

# **Retention Rate and Labour Market Performance of Movers & Stayers in New Brunswick**

by

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M.S.S., Shahjalal University of Science and Technology, 2018

A Report Submitted in Partial Fulfilment of  
the Requirements for the Degree of

**Master of Arts**

in the Graduate Academic Unit of Economics

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This report is accepted by the  
Dean of Graduate Studies

THE UNIVERSITY OF NEW BRUNSWICK

October, 2021

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## **ABSTRACT**

Given low birth rates, an aging population, and youth out-migration, policies concerning attracting and retaining new immigrants to New Brunswick are important for reversing the declining population trend. This study investigates immigrants' short- and long-term retention rates in New Brunswick (NB) and examines their labour market outcomes. Using the Immigrants Longitudinal Database (IMDB) and employing quantitative methods including Kaplan-Meier survival analysis, I estimate retention rates of immigrants who arrived in NB in 1986, 1996, 2006, 2011, and 2012. I observe that immigrants' mobility is high initially and subsequently drops and the overall retention rate stabilizes after nine years. While the retention rate is highest for the family class, it is lowest for the refugee class. My disaggregated analysis based on education-level and age-at-arrival also reiterate the variation in retention rates for different groups of immigrants. My findings will help NB to project short- and long-term population growth and design effective immigration policies to increase immigrants' retention and integration in the labour market upon arrival.

## **DEDICATION**

I would like to dedicate this report to my research supervisor Professor Murshed Chowdhury who has been an excellent professor during my time at the University of New Brunswick. His support, guidance and encouragement helped me to complete this work.

To Department of Economics at the University of New Brunswick for providing me the education, training and support throughout in pursuit of my degree. I found the professors, students and office staffs very much helpful here. Many thanks to the readers of my report Professor Weiqiu Yu and Professor Barry Watson for carefully going through my report with great detail. I really appreciate your contribution and overall support in this report.

And special dedication to my mother Momotaz Shirin for her love and support all the way and my father Late Mustafizur Rahman Siddiquee for his initial influence for me to pursue a degree in Economics.

## **ACKNOWLEDGMENTS**

- This research is funded by NBIF-Research Assistantship Initiative (NBIF-RAI 2019-22).
- The project proposal for RDC was written by Dr. Chowdhury.
- This research was conducted at the University of New Brunswick Research Data Centre (NB-RDC), a part of the Canadian Research Data Centre Network (CRDCN). This service is provided through the support of the University of New Brunswick, the province (s) of New Brunswick, the New Brunswick Social Policy Research Network (NBSPRN), the Canadian Foundation for Innovation, the Canadian Institute of Health Research, the Social Science and Humanities Research Council, and Statistics Canada. All views expressed in this work are our own.

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## 1.0 Introduction

According to the Conference Board of Canada<sup>1</sup>, immigration constitutes 82% of national population growth. Their projection is by 2030, almost 9.2 million Canadian baby boomers will be of retirement age, and this is a particular concern for New Brunswick (Conference Board of Canada, 2021). According to New Brunswick Population Report<sup>2</sup>, between 1979 and 2019, the percentage of NB's population under the age of 15 fell by nearly half (from 26.5% to 14.4%), while the percentage of the population aged 55 and up more than doubled (from 17.9% to 37.3%). These trends are expected to continue going forward at a lessening pace (NB Population Report, 2020). Based on Statistics Canada population projections, the number of individuals aged 55 years or older in NB is expected to exceed those aged 15 to 54 by the early-to-mid 2040s. Thus, declining fertility rates, increased life expectancy, and an aging baby boom generation have contributed to the structural change of the province's population over the past few decades.

Attracting more immigrants to the province is one of the critical policy agendas to address the issue of population growth and labour force shortage. However, despite various immigration policies, NB is facing immigrant retention challenges. According to the 2016 census, while immigrants constitute 21.9% of the overall Canadian population, they are only 4.6% of the NB population<sup>3</sup> (Statistics Canada, 2016). In the new population growth

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<sup>1</sup> <https://www.conferenceboard.ca/focus-areas/immigration/why-is-immigration-important-to-canada>

<sup>2</sup> <https://www.nbjobs.ca/sites/default/files/pdf/2020-06-30-lmi-population-report-en.pdf>

<sup>3</sup> <https://www12.statcan.gc.ca/census-recensement/2016/as-sa/fogs-spg/Facts-pr-eng.cfm?Lang=Eng&GK=PR&GC=13&TOPIC=7>



action plan, the province adopted the strategy to recruit 7500 immigrants annually from 2019-2024 (Govt. of New Brunswick, 2019)<sup>4</sup>. Also, the province targets an 85 % retention rate of newcomers (Govt. of New Brunswick, 2019). In this study, I am analyzing the retention rate of immigrants in NB based on different cohorts and immigrant categories for the past few decades. Also, I analyze the labour market outcomes of movers and stayers for these cohorts.

The analysis of immigrants' retention rate and economic integration is important for various reasons. First, most newly arrived immigrants tend to settle in major cities, e.g., Toronto, Montreal, Vancouver. To attract immigrants in smaller destinations, the federal and provincial governments have created several programs, e.g., Provincial Nominee Programme (PNP) and Atlantic Immigration Strategy (ACOA, 2017). However, these strategies may not work if immigrants utilize PNP or region-specific programmes to enter Canada and subsequently move to larger cities (Flynn and Bauder, 2015). Second, if the retention rate is low, the arrangement of various programmes, e.g., training, language instruction, housing and health care by different provinces for immigrant groups may not work in favour of these provinces subsequent economic gain (Akbari & Sun, 2006). Third, if the retention rate continues to decline in the long-term, as opposed to a decline in initial period only, the projection of population and labour market growth could be misleading. Moreover, due to secondary migration from the initial destination, many smaller provinces and regions, including NB, may fail to project future population growth or labour market scenarios.

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<sup>4</sup> [https://www2.gnb.ca/content/dam/gnb/Departments/petl-epft/PDF/PopGrowth/Population\\_growth\\_strategy.pdf](https://www2.gnb.ca/content/dam/gnb/Departments/petl-epft/PDF/PopGrowth/Population_growth_strategy.pdf)

Most of the Canada-wide studies examining the retention rate of immigrants put Atlantic Canada (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador) together and compared them with other provinces. Therefore, it doesn't provide any detail regarding the retention rate and labour market outcomes of immigrants specifically in NB. Moreover, NB-specific studies (Akbari, 2007; McDonald et al. 2015; Emery et al., 2017; Balcom, 2017; Leonard et al., 2019; McDonald and Miah, 2021) are either descriptive or qualitative, discussing various short-term retention issues. Akbari (2007) uses census data to examine the short-term retention rate of immigrants for each census year starting from 1981 until 2001. McDonald and Miah (2020) recently examined the retention rate of NB immigrants using Medicare registry data for the period 2001 to 2018. They limit their study up to five years for the immigrant cohort of each landing year. These studies are either limited to a short period or do not include discussions related to the economic outcomes of immigrants. Studies based on a short period of time may not reflect the long-term retention rate and give a bias projection of the population growth trajectory. This study attempts to fill these voids by examining the following questions:

1. What is the long-term and short-term retention rate of immigrants in NB? How does the retention rate vary across different immigrant groups?
2. What are the labour market outcomes of movers and stayers?

I address these research questions using the Longitudinal Survey of Immigrants to Canada (IMDB) available through the Research Data Centre (RDC) housed at the University of New Brunswick. I use both landing records and tax files from the IMDB dataset starting from 1986 until 2018. Another important data source for retention estimation in NB is provincial administrative data (The Citizen Database) which gives

more specific information on immigrants landing in NB because it contains immigrants Medicare data as well. But this database does not contain any information on immigrants' income or labour market outcomes. Hence, I use IMDB data where I can link immigrant tax records and measure labour market outcomes. My analysis includes estimation of the retention rate and economic outcomes of different age cohorts over many years. Using the Kaplan-Meier survival analysis, it appears that retention rates substantially vary across immigrants' cohorts and characteristics. Although the decline in the retention rate is high initially, it continues to decline for many years. For most immigrants, regardless of their characteristics, the retention rate stabilizes after nine years. Recent immigrants tend to have a higher retention rate compared to the older cohorts. Also, the labour market outcomes of movers and stayers of different cohorts varies significantly. My findings will help project future retention of immigrants and address labour market issues.

The next section is the literature review. In section 3, data and methods, in 4, results and interpretation and in 5 is conclusion.

## **2.0 Literature Review**

Migration theories have evolved since migration theorist Ernest Ravenstein's seminal work "Laws of Migration" (1889). Using United Kingdom data, he concludes that migration is governed by a "push-pull" process; that is, unfavorable conditions in one place (oppressive laws, heavy taxation, etc.) "push" people out, and favorable conditions in an external location "pull" them out. Ravenstein's law states that the primary cause for migration is better external economic opportunities. He also suggests that the volume of migration decreases as distance increases, and various socio-demographic factors (e.g., gender, social class, age) influence a person's mobility. Since then, an extensive literature has developed.

Etzo (2008) classifies migration literature as international and internal based on the spatial context of migration flows. In turn, Cadwallader (1992) and Stilwell and Congdon (1991) classify these literatures as micro and macro approaches. The micro approach focuses on individuals' behaviour, while the macro approach focuses on places or locations (e.g., countries, regions, municipalities). Greenwood (1997) also addresses two types of migration modelling: micro theory models and macro theory models. In the micro theory models, the objective of the analysis is based on the single individual behaviour and the factors that influence the migration decision. In the macro theory models, the analysis is based on the aggregate flow of migrants rather than the single individual. Greenwood (2005, 2015) describes migration models historically following the 'disequilibrium approach' and the 'equilibrium approach', whereby almost all the research conducted by economists before 1970 was based on the disequilibrium approach. The disequilibrium approach represents the idea that wage differentials provide opportunities for utility gains. But in recent times, the idea of the disequilibrium approach has been challenged by the equilibrium approach. The equilibrium hypothesis assumes that households and firms are in proximate equilibrium at any point in time. This assumption means that the marginal household and firm, while maximizing utility and profit respectively, are spatially arrayed to receive zero consumer and producer surplus from their location. Changes in life cycle factors or generally rising real incomes continuously change the demand for consumer amenities. Because amenities are not evenly distributed, migration occurs and quickly re-equilibrates households.

A large part of migration literature has evolved following the work of Sjaastads (1962) where he has developed a micro theory model based on human capital investment.

His description of migration is the act of locating one's skills in that market which offers the highest return. Harris and Todaro (1970) introduces labour market imperfection in an individual's decision to migrate to the urban and rural sectors. Todaro (1976), also uses the human capital model introduced by Sjaastad in his migration framework to account for personal characteristics. Moreover, migration research emphasizes the important role of personal characteristics (Greenwood, 1975, 1985, 1997; Cadwallader, 1992; Plane and Bitter, 1997; Cushing and Poot, 2004). Again, the decision-making unit is also discussed from a behavioural point of view. The decision-making process of migration involves group of different individuals with different preferences (e.g., families). Mincer (1978) argues that migration decisions are taken by families rather than by the single individual which is an extension from Becker's (1974) work on household decision making process. A recent development in the micro theory models is a dynamic approach of network models (Carrington, 1996; Bauer and Zimmermann, 1995, 1997). In this approach, the idea is that migrants create networks in the destination places, which reduce the migration costs for new migrants and therefore favour future migration. In essence, micro modelling theory emphasizes the role of heterogeneity among migrants, which includes preferences, human capital, and the complexity underlying the decision-making process (Etzo, 2008).

In the macro modelling approach, aggregate migration flows are studied with respect to the whole economic system of defined geographical areas (i.e., regions, provinces, municipalities). Therefore, the focus is on the relationship between migration and the macro variables that characterize destinations. The most common theoretical framework in empirical migration analysis is the gravity model, introduced by Lowry (1966) and Lee (1966) (Greenwood and Hunt, 2003). Gravity models propose a

relationship between the demographic force driving migration and the population density of the migrants' origin, the destination, and the distance between the locations, in analogy to Newton's Law of Gravity (Cruickshank et al, 2018). In addition, gravity models are commonly modified to include economic variables such as regional unemployment rates, income per capita, and other proxies to capture variation in the availability of amenities.

Even though the distinction between micro and macro models reflects two different literature strands, there are significant relationships between the two approaches. Cadwallader (1992) draws attention to individuals' subjective perceptions with respect to the aggregate regional indicators (e.g., differences in per capita GDP or unemployment rates). The decision-making process of the single individual affects the aggregate utility function, which in turn determines the aggregate migration flows. In addition, Champion and Fotheringham (1998) argue that the distinction between micro and macro approach is often blurred because some models that use aggregate data are derived from micro theoretical principles.

Secondary migration is a very common spatial movement among immigrants in Canada. Secondary, or onward migration, occurs when an individual or family decides to relocate after initially settling in Canada. This relocation could occur intra-provincially, for example, from rural to urban areas. It could occur inter-provincially, for example, when an immigrant arrives in one province but later moves to another province. It may also occur internationally if an immigrant decides to return to their home country or move onward to a third country (Cruickshank et al, 2018). Different factors affect internal migration. Champion and Fotheringham (1998) find that demographic factors like age and sex have a major influence on migration propensities. In particular, age affects internal migration in a

regular way and interregional migration is higher for children (0-4 year) and people who are between 20 to 34 years old in Italy in the year 2002 (Etzo, 2008). Education also affects migration propensity. Piras (2005) estimates the regional migration rate of immigrants using panel data and finds that migration increases considerably with educational attainment. Other factors that affect internal migration are marital status (Graves and Linneman, 1979), family ties (Mincer, 1978) and employment status (Da Vanzo, 1978).

Immigration is seen as a remedy for declining fertility rates, aging populations, out-migration, and economic stagnation in Canada. Various immigration policies have been implemented in the past three decades to increase the population of Canada. However, the majority of immigrants settled in Canada's three largest cities (Toronto, Vancouver and Montreal), while the flow of immigrants to smaller provinces decreased (Pandey and Townsend, 2011). Trovato (1988) also finds that recent immigrants tend to migrate to larger centers and subsequently remain there; if they move, it tends to be to other larger centers. It is only after immigrants have resided in larger urban centers for ten years or more when we begin to observe a rise in the probability of movement to smaller urban areas. In 2006, about 68.9% of immigrants arriving between 2001 and 2006 resided in the Census Metropolitan Areas (CMAs) of Montreal, Vancouver, and Toronto, compared to 34.4% of the Canadian-born population (Statistics Canada, 2007). Aydemir and Robinson (2008) estimates a Canadian out-migration rate is around 35% among young, working-age, male immigrants twenty years after arrival and most of those departing (60%) do so within the first year of arrival.

Literature on secondary migration in Canada is generally presented in terms of retention rates using census data or the Immigrant's Longitudinal Database (IMDB), and is

modelled based on determinates including citizenship status, source country, employment status, education, age, business cycle, compatriot communities, and arrival cohort (Cruickshank et al., 2018). In the 1990's Canadian immigration policy was changed by introducing a new point system to attract a large and steady flow of immigrants to offset the declining population (Green, 2004) and generate economic growth (Aydemir and Robinson, 2006). Newbold (2007) finds that new immigrants to Canada are highly mobile compared to the Canadian-born population.

The retention of immigrants is generally low outside of Montreal, Toronto, and Vancouver - in particular, the Atlantic provinces are facing the issue of low retention rates. Due to their small population sizes, all four Atlantic provinces are usually studied together as a region in Canada-wide studies. Akbari (2003), using Census data, finds that although the immigrant population inflow is stable and rising over the years, the provinces in Atlantic Canada are facing out-migration and population loss. Akbari and Sun (2006) find evidence that immigrants in Atlantic Canada will choose to settle in smaller areas if they can secure employment and an existing immigrant population already exists.

Although a small number of studies focus on Atlantic Canada, the studies specific to immigrants in NB are very rare. The existing studies claim that the overall retention rate is low in Atlantic Canada compared to other regions of Canada. However, the variation in low retention rates within Atlantic provinces could have different implications. Immigrants play an important role in economic growth and solving the problem of an aging population. They are also important in enriching the declining labour force of NB (Passaris, 2012). Labour market outcomes of immigrants also plays an important role in immigrants' migration decisions. Much of the existing literature on NB immigration has tended to be



qualitative, focusing on the narratives and experiences of immigrants. In addition to the small number of immigrants in NB, data access has also been an issue, limiting quantitative research in this province. Moreover, most of these studies are limited to a few years of retention after landing and do not discuss immigrants' long-term retention patterns. Among these, past literature used Medicare registration (McDonald, Liu & Boudreau; 2015), permanent resident data, census data (Akbari and Dar; 2005) etc. Also, past literature used non-parametric method of analysis, trend analysis and descriptive analysis (Akbari; 2012).

Akbari et al. (2007) use Landed Immigrant Data System (LIDS) and Census data to analyze annual immigration and labour market trends in NB over the period 1981-2005. In this study they find that of the immigrants who arrived in NB between 1981 and 1986 and between 1991 and 1996, 70 % remained in the province at the end of their respective periods. In the census period 2001-2005, retention rates of new immigrants fell modestly to 67%. In the same study, they find, immigrant contribution to the NB labour force over the 1981-1991 period was in the range of 5% of non-immigrant labour force growth. In the economic downturn of the early 1990s, new immigrants' contribution to the provincial labour force was steady, while growth from other sources contracted substantially (Kustec, 2012). Non-immigrant growth in the labour force continued to decline in the 1996-2001 period, meaning that an even larger proportion of total labour force growth in NB was due to immigration (Akbari, 2007).

Using data from Permanent Resident Data System (PRDS), released by CIC, Akbari (2013) finds that the immigrant inflow is stable in NB from 1981-2005. Recent studies find that the immigrant population has been increasing in NB (McDonald, Liu & Boudreau; 2015). But immigrants' retention has always been a key issue. Recently, Emery,

McDonald and Balcom (2017) used linked immigrant landing records, temporary resident entry records, and tax records to study retention rates of temporary residents in NB who convert to permanent residents and remain in the province. The study found that the conversion rate from a temporary to permanent resident was high, but only 50% of the individuals that converted remained in NB after five years. Deshaw (2006) identifies why immigrants leave the province to the bigger provinces, which include: low employment prospects in NB, underemployment in NB, family income, and extended family in bigger provinces. Hyustee and Jean (2014) use IMDB data to identify the interprovincial mobility of immigrants in Canada over the 2006-2011 period. They find that the net retention rate of immigrants was only 60% in this period in NB. Besides net retention, they also identify immigrants' retention based on age group, gender, knowledge of official language, level of education, and immigrant category. Here, they find that gender and knowledge of language have little effect on immigrants' mobility in NB. But based on level of education and age group, those who have a trade certificate, a diploma degree, or Ph.D. and those who landed in NB at the age 55 or older have more probability of staying in NB. They also find that the family class immigrants also have a higher retention rate (79.2%) in this period.

McDonald et al. (2018) use landing records from IRCC and provincial Medicare data to better understand the secondary migration of NB immigrants using both descriptive and non-parametric survival methodology. Their findings suggest that both previous residents of other countries and previous residents of other provinces are substantially more likely than Canadian-born New Brunswickers to leave the province. In a similar study, Leonard et al. (2021) finds the 1-, 3- and 5-year retention rates of immigrants are 70%, 60% and 50%, respectively, for immigrants who arrived under the Provincial Nominee

Programme (PNP). One of the limitations of these studies is that they are typically limited to a short time period.

Among the studies related to immigrants' economic outcomes upon their arrival in Canada, Abbott and Beach (2011) use tabular data from the IMDB to examine the relationship between admission category and macro-economic conditions for three immigrant entry cohorts (1982, 1988, and 1994). They find that independent class immigrants have consistently higher median earnings than family or refugee class immigrants (see also McHale and Rogers 2008, 2009). Marr and Siklos (1994) were one of the early studies examining the empirical link between immigration and unemployment in Canada. They found increases in the unemployment rate reduced future immigration rates before 1978. However, from 1978 to 1990, they found an association between past immigration and the current unemployment rate. Gross (2004) analyzes regional labour markets' ability to absorb the flow of immigrant workers with declining skill levels during periods of relatively high unemployment. In conclusion, he found out that in the short run, unemployment rises with immigration, but in the long run, it falls permanently.

Although there is some research on immigrants' retention and labour market outcomes, most of these studies are concerned with a few years of data. Also, immigrants' labour market outcomes are often ignored in retention-related studies. In this study, I seek to address these gaps in the literature, using IMDB data to locate the same individual over many years, while examining the short- and long-term retention rates and migration patterns of three migrant groups (Family, Economic, and Refugee). I estimate retention rates for five cohorts from the last three decades and their labour market outcomes in NB.

Moreover, I extend my analysis to observe how the labour market integration of movers varies with the stayers in NB.

### **3.0 Data, Sample and Methods**

#### ***3.1 Data***

Data for this report was retrieved from the Longitudinal Immigration Database (IMDB) held by Statistics Canada<sup>5</sup>. I received access to the dataset through the Research Data Centre (RDC) at the University of New Brunswick, Fredericton. The IMDB dataset includes administrative immigration data for all immigrants since 1952 and non-permanent residents (e.g., temporary residents) since 1980. Income data for this population is available from tax files (T1) since 1982. The Longitudinal Immigration Database (IMDB) brings together immigration information from Immigration, Refugees and Citizenship Canada (IRCC), income data from the Canada Revenue Agency (CRA), and the date of death from the Canadian Mortality Database<sup>6</sup>. It provides various socio-demographic information regarding different types of migrants, particularly primary, return, and other repeat migrants. Each year the IMDB is updated with new immigrant cohorts, new non-permanent residents, citizenship data, settlement services data and new income data. The Longitudinal Immigration Database (IMDB) combines administrative immigration data with T1 Family Files (T1FF) and T4 supplementary files through probabilistic record linkages. Of immigrants admitted between 1980 and 2018, 84.6% were linked to at least one T1FF record.

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<sup>5</sup> The IMDB dataset includes all immigrant population. Therefore, it doesn't require any population weighting.

<sup>6</sup> Source: <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5057>

I selected five cohorts: 1986, 1996, 2006, 2011 and 2012. The first four cohorts are from four decades. As part of examining the retention rates, I choose one cohort from each decade. These cohort years are also census years. Besides these four cohorts, I also include 2012 to analyze and compare immigrants' retention scenarios in the recent decade. Currently, at RDC, there is data available up to the 2018 cohort. However, as I am interested examining both the short- and long-run retention rates, I limit the study upto the 2012 cohort and estimate their retention rate until 2018.

These cohorts show the total number of immigrants that landed in NB during these years. I followed the first three cohorts (1986, 1996 and 2006) for 9 years<sup>7</sup> and the recent two cohorts (2011 and 2012) for 6 years and 5 years respectively. By merging both tax files and landing records for each cohort and expanding the dataset for each cohort up to the maximum eligible years (with respect to the disclosure restriction), I estimate the retention rate for various groups.

To select these cohorts, I started data preparation with the Integrated Permanent and Non-permanent Resident File (PNRF). This file contains landing information of immigrant tax filers. First, I select landing year 1986 or later based on our cohorts. Then I checked the records for the presence of erroneous data using assumptions: first tax year should be greater than year of birth, landing year should be greater than year of birth, and year of death should be greater than landing year. Erroneous data were flagged for removal. After preparing the tax file, it was merged with the PNRF file. Annual cohort files were created from the merged files using landing year (i) and then the tax filing years (i or i+1)

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<sup>7</sup> Due to RDC guidelines I could not release these results beyond 9 years.

as the selection criteria. A person who died at cohort time-point A, year  $i$  or  $i+1$ , were identified based on the PNR variable 'Year of death' and supplementary information. If a person is deceased and the death year is unknown, the last tax year is used as an indicator. Location variable is based on where tax is filed (PRCO).

### ***3.2 Estimation of Retention Rate***

After merging the tax files with landing records for up to 10 years within each cohort, I estimate the short and long-term retention rates using SAS and Stata statistical packages. For the retention estimate, I followed the methods used by Esses and Carter (2019). I identify annual cohorts based on landing year ( $i$ ) and tax filing year ( $i$  or  $i+1$ ), considering that not all immigrants file taxes in the first year of arriving in Canada. For example, among the NB immigrants who landed in 1986, the cohort includes those who filed taxes for the first time in 1986, and those who filed for the first time in 1987. After creating the cohort, I identified the non-mobility-related factors in each cohort. A non-mobility-related factor is identified when an immigrant is dead or has a missing tax record in the study period. Though moving out of country is also an act of mobility, due to low cell counts this factor often had to be aggregated with other non-mobility factors, since location within Canada for such person is unknown (Esses and carter, 2019). I have created two sets of observations for the overall retention rate estimation: one with non-mobility factors and the other without it. I report the retention rates based on both with and without non-mobility factor. For estimating the retention rates based on immigrant categories and other disaggregated groups, I removed the non-mobility elements due to disclosure issues for a small number of observations. Evra and Prokopenko (2018) reports that retention rate estimation may

differ based on the initial cohort's definition on how the mobility is identified<sup>8</sup>. We use both province of destination and province of tax filing in our retention estimation. The estimated retention rate equals:

$$RR_{i+t} = \frac{R_{i+t}}{TR_{i \text{ or } i+1} - NMF} \dots \dots \dots (1)$$

Where,  $RR_{i+t}$  = Retention Rate after t years

R is the number of immigrants resident in NB after  $i + 1$  years. TR is total number of immigrant residents in year  $i$  or  $i + 1$  and NMF is number of immigrants lost because of non-mobility factors. Based on NB's retention rate of immigrants, we expect that,  $R_{i+t} < TR_{i \text{ or } i+1} - NMF$ , which means  $0 \leq RR_{i+t} \leq 1$ . Any value less than 1 means NB is losing immigrants from this cohort over time. Immigrants arrive in Canada in various categories, e.g., economic class, family class, refugee class and this study estimates the retention of immigrants in these different categories. To postulate a broader picture, I also estimate immigrants' retention rates based on their educational attainment and landing age.

### ***3.3 Kaplan-Meier Survival Analysis***

Survival analyses examine changes over time regarding a specified event. For this report, I use Kaplan-Meier survival estimation. This method was first introduced by Kaplan and Meier (1958) which is a non-parametric estimate of the survival function. The survivor function represents the probability that an individual survives from the time of origin to some future time (McDonald, Liu & Boudreau; 2015). This method is mainly used in

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<sup>8</sup> Studies could identify mobility in various ways: it could be based on the mismatch between intended and actual destination or the province of initial tax filing. The outcome would vary based on the methods used.

epidemiology to measure the fraction of patients living for a certain amount of time after treatment for a life-threatening disease. This method is also applied to criminology whereby researchers examine the probability of recidivism (Campedelli and Yaksic, 2020). Here, I use Kaplan-Meier estimates to measure the conditional probabilities of immigrants' remaining in the province for 10 years – i.e. 9 additional years after landing (1986, 1996 and 2006) and after 6 and 5 years of landing (2011 and 2012 cohort).

The Kaplan-Meier estimate is calculated as follows:

$$\hat{S}_i(t) = \prod_{i=t_i \leq t} \left(1 - \frac{d_i}{n_i}\right) \text{-----} (2)$$

Where  $S_i$  is the Kaplan-Meier estimate,  $d_i$  represents the number of immigrants who landed at the base year of every cohort (1986, 1996, 2006, 2011 and 2012),  $n_i$  represents the number of immigrants who remained from  $t_{-1}$  to period  $t$ . I calculate the first-year survival rate by dividing the number of stayers after the first year by the base year, then for successive years I multiply the previous years' survival rate by the ratio of immigrants who remained in the current year over the number who remained in the previous year. I repeat this for all cohorts under each immigrant admission class, age group, and education level.

### ***3.4 Measurement of Labour Market Performance***

This study also examines the labour market outcomes of immigrants upon their arrival to the province. The Canadian Labour Force consists of civilian non-institutional population 15 years of age and over who are employed and unemployed. Employed individuals are those who have a job or business and the unemployed are without work, are available to work and are actively seeking work (Kustec; 2012). From the IMDB data, we identified



movers from their tax filing location. We consider an immigrant a stayer if s/he/they files taxes in NB after landing in Canada and the tax filing location doesn't change during our cohort analysis period. If an immigrants' tax filing location changes to another province, then they are considered as a mover. Using descriptive statistics, we report and discuss immigrants' average annual income, yearly labour force participation rate and yearly unemployment rate for the same cohorts mentioned before. We compare the labour market integration of movers with the stayers.

## **4.0 Results**

In this section, we first present the retention rates in NB for five cohorts 1986, 1996, 2006, 2011 and 2012. The number of immigrants in each cohort are 285, 310, 900, 1010 and 1105 respectively<sup>9</sup>. We then describe the survival rate of immigrants and report the retention rate of different groups and cohorts. Finally, we present the descriptive results of mover's and stayer's earnings and labour market outcomes across the cohorts.

### ***4.1 Retention of Immigrants***

Table 1 reports the aggregate retention rates for three cohorts<sup>10</sup>. Reporting retention rates without non-moving factors (NMFs) is a finetuning of the formula used in the traditional approach (Esses and Carter, 2019). Studies without excluding the NMF could be misleading as the retention estimates with and without NMFs vary. I report the retention rates based on with and without NMF to exhibit the importance of excluding NMF in reporting retention estimates.

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<sup>9</sup> Numbers are rounded to nearest five based on RDC guidelines.

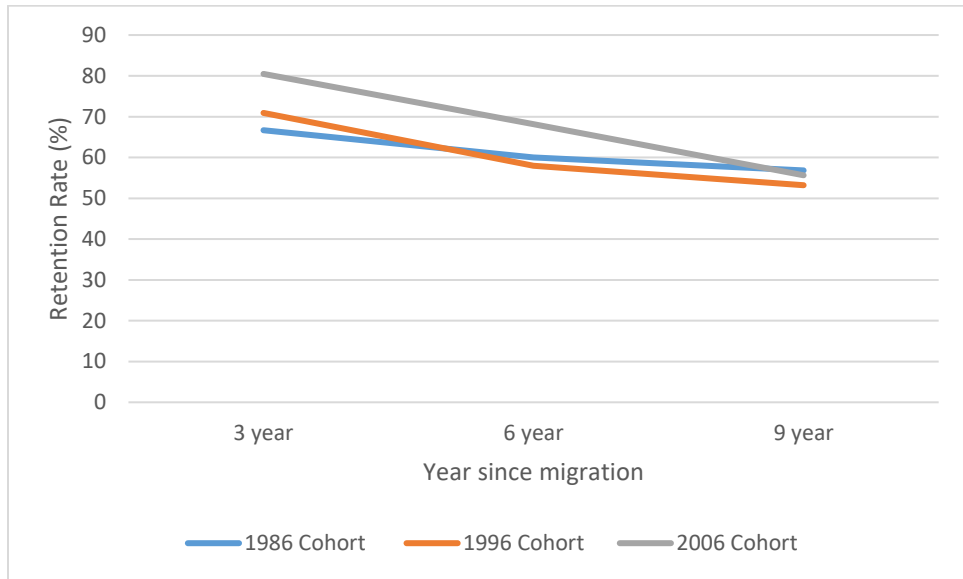
<sup>10</sup> My initial goal was to report retention rates in each successive year up to ten years. However, due to confidential data disclosure issues with RDC, I could not report each consecutive year.

**Table 1** Immigrant Retention Rates in New Brunswick of 1986, 1996 and 2006 Cohort:

Overall (%)

Cohort	With NMF			Without NMF		
	3 year	6 year	9 year	3 year	6 year	9 year
1986	59.65	47.37	43.86	66.67	60.00	56.82
1996	62.90	46.77	40.32	70.91	58.00	53.19
2006	75.56	60.56	46.67	80.47	68.13	55.63

Notes: NMF= non mobility factors (e.g., death or missing tax record)



**Figure 1** Immigrant Retention Rates in New Brunswick of 1986, 1996 and 2006 Cohort  
(Without NMF)

From Table 1 and Figure1, the overall retention rate is declining over the years for all three cohorts. Although the 2006 cohort has a significantly higher retention rate after 3 years (80.47%; without NMF) than the other two cohorts, the retention rate is almost same

after 9 years - falling to around 55% for these cohorts. The retention rate stabilizes after 9 years<sup>11</sup>.

Table 2 reports 3- and 5-year retention rates for the 2011 and 2012 cohorts. Overall, the retention rate is declining in all five cohorts, and it is lower in recent cohorts compared to their older counterparts. The 3- and 5-year retention rate is higher in 2012 cohort than 2011 cohort.

**Table 2** Immigrant Retention Rates in New Brunswick of 2011 and 2012 Cohort: Overall

(%)

Cohort	With NMF		Without NMF	
	3 year	5 year	3 year	5 year
2011	69.31	63.86	57.92	54.46
2012	81.48	72.90	66.51	61.95

**N.B.** NMF= non mobility factors (e.g., death or missing tax record)

Overall, these estimates suggest that, in NB, the retention rate of immigrants gradually declines across cohorts, which aligns with recent studies on NB<sup>12</sup>.

Immigrants come to Canada in different categories. According to the IMDB database, three major admission categories are economic class, family class, and refugees. From Table 3, the 3- year retention rate is lowest for the refugee class across the

<sup>11</sup> If we continue estimating retention rate after 9 years, the cell counts for movers become too small which doesn't qualify for disclosure.

<sup>12</sup> Akabri(2007) uses every five-year census period and finds that the retention rate in NB is around 70% for the census period 1981-1986 and 1991-1996 and approximately 67% for the 1996-2001 period. McDonald and Miah (2021) use longitudinal administrative data and find that for 2005-2019, 1-,3-, and 5-year retention rate for the landed immigrants of 2006 is 81.4%, 66.7% and 54.4%, respectively.

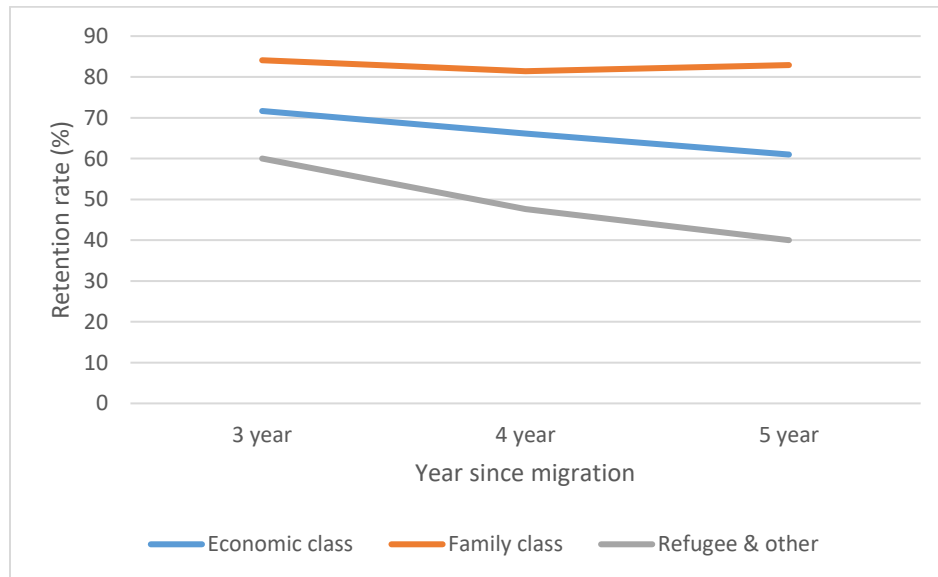
cohorts. The 3-year retention rate is highest for the family class in the 1986 and 1996 cohorts, but in 2006, the retention rate is initially highest for the economy class.

**Table 3** Immigrant Retention Rates in New Brunswick of 1986, 1996 and 2006

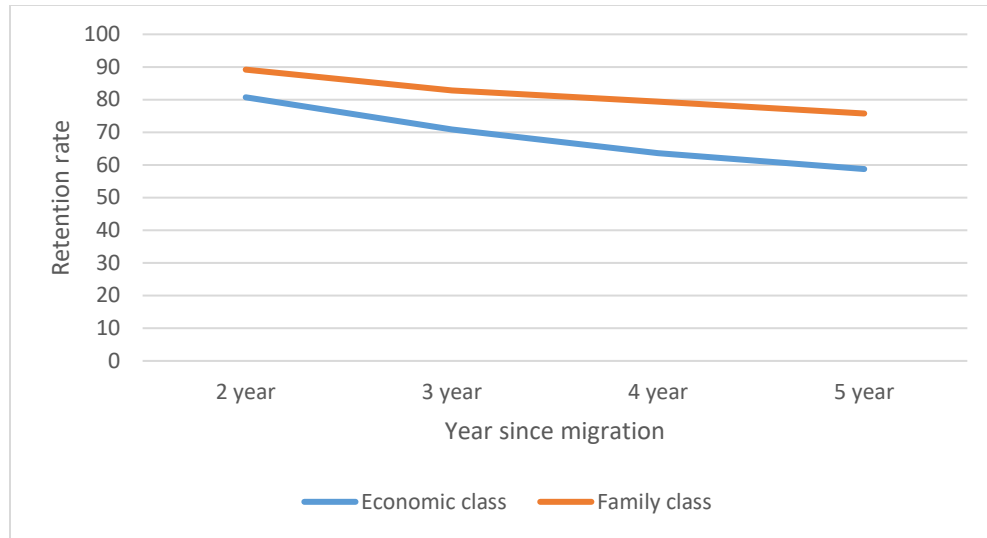
Cohort: Immigrant's Category (%)

Without NMF		
Cohort	Immigration Class	3 year
1986	Economic class	68.75
	Family class	84.21
	Refugee & other	40.00
1996	Economic class	69.57
	Family class	89.47
	Refugee & other	42.86
2006	Economic class	86.24
	Family class	79.49
	Refugee & other	50.00

**N.B.** Due to cell counts only 3-year retention rates can be released.



**Figure 2** Retention Rates in New Brunswick of 2011 Cohort based on immigrant's category.



**Figure 3** Retention Rates in New Brunswick of 2012 Cohort based on immigrant's category.

Again, in Figures 2 and 3 and Table 4, it appears the retention rate declined for all the immigrant classes over the years, and it is lowest for the refugee class in the 2011 cohort<sup>13</sup>. The retention rate is highest for the family class in both the 2011 and 2012 cohorts. Hence, the refugee class immigrants have the lowest possibility of remaining in NB after their landing. In recent cohorts, family class immigrants have been more likely to stay in NB relative to economic class immigrants. These results are consistent with previous literature by Akbari (2012) and Ramos & Bennet (2019).

<sup>13</sup> Results of the refugee class for the 2012 cohort could not be released due to small sample sizes.

**Table 4:** Immigrant Retention Rates in New Brunswick of 2011 and 2012 Cohort:

Immigrant's Category (%)

Without NMF					
Cohort	Immigration Class	3 year	4 year	5 year	6 year
2011	Economic class	71.65	66.14	60.98	57.50
	Family class	84.09	81.40	82.93	N/A
	Refugee & other	60.00	47.62	40.00	N/A
2012	Economic class	80.72	70.91	63.58	58.75
	Family class	89.19	82.86	79.41	75.76
	Refugee & other	N/A	N/A	N/A	N/A

**N.B.** Due to low cell count issues, some results could not be released and are denoted N/A.

Mincer (1974) modeled the natural logarithm of earnings as a function of years of education and years of potential labor market experience, also known as the Mincer equation model. In a recent study, Lemieux (2006) describes although there is a relation between education level and wage earnings but this relationship does not quite follow Mincer Equation since the wage structure has changed over the years. With the introduction of the “point system” in 1967, education became an essential requirement for the success of an immigrant’s application filed under economic class<sup>14</sup> (Lopez; 2007). As a result, educational levels among annual immigrant inflows to Canada have risen (Akbari, 2013). Education may also influence immigrants’ mobility (Etzo, 2008). Therefore, to examine the retention rate with different levels of education, I divide immigrants into three main

<sup>14</sup> Source: <https://pier21.ca/research/immigration-history/immigration-regulations-order-in-council-pc-1967-1616-1967>

categories: High school or less, Some college or diploma, and University (Bachelor, Masters or Ph.D).

**Table 5** Immigrant Retention Rates in New Brunswick: 1986, 1996 and 2006

Cohort: Education Level (%)

<b>Without NMF</b>				
<b>Cohort</b>	<b>Education Level</b>	<b>3 year</b>	<b>6 year</b>	<b>9 year</b>
<b>1986</b>	High school or less	65.22	N/A	N/A
	Some college or diploma	60.00	N/A	N/A
	University	64.29	N/A	N/A
<b>1996</b>	High school or less	61.11	N/A	N/A
	Some college or diploma	75.00	N/A	N/A
	University	72.73	N/A	N/A
<b>2006</b>	High school or less	78.00	66.67	48.89
	Some college or diploma	81.08	73.53	60.61
	University	81.48	68.83	59.15

**N.B.** Due to low cell count issues, some results could not be released and are denoted N/A.

Table 5 reports that the 3-year retention rate has increased across the cohorts over the years. In the 2006 cohort, immigrants' 3-year retention rate is around 80% for all the education levels which is more than the earlier cohorts of 1986 and 1996 initially. However, in the longer period, the retention rate declines, and in the 2006 cohort, 9-year retention rate is lowest for those with less than a high school education.

**Table 6:** Immigrant Retention Rates in New Brunswick: 2011 and 2012 Cohort:

Education Level (%)

Cohort	Without NMF				
	Education Level	3 year	4 year	5 year	6 year
2011	High school or less	68.57	63.77	60.61	N/A
	Some college or diploma	79.07	74.42	N/A	N/A
	University	72.15	67.95	61.04	N/A
2012	High school or less	77.59	68.42	62.50	59.26
	Some college or diploma	83.33	77.36	69.23	60.38
	University	82.69	73.79	67.33	63.27

**N.B.** Due to low cell count issues, some results could not be released and are denoted N/A.

From Table 6, the three-year retention rate is higher in 2012 than in 2011. But it is almost same for both cohorts after 5 years. Those who have some college or a trade/diploma certificate are most likely to stay in NB after 3-4 years. But, after 5 years, the retention rate is almost<sup>15</sup> the same for all the immigrants, regardless of education level. Overall, those who have educational attainment up to college-level diploma or trade certificate have a higher retention rate initially for the most recent cohorts (2011 and 2012). This result is similar to Huystee and Jean (2014), where they find that those who have a trade certificate or Ph.D. degree have higher retention rates for 2006-2011. McDonald and Miah (2021) also find similar results. Using NB Medicare registry data for the period 2005-2018, they find the difference in retention rates by education level does not appear significant initially but over longer periods of time, the difference becomes larger, suggesting that immigrants with higher education are less likely to remain in the province - possibly indicating more job opportunity outside the province.

<sup>15</sup> T-test statistics shows statistical differences in mean values exist, but my discussion is more related to the retention scenario and similarities in the groups. Hence, I am not reporting the t-statistics results.



Age could be another important factor in immigrants' mobility As McDonald et al. (2018) suggest that younger people are more likely to move, relative to the older immigrants (McDonald et al.; 2018).

**Table 7:** Immigrant Retention Rates in New Brunswick of 1986, 1996 and 2006  
Cohort: Landing Age Group (%)

Cohort	Without NMF			
	Age Group	3 year	6 year	9 year
1986	0-24 Year	58.33	50	N/A
	25-34 Year	61.29	55.17	N/A
	35-49 Year	88.89	85.71	N/A
1996	0-24 Year	66.67	50	N/A
	25-34 Year	71.43	55.26	N/A
	35-49 Year	62.5	57.14	N/A
2006	0-24 Year	68	47.83	36.36
	25-34 Year	79.65	68.52	56.31
	35-49 Year	96.67	82.14	72

**N.B.** Due to low cell count issue, we couldn't get the N/A estimates released.

Splitting immigrants into 3 different groups, 0-24, 25-34, and 35-49, Table 7 suggests that the 3-year retention rate is lower for those who landed at a relatively early age. But in the longer period, the retention rate declines, and the 9-year retention rate is lowest for those who landed between 0-24 years of age in the 2006 cohort. The retention rate is highest among those arriving between the ages of 35-49 years. Due to low cell counts, those who landed at the age of 50 or over are excluded.

**Table 8: Immigrant Retention Rates in NB: 2011 and 2012 Cohort: Landing Age Group**

(%)

Cohort	Without NMF				
	Age Group	3 year	4 year	5 year	6 year
2011	0-24 Year	66.67	N/A	57.14	N/A
	25-34 Year	72.52	N/A	62.7	N/A
	35-49 Year	73.68	N/A	70.27	N/A
2012	0-24 Year	N/A	69.57	N/A	63.64
	25-34 Year	N/A	71.43	N/A	59.26
	35-49 Year	N/A	80	N/A	70.21

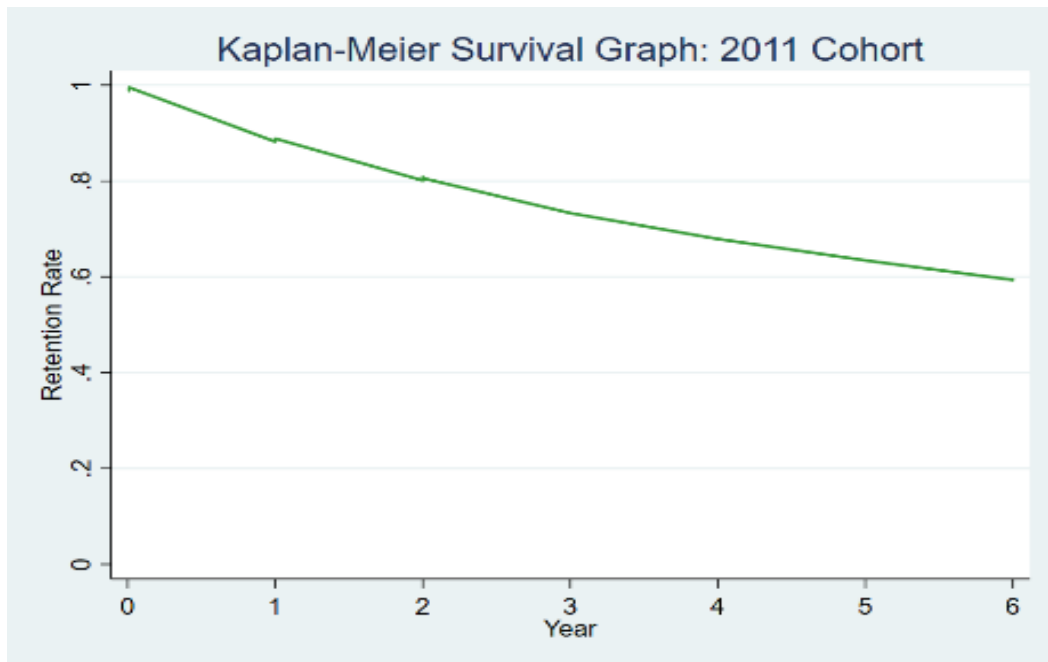
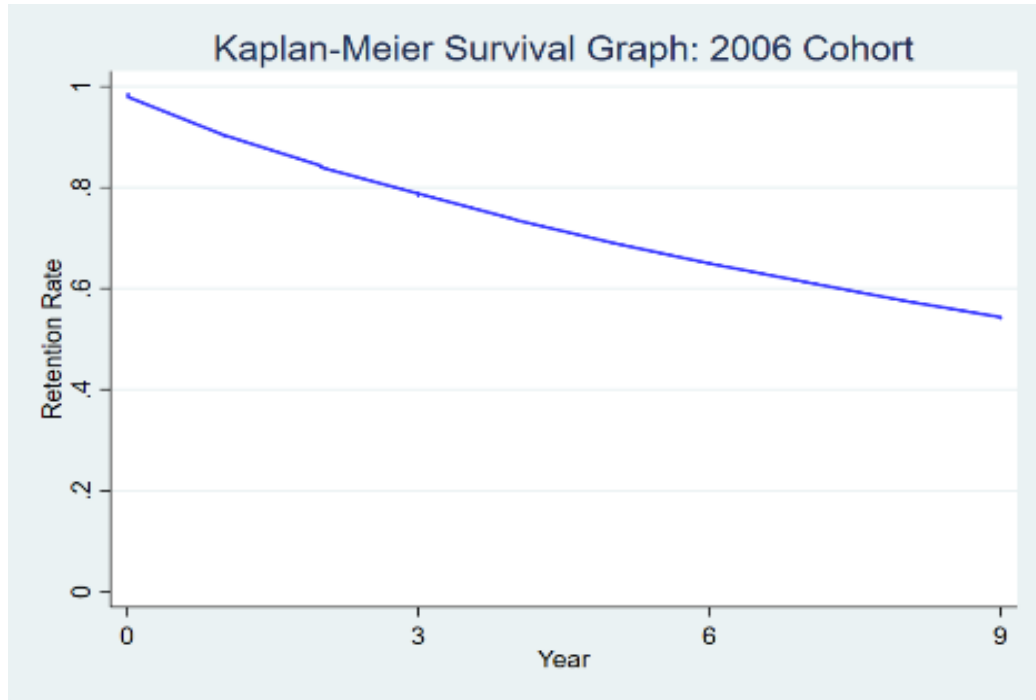
**N.B.** Due to low cell count issue, we couldn't get the N/A estimates released.

From Table 8, the 3-year retention rate is lowest for those who landed at an age of 0-24 years in recent cohorts of 2011 and 2012. The 5-year retention rate is higher for those who landed between 35-49 year of age. Huystee and Jean (2014) find similar results using IMDB data for the years 2006-2011. According to their findings, those aged 20-39 years in Newfoundland, Nova Scotia and New Brunswick had a tendency to leave their respective province.

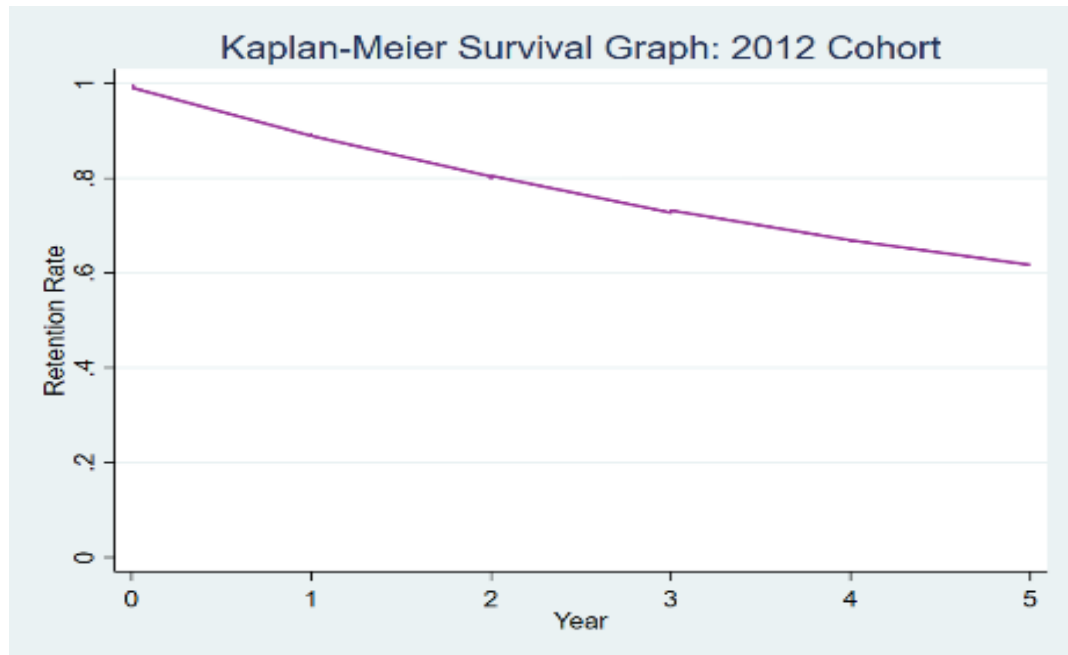
#### ***4.2 Kaplan-Meier Survival Graphs***

Kaplan-Meier (K-M) survival graphs are used to represent the overall migration trends of the 2006, 2011 and 2012 immigrant cohorts. Those who had missing tax records or were pronounced dead in the cohort period are excluded. Movers are identified as those whose tax filing location changed after filing tax in NB in the initial period. The 9-year survival rate is examined for the 2006 cohort, and the 6-year and 5-year survival rates are analyzed for the respective 2011 and 2012 cohorts. Given small sample sizes, K-M analyses for the

1986 and 1991 cohorts are redacted. K-M graphs are smoothed according to RDC guidelines<sup>16</sup>.



<sup>16</sup> Smoothed graphs may not represent the actual numbers rather the trend in retention.



**Figure 4** Kaplan-Meier survival graphs of 2006, 2011 and 2012 immigrant cohorts.

illustrating the cumulative probability of remaining in NB, the Kaplan-Meier trajectories presented in Figure 4 suggest similar trends regarding earlier retention estimates. In all three cohorts, the survival rate of immigrants drops significantly over time. After 3 years, the retention rate is below 80% for all three cohorts. But the retention rate drops more in the recent cohorts than in the 2006 cohort. Where the retention rate is more than 60% in the 2006 cohort after 6 years of landing, it is below 60% in the 2011 cohort after 6 years and around 60% in the 2012 cohort after 5 years of landing of. After 9 years, the retention rate is above 50% for the 2006 cohort. This indicates that the retention rate faces a sharp drop initially, and then there is a gradual drop over the years.

#### ***4.3 Labour Market Outcomes of Movers and Stayers***

This study examines three labour market indicators: labour force participation, unemployment, and earnings. Outcomes are split into two groups: movers and stayers. In

a recent report, Wong (2020) examined the labour market outcomes among very recent immigrants (5 years or less since immigration), recent immigrants (5-10 years since immigration), and Canadian-born workers for the period 2006-2019. Using descriptive methods, Wong (2020) finds that labour force participation and employment rates of new immigrants were comparable to, if not better than, those of the Canadian-born. However, the unemployment rates of new immigrants were higher, and average hourly wages were lower. He also finds, over the 2006 to 2019 period, very recent immigrants experienced an absolute and relative improvement in all four indicators (Unemployment rate, Participation rate and Employment rate) except average hourly wage. Using IMDB data, Kustec (2012) finds two trends have persisted over time for all entry cohorts he has used in his study (Canadians, Provincial nominees, Skilled workers, Family class and Refugees). First, earnings increase with time in Canada. Second, earnings of economic class immigrants (principal applicants) exceed those of all other immigrant categories – both initially and over time.

**Table 9:** Yearly Labour Force Participation Rate (%)

Cohort	Immigrant Status	Year								
		1	2	3	4	5	6	7	8	9
1986	Stayers	72.09	N/A	76.67	N/A	80.00	N/A	78.26	N/A	N/A
	Movers	88.89	N/A	88.89	N/A	76.47	N/A	73.68	N/A	N/A
1996	Stayers	66.04	N/A	73.68	N/A	78.57	N/A	80.00	N/A	N/A
	Movers	44.44	N/A	64.29	N/A	72.22	N/A	77.78	N/A	N/A
2006	Stayers	72.33	74.48	76.12	80.16	80.7	79.05	78.72	77.01	79.01
	Movers	73.68	78.57	76.47	72.5	70.21	69.81	68.33	72.13	75.00
2011	Stayers	73.56	79.22	80.43	81.1	82.61	83.18			
	Movers	69.23	65.79	74.51	72.41	76.19	76.92			
2012	Stayers	68.39	72.25	76.47	78.83	80.8	N/A			
	Movers	77.78	78.57	77.59	77.94	76.32	N/A			

**N.B.** Due to low cell count issues, some results could not be released and are denoted N/A

Table 9 displays the yearly labour market participation rates (LFPR) among stayers and movers of all five cohorts considered in this study. I find the LFPR varies in the initial period for movers and stayers<sup>17</sup>. For the 1986 cohort, the LFPR is significantly high, and it is highest (88.89%) for the movers one year after their landing in NB. But the LFPR declined in the 1996 cohort and it is the lowest among all these cohorts. Both movers and stayers had only 66.04% and 44.44% participation in the labour force respectively one year after landing. After that, for 2006, 2011 and 2012 cohorts, the 1-year LFPR increases. Over time, the labour force participation rate among both the stayers and movers' hovers around 70-80%. My finding is in line with Wong's results for Canada. For earlier periods, Akbari (2007) examined the labour market outcomes of NB residents and finds recent immigrants (arriving within five years of each census year) have participation rates as high as, or higher, than those of Canadian-born, with an increase in the 1991-2001 period. By 2001, recent immigrants in NB had a 9% higher labour force participation rate than Canadian-borns and 12% higher than immigrants overall.

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<sup>17</sup> The differences in outcomes for movers and stayers vary across cohorts and the year since migration. This study didn't report whether the differences in outcomes are statistically significant or not. My preliminary investigation shows that the differences are significant in some cases but not in others. However, I couldn't report detail due to issues related to disclosure from the Research Data Centre and time constraint.

**Table 10: Unemployment Rate**

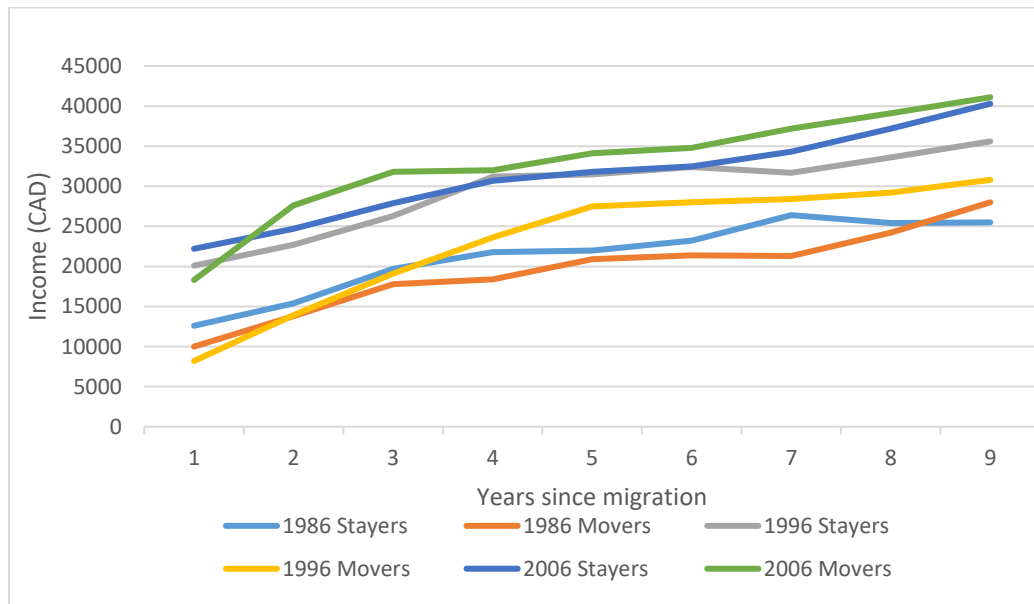
Yearly Unemployment Rate (%)						
Year Since Migration						
Cohort	Immigrant Status	1	3	5	7	9
1986	Stayer	22.58	30.43	35	33.33	31.25
	Mover	25	25	38.46	21.43	13.33
1996	Stayer	17.14	25	13.64	25	15
	Mover	25	22.22	30.77	21.43	26.67
2006	Stayer	7.83	15.69	15.22	13.51	15.63
	Mover	7.14	19.23	15.15	12.2	10.42
2011	Stayer	11.72	15.32	17.89		
	Mover	11.11	18.42	12.5	N/A	N/A
2012	Stayer	12.12	18.8	16.83		
	Mover	9.52	13.33	12.07		

**N.B.** Due to low cell count issue, we couldn't get the N/A estimates released.

Table 10 presents the yearly unemployment rate among stayers and movers for all five cohorts. Notably, the yearly unemployment rate is higher for movers and stayers in the 1986 and 1996 cohorts. For immigrants in the 1986 cohort, the unemployment rate for both movers and stayers are above 35% after 5 years of landing. One reason behind this is the recession in the early 90's caused an increase in overall unemployment and poverty in NB (LeBreton & Leclerc, 2006). But the unemployment rate decreases rapidly afterwards for the moves and comes down to only 13.33% after 9 years of their landing year where it remains at 31.25% for the stayers. This higher unemployment rate occurred because, at the end of the 1980s to the early 1990s, was characterized by weak labour market conditions resulting from an economic downturn (Kustec; 2012). In the 1996 cohort, the yearly unemployment rate always remained above 20% for the movers, and it was 26.67% after 9 years of their landing. However, it remained between 15-25% for the stayers in this

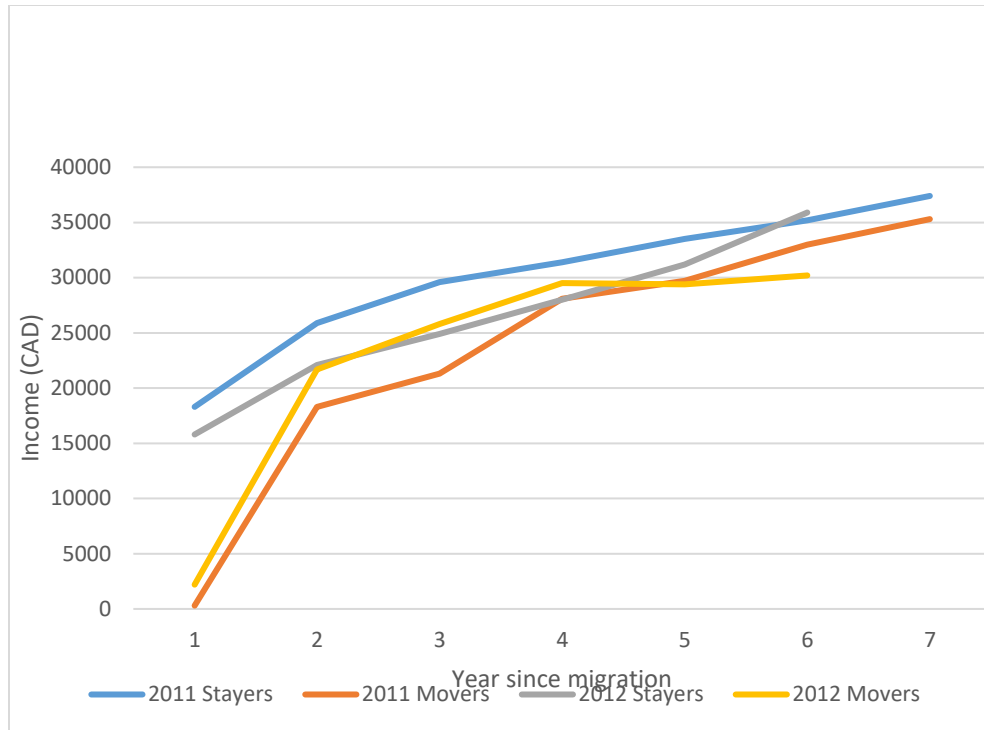
period. From 1993 to the late 1990s, the labour market was hampered by a slow recovery from the early 1990s recession (Kustec; 2012). Job creation was slow and the participation rate depressed. By 2000, job creation had increased and the unemployment rate fell. This is reflected in the above results. Akbari (2007) also finds similar results and finds the unemployment rate was more in the 1986-1991 period than in the 1996-2001 period.

In the 2006 cohort, initially the unemployment rate is lower for both movers and stayers and below 10%. In the 2011 and 2012 cohorts, movers have a lower unemployment rate after 5 years of landing in NB.



**Figure 5:** Average annual income of stayers and movers in NB for the early cohorts 1986,1996 and 2006.





**Figure 6:** Average annual income of stayers and movers in NB for the recent cohorts 2011 and 2012.

**Table 11: Average Annual Income (CAD)**

Average Annual Income of Movers and Stayers (CAD)										
Cohort	Immigrant status	Years								
		1	2	3	4	5	6	7	8	9
1986	Stayers	12600	15400	19700	21800	22000	23200	26400	25400	25500
	Movers	10000	13800	17800	18400	20900	21400	21300	24200	28000
1996	Stayers	20100	22700	26300	31200	31500	32400	31700	33600	35600
	Movers	8200	13900	19100	23600	27500	28000	28400	29200	30800
2006	Stayers	22200	24700	27900	30700	31800	32500	34300	37200	40300
	Movers	18300	27600	31800	32000	34100	34800	37200	39100	41100
2011	Stayers	18300	25900	29600	31400	33500	35200	37400		
	Movers	300	18300	21300	28100	29700	33000	35300		
2012	Stayers	15800	22100	24900	28000	31200	35900			
	Movers	2200	21700	25800	29500	29400	30200			

In Table 11 and Figures 5 and 6, present the yearly average annual income (nominal) of stayers and movers in NB. The average income increases yearly for both

movers and stayers. This finding is consistent with a recent study by Kustec (2012), where he also finds the average income of immigrants in Canada increased over time during the period 1986-2011. However, both stayers and movers has significantly lower income in their first year. It's mostly because immigrants need time to find a suitable job according to their skill level in the first year. In all cohorts, stayers had either a higher or the same average annual income relative to movers.<sup>18</sup>

## **5.0 Conclusion**

Retention estimation of immigrants in NB tends to be highest among family class immigrants and lowest for the refugee class. Also, the retention rate has increased for the initial periods in recent cohorts compared to the earlier cohorts 1986 and 1996. The retention rate continues to decline for a few years and then stabilizes in the long run for these earlier cohorts. Factors such as family size, marital status and sex of the immigrant have an impact on the migration decision. I also find that for both movers and stayers, average annual income increases over time. Immigrants also have a higher participation rate in the labour market. But a higher unemployment rate than the national average may motivate many immigrants to move out of the province.

This study has some limitations. First, immigrants' location is based on their tax filing location from IMDB data. In some cases, people file taxes in different provinces rather than the current province of residence. Second, IMDB data has a typical lag of 2 years, preventing the inclusion of the most recent tax filing years. Third, due to a small

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<sup>18</sup> IMDB data does not provide information on types of unemployment. Hence it is beyond the capacity of this report to explore different type of unemployment scenario (e.g., frictional unemployment).

number of immigrants in the early cohorts, results of the long-term retention rate based on different immigrant categories could not be released.

A large number of refugees have landed in recent years. Thus, future research may wish to expand on this research in light of this most recent wave of entry. Also, I intend to expand this study to examine both immigrants and non-immigrants mobility and compare their labour market outcomes in NB. Besides, if I get the facility to link the tax or income related information with provincial administrative data in the future that will help us to understand immigrants retention scenario from a new dimension (examining retention patterns of landed immigrants in most recent programs; e.g. Atlantic Immigration Pilot Program, NB express entry). This study allows the NB provincial government to look deeper into existing policies and take steps to increase the retention rate of immigrants. NB as a province received the highest number of Syrian refugees per capita in Canada in the year 2016<sup>19</sup>. The provincial government can also look into retaining them since refugee class immigrants tend to move after their landing at NB. Overall, our findings can help NB and similar (smaller) destinations, where the retention rate of immigrants is lower, to project short- and long-term population growth and design effective immigration policies to increase immigrants' retention and integration in the labour market upon their arrival.

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<sup>19</sup> Source: <https://www.cbc.ca/news/canada/new-brunswick/syrian-refugees-new-brunswick-1.3471591>

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