultaneously declining and ageing. At the same time, the industrial and occupational composition of the employed workforce has been altered, resulting in a shift away from the goods-producing sector dominated by private businesses towards the service-producing sector, a large portion of which is publicly funded.

Lack of Growth in Regional Income and GDP

The changing size and composition of the regional employed workforce has resulted in decreased labour income and GDP growth in Timiskaming district from 2001 to 2011. Regional income and GDP are highly correlated with employment as well as labour productivity in various industries, suggesting that Timiskaming's economy did not experience growth from 2001 to 2011.

While many of the demographic and economic trends affecting Timiskaming district are foreboding, the region can mitigate some these issues by investing in its human capital. Given that the Aboriginal population will comprise a larger share of the future workforce, more investment in rural education is needed to reverse the declining human capital composition of the future labour force. Emphasis should not only be put on increased investment, but also on improving the quality of education delivered in urban as well as rural areas. Timiskaming district's long-term prosperity lies in its ability to develop a comprehensive plan that addresses these fundamental labour market and socioeconomic challenges.



Recommendations

The human capital composition – represented as the region's earnings potential as a result of the level of skills and education – of the working-age population in Timiskaming district is lower than regional, provincial and national levels, and is projected to continue declining if educational attainment remain at their current levels. This outlook is being driven by a declining and aging population, as well as from low levels of educational attainment, particularly among the Aboriginal population, which represents a growing segment of the population.

Additionally, low and declining human capital in the district is being exacerbated by recent technological change and the emergence of the knowledge economy which continues to increase the number of jobs that require post-secondary credentials. Absent significant improvements in rural education outcomes in Timiskaming, the district is facing a future of people without jobs and jobs without people. The growing disconnect between labour supply and demand will have an adverse effect on labour productivity, labour income and gross domestic product in the district. The key recommendations to avoid this bleak outlook are as follows:

Recommendation 1

Timiskaming must bolster its population levels. It is recommended that dependency ratios – the number of mouths to feed relative to the number of working-age persons – be used to find an appropriate target. Specifically, Timiskaming should strive to close their dependency ratio gap with that of Ontario's, which can be achieved through immigration, in-migration and youth retention strategies. In fact, in terms of immigration, male immigrants in particular, have shown strong labour market performance in Timiskaming. They have higher participation and employment rates than immigrant men in the Northeast as a whole, as well as lower unemployment rates. This is also true when compared to the total male population in both Timiskaming district and the Northeast as a whole. This confirms the value for Timiskaming to focus on immigration strategies.

Recommendation 2

Timiskaming must improve rural and Aboriginal education levels. As it stands, Timiskaming has lower levels of educational achievement compared to Ontario and Canada, however the Aboriginal population lags even further behind. If education levels in Timiskaming district remain at their current level or decline in the future while skill requirements of the workforce rise, the region will end up with people without jobs and jobs without people. The evidence in this report demonstrates that higher educational attainment leads to higher participation and employment rates and lower unemployment rates.

Recommendation 3

Timiskaming must refocus existing resources and stimulate entrepreneurship and economic diversification. Despite the population wide challenges, employment in Timiskaming's mining and oil and gas extraction industries nearly doubled from 555 in 2001 to 1,095 in 2011. The district enjoys significant natural resources, agricultural opportunities, and access to the large North American market. Timiskaming's long-term and prosperous growth depend on its ability to utilise and refocus existing economic development resources in order to stimulate and support entrepreneurship and economic diversification aimed at strengthening and enhancing industrial clusters.

References

- Ontario. 2014. Ministry of Finance. "Ontario Population Projections, 2013–2041." Toronto.
- Moazzami, B. 2015. "It's What You Know (and Where You Can Go): Human Capital and Agglomeration Effects on Demographic Trends in Northern Ontario." Thunder Bay: Northern Policy Institute.
- Ontario. 2014. Ministry of Finance. "Ontario's Long-Term Report on the Economy." Toronto.
- Hall, R.E., and C.I. Jones. 1999. "Why Do Some Countries Produce So Much More Output per Worker than Others?" *Quarterly Journal of Economics* 114 (1): 83–116.
- Caselli, F. 2003. "Accounting for Cross-Country Income Differences." Unpublished first draft, November.
- Miner, R. 2010. "People without Jobs, Jobs without People: Canada's Future Labour Market." Toronto: Miner Management Consultants.
- Moazzami, B. 2012. "Multi-national and Multi-locational Enterprise Initiative, Survey of Northern Ontario Companies and Analysis of the Results." Prepared for the Federal Economic Development Initiative for Northern Ontario.
- Canadian Council of Chief Executives. "Taking Action for Canada: Jobs and Skills for the 21st Century." Ottawa.





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Northern Policy Institute is Northern Ontario's independent think tank. We perform research, collect and disseminate evidence, and identify policy opportunities to support the growth of sustainable Northern Communities. Our operations are located in Thunder Bay and Sudbury. We seek to enhance Northern Ontario's capacity to take the lead position on socio-economic policy that impacts Northern Ontario, Ontario, and Canada as a whole.

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It's What You Know (And Where You Can Go): Human Capital and Agglomeration Effects on Demographic Trends in Northern Ontario
Dr. Bakhtiar Moazzami

Settling Down in the Northwest
James Cuddy

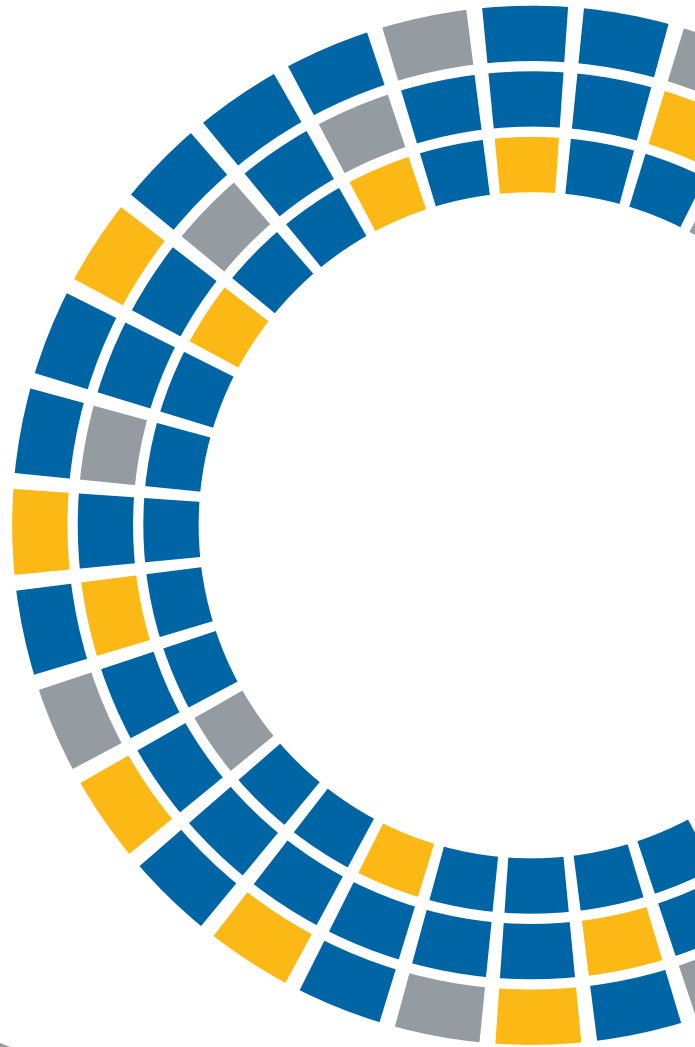
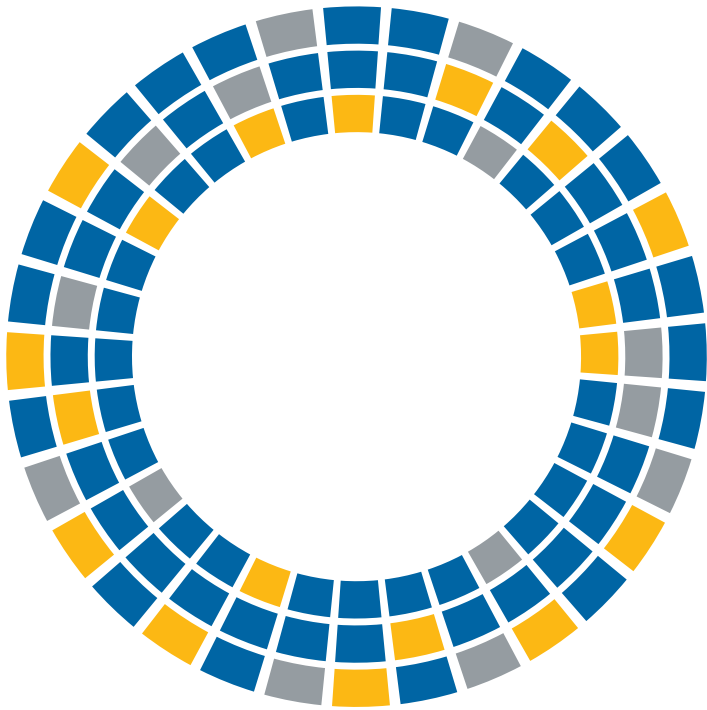
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