

BUSI/INFO 6513 Group Final Project

Interprovincial Migration in Nova Scotia: *Motives and Impacts*

Group Members

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Institution: Dalhousie University
Course: BUSI/INFO 6513

Table of Contents of the Report

NO.	Section	Descriptions
1.	Introduction	<ul style="list-style-type: none">- Brief overview of the Nova Scotia Interprovincial migration.- Importance of analyzing economic and social indicators.
2.	Tool Selection Rationale	<ul style="list-style-type: none">- Reasons for choosing Power BI as the external tool and Tableau as the internal tool.
3.	The Datasets	<ul style="list-style-type: none">- The sources, the descriptions of variables and # of datapoints, explanations of how we found and merged the datasets.- Table summarizing each dataset, including the description and purpose.
4.	Data Collection and Cleaning	<ul style="list-style-type: none">- Steps for data preparation for analysis.- Data wrangling, cleansing, and merging (If have)
5.	Research Question (Data Analysis and Visualization)	<ul style="list-style-type: none">- Research questions →How they evolved during our analysis → Final research questions addressed.- Detailed analysis of metrics using Power BI and Tableau.
6.	Comparative Analysis of Tools	<ul style="list-style-type: none">- User interface, ease of use, visualization capabilities, and Functionalities.
7.	Results and Implications	<ul style="list-style-type: none">- Summary of key insights.- How can these insights inform economic and social policy planning in Nova Scotia?
8.	References	<ul style="list-style-type: none">- APA Style references.
9.	Appendix	<ul style="list-style-type: none">- Additional details not included in the main part.

Introduction

Interprovincial migration is not only a critical factor in demographic change but also holds important policy considerations for any Canadian province (Rashti *et al.*, 2015). These migratory flows can provide significant economic benefits by reallocating labor from regions with low productivity and high unemployment to regions with high productivity and low unemployment. Limited immigration in certain regions may raise concerns about their economic future and imply declining population growth and the inability to address regional skill shortages through immigration strategies (Serlenga and Shin, 2020). To respond to this challenge, the Canadian government introduced the Provincial Nominees Program, which aims to create a balanced regional distribution of immigrants (Baglay, 2012). In Nova Scotia, the province has seen a net influx of interprovincial migrants exceeding the annual target of 1,000 people since mid-2014. From 2021 to 2022 alone, Nova Scotia surpassed its goal by more than 10,300 migrants settling in the province (OneNS, 2023). However, a recent report published by Statistics Canada on the net provincial migration figures shows a sharp contrast for Summer 2023. For the first time in eight years, the net migration figure for the province has plateaued, suggesting that an equal number of people moved away from Nova Scotia as those who arrived from other provinces. Economists caution that it is premature to determine if this signals a broader shift in population patterns unless future quarterly data confirms it (CBC, 2023). Considering the social and economic implications of interprovincial migration, this project proposal aims to understand people's motivations to move into (immigrate) or move out of (emigrate) Nova Scotia and will seek to answer the following questions:

Research Questions

1. What are the origins of migrants to and from Nova Scotia?

Examine what proportion of interprovincial migration to/from Nova Scotia is attributed to citizens or permanent residents versus temporary residents (work permit holders or international students).

2. What motivates people to settle or leave Nova Scotia?

Examine the most common motivations (based on related literature) for people to settle or leave the province and their impact on provincial migration.

3. How have infrastructure investments impacted the NS provincial migration?

Examine how investments in social programs and healthcare infrastructures influence the NS provincial migration.

4. How does the cost of living in Nova Scotia impact migration trends?

Examine how taxation, the high cost of real estate properties, and rising inflation for local goods in Nova Scotia affect patterns of interprovincial migration.

5. How do migration and important policy decisions affect people's movement into and out of Nova Scotia?

Examine the impact of provincial and federal permanent residency nomination programs on the population trends in Nova Scotia.

1. **Move in Nova Scotia: Profile:** Examine the age, original province of individuals moving to Nova Scotia

Q1: What are the origins of migrants to Nova Scotia?

<https://open.canada.ca/data/en/dataset/f083ee31-e3b4-4f96-a655-30caf9eab790>

Q2: What is the profile of migrants to Nova Scotia?

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710001501&pickMembers%5B0%5D=1.4&pickMembers%5B1%5D=2.1&pickMembers%5B2%5D=3.1&cubeTimeFrame.startYear=2010+%2F+2011&cubeTimeFrame.endYear=2021+%2F+2022&referencePeriods=20100101%2C20210101>

2. **Move out Factors:**

- 2.1 The factors of

- Income Levels: Explore the role of income disparities and economic experience
- Consumer Index: Analyze how the cost of living and consumer goods prices affect migration.
- Rental Rates: Examine the impact of rental market conditions on people's decisions to leave.
- Labor Market Conditions: Assess the relationship between employment
-

- 2.2 Access other provinces

Q3: How have public utility infrastructure investments impacted the NS provincial migration?

Q4: How have health infrastructure investments impacted the NS provincial migration?

<https://www.statcan.gc.ca/en/lode/databases/odhf>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1010002401>

Q5: How does the Consumer Index in Nova Scotia impact migration trends?

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810024501>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410001702>

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1810025901&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=1989&cubeTimeFrame.endMonth=01&cubeTimeFrame.endYear=2024&referencePeriods=19890101%2C20240101>

Q6: How does the Income Level in Nova Scotia impact migration trends?

<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110001801&pickMembers%5B0%5D=1.14&pickMembers%5B1%5D=3.1&pickMembers%5B2%5D=4.1&cubeTimeFrame.startYear=2000&cubeTimeFrame.endYear=2021&referencePeriods=20000101%2C20210101>

Q7: What motivates people to leave Nova Scotia?

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<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410001702&pickMembers%5B0%5D=3.1&pickMembers%5B1%5D=4.1&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2008&referencePeriods=20080101%2C20080101>

Q8: Which 3 provinces have the biggest influx of migrants from Nova Scotia (move out)?

Q9: How has the trend in investment infrastructure in these provinces related to the influx of Nova Scotians moving out?

The Datasets

No.	Initial Dataset	Source	Description
1.	Estimates of the components of interprovincial migration by age and sex, annual	<u>LINK</u>	<p>Reference: Statistics Canada</p> <p>Measures & Dimensions:</p> <ul style="list-style-type: none"> - Geography: Canada, Province or Territory - Reference Period: Covering 2010/2011 to 2021/2022 - Sex: Both Sexes, Males, Females - Migrants: In-migrants, out-migrants, net-migrants <p>Description:</p> <p>This dataset will be used to analyze immigration trends for different population groups within Nova Scotia over a specified time frame. It provides annual data on migration</p>

			flows in and out of Nova Scotia, segmented by age and sex, and helps analyze demographic shifts, and understand the migrants' motivations and its impacts on Nova Scotia's population dynamics.
2.	Estimates of interprovincial migrants by province or territory of origin and destination, annual	<u>LINK</u>	<p>Reference: Open Canada</p> <p>Measures & Dimensions:</p> <ul style="list-style-type: none"> - Geography: Canada Provinces - Reference Date: Covering 1971 to 2023 - Unit of Measure: by persons - Unit of Measure ID: by unit - Value <p>Description:</p> <p>This dataset is an overview of interprovincial migrant's information from 1971-2023, including the origin and destination. This will be one of the references to show the tendency in a certain period of time.</p>
3.	Estimates of interprovincial migrants by province or territory of origin and destination, quarterly	<u>LINK</u>	<p>Description:</p> <p>This dataset is similar to the one above but with different time measures. This dataset will be merged for data modeling.</p>

**The above datasets are based on the initial phase of research, and as the project continues, the datasets might be changed or updated accordingly.*

Data Collection and Cleaning

<Start here.>

Description of Two Tools

External Tool - Power BI

Power BI is a business intelligence tool developed and provided by Microsoft. It is designed to help users extract, transform, and visualize data from various data sources to better understand and analyze it.

Power BI allows you to pull the dataset or data source from almost all types, including SQL databases, Excel spreadsheets, JSON, Azure, and even the web, etc. It supports real-time data streaming and automatic refreshing, enabling users to access the latest data at any time and perform real-time analysis and decision-making.

There are three major components of MS Power BI: Power BI Desktop, Power BI Service, and Power BI Mobile. In this project, we will mainly use the first two components which are Power BI Desktop and Power BI Service. Below are some expectations about how we are going to use this tool:

- Use some built-in features like ‘Transform Data’ and ‘Merge Queries’ to shape the datasets, build the relationships among different datasets, and merge different datasets into one data model.
- Build some visualizations (e.g., line chart, bar chart, table, and map, etc.) on the canvas editor to visualize the data model and get some insights.
- Apply some Data Analysis Expressions (DAX) to solve certain calculations and data analysis problems. Understand some basic DAX formula syntax.
- Create a professional dashboard by analyzing, summarizing, and organizing the data model in this project.
- Publish the report (dashboard) to the Power BI cloud by using the ‘Publish’ function and share it online.

As we move forward with the project, we'll also be exploring and applying more of Power BI's functions and capabilities. The goal is to learn this SaaS and understand how Power BI could help us see the insights and make better decisions.

Tableau

<Start here.>

Power BI vs Tableau

<Start here.>

Application of Tools on the Research Questions

<Start here.>

Results and Implications

<Start here.>

Q1: <Insert findings and implications here.>

Q2: <Insert findings and implications here.>

Q3: <Insert findings and implications here.>

Q4: <Insert findings and implications here.>

Q5: <Insert findings and implications here.>

Q6: <Insert findings and implications here.>

Q7: <Insert findings and implications here.>

Q8: <Insert findings and implications here.>

Q9: <Insert findings and implications here.>

References

<Start here.>

Appendix

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Appendix: Metrics

For our business analytics report, we will collect and analyze a collection of Datasets from Statistics Canada to gain insights into the aggregate determinants of net migrations in Nova Scotia. To do this, we will examine factors including

No	Statistic	Use	Purpose
1.	The Labour Force Participation Rate	Determines the percentage of all working-age people who are employed or actively seeking work (Hayes, 2024).	We will use this to assess economic activity and identify labour market trends and opportunities.
2.	GDP to Overall Debt	Compares net debt (total debt minus cash and equivalents) to GDD (Kenton, 2023)	To indicate the province's financial health and fiscal sustainability.
4.	Municipal Financial Stability	Assesses the overall financial condition using economic indicators to assess municipal financial health (ONE Nova Scotia, 2024)	This metric is used to evaluate the fiscal health and sustainability of individual municipalities. This is a joint project between the Province of NS and the Federation of Municipalities (Halifax Regional Municipality, 2024).
5.	Domestic Agricultural Markets	Provides insights into the size of local agricultural product markets in Nova Scotia compared to other provinces.	To understand the dynamics of local agricultural markets and identify growth or diversification opportunities.
6.	Seafood and Agriculture Exports	Tracks the volume and value of seafood and agricultural exports from Nova Scotia (Scotia & Devanney, 2007)	This will be used to analyze export performance and its contribution to the Nova Scotian economy.
7.	Tourism Revenue	Represents tourism revenue trends (Tourism Revenues, 2019)	To illustrate the economic impact of tourism and identify trends for strategic planning.
8.	Venture Capital Funding	Tracks venture capital investments within Nova Scotia (Invest Nova Scotia, 2024)	To gauge the health of the entrepreneurial ecosystem and innovation financing.

No	Statistic	Use	Purpose
9.	Research and Development Partnerships	Visualizes R&D collaborations among post-secondary institutions and other entities (Government of Nova Scotia, 2024)	To uncover the role of academic and research institutions in innovation and economic development.
10.	Post-Secondary Education and Training	Analyzes trends in graduation rates and fields of study against employment rates (Statistics Canada, 2024)	To identify educational alignments or gaps with labour market demands.
11.	Youth Employment	Tracks youth employment trends (Government of Nova Scotia, 2023).	To pinpoint sectors with high youth engagement and areas needing targeted employment programs.
12.	First Nations and African Nova Scotian Employment	Demonstrates labour market progress for these communities.	To show the impact of workforce inclusion on economic growth and identify areas for further inclusion efforts (Nova Scotia Public Service Commission, 2023)
13.	Employment and Participation Rates by Age	Provides a comprehensive view of labour market dynamics, adjusting for aging population impacts (Government of Nova Scotia, 2023).	Understanding labour market shifts and informing policy or strategic planning for addressing aging workforce challenges.
14.	Health Care	Access and availability of healthcare infrastructure and investments in the healthcare sector.	To understand whether access to healthcare infrastructure an underlying factor in may be individual migration decision.
15.	Immigration Rates	Examines the percentage composition of immigrants, etc.	To understand the demographic changes and patterns within the province's economy.

**This table reflects the datasets that have been identified and considered thus far. Additional datasets may be utilized in the future as the analysis progresses.*

References

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Report and Presentation

(The same texts from the syllabus:

- 1) the chosen field of your project (e.g., business, environment, economic development, etc.),*
- 2) proposed research questions,*
- 3) the datasets (the sources, the descriptions of variables and # of datapoints, explanations of how you found and merged (combined) the datasets, etc.),*

- 4) descriptions of the internal and external tool(s),
5) the findings (answering your questions), and 6) the implications of the findings.)

March 6:

Data cleaning - leo

Research question clarification and decide what analysis will go on to used - Luke and Iris

March 13:

Data Visualization – Tableau

Data Visualization - Power BI

March 20:

Report writing

March 27:

Report writing & presentation slides

April 3:

April 5 - submission

Initial Research Questions

6. What are the origins of migrants to and from Nova Scotia?

- *Province of origin to NS (Incoming)*
- *NS to Province of destination (Outgoing)*
-

7. What motivates people to settle or leave Nova Scotia?

-

Examine the most common motivations (based on related literature) for people to settle or leave the province and their impact on provincial migration.

8. How have infrastructure investments impacted the NS provincial migration?

Examine how investments in social programs and healthcare infrastructures influence the NS provincial migration.

9. How does the cost of living in Nova Scotia impact migration trends?

Examine how taxation, the high cost of real estate properties, and rising inflation for local goods in Nova Scotia affect patterns of interprovincial migration.

10. How do migration and important policy decisions affect people's movement into and out of Nova Scotia?

Examine the impact of provincial and federal permanent residency nomination programs on the population trends in Nova Scotia.

Province of origin to NS (Incoming)

- *NS to Province of destination (Outgoing)*

Graph 1: The overview of Move in and out of Nova Scotia (Line Graph)

Indicator: X-axis: Year, Y-axis: The number of Nova Scotia

3. Move in Nova Scotia: Profile: Examine the age, original province of individuals moving to Nova Scotia

Q1: What are the origins of migrants to Nova Scotia?

<https://open.canada.ca/data/en/dataset/f083ee31-e3b4-4f96-a655-30caf9eab790>

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- Rental Rates: Examine the impact of rental market conditions on people's decisions to leave.
- Labor Market Conditions: Assess the relationship between employment
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2.2 Access other provinces

Q3: How have public utility infrastructure investments impacted the NS provincial migration?

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Q7: What motivates people to leave Nova Scotia?

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Q8: Which 3 provinces have the biggest influx of migrants from Nova Scotia (move out)?

Q9: How has the trend in investment infrastructure in these provinces related to the influx of Nova Scotians moving out?

Name	Parts	Deadline
Luke	Introduction, Research Questions, Q8, Q9	March 28 midnight
Leo	Data Sets, Collection & Cleaning, Tool Descriptions	
Iris	Q5, Q6, Q7	
George	1, 2	
Rowena	3, 4	