The Contribution of Immigration to Economic Development in New Brunswick

by

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Abstract

Today, Canada is one of the best places to immigrate. In comparison to some popular immigration destinations such as Ontario and British Columbia, New Brunswick is becoming a superior choice for many immigrants. Turning the growing number of immigrants into a promotion of economic growth is important and should be taken into consideration by the government of New Brunswick. Therefore, the objective of this paper is to find out the relationship between immigration and economic development in New Brunswick. Time series data are used for estimation. I have adopted the Auto Regressive Distributed Lag Model and the Error Correction Model for hypothesis testing based on time series data from 1981 to 2017. I conclude that the increase in the number of immigrants improves the economic performance of NB in the short-run as well as in the long-run. New Brunswick's current immigration policies are discussed in this paper, and I also propose policy implications according to the ADRL model considered.

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1.0 Introduction

With the development of globalization, not only capital, but immigrants do flow among different regions of the world. Canada is among the best destinations for immigration. Due to improving immigration policies of the Canadian government, immigration to Canada become easier compared to the past century. People from all over the world come to Canada to pursue higher income, a better environment, a mature education system, and a higher quality of life in general. Canada has the seventh-largest number of immigrants in the world. Within Canada, ON and BC are very popular immigration destinations because of their developed economy and favourable living environment. In this report, it is claimed that, for many immigrants, New Brunswick is a superior choice relative to these provinces. One reason for this superiority is the lower cost of settlement for new immigrants. Compared to ON and BC, people living in NB tend to pay lower rent, tuition fees, and daily living expenses. The cost of investment for immigration, a priority choice for rich households, is also relatively low. Therefore, as the number of immigrants increases, turning these numbers into a promotion of economic growth should be taken into consideration by the government of New Brunswick.

The objective of this paper is to find the relationship between immigration and economic development in New Brunswick. Time series data of immigration will be analyzed in different categories, such as gender, age at immigration, immigration

category (economic immigration, sponsored family, refugee), language, and source areas to make an overall analysis of the immigration dynamics in New Brunswick. A comparison of income levels between immigrants' average and the population average is one of the ways to uncover labor market dynamics. The retention rate is also used as an important indicator to evaluate the economic impact of immigration. The relationship between unemployment and the total number of immigrants in New Brunswick is discussed by using the cointegration method.

This paper will also talk about current immigration policies in New Brunswick and try to seek policy implications from a computable ADRL model to attract immigration and promote economic growth.

2.0 Literature review

Since New Brunswick is an Atlantic province, the immigration situation in the Atlantic area can serve as an important reference for the study of immigration in New Brunswick. Akbari & Lynch (2007) showed a socio-economic and demographic overview of immigrants in Atlantic Canada. This document includes immigration sources, trends, retention, and contribution to the population growth of Atlantic Canada. The study found that immigration plays an important role in promoting population growth and solving the problem of population aging. In addition, immigrants have higher attainment than non-immigrants, and more highly skilled immigrants arrived in current years than in the past. However, the Atlantic provinces

have had fewer business immigrants for a long time; this area needs improvement in policies to attract business immigrants. Rankaduwa (2011) studied the relationship between immigration and economic growth of Prince Edward Island, another Atlantic province. He used an economic growth model based on the annual time series data for the period 1981-2005 and concluded that the growth rate of immigration inflows is an important determinant of PEI's economic growth rate. He also determined that the promotion of immigration could help boost the province's economic growth potential. The conclusion of Randakuwa (2011) is that it is important to find out effective policy directions to increase the number of immigrants to PEI. Bruce (2007) focused on the immigration status of rural areas in Canadian Maritimes. He concluded that although rural counties attract a fair amount of immigrants, the numbers are low relative to the total number of immigrants, and the total population of the counties. This is especially true in counties that are not adjacent to metropolitan areas. Even in neighboring metropolitan counties, the rate of new arrivals is lower than the percentage of existing immigrants in those counties.

Marr and Siklos (1994), were the first to evaluate the empirical link between immigration and unemployment in Canada, and they applied a time-series approach that allows current immigration to be determined by past as well as current and future estimates of the unemployment rates. Additionally, they presented evidence on the short and long-term effects of unemployment on immigration. One of the striking results of this study is that the current rise in unemployment has reduced future

immigration rates before 1978. After 1978, however, there was a positive link between past immigration and present unemployment. The dynamics of the labor market is an important index to measure the economy, therefore studying the impact of immigration on the labor market is crucial. Gross (2004) analyzed the ability of regional labor markets 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. The level and skill composition of immigrant workers is crucial. It is necessary to increase the gap between the skill distribution of immigrants and that of the existing labor force to mitigate the adverse effects on unemployment in the short term. Latif (2015) used provincial panel data to study the impact of permanent international migration on the unemployment rate in Canada and adopted the panel measurement technique. The results show that immigration has a significant positive effect on the unemployment rate in the short term, and there is a one-way short-term causal relationship between immigration and the unemployment rate. The findings further suggest that the long-term effect of immigration on unemployment is negative, but not significant. Instead of only focusing on the impact of immigrants on economic indicators such as GDP, government expenditure, and investment, Dungan and Fang (2012) focused on immigrants themselves. They found that more immigration could have a positive impact on Canada's labor market and the overall economy. However, it is the immigrants themselves that are of real concern, as they appear to be increasingly difficult to integrate into the Canadian labor market, and new immigrants

are increasingly falling into poverty. In addition, existing immigrants are likely to be adversely affected by the expansion of immigration, since new and existing immigrants may be substitutes.

Changes in immigration situations are closely linked to changes in policy. Ferrer and Picot (2014) discussed recent changes in Canada's immigration policy, reviewed an initial assessment of the new program, and mentioned the future problems that those changes could bring. They came up with three policy concerns surrounding economic immigration in Canada. The first is that labor shortages are looming as the population ages. Second, many Canadian provinces want to accept more immigrants, which they believe will help alleviate "current" skills shortages and boost population and broader economic growth. A third driver is the need to improve the economic outcomes of immigrants in the face of the deterioration of the past 30 years. To deal with these labor-market problems, Canada's immigration system has changed dramatically over the past decade. Green (1996) indicated that Canada's immigration policy is a complex entity composed of a set of interrelated guidelines and actions of government agencies. They examined the development of key institutional features of Canadian immigration policy and how they have been used to provide a basis for explaining recent policy changes. In 2006, Green studied how changes in immigration policy leverage affected the skill characteristics of immigrant arrivals. The study found that the higher the inflow rate of immigrants, the lower the average skill level of immigrants. Increasing the point system weight of a particular skill dimension does

intentionally increase the average skill level of the arriving major applicants in that dimension. Among the levers of immigration policy, an increase in the proportion of immigrants with poor assessment skills seems to have the biggest impact.

However, most of the previous literature focused on the overall immigration situation in Canada, but few study the relationship between immigration and economic development in a particular province. Therefore, this paper focused on New Brunswick, a particular Atlantic province, and studied how does the change of the total number of immigrants affect unemployment.

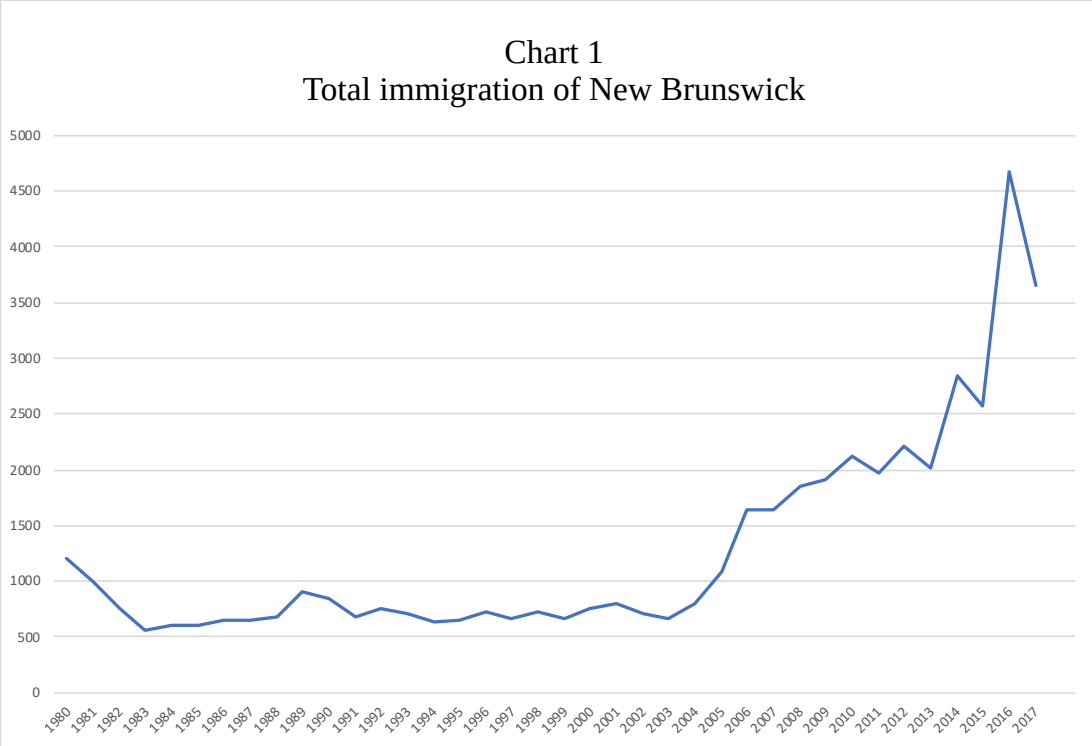
3.0 Overview of New Brunswick immigration

3.1 Background of immigration in New Brunswick

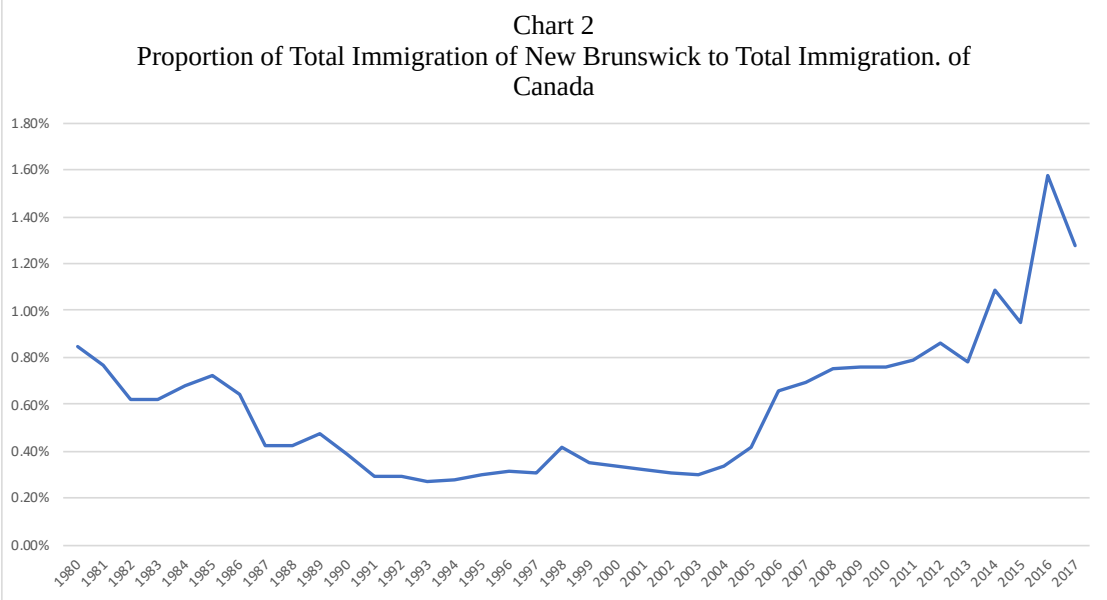
To study the relationship between immigration and economic development, we did an overview of the immigration status of New Brunswick first. Here immigrants are divided by gender, age, category, source area, and language abilities. We analyzed the immigration situation of New Brunswick according to the above classifications.

Immigration in New Brunswick has changed dramatically in recent decades. From 1981 to 2004, the total number of immigrants was always under 1000, less than 1% of Canadian's total immigrants. However, the number has increased significantly since 2004 and exceeded the 2000 threshold in 2010. In addition, the total number of immigrants peaked in 2016, when it was almost double that of 2015. Even though total immigration increased a lot in recent years, the proportion of total immigration

in Canada is still very small, less than 1.6%. This means even though the number of immigrants in NB is rising fast, it is still small compared to the Canadian immigrants as a whole. This can be seen from the large number of immigrants in Canada, as well as the small immigration base and capacity of NB.

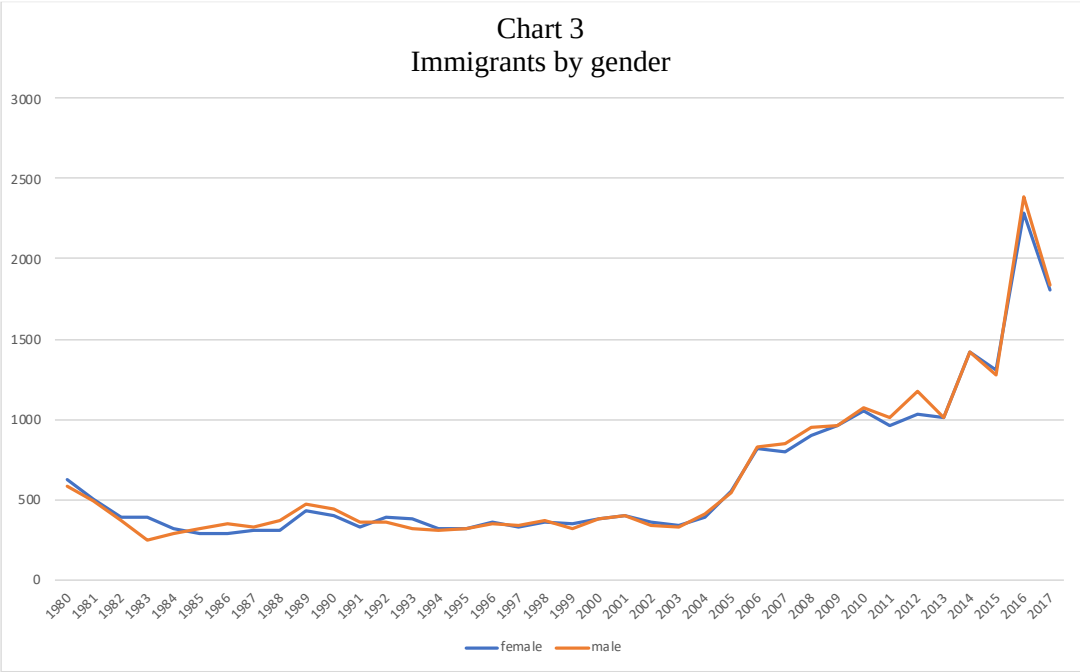


Source: Table A1.



Source: Table A1.

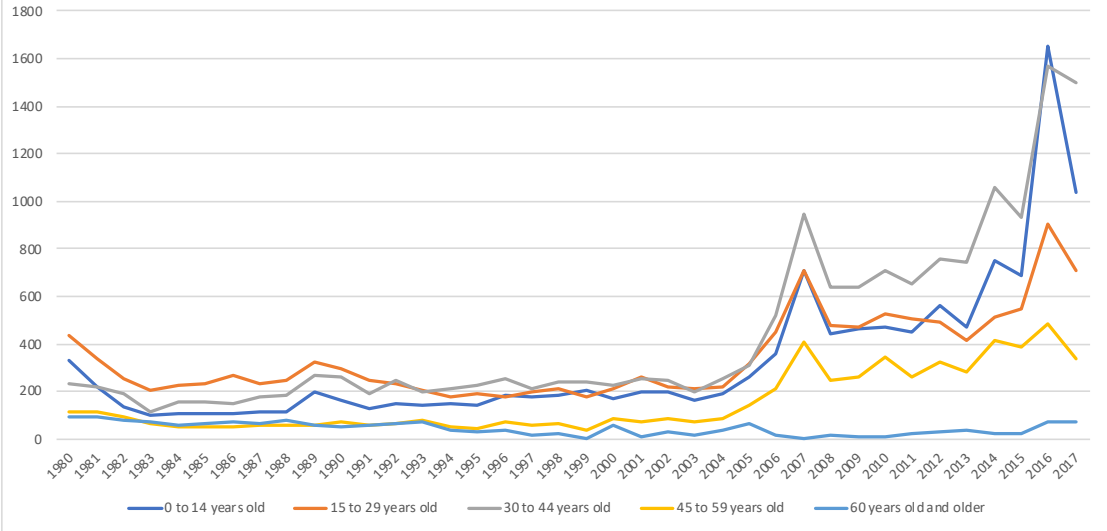
Chart 3 shows the changes in immigrants divided by gender. According to this chart, there does not exist a significant difference between the number of male immigrants and female immigrants. Men have slightly outnumbered women in recent years. It shows that the number of immigrants of different genders in NB province is growing in a balanced way.



Source: Table A1.

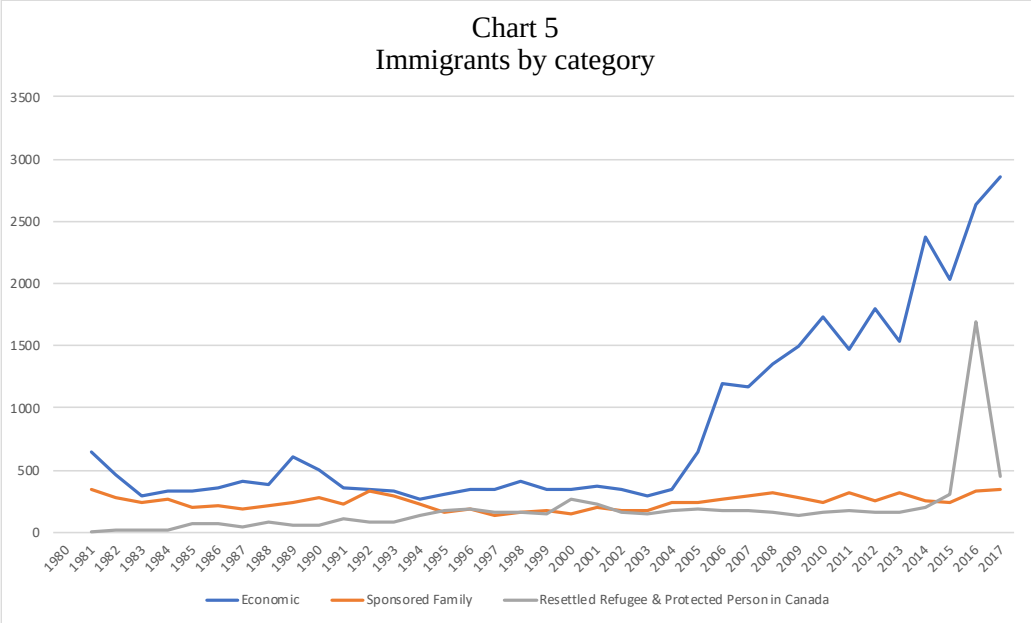
Here we also classified immigrants into five age groups: 0 to 14, 15 to 29, 30 to 44, 45 to 59 and 60 and over. The 60 and over group has been the lowest number of immigrants all the time. The other 4 groups have very similar wave curves. Before 2005, the size of each age group was very small, always below 300. After 2005, the number of immigrants in each age group rose rapidly. After reaching a peak in 2007, the number has fallen somehow and has kept fluctuating since 2008 until reaching an all-time peak in 2016. We could conclude that since 2005, the majority of immigrants were between 30 and 40 years old. Among all immigrants, the working population is larger than the non-working population. This provides NB province with a considerable additional labor force.

Chart 4
Immigrants by age



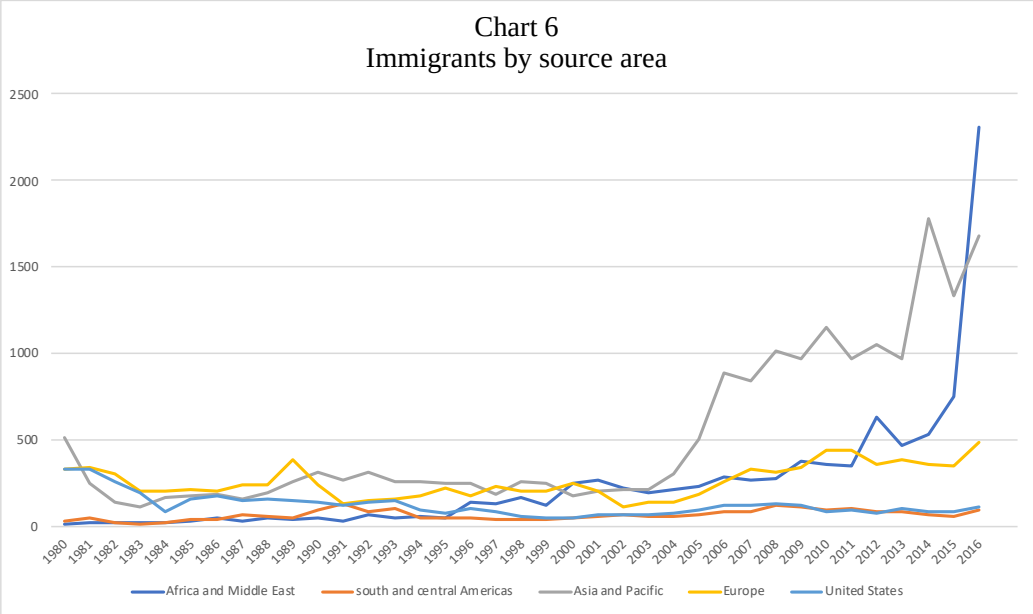
Source: Table A2

There are four categories of immigrants in Canada: sponsored family, economic immigrants, refugees, humanitarian and other categories. Since the number of the fourth group of immigrants in NB (that is, humanitarian and other categories) is very small (equal to 0 for most of the years), we ignore the fourth kind of immigration for our estimation. According to chart 5, economic immigrants make up the majority of total immigrants and the number of economic immigrants has risen sharply since 2005. For the number of sponsored families, there is nearly no fluctuation from 1980 to 2016. We could also find a substantial increase in the number of refugees in 2016, nearly five times the number in 2015.



Source: Table A3

In the 1980s, people from the United States made up the majority of the total immigrants. The lowest percentage of immigrants came from South and Central America, and there was minimal fluctuation. Asians have always been the main group of immigrants. The number of Asian immigrants has risen rapidly since 2003 and ranked first after that. The number of immigrants from Europe has consistently ranked in the top three, without significant fluctuations. Before 2000, there were few immigrants from Africa. However, since 2000, the number of immigrants from Africa started to increase and peaked in 2016. These statistics indicate that the number of immigrants from developed countries is decreasing, while the number of immigrants from developing countries and regions is gradually increasing.

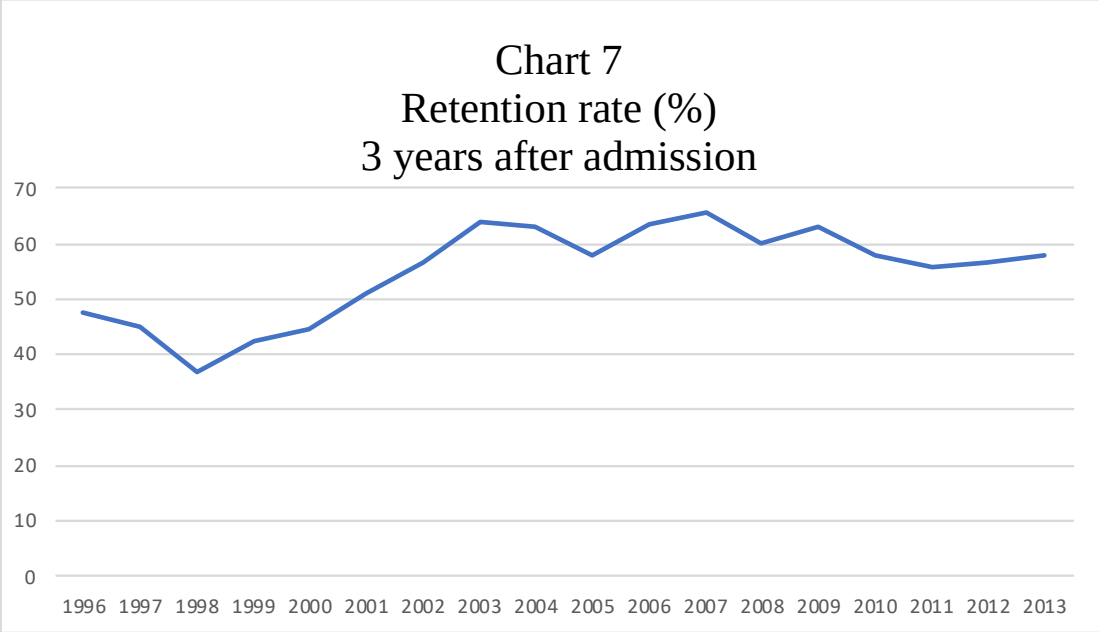


Source: Table A4

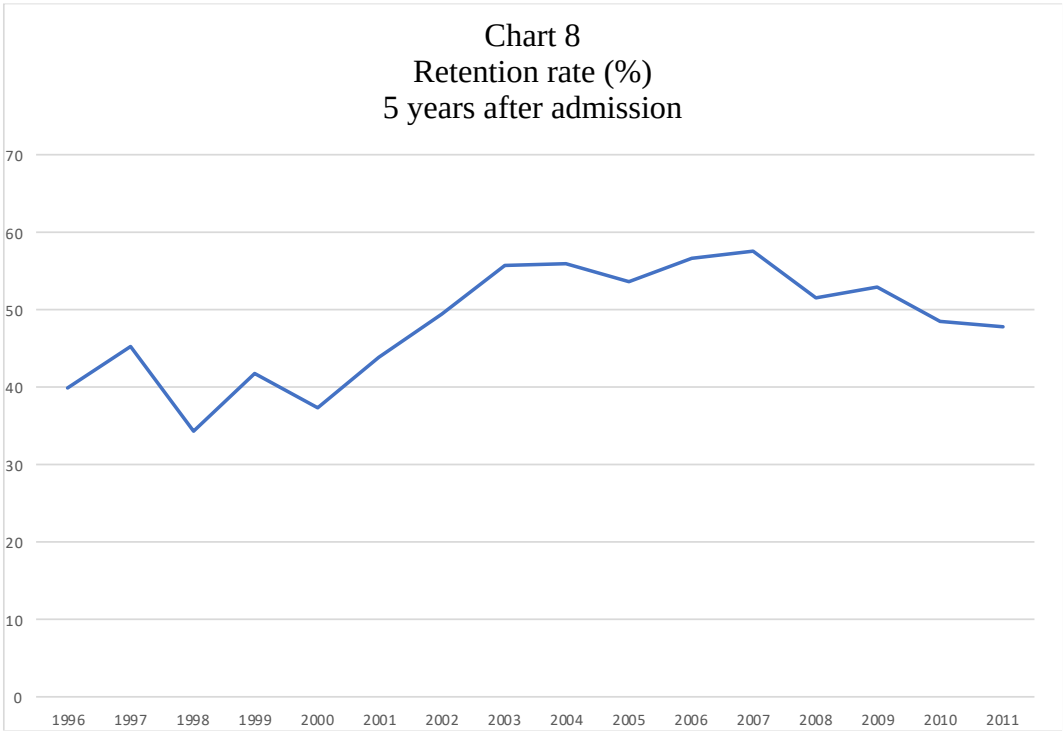
3.2 Retention rate

Retention rate shows how long immigrants did stay after they complete the legal immigration process. The longer they stay in NB, the more likely they are to contribute to economic development. Chart 7 shows the retention rate for 3 years after admission. There is a sharp increase since 1998, from under 40% to over 60%. And the rate keeps a stable level between 60% to 70%. The retention rates have fallen a little since 2009 but remain stable overall. Chart 8 shows the retention rate of immigration for 5 years. From 1996 to 2000, the retention rate fluctuated around 40% and has kept rising since 2000. From 2003 to 2010, the retention rate has stayed in the 50% to 60% interval and has fluctuated slightly. The highest retention rate for 10 years appears in 2004 at nearly 50%. And the lowest appears in 1998 and 2000 at around 30%. That means after immigrating to New Brunswick for 10 years, only 30% of previous immigrants stayed

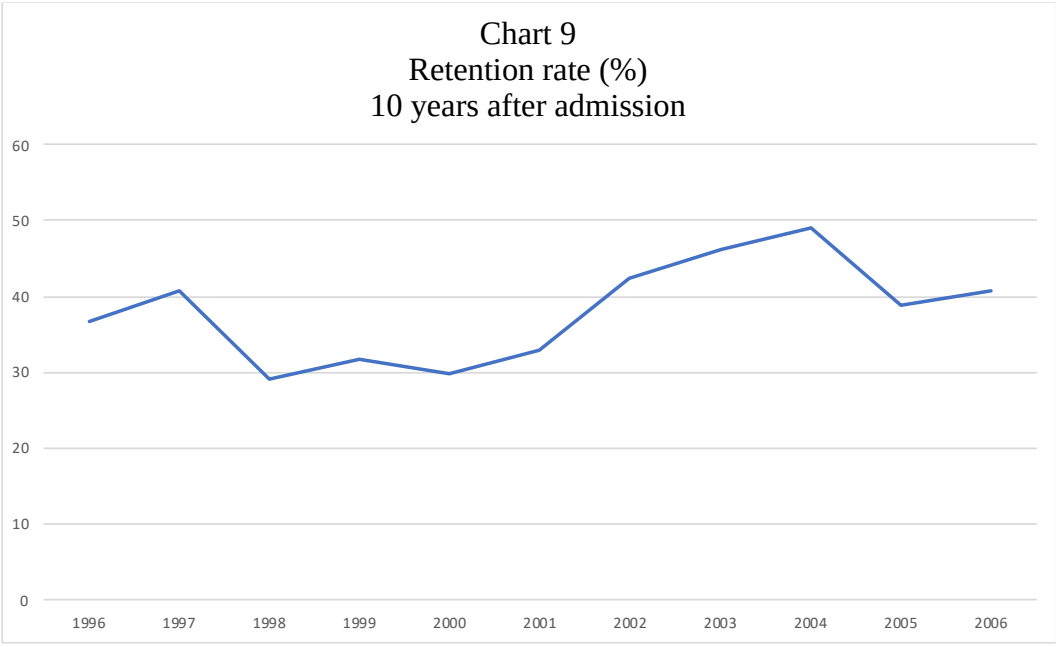
in NB. Taking 2003 as the cut-off point, the retention rate after 2003 was significantly higher than before. However, after a longitudinal comparison, it is clear that the retention rate is decreasing. The 10-year retention rate is less than the 5-year retention rate and much less than the 3-year retention rate. This means as time went on, more and more immigrants wanted to leave their original point of settlement. If the number of immigrants increases slower than the rate of decrease in immigrant retention rate, the total number of immigrants retained will decline. The loss of population is not conducive to the maintenance of the labor force.



Source: Table B



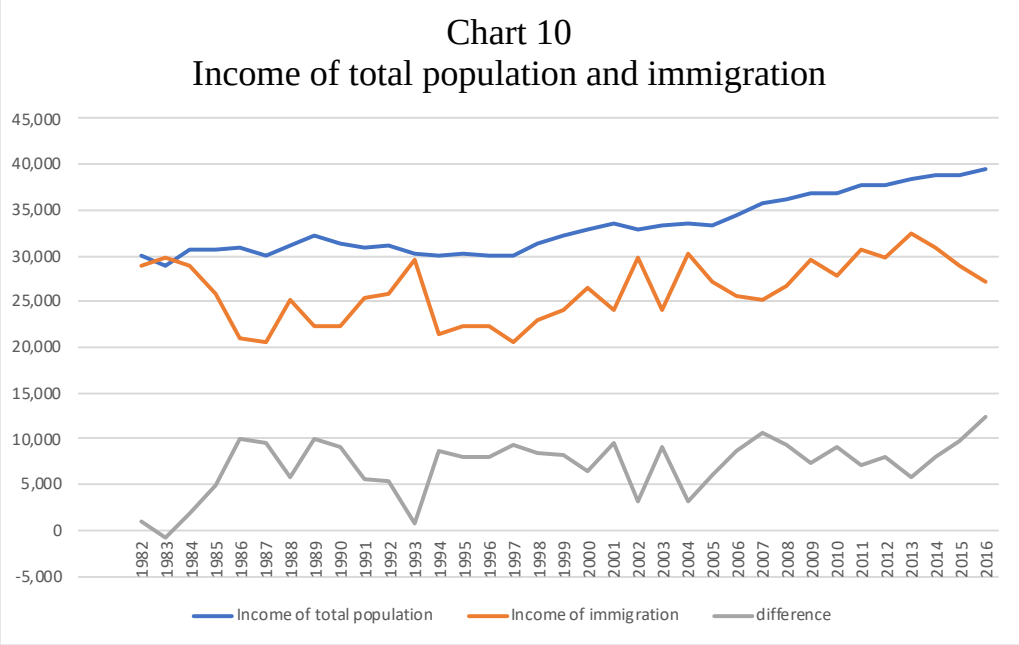
Source: Table B



Source: Table B

3.3 Income of immigrants and total population

In this report, we also compared the average income of the total population and immigrants of New Brunswick. The chart below shows that the income of the total population is always higher than the income of immigrants. Immigrant income here refers to the income of new immigrants (0 years since admission). Income inequality fluctuates throughout the dataset under consideration. Income inequality is also an important factor in attracting new immigrants. NB is a province with an aging population. A large number of local young people leave NB to work and live in more developed areas. Immigrants in New Brunswick work in different industries and earn higher incomes than in their home countries. At the same time, they also promote the economic development of NB, which is a win-win situation.



Source: Table C.

4.0 Data and methodology

4.1 Data

This study used annual data from 1980 to 2017 of New Brunswick from Statistics Canada (open government data), IRCC (Immigration, Refugees and Citizenship Canada) datasets on the open data portal, and Citizenship and Immigration statistics archives (1966 to 1996) including immigrants by different groups (gender, age, category, source area, language ability and retention rate). Data for the income of the total population, income of immigrants are collected from the Labor Force Surveys of Statistics Canada. In this report, data of unemployment, total immigrants, and per capita real GDP are used in regression analysis. Here are the descriptive statistics of all variables:

Table 1: Descriptive Statistics of All Variables

Variable	Obs	Mean	Std.Dev.	Min	Max
Total immigrants	37	1278.919	955.0739	554	4675
Per Capita GDP	37	31850.65	5798.522	21842	39772
Unemployment	37	39375.68	4153.673	28900	46900

Source: Table D

4.2 Methodology

In this paper, we focused on the relationship between immigration and economic development. Here we use unemployment to represent economic development.

Because unemployment and GDP are closely related, unemployment often reflects the level of economic development in a region. According to Gross (2004), when unemployment is relatively high, immigrants are seen as stealing jobs from local workers or becoming a burden, as they cannot find work because they are mostly unskilled. As the number of immigrants has increased in recent years, one major issue surrounding immigration is the labor market assimilation of immigrants. Immigration is also crucial for Canada to address the challenges of a shrinking working-age population and skills shortages in the labor market (Latif, 2015). Therefore, immigration has an important impact on the labor market, and changes in the number of immigrants may lead to changes in the unemployment. Time series analysis methods are employed. ADRL model is considered to be the most direct and effective method of analysis to analyze the relationship between immigration and economic development of NB.

Following Latif (2015), unemployment could be modelled as a function of total immigrants and per capita real GDP:

$$\mathrm{UN}_t = \mathrm{f}\,(\mathrm{IMM}_t,\ \mathrm{PGDP}_t)$$

subscript t (t=1….T) indicates the time period.

UN = The number of unemployment in New Brunswick

IMM = The number of total immigrants in New Brunswick

PGDP = Per capita real GDP of New Brunswick

Subscript t (t=1….T) indicates the time period.

Augmented Dickey-Fuller tests could not reject the null hypotheses of non-stationary data. Then we adopted ARDL to estimate the relationship between immigration and unemployment. Here we take the logarithm of all the variables. The test for cointegration was conducted first, then we estimate the long-run equation. After the estimation, we found that the number of total immigrants is negatively related to unemployment. This means the increase in the number of immigrants will lower unemployment, therefore, the growth of total immigrants may promote the economic growth of NB in the long-run. Over time, immigrants gain work experience as well as education and training in Canada. These have improved the employment prospects of immigrants, thus contributing to the decline in unemployment (Latif, 2015). This is consistent with previous studies by Dungan and Fang (2012). They found that more immigration could have a positive impact on Canada's labor market and the overall economy. This result also agrees with the findings from Rankaduwa (2011) about the relationship between immigration and economic growth of Prince Edward Island. He indicated that the growth rate of immigration inflow is an important factor in PEI's economic growth rate, and promoting immigration could improve the province's economic growth potential.

The ARDL long-run form and Bounds Test is used for cointegration. According to the value of F-statistic, we could identify a cointegration vector at 1% critical value. Therefore we could run the ARDL Error Correction Regression to find the short-run relationship between immigrants and unemployment. From the cointegration test before, the value of residual u_{t-1} estimates the deviation from long-run equilibrium in period (t - 1). Then we used the residual vector as an auxiliary variable in the ECM estimation. This model is useful for estimating both short-run and long-run effects of one-time series on another; it directly estimates the speed at which a dependent variable returns to equilibrium after a change in other variables. And it shows if there is a short-run adjustment to make the model in equilibrium condition in the long-run.

5.0 Results

5.1 The Results of Cointegration

Here is the result of cointegration with ARDL Long Run Form and Bounds Test.

Table 2: The Results of Cointegration

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.159695	10%	3.17	4.14
k	2	5%	3.79	4.85
		2.5%	4.41	5.52
		1%	5.15	6.36

According to the value of F-Statistics, all variables are cointegrated. Therefore the residual from the long-run equilibrium model could be used for the following error correction model to test for the short-run equilibrium.

5.2 The results from ARDL regression model

Here are the results of the empirical analysis. According to the table below, we could generally tell that all independent variables are negatively related to unemployment. The coefficient of total immigrants is negative which means unemployment decreases with the increase in the number of total immigrants of NB. However, the result is not significant. This result is consistent with the study of Gross (2004) indicating that in the long-run unemployment may fall with immigration permanently. This finding also agrees with Latif (2015) in the long run, suggesting that the long-term effect of immigration on unemployment is negative, and his result is not significant either. However, the result of this paper conflicts with the first evaluation of the empirical link between immigration and unemployment in Canada by Marr and Siklos (1994); they found that there was a positive link between past immigration and present unemployment, which means the growth of immigration increases unemployment.

The per capita real GDP is also negatively related to unemployment. The coefficient for per capita real GDP is -0.25, which shows that when per capita GDP of NB increases by 1 dollar, unemployment will decrease by 0.25%. And the result is significant at the 1% significance level according to the p-value 0.0094. The R-square is 0.66 and the adjusted R-squared is 0.63.

There are also some limitations of this empirical analysis. The entire analysis is based on a relatively short time series which only contains 37 years, and this may lead to a small R-squared.

Table 3: The ARDL Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNUNEMPLOYMENT(-1)	0.470586	0.130483	3.606480	0.0010
LNTOTALIMMIGRANTS	-0.003562	0.030314	-0.117493	0.9072
LNPGDP	-0.257047	0.093039	-2.762791	0.0094
C	11.76357	2.756426	4.267691	0.0002

5.3 The ECM results

The results from the ARDL Error Correction Model show that the P-value of the cointegrated equation is 0.000, which indicates a significant adjustment when the variable move away from its long-run equilibrium path. The coefficient measures the speed of adjustment towards long-run equilibrium. The value of the coefficient is -0.529 meaning that the system corrects its previous period disequilibrium at a speed of 52.9%. According to the the coefficient value, the time for returning from disequilibrium to long-run equilibrium is around one year, which means the convergence speed is very fast. It may because we didn't take retention into consideration. Since the retention rate is relatively low in New Brunswick, lots of immigrants left NB after immigrating here for only a few years. Their contribution to the decline in unemployment may happen in other provinces. Therefore, if we take retention rate into the long-run estimation, the convergence speed may decrease. There are some possible reasons for having an insignificant relationship between unemployment and the number of immigrants in NB in the long-run. First, the total number of immigrants is very small compared to the total population in NB, therefore, the impact on unemployment may not be significant. In addition, due to data

unavailability, only 37 years of data could be used for the estimates. It is impossible to determine whether the unemployment decreased among the immigrants of NB before 1981.

Table 4: The Results of ECM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.76357	2.462956	4.776202	0.0000
CointEq(-1)*	-0.529414	0.110821	-4.777188	0.0000

6.0 Conclusion

In this paper, we analyzed trends in the growth of immigrants of all types from 1980 to 2017. We found that 2005 is a turning point. Since 2005, the number of total immigrants to New Brunswick shows a significant growth trend. To determine the relationship between immigration and economic development, we used time series data for empirical analysis. In conclusion, total immigrants are negatively related to unemployment in New Brunswick both in the short-run and in the long-run. When the number of total immigrants increases, unemployment will decrease. But the result is not significant in the long-run. At present, the main immigration program is the New Brunswick Provincial Nominee Program (NBPNP). This program nominates qualified commercial related persons and skilled workers from all over the world to stay in New Brunswick. It is a program for economic immigration and designed to contribute to the local economy. This immigration program attracts a substantial labor force, and in the meantime brings in foreign capital which is conducive to creating and providing employment opportunities. Another program is the Atlantic Immigration Pilot

program (AIPP). The plan is an important part of the Atlantic growth strategy and the New Brunswick economic growth plan. It is an employer-driven effort to help employers find permanent workers to meet the demand in labor market and retain global talent while supporting population growth and addressing labor shortages. In conclusion, the results suggest that immigration inflows have no significant effect on unemployment in the long-run, therefore, the government of New Brunswick does not have to worry about any negative impact of immigration on the employment situation in the long-run (Latif, 2015). The government of New Brunswick should promote the implementation of the Atlantic Immigration Pilot program and try to extend the length of the program to make it a long-term program for NB immigrants.

There are some limitations of this paper. First, the data used for estimation in this paper is based on a short time period which only contains 37 years. The lack of observations may lead to inaccurate results. Second, the ARDL model used for estimation can only show the relationship between the number of immigrants and unemployment, not the causation. We could only find that the number of total immigrants in NB is negatively related to unemployment, but cannot say the increase in the number of immigrants cause a decrease in unemployment. Besides, due to data unavailability, only 2 independent variables are used for estimation. If data available, other variables that related to immigration like retention rate, real wage and government subsidies for immigrants may also be added into the regression model.

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APPENDIX I

Table A1: Total Immigration and Immigrants by Gender			
Time	Total immigration New Brunswick	female	male
1980	1207	621	586
1981	988	499	489
1982	751	385	366
1983	554	388	246
1984	600	317	283
1985	609	291	318
1986	641	288	353
1987	642	313	329
1988	679	306	373
1989	905	435	470
1990	842	397	445
1991	684	328	356
1992	754	391	363
1993	701	380	321
1994	627	315	312
1995	643	318	321
1996	717	363	351
1997	663	324	339
1998	724	360	365
1999	660	344	316
2000	758	378	381
2001	798	402	396
2002	705	364	341
2003	666	335	332
2004	795	386	410
2005	1091	551	540
2006	1646	816	830
2007	1643	794	850
2008	1856	902	955
2009	1914	956	958
2010	2125	1056	1070
2011	1968	961	1007
2012	2212	1036	1177
2013	2020	1011	1009
2014	2837	1417	1420
2015	2578	1305	1280
2016	4675	2285	2390
2017	3649	1805	1840

Source: IRCC (Immigration, Refugees and Citizenship Canada) datasets on the open data portal and Citizenship and Immigration statistics archives (1966 to 1996). https://www.canada.ca/en/immigration-refugees-citizenship/corporate/reports-statistics/statistics-open-data.html

Table A2: Immigrants by Age					
Time	0 to 14 years old	15 to 29 years old	30 to 44 years old	45 to 59 years old	60 years old and older
1980	333	434	236	111	93
1981	220	337	221	117	93
1982	136	255	192	91	77
1983	100	204	115	66	69
1984	104	229	153	53	61
1985	107	231	158	50	63
1986	104	266	147	52	72
1987	117	236	176	55	63
1988	116	245	184	58	76
1989	195	326	269	58	57
1990	164	296	259	72	51
1991	127	248	190	61	58
1992	146	232	245	64	67
1993	145	208	198	80	70
1994	151	179	211	52	34
1995	145	192	228	41	33
1996	182	177	251	70	34
1997	174	199	212	58	16
1998	180	212	242	64	20
1999	207	177	237	40	1
2000	171	213	229	86	55
2001	200	261	252	73	8
2002	198	218	248	84	32
2003	165	211	195	70	17
2004	193	221	253	88	37
2005	259	315	307	142	66
2006	360	450	520	215	15
2007	710	710	945	405	5
2008	445	480	635	245	15
2009	460	470	635	260	10
2010	470	525	705	345	10
2011	450	505	650	260	20
2012	560	490	755	320	30
2013	470	415	740	285	35
2014	750	510	1055	415	20
2015	685	550	935	385	25
2016	1655	905	1565	485	70
2017	1035	710	1495	340	70

Source: IRCC (Immigration, Refugees and Citizenship Canada) datasets on the open data portal and Citizenship and Immigration statistics archives (1966 to 1996). https://www.canada.ca/en/immigration-refugees-citizenship/corporate/reports-statistics/statistics-open-data.html

Table A3: Immigrants by Category			
Time	Economic	Sponsored Family	Resettled Refugee & Protected Person in Canada
1981	644	341	3
1982	462	278	11
1983	293	242	19
1984	327	260	13
1985	335	204	70
1986	360	215	66
1987	413	181	48
1988	380	216	83
1989	606	242	57
1990	507	273	62
1991	355	227	102
1992	346	328	80
1993	330	295	76
1994	266	227	134
1995	308	158	173
1996	340	186	188
1997	347	135	155
1998	409	156	156
1999	344	168	148
2000	343	148	266
2001	371	197	230
2002	348	174	156
2003	292	180	146
2004	349	239	174
2005	649	244	181
2006	1191	268	178
2007	1171	289	174
2008	1355	323	165
2009	1499	282	132
2010	1727	236	157
2011	1473	312	179
2012	1798	256	155
2013	1529	322	165
2014	2378	251	200
2015	2030	238	307
2016	2640	333	1686
2017	2858	342	442

Source: IRCC (Immigration, Refugees and Citizenship Canada) datasets on the open data portal and Citizenship and Immigration statistics archives (1966 to 1996). https://www.canada.ca/en/immigration-refugees-citizenship/corporate/reports-statistics/statistics-open-data.html

Table A4: Immigrants by Source Areas					
Time	Africa and Middle East	south and central America	Asia and Pacific	Europe	United States
1981	13	28	509	326	331
1982	21	50	248	343	326
1983	24	25	138	306	256
1984	23	16	114	204	197
1985	21	24	169	199	87
1986	31	37	174	212	155
1987	44	38	183	200	174
1988	32	67	154	242	147
1989	44	53	194	235	153
1990	38	46	253	384	146
1991	52	96	312	241	141
1992	34	134	265	127	124
1993	66	83	314	150	141
1994	45	100	253	157	146
1995	54	47	255	177	94
1996	47	48	249	219	76
1997	142	46	248	176	102
1998	130	35	181	233	83
1999	164	39	260	204	53
2000	117	42	246	205	48
2001	247	46	171	249	52
2002	271	58	199	199	68
2003	223	65	215	115	62
2004	197	57	208	138	64
2005	209	58	305	140	79
2006	231	65	505	189	95
2007	281	87	883	260	122
2008	270	85	838	326	122
2009	277	117	1014	309	132
2010	374	108	966	341	123
2011	359	93	1148	440	81
2012	352	103	972	436	97
2013	631	86	1053	358	79
2014	470	80	971	387	107
2015	534	70	1780	356	88
2016	751	56	1335	351	81
2017	2311	95	1677	486	110

Source: IRCC (Immigration, Refugees and Citizenship Canada) datasets on the open data portal and Citizenship and Immigration statistics archives (1966 to 1996). https://www.canada.ca/en/immigration-refugees-citizenship/corporate/reports-statistics/statistics-open-data.html

Table B: Retention Rate			
Time	3 years	5 years	10 years
1996	47.6	40	36.7
1997	45.2	45.2	40.7
1998	37	34.4	29.2
1999	42.5	41.9	31.8
2000	44.7	37.5	29.9
2001	50.9	43.8	33
2002	56.8	49.4	42.4
2003	64	55.7	46.1
2004	62.9	56.1	49
2005	58	53.7	38.8
2006	63.5	56.6	40.8
2007	65.6	57.6	
2008	60.2	51.6	
2009	63.1	52.9	
2010	57.7	48.5	
2011	55.8	47.9	
2012	56.7		
2013	57.8		

Source: Statistic Canada (open government data). https://open.canada.ca/data/en/dataset?q=immigration&subject=economics_and_industry&sort=

Table C: Income		
Time	Income of total population	Income of immigration
1982	30,000	29,000
1983	29,000	29,800
1984	30,700	28,800
1985	30,700	25,800
1986	30,800	20,900
1987	30,000	20,500
1988	31,000	25,100
1989	32,300	22,400
1990	31,400	22,400
1991	30,900	25,300
1992	31,100	25,800
1993	30,300	29,500
1994	30,100	21,400
1995	30,300	22,300
1996	30,100	22,200
1997	29,900	20,600
1998	31,400	23,000
1999	32,300	24,000
2000	32,800	26,400
2001	33,500	24,000
2002	32,900	29,700
2003	33,200	24,000
2004	33,500	30,300
2005	33,300	27,200
2006	34,300	25,700
2007	35,800	25,100
2008	36,100	26,800
2009	36,900	29,600
2010	36,900	27,700
2011	37,800	30,700
2012	37,800	29,700
2013	38,300	32,500
2014	38,800	30,900
2015	38,700	28,900
2016	39,400	27,100

Source: Statistic Canada (open government data), Labor Force Surveys.
https://www.statcan.gc.ca/eng/survey/household/3701

Table D: Variables for Estimation			
Time	total immigrants	unemployment	PGDP
1981	988	33700	21842
1982	751	40600	22088
1983	554	43900	24030
1984	600	43600	24260
1985	609	46900	24567
1986	641	45500	25964
1987	642	42700	27075
1988	679	38800	27094
1989	905	40800	27131
1990	842	41300	26459
1991	684	43000	26273
1992	754	44400	26579
1993	701	43300	27280
1994	627	42800	27830
1995	643	39700	28643
1996	717	40200	29019
1997	663	44800	29215
1998	724	43800	30288
1999	660	36800	32118
2000	758	36800	32855
2001	798	41100	33596
2002	705	38600	34900
2003	666	38900	35753
2004	795	37800	36633
2005	1091	37100	36879
2006	1646	33500	37465
2007	1643	28900	37945
2008	1856	33600	38226
2009	1914	34100	38009
2010	2125	36200	38596
2011	1968	37400	38898
2012	2212	40100	38187
2013	2020	40600	37598
2014	2837	39100	37611
2015	2578	38400	38463
2016	4675	37100	39772
2017	3649	31000	39333

Source: Statistics Canada. Table 36-10-0222-01 Gross domestic product, expenditure-based, provincial and territorial, annual
https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201

APPENDIX II

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