

Home Ownership as a Means to Retain Immigrants in Atlantic Canada

by

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ABSTRACT

Various policy measures have been put in place to attract and retain newcomers to Atlantic Canada but the policies have met with limited success. Using the Longitudinal Survey of Immigrants to Canada, this paper examines the relationship between housing status and inter-provincial migrations. It examines the capacity of entry to home ownership as a means to retain human capital within a region and reverse demographic trends. The literature review examines characteristics of new immigrants and the potential for Atlantic Canada to use its housing market to anchor newcomers in the region. Results indicate a strong correlation between the initial province of residence and the province of address four years later. Immigrant households show a high rate of transition from tenancy to ownership and this may deter their interprovincial mobility. In comparison to other regions, Atlantic Canada has generally more affordable housing, and a significantly lower proportion of individuals spending over 50% of their income across different levels of housing.

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CHAPTER 1: INTRODUCTION

This paper arises as a response to concerning demographic trends in Atlantic Canada of an aging population and pronounced out-migration, especially of younger people. The need for effective measures to anchor young workers arises due to a continuing exodus of young professionals and tax payers away from Atlantic Canada. (Ostrovsky, Hou and Picot, 2008; Minister of Industry Canada, 2011; Newfoundland 2011; Prince Edward Island, 2011; Nova Scotia, 2011; New Brunswick Population Growth Secretariat, 2011).

The steady increase in the number of elderly people who need government services in the wake of these out-migrations presents growing problems for the region. Within a 19 year span from 1992 to 2011, the four Atlantic Provinces reported a net outflow of 126,000 people according to Employment and Social Development Canada, (2013). Statistics Canada (2013) reports that over 17% of the Atlantic Canadian population is over the age of 65 and that the median age for the region is approximately 44. Newcomers to Canada have been targeted in an effort to reverse the trends. Academics like Professor Donald Savoie from University of Moncton suggest that the energy, entrepreneurial spirit and the desire of a fresh start that new immigrants bring is needed to revitalize the economic conditions in Atlantic Canada. They are also often much younger, technically trained and educated which makes them good candidates to recruit to the region.

Data derived regarding the settlement and spatial adjustments of new immigrants however suggests a number of secondary migrations away from Atlantic Canada similar to the existing trends among the native population. In comparison to Quebec, Ontario,

Alberta and British Columbia, the Atlantic Provinces report the lowest level of net migration and population growth. This is supported by demographic studies of Atlantic Canada by Newbold (2011) and Denton et al (2014). A number of initiatives, including business tax cuts, tuition rebates and provincial nominations have not curtailed the out-migrations. The reasons are many but the distribution of newcomers largely reflects preceding immigration history. Previous immigrants to Canada settled in major metropolitan areas in search of better employment prospects and income levels. The preference to be in proximity to family and friends and the need to meet social and cultural needs continues to enforce settlement in these regions.

This project is inspired by the short-lived effectiveness of previous retention policies and the need to focus on more durable incentives. Home ownership is often a result of labour market success and the decision to settle in a province. It is a major financial investment with transaction costs that discourage mobility. However, the retention potential of home ownership is difficult to show through multivariate analysis because of endogeneity issues that arise. The reverse causality between the decision to settle and home ownership is difficult to control. This paper therefore is a preliminary effort to understand the mobility decisions of recent immigrants and particularly those who make inter-provincial moves. The LSIC (2001-2004) is used to observe housing status and test for differences among demographic variables to provide direction in retention capacities within Atlantic Canada.

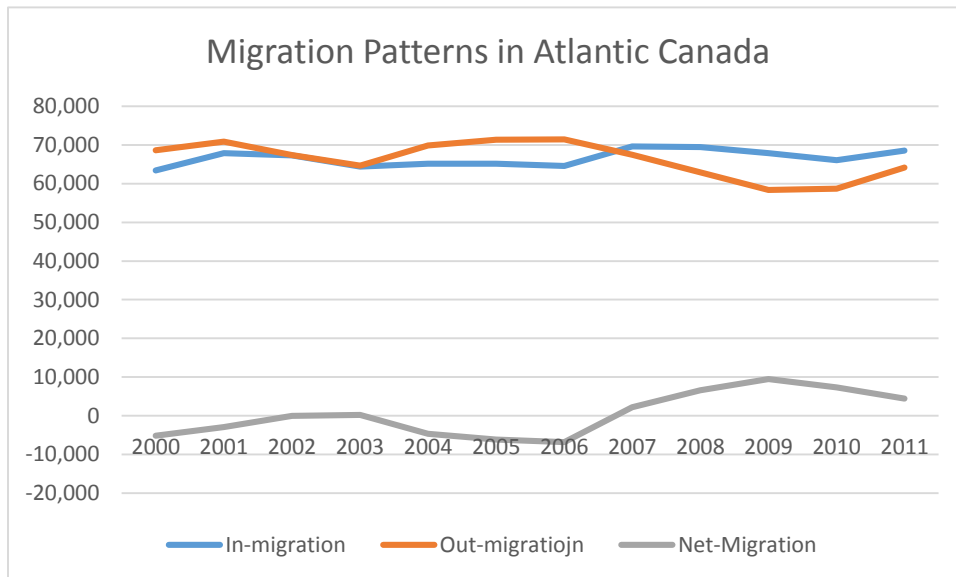
The methodology comprises a descriptive analysis and a survival (duration) analysis using the Cox proportional hazards model. Data from the National Household Survey (NHS) is used to better understand the housing market across Canada. Although the longitudinal nature of the LSIC is advantageous in understanding event times and settlement patterns of the same individuals over time, there are severe limitations. The sample size of those who resided in Atlantic Canada is significantly smaller than in most other regions. Analysis of out-migrations only from Atlantic Canada would not meet the release requirements of the RDC for the purpose of this study. The data are therefore aggregated to look at patterns among all immigrants surveyed. The LSIC does not include international students and temporary workers. This again is a shortcoming in applying to the broader scope of human capital retention within the Atlantic Provinces.

The focus of this paper is to observe how well home ownership ‘anchors’ individuals and the application is to lend insights in tailoring the spatial distribution of immigrants in Canada. The LSIC captures the first four years of immigrant experiences, and a survival model is set up to observe the event times of inter-provincial migrations and home purchases within this period. Housing status and secondary migration propensities are tested for variation among immigration categories, ethnic groups, education status, age groups, income, marital status, gender and household size. The results show that a majority of the movers were not home owners prior to their move. Most home purchases and inter-provincial moves take place within the first two years in Canada. Immigrant households show a high preference for home ownership with over 56% of those surveyed purchasing their first home within four years of living in Canada.

CHAPTER 2: WHAT DRIVES IMMIGRATION AND SETTLEMENT CHOICES?

Existing literature shows that settlement location choices are shaped in response to economic and housing needs, personal preferences and broader social and cultural environments. (Ram and Shin, 1999; Smith, 2004). Thornton, in her paper “The Problem of Out-Migration from Atlantic Canada” (1985), suggests that there are structural economic problems with Atlantic Canada as both the Maritimes and Newfoundland failed to complete their industrial transformation in the period of the 1860s to the 1920s. Issac (1997) and Sjaastad (1992) similarly theorize out-migration as a consequence of economic forces. Provinces that advanced their industrial transformation remain hot spots for employment and investments due to their economies of scale and continually attract newcomers. The ethnic enclaves created as a result reinforce immigrant concentration and segregations (Balakrishnan and Hou, 1999).

The graph below shows the recurring migratory trends in Atlantic Canada for the years between 2000 and 2011. Net migration increases in (2000-2003) and (2006-2009) in part due to population growth policies are followed by sharp decreases soon after. It could be argued the population growth policies had limited success in the region because of sensitivity to temporary economic downturns and slumps such as the 2008 global financial crisis (Issac, 1997, Sjaastad, 1992). The combination of a very mobile workforce and a lagging industrial and technological sector means that there isn't much to 'anchor' the population in Atlantic Canada.



Source: *Longitudinal Survey of Immigrants to Canada (2011)*

In addition to creating an improved outcome for households, home ownership is expected to give individuals a stake in the local economy and work as a social investment. The assertion that home owners are better off financially, secure better futures for their children, enjoy better health, and produce more economic impact in their communities is widely confirmed. (Coulson, Edward and Herman, 2013). Easier access to home ownership could therefore be a durable retention mechanism in Atlantic Canada to make up for the structural differences in urban-rural capacity and long run differentials in comparison to other provinces.

2.1) Secondary Migrations: Cumulative Inertia or Cumulative Stress

People immigrate to Canada for a variety of reasons which could be classified as economic, social, political or environmental. In understanding secondary migrations, two competing hypothesis have been proposed (Huff and Clark, 1978; Molho, 1995; Gordon

and Molho, 1995). The first hypothesizes 'cumulative inertia', the notion that the probability to migrate decreases as the length of residence increases. An individual's attachments to home, friends and the area of residence grows over the length of time as their human capital develops and social networks increase (Detang-Dessendre, 1999; Molho, 2000) which makes them less likely to move. An alternative hypothesis argues that migration becomes more likely over time as individuals become increasingly dissatisfied with their situation in the current location as time passes, perhaps reflecting on a progression through their career or life-cycle (Tervo, 2009; Topel 2003).

New immigrants are expected to be a mobile group as they have not yet established strong ties to any specific region in the country. The empirical results in this paper support the findings that there is a high correlation between the intended destination of immigrants, their initial province of residence, and their province of residence four years later (Alboim et al 2005; Li 2001; Reitz 2005). Data derived from the LSIC show that 70% of immigrants to Canadian settle in the cities of Toronto, Montreal and Vancouver whereas Atlantic Canada receives only about 2.5 % of immigrants. This demonstrates that a majority of the decision on where to settle takes place prior to arrival in Canada. Any effort to grow the population base in Atlantic Canada should take this into account.

The LSIC shows that approximately 30% of recent immigrants to Atlantic Canada moved within first two years of arriving in the region. An early entry to home ownership in Atlantic Canada is expected to retain individuals whether settlement decisions are influenced by cumulative inertia or cumulative stress. Ownership could enforce a longer

duration of stay and enable the creation of stronger social networks and ties to the region. A home purchase is also a serious financial investment that literally anchors individuals to the geographical area. The high transaction costs associated with home ownership are expected to reduce mobility despite changes in career or life-cycle. Being able to anchor immigrants in Atlantic Canada through housing facilities also means that it creates a domino effect and a support system for newer immigrants.

2.2) Demographic Variables and the Effect on Mobility

The federal government of Canada in the last few decades increasingly emphasized attracting younger, highly educated and skilled economic migrants with English and French language skills rather than family class migrants or refugee claimants (Citizenship and Immigration Canada, 2008). Newcomers with these features are arguably more mobile as they are more sensitive to the labour market and economic opportunities. This could partly explain their concentration in large urban centers with high income opportunities. However, even the incentives among economic migrants are various and mobility patterns could depend on environments they are accustomed to and how it compares to their destination in Canada. Literature on migration refers to these as push and pull factors.

Country of Origin (Ethnicity)

Many people who immigrate to Canada do so because of undesirable conditions in their country of their origin or the attractive features of Canada. Maslow (1943) theorized that mobility is dictated by a hierarchy of needs. An individual's lower level need must be

met before a higher level need is desired. Low level needs or basic needs include safety, security and employment. Higher needs include higher income, better housing, weather and quality of environment. Once lower level needs are satisfied, Maslow argues that the next higher level in the hierarchy of needs and wants emerges and the lower level need ceases to influence behavior. Post-arrival migrations within Canada could possibly be explained by these changing needs among immigrants.

Table 1: Push and pull factors in foreign countries and in Canada

Possible factors that cause people to leave their countries of origin.	Possible factors that causes individuals to choose Canada as a settlement destination
<ul style="list-style-type: none"> • High Levels of Unemployment and Unsustainable Income • Little to no Economic Freedom, Limited Career and Investment Opportunities • Discrimination, Social Immobility and Poor Quality of Education • Cultural Constraints and Limited Individual Freedom • High Crime Rates, Political and Social Insecurity and Instability • Unaffordable or Low Quality Health Care • Pollution, Overcrowding and Low Quality of Environment • Family Ties Outside of the Country of Origin 	<ul style="list-style-type: none"> • Sustainable Income and Relatively Low Unemployment Levels • Opportunities for Career Development and Secure Business Investments • Equal Opportunities, High Quality Education and Training • Cultural Diversity, Freedom and Social Richness • Relatively Low Crime Rates, Political Stability and Security • Universal and Good Quality Health Care • Cleanliness, Environmental Qualities • Family Reunion and Lifestyle Preferences

Settlement patterns could vary depending on these needs. Immigrants from countries in severe crises and poorer regions are expected to be motivated by more basic needs than those from more privileged backgrounds. The quantitative section of this paper broadly categorizes households in the LSIC based on their immigrating category and country of

origin (ethnicity) to Africa, Middle East, South East Asia, South Central Asia, East Asia and Europe. Limitations of these broad categories are acknowledged as countries in each of these regions may vary significantly and produce an array of immigrants with different priorities and preferences. The RDC release requirements ask to report tables with cell counts that are 10 or greater, and therefore data is often aggregated in the quantitative section of this paper to meet these standards.

Immigrant Category

The major category of immigrants who arrive in Canada is economic immigrants with professional certifications, higher education, and specific skills (Statistics Canada, 2013). They are also younger, fluent in English or French and more easily assimilate into the Canadian labour market. These features are expected to make them more mobile across the national labour market. Those who come to Canada under the family class are often planning to settle in proximity to their family members already residing and settled in Canada. Individuals immigrating as refugees are often assigned settlement by government agencies (Statistics Canada, 2013). They may also not have the language, education and skills to easily assimilate. Therefore, they may be more heavily reliant on finding well-established ethnic enclaves to assist their adjustment and incorporation.

An overwhelming percentage from all immigrant classes choose to settle in provinces with large CMAs (Hou, 2005) namely Ontario, Quebec, British Columbia and Alberta. Statistics Canada reports that of the 250,000 immigrants that arrive in Canada annually, only 2% or about 5,000 declare Atlantic Canada as their intended destination and only

about 60% of this population are thought to stay (LSIC). Although higher wages and other economic opportunities are very influential in mobility and settlement decisions among all category of immigrants, the most cited reason is the ties to a network of family and friends (LSIC). From those who moved out of Atlantic Canada, 50% mention moving to join extended family members. The table below shows a few other push and pull factors associated with Atlantic Canada. Entry to home ownership in the region is expected to provide residential stability and in turn root and strengthen family and social ties to the region. It could also have a cumulative effect in attracting newer immigrants to the region and create the ethnic diversity that is often attractive to newcomers.

Table 2: Atlantic Canada- Factors that may contribute to mobility

Atlantic Canada: What factors contribute to out-migration and secondary migrations?	Atlantic Canada: What factors can be used to attract and anchor educated and skilled workers?
<ul style="list-style-type: none"> • Family Ties in Other Provinces • Underemployment • Better Income Potential and Career Development Opportunities in larger CMAs • Lack of Metropolitan Amenities and Ethnic Diversity • Severe Winters 	<ul style="list-style-type: none"> • An Attractive and Affordable Housing Market to Strengthen Family Ties and Social Networks • Employment Opportunities • Opportunities for Career Development and Business Investments • Increasing Amenities to Cater to Ethnically Diverse and a Younger Demographic Population.

Education and Employment

According to previous studies on inter-provincial migrations (Alboim et al. 2005; Li 2001; Reitz 2005; Shin et al. 2007, Bollman, 2013) skilled and educated immigrants are more mobile and likely to pursue opportunities where the labour market can reward their

education and experience. The LSIC shows that 35% of those with a University education or a skilled trade moved out of the Atlantic region, whereas only 25% of those without it moved. Immigrants who arrived within the last decade have higher levels of educational attainment in general and their economic integration appears to improve with the length of time in Canada. Immigrants with higher education enjoy higher employment rates than immigrants with lower education levels regardless of their length of stay in Canada (Bollman, 2013). Few studies such as that by Alboim (2005) show that nationally, the employment gap rises for immigrants with higher educational attainment because as education rises, the employment rate of the Canadian born rises faster than that of immigrants. The patterns are found to be more pronounced among female immigrants than their male counterparts. The LSIC however, shows that proportionally more men (40%) moved out of the Atlantic Provinces than women (25%).

Most of the highly educated recent immigrants are attracted to urban areas with concentrated economies of scale, market potential and productivity. Of the 1.1 million immigrants who landed in Canada between 2001 and 2006, 70% settled in big urban centers. Atlantic Canada is one of the most rural jurisdictions in all of Canada. Only about 3% of immigrant populations chose to settle in rural areas (2006 Census, Statistics Canada).

A labour market comparison across Canada shows that landed immigrants in Atlantic Canada have an employment rate of 77.4%, which is higher than the national average of 76.7% (Statistics Canada, Cansim Table 282-0102). This shows the potential for Atlantic

Canada to offer a labour market success which is significantly related to an intent to settle in a region (Slugoski, 2009). Landed immigrants in Ontario and Quebec report lower employment rates at (76.4%) and (72%) respectively. Cansim Table 282-0102 from the year 2012 shows that the unemployment rate in Atlantic Canada at 7.4% is lower than in Quebec (11.6%) and Ontario (8%). Newcomers to Atlantic Canada also show higher employment rates with the length of their duration. In fact, those who lived in the region longer than five years, do better than the Canadian born population. This is a tendency unique to Atlantic Canada as employment rates for landed immigrants are generally lower than for those born in Canada. Secondary migrations despite these figures suggest an issue of underemployment rather than unemployment, as those with higher education and experiences may move to areas where they can attain a better rate of return. Once again, the affordable housing market in Atlantic Canada and an entry to home ownership could possibly compensate for much of the wage disparity resulting from underemployment.

Income

The median annual household income in Atlantic Canada in 2007 was \$57,488 and had increased to \$65,915 by 2011. This was \$9,062 to \$6,325 below the national median household income. In Ontario, although the average household made \$2,640 more than the national median, by 2011 this figure was only \$1,050 above the national median. Households in British Columbia and Quebec are also reported to be earning increasingly less than the national median although the cost of living is significantly higher than in

Atlantic Canada. Households in Alberta earned much higher amounts (\$15,150 to \$17,590) than the national average during the oil market boom.

Table 3: Household Incomes across Canada, (Cansim 2013)

Year	Annual Median Household Income (Constant Dollars)				
	2007	2008	2009	2010	2011
Canada	66,550	68,860	68,410	69,860	72,240
Atlantic Canada	57,488	60,525	61,405	63,110	65,915
Quebec	61,780	63,830	64,420	65,900	68,170
Ontario	69,190	70,910	69,790	71,540	73,290
Alberta	82,030	86,080	83,560	85,380	89,830
British Columbia	65,780	67,890	66,700	66,970	69,150
Difference in Earnings	2007	2008	2009	2010	2011
Atlantic Canada	-9,063	-8,335	-7,005	-6,750	-6,325
Quebec	-4,770	-5,030	-3,990	-3,960	-4,070
Ontario	2,640	2,050	1,380	1,680	1,050
Alberta	15,480	17,220	15,150	15,520	17,590
British Columbia	-770	-970	-1,710	-2,890	-3,090

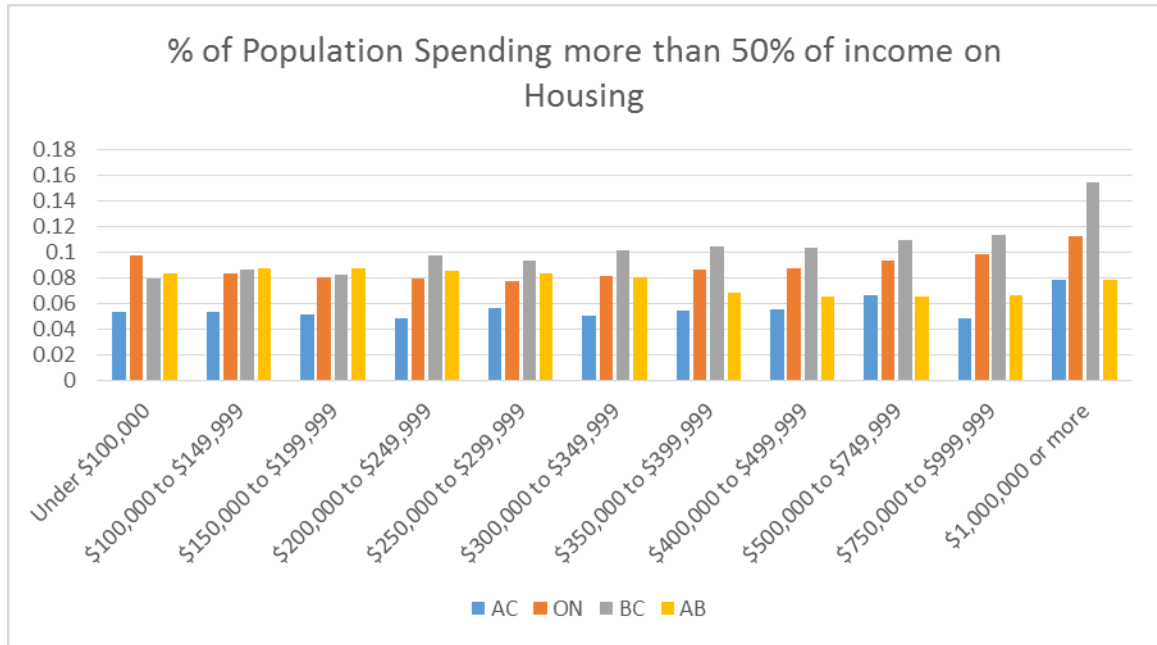
A review of Canada's Average Household Expenditure Survey (2011) shows the cost of living in Atlantic Canada to be the lowest among the provinces of Alberta, British Columbia and Quebec. Average annual household expenditures averaged \$59,248 in Atlantic Canada, \$80,883 for Alberta, \$72,520 for Ontario and \$69,312 for British Columbia. Although, household incomes appear higher in these provinces, the cost of living is also higher and reduces the financial incentives in comparison to Atlantic Canada.

Family Size

The size of a family is thought to affect mobility and the decision to own a home. Past studies have found that the presence of a child in a household has a significant positive effect on home ownership (Haurin, Hendershott and Kim, 1992). An increase in family size may therefore yield a greater need for home ownership and increase the costs to mobility. Recent immigrants to Canada are similar to Canadian households given that most live in two parent families with children. However, they are also more likely to live in extended family situations. A large majority of immigrants live in households with two or more people, and 12% of the households in the LSIC dataset lived with extended family members. Almost 8 out of 10 of recent immigrant families are reported to have at least one child of any age living at home. Older children stay longer in parental homes and seniors (above 65) are also found to live with family members. Buying a home may be less costly with mortgage payments and tax benefits rather than renting a space large enough to accommodate big families. Large families may also face more financial constraints that prevent them from home ownership as their day to day expenses may be greater and may not allow for a sizable commitment to savings and wealth. (Winkler, 2011). Larger families could therefore be more allured to the possibility of lower barriers to home ownership in Atlantic Canada.

Home Ownership

Households maximize their utility by choosing to own or rent, where they live, how much to save and how much to spend on housing. The decision to buy a home may be affected by wealth constraints, expected mobility, home price appreciation, access to a mortgage, tax benefits and having more freedom over the way the house is used. A large body of literature documents the positive association between home ownership and household well-being. Home ownership is also shown to encourage investment in social amenities and capital as home owners are more committed to a region and generally have a vested interest in improving the quality of their community. The Canada Mortgage and Housing Corporation points out an interesting national trend where real disposable income is falling while affordable housing is becoming scarce in many of Canada's immigrant hotspots. Data collected from the Canadian Housing Observer (2009) and the National Household Survey (2011) show that Atlantic Canada has one of the most affordable housing markets in all of Canada. Graphing the data below shows that across all different housing levels, Atlantic Canada has a lower proportion of individuals spending over 50% of their income on housing. The average household costs to owning a home in Atlantic Canada, including mortgage payments, utilities and property taxes is approximated to take up 33% of a typical household's monthly pre-tax income (RBC Housing Trends and Affordability Report, 2013). This arguably makes ownership attractive in Atlantic Canada in comparison to other regions of the country.



Bertrand (2010) finds that factors that influence home ownership demand vary strongly with the life cycle stage of the household. This could partly explain why the affordable housing market in Atlantic Canada is not being fully taken advantage of. Young households generally appear to be attracted to urban centers and amenities. These locational characteristics and individual professional development appear more influential than housing needs at an early stage of a household. Secondary migrations of university graduates and young professionals from the Atlantic Provinces could partly be explained by these preferences.

Middle-aged households (aged 45-64) are shown to exhibit a locational behavior that favours semi urban and rural areas but relatively close to urban centers. These households require proximity to employment but have bigger families and as a result, a higher housing demand. They also exhibit need for educational and social amenities, health care

and other family friendly recreational facilities. These needs may be more difficult to satisfy in large urban centers whereas they may be more feasible in Atlantic Canada.

CHAPTER 3: AN EMPIRICAL STUDY USING THE LSIC

Much of the existing literature on immigrants to Atlantic Canada is qualitative in nature. There are few studies (Akbari and Dar, 2005, 2008; Newbold, 2006; Houle, 2007) that used quantitative methods to show migration trends in the region, but not much has been done to examine the characteristics of immigrants and observe any association with their secondary migrations. The primary goal of this section is to use the Longitudinal Survey of Immigrants to Canada (LSIC) to do this and also observe to what extent housing status segregates the movers from the stayers.

Mobility decisions may be affected by employment offers from other regions, income shocks, housing shocks, moving costs and geographic differences among others.

Unobservable individual characteristics may affect both housing and mobility decisions.

Home owners are usually those who have been successful in the labour market, have established social networks and have made the decision to settle. The endogeneity problem therefore makes it difficult to establish a causal relationship between home ownership and retention. One direct causal effect of home ownership on migration relates to transaction costs. The transaction costs of buying and selling a house (both financial and non-pecuniary) are substantial and so higher transaction costs might inhibit out-migration. However, individuals would be more likely to buy a house if their expected mobility were already expected to be low. Similarly, once individuals become home

owners they are expected to be less likely to move in response to economic shocks and life cycle changes.

3.1 Data and Limitations

The target population for the LSIC survey consists of immigrants who arrived in Canada in 2001 through a Canadian Mission abroad. International students and temporary foreign workers are not included in the LSIC and this is a limitation in advancing retentive policies in Atlantic Canada. The LSIC survey has results for three waves of data: six months, two years and four years after arriving in Canada. The survey was not entirely randomly assigned but instead uses a ‘probability proportional to size method’ to observe one member above the age of 15 within each household. This “funnel shaped” approach is subject to attrition where only immigrants who respond to wave one are traced for wave two, and only those who responded to wave two are traced for the wave three interview. A total of 7, 716 individuals responded to all three waves.

In addition to the presence of endogeneity and unobserved heterogeneity, another limitation is the small number of immigrants in Atlantic Canada surveyed in the dataset. The RDC result release requirements have forced the aggregation of the data to observe inter-provincial moves across all of Canada. The attrition in data that occurs due to individuals lost to follow up could be correlated to interprovincial mobility. Those who become home owners earlier on may be easier to track as are less susceptible to changes in contact information. Of those surveyed in Atlantic Canada, approximately 15% were lost due to attrition by Wave 3. This is a significant loss given the small sample size of

immigrants surveyed in Atlantic Canada. Those who are lost due to follow-up are treated as censored in the survival models.

The advantage of using the LSIC is that the same individuals are interviewed directly and over time, therefore allowing the incidence and timing of transitions in home ownership and migration to be observed. Time varying covariates can also be accounted for as they occur. For the purpose of this project, individuals who make a provincial change in their address are observed. The last date resided in each province is obtained and aligned with the housing status prior to the inter-provincial move. A majority of the movers are expected to be non-homeowners if early entry to ownership works as an anchor mechanism.

3.2 Methodology

The methodology employed in this chapter can be divided into two sections. The first section focuses on a descriptive analysis of the immigrants, priorities regarding housing and the reasons given for mobility decisions. The second section uses a survival (duration) analysis to observe those who make an inter-provincial move over the course of 48 months. The purpose is to test for significant differences among movers and stayers by housing status and demographic variables such as income, level of education, category of immigration, ethnicity, age, gender, marital status and family size.

The Cox model of survival analysis is used rather than simple regression model because of the nature of home ownership and possibilities of outmigration. The time to an event such as purchasing a home or making an inter-provincial move is not normally

distributed. This makes conventional parametric statistical methods inappropriate. In survival analysis, the distributional assumption is removed because the events are ordered in the sequence that they occur. The endogeneity issue remains unaddressed but the Cox model is more robust and can better account for the discrete and continuous variables.

There is no clear way suggested in controlling the issue of reverse causality between settlement decisions and housing status but Yamaguchi (1999) points out that there are two facets (rate and state dependence) of reverse causality that studies should be cautious about. Rate dependence occurs when time-varying covariates are affected by the likelihood that the duration will end. For example, the presence and number of children in a household may affect the likelihood that the family unit out-migrates given that it affects transaction and mobility costs. The presence or number of children can change during the course of the four year period. But the likelihood that the household chooses not to buy a home and plan to out-migrate may affect whether the couple choose to have (more) children. State dependence relates to whether the duration period ending affects the time-varying covariate. Out-migration and home ownership can both depend on labour market success since those who are successful and satisfied in the local labour market early may decide to settle and therefore purchase a home.

The Cox model is non-parametric to the extent that no assumptions are made about the form of the baseline hazard. It assumes a proportional (constant relative) hazard. In this report, this assumption means every immigrant has the same risk of out-migrating from the province of their primary residence. The underlying hazard function denoted as $\lambda_0(t)$ describes how the risk of event per time unit changes over time at baseline levels of covariates. The effect parameters, describe how the hazard varies in response to

explanatory covariates. The Cox model therefore models the effect of covariates on the hazard rates but leaves the baseline hazard rate unspecified. That is, the model does not assume knowledge of absolute risk of out-migration but estimates the relative risk of outmigration between say, home owners and non-home owners. For non-stationary explanatory variables, each unit increase results in proportional scaling of the hazard. (Box-Stesensmeir and Zorn, 2001).

3.3 Data Setup and Analysis

The LSIC data is first trimmed and cleaned in order to be suitable for analysis. Two different files (The Main file and the Where Lived file) are merged together to create a duration format that would define the analysis time. Analysis time was recorded in months for each individual t_0 to t_1 where (t_0) is the first month in Canada and (t_1) is the month in which the individual either makes an out-migratory move or is right censored at the end of the third interview. The data contains up to a maximum of six addresses each individual has lived at since arriving in Canada and gives the dates on which individuals move out of each of these addresses. This is used to identify an inter-provincial migration and the month in which it occurs. Wave one of the LSIC shows 12,000 completed records with individuals reporting 6,000 total places of residence they moved from. In wave two, 9,000 complete records, and 10,000 different places of residence. Wave three, 7,000 records and 12,000 different addresses. This shows that new immigrants are highly mobile but further disaggregation of data shows that most of these moves are short moves within the same province.

Of a total of (6,690) individuals observed from the combined *Main File* and *Where Lived File*, everyone enters the study at time 0 and each individual is observed for 47 months. The count or number of months for each individual is expanded to accommodate changes in time varying covariates of income, marital status, family size and home ownership status. The purchase month of those who responded to having bought a house are ordered in the duration period. Individuals are set to ‘exit’ (fail) when they first out-migrate and are not observed after this period. The out-migratory move is then examined as a function of risk factors. This includes age, income, ethnicity, immigration category, gender, marital status, family size and housing status. The inter-provincial moves take place throughout the four years and no tied failures are observed.

3.4 Results

A total number of 311 out-migrations are observed from the 6,690 population surveyed. The mean number of months these individuals spent in their primary province of residence is 32 with a standard deviation of 11. This shows that although individuals make a lot of short moves in their initial years in Canada motivated by finding better housing, economic opportunities and the need to be closer to family and friends, they tend to remain within the same province they initially reside in. The first two years appear to be crucial in the decision to either out-migrate or purchase a home in the province. Home purchases take place on an average of 19 months since arrival in Canada with a standard deviation of 16 months. The observed low out-migration rates overall show what an anomaly the demographic issue in Atlantic Canada really is. However, the small sample size of immigrants to Atlantic Canada is a serious limitation and makes a

multivariate analysis solely on out-migration from the region difficult. It is also interesting to note that among all those who made interprovincial moves from Atlantic Canada, almost everyone moved to a province outside of the region. Over the duration of 48 months, 20% of immigrants sampled from Atlantic Canada were lost to attrition and could not be observed at the end of wave 3.

Table 4: Summary of Results (LSIC, 2001)

Variable	Mean	Std. Dev
Length of Stay (Months)	32.97	11.26
Point of Home Purchase (Months)	19.51	16.53
Age (Years)	34	10
Family Size	2.75	1.44
Income (Cdn \$ per Month in 2000\$)	3,090.91	2,938.70
Monthly Expense for Renters	781.43	352.77
Monthly Expense for Owners	1,273.31	720.07

The majority of immigrants are relatively young with a mean age of 34 and standard deviation of 10 years. The average family size of the household is 3 and the reported total household income is at a mean of \$3,090 per month with the standard deviation of \$2,939. This income range is relatively large and insinuates the presence of outliers skewing the mean. The average monthly expense to rent for the households is approximately \$800 whereas the expense to own is around \$1300 for the reported observations. The male to female ratio of new immigrants is almost equal with 48% of the population being female. A majority of these individuals are married (83% by the end of the third wave) and 52% of the households have between three and five members.

Immigrants to Canada generally show a keen interest in prioritizing home ownership and transition from tenancy to ownership. Among the surveyed population, 56% own their homes within the first four years of arrival in Canada. This is a remarkable rate given the integration and settlement challenges as well as the processes involved in becoming a home owner. Adapting to a foreign environment, being successful in the labour market, building credit history and eligibility for mortgage are all serious barriers that newcomers overcome in becoming homeowners. From the LSIC, 17% of the individuals report home ownership upon their arrival. 21% of the individuals purchased their first home between two to six months of arriving in the country, 23% made the purchase between six months and two years, the largest group 38% purchase their first home between two to four years in the country. The results show the average time period before home purchase to be 1.5 years and the average period before an out-migratory move to be 2.5 years. As out-migrations and home purchases must be preceded by the decisions to do so, the critical time period to implement effective retention policies should take this into account.

Table 5: Transition to Ownership (LSIC, 2001)

Ownership	Freq.	Percent	Cum.
Upon Arrival	13,405	17.41	17.41
1 to 6 months	16,316	21.19	38.60
7 to 24 months	17,848	23.18	61.78
24 to 48 months	29,425	38.21	100
Total	76,996	100	

The LSIC shows that there is a strong correlation (correlation factor approaching 1) between the intended, initial and observed provincial destinations. Nearly 60% and 53% identify Ontario and Toronto as their intended destination before arrival in Canada, while 15% identify Quebec and BC as their destination of choice. Montreal and Vancouver are recorded to be intended destination for 13% of new arrivals. Calgary and Edmonton, were intended destinations for 5.2% and 2.3% for new arrivals. Only 1.2% identified Atlantic Canada as their intended destination. This shows the need to directly attract immigrants to Atlantic Canada rather than relying on labour market and other economic dynamics to influence their mobility to the region once in Canada. The desire to be near immediate family and closest friends, reported by 31% of respondents, is the most important single factor in deciding provincial destinations and settlement. This shows great potential for policy initiatives directed towards home ownership in Atlantic Canada as ownership can strengthen these family ties and enable accommodation and encouragement of more immigrants settling in the future. 16% cited job opportunities and 22% reported other employment related reasons for choosing their destination province. The data show that mobility decreases very rapidly with increasing length of residence. The largest stated reason for internal mobility is the need for privacy and better housing. This shows the potential of the Atlantic Canadian housing market to meet the needs of new immigrants.

The LSIC population is relatively well educated with a majority showing completion of a Bachelor's degree (39%) or some skilled trade (19%) as the table below shows. Those with a high school diploma or less account for 22% of the population. Further dissecting the inter-provincial mover and the home owners, it is found that home ownership levels

are relatively consistent among immigrants with all different levels of education. Interestingly a slightly larger percentage of those with lower educational levels purchased homes, while those in the higher educational categories show slightly lower share of home purchases and higher levels of out-migration. One reason for this could be that those with higher education may try to find the best return to their education and may not settle as easily in a region as their counterparts.

Table 6: Mobility and Ownership across Education Levels

Education	Composition (%)	Outmigrated (%)	Homeowner (%)
Below High School	11.58	3.18	60.90
High School	10.54	3.93	60.11
Trade or College	19.19	3.37	57.21
Bachelors	39.28	4.31	55.05
Masters	16.06	5.34	49.18
Medical or PhD	3.35	5.89	54.57

The data shows that the largest ethnic group of immigrants are South Central Asians (37%) and South East Asians (26%). In cross examining home ownership and ethnicity as summarized in the table below, South East Asians (from all countries between Philippines to Myanmar) have the highest rate of home ownership at 65%. Immigrants of European descent and those from South Central Asia (from Bangladesh to the Maldives) are second with 57% owning their home. In comparison to other ethnic categories, Middle Easterners have the lowest home ownership rate at 29%. This large gap in home

ownership is interesting because the findings reported by Statistics Canada (2012) state that other than differences in resource levels, visible minority groups face the same barriers in the beginning as they approach Canada’s housing market. Over time however, there is an observed divergence in the home ownership rates among ethnic groups. The entry gap between the high and low attainment groups nearly doubles by the end of four years (Statistics Canada, 2012). This leaves room for further research regarding levels of integration across ethnicities and potential differences in barrier to ownership across ethnicities. In terms of mobility, Africans and East Asians (From Russia to Japan) appear to be the most mobile among the groups.

Table 7: Mobility and Ownership across Ethnicity

Ethnicity	Composition (%)	Outmigrated (%)	Homeowner (%)
European	15.45	2.77	57.32
Middle Eastern	8.02	1.98	28.95
East Asian	6.13	5.86	46.45
South East Asian	26.40	4.43	64.77
South Cent. Asian	36.62	4.19	56.97
African	4.3	8.81	41.83
Latin American	3.09	3.92	55.39

The largest number of individuals immigrated into Canada under the category of skilled workers (68%) followed by Family Class immigrants at 20%. Those who immigrated under the business class have the highest ratio of home ownership among all immigrant

categories at 78% followed closely by the provincial nominees at 72%. 52% of skilled workers owned their own homes within the first four years and only 21% of those under refugee status show home ownership.

Table 8: Mobility and Ownership across Immigrating Category

Immigrating Category	Composition (%)	Homeowner (%)
Family Class	19.50	69.32
Provincial Nominee	0.72	72.49
Skilled Worker	68.30	52.43
Business Immigrant	4.92	78.19
Refugee	6.56	21.39

In examining whether family size influences home ownership, there is not much descriptive evidence that it does. The dataset does not show much difference in home ownership rates between single member households and households encompassing two members. Approximately 50% of both cohorts own their homes. Those with three to five members show the highest share among home owners (60%). Interestingly, even higher than those with more than five members (56%).

Table 9: Mobility and Ownership by Family Size

Family Size	Composition (%)	Outmigrated (%)	Homeowner (%)
Single	26.08	4.33	51.39
Two Members	19.16	4.10	50.95
Three to Five	51.61	4.09	59.97
Six or More	3.15	3.92	55.92

3.5 Cox Proportional Hazards Model

The Cox regression based on forming a risk set or a risk pool at each failure time shows which individuals are at risk of failure and maximizes that conditional probability of failure. The models are set up using a combination of indicator variables, categorical variables and continuous variables. Indicator variables such as ‘married’ or ‘home owner’ have a value of 1 or 0 and changes are accounted within the 48 months. The values these time varying covariates take prior to out-migration are the values assigned to the covariates. Individual coefficients in the Cox model have the interpretation of the ratio of the hazards for a one unit change in the corresponding covariate (Kalbfleish and Prentice, 1980).

Hazard ratios reflect the analysis of time survived to an event. The term hazard is interchangeable with term ‘relative risk’. Hazard ratios in this case, provide an insight to the probability of failure or outmigration from the first province the immigrant resided in

since arrival in Canada. A positive coefficient indicates a higher likelihood of outmigration and a negative coefficient indicates a lower probability.

The hazard function: $h(t) = \lim_{\Delta t \rightarrow 0} \frac{p(t \leq T < t + \frac{\Delta t}{T} \geq t)}{\Delta t} = f(t)/S(t)$
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Immigrants surveyed have out migration events at distinct times in all three waves. The events are assumed to occur independently of one another and the probabilities of surviving from one interval to the next may be multiplied together to give the cumulative survival probability. The Cox specification models the effect on covariates on the hazard rates but leaves the baseline hazard rate unspecified. That is, the model does not assume knowledge of absolute risk of out-migration but rather estimates the relative risk of outmigration between different groups such as home owners and renters.

The hazard rate can vary from zero (meaning no risk at all) to infinity (meaning the certainty of failure at that instant) (Kalbfleish and Prentice, 1980). Over time, the hazard rate can increase, decrease or remain constant. Hazard ratios are used to compare groups and are estimated by the regression models which treat the logarithm of the hazard rate as the function of a baseline hazard $h_0(t)$. The hazard ratio considers the absolute risk of out-migration to be 1, a ratio closer to this value means the event hazard is the same. Hazard ratio of 2 means that at any time, twice as many individuals in the group are having an event proportionality with regards to the comparator group.

Table 10: (Model 1): Cox Proportional Hazards Model (LSIC, 2001)

Model 1	Hazard Ratio	Std. Error	z	P>z	Coef.
Owner	0.61	0.07	-4.2	0	-0.49
(Log)Age	2.75	2.72	1.02	0.31	1.01
Age	0.96	0.02	-1.25	0.21	-0.03
Female	0.94	0.10	-0.51	0.61	0.05
Married	0.97	0.17	-0.13	0.89	-0.02

Given the complexity of issues that determine location and settlement choices, the first model (Model 1) includes only basic demographic variables like age, gender, marital and housing status. Model specification tests are used to verify that the models are adequately parameterized and that the survival time is well specified. A link test is used to select variables, they are tested for their explanatory power and the correct functional form. The total number individuals observed is 6,690 and the count for each individual is expanded to account for each month they are in Canada. The number of failures observed in the survival model is 311. P-values of the models are close to 0, giving reason to believe that model is statistically significant.

The results shows that owning a home decreases the probability of moving by at least a third. The z and p values associated shows that it is significant variable in predicting inter-provincial moves. The age variable and its log functional form do not appear statistically significant but have different directional effects. Including the variable ‘age’ by itself places a constraint on each additional year to affect the hazard by a multiplicative constant that is independent of the level of age. When the effect of age is modeled in a quadratic form, the results show that the relative hazard for out-migration increases until the age of 28 and decreases after that. Gender and marital status do not

show any particular statistical significance in out-migratory behavior. Although the variables 'female' and 'married' have a negative coefficient in the models, they are not independently statistically significant. This is interesting because married couples were initially expected to be less likely to out-migrate than unattached individuals given the added costs to mobility.

In Model 1 the hazard ratio for homeowners is 0.6 suggesting that that home owners are at least a third less likely to make out migratory moves compared to their non-homeowner counterparts. The hazard ratio for females (0.94) and married individuals (0.97) suggests they are not significantly different in likelihood of out-migration in comparison to their counterparts.

Table 11: (Model 2): Cox Proportional Hazards Model (LSIC, 2001)

Model 2	Haz. Ratio	Std.Err	z	P>z	Coef.
Home Owner	0.71	0.10	-2.44	0.02	-0.34
(Log)Income	0.99	0.03	-0.2	0.84	-0.01
Age	0.99	0.03	-0.36	0.72	-0.01
Age -Quadratic Form	1.00	0.00	0.09	0.93	0.00
Female	0.92	0.12	-0.66	0.51	-0.08
FamilySize	1.00	0.07	0.04	0.97	0.00
MiddleEastern	1.01	0.31	0.04	0.97	0.01
East Asian	1.53	0.38	1.72	0.09	0.43
SouthEastAsian	1.69	0.37	2.4	0.02	0.52
SouthCenAsian	1.52	0.32	1.99	0.05	0.42
African	2.04	0.51	2.82	0.01	0.71
SouthAmerican	1.12	0.45	0.3	0.77	0.12
FamilyClass	1.15	0.25	0.64	0.52	0.14
ProvNominee	2.16	1.55	1.08	0.28	0.77
BusinessImg	1.01	0.35	0.04	0.968	0.01
Refugee	2.81	0.63	4.59	0	1.03
Trade/College	1.24	0.30	0.88	0.38	0.21
Bachelors	1.88	0.47	2.52	0.012	0.63
Masters	2.15	0.62	2.66	0.008	0.77
Medical/PhD	2.75	0.99	2.82	0.005	1.01

The introduction of new independent variables does not change the coefficient on home ownership very much in this second model. The hazard ratios show that home owners are still at a significantly lower risk (71% HR) than non-homeowners to make inter-

provincial moves. The variable remains statistically significant. The martingale residual method is used to find the appropriate functional form of income. This method gives a visual indication of the transformation needed and the log transformation of income which shows a more linear smooth plot is chosen for inclusion in the model. As expected, income is negatively related to out-migration. Marital status is replaced by a variable capturing family size and shows that households with more than two members are less likely to be mobile. Stata by default uses the lowest value as the base level or omitted group. In the case of ethnicity, the base group or the omitted category is European. Immigrants from African countries project the highest hazard ratio of 2.22, and so exhibit the highest risk of inter-provincial moves. South East Asians and South Central Asians also appear relatively more mobile than other ethnicities.

In terms of immigrant categories, the base group or omitted category is skilled immigrants. Refugees and provincial nominees show a higher risk of inter-provincial mobility than do family class migrants and business migrants. The findings is in line with previous study by Simich et al (2002) which showed that refugees who arrive in a region as part of government policy or through sponsoring agencies find it disruptive to their integration and often move to areas with more suitable social networks and ethnic enclaves. After two months in Canada, 5% of them moved to a different city while roughly 2% of family migrants and economic migrants did so. Two years after landing, nearly 14% of refugees, 10% of economic migrants and 5% of family class migrants moved from their initial city of residence. Immigrants with higher education show a greater hazard for inter-provincial mobility. Those with Doctorate and Masters degrees appear twice as mobile as those with Bachelors or College degrees. Checks for shared

frailty are run among ethnic groups and immigration categories. The shared frailty test is used to see if there is unobserved frailty shared among groups of individuals. It may be thought of as random effects model for the survival data. The frailty test accounts for the presence of a latent multiplicative effect on the hazard function. In cases where the frailty is greater than one, the subjects experience a higher risk or an increased hazard and are said to be more frail than their cohorts. The results suggests that group level frailties are minimal among the observations.

CHAPTER 4: CONCLUSION

In conclusion, this paper aimed to contribute to the current debate on how best to reverse the demographic trends in Atlantic Canada. It hypothesized that home ownership status affects migration decisions and estimated the effect of demographic characteristics on inter-provincial migrations. It worked towards providing an empirical support to match immigrant characteristics with the features of Atlantic Canada and looked at geographic differences in housing prices as an incentive for migration and settlement decisions into the region. The findings show that owning a home has a negative effect on mobility, with home ownership decreasing the probability of moving provinces by a third. However, the study was characterized by limitations such as difficulty in controlling for reverse causality and heterogeneity. The anchoring effect of home ownership observed could be the effect in itself or the effect of unobservable variables that are correlated with both the decision to buy a house and to the extent they are successful in a labour market or respond to labour market shocks. Transaction and mobility costs are however significant and immigrants to Canada do show a high propensity to own their homes. They largely

tend to remain in the province of their primary residence and the effort to grow population base in Atlantic Canada should take this into account. The results of this paper show that there are differences in home ownership by admission category, education levels and ethnicity. The findings imply considerable accomplishments by many newcomers as they rapidly transition from renters to home owners with a majority of the population owning their homes by the end of four years in Canada. The scale of this attainment is impressive given that immigrants often face difficulties adjusting to a new society and labour market. The results suggest that Atlantic Canada can benefit from policies that promote home ownership as the positive externalities could lead to a much needed structural change in the economy and demographics of the region.

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